



Hydraulic Filtration Product Guide

Spin-ons • Cartridges • In-tank • Low Pressure • Medium Pressure • High Pressure • Duplex • Accessories



Donaldson Delivers Performance Under Any Pressure!

Clean, dry oil is essential for your equipment. Donaldson Company, a leader in filtration for over 90 years, has proven performance in thousands of applications – offering the industry's largest selection of replacement hydraulic, lube and gear oil filtration products for contamination control.

Distributed by:

Hydraulic Filter Housing Selection Guide

Locate the Donaldson model closest to the intersection of the maximum operating pressure and maximum flow rate. If there is not a model at the exact intersection, select the nearest series to the right or above the intersection to ensure a filter that is adequate to handle the maximum operating pressure and flow rate has been selected.

Pressure families are color coded in the selection chart for low, medium and high model series. Filter housing styles are identified by their shape.

Filter Housing Style Code



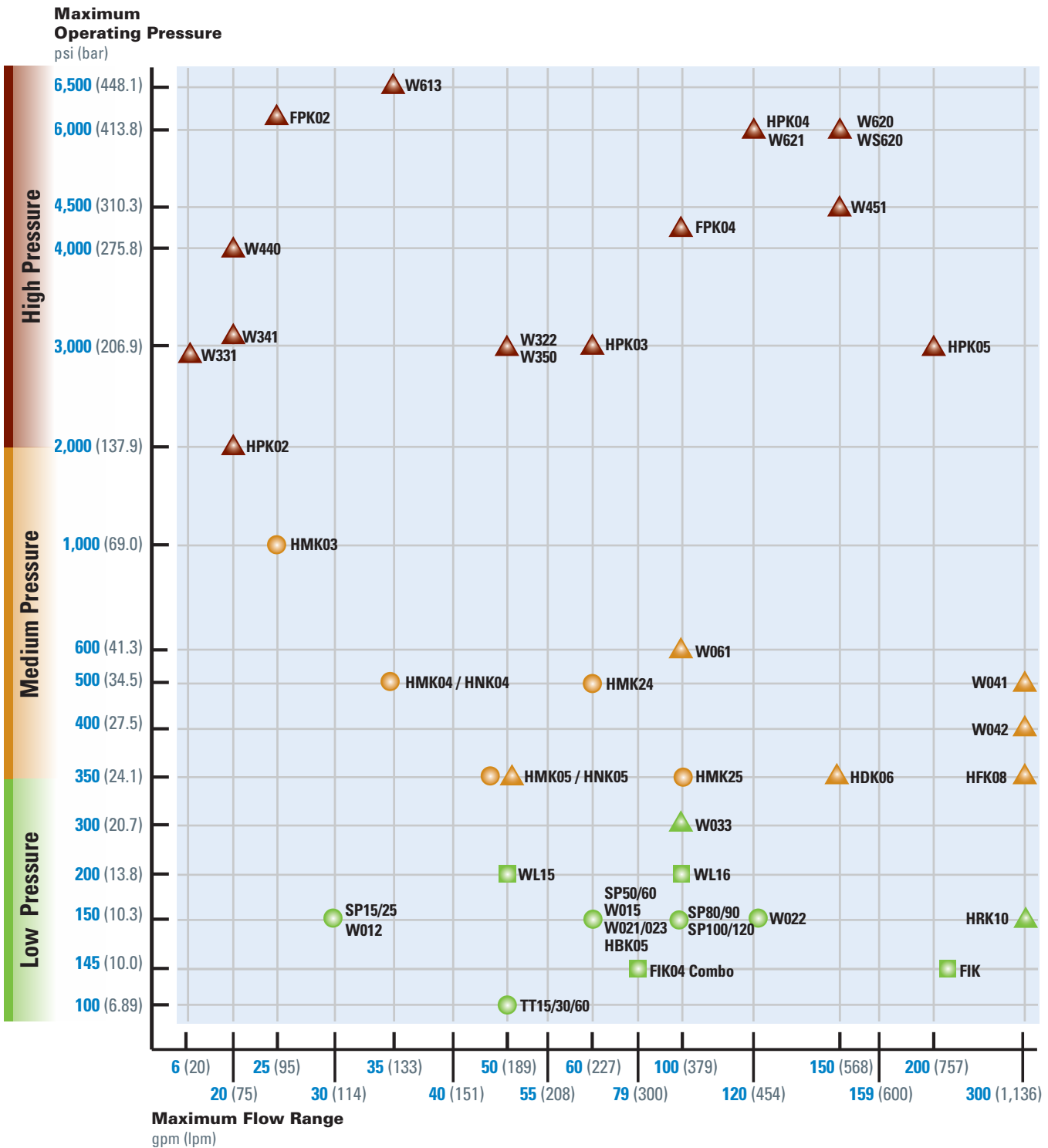
Spin-on



In-tank Housing / Cartridge



In-line Housing / Cartridge



Selecting the Proper Hydraulic Filter

Sensitive hydraulic circuits are vulnerable to a variety of contaminants that result in inefficiency, downtime and excessive repair costs. It is important to remember that protecting and maintaining the most sensitive components within a circuit will result in effective contamination control.

With the broad range of housing styles and filters available from Donaldson, how do you choose the right filter to reliably protect your systems and equipment? Follow these recommended steps to identify the correct Donaldson filter and parts required for efficient contamination control.

1 Determine the system operating pressure and flow rate

Start by identifying two key factors in the hydraulic system operating environment for the component being protected.

- nominal and maximum operating pressure
- nominal and maximum flow rate

2 Select the filter housing model

Refer to the *Hydraulic Filter Model Series Selection Guide* on the left to select the filter housing that meets your requirements.

- Pressure families are color coded for low, medium and high models.
- Housing styles are identified by their shape code: spin-on, in-tank and in-line
- Porting type options – see page 3 for model series details.

3 Consider application factors when selecting the filter

After the appropriate housing is identified, other application factors must be considered when selecting the appropriate filter. Use the filter choice tables to determine a specific part number.

- ISO Code
- fluid type
- oil viscosity (SUS/cSt) & temperature
- components being protected
- flow rate (GPM/LPM)
- maximum allowable pressure drop
- efficiency / beta rating
- seal options
- standard vs. high-performance filters
- servicing and installation convenience

4 Choose the appropriate line and reservoir accessories

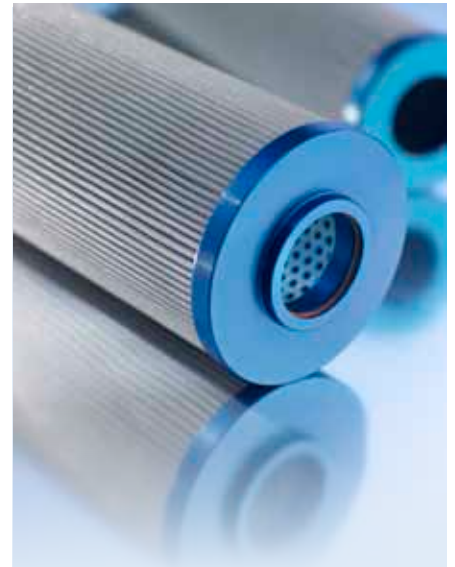
Items such as breathers, suction strainers, and gauges are important parts of an overall hydraulic system.

Refer to the Accessories Section for more information.

5 On-going contamination control practices

To optimize system performance and lengthen component life, new oil should be filtered before being transferred into a reservoir or gearbox. Monitor the condition of fluids and identify wear and contamination with regular fluid analysis.

Refer to the Off-Line Filtration and Fluid Analysis Sections for more information.



Looking for a Replacement Cartridge Filter?

Donaldson high-performance DT filters extend filter life, allow higher initial cleanliness and provide superior system protection.

DT cartridges are engineered to fit many competitive applications and are constructed to meet application housing requirements:

- standard collapse
- high collapse
- coreless

See the DT numberfinder cross reference on page 213.



How Donaldson Displays Filter Flow versus Pressure Loss Data

Pressure Drop (ΔP) Correction Formulae

To properly calculate pressure loss for viscosity and/or specific gravity, use the filter and housing formulae below to determine the clean filter assembly pressure drop.

Filter Correction Calculation

$$\Delta P_{\text{Filter}} = \Delta P_{\text{from graph}} \times \frac{\text{New Saybolt Seconds Universal Viscosity (SSU)}}{150} \times \frac{\text{New Specific Gravity (S.G.)}}{.90}$$

- or -

$$\Delta P_{\text{Filter}} = \Delta P_{\text{from graph}} \times \frac{\text{New Centistokes Viscosity (cSt)}}{32} \times \frac{\text{New Specific Gravity (S.G.)}}{.90}$$

Housing Correction Calculation

$$\Delta P_{\text{Housing}} = \Delta P_{\text{from graph}} \times \frac{\text{New Saybolt Seconds Universal Viscosity (SSU)}}{150} \times \frac{\text{New Specific Gravity (S.G.)}}{.90}$$

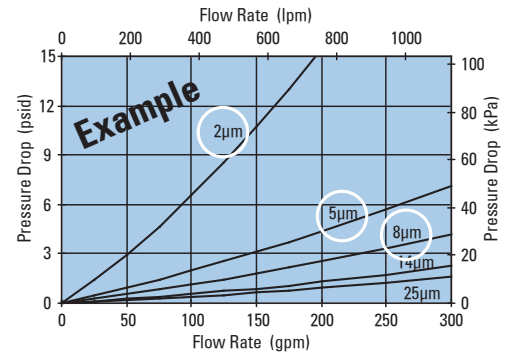
- or -

$$\Delta P_{\text{Housing}} = \Delta P_{\text{from graph}} \times \frac{\text{New Centistokes Viscosity (cSt)}}{32} \times \frac{\text{New Specific Gravity (S.G.)}}{.90}$$

Clean Filter Assembly Pressure Drop (ΔP) Calculation

$$\Delta P_{\text{Clean Filter Assembly}} = \Delta P_{\text{head}} + \Delta P_{\text{filter}}$$

Filter, Head or Housing/Assembly Reference



Performance Curve Notes

- All flow measurements were made with 32cSt [150 SSU] hydraulic oil at 100°F (37.7°C), fluid specific gravity of 0.9.
- The performance curves displayed are for the filter, head or housing assembly.
- Filter performance curves will either list media numbers or beta ratings (see circled areas on chart above). These labels correspond with the filter choice tables.

The Importance of Temperature in Determining Pressure Drop

Fluid viscosity plays an important role in restricting the flow through filters. It's crucial to select the proper filter to maintain adequate flow and avoid excessive pressure drops. Measured in centiStokes (cSt) or Saybolt Seconds Universal (SSU or SUS), fluid viscosity is the resistance of a fluid to flow (thickness of fluid). Low viscosity fluids pass through filters with less resistance than high viscosity fluids. Higher fluid viscosities have higher pressure drops due to higher resistance passing through the media. The colder the fluid, the higher the viscosity, so the lowest potential temperature of the fluid is the best measure for calculating pressure drop.

Use the chart below to determine the viscosity of the fluid to be filtered.

Oil Kinematic Viscosity Combined With Temperature in centiStokes (cSt)

| SAE Gear Oil | | 75W | | | 80W | 85W | 90W | | | 140W | | |
|-------------------------|-----|-----|-----|------|------|------|-------|-------|-------|-------|-------|-------|
| Hydraulic Oil ISO Grade | | 15 | 22 | 32 | 46 | 68 | 100 | 150 | 220 | 320 | 460 | 680 |
| °F | °C | | | | | | | | | | | |
| 248 | 120 | | | 3.7 | 3.5 | 5.7 | 7.3 | 9.3 | 11.7 | 14.7 | 18.2 | 22.9 |
| 230 | 110 | | | 4.4 | 5.5 | 7.0 | 9.0 | 11.7 | 14.9 | 18.9 | 23.7 | 30.2 |
| 212 | 100 | 1 | 4.5 | 5.4 | 6.8 | 8.8 | 11.4 | 15.0 | 19.4 | 25.0 | 31.8 | 41.1 |
| 194 | 90 | 3 | 5.3 | 6.7 | 8.5 | 11.2 | 14.8 | 19.8 | 26.0 | 34.1 | 44.0 | 57.9 |
| 176 | 80 | 5 | 6.5 | 8.5 | 11.0 | 14.8 | 19.9 | 27.1 | 36.2 | 48.2 | 63.3 | 84.8 |
| 158 | 70 | 6.2 | 8.5 | 11.1 | 14.8 | 20.2 | 27.7 | 38.5 | 52.4 | 71.1 | 95.2 | 130 |
| 140 | 60 | 8 | 12 | 15.1 | 20.6 | 28.7 | 40.2 | 57.2 | 79.6 | 110 | 151 | 211 |
| 122 | 50 | 11 | 15 | 21.5 | 29.9 | 42.9 | 61.5 | 98.7 | 128 | 181 | 254 | 365 |
| 104 | 40 | 15 | 22 | 32 | 46 | 68 | 100 | 150 | 220 | 320 | 460 | 680 |
| 86 | 30 | 21 | 32 | 50.7 | 75.6 | 116 | 175 | 271 | 409 | 613 | 907 | 1380 |
| 68 | 20 | 33 | 51 | 86.7 | 135 | 214 | 334 | 536 | 838 | 1290 | 1980 | 3130 |
| 50 | 10 | 52 | 87 | 162 | 264 | 438 | 711 | 1190 | 1920 | 3070 | 4870 | 8020 |
| 32 | 0 | 85 | 180 | 340 | 585 | 1020 | 1720 | 2990 | 5060 | 8400 | 13900 | 23900 |
| 14 | -10 | 185 | 375 | 820 | 1500 | 2770 | 4880 | 8890 | 15700 | 27200 | 47000 | 85000 |
| -4 | -20 | 400 | 800 | 2350 | 4650 | 9120 | 16800 | 32300 | 60000 | | | |

This publication contains a wide selection of standard, stocked and custom hydraulic housing models and replacement filters for both original equipment manufacturers and stationary equipment that operate in today's mobile and industrial environments. For variations on a hydraulic filtration system design, please contact your Donaldson supplier.

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PRODUCT INFORMATION



www.donaldsonfilters.com

Product Line Overview

Comprehensive Hydraulic Filtration Solutions

Low Pressure Filtration

Max operating pressure < 350 psi (24 bar)



Low pressure filters are the most commonly used type of filter in hydraulic circuits, used most often in return line applications.

Donaldson low pressure filters are rated for working pressures up to 350 psi (2400 kPa). In-tank and in-line configurations are available to accommodate virtually any application.

Medium Pressure Filtration

Max operating pressure < 2,000 psi (138 bar)



Medium pressure filters can be used in applications up to 2000 psi (13790 kPa). Donaldson offers both spin-on and in-line cartridge-style filters.

Donaldson Duramax® filters are the highest rated medium pressure spin-on filters available. Duramax filters are proven, reliable, long-lived and easy to install.

High Pressure Filtration

Max operating pressure < 6,500 psi (450 bar)



High pressure filters are positioned between pumps and critical components such as cylinders, motors and valves. They help protect these critical components from catastrophic failure.

Donaldson heavy-duty high pressure filters are rated for working pressures up to 6500 psi (44818 kPa). Various porting sizes and types, including manifold style, are available for a wide range of applications.

Product Line Overview

Comprehensive Hydraulic Filtration Solutions

Low Pressure Filtration
Pages 29-92

| Model Series | Max Flow gpm (lpm) | Max Pressure psi (kPa) / bar | Porting Size Options | Page # |
|----------------------------------|-----------------------|---------------------------------|--|--------|
| Spin-on Filters | | | | |
| SP15/25 | 30 (114) | 150 (1034) / 10.3 | ½", ¾" NPT, SAE-8, -12 O-ring | 30 |
| W012 | 30 (114) | 150 (1034) / 10.3 | ¾" NPT, SAE-12 O-ring | 34 |
| W015 | 60 (227) | 150 (1034) / 10.3 | SAE-20 O-ring | 38 |
| W021/023 | 60 (227) | 150 (1034) / 10.3 | 1¼" NPT, SAE-20 O-ring | 42 |
| HBK05 | 60 (227) | 150 (1034) / 10.3 | 1¼" NPT, SAE-20 O-ring | 46 |
| SP50/60 | 60 (227) | 150 (1034) / 10.3 | 1¼" NPT, SAE-20 O-ring | 50 |
| SP80/90 | 100 (380) | 150 (1034) / 10.3 | 1½" NPT, SAE-24 O-ring, 2" SAE 4-Bolt Flange Code 61 | 54 |
| SP100/120 | 100 (380) | 150 (1034) / 10.3 | 1½" NPT | 58 |
| W022 | 120 (454) | 150 (1034) / 10.3 | 1½" NPT, SAE-24 O-ring, 1½" SAE 4-Bolt Flange Code 61 | 62 |
| TT15/30/60 | 50 (190) | 100 (689) / 6.89 | ¾", 1½" NPT | 66 |
| In-tank Filters | | | | |
| WL15 | 50 (190) | 200 (1379) / 13.8 | SAE-24 O-ring, 1½" SAE 4-Bolt Flange Code 61 | 68 |
| WL16 | 100 (380) | 200 (1379) / 13.8 | 1½" NPT, SAE-24 O-ring, 1½" SAE 4-Bolt Flange Code 61 | 72 |
| FIK | 170 (639) | 145 (1000) / 10.0 | ½", ¾", 1" NPT, SAE-8,-12,-16,-20,-24 O-ring, 2" SAE 4-Bolt Flange Code 61 | 76 |
| FIK04 Combo | 79 (300) | 145 (1000) / 10.0 | Inlet: SAE-16, -20 O-ring, Outlet: SAE-16 O-Ring | 82 |
| In-line Cartridge Filters | | | | |
| W033 | 100 (380) | 300 (2068) / 20.7 | 1½" NPT, SAE-24 O-ring, 1½" SAE 4-Bolt Flange Code 61 | 84 |
| HRK10 | 300 (1136) | 150 (2413) / 10.3 | 4" ANSI Flange, 8-bolt 150# | 88 |

Medium Pressure Filtration
Pages 93-130

| | | | | |
|----------------------------------|------------|--------------------|---|-----|
| Spin-on Filters | | | | |
| HMK03 | 25 (95) | 1000 (6895) / 69.0 | SAE-12 O-ring | 94 |
| HMK04 | 35 (130) | 500 (3448) / 34.5 | ¾", 1" NPT, SAE-12, -16 O-ring | 98 |
| HNK04 | 35 (130) | 500 (3448) / 34.5 | SAE-12, -16 O-ring | 106 |
| HMK05 | 50 (189) | 350 (2413) / 24.1 | 1¼" NPT, SAE-20 O-ring | 102 |
| HNK05 | 50 (189) | 350 (2413) / 24.1 | SAE-20 O-ring | 106 |
| HMK24 | 60 (230) | 500 (3450) / 34.5 | SAE-20 O-ring, 1¼" SAE 4-Bolt Flange Code 61 | 98 |
| HMK25 | 100 (378) | 350 (2413) / 24.1 | 1½" NPT, SAE-24 O-ring, 1½" SAE 4-Bolt Flange Code 61 | 102 |
| In-line Cartridge Filters | | | | |
| W061 | 100 (379) | 600 (4137) / 41.3 | SAE-12, -16, -20 O-ring | 110 |
| HDK06 | 150 (568) | 350 (2413) / 24.1 | 2½" NPT | 114 |
| W041 | 300 (1136) | 500 (3450) / 34.5 | SAE-24 O-ring, 2" or 2½" SAE 4-Bolt Flange Code 61 | 118 |
| W042 | 300 (1136) | 400 (2757) / 27.5 | 3" SAE 4-Bolt Flange Code 61 | 122 |
| HFK08 | 300 (1136) | 350 (2413) / 24.1 | 3" NPT, SAE-20 O-ring | 126 |

High Pressure Filtration
Pages 131-212

| | | | | |
|----------------------------------|-----------|----------------------|--|-----|
| In-line Cartridge Filters | | | | |
| W331 | 6 (23) | 3000 (20685) / 206.9 | SAE-8 O-ring | 132 |
| HPK02 | 20 (75) | 2000 (13790) / 137.9 | SAE-12 O-ring | 136 |
| W341 | 20 (75) | 3000 (20685) / 206.9 | SAE-12 O-ring | 142 |
| W440 | 20 (75) | 4000 (27580) / 275.8 | SAE-12 O-ring or Manifold Mounting | 146 |
| FPK02 | 25 (95) | 6090 (42000) / 420.0 | SAE-12 O-ring | 150 |
| W613 | 35 (130) | 6500 (44818) / 448.1 | SAE-12, -16 O-ring, 1" SAE 4-Bolt Flange Code 61 or 62 | 156 |
| W322 | 50 (190) | 3000 (20685) / 206.9 | SAE-16 O-ring | 160 |
| W350 | 50 (190) | 3000 (20685) / 206.9 | SAE-12, -16 O-ring | 164 |
| HPK03 | 60 (227) | 3000 (20685) / 206.9 | SAE-12, -16 O-Ring | 168 |
| FPK04 | 100 (379) | 4350 (29993) / 299.9 | SAE-20 O-ring | 174 |
| HPK04 | 120 (454) | 6000 (41370) / 413.8 | SAE-20 O-ring, 1¼" or 1½" SAE 4-Bolt Flange Code 61 or 62 | 180 |
| W621 | 120 (454) | 6000 (41370) / 413.8 | SAE-20,-24 O-ring, 1¼" or 1½" SAE 4-Bolt Flange Code 61 or 62 | 188 |
| W451 | 150 (568) | 4500 (31027) / 310.3 | SAE-24 O-ring, 1½" SAE 4-Bolt Flange Code 61 or 62, Manifold Mounting | 193 |
| W620 | 150 (568) | 6000 (41370) / 413.8 | SAE-16,-20, -24 O-ring, 1¼" SAE 4-Bolt Flange Code 61 or 62 or 1½" Code 61 | 197 |
| WS620 | 150 (568) | 6000 (41370) / 413.8 | Manifold Mounting | 202 |
| HPK05 | 200 (757) | 3000 (20685) / 206.9 | 2" SAE 4-Bolt Flange Code 61 | 207 |

Product Line Overview

Comprehensive Hydraulic Filtration Solutions

Off-Line Filtration

The Donaldson Filter Cart, Filter Panel and Filter Buddy™ offer convenient off-line filtration, flushing and fluid transfer. Use them with your industrial and mobile equipment to achieve and maintain proper ISO cleanliness levels.

Filter Cart

Designed with performance, convenience and safety in mind. Includes value-added features to protect your machinery and equipment from breakdowns caused by contamination.

Filter Panel

Provides fixed/mounted offline filtration and a turn-key approach to supplemental filtration.

Filter Buddy™

This handheld portable system provides the capability to kidney loop reservoirs that you normally cannot reach with larger filter carts. Its small size and light weight allow for carrying up and down stairs and access into tight or confined spaces.



Replacement Filters

The Industry's Largest Selection of In-Stock Replacement Filters!

Donaldson offers a complete line of hydraulic filter heads and housings for low, medium, and high pressure applications. Spin-ons and cartridges are available in a wide range of filter medias.

When replacing another filter brand, our comprehensive and up-to-date cross-reference guide, available at crossreference.donaldson.com, can guide you through performance improvement possibilities.

Our worldwide network of authorized distributors is ready to serve you with their extensive experience with hydraulic circuits and with Donaldson filters. Most distributors stock our filters, and we have quick-ship programs so you can get the filter you need, when you need it.

To find a distributor near you, visit www.buydonaldson.com.



Product Line Overview

Comprehensive Hydraulic Filtration Solutions

Accessories

Accessories for hydraulic circuits, lines and reservoirs that will help you maintain proper ISO cleanliness levels.

Filter Service Indicators

- Service indicators to maximize filter life

Hydraulic Line Accessories

- Pressure gauges for monitoring system pressure
- Hoses and test points for sampling oil and determining ISO cleanliness levels
- Flanges to connect components
- Valves for system control

Reservoir Accessories

- Suction strainers help protect pumps from damage
- Diffusers for reducing aeration, foaming, turbulence and noise caused by return lines
- Sight and level gauges available, including plastic or steel screw-in styles for use in a variety of applications
- Plugs, caps and vents for small power units and gearboxes
- Filler breathers and caps come in chrome, zinc, epoxy-coated weatherproof finishes, and corrosion-resistance techno polymer – lockable, dipsticks and side-mount versions available.



T.R.A.P.[™] Breather Technology (Thermally Reactive Advanced Protection)

T.R.A.P. breathers provide fast-acting protection against airborne moisture and particulate contamination. They stop solid particulate down to 3 μm at 97% efficiency and prevent moisture from entering the reservoir. Water-holding capacity is regenerated with every oil return phase. This self-regenerating capability enables extended breather life.

Hydraulic Filtration Solutions

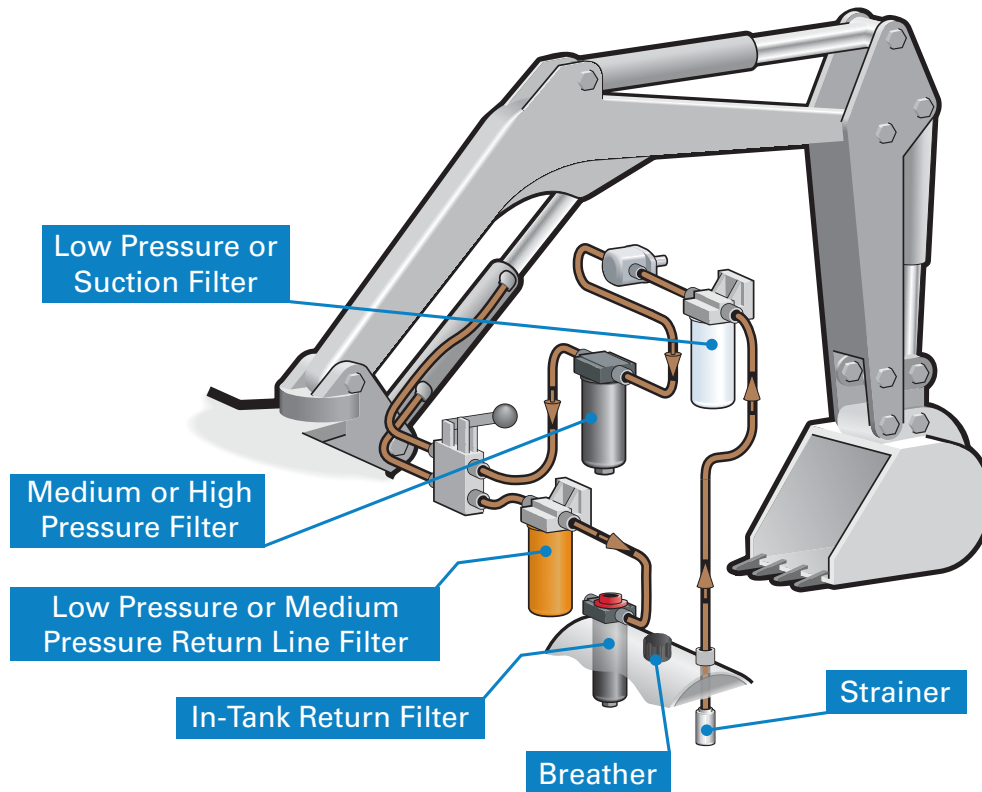
Engineered for Today's Industrial & Mobile Equipment



The best solutions for clean, dry oil.

Count on Donaldson to have the right filters, contamination control products and services to protect critical components in hundreds of applications – in the factory and on heavy-duty mobile equipment.

When you need hydraulic filtration, Donaldson delivers.



Full-Product Range

The industry's largest selection of in-stock filters and accessories – manufactured with consistent, high-quality performance.

Expert Technical Support

Prompt, accessible and knowledgeable customer service experts.

High-Performance Filtration

Increase dirt-holding capacity and lower ΔP with Donaldson high-performance DT filters.

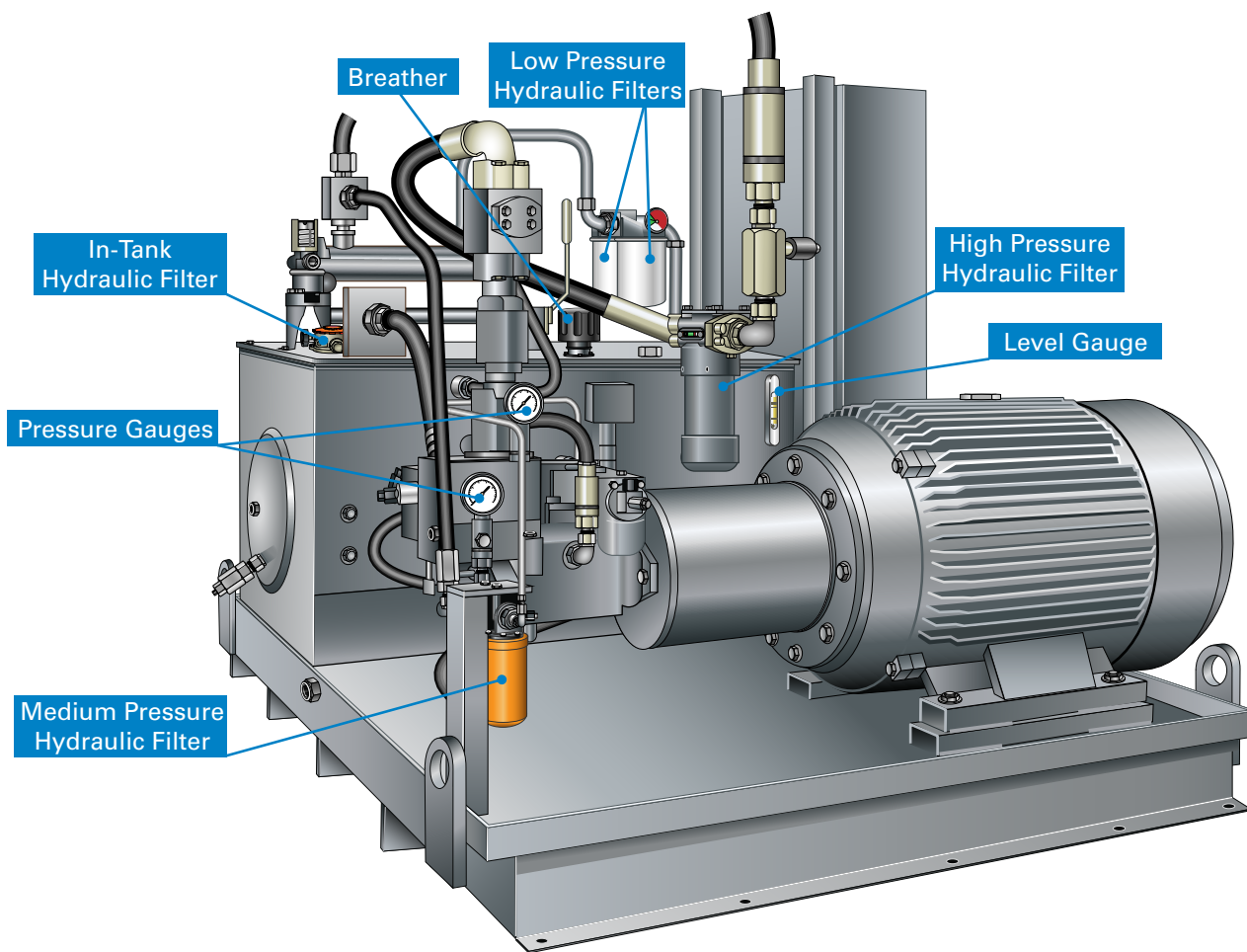
Hydraulic Filtration Solutions

Engineered for Today's Industrial & Mobile Equipment



any Performance Under Pressure

- Low, medium and high pressure filtration
- Spin-on, cartridge and in-tank style filters
- Hydraulic line and reservoir accessories
- T.R.A.P.™ reservoir breather technology



Off-Line Filtration

Filter carts, filter panels and Filter Buddy™ handheld filtration.

Water Removal

Systems and products designed to prevent water ingress and remove entrained water.


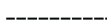
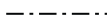



Vacuum Dehydrators & Coalescers

Quick removal of free water, dissolved water, particles and gases.




Common Fluid Power Symbols and Circuit Diagrams

Instrumentation and Pipeline Components

Lines

-  Continuous Line: Flow Line, Symbol Enclosure
-  Dashed Line: Pilot Line, Drain Line
-  Symbol Enclosure: Long and Short Dashes around Two or More Component Symbols
-  Flexible Hose
-  Lines Connecting
-  Lines Crossing



Circular

-  Large Circle: Pump, Motor
-  Small Circle: Measuring Devices
-  Semi-Circle: Rotary Actuator



Square

-  One Square: Pressure Control Function
-  Two or Three Adjacent Squares: Directional Control




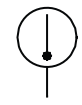
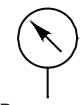


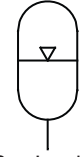
Diamond

-  Diamond: Fluid Conditioner (filter, separator, lubricator, heat exchanger)
-  Diamond with Dashed Line: Filter




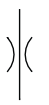


Triangle

-  Solid: Direction of Hydraulic Fluid Flow
-  Open: Direction of Pneumatic Flow

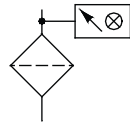
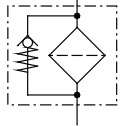
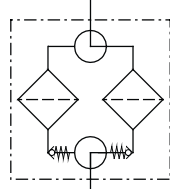
Miscellaneous Symbols

-  Spring
-  Flow Restriction
-  Connections to Tank
-  Temperature Gauge
-  Pressure Gauge
-  Test Point
-  Flow Meter
-  Gas Loaded Accumulator

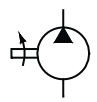
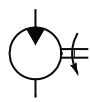
Isolation and Flow Control Valves

-  Isolator (Open)
-  Isolator (Closed)
-  Diverter Valve
-  Orifice (Jet)
-  Throttle Valve
-  Check Valve

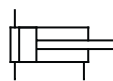

Filters

-  Filter with Visual Clogging Indicator
-  Filter with Bypass Valve
-  Duplex Filter with Check Valve

Pumps and Motors

-  Fixed Displacement Pump
Uni-directional Flow
Anti-clockwise Rotation
-  Fixed Displacement Motor
Anti-clockwise Rotation

Cylinders and Semi-rotary Actuators

-  Double Acting Cylinder
-  Bi-directional
Semi-rotary Actuator

Hydraulic Filter Locations

Comprehensive Selection of Filtration Solutions

Typical Hydraulic Circuit and Filter Locations



Filter Symbol in a Circuit



Pressure Line Filter

Protects high-pressure side components. Helps prevent component wear or failure brought about by debris in the system.



Suction Line Filter

Designed to remove particles in the 5 to 150 micron range. Easy to service and less expensive than other types of filters. Low by-pass valve use recommended to prevent pump starvation.



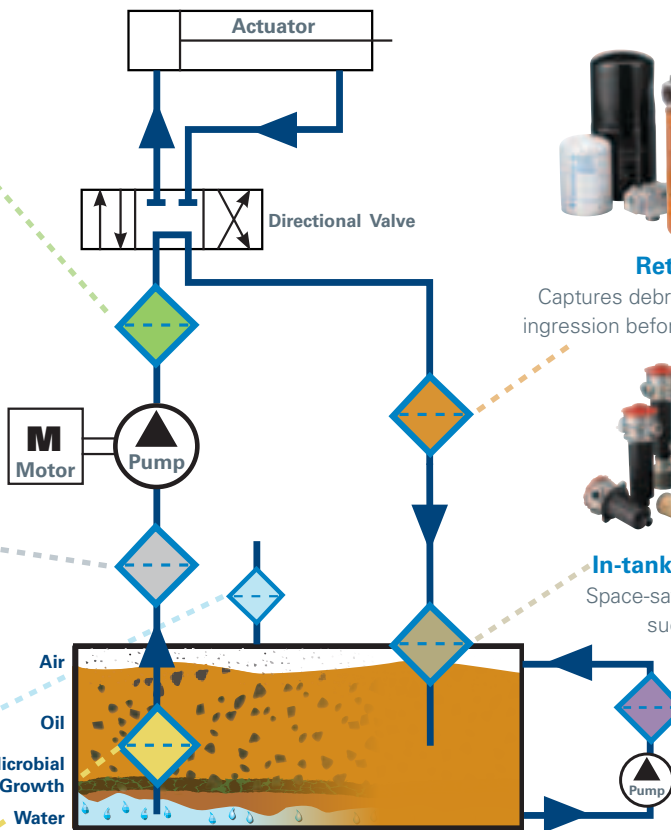
Reservoir Air Breather

Prevents ingress of airborne contaminants from entering the reservoir tank.



Suction Strainer

Removes large particles or objects built into the system during assembly or introduced during standard maintenance. Prevents catastrophic failure.



Reservoir Tank

Water in reservoir tanks is a serious threat to hydraulic systems. Dirt, particles and microbial growth are also common contaminants existing in tanks.



In-Line Accessories

Pressure gauges for monitoring system pressure. Hoses and test points for sampling oil and determining ISO cleanliness levels. Flanges and valves for system control.



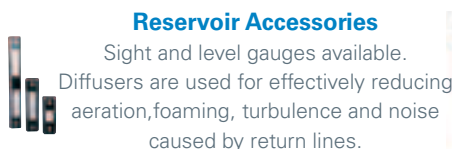
Return Line Filter

Captures debris from component wear or ingestion before it travels into the reservoir.



In-tank Return Line Filter

Space-saving in-tank return and suction line filters.



Reservoir Accessories

Sight and level gauges available. Diffusers are used for effectively reducing aeration, foaming, turbulence and noise caused by return lines.



Kidney Loop Filters

Off-line filtration supplements system cleanliness. Use with industrial and mobile equipment to achieve and maintain proper ISO cleanliness levels.

Industry Shaping Technology

Advanced Media Technology for Optimal Filtration Performance

Donaldson Media Formulations Set the Standard for Filtration Performance!

Donaldson offers extensive filter media technology choices for hydraulic filters – over 35 different formulations. These multiple formulations enable our engineers to develop filtration systems that meet or exceed a wide variety of customer specifications.



Synthetic media captures more and contaminants smaller than cellulose media. When an application requires higher efficiency filtration than what cellulose filter media can deliver, Donaldson uses Synteq™ synthetic media technology.

We use a variety of techniques to enhance filter media so it can withstand the high differential pressures found in typical hydraulic systems. Oven-curing, wire backing and multiple layers all contribute to our media integrity.

More detailed information on filtration media is available in the technical reference guide.

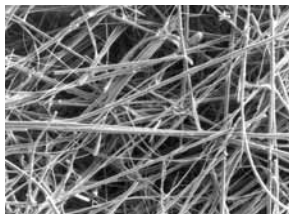
DT Synteq™ Synthetic Media (High-Performance)

DT grades of Synteq media utilize a blend of borosilicate glass fiber whose matrix is bonded together with an epoxy-based resin system. Donaldson filter media scientists found this to provide the best available chemical resistance for the broadest array of hydraulic applications. DT Synteq is ideal for use with phosphate ester and water glycol fluids.



Synteq™ Synthetic Media

This media's uniform synthetic fiber structure delivers higher filtration efficiency and longer filter life. Synteq™ filter media technology is ideal for synthetic fluids, water glycols, water/oil emulsions, HWCF (high water content fluids) and petroleum-based fluids. The smooth rounded fibers provide low resistance to fluid flow.



Cellulose Media

This media often has lower beta ratings, providing effective filtration for a wide variety of petroleum-based fluids. The smaller pores result in greater flow resistance, in turn causing higher pressure drop.

Water Removal Media

This media is formulated with desiccants and resins to remove moisture and condensation from petroleum-based fluids.

Wire-Mesh Media

Wire-mesh media consists of stainless steel, epoxy-coated wire mesh. This media is used to catch very large, harsh particulate that would rip up a normal filter. This media is also useful as a coarse filter in viscous fluid applications.

Filter Media Design & Development

From traditional cellulose to synthetic – the development of proprietary filtration substrates is at the heart of every Donaldson filtration system. If one of our existing media formulations does not meet our customer's specifications, our scientists use our in-house media development laboratory to develop new formulations that meet or exceed your requirements.

Media Characterization Testing

- Proprietary formulations
- Permeability
- Tensile strength
- Mullen burst
- Basis weight
- Pore size
- Thickness
- Gurley stiffness
- LEFS bench
- 3-Point bend

In-House Media Mill

- For application development
- Trial media production runs
- Development of proprietary formulations



Filtration Performance Testing

- Particle counting
- Multi-pass testing
- Water removal efficiency

Industry Shaping Technology Hydraulic Filtration Trends and Evolution

Hydraulic Filtration System Trends

Today's hydraulic systems are intolerant of corrosion, require higher cleanliness standards, and demand increased filtration performance. Hydraulic-powered vehicles and equipment owners desire the assumption of lower operation and ownership costs – a unique challenge that Donaldson understands.

Unique Filtration Systems

Donaldson continually strives to introduce new and effective filtration technologies that work within your engineering specifications and add customer value.

Low Pressure Systems

- Sensors, valves, and switches in a variety of styles and port sizes
- Unique filtration performance options
- Integrated mounting brackets
- Broad range of package sizes
- Custom design options

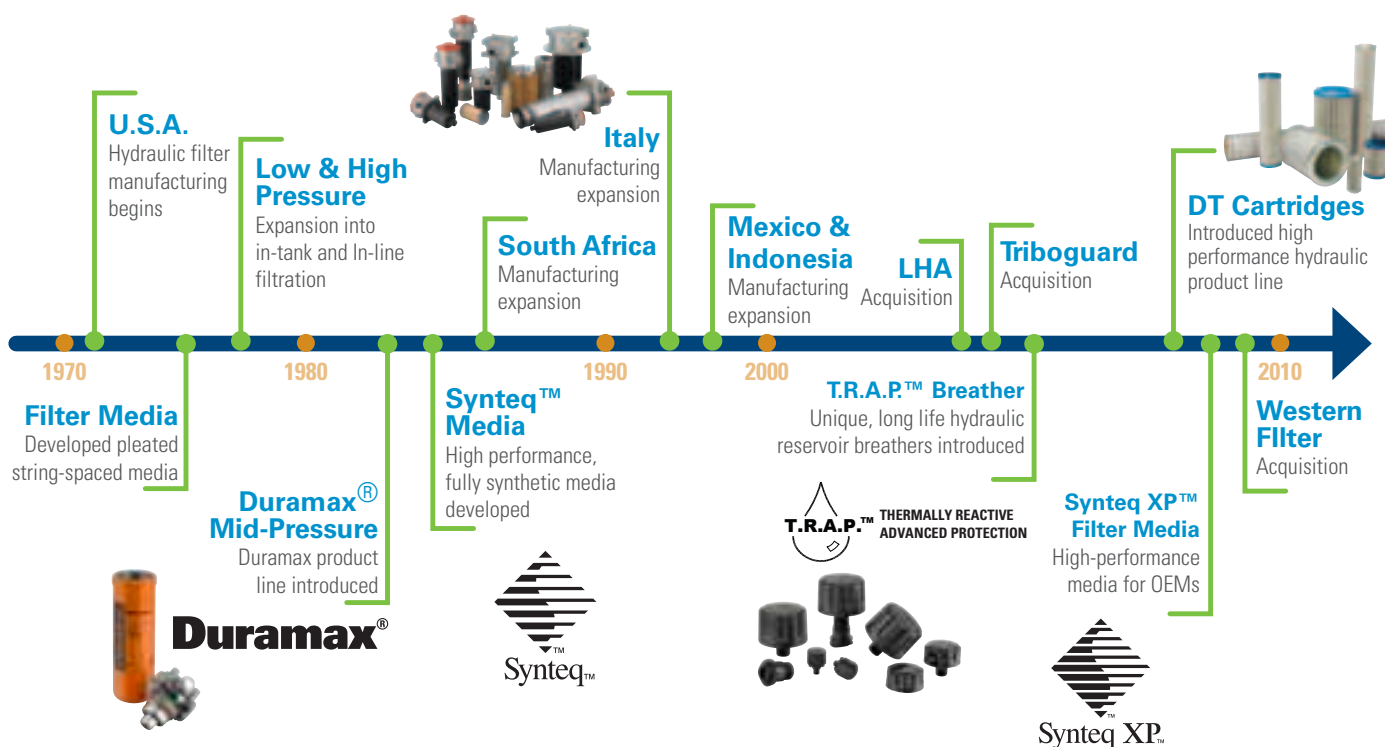
Medium Pressure Systems

- Die-cast and sand-cast custom head assemblies integrated into systems
- Enhanced system component protection
- Customized to existing filter interface – no system modification required

High Pressure Systems

- High-performance media options
- Synteq™ Filtration Media
- Material options - metal or plastic
- Multiple head interfaces

Hydraulic Filtration Design & Manufacturing Experience



Industry Shaping Technology

Global Design & Logistic Capabilities

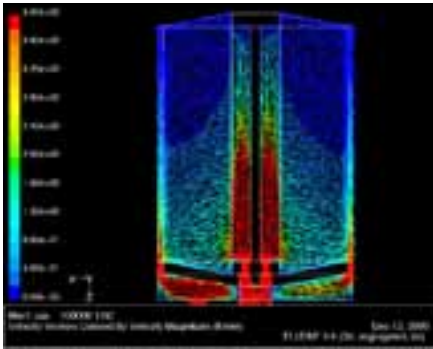
Donaldson has pioneered the use of a wide range of engineering, design and testing tools used during the product development and validation process.

Engineering Capabilities

- Design centers in three key regions – United States, Asia and Europe

Prediction and Simulation

- CAD
- Media modeling
- Fluid mechanics
- Structural analysis
- Thermal analysis



Development and Validation

Filter Durability

- Filtration performance testing per applicable SAE and ISO standards
- Fabrication integrity
- Environmental conditions
 - Salt spray and thermal cycling
- Pressure fatigue
- Flow fatigue
- Hydrostatic burst
- Flow benches
- Vibration benches
- Gravimetric analysis

Rapid Prototyping

- SLA, SLS
- Investment casting
- RTV molding

Test & Evaluation Tools

Structural Analysis

- Per SAE, ISO, and NFPA standards
- Burst
- Collapse
- Pressure impulse and fatigue

Tensile Compression

- Used to test material, component and assembly properties

Environmental Chambers

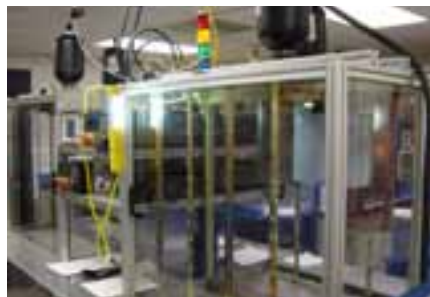
- Allows testing at hot or cold temperature, with humidity control

Flow Test Benches

- Allows measurement of static and dynamic flow and restriction for a device
- Allows calculation of device restriction at varying flows and temperatures
- System simulation

Filtration Performance Testing

- ISO, SAE, NFPA
- Customer standards
- Contaminant (particle or water) removal efficiency
- Contaminant capacity



Analytical Chemistry Laboratory

- Optical microscopy
- Scanning electron microscopy (SEM)
- Chemical analysis
- Fourier transform infrared (FTIR)
- Gas chromatography (GC/MS)
- Thermal analysis (DSC, TGA)
- Liquid chromatography



Design Validation

- Test cell locations in three key regions
 - United States, Asia and Europe
- High viscosity ΔP
- High temperature
- Flow fatigue
- Used oil analysis
- Component durability
- 24/7 durability testing
- Web-based test cell monitoring access
- Fluid compatibility



Vibration/Shaker

- Multiple benches
- Performance vibration with flow test
- Can apply random, shock or custom variable vibration profiles
- Capable of hot or cold tests

Field Testing

- On and off highway
- Heavy-duty
- Tests conducted on both end user and OEM applications

Field Data Acquisition

- Real time measurements
- Remote communications
- On-line collection tools
- Review daily, weekly and monthly reports to analyze operational trends

Quality Certified

- All facilities are ISO/TS certified

Quality Controls

- Consistent, reliable product
- On-site verification test units and equipment
- Part number specific PLC controls
- Manufacturing dates for tracking and warranty

Manufacturing

Locations for Liquid Filtration

- United States, Canada, Mexico, Europe and Asia-Pacific
- Located strategically with global partners



Base Component Materials

- Built for long-life, durability, corrosion resistance and liquid compatibility
- Metal and non-metal materials
- Methods to enhance media durability include oven-curing, wire backing and multiple layered media



Packaging Options

- Returnable packaging
- Heavy-duty packaging
- Pallets ISPM-15 compliant for international routing

Logistics / Distribution

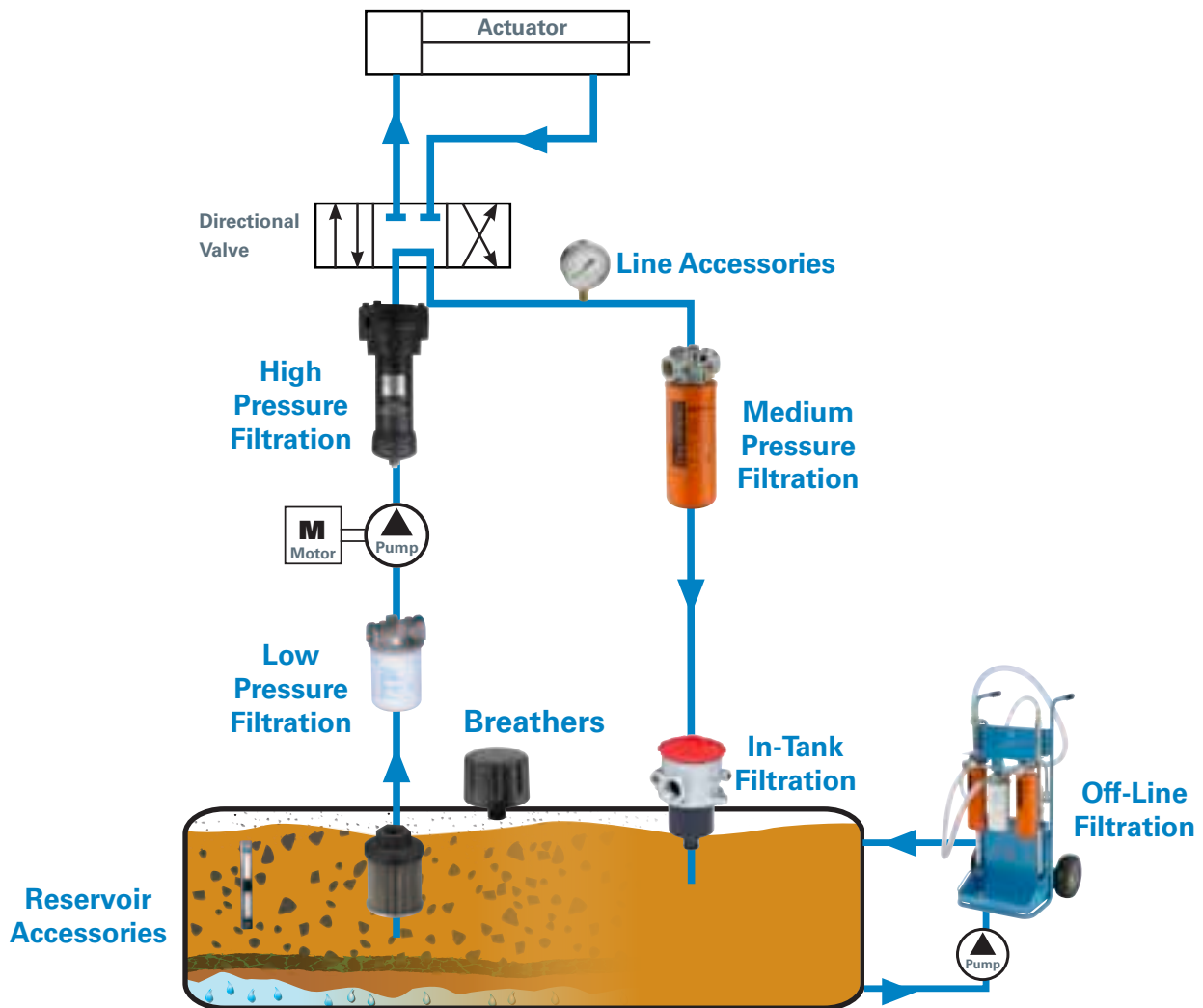
Donaldson has established a global distribution network to serve our customers locally and around the world. We operate as a global company with a network of primary distribution locations that support a mature hub of regional distribution centers and warehouses.

Donaldson distribution centers are strategically located around the globe to quickly and accurately deliver filtration and exhaust products wherever replacement products are needed. We work with a network of transportation, third party logistics companies, consolidators and cross-docking facilities to meet or exceed our customers' requirements.

Customers around the world benefit from our umbrella of distribution centers. We focus our efforts on local support and the capabilities of our staff. We continue to make significant investments in facilities, systems, supply chain relationships and staffing to offer the best order fulfillment options available.

Performance Under ^{any} Pressure

Donaldson hydraulic filters and accessories reduce a broad range of contaminants to keep sophisticated equipment running smoothly, resulting in efficient systems with superior performance. Whether it's located outdoors on equipment or inside a crowded manufacturing plant, hydraulic components need clean hydraulic and lubrication oil for maximum life and optimal productivity.



Tech-Tips for Hydraulic-Powered Vehicles and Equipment Owners

Catch-up on the latest information!

The Shoptalk section contains maintenance tips, cost reduction ideas, product features and benefits.

If you're interested in receiving Shoptalk, sign up at www.shoptalk.donaldson.com. Shoptalk is available as direct mail cards or email. New topics and tech-tips are sent out 3-4 times a year.

3.5" x 7" card deck sent out in packs of 4



Email Version



On-line Collection www.shoptalk.donaldson.com



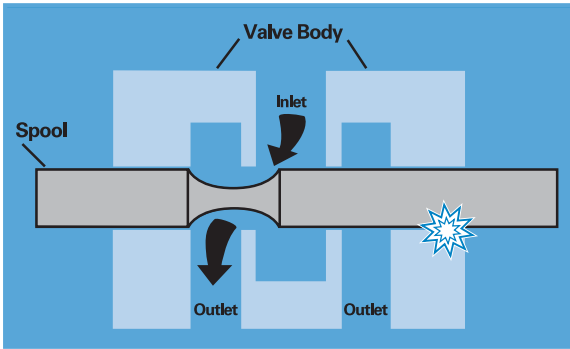
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SHOPTALK INFORMATION



www.shoptalk.donaldson.com

Hydraulic Components Need Protection



This illustration of a simple hydraulic valve shows how particles damage components. If a particle lodges between the spool and valve body, it will erode small flakes from the metal surfaces. As these flakes are moved back and forth by the action of the spool, they can roll into a burr that jams the spool and disables the valve.

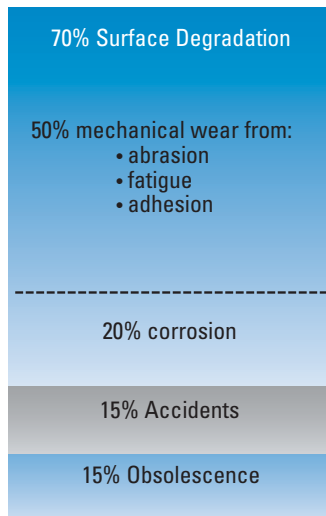
Protect Precision Parts from Contamination Damage and Hydraulic Failures

Good filtration needs to be an integral part of the hydraulic circuit to ensure long life and the proper operation of pumps, valves and motors. Hydraulic circuits are designed in all shapes and sizes, both simple and complex in design, and they all need protection from damaging contamination. Abrasive particles enter the system and, if unfiltered, damage sensitive components like pumps, valves and motors. It is the job of the hydraulic filter to remove these particles from the oil flow to help prevent premature component wear and system failure. As the sophistication of hydraulic systems increases, the need for reliable filtration protection becomes ever more critical.

Typical Factors in Component Life

Studies show that most (typically 70%) of hydraulic component replacement is necessary because of surface degradation, and most of that is due to mechanical wear.

Proper filtration of hydraulic fluids can lengthen component life. Don't cut costs by eliminating hydraulic filters. It could cost you more in the long run in major component repair!



Ref: Shoptalk Card F115306

Where does Hydraulic System Contamination Come From?

Sources of Hydraulic System Contamination

New oil out of shipping containers is usually contaminated to a level above what is acceptable for most hydraulic systems. Never assume your oil is clean until it has been filtered. There are a surprising number of different sources of system contamination in hydraulic filtration.

New Fluid – most new fluid is not acceptable for use in hydraulic systems and must be filtered first. Learn how in the off-line filtration section (page 299).

Built-In – contamination introduced into the system during the manufacture, assembly and testing of components

Ingressed – external ingress of atmospheric contamination; air condenses and water is released into the reservoir

Induced – particles introduced during normal maintenance or system operation

In-Operation – wear generation contamination caused by the pump, actuators, cylinder or the hydraulic motor

Rubber and Elastomers – degradation of rubber compounds and elastomers products

High Water Based Fluids – supports biological growth

Replacement of Failed Components – failure to thoroughly clean conductor lines after replacing a failed pump

Types of Contaminant

Many different types of contamination may be present in hydraulic fluid. Contaminants grind and wear at the surface of moving parts, introducing even more particles into the system. These contaminants cause more than 70% of all hydraulic system downtime.

- particulate – ingressed and built-in (dust, dirt, sand, rust, fibers, elastomers, paint chips)
- wear metals, silicon, and excessive additives (aluminum, chromium, copper, iron, lead, tin, silicon, sodium, zinc, barium, phosphorous)
- water
- sealant (tape, pastes)
- sludge, oxidation, and other corrosion products
- acids and other chemicals
- biological and microbial



Scratches along the inside surface of a hydraulic cylinder reveal component damage caused by contaminants.

Ref: Shoptalk Card F115305

Understanding the Beta Rating System

This information is provided as an aid to understanding fluid filter efficiency terminology based on current ISO, ANSI and NFPA test standards. It is not proprietary and may be reproduced or distributed in any manner for educational purposes.

What Is Beta Ratio?

Beta ratio (symbolized by β) is a formula used to calculate the filtration efficiency of a particular fluid filter using base data obtained from multi-pass testing.

In a multi-pass test, fluid is continuously injected with a uniform amount of contaminant (i.e., ISO medium test dust) then pumped through the filter unit being tested. Filter efficiency is determined by monitoring fluid contamination levels upstream and downstream of the test filter at specific times. An automatic particle counter is used to determine the contamination level. Through this process an upstream to downstream particle count ratio is developed, known as the beta ratio.

The formula used to calculate the beta ratio is:

$$\text{Beta ratio}_{(x)} = \frac{\text{particle count in upstream fluid}}{\text{particle count in downstream fluid}}$$

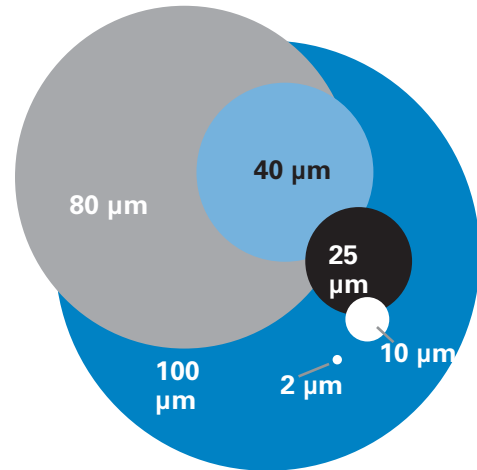
where (x) is a given particle size

Indicates that testing was done with APC's calibrated with NIST fluid

$$\beta_{10(c)} = 1000$$

1000 times more particles upstream than downstream that are 10 μm and larger

How Big is a Micron?



Micron Sizes of Familiar Particles

| | |
|---------------------------|-------------------|
| Grain of table salt | 100 μm |
| Human hair | 80 μm |
| Lower limit of visibility | 40 μm |
| White blood cell | 25 μm |
| Talcum powder | 10 μm |
| Red blood cell | 8 μm |
| Bacteria | 2 μm |
| Silt | <5 μm |

Hydraulic Oil Test Kits

The Advanced Fluid Analysis Kit is designed to monitor component wear, contamination and fluid condition.

Advanced Hydraulic Oil Test Kit

Kit X009330

| |
|---|
| 24 Metals by ICP |
| Water by Karl Fischer, ppm |
| Viscosity at 40°C or 100°C |
| Oxidation/Nitration by FTIR |
| Total Acid Number |
| ISO Particle Count/Particle Quantifier |
| Sample Extraction Pump Part #P176431 |
| Sample Extraction Tubing Part #P176433 |

Our basic hydraulic oil kit reports TAN (total acid number), water in PPM and ISO particle count.

Basic Hydraulic Oil Test Kits

- 1- Basic Use Kit X007374
- 2- Correct Drain and ISO use Kit X007377

| | 1 | 2 |
|--------------------|---|---|
| Metals, ppm by wt | ◆ | ◆ |
| Viscosity, cSt. | ◆ | ◆ |
| Water % | ◆ | |
| TAN (Total Acid #) | ◆ | |
| Water, ppm | | ◆ |
| ISO Particle Count | | ◆ |



Kit X007377 for basic hydraulic oil analysis

Recommended Sampling Interval

Industrial / Stationary

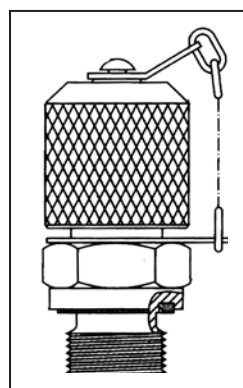
| | |
|---------------|---------------------|
| Transmissions | 500 hours / monthly |
| Geared Drives | 500 hours / monthly |
| Bearings | 500 hours / monthly |
| Hydraulics | 500 hours /monthly |

Oil Sampling Accessories

These accessories can simplify your oil analysis during normal maintenance routines.



Sampling Pump (P176431) & Plastic Tubing (P176433) sold separately in 100 ft. rolls



Quick Sampling Metal Valve for test point. 1/8" NPT (P563212)
Working Pressure
5800 psi / 400 bar

Ref: Shoptalk Card F11523

Watch Out for Dents on Liquid Filters!



Dents in a steel filter canister create a concentration of stress—making the canister more susceptible to fatigue.

Dents May Cause Cracks

Cracked filters can be caused by dents made during improper installation. Filters that are dented prior to or during installation should not be used. Filters dented after installation should be replaced immediately. The cost of replacing a dented filter is much less than the cost of the damages that could result from a dented filter that fails during service.

Filter fatigue results from pressure pulses within the system. Pressure is regulated by a pressure regulating valve. This valve is spring operated and intermittently opens and closes to regulate pressure. Once pressure exceeds the setting of the spring in the regulating valve, the valve will open and relieve pressure until the spring can expand and close the valve. This function is repeated continuously during operation of the system, creating a pulsing effect. Filter canisters are subjected to the same pulsation. However, unlike the spring in the pressure regulating valve, canister material is susceptible to failure after such fatigue.

Filters are designed with a low carbon steel to resist fatigue and are formed so the stress created by the pulses in the system are equalized over the surface area of the canister. A dent provides an area of stress concentration where pressure pulses can greatly shorten the fatigue life of the canister.

If you receive filters that were dented prior to your receipt, you should contact Donaldson customer support for corrective action.

More information is available through the Filter Manufacturers Council at:
<http://www.filtercouncil.org/techdata/tsbs/97-8R1.html>

Ref: Shoptalk Card F115275

Watch Out for Old Compression Gaskets!



When changing any filter that has a gasket — use caution as old gaskets may stick!

A compression seal is a means of preventing migration of liquids, gases or solid contaminants across a joint or opening in an assembly or housing. A seal not only prevents the escape of fluid from inside and foreign material from entering the system from outside, but it must provide for easy installation and removal. A new gasket is critical for proper filter function.

Remember ...

- Remove used gaskets and clean the sealing area thoroughly
- Always use a new gasket with a replacement filter
- Over-tightening the filter may damage the head
- Dispose of used filters properly

More information on compression gaskets can be found at the Filter Manufacturers Council at www.filtercouncil.org/uploads/docs/TSB/English/94-4R2.pdf

Ref: Shoptalk Card F115233

How Clean is Your Oil?

Donaldson Hydraulic Filter
Synteq™ Media

Standard Hydraulic Filter
Cellulose Filter Media

New, Unfiltered Hydraulic Oil



Amount of contaminant in 100 gallons hydraulic oil

| ISO 14/9/3 | ISO 19/17/14 | ISO 22/21/18 |
|----------------|----------------|-----------------|
| .004 gram dust | .363 gram dust | 4.73 grams dust |

Contamination Levels of Different ISO 4406 Codes Vary Dramatically.*

New, unfiltered hydraulic oil can contain 1,000 times more contaminant than oil that has passed through filter media.

Protect your hydraulic system from costly repairs and downtime with Donaldson hydraulic products with Synteq™ filter media technology – designed to meet equipment filtration requirements and strength needs!

Prevent Catastrophic Damage to Your Expensive Equipment

Hydraulic Pump Exposure to Dirt

| Synteq™ Media | Cellulose Media | New Hydraulic Oil |
|---------------|-----------------|-------------------|
| ISO 14/9/3 | ISO 19/17/14 | ISO 22/21/18 |
| .03 lbs | 2.5 lbs | 32.5 lbs |
| 12.5 grams | 1,125 grams | 4,750 grams |

Amount of contaminant that passes through a 25 gallon hydraulic reservoir with a 25 gpm pump running for a period of 500 hours.

* Derived from the ISO 16889 test standard with NIST certified on-line automatic particle counters and ISO medium test dust (assumes spherical particle shape and lower bound diameter for test dust). Actual results may vary.

** Achieved with $\beta_4(c) \mu m > 1000$ Synteq™ media technology.

Ref: Shoptalk Card F115284

High-Performance DT Cartridges Deliver Uptime Protection



Using Donaldson Synteq™ media technology, DT filters extend filter life, allow for higher initial cleanliness and provide superior system protection.

Premium Uptime Protection

Every hydraulic system has suspended particles in its fluid. Contaminants grind and wear at the surface of moving parts, introducing even more particles into the system. These contaminants cause more than 70% of all hydraulic system downtime.

Donaldson high-performance DT cartridge filters provide better protection from the particles and contaminants that reduce the effectiveness of lubricant and hydraulic fluid.

DT filters are ideally suited for a variety of demanding applications, including:

- heavy-duty mobile equipment
- in-plant hydraulics
- transmissions
- bearing lube oil systems

DT high-performance hydraulic cartridges provide 73% higher dirt-holding capacity and 47% lower initial pressure drop than traditional filters – with micron ratings down to 2 µm.

Donaldson DT filters are engineered to fit many competitive applications, including Fairey Arlon, Hydac, Pall, Parker, PTI/Mahle and Schroeder.

For a complete list of replacement part numbers, visit www.crossreference.donaldson.com.

Ref: Shoptalk Card F115304

T.R.A.P.™ Moisture Vapor with Breathers for Hydraulic Reservoirs



Water has a way of sneaking into hydraulic circuits, which can cause damage. Minimize moisture with the Donaldson Thermally Reactive Advanced Protection (T.R.A.P.™) Breather.

Features and Benefits

- Minimize water in your system – T.R.A.P. breather strips moisture from the incoming air, allowing only dry air to enter the hydraulic circuits
- Maximize system uptime – T.R.A.P. media regenerates its water holding capacity for longer service life
- Hydraulic reservoir can breathe – the T.R.A.P. doesn't restrict air flow

Fast-acting Breather Eliminates Moisture from Hydraulic Reservoirs

- Extended service life (exhales moisture and refreshes its holding capacity on each cycle)
- Reacts instantly to conditions in the hydraulic circuit, creating a moisture barrier without impeding airflow
- Reduced maintenance costs
- Thermally reactive barrier that removes moisture at relative humidity levels as low as 15%
- Superior moisture blocking and particulate filtration down to 3 µm at 97%
- Will not freeze in winter

Ref: Shoptalk Card F115241

Filter Recycling

Donaldson encourages all individuals and businesses to recycle their used hydraulic filters. Recycling used hydraulic filters helps divert waste from landfills while providing a valuable resource for recycling. We encourage you to check your local disposal regulations for proper disposal and recycling.

Industry Resource: The Filter Manufacturers Council

Established in 1971, the Filter Manufacturers Council represents North American manufacturers of vehicular and industrial filtration products. Initially developed to monitor regulatory and technological developments that affect the industry, the Council has since expanded its activities substantially.



www.filtercouncil.org

The Council has undertaken several environmental initiatives including partnering with states to promote the proper management of used oil filters. In addition, the operation of the hotline and web site provide valuable information regarding state regulations and companies that transport, process and recycle used oil filters.

Donaldson Company is a member of the Filter Manufacturers Council.

Do You Store or Warehouse Filters On-Site?

Whether it's an empty trailer or building, it's important to practice good storage and handling techniques when it comes to filters.

Before installing any filter on a piece of equipment make sure the filter is clean, unused and free of damage.

Filter Storage Tips and Recommendations for Contamination Control

- Never store a filter on a shelf without it being in a box or totally sealed from outside contaminant.
- When you see an open box of filters on the shelf, tape it shut—unless the filters inside the box are individually sealed.
- Handle filters with care to prevent filter damage; for example, don't throw filters into the back of a truck.
- If transporting filters from one job site to another, don't let them roll around on the floorboard or in the back of a truck as it may damage the filter.
- Metal storage shelves may cause condensation to form on filters if sitting directly on metal. Over time the filter may get rusty. This is another good reason to store filters in boxes.
- If a product box has layers of contaminant, take care that the contaminant doesn't get on the new filter as you remove it from the box.
- Practice "first-in, first-out" with your inventory. When possible, always use the oldest inventory first.
- Make sure labels with product information and manufacturing dates are visible to personnel selecting from the shelves.

Ref: Shoptalk Card F115285

HRK10 at a Paper Mill



HRK10 Duplex

- Industry:** Paper
- Problem:** Collapsing Competitive Filter Elements on PMO Circuit
- Solution:** Donaldson HRK10 Duplex
Donaldson High-Performance DT Cartridges

Donaldson Company was contacted by an upper Midwestern paper mill. This paper mill called Donaldson and our Distribution Partner for assistance with filter collapse in existing competitive filter housings that resulted in contamination of the main lube circuit. In addition, the filtration system, using 8300 competitive style housings, was inefficient and didn't offer a bypass option. The mill runs a demanding 24/7 operation with minimal shutdown opportunities, but the company had a major maintenance shutdown (20 hours max) scheduled, which provided a narrow window of opportunity for Donaldson and our Distribution Partner to shine.

The mill found a solution in Donaldson's new HRK10 filter housings and Donaldson high-performance DT filters. Four HRK10 units were configured in a duplex arrangement. Donaldson DT B5(c)=1000 filter elements were installed and are currently achieving an ISO cleanliness level of 16/14/11. Routine oil samplings upstream and downstream continue to confirm great results. Through the joint efforts of Donaldson Company and our Distribution Partner, we delivered an economical solution which created a new relationship and happy customer.

T.R.A.P.™ at a Coal Plant



T.R.A.P. Breathers

- Industry:** Power Generation
- Problem:** Short Life of Desiccant Breathers and High Maintenance
- Solution:** Donaldson T.R.A.P. Breathers

A coal-fired power plant in northeast Florida is always looking for a better way to protect its equipment and reduce downtime. The desiccant breathers that this around-the-clock operating facility was using to keep water and dirt out of its gearboxes required frequent change-outs. Gearboxes in the hot, humid air of the southeastern United States need robust and reliable protection against atmospheric moisture. The plant needed a breather that would work better and last longer than the desiccant breathers they were using. The plant's Predictive Maintenance Technician found a solution in Donaldson's T.R.A.P. breather – an advanced breather technology that provides unbeatable system protection and lasts longer.

By installing T.R.A.P. breather filters on its gearboxes, the power plant has extended breather filter life by over 50%. "We test our oil frequently, our current breathers are working well, but the T.R.A.P. breathers are working longer," says the PdM Tech. Unlike desiccant breathers that absorb and hold moisture resulting in shorter life, Donaldson's Thermally Reactive Advanced Protection (T.R.A.P.) senses and begins to remove moisture at only 15% relative humidity. Unlike desiccant breathers that require frequent changeouts, a T.R.A.P. breather exhales moisture with every flow cycle, regenerating its water-holding capacity and resulting in longer breather life.

HMK25 at a Gold Mine



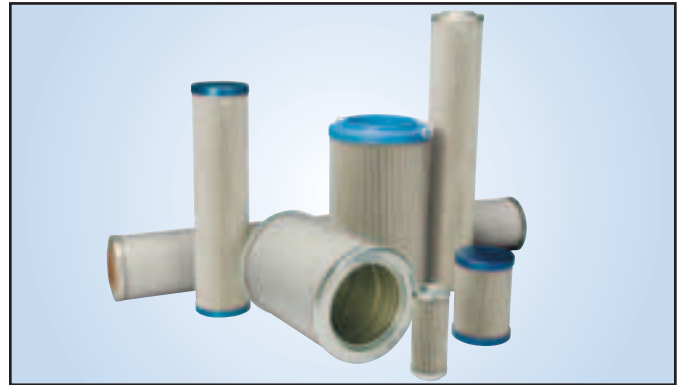
HMK25 Spin-On Filter

- Industry:** Mining
Problem: Gyro Crusher Seizure due to Oil Starvation
Solution: Donaldson HMK Duramax

The relationship between a rock crusher rebuilder and Donaldson began after a 36" Telsmith gyro crusher was reconditioned and put back into service at a South African gold mine. Within weeks of its return (and while still under warranty), the crusher seized. It happened on a cold morning shortly after start-up. There was no warning of any oil pressure problem and no obvious reason for the failure. Oil starvation was quickly identified as the cause of seizure—but what was the cause of the oil starvation? The first part of the investigation determined that a pressure switch was on the pump side of the filter instead of beyond the filter. Donaldson redesigned the entire filtration system.

"We went for a double head HMK25 filter system, 380 lpm at 24 bar. We also dropped the filter media from 60 µm down to 20 µm." The oil used was a non-foaming 150 cSt gear oil. However, at 0°C the viscosity is 2990 cSt. "The viscosity goes up exponentially. On a cold morning, if the guys start up their crusher straight away, that oil is not going through the filters easily." The Donaldson-modified system was implemented and the crusher was successfully put back into service. "It has worked 100% for a year now. They are changing the Donaldson filters at 1000 hour intervals on restriction. Changing the filtering system and the filtering points made all the difference."

DT Filters at an Injection Molder



Donaldson High-Performance DT Filters

- Industry:** Injection Molding
Problem: Short Servo Valve Life
Solution: Donaldson DT High-Performance Filter

Donaldson DT elements were recently installed on injection molding equipment at a Midwestern molder's facility. This molder was running nine machines that make plastic components for the product security industry. Their normal operating procedure included regularly sampling and analyzing their hydraulic oil (ISO VG 46), and they were not satisfied with their ISO cleanliness codes or their short servo valve life. Servo valve life (lasting only a few months) led to a drastic change to their maintenance procedures, including: new oil, moisture removal breathers, side-loop cleanup systems, and Donaldson DT pressure line filters.

In side-by-side tests the injection molder compared their existing supplier's hydraulic pressure line elements with Donaldson DT <4 µm(c) rated filters. Oil analysis proved that by using the Donaldson DT filters, they could regularly achieve as much as a one to two ISO code improvement in particulate cleanliness over the filters they had used in the past. With a target of 17/14/11, they were regularly able to achieve 14/12/9. At the time of this writing, the injection molder's maintenance manager reported, "we have not had to replace servo valves in over one year." As a result of the change in pressure line filters and their other improved practices, they are expecting extended servo valve life and greater uptime.

Shoptalk Simple Facts about Hydraulic Filtration

Will Using Aftermarket Filters Void My Warranty?

Answer:

Good News! No need to worry about voiding your warranty – you can use aftermarket products! You still need to follow your manufacturer's recommended maintenance practices, but your warranty is protected under the Magnuson-Moss Warranty Act. Information on the Magnuson-Moss Warranty Act is available at <http://www.ftc.gov/bcp/edu/pubs/business/adv/bus01.shtm#Magnuson-Moss>.

In addition, Donaldson warrants its aftermarket products against failure due to defects in materials and workmanship for the period specified under the Terms and Conditions for the particular product. More information is available at www.donaldson.com/en/engine/support/datalibrary/000194.pdf.



Filtration Service Videos now on YouTube®!

www.youtube.com/user/donaldsonengine

Thirty Donaldson Academy filter servicing videos are now available as a resource for understanding filtration selection and maintenance. They cover detailed hydraulic filter service steps and best practices. Air, lube, fuel and coolant training modules are also available.

These videos are easily accessible from smart phones – making them a great tool for mobile training!

YouTube® is a registered trademark of Google Inc.



SERVICE TRAINING VIDEOS



youtube.com/user/donaldsonengine

Filter Installation and Servicing Icons



Donaldson spin-on filters have pictograms on the sides to define the proper servicing steps.

Maintenance Practices for Contamination Control

Here are recommended practices from Donaldson about hydraulic filter servicing and handling. These steps are universal to many hydraulic systems. This servicing information is provided as a best practices guide. Donaldson recommends that where possible, follow the filter service instructions supplied by your original equipment manufacturer. It is not however intended to replace or supersede the service instructions supplied by your equipment or vehicle manufacturer.

Spin-On Filter Servicing



Check the filter service indicator.

- Check to see that the OEM specified service interval has been reached or that the service indicator shows that the filter is due for servicing.



Turn system off and release pressure.

- Ensure that the hydraulic system is turned off.
- Check that there is no pressure present.



Unscrew and remove old filter and gasket.

- Properly dispose of the filter as may be required by local regulations or recycle it.



Wipe filter head with clean cloth.

- Clean the filter head or cover surfaces
- When performing a hydraulic oil change, it is best to use a clean cloth.



Align threads. Spin filter until gasket contacts.

- Spin the new filter on until the top of the gasket first contacts the sealing surface.



Inspect the new filter for damage.

- Check the new filter you will be installing for any shipping and handling damage.
- Do not install a dented filter since the canister has been weakened.



Hand tighten the filter.

- Tighten per the guidance of the icons which appear on the filter housing. Do not over-tighten.



Lubricate the threads.

- Lubricate threads of filter head.



Apply thin film of clean motor oil to gasket.

- Lubricate seal(s) with clean system oil.



Bleed the system and check for leaks.

Shoptalk

Simple Facts about Hydraulic Filtration

Cartridge Filter Servicing



Check the filter service indicator.

- Check to see that the OEM specified service interval has been reached or that the service indicator shows that the filter is due for servicing.



Turn system off and release pressure.

- Ensure that the hydraulic system is turned off.
- Check that there is no pressure present.



Unscrew the cartridge housing.



Remove the used filter and gasket, if applicable.



Clean out the housing seal area and cap.

- Clean out any sediment from the inside of the filter housing.
- Properly dispose of the cartridge according to local regulations.



Inspect the new filter cartridge for damage.

- Check the new filter you will be installing for any shipping and handling damage.



Lubricate seals, gaskets and threads. Install new cartridge.

- Lubricate the o-rings, gaskets, housing seals and threads with clean system oil.



- Install filter into the housing.



Align threads. Spin filter until gasket contacts.

- Fit the housing to the filter head as instructions on the housing.



Hand tighten the filter.

- Tighten per the guidance of the icons which appear on the filter housing.
- Do not over-tighten.



Bleed the system and check for leaks.

In-tank Filter Servicing



Check the filter service indicator.

- Check to see that the OEM specified service interval has been reached or that the service indicator shows that the filter is due for servicing.

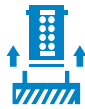


Turn system off and release pressure.

- Ensure that the hydraulic system is turned off.
- Check that there is no pressure present.



Remove the housing cover.



Remove the used filter, gasket and spring, if applicable.

- Remove the filter as gently as possible.
- Avoid contaminant dropping into the clean side of the housing.
- Properly dispose of the cartridge, seal and spring.



Clean the filter mount, cap, inside of the housing and cover.

- Clean out any sediment from the inside of the filter housing.



- Wipe away any sediment on the outside of the filter cover.



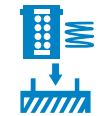
Inspect the new filter cartridge for damage.

- Check the new filter you will be installing for any shipping and handling damage.



Lubricate the filter gasket and cover seal.

- Lubricate the new filter cartridge O-ring and cover seal with clean system oil.



Install new filter and spring, if applicable.



Reinstall the housing cover.

- Refit the cover following any instructions given.



Bleed the system and check for leaks.

Donaldson's Commitment to Quality & Continuous Improvement

Donaldson Quality Commitment

Our employees are committed to providing our Customers with products and services that consistently meet or exceed their expectations.

We will work towards:

- Continuous improvement of products, processes, and services for the benefit of our Customers;
- Complete Customer satisfaction;
- Elimination of waste and variation;
- World-class standards and benchmarks.

We believe in:

- The development and empowerment of our people;
- Standardization of processes and measurement of progress;
- Simplicity, visibility and capability of all activities;
- Continuous improvement in our management and quality systems.

For the long-term success of our company, our first operating priority is the satisfaction of our Customers. Understanding their needs and serving them will benefit both our shareholders and our employees. Our management is responsible for ensuring that this policy is understood, implemented and maintained at all levels of our organization.

Bill Cook
Chairman, President, CEO





Low Pressure Filters

Low pressure filters are the most commonly used type of filter in hydraulic circuits – used most often in return line applications.

Donaldson low pressure filters are rated for working pressures up to 350 psi (2400 kPa). In-tank and in-line configurations are available to accommodate virtually any application.



Section Index

Max Operating Pressure < 350 psi (24 bar)
Models arranged from low to maximum flow rates

Spin-on Filters

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| SP15/25 | 30 |
| W012 | 34 |
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| SP50/60 | 50 |
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In-tank Filters

| | |
|-------------------|----|
| WL15 | 68 |
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| FIK | 76 |
| FIK04 Combo | 82 |

In-line Cartridge Filters

| | |
|-------------|----|
| W033 | 84 |
| HRK10 | 88 |



SP15/25

Max Flow: 30 gpm (114 lpm)

SP15/25 Spin-On Filters

Maximum Working Pressures to: 150 *psi*
1034 kPa
10.3 bar

Rated Static Burst to: 375 *psi*
2590 kPa
25.9 bar

Flow Ranges to: 30 *gpm*
114 *lpm*



Features

The SP15/25 series are economical, low pressure filters with spin-on convenience and a wide range of cleanliness ratings. Filters are available with the bypass ratings of your choice – 25 psi, 15 psi, 5 psi or no bypass. Take advantage of our mix and match system of in-stock heads and filters, so you can get exactly what you need. Choose the media type and configuration that's best for your application. Options include Donaldson's exclusive Synteq™, natural fiber cellulose, stainless steel wire-mesh or water absorbing media.

Beta Rating

- Performance to $\beta_{6(c)}=1000$

Porting Size Options

- 1/2", 3/4" NPT
- SAE-8, -12 O-ring

Replacement Filter Lengths

- Synteq™ 5.35" / 136 mm
7.87" / 200 mm
- Cellulose 5.35" / 136 mm
7.87" / 200 mm
- Wire Mesh 5.35" / 136 mm
- Water Removal 5.35" / 136 mm

Standard Bypass Ratings

- 25 *psi* / 172.5 kPa / 1.7 bar
- 15 *psi* / 97 kPa / .97 bar
- 5 *psi* / 34.5 kPa / .34 bar
- No Bypass

Assembly Weight

- 5.35": 1.6 lbs / .7 kg (approximately)
- 7.87": 2.2 lbs / 1 kg (approximately)

Operating Temperatures

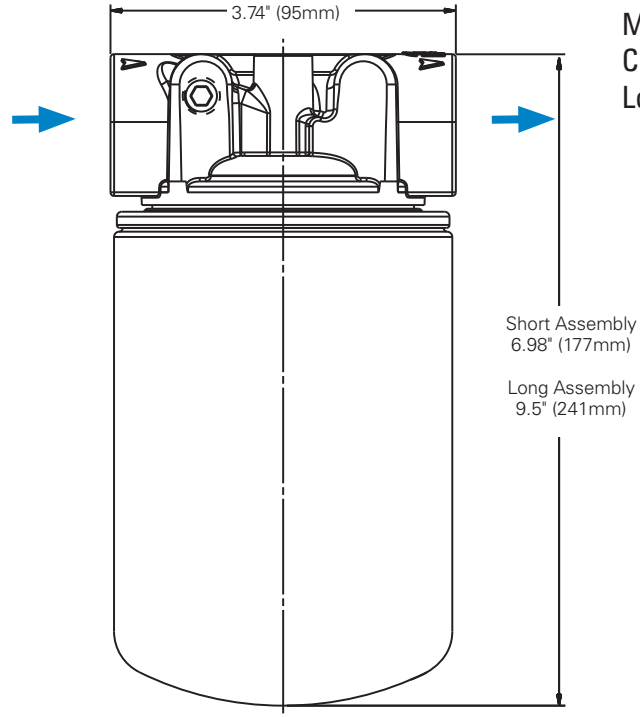
- -20°F to 225°F / -27°C to 107°C

Collapse Ratings

- 100 *psid* / 690 kPa / 6.9 bar (standard)

SP15/25 Specification Illustrations

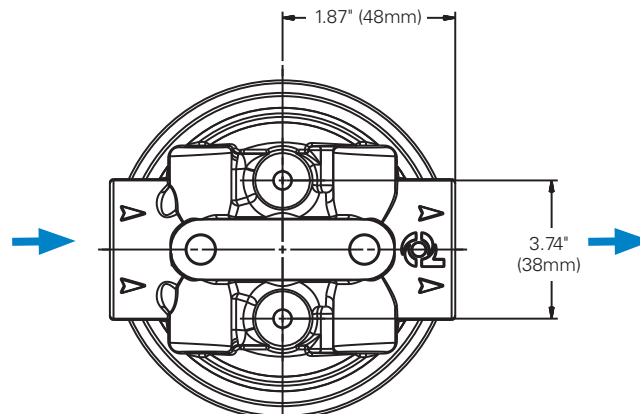
Assembly - Side View



Applications:

- In-Plant Systems
- Agriculture Equipment
- Mining
- Construction
- Logging

Head - Top View





SP15/25

Max Flow: 30 gpm (114 lpm)



SP15/25 Components

Filter Choices

| Media Type | Beta _(c) ₂₀₀ Rating | Beta _(c) ₁₀₀₀ Rating | Length (in./mm) | Donaldson Part No. | Comments |
|-----------------------|---|--|-----------------|--------------------|--|
| Synteq Media # 1 | | 5 µm | 5.35/136 | P564967 | Synthetic Media |
| Synteq Media # 2 | | 9 µm | 7.87/200 | P564357 | Synthetic Media |
| Synteq Media # 2-1/2 | | 10 µm | 5.35/136 | P560693 | Synthetic Media |
| Synteq Media # 2-1/2 | | 10 µm | 7.87/200 | P179089 | Synthetic Media |
| Synteq Media # 9 | | 23 µm | 5.35/136 | P560694 | Synthetic Media |
| Cellulose Media # 10 | | 23 µm | 5.35/136 | P551551 | |
| Cellulose Media # 10 | | 23 µm | 7.87/200 | P565059 | |
| Cellulose Media # 3 | | 24 µm | 5.35/136 | P565061 | |
| Cellulose Media # 25 | 32 µm | | 5.35/136 | P551553 | |
| Cellulose Media # 25 | 32 µm | | 7.87/200 | P565060 | |
| Water Absorbing Media | 32 µm | | 5.35/136 | P565062 | Absorbs Approx. 6 oz/170 ml of water @ 20 psid/1.4 bar |
| Wiremesh Media # 149 | 150 µm | | 5.35/136 | P550274 | 100 mesh |

* Thread size 1"-12 UNF

Head Choices

| Port Size | Bypass Range | Gauge ports (drill, tap, plug) | Gauge Port Location | Donaldson Part No. |
|-----------|-------------------------------|--------------------------------|---------------------|--------------------|
| ½" NPT | 15 psi / 103.4 kPa / 1.34 bar | (2) 1/8" NPT | upstream side | P563288 |
| ¾" NPT | 25 psi / 172.5 kPa / 1.72 bar | (2) 1/8" NPT | upstream side | P561131 |
| ¾" NPT | 5 psi / 34.5 kPa / .34 bar | (2) 1/8" NPT | downstream side | P561132 |
| ¾" NPT | 25 psi / 172.5 kPa / 1.72 bar | none | na | P561134 |
| ¾" NPT | 5 psi / 34.5 kPa / .34 bar | none | na | P561135 |
| ¾" NPT | none | none | na | P561136 |
| ¾" NPT | 15 psi / 103.4 kPa / 1.34 bar | none | na | P563278 |
| SAE-12 | none | none | na | P561133 |
| SAE-12 | none | (1) SAE-4 | upstream side, LH | P561137 |
| SAE-12 | 5 psi / 34.5 kPa / .34 bar | none | na | P561140 |
| SAE-12 | 25 psi / 172.5 kPa / 1.72 bar | none | na | P561141 |
| SAE-12 | 15 psi / 103.4 kPa / 1.34 bar | none | na | P563279 |
| SAE-12 | 25 psi / 172.5 kPa / 1.72 bar | (2) 1/8" NPT | upstream side | P563280 |
| SAE-12 | 15 psi / 103.4 kPa / 1.34 bar | none | M6 mtg. threads | P563287 |
| SAE-8 | 25 psi / 172.5 kPa / 1.72 bar | none | na | P561138 |

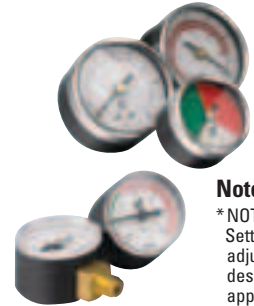


Mix and Match

Donaldson's mix and match system provides the great performance and functional advantages of custom-engineered filters with the convenience and speedy delivery of in-stock parts. Choose your options and build a filter model to suit your specifications.

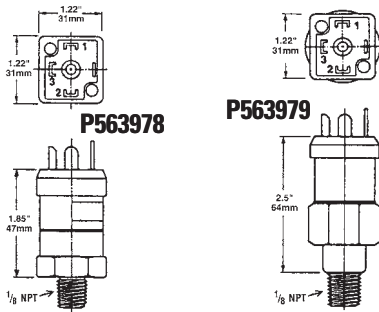
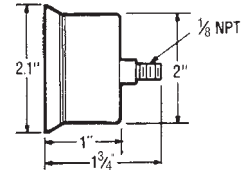
Filter Service Gauges - Visual Indicators

| Donaldson Part No. | Pressure Range | Use With Bypass Valve Rating | Type |
|--------------------|-------------------------------|---|----------------------------------|
| P563978 | 5 to 30 psi field adj.* | 15 psi / 103.4 kPa / 1.34 bar or 25 psi / 172.5 kPa / 1.72 bar or No Bypass | Return indicator, electrical |
| P563979 | -5 to 15 in Hg field adj.* | 5 psi / 34.5 kPa / .34 bar or No Bypass | Suction indicator, electrical |
| P563296 | 0 to 100 psi | 15 psi / 103.4 kPa / 1.34 bar or 25 psi / 172.5 kPa / 1.72 bar or No Bypass | Return indicator, numeric scale |
| P563297 | 0 to 100 psi | 15 psi / 103.4 kPa / 1.34 bar Bypass | Return indicator, color coded |
| P563298 | 0 to 100 psi | 25 psi / 172.5 kPa / 1.72 bar or No Bypass | Return indicator, color-coded |
| P563299 | 0 to -20 Hg | 5 psi / 34.5 kPa / .34 bar or No Bypass | Suction indicator, numeric scale |



Notes
*NOT PRESET:
Setting adjustable for desired application

P563296 - P563299



#1 Common; #2 Normally Closed;
#3 Normally Open

Instructions

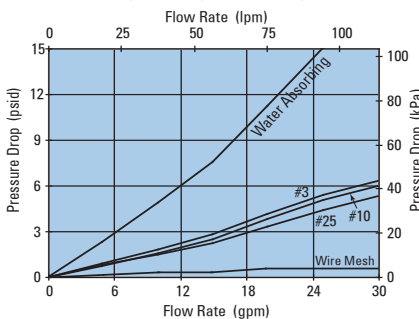
1. Remove DIN adaptor
2. Remove small brass screw
3. Using 1/8" allen wrench adjust clockwise to increase set point/counter-clockwise to decrease set point
4. NO / NC

Adjustment screw located in center of electronic prongs

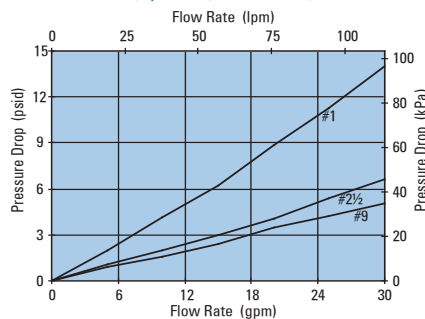


Performance Data

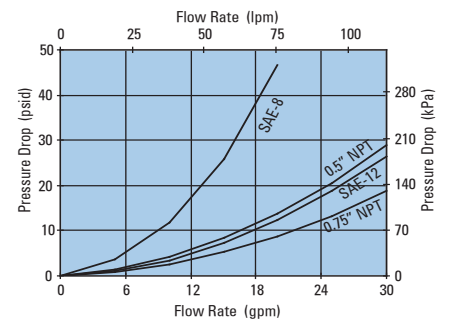
SP15 Filter Only
(Cellulose, 5.35"/136mm)



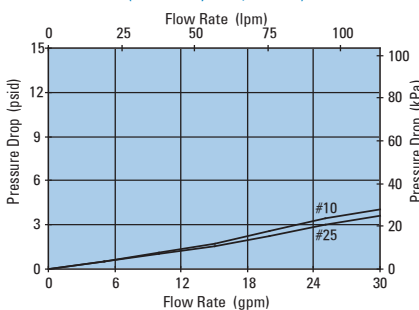
SP15 Filter Only
(Synthetic, 5.35"/136mm)



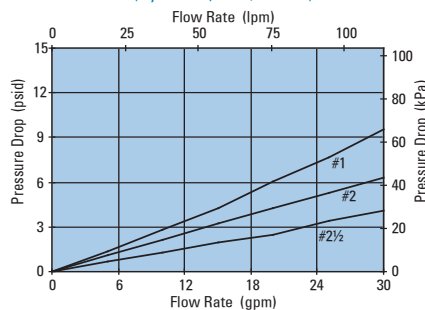
SP15/25 Head Only



SP25 Filter Only
(Cellulose, 7.87"/200mm)



SP25 Filter Only
(Synthetic, 7.87"/200mm)





W012

Max Flow: 30 gpm (114 lpm)



W012 Spin-On Filters

Working Pressures to: 150 *psi*
10.3 bar

Rated Static Burst to: 300 *psi*
20.7 bar

Flow Range to: 30 *gpm*
114 *lpm*



Features

The W012 series are economical, low pressure filters with spin-on convenience and a wide range of cleanliness ratings. Heads are available bypass ratings of your choice – 25 psi or no bypass. Take advantage of our mix and match system of heads and filters, so you get exactly what you need. You can choose the media type and configurations that's best for your application. Options include Donaldson's exclusive Synteq™, natural fiber cellulose, stainless steel wiremesh or water absorbing media.

Beta Rating (per ISO 16889)

- Performance to $\beta_{4(c)}=1000$

Porting Size Options

- 3/4" NPT
- SAE-12 O-ring

Replacement Filter Lengths

- Synteq™ 5.35" / 136 mm
7.87" / 200 mm
- Cellulose 5.35" / 136 mm
7.87" / 200 mm
- Wiremesh 5.35" / 136 mm
- Water Removal 5.35" / 136 mm

Standard Bypass Rating

- 25 psi / 172 kPa / 1.7 bar
- No Bypass

Assembly Weight

- 5.35": 1.6 lbs / .7 kg (approximately)
- 7.87": 2.2 lbs / 1 kg (approximately)

Operating Temperatures

- -20°F to 225°F / -27°C to 107°C

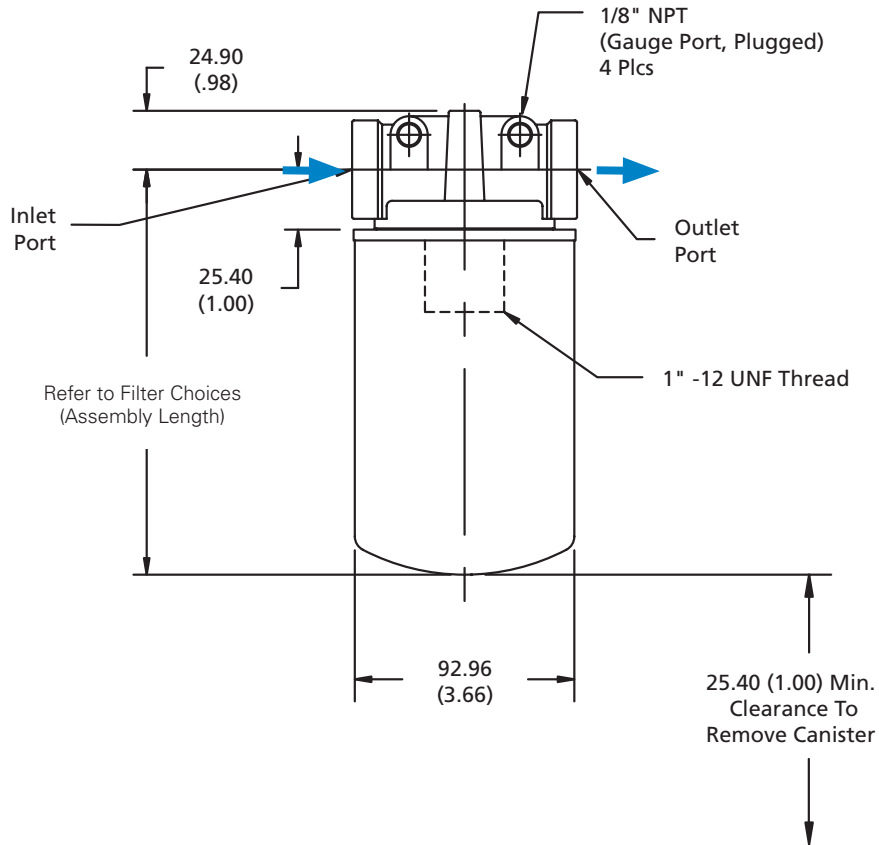
Collapse Ratings

- 100 *psid* / 690 kPa / 6.9 bar (standard)

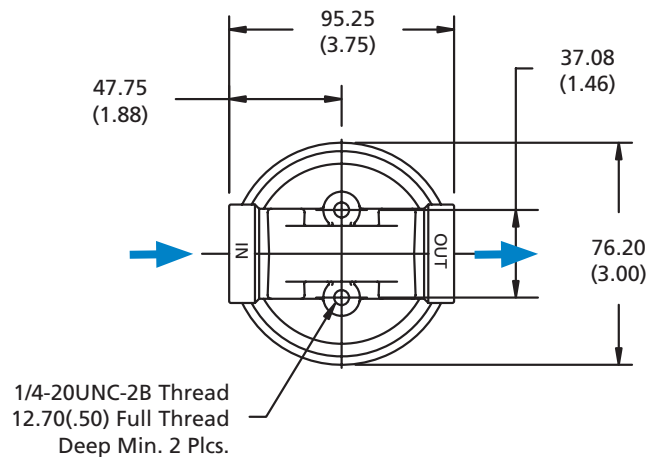
W012 Specification Illustrations

All dimensions are shown in millimeters [inches].

Assembly - Side View



Head - Top View





W012

Max Flow: 30 gpm (114 lpm)

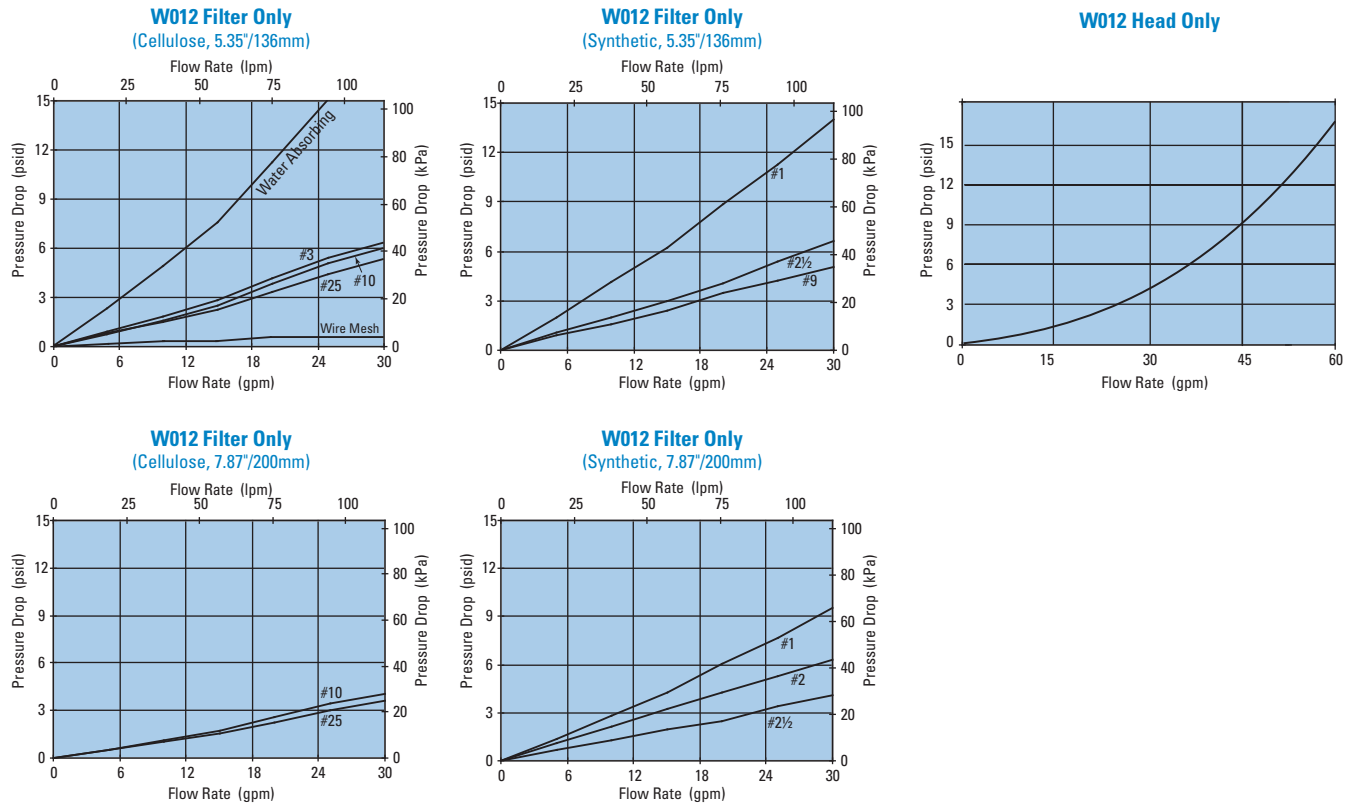


W012 Components Filter Choices

| Media Type | Beta _(fc) =200 Rating | Beta _(fc) =1000 Rating | Length (in./mm) | Donaldson Part No. | Comments |
|-----------------------|----------------------------------|-----------------------------------|-----------------|--------------------|--|
| Synteq Media # 1 | | 5 µm | 5.35/136 | P564967 | Synthetic Media |
| Synteq Media # 2 | | 9 µm | 7.87/200 | P564357 | Synthetic Media |
| Synteq Media # 2-1/2 | | 10 µm | 5.35/136 | P560693 | Synthetic Media |
| Synteq Media # 2-1/2 | | 10 µm | 7.87/200 | P179089 | Synthetic Media |
| Synteq Media # 9 | | 23 µm | 5.35/136 | P560694 | Synthetic Media |
| Cellulose Media # 10 | | 23 µm | 5.35/136 | P551551 | |
| Cellulose Media # 10 | | 23 µm | 7.87/200 | P565059 | |
| Cellulose Media # 3 | | 24 µm | 5.35/136 | P565061 | |
| Cellulose Media # 25 | 32 µm | | 5.35/136 | P551553 | |
| Cellulose Media # 25 | 32 µm | 740 µm | 7.87/200 | P565060 | |
| Water Absorbing Media | 32 µm | 730 µm | 5.35/136 | P565062 | Absorbs Approx. 6 oz/170 ml of water @ 20 psid/1.4 bar |
| Wiremesh Media # 149 | 150 µm | | 5.35/136 | P550274 | 100 mesh |

* Thread size 1"-12 UNF

Performance Data





Filter Head Ordering Guide

| | | | | | | |
|-----------------|---------|---------|---------|---------|---------|---------|
| Filter Assembly | W012 | 1 | A | 3 | 4 | B |
| | TABLE 1 | TABLE 2 | TABLE 3 | TABLE 4 | TABLE 5 | TABLE 6 |

Service Filter
Filters ordered separately. See previous page for filter options.

LEAD TIME NOTE:

This product is configured with the specifications and features of your choice. Please contact your Donaldson sales representative for lead time details.

Table 1

| Filter Assembly / Service Filter | |
|----------------------------------|-------------|
| CODE | DESCRIPTION |
| W012 | Assembly |

Table 2

| Filter Collapse Options | |
|-------------------------|-------------|
| CODE | DESCRIPTION |
| 1 | 150 psid |

Table 3

| Port Size Options | |
|-------------------|---------------|
| CODE | PORT SIZE |
| A | SAE-12 O-ring |
| I | 3/4" NPT |

Table 4

| Bypass Setting Options | |
|------------------------|-----------------------|
| CODE | BYPASS SETTING |
| 1 | Non-bypass (blocked)* |
| 3 | 25 psid |

*80 psid maximum operating pressure

Table 5

| Upstream Pressure Gauge and Switch Option | |
|---|---|
| CODE | INDICATOR STYLE & SETTING |
| 1 | Gauge ports drilled, tapped and plugged |
| 4 | 0-60 psi pressure gauge |
| 6 | Pressure switch 18 psi Brad Harrison® (5-pin) |
| 8 | Pressure switch 18 psi Hirschmann® (4-pin) |

Table 6

| Seal Options | |
|--------------|----------|
| CODE | MATERIAL |
| B | Buna-N® |

Media Ratings

Western Filter spin-ons have been replaced by Donaldson spin-on filters.

| WESTERN MEDIA CODE | DONALDSON MEDIA |
|--------------------|-----------------|
| P10 | #10 |
| P20 | #25 |
| R10 | #2½ |

For a complete filter interchange, visit crossreference.donaldson.com.



W015

Max Flow: 60 gpm (227 lpm)



W015 Spin-On Filters

Working Pressures to: 150 *psi*
10.3 bar

Rated Static Burst to: 250 *psi*
17.2 bar

Flow Range to: 60 *gpm*
227 *lpm*



Features

The W015 series are economical, low pressure filters with spin-on convenience and a wide range of cleanliness ratings. The die-cast aluminum heads are available with the bypass rating of your choice – 25 psi or no bypass. Take advantage of our mix and match system of heads and filters, so you get exactly what you need. You can choose the media type and configurations that's best for your application. Options include Donaldson's exclusive Synteq™, natural fiber cellulose, stainless steel wiremesh or water absorbing media.

Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- SAE-20 O-ring

Replacement Filter Lengths

- 6.7" / 170 mm
- 10.7" / 271 mm

Standard Bypass Ratings

- 25 psi / 172.5 kPa / 1.7 bar
- No bypass

Assembly Weight

- 4.7 lbs / 2.1 kg (short)
- 5.6 lbs / 2.5 kg (long)

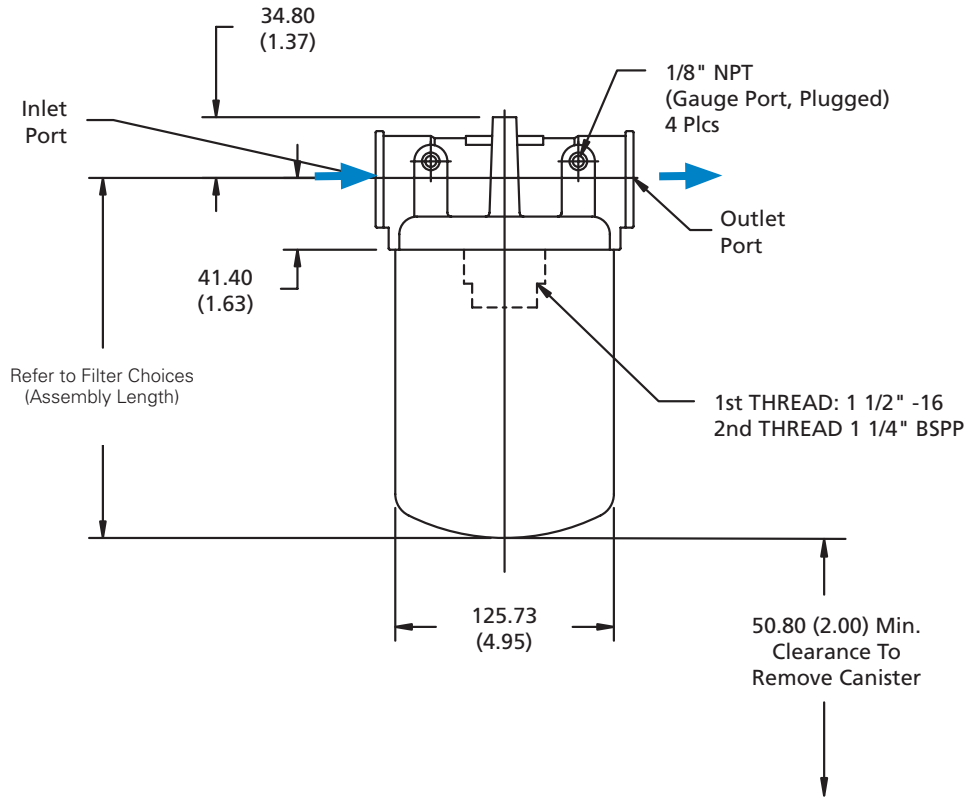
Operating Temperatures

- -22°F to 250°F / -30°C to 121°C

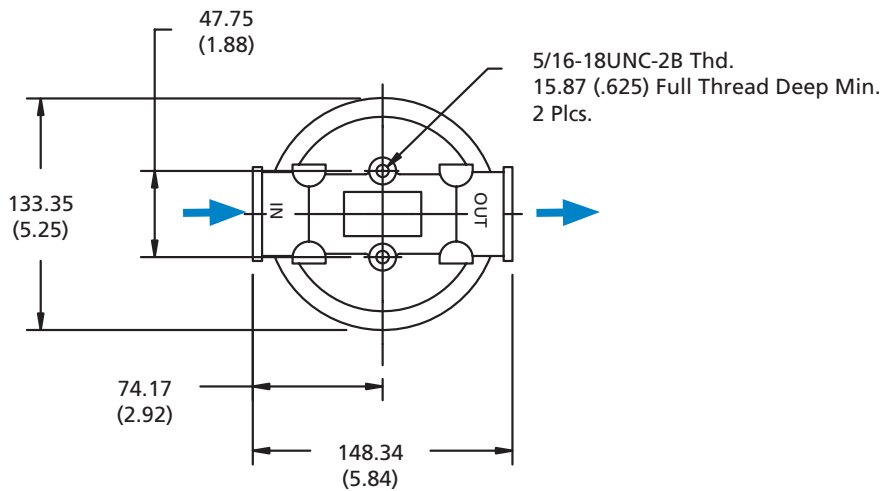
W015 Specification Illustrations

All dimensions are shown in millimeters [inches].

Assembly - Side View



Head - Top View





W015

Max Flow: 60 gpm (227 lpm)



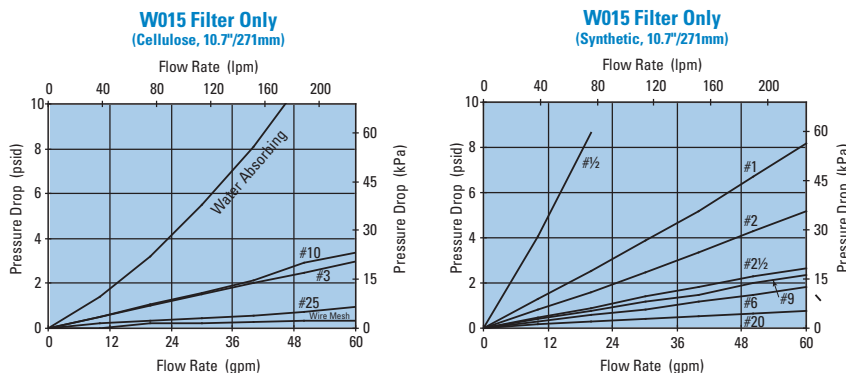
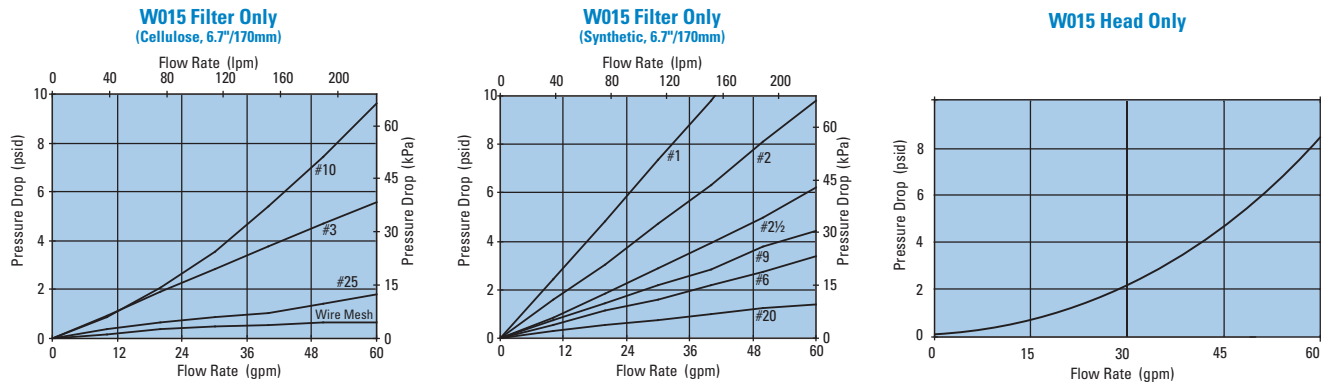
W015 Components

Filter Choices

| Media Type | Beta _{x(c)} =200 Rating | Beta _{x(c)} =1000 Rating | Length (in./mm) | Donaldson Part No. | Comments |
|------------------|----------------------------------|-----------------------------------|-----------------|--------------------|--|
| No. 1/2 | | <4 μm | 10.7/271 | P167796 | Synthetic, Viton® O-ring & square seal kit |
| No. 1 | | 5 μm | 6.7/170 | P169430 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P167832 | Synthetic, 3-seal kit |
| No. 2 | | 9 μm | 6.7/170 | P167162 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P165762 | Synthetic, 3-seal kit |
| No. 2 1/2 | | 10 μm | 6.7/170 | P165875 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P165876 | Synthetic, 3-seal kit |
| No. 6 | | 13 μm | 6.7/170 | P167944 | Synthetic, Viton O-ring & square seal kit |
| | | | 10.7/271 | P167945 | Synthetic, Viton O-ring & square seal kit |
| No. 9 | | 23 μm | 6.7/170 | P165877 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P165878 | Synthetic, 3-seal kit |
| No. 20 | | >50 μm | 6.7/170 | P165879 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P165880 | Synthetic, 3-seal kit |
| No. 3 | | 24 μm | 6.7/170 | P550386 | Cellulose, 3-seal kit |
| | | | 10.7/271 | P550250 | Cellulose, 3-seal kit |
| No. 10 | | 23 μm | 6.7/170 | P550388 | Cellulose, 3-seal kit |
| | | | 10.7/271 | P550251 | Cellulose, 3-seal kit |
| | | | 7.00/178 | P565245 | Cellulose, square-seal, 1/4" BSP thread |
| No. 25 | 32 μm | | 6.7/170 | P550387 | Cellulose, 3-seal kit |
| | | | 10.7/271 | P550252 | Cellulose, 3-seal kit |
| | | | 7.00/178 | P171616 | Cellulose, square-seal, 1/4" BSP thread |
| Water Absorbing* | 10 μm | | 10.7/271 | P561183 | Cellulose, "L" & square-seal kit |
| Wire Mesh | 150 μm nom | | 6.7/170 | P550275 | SS Wire Mesh, 3-seal kit |
| | | | 10.7/271 | P550276 | SS Wire Mesh, 3-seal kit |

All models have 1/2-16 UNF threads except where otherwise noted. All models measure 5.0"/127 mm outer diameter. * Absorbs 350 ml water.

Performance Data



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Filter Head Ordering Guide

| | | | | | | |
|-----------------|---------|---------|---------|---------|---------|---------|
| Filter Assembly | W015 | 1 | A | 3 | 4 | B |
| | TABLE 1 | TABLE 2 | TABLE 3 | TABLE 4 | TABLE 5 | TABLE 6 |

Service Filter
Filters ordered separately. See previous page for filter options.

LEAD TIME NOTE:

This product is configured with the specifications and features of your choice. Please contact your Donaldson sales representative for lead time details.

Table 1

| Filter Assembly / Service Filter | |
|----------------------------------|-------------|
| CODE | DESCRIPTION |
| W015 | Assembly |

Table 2

| Filter Collapse Options | |
|-------------------------|-------------------------------------|
| CODE | DESCRIPTION |
| 1 | 150 psid for housing w/bypass valve |

Table 3

| Port Size Options | |
|-------------------|---------------|
| CODE | PORT SIZE |
| C | SAE-20 O-ring |

Table 4

| Bypass Setting Options | |
|------------------------|-----------------------|
| CODE | BYPASS SETTING |
| 1 | Non-bypass (blocked)* |
| 3 | 25 psid |

*80 psid maximum operating pressure

Table 5

| Upstream Pressure Gauge and Switch Option | |
|---|---|
| CODE | INDICATOR STYLE & SETTING |
| 1 | Gauge ports drilled, tapped and plugged |
| 2 | 0-200 psi pressure gauge** |
| 3 | 0-60 psi pressure gauge** |
| 4 | 0-60 psi pressure gauge* |
| 6 | Pressure switch 18 psi Brad Harrison® (5-pin) |
| 7 | Pressure switch 35 psi Brad Harrison® (5-pin) |
| 8 | Pressure switch 18 psi Hirschmann® (4-pin) |
| 9 | Pressure switch 35 psi Hirschmann® (4-pin) |

*Bypass setting option code 3 only

**Bypass setting option code 4 only

Table 6

| Seal Options | |
|--------------|----------|
| CODE | MATERIAL |
| B | Buna-N® |

Media Ratings

Western Filter spin-ons have been replaced by Donaldson spin-on filters.

| WESTERN MEDIA CODE | DONALDSON MEDIA |
|--------------------|-----------------|
| P10 | #10 |
| P20 | #25 |
| R03 | #1 |
| R05 | #2 |
| R10 | #2½ |
| R20 | #9 |
| W10 | WA |

For a complete filter interchange, visit crossreference.donaldson.com.

Brad Harrison® is a registered trademark of Woodhead Industries, Inc.
Hirschmann® is a registered trademark of Richard Hirschmann of America Inc.
Buna-N® is a registered trademark of E. I. DuPont de Nemours and Company.



W021/023

Max Flow: 60 gpm (227 lpm)

W021/023 Spin-On Filters

Working Pressures to: 150 *psi*
10.3 bar

Rated Static Burst to: 250 *psi*
17.2 bar

Flow Range to: 60 *gpm*
227 *lpm*

Features

This versatile spin-on series is an excellent choice for use in high corrosion environments. The gray iron head construction can be ordered with gauge or differential pressure indicator ports. Take advantage of our mix and match system of heads and filters, so you get exactly what you need. You can choose the media type and configurations that's best for your application.



Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- 1¼" NPT
- SAE-20 O-ring

Replacement Filter Lengths

- 6.7" / 170 mm
- 7.0" / 178 mm
- 10.7" / 271 mm

Filter Collapse Ratings

- 100 *psid* / 690 kPa / 6.9 bar

Standard Bypass Ratings

- 50 psi / 345 kPa / 3.5 bar
- 25 psi / 172.5 kPa / 1.72 bar
- No bypass

Assembly Weight

- 7.0lbs / 3.2 kg (short)
- 8.0 lbs / 3.6 kg (long)

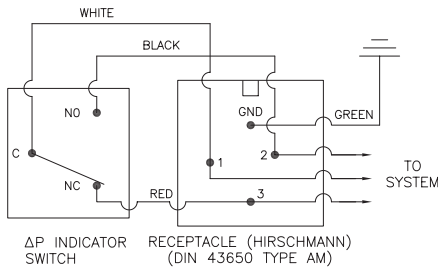
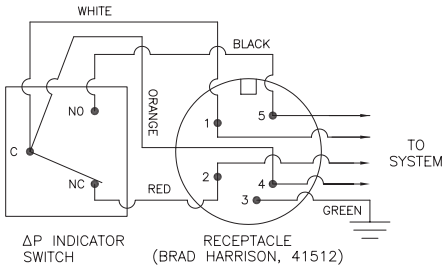
Operating Temperatures

- -22°F to 250°F / -30°C to 121°C

W021/023 Specification Illustrations

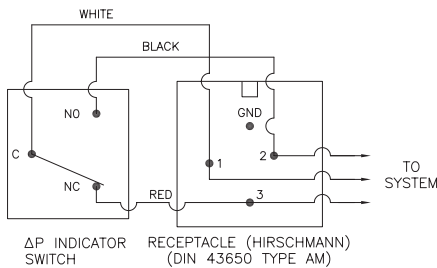
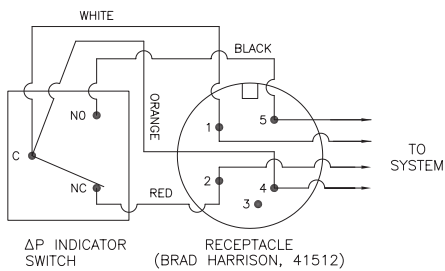
All dimensions are shown in millimeters [inches].

Indicator Switch Schematic Wiring Diagram Aluminum Electrical Housings



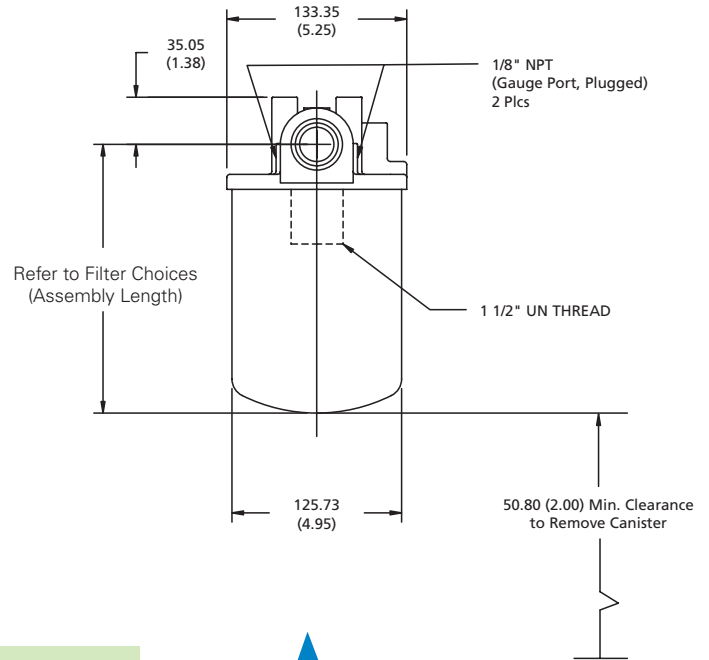
Note: The female plug (connector) is to be furnished by customer.

Plastic Electrical Housings

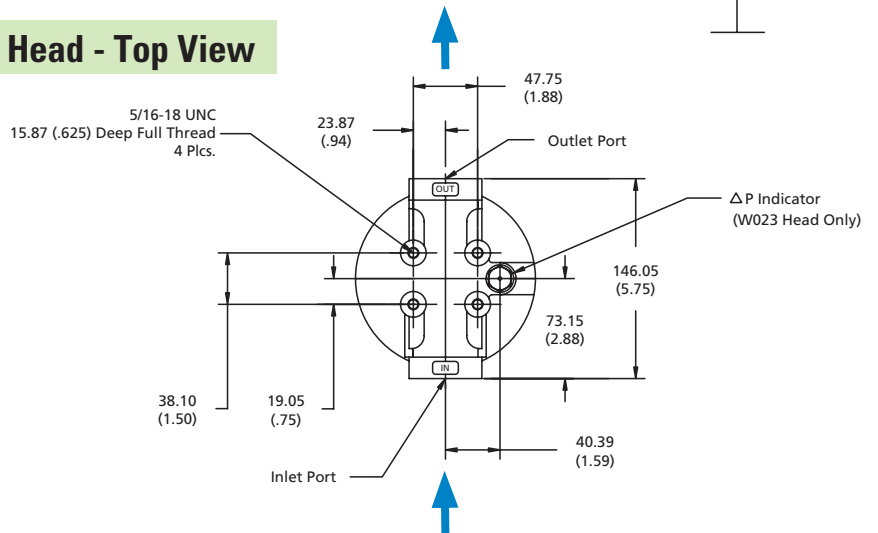


Note: The female plug (connector) is to be furnished by customer.

Assembly - Side View



Head - Top View



Differential Indicators:

Indicators are designed to actuate at approximately 80% of bypass valve cracking pressure. It is recommended that an indicator with a bypass setting of 100 psid is used with a non-bypass housing.

Surge Control:

This optional feature is used to dampen pressure surges or spikes to avoid premature actuation of the indicator. Surge control delays the indicator response.

Thermal Lockout:

The Thermal Lockout prevents premature signaling of a bypass condition created by viscous fluid during cold start-ups. Normal indicator actuation capability is resumed once the operating temperature of the fluid reaches approximately 80° F.



W021/023

Max Flow: 60 gpm (227 lpm)



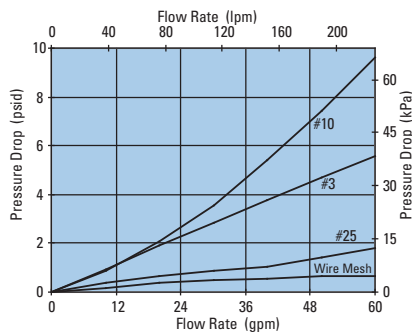
W021/23 Components Filter Choices

| Media Type | Beta _{x(c)} =200 Rating | Beta _{x(c)} =1000 Rating | Length (in./mm) | Donaldson Part No. | Comments |
|------------------|----------------------------------|-----------------------------------|-----------------|--------------------|--|
| No. 1/2 | | <4 µm | 10.7/271 | P167796 | Synthetic, Viton® O-ring & square seal kit |
| No. 1 | | 5 µm | 6.7/170 | P169430 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P167832 | Synthetic, 3-seal kit |
| No. 2 | | 9 µm | 6.7/170 | P167162 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P165762 | Synthetic, 3-seal kit |
| No. 2 1/2 | | 10 µm | 6.7/170 | P165875 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P165876 | Synthetic, 3-seal kit |
| No. 6 | | 13 µm | 6.7/170 | P167944 | Synthetic, Viton O-ring & square seal kit |
| | | | 10.7/271 | P167945 | Synthetic, Viton O-ring & square seal kit |
| No. 9 | | 23 µm | 6.7/170 | P165877 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P165878 | Synthetic, 3-seal kit |
| No. 20 | | >50 µm | 6.7/170 | P165879 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P165880 | Synthetic, 3-seal kit |
| No. 3 | | 24 µm | 6.7/170 | P550386 | Cellulose, 3-seal kit |
| | | | 10.7/271 | P550250 | Cellulose, 3-seal kit |
| No. 10 | | 23 µm | 6.7/170 | P550388 | Cellulose, 3-seal kit |
| | | | 10.7/271 | P550251 | Cellulose, 3-seal kit |
| | | | 7.00/178 | P565245 | Cellulose, square-seal, 1 1/4" BSP thread |
| No. 25 | 32 µm | | 6.7/170 | P550387 | Cellulose, 3-seal kit |
| | | | 10.7/271 | P550252 | Cellulose, 3-seal kit |
| | | | 7.00/178 | P171616 | Cellulose, square-seal, 1 1/4" BSP thread |
| Water Absorbing* | 10 µm | | 10.7/271 | P561183 | Cellulose, "L" & square-seal kit |
| Wire Mesh | 150 µm nom | | 6.7/170 | P550275 | SS Wire Mesh, 3-seal kit |
| | | | 10.7/271 | P550276 | SS Wire Mesh, 3-seal kit |

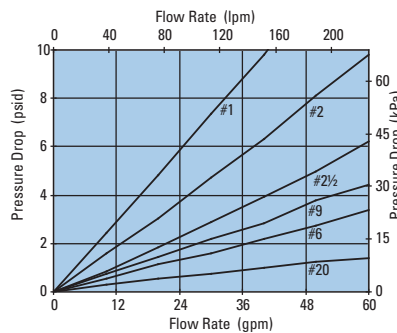
All models have 1/2-16 UNF threads except where otherwise noted. All models measure 5.0"/127 mm outer diameter. * Absorbs 350 ml water.

Performance Data

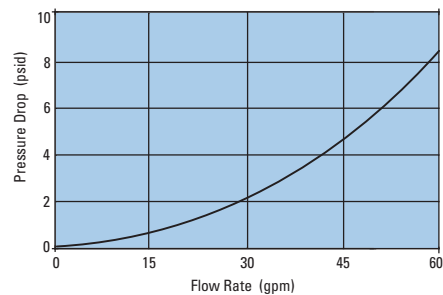
W012/23 Filter Only
(Cellulose, 6.7"/170mm)



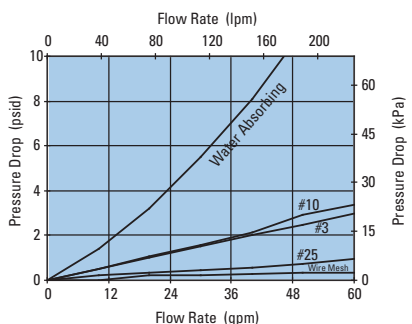
W012/23 Filter Only
(Synthetic, 6.7"/170mm)



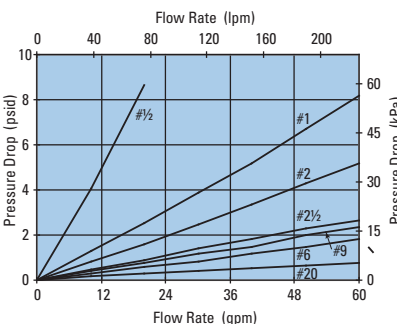
W012/23 Head Only



W012/23 Filter Only
(Cellulose, 10.7"/271mm)



W012/23 Filter Only
(Synthetic, 10.7"/271mm)



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Filter Head Ordering Guide

| | | | | | | |
|-----------------|---------|---------|---------|---------|---------|---------|
| Filter Assembly | W021 | 1 | C | 3 | 4 N | B |
| | TABLE 1 | TABLE 2 | TABLE 3 | TABLE 4 | TABLE 5 | TABLE 6 |

Service Filter
Filters ordered separately. See previous page for filter options.

LEAD TIME NOTE:

This product is configured with the specifications and features of your choice. Please contact your Donaldson sales representative for lead time details.

Table 1

| Filter Assembly | |
|-----------------|----------------------------------|
| CODE | DESCRIPTION |
| W021 | Machined for pressure gauge only |
| W023 | Machined for ΔP indicator only |

Table 2

| Filter Collapse Options | |
|-------------------------|-------------|
| CODE | DESCRIPTION |
| 1 | 150 psid |

Table 3

| Port Size Options | |
|-------------------|---------------|
| CODE | PORT SIZE |
| C | SAE-20 O-ring |
| P | 1¼" NPT |

Table 4

| Bypass Setting Options | |
|------------------------|-------------------------|
| CODE | BYPASS SETTING |
| 1 | Non-bypassed (plugged)* |
| 3 | 25 psid |
| 4 | 50 psid |

*80 psid maximum operating pressure

Table 5 (Primary W023 only)

| Indicator Style and Setting | |
|-----------------------------|---|
| CODE | ΔP INDICATOR STYLE & SETTING |
| C | Electrical/visual 15 psid |
| D | Electrical/visual 35 psid |
| F | Electrical/visual 15 psid & TL |
| G | Electrical/visual 35 psid & TL |
| H | Electrical/visual 15 psid with 12" 3-wire flying lead |
| J | ΔP indicator plug |
| K | Visual indicator 15 psid |
| L | Visual indicator 35 psid |
| M | Visual indicator 35 psid with TL and surge |
| N | Electrical/visual 35 psid with 12" 3-wire flying lead |
| Q | Electrical switch 15 psid |
| R | Electrical switch 35 psid |
| X | Electrical/visual 15 psid with TL and surge |
| Y | Electrical/visual 35 psid with TL and surge |

TL (thermal lockout)

Table 5 (W021 only)

| Upstream Pressure Gauge and Switch Option | |
|---|--|
| CODE | INDICATOR STYLE & SETTING |
| 1 | Gauge ports drilled, tapped and plugged |
| 2 | 0-200 psi pressure gauge** |
| 3 | 0-60 psi pressure gauge** |
| 4 | 0-60 psi pressure gauge* |
| 6 | Pressure switch 18 psi Brad Harrison (5-pin) |
| 8 | Pressure switch 18 psi Hirschmann (4-pin) |
| 9 | Pressure switch 35 psid Hirschmann (4-pin) |

*Bypass setting option code 3 only

**Bypass setting option code 4 only

Table 5 (Secondary W023 only)

| Receptacle Options | |
|--------------------|-------------------------------|
| CODE | ELECTRICAL STYLE |
| B | Brad Harrison® (5-pin) |
| H | Hirschmann® (4-pin) |
| N | None, for visual ΔP indicator |

Table 6

| Seal Options | |
|--------------|----------|
| CODE | MATERIAL |
| B | Buna-N® |

Media Ratings

Western Filter spin-ons have been replaced by Donaldson spin-on filters.

| WESTERN MEDIA CODE | DONALDSON MEDIA |
|--------------------|-----------------|
| P10 | #10 |
| P20 | #25 |
| R03 | #1 |
| R05 | #2 |
| R10 | #2½ |
| R20 | #9 |
| W10 | WA |

For a complete filter interchange, visit crossreference.donaldson.com.



HBK05

Max Flow: 60 gpm (227 lpm)



HBK05 Spin-On Filters

Working Pressures to: 150 *psi*
1034 kPa
10.3 bar

Rated Static Burst to: 250 *psi*
1724 kPa
17.2 bar

Flow Ranges to: 60 *gpm*
227 *lpm*

Features

HBK05 is a strong and durable low pressure filter with a spin-on design that simplifies servicing and reduces maintenance costs. Its heavy-duty steel canister has a rigid steel attachment plate for added strength. The head-to-canister O-ring seal is designed to ensure seal integrity beyond 250 psi/17 bar. The head is made of die-cast aluminum.

Take advantage of our mix and match system of in-stock heads and filters—so you can get exactly what you need, HBK05 is available with your choice of visual or electrical service indicators, and bypass ratings of 25 psi or 5 psi. The filter media is Synteq™, our proprietary synthetic media specifically designed for liquid filtration.

HBK05 filters ship with "L", square, and O-ring gaskets (unless noted with Viton® seals, then with square and o-ring gaskets). All HBK05 filters are interchangeable with SP50/60, SP80/90 and SP100/120 spin-ons, and have 1½" - 16 UN threads.

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Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- 1¼" NPT
- SAE-20 O-ring

Replacement Filter Lengths

- 6.7" / 170 mm (short)
- 10.7" / 271 mm (long)

Standard Bypass Ratings

- 25 *psi* / 172.5 kPa / 1.7 bar
- 5 *psi* / 34.5 kPa / .34 bar

Assembly Weight

- 6.9 lbs / 3.1 kg (long)
- 5.7 lbs / 2.6 kg (short)

Operating Temperatures

- -20°F to 225°F / -29°C to 107°C

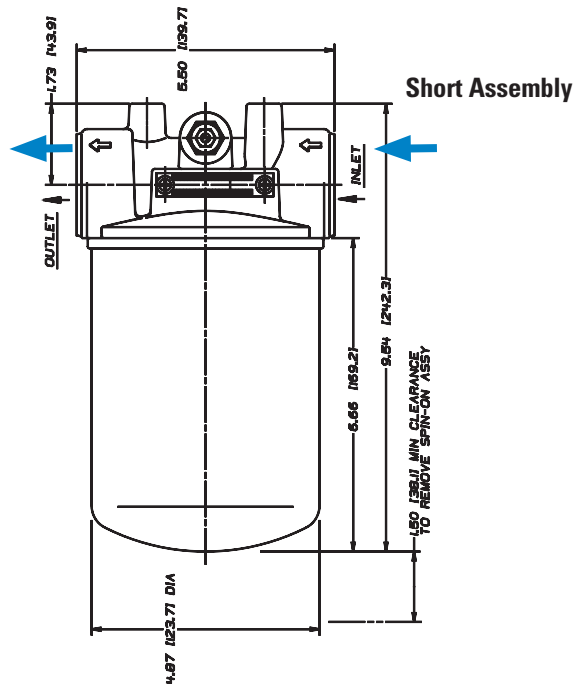
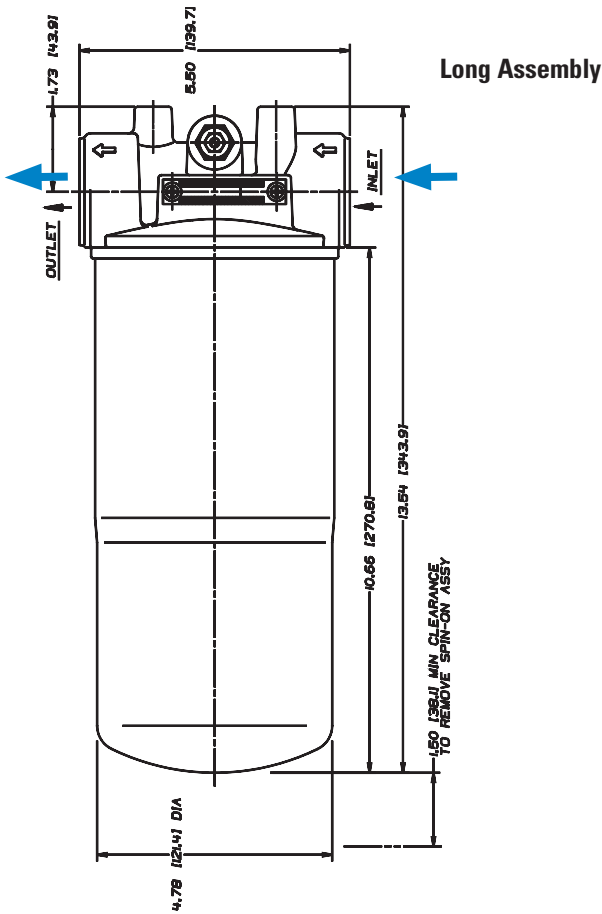
Filter Collapse Ratings

- 125 *psid* / 863 kPa / 8.6 bar

HBK05 Specification Illustrations

All dimensions are shown in inches [millimeters].

Assembly - Side View

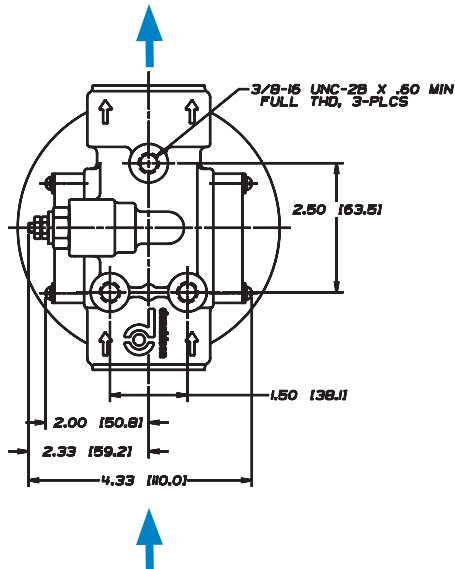


Applications:

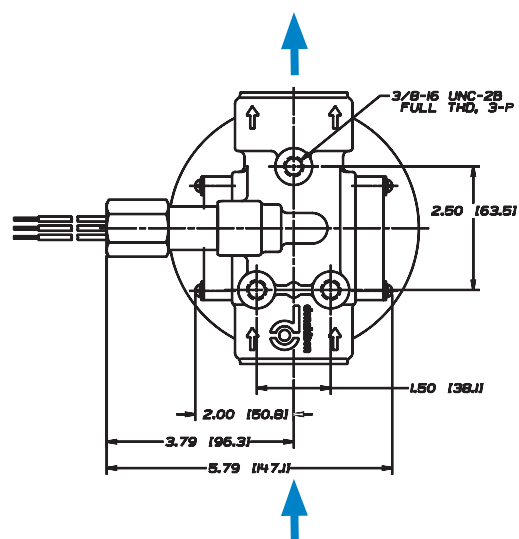
- Fluid Conditioning
- Return-Line/Side-Loop
- Hydrostatic Charge Pump Suction
- Lube Oil & Process Systems
- Power Transmissions
- Cooling Circuits

Head - Top View

with DC Electrical Service Indicator



with AC/DC Electrical Service Indicator





HBK05

Max Flow: 60 gpm (227 lpm)

HBK05 Components

Filter Choices

| Media Rating | B _(c) = 1000 | Length (in.) | Length (mm) | Part No. |
|--------------|-------------------------|--------------|-------------|-----------------------------|
| No. ½ | <4 µm | 10.7 | 271 | P167796 with Viton® Seal |
| No. 1 | 5 µm | 6.7 | 170 | P169430 |
| | | 10.7 | 271 | P167832 |
| No. 2 | 9 µm | 6.7 | 170 | P167162 |
| | | 10.7 | 271 | P165762 |
| No. 2½ | 10 µm | 6.7 | 170 | P165875 |
| | | 10.7 | 271 | P165876 |
| No. 6 | 13 µm | 6.7 | 170 | P167944 with Viton Seal |
| | | 10.7 | 271 | P167945 with Viton Seal |
| No. 9 | 23 µm | 6.7 | 170 | P165877 |
| | | 10.7 | 271 | P165878 |
| No. 20 | >50 µm | 6.7 | 170 | P165879 |
| | | 10.7 | 271 | P165880 |

* Thread size 1½"-16 UNF

Head Choices

| Port Size | Bypass Rating | Indicator Style & Location | Part No. |
|--------------------|-------------------|----------------------------|----------|
| 1¼" NPT 345 kPa | 50 psi | Visual, Both Sides | P172953 |
| 1¼" NPT 172 kPa | 25 psi | Visual, Both Sides | P166418 |
| 1¼" NPT 34 kPa | 5 psi | Visual, Both Sides | P166665 |
| SAE-20 O-Ring | 25 psi 172 kPa | Visual, Both sides | P166439 |

Note

* Donaldson uses the inlet port as the reference point. "Left side," for instance, means that the indicator mounts on the side of the filter head that is on your left when you face the inlet port.

Service Indicator Options

Electric Models⁽¹⁾

| Use with Bypass Valve Pressure of: | Indicator Part No. | Style ⁽³⁾ | Description |
|------------------------------------|--------------------|----------------------|--|
| 5 psi / 34.5 kPa | P163642 | A | Single post DC. Normally open. |
| 15 psi / 103 kPa | P163601 | A | Single post DC. Normally open. |
| 25 psi / 172.5 kPa | P163839 | A | Single post DC. Normally closed. |
| 25 psi / 172.5 kPa | P162400 | A | Single post DC. Normally open. |
| 25 psi / 172.5 kPa | P171143 | B | 2-wire with Cannon connector. Normally open. |
| 25 psi / 172.5 kPa | P173944 | C | 3-wire: White = normally open Red = normally closed Black = common |

Visual Models (Non-Electric)⁽²⁾

| Use with Bypass Valve Pressure of: | Indicator Part No. | Style ⁽³⁾ |
|------------------------------------|--------------------|----------------------|
| 5 psi / 34.5 kPa | P162694 | D |
| 15 psi / 103 kPa | P162642 | D |
| 25 psi / 172.5 kPa | P162696 | D |
| N/A | P165984 | (blank plate) |

Indicator Notes

⁽¹⁾ All electric models have a maximum operating temperature of 250°F/ 121°C.

⁽²⁾ All non-electric models have a maximum operating temperature of 180°F/ 82°C.

⁽³⁾ See indicator illustrations on facing page.



Mix and Match

Donaldson's mix and match system provides the great performance and functional advantages of custom-engineered filters with the convenience and speedy delivery of in-stock parts. Choose your options and build an HBK05 filter to suit your specifications.

HBK05 Service Parts

SERVICE PARTS NOTE:

Some service parts may not be stocked. Please contact your Donaldson sales representative for lead time details.

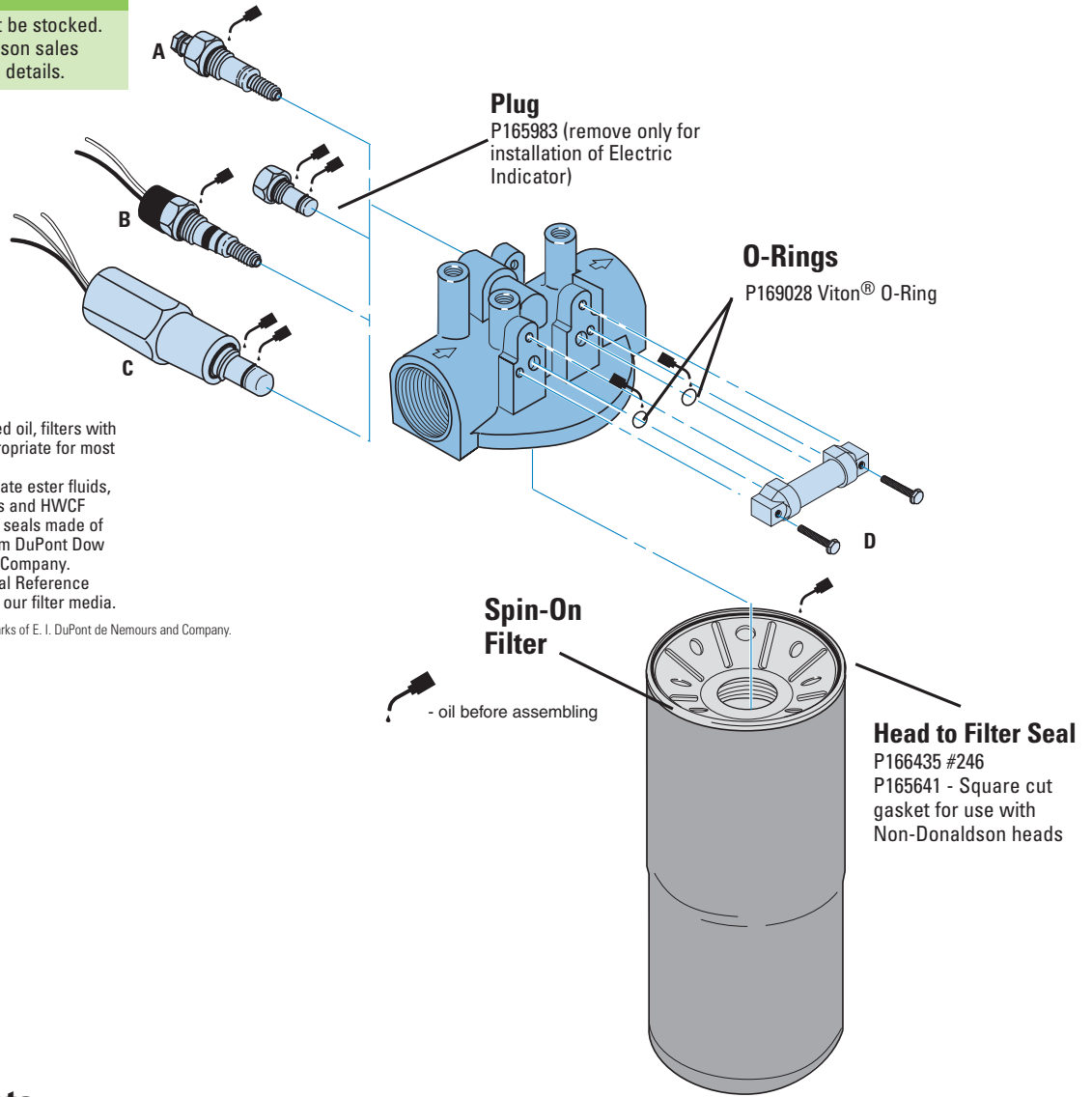
Service Indicator Styles

(See table on opposite page)

Filter Notes

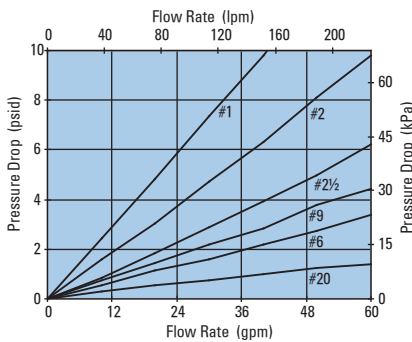
- If you're filtering petroleum-based oil, filters with seals made of Buna-N® are appropriate for most applications.
- If you're filtering diester, phosphate ester fluids, water glycol, water/oil emulsions and HWCF over 150°F/ 83°C, use filters with seals made of fluorocarbon, such as Viton® from DuPont Dow Elastomers, or Fluorel® from 3M Company.
- Refer to the table in the Technical Reference Guide for fluid compatibility with our filter media.

Viton® and Buna-N® are registered trademarks of E. I. DuPont de Nemours and Company.

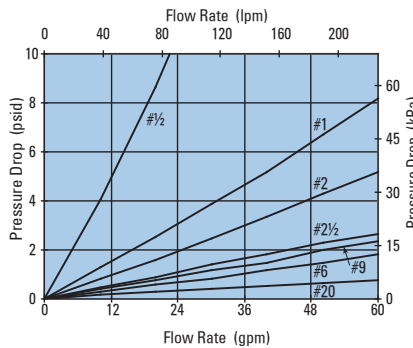


Performance Data

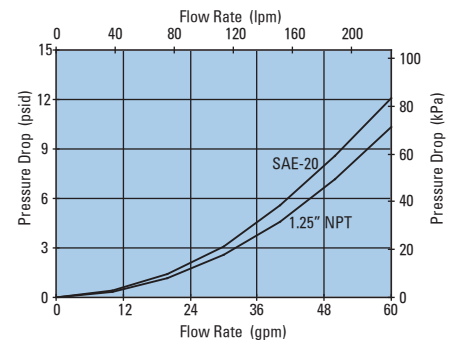
HBK05 Filter Only
(Synthetic, 6.7"/170mm)



HBK05 Filter Only
(Synthetic, 10.7"/271mm)



HBK05 Head Only





SP50/60

Max Flow: 60 gpm (227 lpm)



SP50/60 Spin-On Filters

Working Pressures to: 150 *psi*
1035 kPa
10.3 bar

Rated Static Burst to: 250 *psi*
1725 kPa
17.2 bar

Flow Range to: 60 *gpm*
227 *lpm*



Features

The SP50/60 spin-on filter is an economical, low-pressure model with a broad selection of media ratings. The die cast aluminum head and steel body ensure strength and durability—perfect for a wide variety of mobile and in-plant applications.

Take advantage of Donaldson's mix and match system of in-stock heads and filter choices—so you can get exactly what you need. Filter options include: synthetic media, natural-fiber cellulose, water-absorbing cellulose media and wire mesh media. SP50/60 spin-on filters are interchangeable with HBK05 filters, as listed on page 46. Please note gasket options on page 52.

Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- 1¼" NPT
- SAE-20 O-ring

Replacement Filter Lengths

- 6.7" / 170 mm
- 7.0" / 178 mm
- 10.7" / 271 mm

Outer Diameter

- 5" / 127 mm

Filter Collapse Ratings

- 100 *psid* / 690 kPa / 6.9 bar

Standard Bypass Ratings

- 25 *psi* / 172.5 kPa / 1.7 bar
- 15 *psi* / 103.4 kPa / 1.03 bar
- 5 *psi* / 34.5 kPa / .34 bar
- 2.5 *psi* / 17.2 kPa / .17 bar
- No Bypass

Assembly Weight

- 4.7 lbs / 2.1 kg (short)
- 5.6 lbs / 2.5 kg (long)

Operating Temperatures

- -22°F to 250°F / -30°C to 121°C



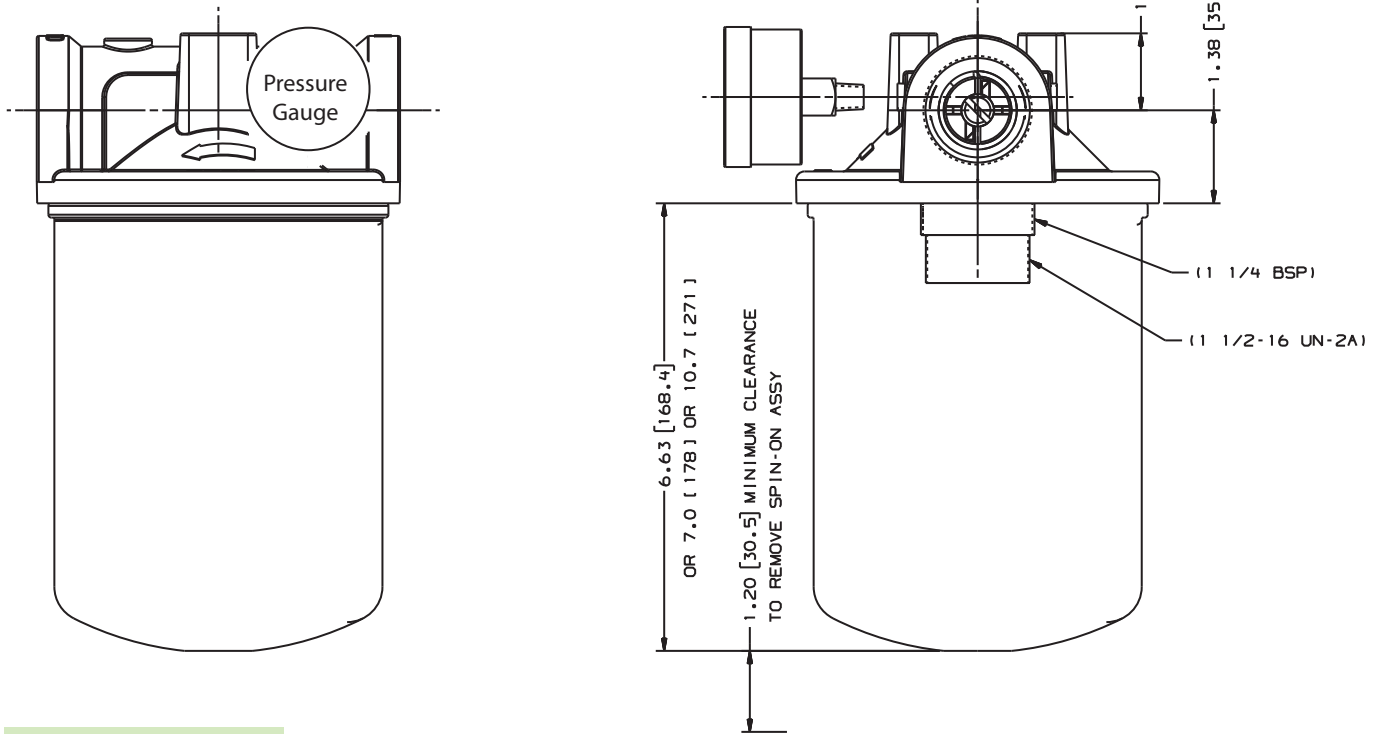
SP50/60 Specification Illustrations

All dimensions are shown in inches [millimeters].

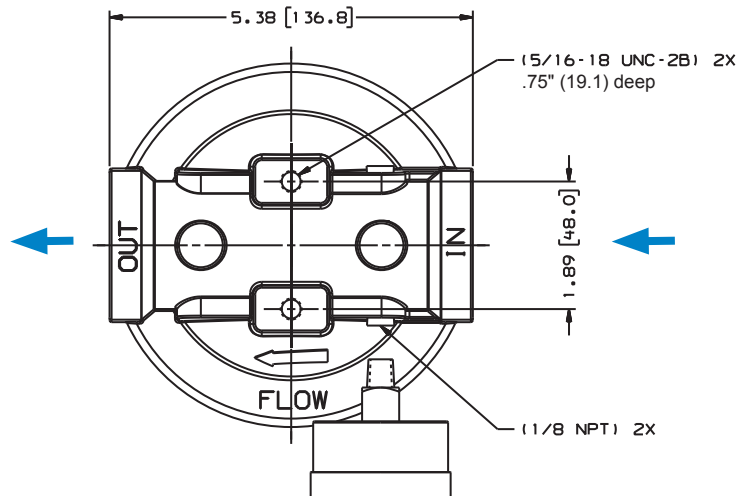
Applications:

- Process Systems
- Fluid Conditioning
- In-Plant & Mobile Equipment
- Power Transmissions
- Filter Cart

Assembly - Side View



Head - Top View





SP50/60

Max Flow: 60 gpm (227 lpm)



SP50/60 Components

Filter Choices

| Media Type | Beta _{rc} =200 Rating | Beta _{rc} =1000 Rating | Length (in./mm) | Donaldson Part No. | Comments |
|------------------|--------------------------------|---------------------------------|-----------------|--------------------|--|
| No. ½ | | <4 µm | 10.7/271 | P167796 | Synthetic, Viton® O-ring & square seal kit |
| No. 1 | | 5 µm | 6.7/170 | P169430 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P167832 | Synthetic, 3-seal kit |
| No. 2 | | 9 µm | 6.7/170 | P167162 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P165762 | Synthetic, 3-seal kit |
| No. 2½ | | 10 µm | 6.7/170 | P165875 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P165876 | Synthetic, 3-seal kit |
| No. 6 | | 13 µm | 6.7/170 | P167944 | Synthetic, Viton O-ring & square seal kit |
| | | | 10.7/271 | P167945 | Synthetic, Viton O-ring & square seal kit |
| No. 9 | | 23 µm | 6.7/170 | P165877 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P165878 | Synthetic, 3-seal kit |
| No. 20 | | >50 µm | 6.7/170 | P165879 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P165880 | Synthetic, 3-seal kit |
| No. 3 | | 24 µm | 6.7/170 | P550386 | Cellulose, 3-seal kit |
| | | | 10.7/271 | P550250 | Cellulose, 3-seal kit |
| No. 10 | | 23 µm | 6.7/170 | P550388 | Cellulose, 3-seal kit |
| | | | 10.7/271 | P550251 | Cellulose, 3-seal kit |
| | | | 7.00/178 | P565245 | Cellulose, square-seal, 1¼" BSP thread |
| No. 25 | 32 µm | | 6.7/170 | P550387 | Cellulose, 3-seal kit |
| | | | 10.7/271 | P550252 | Cellulose, 3-seal kit |
| | | | 7.00/178 | P171616 | Cellulose, square-seal, 1¼" BSP thread |
| Water Absorbing* | 10 µm | | 10.7/271 | P561183 | Cellulose, "L" & square-seal kit |
| Wire Mesh | 150 µm nom | | 6.7/170 | P550275 | SS Wire Mesh, 3-seal kit |
| | | | 10.7/271 | P550276 | SS Wire Mesh, 3-seal kit |

All models have 1½-16 UNF threads except where otherwise noted.
All models measure 5.07/127 mm outer diameter.

* Absorbs 350 ml water.

Viton® is a registered trademark of E. I. DuPont de Nemours and Company.

Head Choices

| Port Size | Bypass Rating | Gauge Ports (drill, tap, plug) | Gauge Port Location | DCI Part No. |
|-----------|-------------------------------|--------------------------------|---------------------|--------------|
| 1¼" NPT | 15 psi / 103.4 kPa / 1.34 bar | (2) 1/8" NPT | upstream side | P563267 |
| 1¼" NPT | 25 psi / 172.5 kPa / 1.72 bar | (2) 1/8" NPT | upstream side | P563268 |
| 1¼" NPT | 5 psi / 34.5 kPa / .34 bar | (2) 1/8" NPT | downstream side | P563269 |
| 1¼" NPT | 15 psi / 103.4 kPa / 1.34 bar | none | na | P563270 |
| 1¼" NPT | Blocked | (2) 1/8" NPT | downstream side | P561952 |
| 1¼" NPT | 2.5 psi / 17.3 kPa / .17 bar | none | na | P563490 |
| 1¼" NPT | 2.5 psi / 17.3 kPa / .17 bar | (2) 1/8" NPT | downstream side | P563491 |
| 1¼" NPT | 25 psi / 172.5 kPa / 1.72 bar | none | na | P563492 |
| SAE-20 | 15 psi / 103.4 kPa / 1.34 bar | (2) 1/8" NPT | upstream side | P563271 |
| SAE-20 | 25 psi / 172.5 kPa / 1.72 bar | (2) 1/8" NPT | upstream side | P563272 |
| SAE-20 | Blocked | (2) 1/8" NPT | upstream side | P564147 |

Gaskets

SP spin-on filters can be used with three gasket styles. Donaldson filters ship with a 3-seal kit, containing an "L" shaped, a square cut, and an O-ring gasket seal, unless otherwise noted. Individual gaskets can be ordered separately using the part numbers below:

P569908

L Shaped



Use with Donaldson SP50/60 head and some non-Donaldson heads. Shipped with each Donaldson-branded spin-on filter.

P165641-Nitrile Square Cut
P169027-Fluorocarbon



Use with SP50/60, SP80/90, SP100/120 and some non-Donaldson heads. Shipped with each Donaldson-branded spin-on filter.

P166435-Nitrile O-Ring -246



Use with Donaldson HBK05 head.

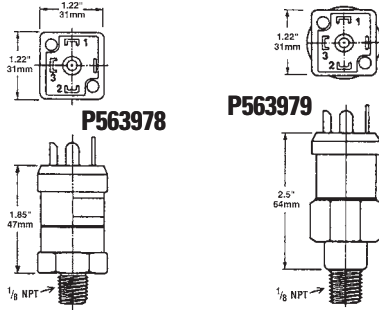
Optional Filter Service Indicators

This handy pressure gauge, mounted on the side of an SP50/60 filter head, will tell you when it's time to service the filter.

| Donaldson Part No. | Pressure Range | Use With Bypass Valve Rating | Type |
|--------------------|----------------------------|---|---|
| P563978 | 5 to 30 psi | 15 psi / 103.4 kPa / 1.34 bar field adj.* or No Bypass | Return indicator, electrical or 25 psi / 172.5 kPa / 1.72 bar |
| P563979 | -5 to 15 in Hg field adj.* | 5 psi / 34.5 kPa / .34 bar or No Bypass | Suction indicator, electrical |
| P563296 | 0 to 100 psi | 15 psi / 103.4 kPa / 1.34 bar or 25 psi / 172.5 kPa / 1.72 bar or No Bypass | Return indicator, numeric scale |
| P563297 | 0 to 100 psi | 15 psi / 103.4 kPa / 1.34 bar Bypass | Return indicator, color coded |
| P563298 | 0 to 100 psi | 25 psi / 172.5 kPa / 1.72 bar or No Bypass | Return indicator, color-coded |
| P563299 | 0 to -20 Hg | 5 psi / 34.5 kPa / .34 bar or No Bypass | Suction indicator, numeric scale |



Notes
*NOT PRESET:
Setting adjustable for desired application

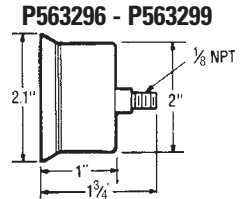


#1 Common; #2 Normally Closed;
#3 Normally Open

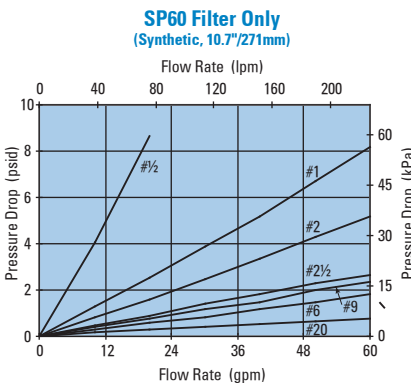
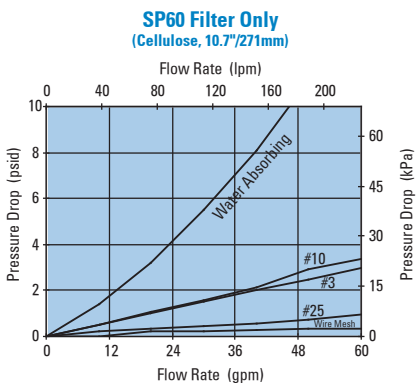
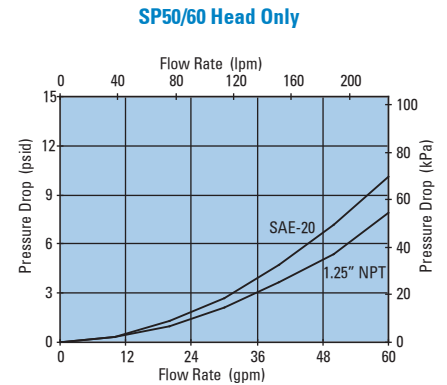
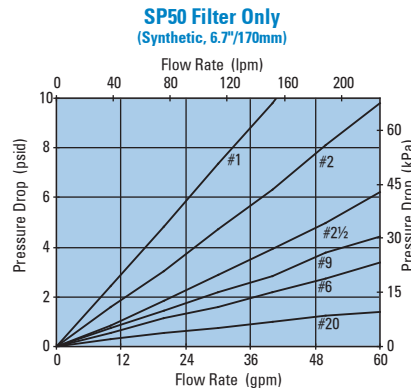
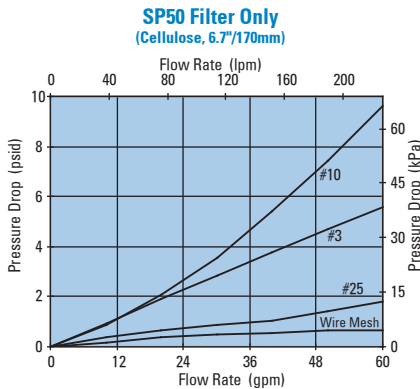
Instructions

1. Remove DIN adaptor
2. Remove small brass screw
3. Using 1/8" allen wrench adjust clockwise to increase set point/counter-clockwise to decrease set point
4. NO / NC

Adjustment screw located in center of electric prongs



Performance Data





SP80/90

Max Flow: 100 gpm (380 lpm)



SP80/90 Spin-On Filters

Working Pressures to: 150 *psi*
1035 kPa
10.3 bar

Rated Static Burst to: 250 *psi*
1725 kPa
17.2 bar

Flow Range to: 100 *gpm*
380 *lpm*



Features

SP80/90 double filter head allows for double the flow capacity, with two filters to hold more contaminant. Aluminum casting and Buna-N® seals standard. SP80/90 filters are interchangeable with SP50/60 filters.

Buna-N® is a registered trademark of E. I. DuPont de Nemours and Company.

Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- 1½" NPT
- SAE-24 O-ring
- 2" SAE 4-Bolt Flange Code 61

Replacement Filter Lengths

- 6.7" / 170 mm
- 7.0" / 178 mm
- 10.7" / 271 mm

Filter Collapse Ratings

- 100 *psid* / 690 kPa / 6.9 bar

Standard Bypass Ratings

- 25 psi / 172.5 kPa / 1.72 bar
- 15 psi / 103.4 kPa / 1.34 bar
- 5 psi / 34.5 kPa / .34 bar
- No Bypass

Operating Temperatures

- -22°F to 250°F / -30°C to 121°C

Assembly Weight

- 10.0 lbs / 4.5 kg (short) - approximate
- 11.8 lbs / 5.4 kg (long)

SP80/90 Specification Illustrations

All dimensions are shown in inches [millimeters].

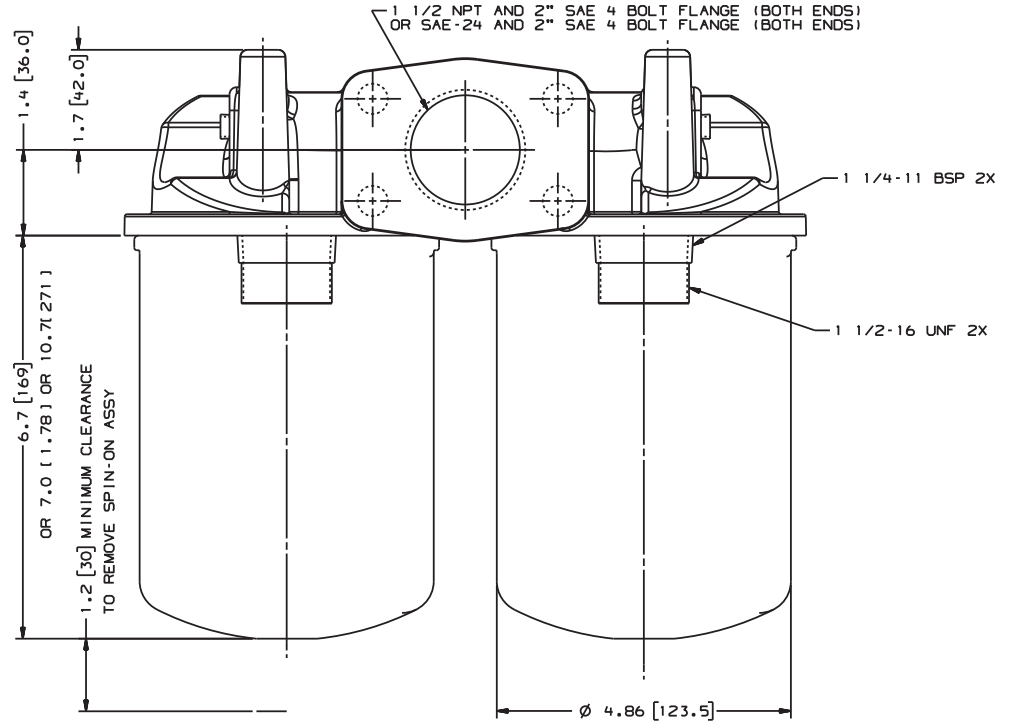
Assembly - Side View

Combination

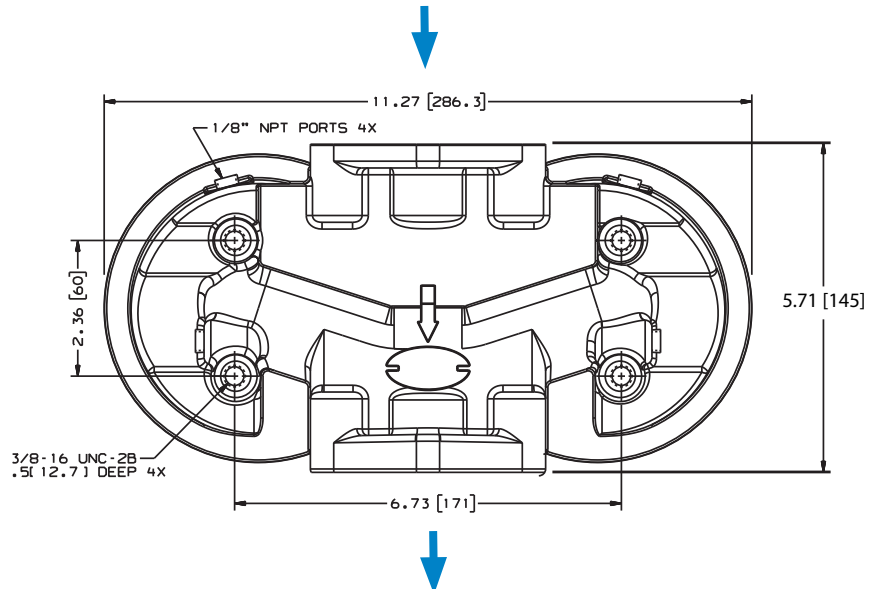
1 1/2" NPT and 2" SAE

4-Bolt Flange (Both Ends) or

SAE-24 & 2" SAE-4 Bolt



Head - Top View





SP80/90

Max Flow: 100 gpm (380 lpm)



SP80/90 Components

Filter Choices

| Media Type | Beta _(c) =200 Rating | Beta _(c) =1000 Rating | Length (in./mm) | Donaldson Part No. | Comments |
|------------------|---------------------------------|----------------------------------|-----------------|--------------------|--|
| No. ½ | | <4 µm | 10.7/271 | P167796 | Synthetic, Viton® O-ring & square seal kit |
| No. 1 | | 5 µm | 6.7/170 | P169430 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P167832 | Synthetic, 3-seal kit |
| No. 2 | | 9 µm | 6.7/170 | P167162 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P165762 | Synthetic, 3-seal kit |
| No. 2½ | | 10 µm | 6.7/170 | P165875 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P165876 | Synthetic, 3-seal kit |
| No. 6 | | 13 µm | 6.7/170 | P167944 | Synthetic, Viton O-ring & square seal kit |
| | | | 10.7/271 | P167945 | Synthetic, Viton O-ring & square seal kit |
| No. 9 | | 23 µm | 6.7/170 | P165877 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P165878 | Synthetic, 3-seal kit |
| No. 20 | | >50 µm | 6.7/170 | P165879 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P165880 | Synthetic, 3-seal kit |
| No. 3 | | 24 µm | 6.7/170 | P550386 | Cellulose, 3-seal kit |
| | | | 10.7/271 | P550250 | Cellulose, 3-seal kit |
| No. 10 | | 23 µm | 6.7/170 | P550388 | Cellulose, 3-seal kit |
| | | | 10.7/271 | P550251 | Cellulose, 3-seal kit |
| | | | 7.00/178 | P565245 | Cellulose, square-seal, 1¼" BSP thread |
| No. 25 | 32 µm | | 6.7/170 | P550387 | Cellulose, 3-seal kit |
| | | | 10.7/271 | P550252 | Cellulose, 3-seal kit |
| | | | 7.00/178 | P171616 | Cellulose, square-seal, 1¼" BSP thread |
| Water Absorbing* | 10 µm | | 10.7/271 | P561183 | Cellulose, "L" & square-seal kit |
| Wire Mesh | 150 µm nom | | 6.7/170 | P550275 | SS Wire Mesh, 3-seal kit |
| | | | 10.7/271 | P550276 | SS Wire Mesh, 3-seal kit |

All models have 1½"-16UNF threads except where otherwise noted.
All models measure 5.0"/127 mm outer diameter.

* Absorbs 350 ml water.

Viton® is a registered trademark of E. I. DuPont de Nemours and Company.

Head Choices

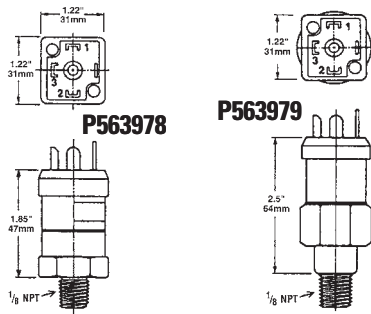
| Port Size | Bypass Rating | Gauge Ports (drill, tap, plug) | Gauge Port Location | DCI Part No. |
|-------------------------|-------------------------------|--------------------------------|-----------------------------|--------------|
| 1½" NPT & 2" SAE 4 BOLT | 15 psi / 103.4 kPa / 1.34 bar | (4) 1/8" NPT | upstream & downstream sides | P563273 |
| 1½" NPT & 2" SAE 4 BOLT | 25 psi / 172.5 kPa / 1.72 bar | (4) 1/8" NPT | upstream & downstream sides | P563274 |
| 1½" NPT & 2" SAE 4 BOLT | Blocked | (4) 1/8" NPT | upstream & downstream sides | P563275 |
| 1½" NPT & 2" SAE 4 BOLT | 5 psi / 34.5 kPa / .34 bar | (4) 1/8" NPT | upstream & downstream sides | P563276 |
| SAE-24 O-Ring | 25 psi / 172.5 kPa / 1.72 bar | (4) 1/8" NPT | upstream & downstream sides | P564892 |

Optional Filter Service Indicators

| Donaldson Part No. | Pressure Range | Use With Bypass Valve Rating | Type |
|--------------------|----------------------------|---|----------------------------------|
| P563978 | 5 to 30 psi field adj.* | 15 psi / 103.4 kPa / 1.34 bar or 25 psi / 172.5 kPa / 1.72 bar or No Bypass | Return indicator, electrical |
| P563979 | -5 to 15 in Hg field adj.* | 5 psi / 34.5 kPa / .34 bar or No Bypass | Suction indicator, electrical |
| P563296 | 0 to 100 psi | 15 psi / 103.4 kPa / 1.34 bar or 25 psi / 172.5 kPa / 1.72 bar or No Bypass | Return indicator, numeric scale |
| P563297 | 0 to 100 psi | 15 psi / 103.4 kPa / 1.34 bar Bypass | Return indicator, color coded |
| P563298 | 0 to 100 psi | 25 psi / 172.5 kPa / 1.72 bar or No Bypass | Return indicator, color-coded |
| P563299 | 0 to -20 Hg | 5 psi / 34.5 kPa / .34 bar or No Bypass | Suction indicator, numeric scale |



Notes
*NOT PRESET: Setting adjustable for desired application



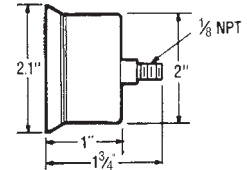
#1 Common; #2 Normally Closed; #3 Normally Open

Instructions

1. Remove DIN adaptor
2. Remove small brass screw
3. Using 1/8" allen wrench adjust clockwise to increase set point/counter-clockwise to decrease set point
4. NO / NC

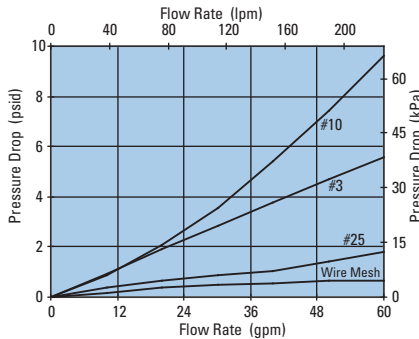
Adjustment screw located in center of elec. prongs

P563296 - P563299

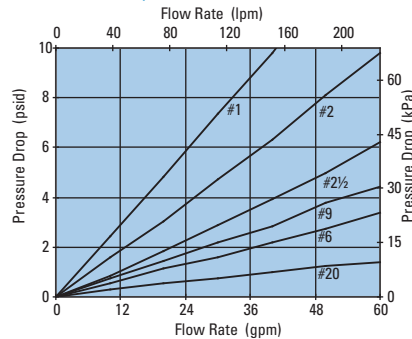


Performance Data

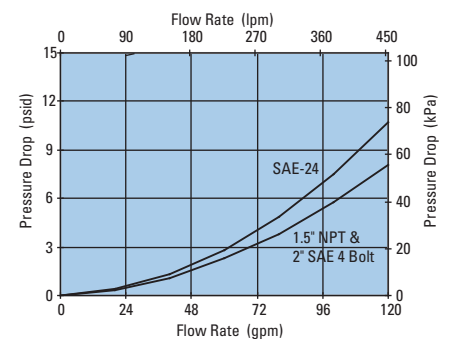
SP80 Filter Only
(Cellulose, 6.7"/170mm)



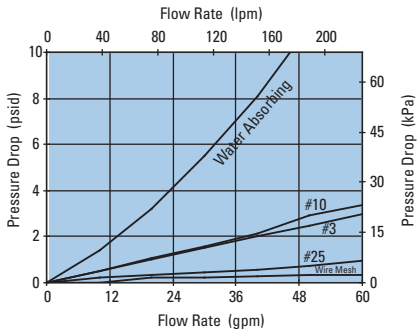
SP80 Filter Only
(Synthetic, 6.7"/170mm)



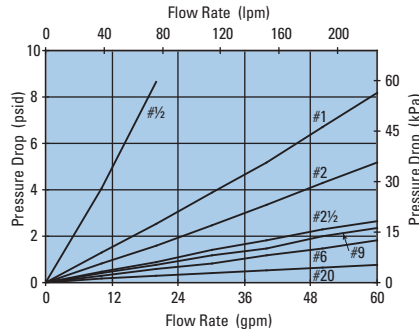
SP80/90 Head Only



SP90 Filter Only
(Cellulose, 10.7"/271mm)



SP90 Filter Only
(Synthetic, 10.7"/271mm)





SP100/120

Max Flow: 100 gpm (380 lpm)



SP100/120 Spin-On Filters

Working Pressures to: 150 *psi*
1035 kPa
10.3 bar

Rated Static Burst to: 250 *psi*
1725 kPa
17.2 bar

Flow Range to: 100 *gpm*
380 *lpm*

Features

SP100/120 double filter head allows for double the flow capacity and a unique, space-saving configuration. Aluminum casting and Buna-N® seals standard. SP100/120 filters are interchangeable with SP50/60 filters.

Buna-N® is a registered trademark of E. I. DuPont de Nemours and Company.



Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- 1½" NPT

Replacement Filter Lengths

- 6.7" / 170 mm
- 7.0" / 178 mm
- 10.7" / 271 mm

Standard Bypass Ratings

- 25 psi / 172.5 kPa / 1.72 bar

Operating Temperatures

- -22°F to 250°F / -30°C to 121°C

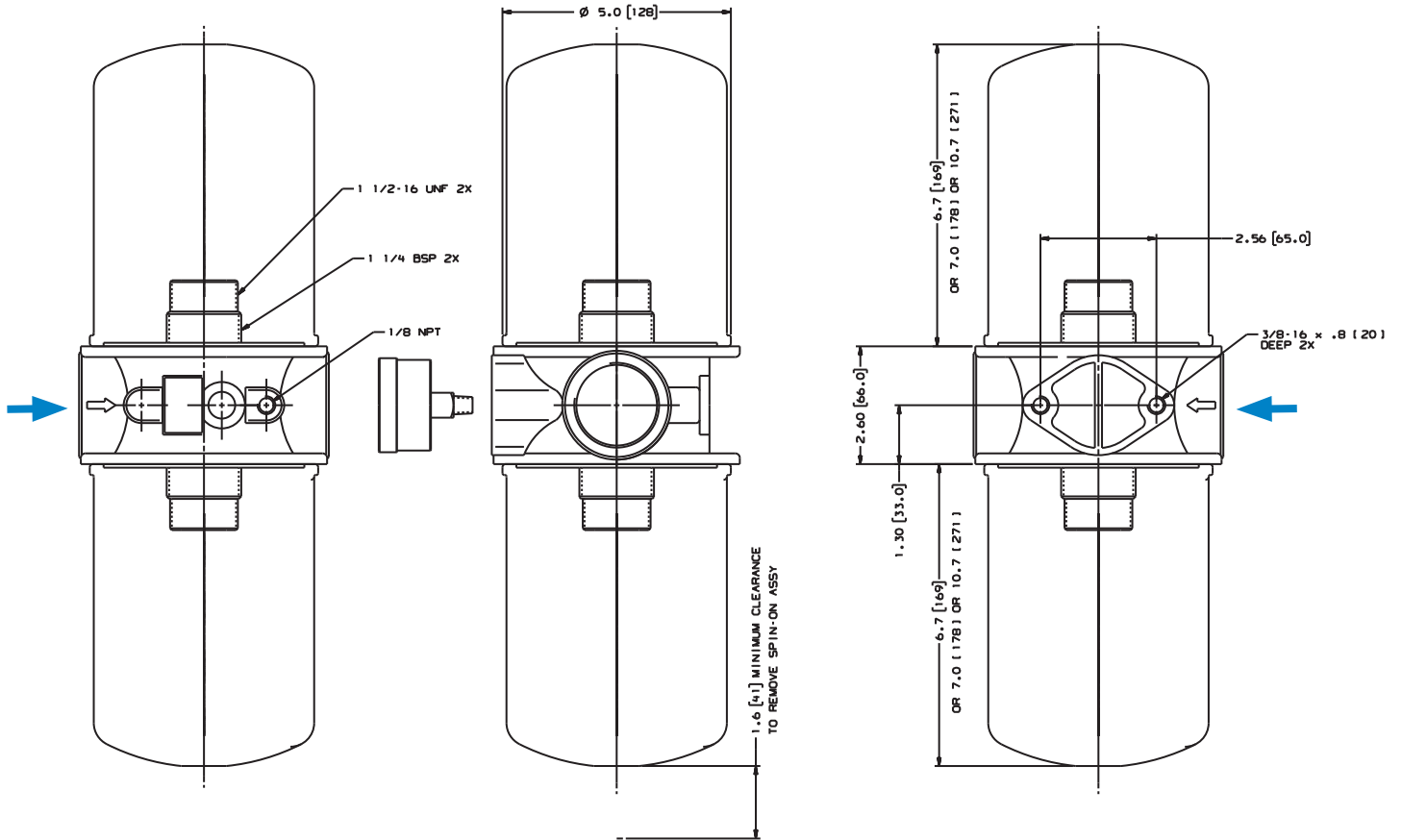
Assembly Weight

- 7.0 lbs / 3.2 kg (short)
- 8.8 lbs / 4.0 kg (long)

SP100/120 Specification Illustrations

All dimensions are shown in inches [millimeters].

Assembly - Side View





SP100/120

Max Flow: 100 gpm (380 lpm)



SP100/120 Components

Filter Choices

| Media Type | Beta _{x(c)} =200 Rating | Beta _{x(c)} =1000 Rating | Length (in./mm) | Donaldson Part No. | Comments |
|------------------|----------------------------------|-----------------------------------|-----------------|--------------------|--|
| No. ½ | | <4 µm | 10.7/271 | P167796 | Synthetic, Viton® O-ring & square seal kit |
| No. 1 | | 5 µm | 6.7/170 | P169430 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P167832 | Synthetic, 3-seal kit |
| No. 2 | | 9 µm | 6.7/170 | P167162 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P165762 | Synthetic, 3-seal kit |
| No. 2½ | | 10 µm | 6.7/170 | P165875 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P165876 | Synthetic, 3-seal kit |
| No. 6 | | 13 µm | 6.7/170 | P167944 | Synthetic, Viton O-ring & square seal kit |
| | | | 10.7/271 | P167945 | Synthetic, Viton O-ring & square seal kit |
| No. 9 | | 23 µm | 6.7/170 | P165877 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P165878 | Synthetic, 3-seal kit |
| No. 20 | | >50 µm | 6.7/170 | P165879 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P165880 | Synthetic, 3-seal kit |
| No. 3 | | 24 µm | 6.7/170 | P550386 | Cellulose, 3-seal kit |
| | | | 10.7/271 | P550250 | Cellulose, 3-seal kit |
| No. 10 | | 23 µm | 6.7/170 | P550388 | Cellulose, 3-seal kit |
| | | | 10.7/271 | P550251 | Cellulose, 3-seal kit |
| | | | 7.00/178 | P565245 | Cellulose, square-seal, 1¼" BSP thread |
| No. 25 | 32 µm | | 6.7/170 | P550387 | Cellulose, 3-seal kit |
| | | | 10.7/271 | P550252 | Cellulose, 3-seal kit |
| | | | 7.00/178 | P171616 | Cellulose, square-seal, 1¼" BSP thread |
| Water Absorbing* | 10 µm | | 10.7/271 | P561183 | Cellulose, "L" & square-seal kit |
| Wire Mesh | 150 µm nom | | 6.7/170 | P550275 | SS Wire Mesh, 3-seal kit |
| | | | 10.7/271 | P550276 | SS Wire Mesh, 3-seal kit |

Viton® is a registered trademark of E. I. DuPont de Nemours and Company.

All models use L-shaped gaskets.

All models have 1½"-16UNF threads except where otherwise noted.

All models measure 5.0"/127 mm outer diameter.

* Absorbs 350 ml water.

Head Choice

| Port Size | Bypass Rating | Gauge Ports (drill, tap, plug) | Gauge Port Location | Donaldson Part No. |
|-----------|-------------------------------|--------------------------------|-----------------------------|--------------------|
| 1½" NPT | 25 psi / 172.5 kPa / 1.72 bar | (2) 1/8" NPT | upstream & downstream sides | P563277 |

Optional Filter Service Indicators

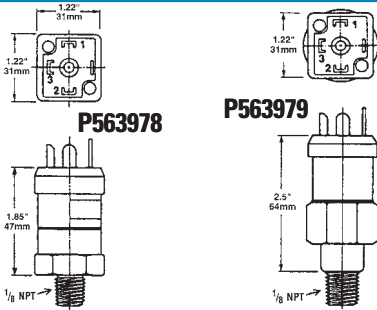
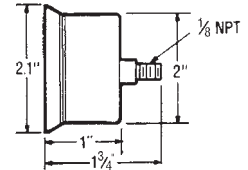
This handy pressure gauge, mounted on the side of an SP100/120 filter head, will tell you when it's time to service the filter.

| Donaldson Part No. | Pressure Range | Use With Bypass Valve Rating | Type |
|--------------------|----------------------------|---|----------------------------------|
| P563978 | 5 to 30 psi field adj.* | 15 psi / 103.4 kPa / 1.34 bar or 25 psi / 172.5 kPa / 1.72 bar or No Bypass | Return indicator, electrical |
| P563979 | -5 to 15 in Hg field adj.* | 5 psi / 34.5 kPa / .34 bar or No Bypass | Suction indicator, electrical |
| P563296 | 0 to 100 psi | 15 psi / 103.4 kPa / 1.34 bar or 25 psi / 172.5 kPa / 1.72 bar or No Bypass | Return indicator, numeric scale |
| P563297 | 0 to 100 psi | 15 psi / 103.4 kPa / 1.34 bar Bypass | Return indicator, color coded |
| P563298 | 0 to 100 psi | 25 psi / 172.5 kPa / 1.72 bar or No Bypass | Return indicator, color-coded |
| P563299 | 0 to -20 Hg | 5 psi / 34.5 kPa / .34 bar or No Bypass | Suction indicator, numeric scale |



Notes
*NOT PRESET: Setting adjustable for desired application

P563296 - P563299



#1 Common; #2 Normally Closed;
#3 Normally Open

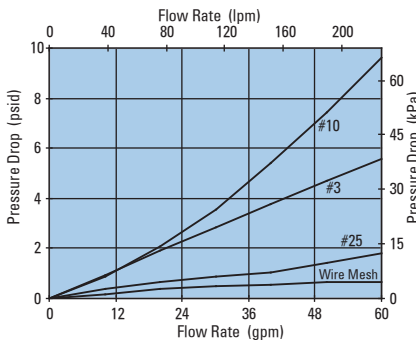
Instructions

1. Remove DIN adaptor
2. Remove small brass screw
3. Using 1/8" allen wrench adjust clockwise to increase set point/counter-clockwise to decrease set point
4. NO / NC

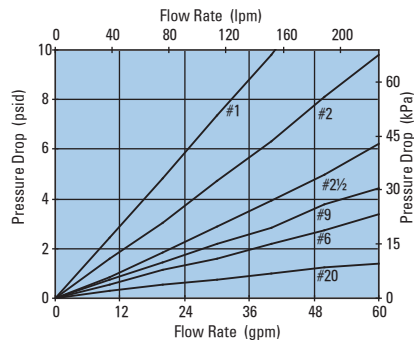
Adjustment screw located in center of elec. prongs

Performance Data

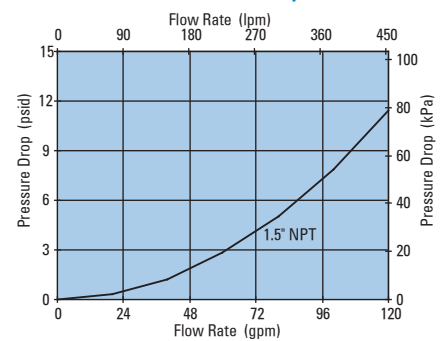
SP100 Filter Only
(Cellulose, 6.7"/170mm)



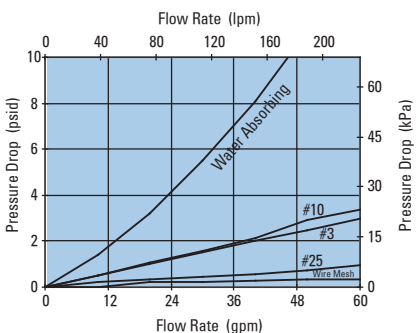
SP100 Filter Only
(Synthetic, 6.7"/170mm)



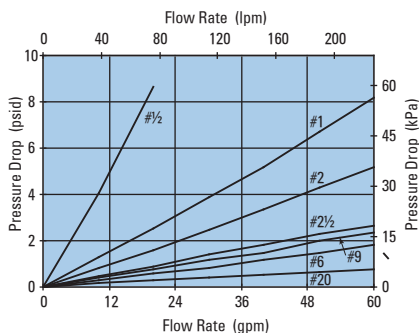
SP100/120 Head Only



SP120 Filter Only
(Cellulose, 10.7"/271mm)



SP120 Filter Only
(Synthetic, 10.7"/271mm)





W022

Max Flow: 120 gpm (454 lpm)



W022 Spin-On Filters

Working Pressures to: 150 *psi*
10.3 bar

Rated Static Burst to: 250 *psi*
17.2 bar

Flow Range to: 120 *gpm*
454 *lpm*



Features

W022 double filter head allows for double the flow capacity, with two filters to hold more contaminant. Take advantage of our mix and match system of head and filters, so you get exactly what you need. You can choose the media type and configurations that's best for your application. What sets this apart from the SP80/90 is the cast iron head, which is especially desirable for mobile equipment and high vibration applications.

Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- 1½" NPT
- SAE-24 O-ring
- 1½" SAE 4-Bolt Flange Code 61

Replacement Filter Lengths

- 6.7" / 170 mm
- 7.0" / 178 mm
- 10.7" / 271 mm

Standard Bypass Ratings

- 50 psi / 345 kPa / 3.5 bar
- 25 psi / 172.5 kPa / 1.72 bar
- No bypass

Operating Temperatures

- -22°F to 250°F / -30°C to 121°C

Assembly Weight

- 19.0 lbs / 4.5 kg (short)
- 20.6 lbs / 5.4 kg (long)

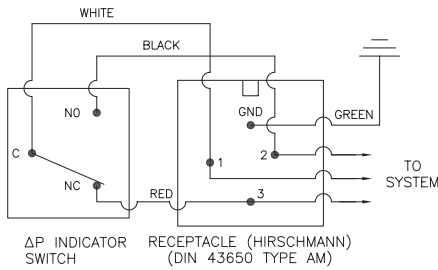
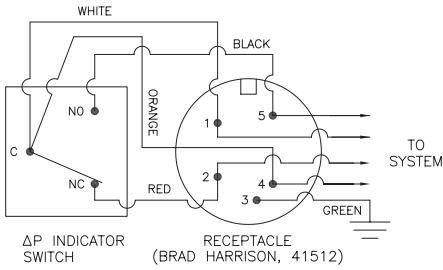
Filter Collapse Ratings

- 100 *psid* / 690 kPa / 6.9 bar

W022 Specification Illustrations

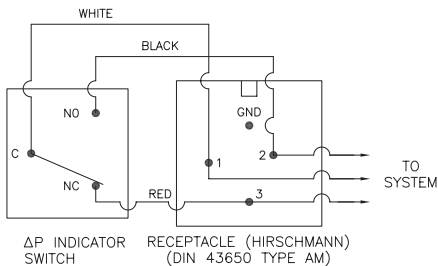
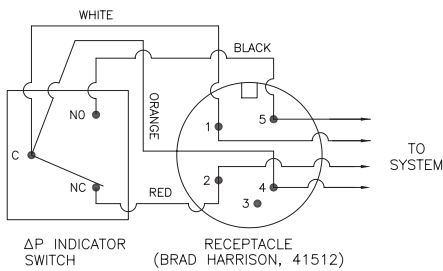
All dimensions are shown in millimeters [inches].

Indicator Switch Schematic Wiring Diagram Aluminum Electrical Housings



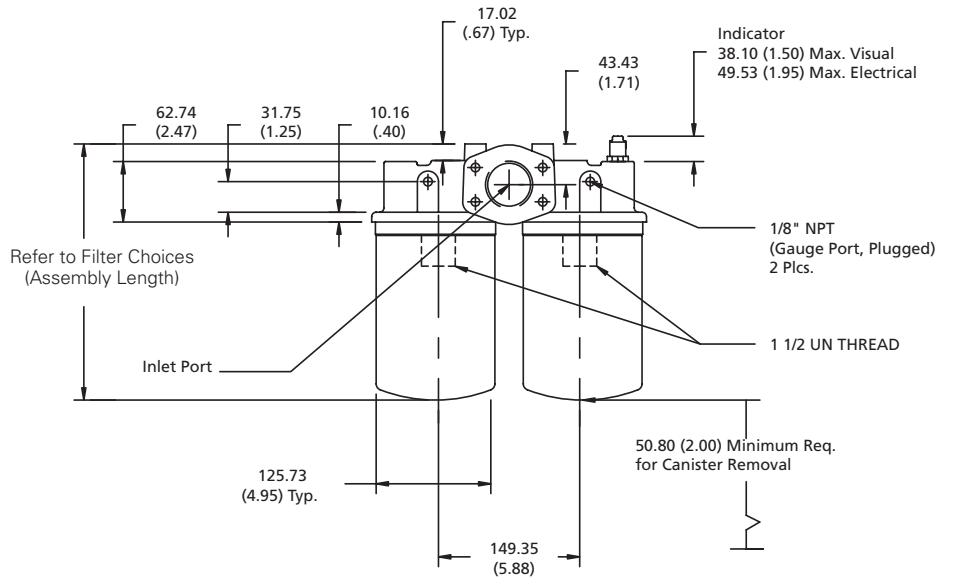
Note: The female plug (connector) is to be furnished by customer.

Plastic Electrical Housings

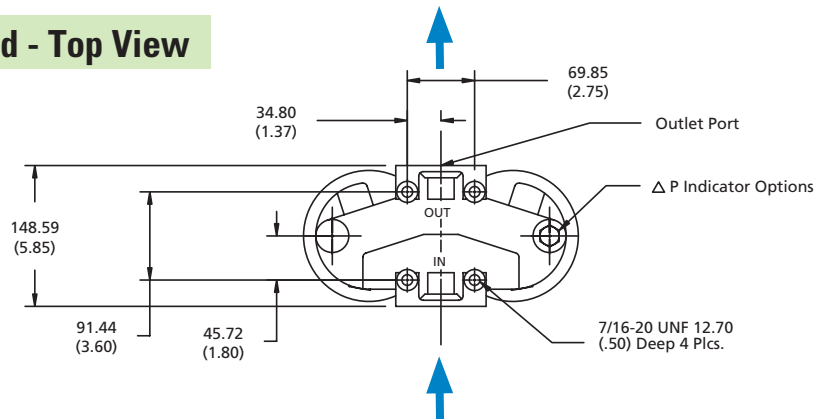


Note: The female plug (connector) is to be furnished by customer.

Assembly - Side View



Head - Top View



Differential Indicators:

Indicators are designed to actuate at approximately 80% of bypass valve cracking pressure. It is recommended that an indicator with a bypass setting of 100 psid is used with a non-bypass housing.

Surge Control:

This optional feature is used to dampen pressure surges or spikes to avoid premature actuation of the indicator. Surge control delays the indicator response.

Thermal Lockout:

The Thermal Lockout prevents premature signaling of a bypass condition created by viscous fluid during cold start-ups. Normal indicator actuation capability is resumed once the operating temperature of the fluid reaches approximately 80°F / 27°C.



W022

Max Flow: 120 gpm (454 lpm)



W022 Components Filter Choices

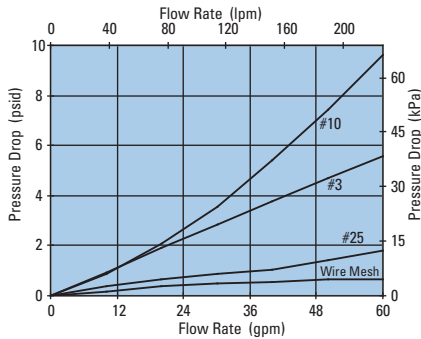
| Media Type | Beta _{x(e)} =200 Rating | Beta _{x(e)} =1000 Rating | Length (in./mm) | Donaldson Part No. | Comments |
|------------------|----------------------------------|-----------------------------------|-----------------|--------------------|--|
| No. ½ | | <4 µm | 10.7/271 | P167796 | Synthetic, Viton® O-ring & square seal kit |
| No. 1 | | 5 µm | 6.7/170 | P169430 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P167832 | Synthetic, 3-seal kit |
| No. 2 | | 9 µm | 6.7/170 | P167162 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P165762 | Synthetic, 3-seal kit |
| No. 2½ | | 10 µm | 6.7/170 | P165875 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P165876 | Synthetic, 3-seal kit |
| No. 6 | | 13 µm | 6.7/170 | P167944 | Synthetic, Viton O-ring & square seal kit |
| | | | 10.7/271 | P167945 | Synthetic, Viton O-ring & square seal kit |
| No. 9 | | 23 µm | 6.7/170 | P165877 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P165878 | Synthetic, 3-seal kit |
| No. 20 | | >50 µm | 6.7/170 | P165879 | Synthetic, 3-seal kit |
| | | | 10.7/271 | P165880 | Synthetic, 3-seal kit |
| No. 3 | | 24 µm | 6.7/170 | P550386 | Cellulose, 3-seal kit |
| | | | 10.7/271 | P550250 | Cellulose, 3-seal kit |
| No. 10 | | 23 µm | 6.7/170 | P550388 | Cellulose, 3-seal kit |
| | | | 10.7/271 | P550251 | Cellulose, 3-seal kit |
| No. 25 | 32 µm | | 6.7/170 | P550387 | Cellulose, 3-seal kit |
| | | | 10.7/271 | P550252 | Cellulose, 3-seal kit |
| | | | 7.00/178 | P171616 | Cellulose, square-seal, 1¼" BSP thread |
| Water Absorbing* | 10 µm | | 10.7/271 | P561183 | Cellulose, "L" & square-seal kit |
| Wire Mesh | 150 µm nom | | 6.7/170 | P550275 | SS Wire Mesh, 3-seal kit |
| | | | 10.7/271 | P550276 | SS Wire Mesh, 3-seal kit |

All models have 1½"-16UNF threads except where otherwise noted. All models measure 5.0"/127 mm outer diameter.

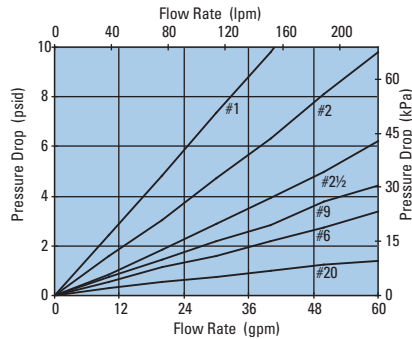
* Absorbs 350 ml water.

Performance Data

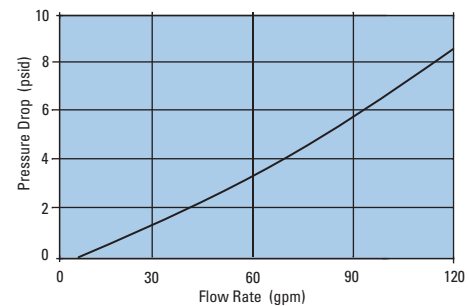
W022 Filter Only
(Cellulose, 6.7"/170mm)



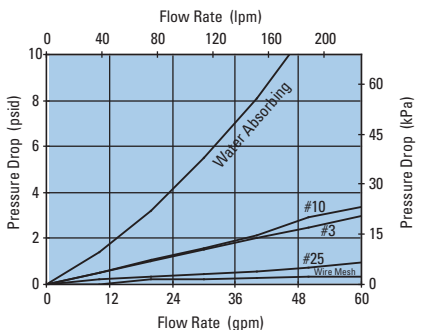
W022 Filter Only
(Synthetic, 6.7"/170mm)



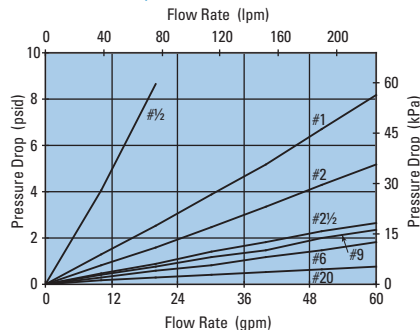
W022 Head Only



W022 Filter Only
(Cellulose, 10.7"/271mm)



W022 Filter Only
(Synthetic, 10.7"/271mm)



Viton® is a registered trademark of E. I. DuPont de Nemours and Company.



Filter Head Ordering Guide

| | | | | | | |
|-----------------|-----------------|--------------|--------------|--------------|----------------|--------------|
| Filter Assembly | W022 TABLE 1 | 1 TABLE 2 | D TABLE 3 | 4 TABLE 4 | L N TABLE 5 | B TABLE 6 |
|-----------------|-----------------|--------------|--------------|--------------|----------------|--------------|

Service Filter: Filters ordered separately. See previous page for filter options.

LEAD TIME NOTE:

This product is configured with the specifications and features of your choice. Please contact your Donaldson sales representative for lead time details.

Table 1

| Filter Assembly | |
|-----------------|-------------|
| CODE | DESCRIPTION |
| W022 | Assembly |

Table 2

| Filter Collapse Options | |
|-------------------------|-------------|
| CODE | DESCRIPTION |
| 1 | 150 psid |

Table 3

| Port Size Options | |
|-------------------|-------------------------------|
| CODE | PORT SIZE |
| D | SAE-24 O-ring |
| E | 1½" SAE 4-Bolt Flange Code 61 |
| U | 1½" NPT |

Table 4

| Bypass Setting Options | |
|------------------------|-------------------------|
| CODE | BYPASS SETTING |
| 1 | Non-bypassed (plugged)* |
| 3 | 25 psid |
| 4 | 50 psid |

*80 psid maximum operating pressure

Table 5 (Primary)

| Indicator Style and Setting | |
|-----------------------------|---|
| CODE | ΔP INDICATOR STYLE & SETTING |
| C | Electrical/visual 15 psid |
| D | Electrical/visual 35 psid |
| F | Electrical/visual 15 psid & TL |
| G | Electrical/visual 35 psid & TL |
| H | Electrical/visual 15 psid with 12" 3-wire flying lead |
| J | ΔP indicator plug |
| K | Visual indicator 15 psid |
| L | Visual indicator 35 psid |
| M | Visual indicator 35 psid with TL and surge |
| N | Electrical/visual 35 psid with 12" 3-wire flying lead |
| Q | Electrical switch 15 psid |
| R | Electrical switch 35 psid |
| X | Electrical/visual 15 psid with TL and surge |
| Y | Electrical/visual 35 psid with TL and surge |

TL (thermal lockout)

Media Ratings

Western Filter spin-ons have been replaced by Donaldson spin-on filters.

| WESTERN MEDIA CODE | DONALDSON MEDIA |
|--------------------|-----------------|
| P10 | #10 |
| P20 | #25 |
| R03 | #1 |
| R05 | #2 |
| R10 | #2½ |
| R20 | #9 |
| W10 | WA |

For a complete filter interchange, visit crossreference.donaldson.com.

Table 5

| Upstream Pressure Gauge and Switch Option | |
|---|--|
| CODE | INDICATOR STYLE & SETTING |
| 1 | Gauge ports drilled, tapped and plugged |
| 2 | 0-200 psi pressure gauge** |
| 3 | 0-60 psi pressure gauge** |
| 4 | 0-60 psi pressure gauge* |
| 6 | Pressure switch 18 psi Brad Harrison® (5-pin) |
| 7 | Pressure switch 35 psid Brad Harrison® (5-pin) |
| 8 | Pressure switch 18 psi Hirschmann® (4-pin) |
| 9 | Pressure switch 35 psid Hirschmann® (4-pin) |

*Bypass setting option code 3 only
**Bypass setting option code 4 only

Table 5 (Secondary)

| Receptacle Options | |
|--------------------|-------------------------------|
| CODE | ELECTRICAL STYLE |
| B | Brad Harrison® (5-pin) |
| H | Hirschmann® (4-pin) |
| N | None, for visual ΔP indicator |

Table 6

| Seal Options | |
|--------------|----------|
| CODE | MATERIAL |
| B | Buna-N® |

Brad Harrison® is a registered trademark of Woodhead Industries, Inc.
Hirschmann® is a registered trademark of Richard Hirschmann of America Inc.
Buna-N® is a registered trademark of E. I. DuPont de Nemours and Company.



TT15/30/60

Max Flow: 50 gpm (190 lpm)



TT15/30/60 Tank Top Return Spin-On Filters

Working Pressures to: 100 *psi*
690 *kPa*
6.9 *bar*

Flow Range to: 50 *gpm*
190 *lpm*

Features

TT15/30/60 Tank Top filters are designed for industrial service. Aluminum casting and Buna-N® seals standard. For use with mineral and synthetic based fluids. These return filters conveniently mount to tank tops with four screws. Common holes are used to mount the filter head to the reservoir without welding. A down pipe is attached to a threaded port and the gasket surface provides a watertight seal. Each filter provides a new bypass valve and anti-drainback valve for easy filter change.

Buna-N® is a registered trademark of E. I. DuPont de Nemours and Company.



Beta Rating

- Performance to $\beta_{23(c)}=1000$

Porting Size Options

- 3/4", 1 1/2" NPT

Replacement Filter Lengths

- 5.83" / 148mm TT15
- 7.05" / 179mm TT30
- 9.29" / 236mm TT60

Standard Bypass Ratings

- 22 *psi* / 150 *kPa* / 1.5 *bar*

Operating Temperatures

- -22°F to 250°F / -30°C to 121°C

Assembly Weight

- 2.0 lbs / 0.9 kg TT15
- 4.3 lbs / 2.0 kg TT30
- 5.2 lbs / 2.4 kg TT60

TT15/30/60 Components

Filter Choices

| Media Type | Beta _{23(c)} =1000 Rating | Length (in./mm) | Donaldson Part # | Filter Thread | Description |
|-----------------------------|------------------------------------|-----------------|------------------|---------------|-------------|
| 10 Micron Nominal Cellulose | 23 µm | 5.36 / 136 | P565242 | 3/4" BSP | TT15 Series |
| 10 Micron Nominal Cellulose | 23 µm | 7.05 / 179 | P550269 | 1 1/4" BSP | TT30 Series |
| 10 Micron Nominal Cellulose | 23 µm | 9.29 / 236 | P171640 | 1 1/4" BSP | TT60 Series |

Head Choices

| Port Size | Bypass Rating* | Gauge Ports (drill, tap, plug) | Gauge Port Location | Donaldson Part No. | Description | Head to Tank** Seal Part No. |
|------------|----------------------------|--------------------------------|---------------------|--------------------|----------------|------------------------------|
| 3/4" NPT | 22 psi / 150 kPa / 1.5 bar | (2) 1/8" NPT | upstream side | P564038 | TT15 Series | P563975 |
| 1 1/2" NPT | 22 psi / 150 kPa / 1.5 bar | (2) 1/8" NPT | upstream side | P563973 | TT30/60 Series | P563976 |

Note

* Bypass valve is integral part of replacement filter.

** Included with head.

Optional Filter Service Indicators

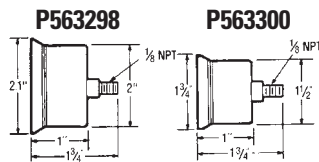
| Donaldson Part No. | Pressure Range | Use With Series | Type |
|--------------------|----------------------------|-----------------|-------------------------------|
| P563300 | 0 to 30 psi | TT15/30/60 | Return indicator, color-coded |
| P563978 | 5 to 30 psi field adj.* | TT15/30/60 | Return indicator, electrical |
| P563298 | 0 to 100 psi | TT15/30/60 | Return indicator, color-coded |

Note

* NOT PRESET: Setting adjustable for desired application.

1/8" - 27 NPTF threads

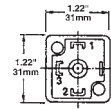
- Built in snubber to minimize damage caused by pressure surges
- Compatible with petroleum and mineral-based fluids
- Anti-splash



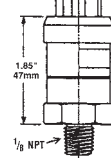
Instructions

1. Remove DIN adaptor
2. Remove small brass screw
3. Using 1/8" allen wrench adjust clockwise to increase set point/counter-clockwise to decrease set point
4. NO / NC

- #1 Common
- #2 Normally Closed
- #3 Normally Open



P563978

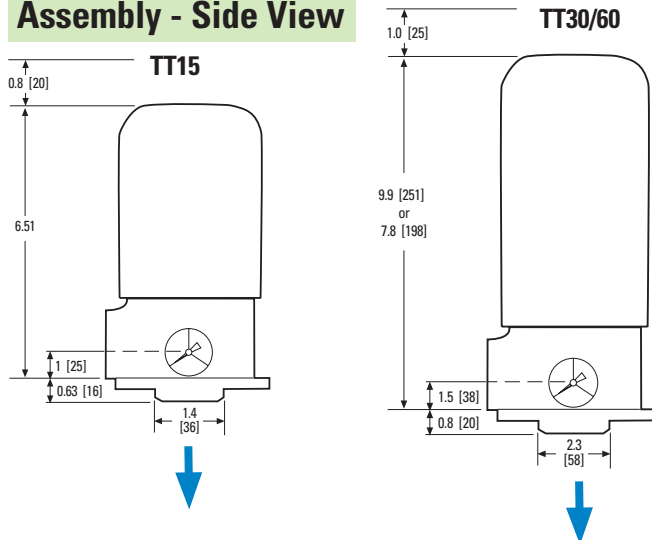


Adjustment screw located in center of elec. prongs

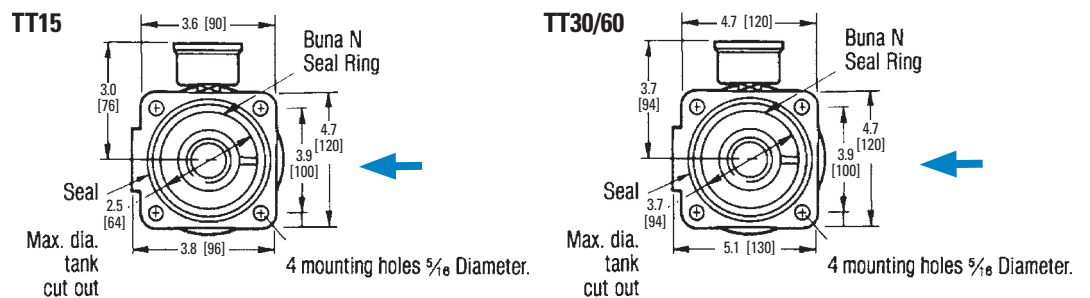
TT/15/30/ Specification Illustrations

All dimensions are shown in inches [millimeters].

Assembly - Side View

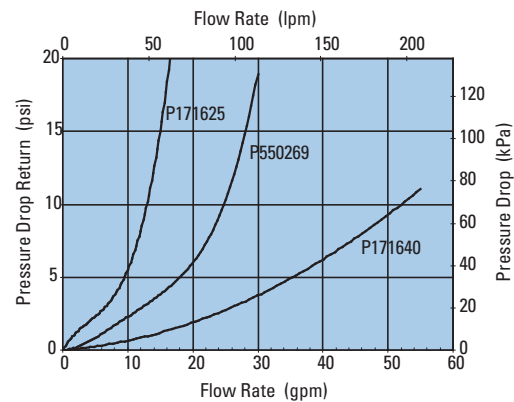


Head - Top View



Performance Data

TT Filters Only





WL15

Max Flow: 50 gpm (190 lpm)



WL15 In-Tank Filters

Working Pressures to: 200 *psi*
1,400 *kPa*
14 *bar*

Rated Static Burst to: 300 *psi*
2,100 *kPa*
20.7 *bar*

Flow Range to: 50 *gpm*
190 *lpm*



Features

WL15 in-tank filter meets HF4 automotive standard. The quick disconnect cover allows for easy and efficient filter change outs. An optional secondary inlet port offers the use of a second return line. DT high-performance replacement filters are available in five different media grades to fit any application.

Beta Rating (per ISO 16889)

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- SAE-24 O-ring
- 1½" SAE 4-Bolt Flange Code 61

Replacement Filter Lengths

- 9" / 229 mm

Assembly Weight

- Code 3: 5.25 lbs / 2.38 kg
- Code 9 (with 12" extension tube):
6.25 lbs / 2.84kg

Standard Bypass Ratings

- 50 psi / 345 kPa / 3.5 bar
- 25 psi / 172.5 kPa / 1.72 bar

Operating Temperatures

- -45° to 250°F (-43° to 121°C)

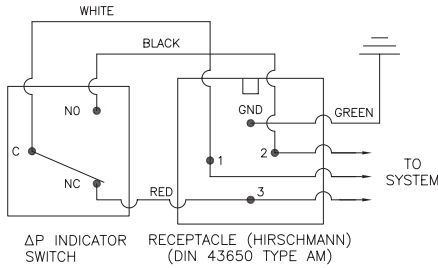
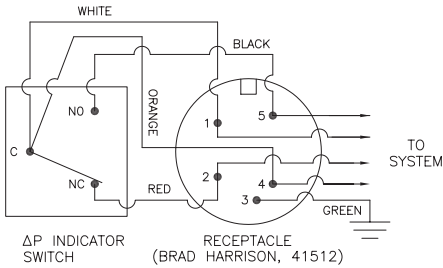
Filter Collapse Ratings

- 150 psi / 1034 kPa / 10.3 bar

WL15 Specification Illustrations

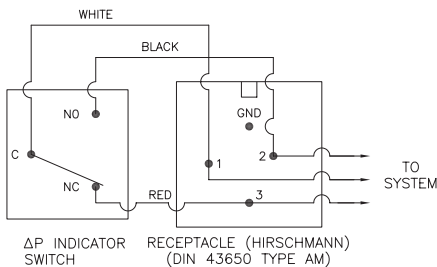
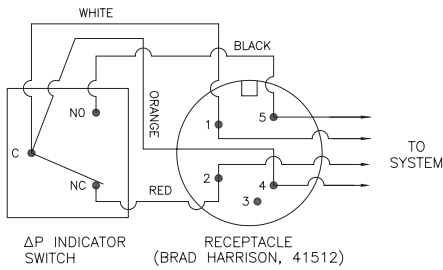
All dimensions are shown in millimeters [inches].

**Indicator Switch
Schematic Wiring Diagram
Aluminum Electrical Housings**



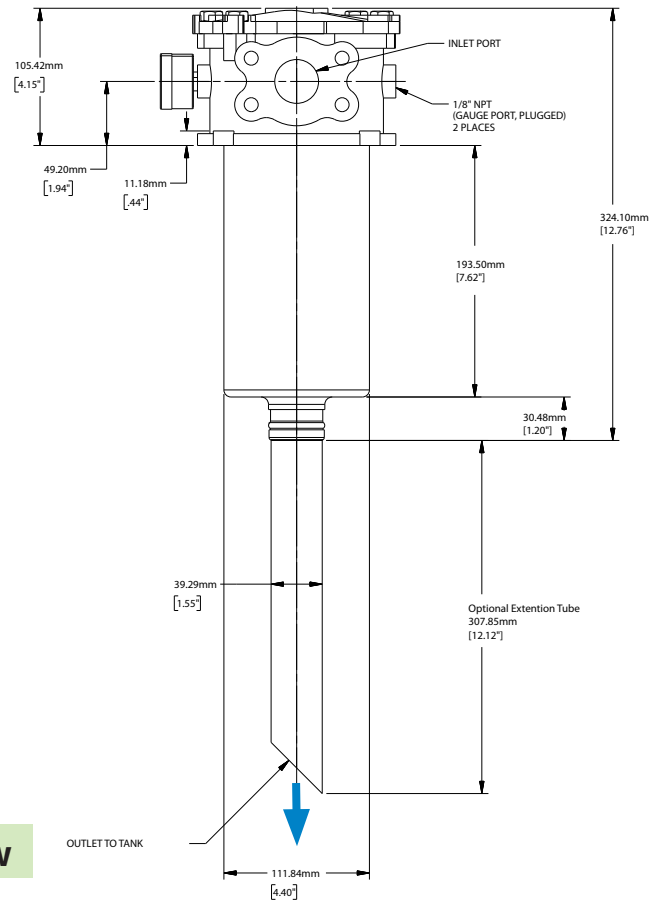
Note: The female plug (connector) is to be furnished by customer.

Plastic Electrical Housings

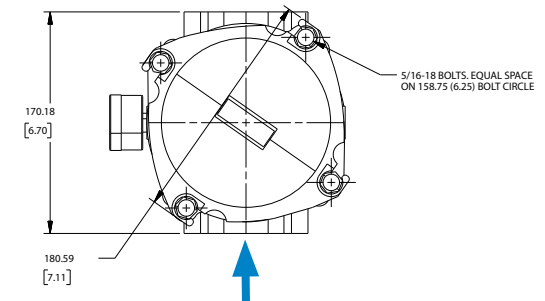


Note: The female plug (connector) is to be furnished by customer.

Assembly - Side View



Head - Top View



Differential Indicators:

Indicators are designed to actuate at approximately 80% of bypass valve cracking pressure. It is recommended that an indicator with a bypass setting of 100 psid is used with a non-bypass housing.

Surge Control:

This optional feature is used to dampen pressure surges or spikes to avoid premature actuation of the indicator. Surge control delays the indicator response.

Thermal Lockout:

The Thermal Lockout prevents premature signaling of a bypass condition created by viscous fluid during cold start-ups. Normal indicator actuation capability is resumed once the operating temperature of the fluid reaches approximately 80° F.



WL15

Max Flow: 50 gpm (190 lpm)



WL15 Components High-Performance DT Filter Choices

| Media Number | Beta _{x10} _(c) Rating | Length (in./mm) | Donaldson DT Part No. | Comments |
|--------------|---|-----------------|-----------------------|---------------|
| 5 μm | 5 μm | 9/231.8 | P566270 | DT-HF4-9-5UM |
| 8 μm | 8 μm | 9/231.8 | P566271 | DT-HF4-9-8UM |
| 14 μm | 14 μm | 9/231.8 | P566272 | DT-HF4-9-14UM |
| 25 μm | 25 μm | 9/231.8 | P566273 | DT-HF4-9-25UM |

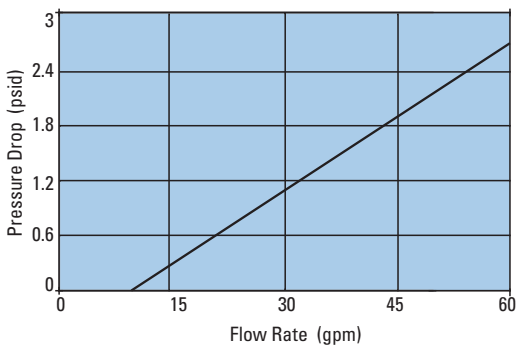


Filter Notes

- All Donaldson DT filters utilize glass fiber media with an epoxy-based resin system for the ultimate in chemical compatibility.
- All Donaldson DT filters are potted with epoxy-based adhesives.
- Standard collapse designs are double wire-backed using epoxy-coated steel mesh for maximum pleat support and dirt capacity.
- Viton® seals are standard on all Donaldson DT filters. Viton® is a registered trademark of E. I. DuPont de Nemours and Company.

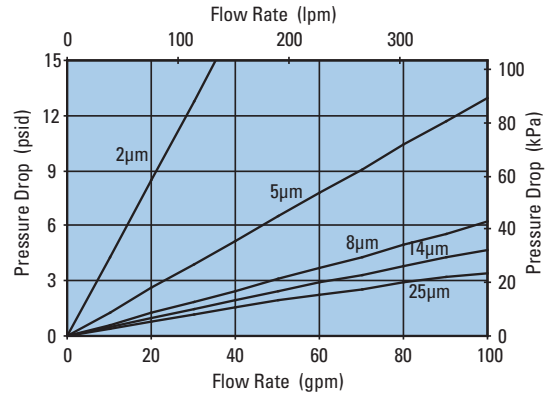
Performance Data

WL15 Housing Only



WL15 9" DT Filter Only

DT-HF-9, 9"/229mm



Filter Head Ordering Guide

Filter Assembly

| | | | | | | | |
|---------|---------|---------|---------|---------|---------|---------|---------|
| WL15 | 1 | D | 3 | 4 | B | 3 | N |
| TABLE 1 | TABLE 2 | TABLE 3 | TABLE 4 | TABLE 5 | TABLE 6 | TABLE 7 | TABLE 8 |

Service Filter

Filters ordered separately. See previous page for filter options.

LEAD TIME NOTE:

This product is configured with the specifications and features of your choice. Please contact your Donaldson sales representative for lead time details.

Table 1

| Filter Assembly | |
|-----------------|-------------|
| CODE | DESCRIPTION |
| WL15 | Assembly |

Table 2

| Filter Collapse Options | |
|-------------------------|-------------|
| CODE | DESCRIPTION |
| 1 | 150 psid |

Table 3

| Port Size Options | |
|-------------------|------------------------------|
| CODE | PORT SIZE |
| D | SAE-24 O-ring |
| E | 1½"SAE 4-Bolt Flange Code 61 |

Table 4

| Bypass Setting Options | |
|------------------------|----------------|
| CODE | BYPASS SETTING |
| 3 | 25 psid |
| 4 | 50 psid |

Table 5

| Upstream Pressure Gauge and Switch Option | |
|---|---|
| CODE | INDICATOR STYLE & SETTING |
| 1 | No indicator |
| 3 | 0-60 psi pressure gauge** |
| 4 | 0-60 psi pressure gauge* |
| 6 | Pressure switch 18 psi Brad Harrison® (5-pin) |
| 7 | Pressure switch 35 psid Brad Harrison® (5-pin) |
| 8 | Pressure switch 18 psi Hirschmann® (4-pin) |
| 9 | Pressure switch 35 psid Hirschmann® (4-pin) |

*Bypass setting option code 3 only

**Bypass setting option code 4 only

Table 6

| Seal Options | |
|--------------|----------|
| CODE | MATERIAL |
| B | Buna-N® |
| V | Viton® |

Table 7

| Assembly & Filter Length | |
|--------------------------|---------------|
| CODE (LGTH) | FILTER LENGTH |
| 3 (12.76") | 9.0" |
| 9 (24.88")* | 9.0" |

*With 12" extension tube

Table 8

| Secondary Port Options | |
|------------------------|-------------------------------------|
| CODE | PORT SIZE |
| D | 1-7/8" - 12 UN (SAE-24) |
| E | 1-1/2" SAE 4-Bolt Flange Code 61 |
| N | None |

Media Ratings

Western Filter elements have been replaced by Donaldson DT high-performance cartridges.

| WESTERN MEDIA CODE | DONALDSON DT MEDIA |
|--------------------|--------------------|
| 01 | DT 2µm |
| 03 | DT 5µm |
| 05 | DT 8µm |
| 10 | DT 14µm |
| 20 | DT 25µm |

For a complete filter interchange, visit crossreference.donaldson.com.



WL16

Max Flow: 100 gpm (380 lpm)



WL16 In-Tank Filters

Working Pressures to: 200 *psi*
13.8 bar

Rated Static Burst to: 300 *psi*
21 bar

Flow Range to: 100 *gpm*
380 *lpm*



Features

WL16 in-tank filters meet the HF-4 automotive standard. The quick disconnect cover allows for easy and efficient filter change-outs. An optional secondary inlet port offers the use of a second return line. These units can be top or side reservoir mounted. Use the optional anti-backflow valve when installing this filter assembly to the side of a reservoir. DT high-performance replacement filters are available in five different media grades to fit any application.

Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- 1½" NPT
- SAE-24 O-ring
- 1½" SAE 4-Bolt Flange Code 61

Replacement Filter Lengths

- 9" / 229 mm
- 18" / 457 mm
- 27" / 686 mm

Filter Collapse Ratings

- 150 *psid* / 1034 kPa / 10.3 bar

Standard Bypass Ratings

- 50 psi / 345 kPa / 3.5 bar
- 25 psi / 172.5 kPa / 1.72 bar

Assembly Weight

- Length 3, 5.25 lbs / 2.3 kg
- Length 6, 16 lbs / 7.3 kg
- Length 7, 23 lbs / 10 kg

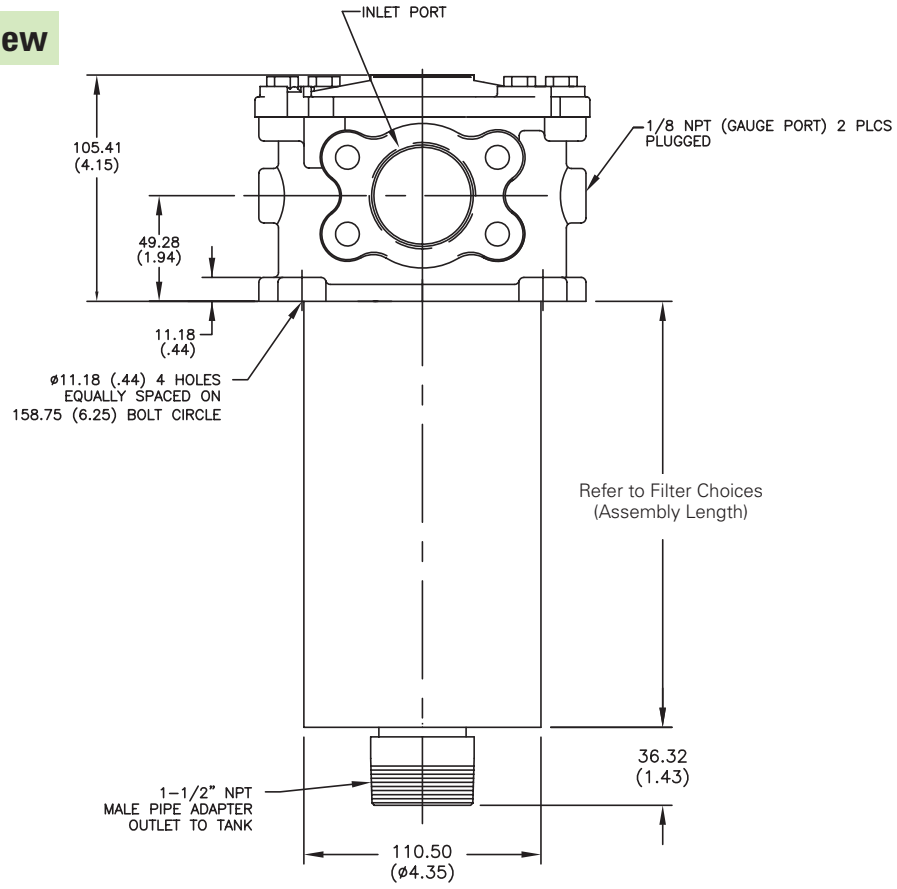
Operating Temperatures

- -45° to 250°F (-43° to 121°C)

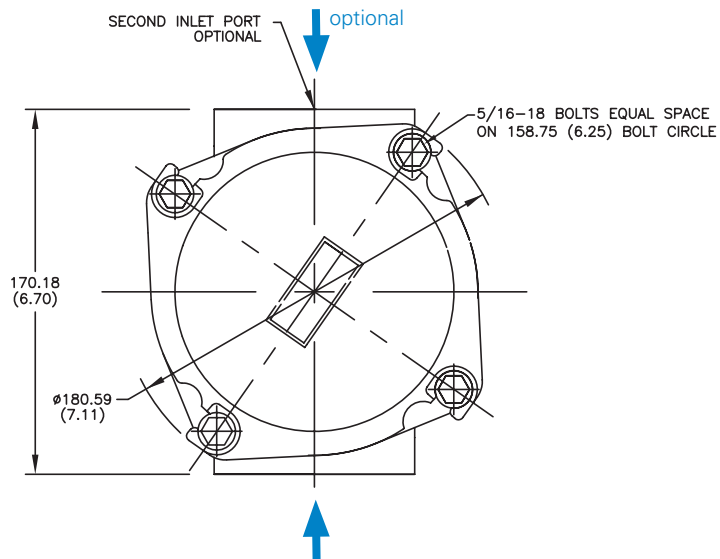
WL16 Specification Illustrations

All dimensions are shown in millimeters [inches].

Assembly - Side View



Head - Top View





WL16
Max Flow: 100 gpm (380 lpm)



WL16 Components

High-Performance DT Filter Choices

| Media Number | Beta _{x(c)} =1000 Rating | Length (in./mm) | Donaldson DT Part No. | Comments |
|--------------|-----------------------------------|-----------------|-----------------------|----------------|
| 5 μm | 5 μm | 9/231.8 | P566270 | DT-HF4-9-5UM |
| 8 μm | 8 μm | 9/231.8 | P566271 | DT-HF4-9-8UM |
| 14 μm | 14 μm | 9/231.8 | P566272 | DT-HF4-9-14UM |
| 25 μm | 25 μm | 9/231.8 | P566273 | DT-HF4-9-25UM |
| 5 μm | 5 μm | 18/462.3 | P566274 | DT-HF4-18-5UM |
| 8 μm | 8 μm | 18/462.3 | P566275 | DT-HF4-18-8UM |
| 14 μm | 14 μm | 18/462.3 | P566276 | DT-HF4-18-14UM |
| 25 μm | 25 μm | 18/462.3 | P566277 | DT-HF4-18-25UM |
| 5 μm | 5 μm | 27/702.5 | P566278 | DT-HF4-27-5UM |
| 8 μm | 8 μm | 27/702.5 | P566279 | DT-HF4-27-8UM |
| 14 μm | 14 μm | 27/702.5 | P566280 | DT-HF4-27-14UM |
| 25 μm | 25 μm | 27/702.5 | P566281 | DT-HF4-27-25UM |

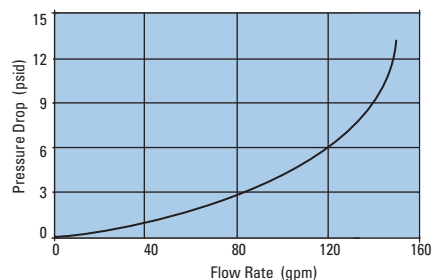


Filter Notes

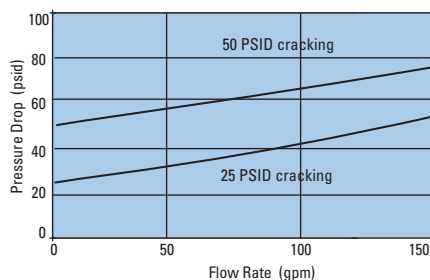
- All Donaldson DT filters utilize glass fiber media with an epoxy-based resin system for the ultimate in chemical compatibility.
- All Donaldson DT filters are potted with epoxy-based adhesives.
- Standard collapse designs are double wire-backed using epoxy-coated steel mesh for maximum pleat support and dirt capacity.
- Viton® seals are standard on all Donaldson DT filters. Viton® is a registered trademark of E. I. DuPont de Nemours and Company.

Performance Data

WL16 Housing Only

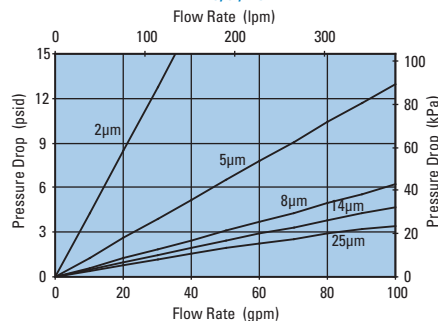


WL16 Bypass Valve



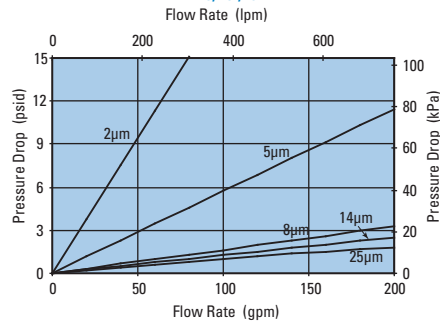
WL16 9" DT Filter Only

DT-HF4-9, 9"/229mm



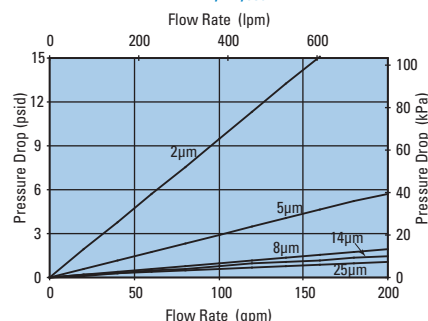
WL16 18" DT Filter Only

DT-HF4-18, 18"/457mm



WL16 27" DT Filter Only

DT-HF4-27, 27"/686mm



Filter Head Ordering Guide

Filter Assembly

| | | | | | | | |
|-----------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| WL16 TABLE 1 | 1 TABLE 2 | D TABLE 3 | 4 TABLE 4 | 2 TABLE 5 | V TABLE 6 | 6 TABLE 7 | D TABLE 8 |
|-----------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|

Service Filter

Filters ordered separately. See previous page for filter options.

LEAD TIME NOTE:

This product is configured with the specifications and features of your choice. Please contact your Donaldson sales representative for lead time details.

Table 1

| Filter Assembly | |
|-----------------|-------------|
| CODE | DESCRIPTION |
| WL16 | Assembly |

Table 2

| Filter Collapse Options | |
|-------------------------|-------------|
| CODE | DESCRIPTION |
| 1 | 150 psid |

Table 3

| Port Size Options | |
|-------------------|-------------------------------|
| CODE | PORT SIZE |
| D | SAE-24 O-ring |
| E | 1½" SAE 4-Bolt Flange Code 61 |
| U | 1½" NPT |

Table 4

| Bypass Setting Options | |
|------------------------|----------------|
| CODE | BYPASS SETTING |
| 3 | 25 psid |
| 4 | 50 psid |

Table 5

| Upstream Pressure Gauge and Switch Option | |
|---|--|
| CODE | INDICATOR STYLE & SETTING |
| 1 | No indicator |
| 2 | 0-200 psi pressure gauge** |
| 3 | 0-60 psi pressure gauge** |
| 4 | 0-60 psi pressure gauge* |
| 6 | Pressure switch 18 psi Brad Harrison® (5-pin) |
| 7 | Pressure switch 35 psi Brad Harrison® (5-pin) |
| 8 | Pressure switch 18 psi Hirschmann® (4-pin) |
| 9 | Pressure switch 35 psi Hirschmann® (4-pin) |

*Bypass setting option code 3 only
**Bypass setting option code 4 only

Table 6

| Seal Options | |
|--------------|----------|
| CODE | MATERIAL |
| B | Buna-N® |
| V | Viton® |

Table 7

| Assembly & Filter Length | |
|--------------------------|---------------|
| CODE (LGTH) | FILTER LENGTH |
| 3 (12.76") | 9" |
| 6 (16.94") | 18" |
| 7 (26.31") | 27" |

Note: As an alternative, you can stack two or three 9" filters to achieve the 18" or 27" filter length. This configuration requires a connector (No. P167324) inserted between each filter.

Table 8

| Secondary Port Options | |
|------------------------|-------------------------------------|
| CODE | PORT SIZE |
| D | 1-7/8" - 12 UN (SAE-24) |
| E | 1-1/2" SAE 4 Bolt Flange Code 61 |
| N | None |
| U | 1-1/2" NPT |

Metric Porting Available

Change WL16 to GL16
Porting code E becomes 1-1/2"
SAE 4 bolt flange with M12 threads

Media Ratings

Western Filter elements have been replaced by Donaldson DT high-performance cartridges.

| WESTERN MEDIA CODE | DONALDSON DT MEDIA |
|--------------------|--------------------|
| 01 | DT 2µm |
| 03 | DT 5µm |
| 05 | DT 8µm |
| 10 | DT 14µm |
| 20 | DT 25µm |

For a complete filter interchange, visit crossreference.donaldson.com.



FIK

Max Flow: 170 gpm (639 lpm)



FIK In-Tank Filters

Working Pressures to: 145 *psi*
1000 kPa
10 bar

Rated Static Burst to: 217 *psi*
1500 kPa
15 bar

Flow Range to: 170 *gpm*
639 *lpm*

Features

FIK in-tank filters are economical, space-saving units with simple screw-on covers, ideal for low pressure in-tank applications. This is a heavy-duty filter, with a die cast aluminum head and a steel or nylon canister. The head (and inlet) sit above the tank, with the housing in the tank. Filter flow is outside to inside. Three service indicators are available: pressure gauge, visual indicator, and electrical indicator. Optional air breathers are also available. FIK filter assemblies are provided from the factory with cellulose or Synteq™ filter media. Replacement cartridges are offered in a range of media types and performance ratings.



Beta Rating

- Performance to $\beta_{8(c)}=1000$

Porting Size Options

- 1/2", 3/4", 1" NPT
- SAE-8,-12,-16,-20,-24 O-ring
- 2" SAE 4-Bolt Flange Code 61

Standard Bypass Ratings

- 22 *psi* / 150 kPa / 1.5 bar

Operating Temperatures

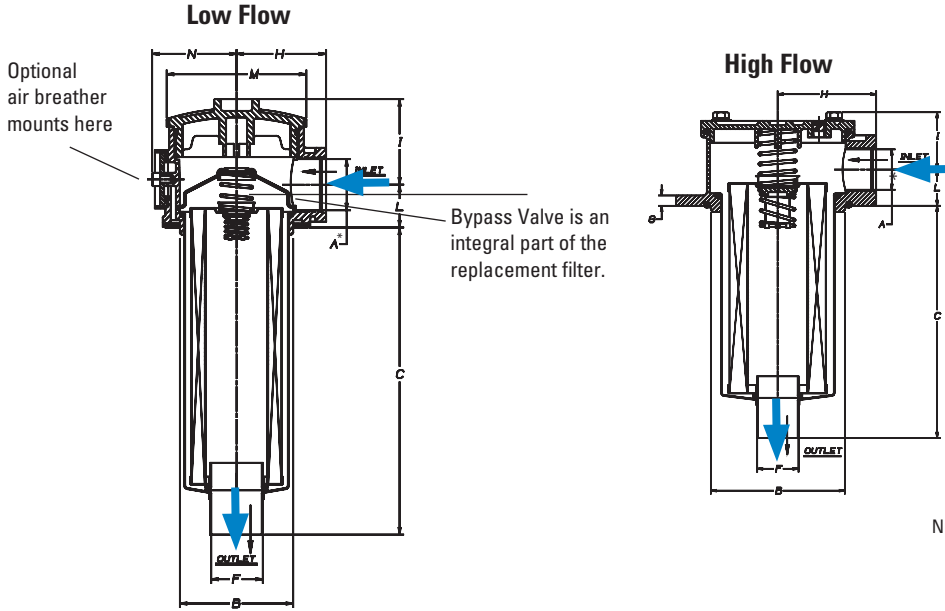
- -4°F to 194°F / -20°C to 90°C

Collapse Ratings

- 145 *psid* / 1000 kPa / 10 bar

SP15/25 Specification Illustrations

Assembly - Side View



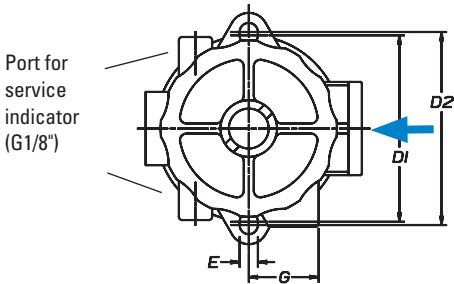
Applications:

- Return Lines
- Side Loop Systems
- Fluid Conditioning Systems
- Process Systems
- Cooling Circuits
- Lube Oil Systems

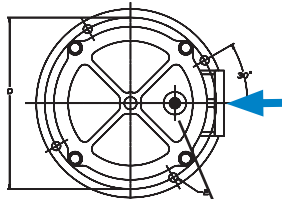
NOTE: * For "A" dimensions see next page.

Head - Top View

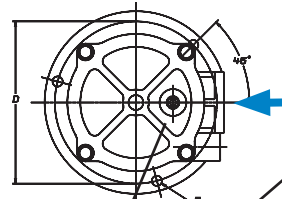
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FIK-040812, FIK-040813,



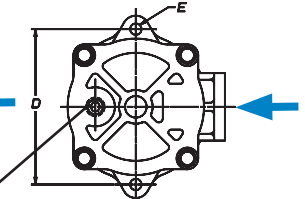
FIK-070248, FIK-070249,
FIK-070250, FIK-071001,
FIK-071002, FIK-071003



FIK-051204, FIK-052053



FIK-040799, FIK-041771,
FIK-041772, FIK-041773,
FIK-041774, FIK-041769,
FIK-041770



| FIK Model | K030319 | | K040811 | | K040812 | | K040813 | | K031027 | | K041769 K041770 | | K040799 K041771 K041772 K041773 K041774 | | K051204 K052053 | | K070248 K071001 | | K070249 K071002 | | K070250 K071003 | |
|---------------|---------|-----|---------|------|---------|------|---------|------|---------|-----|--------------------|-----|---|------|--------------------|------|--------------------|------|--------------------|------|--------------------|------|
| | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm | in. | mm |
| B | 2.4 | 60 | 3.4 | 89 | 3.4 | 86 | 3.4 | 86 | 2.6 | 67 | 3.5 | 90 | 3.54 | 90 | 5.2 | 131 | 6.9 | 175 | 6.8 | 174 | 6.8 | 174 |
| C | 7.2 | 184 | 4.1 | 104 | 5.9 | 150 | 9.3 | 235 | 3.1 | 78 | 3.9 | 100 | 5.7 | 145 | 9 | 230 | 9.5 | 242 | 11.7 | 297 | 15.9 | 405 |
| D1 | 3.3 | 84 | 4.4 | 112 | 4.4 | 112 | 4.4 | 112 | 3.54 | 90 | 4.53 | 115 | 4.52 | 115 | 6.9 | 175 | 8.66 | 220 | 8.66 | 220 | 8.66 | 220 |
| D2 | 3.46 | 88 | 4.56 | 116 | 4.56 | 116 | 4.56 | 116 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| E | 0.4 | 10 | 0.43 | 11 | 0.43 | 11 | 0.43 | 11 | 0.25 | 6.4 | 0.33 | 8.4 | 0.33 | 8.4 | 0.4 | 10.5 | 0.4 | 10.5 | 0.4 | 10.5 | 0.4 | 10.5 |
| F | 0.87 | 22 | 1.1 | 28 | 1.1 | 28 | 1.6 | 40 | 1.0 | 25 | 1.1 | 28 | 1.1 | 28 | 1.57 | 40 | 1.97 | 50 | 2.5 | 63.5 | 2.5 | 63.5 |
| G | NA | NA | 0.47 | 42 | 0.47 | 42 | 0.47 | 42 | 0.35 | 9 | 0.39 | 10 | 0.4 | 10 | 0.4 | 10 | 0.4 | 10 | 0.4 | 10 | 0.4 | 10 |
| H | 1.9 | 48 | 2.67 | 68 | 2.67 | 68 | 2.67 | 68 | 1.9 | 49 | 2.6 | 66 | 2.6 | 66 | 3.7 | 95 | 4.7 | 119 | 4.7 | 119 | 4.7 | 119 |
| I | 1.85 | 47 | 2.56 | 65 | 2.56 | 65 | 2.56 | 65 | 1.2 | 30 | 1.7 | 43 | 1.7 | 43 | 2.1 | 53 | 2.5 | 64 | 2.5 | 64 | 2.5 | 64 |
| L | 0.82 | 21 | 1.26 | 32 | 1.26 | 32 | 1.26 | 32 | 0.87 | 22 | 1.1 | 28 | 1.1 | 28 | 1.4 | 35 | 1.6 | 41 | 1.6 | 41 | 1.6 | 41 |
| M | 2.9 | 74 | 4.2 | 106 | 4.2 | 106 | 4.2 | 106 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| N | 2.4 | 60 | 3.4 | 86 | 3.4 | 86 | 3.4 | 86 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Weight | lbs | kg | lbs | kg | lbs | kg | lbs | kg | lbs | kg | lb | kg | lb | kg | lbs | kg | lbs | kg | lbs | kg | lbs | kg |
| | 1.8 | 0.8 | 2.1 | 0.95 | 3.2 | 1.45 | 4.1 | 1.86 | 1.1 | 0.5 | 1.8 | 0.8 | 2.1 | 0.95 | 7.0 | 3.2 | 10.0 | 4.5 | 13.1 | 5.9 | 18.6 | 8.4 |


FIK

Max Flow: 170 gpm (639 lpm)



FIK Components

Assemblies & Service Part Choices

| Port Size | Bypass Rating* | FIK Assembly Number | Bx(c) = 1000 Rating | Filter Media | Provided with this Filter | Filter Diameter (in./mm) | Filter Length (in./mm) | Flow Range (@~5 psid / 34.5 kPa) |
|---------------|----------------|---------------------|---------------------|--------------|---------------------------|--------------------------|------------------------|----------------------------------|
| SAE 8 O-Ring | 22 psi/1.5 bar | K030319 | 36 µm | Cellulose | P171839 | 1.69 / 43 | 6.38 / 162 | 10 gpm / 38 lpm |
| SAE 12 O-Ring | 22 psi/1.5 bar | K040811 | 36 µm | Cellulose | P171527 | 2.76 / 70 | 3.23 / 82 | 14 gpm / 53 lpm |
| SAE 16 O-Ring | 22 psi/1.5 bar | K040812 | 36 µm | Cellulose | P171533 | 2.76 / 70 | 5.04 / 128 | 23 gpm / 86 lpm |
| SAE 20 O-Ring | 22 psi/1.5 bar | K040813 | 36 µm | Cellulose | P171840 | 2.76 / 70 | 8.27 / 210 | 32 gpm / 120 lpm |
| 1/2" NPT | 22 psi/1.5 bar | K031027 | 36 µm | Cellulose | P171503 | 2.05 / 52 | 2.64 / 67 | 5 gpm / 18 lpm |
| SAE 12 O-Ring | 22 psi/1.5 bar | K041769 | 11 µm | Synteq | P171525 | 2.76 / 70 | 3.23 / 82 | 9.5 gpm / 36 lpm |
| 1" NPT | 22 psi/1.5 bar | K041770 | 36 µm | Cellulose | P171527 | 2.76 / 70 | 3.23 / 82 | 15 gpm / 56 lpm |
| SAE 12 O-Ring | 22 psi/1.5 bar | K041773 | 36 µm | Cellulose | P171533 | 2.76 / 70 | 5.04 / 128 | 18 gpm / 68 lpm |
| SAE 12 O-Ring | 22 psi/1.5 bar | K041774 | 11 µm | Synteq | P171531 | 2.76 / 70 | 5.04 / 128 | 13 gpm / 49 lpm |
| 3/4" NPT | 22 psi/1.5 bar | K041771 | 36 µm | Cellulose | P171533 | 2.76 / 70 | 5.04 / 128 | 18 gpm / 68 lpm |
| SAE 16 O-Ring | 22 psi/1.5 bar | K040799 | 36 µm | Cellulose | P171533 | 2.76 / 70 | 5.04 / 128 | 21 gpm / 79 lpm |
| 1" NPT | 22 psi/1.5 bar | K041772 | 36 µm | Cellulose | P171533 | 2.76 / 70 | 5.04 / 128 | 21 gpm / 79 lpm |
| SAE 20 O-Ring | 22 psi/1.5 bar | K051204 | 36 µm | Cellulose | P171539 | 3.74 / 95 | 7.49 / 203 | 47 gpm / 177 lpm |
| SAE 20 O-Ring | 22 psi/1.5 bar | K052053 | 11 µm | Synteq | P171537 | 3.74 / 95 | 7.49 / 203 | 32 gpm / 120 lpm |
| SAE 24 O-Ring | 22 psi/1.5 bar | K070248 | 36 µm | Cellulose | P171557 | 5.51 / 140 | 7.49 / 203 | 66 gpm / 248 lpm |
| SAE 24 O-Ring | 22 psi/1.5 bar | K071001 | 11 µm | Synteq | P171555 | 5.51 / 140 | 7.49 / 203 | 44 gpm / 165 lpm |
| 2" SAE 4-Bolt | 22 psi/1.5 bar | K070249 | 36 µm | Cellulose | P171575 | 5.51 / 140 | 9.84 / 250 | 106 gpm / 399 lpm |
| 2" SAE 4-Bolt | 22 psi/1.5 bar | K071002 | 11 µm | Synteq | P171573 | 5.51 / 140 | 9.84 / 250 | 74 gpm / 278 lpm |
| 2" SAE 4-Bolt | 22 psi/1.5 bar | K070250 | 36 µm | Cellulose | P171581 | 5.51 / 140 | 15.75 / 400 | 170 gpm / 639 lpm |
| 2" SAE 4-Bolt | 22 psi/1.5 bar | K071003 | 11 µm | Synteq | P171579 | 5.51 / 140 | 15.75 / 400 | 120 gpm / 451 lpm |

Note

*Bypass valve is an integral part of the replacement filter.
Service indicator port available for all assemblies.

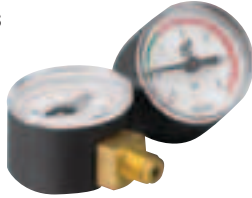
Filter Notes

- FIK filters utilize either glass fiber, cellulose, or wire mesh media.
- All FIK filters are potted with polyurethane adhesives.
- Synteq media designs are double wire-backed using epoxy-coated steel mesh for maximum pleat support and dirt capacity.
- Buna-N® seals are standard on all FIK filters. Buna-N® is a registered trademark of E. I. DuPont de Nemours and Company.

Service Indicators

Pressure Gauges P171956

G 1/8
(center back)



P171953

G 1/8
(bottom mount)

-14.5 to 72 psi
-1 to +5 bar

DC Electrical Indicator P171966

17 psi
1.2 bar
(48V AC/DC)



G 1/8 →

Visual Indicator P171958

17 psi
1.2 bar



G 1/8 →

Optional Air Breathers

| Part No. | Beta Rating | Fits Assembly Models: |
|----------|-------------|---------------------------|
| P172434 | 10 µm | K040811, K040812, K040813 |
| P173330 | 10 µm | K030319 |



Optional air breather is easily installed on filter head.

Filter Choices - Low Flow Assemblies

| Media Type | Beta Rating | K030319 | K040811 | K040812 | K040813 |
|------------|-------------|---------|---------|---------|---------|
| Synteq | β8 = 1000 | P569273 | P569274 | P569275 | P569276 |
| Synteq | β11 = 1000 | P171845 | P171525 | P171531 | P171846 |
| Synteq | β23 = 1000 | P171842 | P171526 | P171532 | P171843 |
| Cellulose | β36 = 1000 | P171839 | P171527 | P171533 | P171840 |
| Cellulose | β40 = 1000 | P171836 | P171528 | P171534 | P171837 |
| Wire Mesh | 60 µm | P171833 | P171529 | P171535 | P171834 |
| Wire Mesh | 90 µm | P171830 | P171524 | P171530 | P171831 |

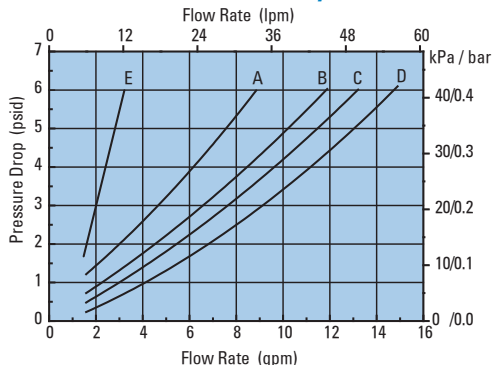
Filter Choices - High Flow Assemblies

| Media Type | Beta Rating | K031027 | K041769 K041770 | K040799 K041771 K041772 | K051204 K052053 | K070248 K071001 | K070249 K071002 | K070250 K071003 |
|------------|-------------|---------|--------------------|-------------------------------|--------------------|--------------------|--------------------|--------------------|
| | | | | K041773 K041774 | | | | |
| Synteq | β8 = 1000 | P569277 | P569274 | P569275 | P569278 | P569279 | P569280 | P176749 |
| Synteq | β11 = 1000 | P171501 | P171525 | P171531 | P171537 | P171555 | P171573 | P171579 |
| Synteq | β23 = 1000 | P171502 | P171526 | P171532 | P171538 | P171556 | P171574 | P171580 |
| Cellulose | β36 = 1000 | P171503 | P171527 | P171533 | P171539 | P171557 | P171575 | P171581 |
| Cellulose | β40 = 1000 | P171504 | P171528 | P171534 | P171540 | P171558 | P171576 | P171582 |
| Wire Mesh | 60 µm | P171505 | P171529 | P171535 | P171541 | P171559 | P171577 | P171583 |
| Wire Mesh | 90 µm | P171500 | P171524 | P171530 | P171536 | P171554 | P171572 | P171578 |



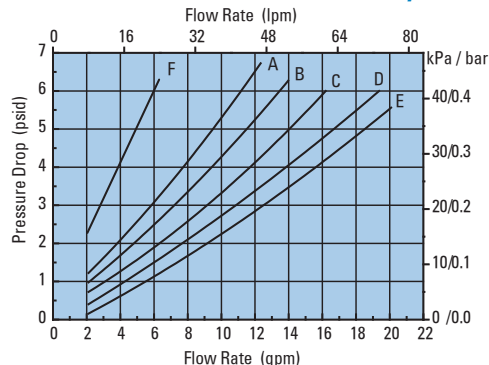
Performance Data

K030319 Assembly



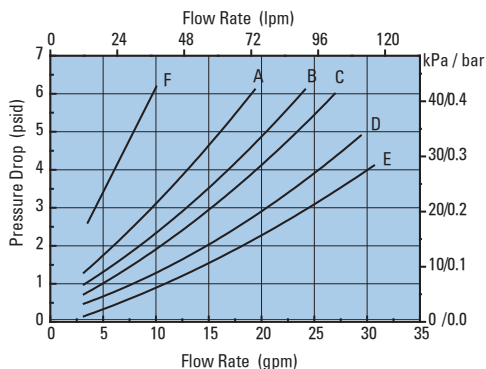
- A. P171845 (Synthetic)
- B. P171839 (Cellulose)
- C. P171836 (Cellulose)
- D. P171833, P171830 (Wiremesh)
- E. P569273 (Synthetic)

K040811/K041769/K041770* Assembly



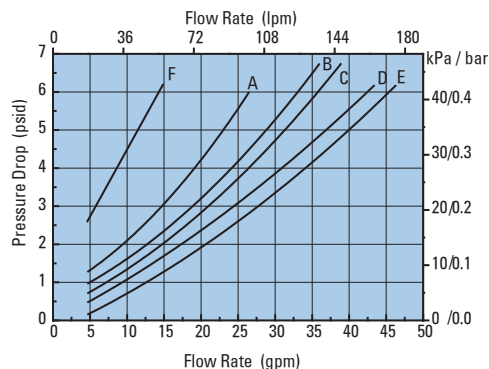
- A. P171525 (Synthetic)
- B. P171526 (Synthetic)
- C. P171527 (Cellulose)
- D. P171528 (Cellulose)
- E. P171529, P171524 (Wiremesh)
- F. P569274 (Synthetic)

K040812 Assembly



- A. P171531 (Synthetic)
- B. P171532 (Synthetic)
- C. P171533 (Cellulose)
- D. P171534 (Cellulose)
- E. P171535, P171530 (Wiremesh)
- F. P569275 (Synthetic)

K040813 Assembly

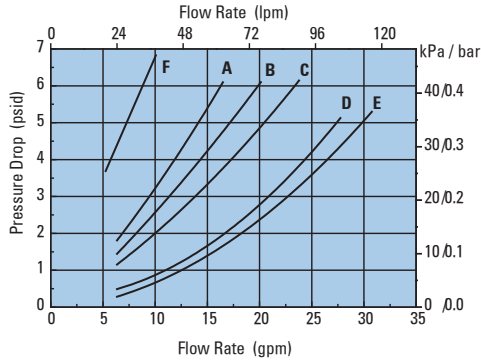


- A. P171846 (Synthetic)
- B. P171843 (Synthetic)
- C. P171840 (Cellulose)
- D. P171837 (Cellulose)
- E. P171834, P171831 (Wiremesh)
- F. P569276 (Synthetic)

NOTE:
* subtract ½ psi
** add ½ psi

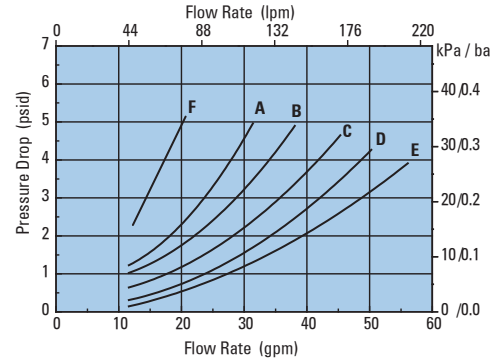
Performance Data

K040799, K041771, K041772, K041773**, K041774** Assembly**



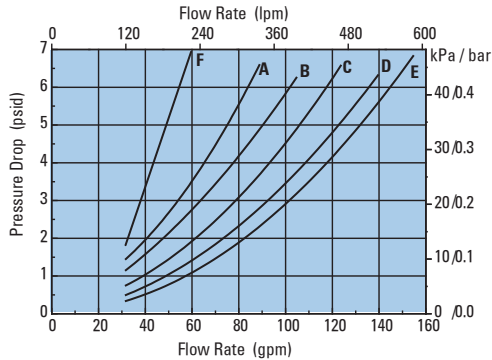
- A. P171531 (Synthetic)
- B. P171532 (Synthetic)
- C. P171533 (Cellulose)
- D. P171534 (Cellulose)
- E. P171535, P171530 (Wiremesh)
- F. P569275 (Synthetic)

K051204/K052053 Assembly



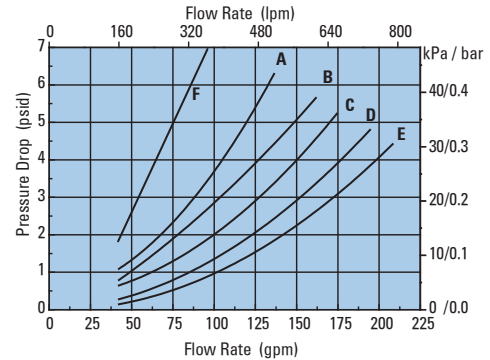
- A. P171537 (Synthetic)
- B. P171538 (Synthetic)
- C. P171539 (Cellulose)
- D. P171540 (Hvy Duty Cellulose)
- E. P171541, P171536 (Wiremesh)
- F. P569278 (Synthetic)

K070249/K071002 Assembly



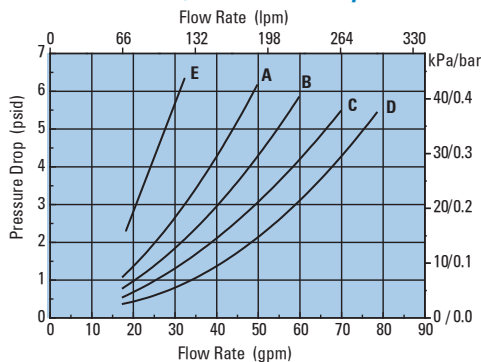
- A. P171573 (Synthetic)
- B. P171574 (Synthetic)
- C. P171575 (Cellulose)
- D. P171576 (Cellulose)
- E. P171572 (Wiremesh)
- F. P569280 (Synthetic)

K070250/K071003 Assembly



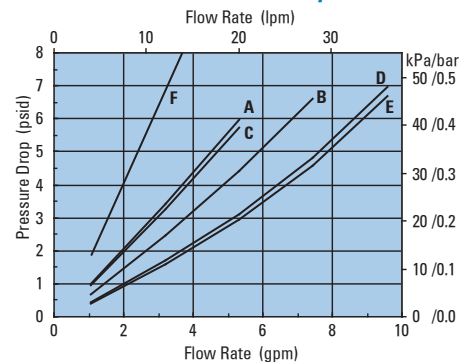
- A. P171579 (Synthetic)
- B. P171580 (Synthetic)
- C. P171581 (Cellulose)
- D. P171582 (Cellulose)
- E. P171583 (Wiremesh)
- F. P176749 (Synthetic)

K070248/K071001 Assembly



- A. P171555 (Synthetic)
- B. P171556 (Synthetic)
- C. P171557 (Cellulose)
- D. P171558 (Cellulose)
- E. P569279 (Synthetic)

K031027 Assembly



- A. P171501 (Synthetic)
- B. P171502 (Synthetic)
- C. P171503 (Cellulose)
- D. P171504 (Cellulose)
- E. P171505 (Wiremesh)
- F. P569277 (Synthetic)

NOTE:
* subtract 1/2 psi
** add 1/2 psi



FIK04 Combo

Max Flow: 79 gpm (300 lpm)

FIK04 Suction/Return Combination In-Tank Filters

Working Pressures to: 145 *psi*
10 bar

Rated Static Burst to: 217 *psi*
15 bar

Flow Range to: 79 *gpm*
300 *lpm*

Features

The FIK04 series of tank-mounted suction and return filters are popular choices for hydrostatic transmissions. The filtered flow is maintained at a slight backpressure to provide clean, pressurized oil, mainly for charge pumps in hydrostatic transmission systems. The pressurized flow is designed to reduce cavitation risks. This patented design uses an integrated main flow and bypass flow filter filter, which is capable of delivering filtered and pressurized oil, even in bypass situations. Emergency suction flow is also filtered. The FIK04 operates in a standard flow (outside to inside) configuration. SAE O-Ring ports are standard to meet popular application requirements.



- 4-point mounting
- Head material: aluminum
- Housing material: steel
- Cover material: glass-filled nylon
- Buna-N[®] seals standard
- Main filters include integrated bypass filters

Buna-N[®] is a registered trademark of E. I. DuPont de Nemours and Company.

Beta Rating (per ISO 16889)

- Performance to $\beta_{11(c)}=1000$

Porting Size Options

- Inlet: SAE-16, -20 O-ring
- Outlet: SAE-16 O-Ring

Assembly Weight

- 10.8 lbs / 4.9 kg

Replacement Filter Lengths

- 18.6"/472 mm

Standard Bypass Rating

- 36 *psi* / 250 kPa / 2.5 bar

Standard Backpressure Rating

- 7.3 *psi* / 50 kPa / 0.5 bar

Operating Temperatures

- -22°F to 212°F / -30°C to 100°C

Filter Collapse Pressure

- 145 *psid* / 1000 kPa / 10 bar

Return Flow Rate

- 79 *gpm* (300 *lpm*)

Emergency Suction Flow Rate

- 27 *gpm* (100 *lpm*)

FIK04 Filter Assemblies

| Donaldson Part No. | Inlet Port Connections | Outlet Port Connections | Bypass Valve | Emergency Suction | Comments | Indicator Includes |
|--------------------|------------------------|-------------------------|------------------|-------------------|-----------|--------------------|
| K041634 | SAE-20 & SAE-16 | (2) - SAE-16 | 36 psi (2.5 bar) | 125 µm Wire | Combo 300 | None, see below |

Filter Choices

| Media Type | $\beta_{x(c)} = 1000$ | Length (in./mm) | Part Number | Bypass | Comments |
|------------|-----------------------|-----------------|-------------|-------------|--------------------------|
| Synteq | 11 µm | 18.6"/472 mm | P765457 | 125 µm Wire | For Combo 300 Assemblies |

Filter Notes

- All $\beta=1000$ filters utilize glass fiber media.
- Standard collapse designs are double wire-backed using epoxy-coated steel mesh for maximum pleat support and dirt capacity.
- All FIK04 filters are standard flow (outside to inside).
- Buna-N seals are standard on all FIK04 filters.

Suction Filter Choices

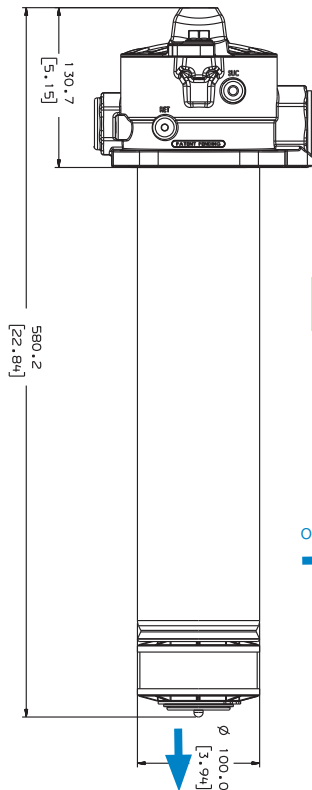
| Media Type | $\beta_{x(c)} = 1000$ | Length (in./mm) | Part Number | Comments |
|------------|-----------------------|-----------------|-------------|--------------------------|
| Wire Mesh | 125 µm wire mesh | 50.2 mm | P764183 | For Combo 300 Assemblies |

Indicator Options

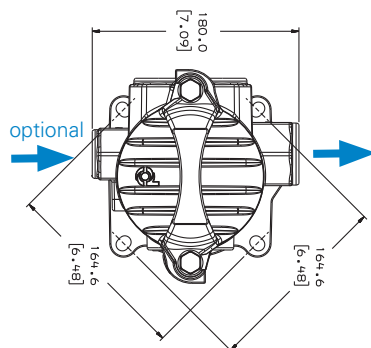
| Part Number | Set Point | Style | Connection | Comments |
|-------------|------------------|--------------|------------|-------------------|
| P764467 | 36 psi (2.5 bar) | 30 VDC, N.O. | G1/8" | for FIK Combo 300 |
| P764613 | 36 psi (2.5 bar) | 30 VDC, N.C. | G1/8" | for FIK Combo 300 |
| P764612 | 36 psi (2.5 bar) | Visual | G1/8" | for FIK Combo 300 |

Assembly - Side View

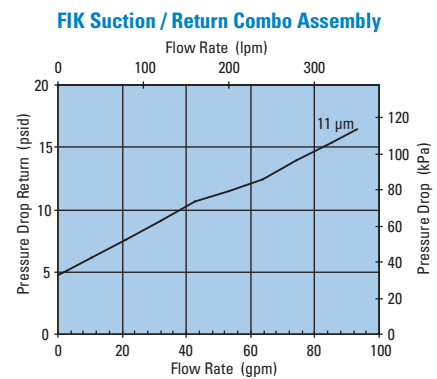
All dimensions are shown in millimeters [inches].



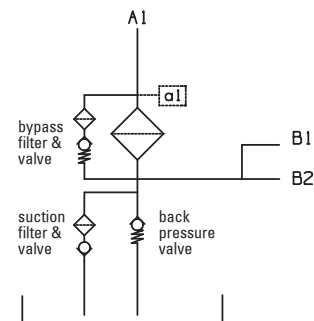
Head - Top View



Performance Data



Flow Schematic





W033

Max Flow: 100 gpm (380 lpm)



W033 In-Line Cartridge Filters

Working Pressures to: 300 *psi*
20 bar

Rated Static Burst to: 1000 *psi*
70 bar

Flow Range to: 100 *gpm*
380 *lpm*



Features

The W033 filter assembly features a heavy duty steel canister with an aluminum head. Donaldson DT high-performance 4-layer media is offered in five different media grades. The differential pressure indicator line is designed to work with the wide assortment of bypass valves. Thermal lockout and surge control are two key features incorporated in many of the differential indicators.

- Conforms to HF4 specifications
- Head material: Aluminum
- Housing material: Steel
- Three housing length options

Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- 1½" NPT
- SAE-24 O-ring
- 1½" SAE 4-Bolt Flange Code 61

Replacement Filter Lengths

- 9" / 229 mm
- 18" / 457 mm
- 27" / 686 mm

Filter Collapse Ratings

- 150 *psid* / 1034 kPa / 10.3 bar

Standard Bypass Ratings

- 50 psi / 345 kPa / 3.5 bar
- 25 psi / 172.5 kPa / 1.72 bar

Assembly Weight

- Code 3, 15.5 lbs / 7.0 kg
- Code 6, 18.7 lbs / 8.5 kg
- Code 7, 22.0 lbs / 10.0 kg

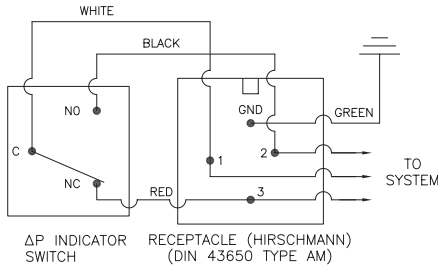
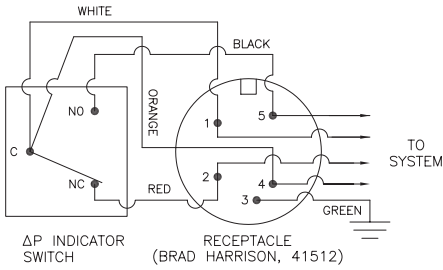
Operating Temperatures

- -45° to 250°F (-43° to 121°C)

W033 Specification Illustrations

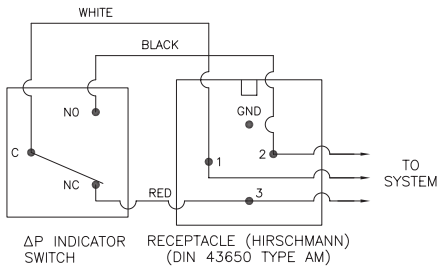
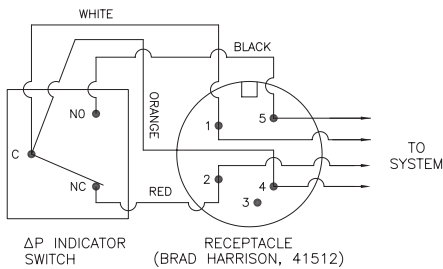
All dimensions are shown in millimeters [inches].

Indicator Switch Schematic Wiring Diagram Aluminum Electrical Housings



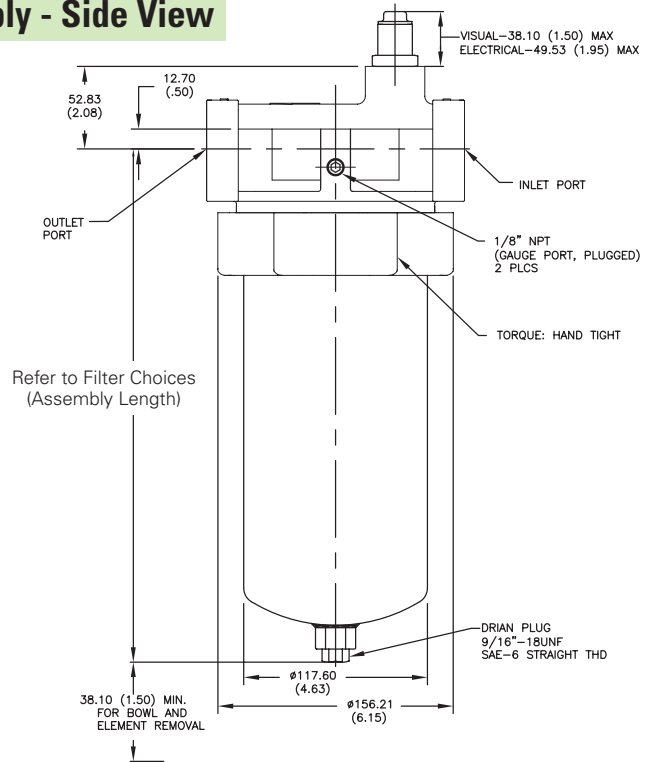
Note: The female plug (connector) is to be furnished by customer.

Plastic Electrical Housings

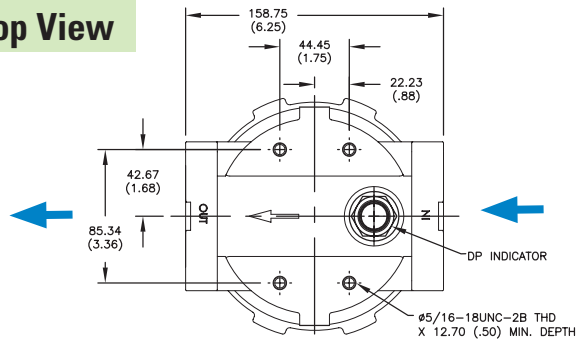


Note: The female plug (connector) is to be furnished by customer.

Assembly - Side View



Head - Top View



Differential Indicators:

Indicators are designed to actuate at approximately 80% of bypass valve cracking pressure. It is recommended that an indicator with a bypass setting of 100 psid is used with a non-bypass housing.

Surge Control:

This optional feature is used to dampen pressure surges or spikes to avoid premature actuation of the indicator. Surge control delays the indicator response.

Thermal Lockout:

The Thermal Lockout prevents premature signaling of a bypass condition created by viscous fluid during cold start-ups. Normal indicator actuation capability is resumed once the operating temperature of the fluid reaches approximately 80° F.



W033

Max Flow: 100 gpm (380 lpm)



W033 Components

High-Performance DT Filter Choices

| Media Number | Beta _{x(c)} =1000 Rating | Length (in./mm) | Donaldson DT Part No. | Comments |
|--------------|-----------------------------------|-----------------|-----------------------|--------------------------------|
| 5 μm | 5 μm | 9/231.8 | P566270 | DT-HF4-9-5UM |
| 8 μm | 8 μm | 9/231.8 | P566271 | DT-HF4-9-8UM |
| 14 μm | 14 μm | 9/231.8 | P566272 | DT-HF4-9-14UM |
| 25 μm | 25 μm | 9/231.8 | P566273 | DT-HF4-9-25UM |
| 5 μm | 5 μm | 18/462.3 | P566274 | DT-HF4-18-5UM |
| 8 μm | 8 μm | 18/462.3 | P566275 | DT-HF4-18-8UM |
| 14 μm | 14 μm | 18/462.3 | P566276 | DT-HF4-18-14UM |
| 25 μm | 25 μm | 18/462.3 | P566277 | DT-HF4-18-25UM |
| 5 μm | 5 μm | 27/702.5 | P566278 | DT-HF4-27-5UM |
| 8 μm | 8 μm | 27/702.5 | P566279 | DT-HF4-27-8UM |
| 14 μm | 14 μm | 27/702.5 | P566280 | DT-HF4-27-14UM |
| 25 μm | 25 μm | 27/702.5 | P566281 | DT-HF4-27-25UM |
| WA | B>30(c) = 200 | 9/233.5 | P569527 | Absorbs 250 ml water @ 25 psid |



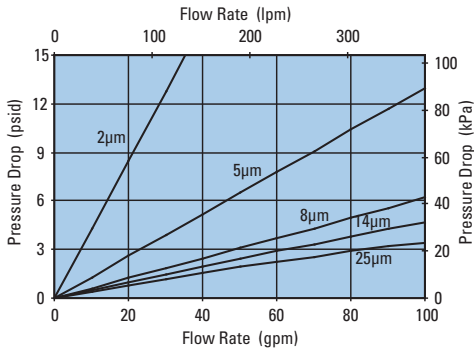
Filter Notes

- All Donaldson DT filters utilize glass fiber media with an epoxy-based resin system for the ultimate in chemical compatibility.
- All Donaldson DT filters are potted with epoxy-based adhesives.
- Standard collapse designs are double wire-backed using epoxy-coated steel mesh for maximum pleat support and dirt capacity.
- Viton® seals are standard on all Donaldson DT filters. Viton® is a registered trademark of E. I. DuPont de Nemours and Company.

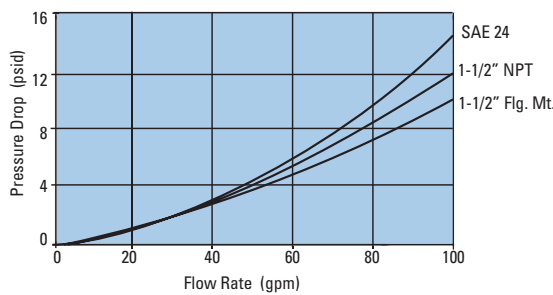
Performance Data

W033 9" DT Filter Only

DT-HF4-9, 9"/229mm

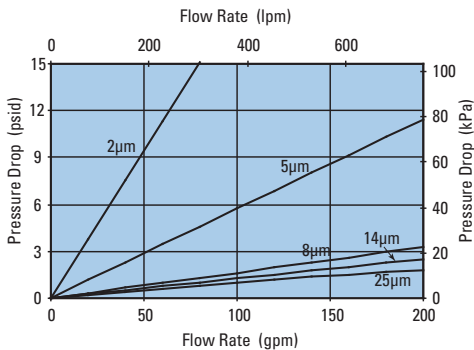


W033 Housing Only



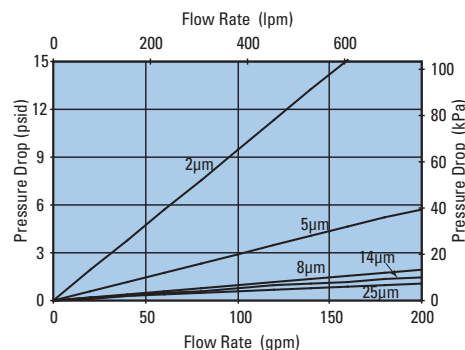
W033 18" DT Filter Only

DT-HF4-18, 18"/457mm



W033 27" DT Filter Only

DT-HF4-27, 27"/687mm





Filter Head Ordering Guide

| | | | | | | | |
|-----------------|---|--------------|--------------|--------------|----------------|--------------|--------------|
| Filter Assembly | W033 TABLE 1 | 1 TABLE 2 | D TABLE 3 | 4 TABLE 4 | L N TABLE 5 | B TABLE 6 | 3 TABLE 7 |
| Service Filter | Filters ordered separately. See previous page for filter options. | | | | | | |

LEAD TIME NOTE:
This product is configured with the specifications and features of your choice. Please contact your Donaldson sales representative for lead time details.

Table 1

| Filter Assembly | |
|-----------------|-------------|
| CODE | DESCRIPTION |
| W033 | Assembly |

Table 2

| Filter Collapse Options | |
|-------------------------|-------------|
| CODE | DESCRIPTION |
| 1 | 150 psid |

Table 3

| Port Size Options | |
|-------------------|---------------------------------|
| CODE | PORT SIZE |
| D | SAE 24 O-ring |
| E | 1½"SAE 4-bolt flange Code 61 |
| U | 1½" NPT |

Table 4

| Bypass Setting Options | |
|------------------------|----------------|
| CODE | BYPASS SETTING |
| 3 | 25 psid |
| 4 | 50 psid |

Table 5 (Primary)

| Upstream Pressure Gauge and Switch Option | |
|---|---|
| CODE | INDICATOR STYLE & SETTING |
| C | Electrical/visual 15 + 4 psid |
| D | Electrical/visual 35 + 5 psid |
| F | Electrical/visual 15 + 4 psid with TL |
| G | Electrical/visual 35 + 5 psid with TL |
| H | Electrical/visual 15 + 4 psid with 12" 3-wire flying lead |
| J | No indicator |
| K | Visual 15 + 4 psid |
| L | Visual 35 + 5 psid with TL |
| M | Visual 35 + 5 psid with TL and surge |
| N | Electrical/visual 35 + 5 psid with 12" 3-wire flying lead |
| Q | Electrical switch 15 + 4 psid |
| R | Electrical switch 35 + 5 psid |
| X | Electrical/visual 15 + 4 psid with TL and surge |
| Y | Electrical/visual 35 + 5 psid with TL and surge |

TL (thermal lockout)

Table 5 (Secondary)

| Receptacle Options | |
|--------------------|------------------------|
| CODE | ELECTRICAL STYLE |
| B | Brad Harrison® (5-pin) |
| H | Hirschmann® (4-pin) |
| N | None |

Table 6

| Seal Options | |
|--------------|----------|
| CODE | MATERIAL |
| B | Buna-N® |
| V | Viton® |

Table 7

| Assembly & Filter Length | |
|--------------------------|---------------|
| CODE (LGTH) | FILTER LENGTH |
| 3 (12.81")* | 9.0" |
| 6 (22.17") | 18.0" |
| 7 (31.54") | 27.0" |

Metric Porting Available
Change W033 to G033
Porting code D becomes 1-1/2" ISO 228 BSPD
Porting code E becomes 1-1/2" SAE 4 bolt flange with M12 threads

Media Ratings

Western Filter elements have been replaced by Donaldson DT high-performance cartridges.

| WESTERN MEDIA CODE | DONALDSON DT MEDIA |
|--------------------|--------------------|
| 01 | DT 2µm |
| 03 | DT 5µm |
| 05 | DT 8µm |
| 10 | DT 14µm |
| 20 | DT 25µm |

For a complete filter interchange, visit crossreference.donaldson.com.

Brad Harrison® is a registered trademark of Woodhead Industries, Inc.
Hirschmann® is a registered trademark of Richard Hirschmann of America Inc.
Buna-N® and Viton® are registered trademarks of E. I. DuPont de Nemours and Company.



HRK10

Max Flow: 300 gpm (1135 lpm)



HRK10 In-Line Cartridge Filters

Working Pressures to: 150 *psi*
10.3 bar

Rated Static Burst to: 500 *psi*
34.5 bar

Flow Range to: 300 *gpm*
1135 *lpm*



Features

The HRK10 high flow filter combines the best features of its predecessor, the HEK11: ANSI inlet port options, top cover filter servicing for ease of maintenance, and a selection of service indicators. The HRK10 all-steel housing design provides a strong, durable, and dependable unit. It offers standard features like deep pleat filters for higher dirt holding capacity and standard Donaldson DT 4-layer media filter construction. This technology, combined with many other standard features, is ideal for today's applications in pulp and paper, power generation and steel mill applications. Six standard grades of media are offered. A port for an electrical indicator is incorporated into the differential indicator block.

- Robust "Twist & Lift" cover for simplified servicing
- Multiple bypass valves design assure proper operation
- Wide variety of bypass valve ratings
- Reverse flow (inside to outside) filters for positive contamination containment
- Fluorocarbon seals standard
- Housing & cover material: steel
- Drain plug in bottom
- Bleed valve in cover
- Fill plug in cover

Beta Rating (per ISO 16889)

- Performance to $\beta_{<4} (c) = 1000$

Porting Size Option

- 4" ANSI Flange, 8-bolt 150#

Assembly Weight

- 140 lbs / 64 kg

Replacement Filter Lengths

- 22" / 559 mm

Standard Bypass Rating

- No Bypass
- 5 *psi* / 34.5 kPa / 0.34 bar
- 25 *psi* / 172 kPa / 1.7 bar
- 50 *psi* / 345 kPa / 3.4 bar

Operating Temperatures

- -20°F to 250°F (-29° to 121°C)

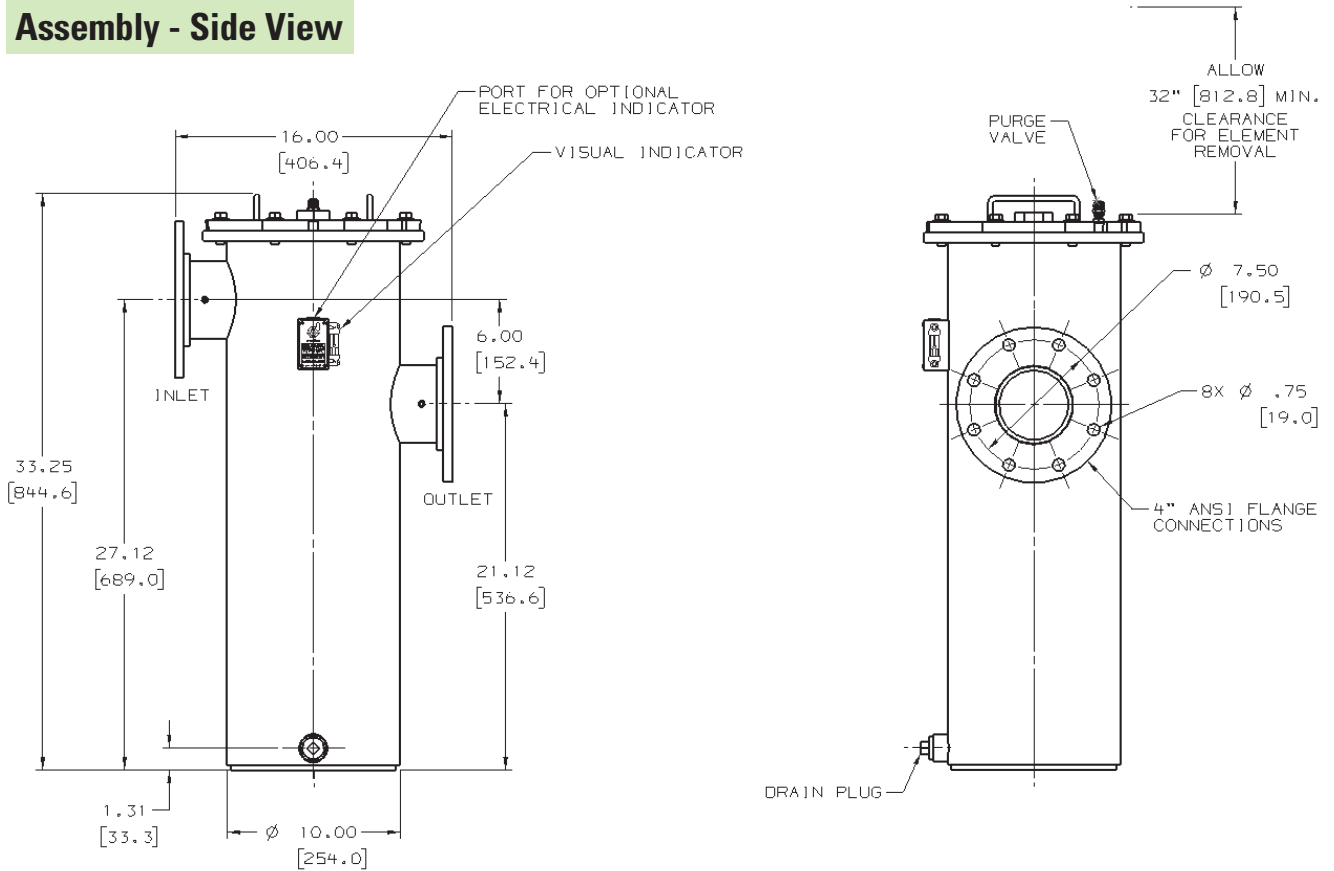
Filter Collapse Pressure

- 100 *psid* / 689 kPa / 6.9 bar

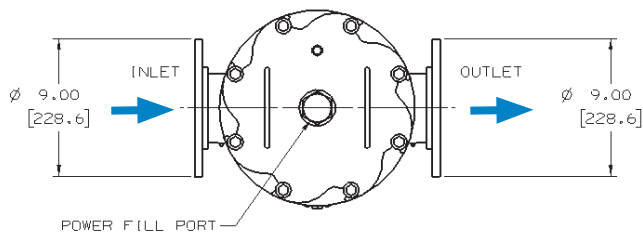
HRK10 Specification Illustrations

All dimensions are shown in inches [millimeters].

Assembly - Side View



Head - Top View





HRK10

Max Flow: 300 gpm (1135 lpm)



HRK10 Components Housing Choices

Note: Filters ordered separately. See below for filter options.

| Part No. | Port Connections | Bypass Valve | Indicator Options |
|----------|------------------|-------------------------|--------------------------------------|
| K100001* | 4" ANSI Flange | No bypass | Visual standard, electrical optional |
| K100002* | 4" ANSI Flange | 5 psi (0.34 bar) bypass | Visual standard, electrical optional |
| K100003* | 4" ANSI Flange | 25 psi (1.7 bar) bypass | Visual standard, electrical optional |
| K100004* | 4" ANSI Flange | 50 psi (3.4 bar) bypass | Visual standard, electrical optional |

Electrical Indicator Options

| Part No. | Set Point | Bypass Valve |
|----------|------------------|---------------|
| P173944 | 20 psi (1.4 bar) | AC/DC, 3-wire |
| P174396 | 40 psi (2.8 bar) | AC/DC, 3-wire |

High-Performance DT Filter Choices

| Media Number | $B_{x(c)} = 1000$ | Length (in./mm) | DT Part Number | Comments | Replaces old HEK11 Filters |
|--------------|----------------------|-----------------|----------------|---------------------------------|----------------------------|
| 2 μ m | <4 μ m | 22/559 | P566187 | HRK10 Series | P163472 |
| 5 μ m | 5 μ m | 22/559 | P566188 | HRK10 Series | none |
| 8 μ m | 8 μ m | 22/559 | P566189 | HRK10 Series | P176417* or P176223** |
| 14 μ m | 14 μ m | 22/559 | P566190 | HRK10 Series | P165449 |
| 25 μ m | 25 μ m | 22/559 | P566191 | HRK10 Series | P164707 |
| 150 μ m | N/A | 22/559 | P566192 | HRK10 Series: Wire mesh media | P160078 |
| WA | $B > 30_{(c)} = 200$ | 22/559 | P569531 | Absorbs 1800 ml water @ 25 psid | N/A |



Use HRK10 in place of previous HEK11 housings.

For better performance use HRK10 filters in existing HEK11 housings.

* 9 μ m rating

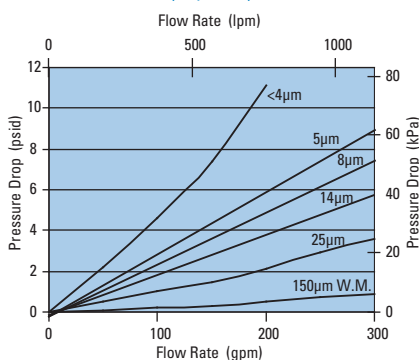
** 10 μ m rating

Filter Notes:

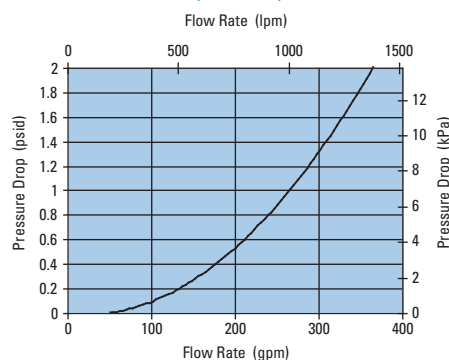
- All $\beta=1000$ filters utilize glass fiber media with an epoxy-based resin system for the ultimate in chemical compatibility.
- All Donaldson HRK10 filters are potted with epoxy-based adhesives.
- All HRK10 filters are reserve flow (inside to outside), keeping contaminants contained during servicing.
- Viton® seals are standard on all HRK10 filters. Viton® is a registered trademark of E. I. DuPont de Nemours and Company.

Performance Data

HRK10 Filter Only
(22"/559mm)



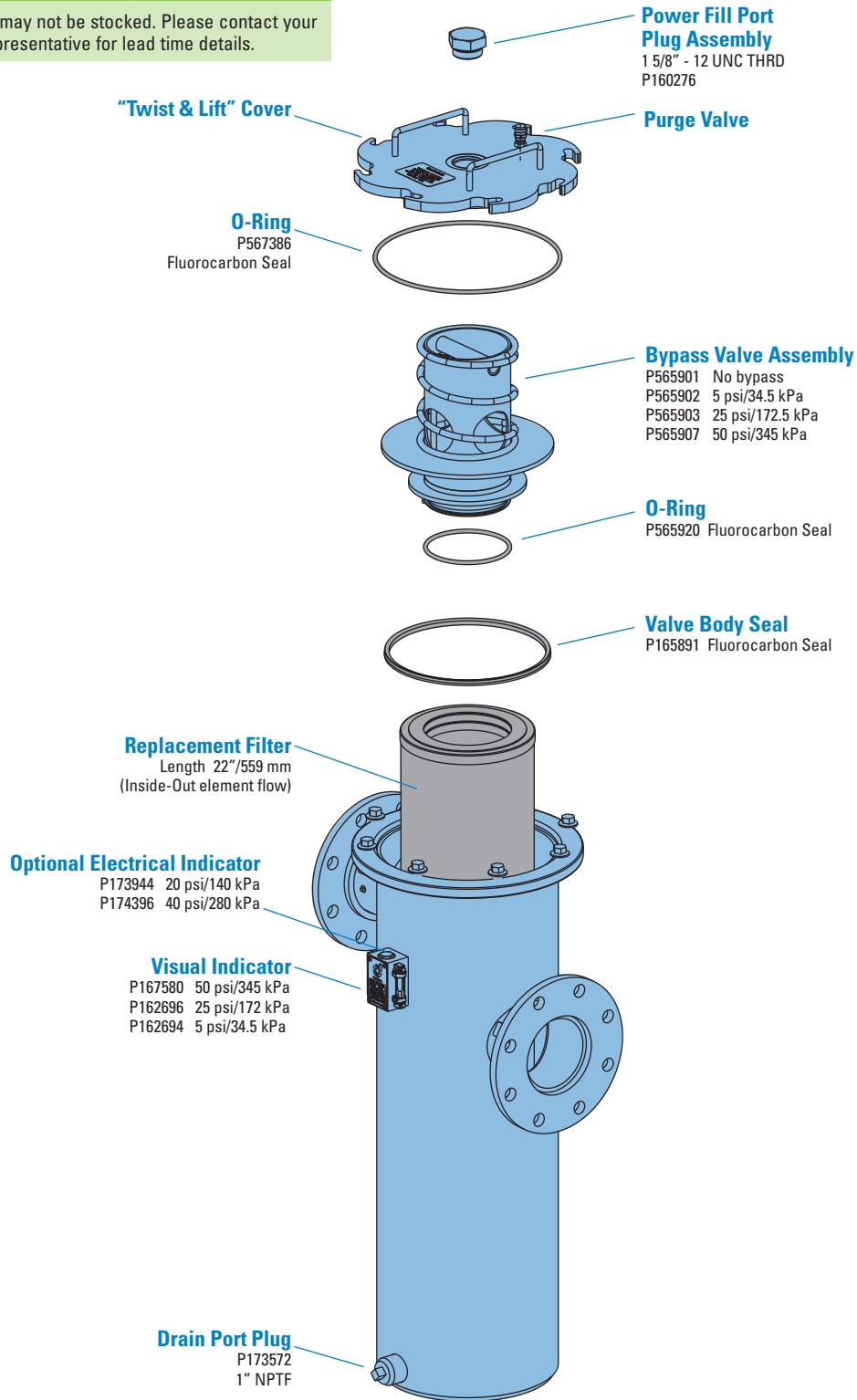
HRK10 Housing Only
(with 4" Port)



HRK10 Service Parts

SERVICE PARTS NOTE:

Some service parts may not be stocked. Please contact your Donaldson sales representative for lead time details.



Even More
^

Donaldson Delivers Innovative Filtration Solutions for Engines, Equipment and the People Who Use Them

Fuel Filtration

- Expanded line of fuel filters protect engine components and extend equipment life.
- Includes a full complement of filters to fit Stanadyne® and Racor® fuel systems, and Cummins® engines.
- Twist&Drain™ valves turn the complicated task of removing water into an easy process.



Stanadyne® is a registered trademark of Stanadyne Corporation. Racor® is a registered trademark of Parker Hannifin Corporation. Cummins® is a registered trademark of Cummins Inc.

Lube Filtration

- Donaldson lube filters keep engine oil clean by capturing contaminants that can cause engine damage.
- With coverage for a full range of popular engines, Donaldson lube filters meet or exceed application requirements.
- Donaldson Endurance™ lube filters – with Synteq™ media – deliver improved lubricant flow, improved cold start performance and a higher level of engine protection to prolong engine and equipment life.



Mufflers & Exhaust Accessories

- For more than 50 years, Donaldson has been a leading supplier of exhaust systems, components and accessories for medium and heavy-duty diesel powered trucks and equipment.



Air Filtration

- Delivering an expansive line of two-stage filtration systems, including our industry shaping PowerCore® Air Cleaner housings that pack big performance in a small, compact size. PowerCore® air cleaners are easily adaptable to a scavenge air system for higher pre-cleaner efficiency.
- Standard and extended life filter options are available for nearly all Donaldson air cleaners - both axial and RadialSeal™ filters.
- Extend air filter life with long life filters, pre-cleaners, scavenged / pre-cleaners systems, filter service indicators, Dust Dumpa tube extensions and kits that convert older SRG housings to Donaldson RadialSeal™ filters.
- High efficiency Donaldson Endurance™ filters offer improved engine protection for work trucks.



PowerCore.



Coolant Filtration

- Donaldson coolant filters remove contaminants and maintain cooling system balance – keeping today's hot-running engines cool and reducing downtime.
- Donaldson Endurance™ coolant filters allow you to extend filter life while maintaining coolant condition.





Medium Pressure Filters

Medium pressure filters can be used in applications up to 2000 psi (13790 kPa). Donaldson offers both spin-on and in-line cartridge-style filters.

Donaldson Duramax® filters are the highest rated medium pressure spin-on filters available. Duramax filters are proven, reliable, long-lived and easy to install.



Section Index

Max Operating Pressure < 2000 psi (138 bar)

Models arranged from low to maximum flow rates

Spin-on Filters

| | |
|-------------|-----|
| HMK03 | 94 |
| HMK04 | 98 |
| HNK04 | 106 |
| HMK05 | 102 |
| HNK05 | 106 |
| HMK24 | 98 |
| HMK25 | 102 |

In-line Cartridge Filters

| | |
|-------------|-----|
| W061 | 110 |
| HDK06 | 114 |
| W041 | 118 |
| W042 | 122 |
| HFK08 | 126 |



HMK03

Max Flow: 25 gpm (95 lpm)



HMK03 DURAMAX® Spin-On Filters

Working Pressures to: 1000 *psi*
6895 kPa
69 bar

Rated Static Burst to: 2000 *psi*
13790 kPa
138 bar

Flow Range to: 25 *gpm*
95 *lpm*



Features

HMK03 Series Duramax® spin-on filters offer twice the capacity of competitive filters, yet they are physically smaller than traditional housing/cartridge filter assemblies. It features a die cast aluminum head and a unique radial seal O-ring gasket design that eliminates leakage.

Take advantage of Donaldson's mix and match system of in-stock heads, housings and media choices – so you can get exactly what you need. A full range of media options are available, using Donaldson's exclusive Synteq™ synthetic media designed especially for liquid filtration. You can also select the exact indicator types and bypass options to suit your application.

Beta Rating

- Performance to $\beta_{6(c)}=1000$

Porting Size Option

- SAE-12 O-ring

Assembly Weight

- Short: 3.3 lbs / 1.5 kg
- Long: 4.2 lbs / 1.9 kg

Replacement Filter Lengths

- 5.5" / 140mm
- 9.5" / 242mm

Standard Bypass Ratings

- 50 *psi* or No Bypass

Operating Temperatures

- -20°F to 250°F / -29°C to 121°C

Housing Fatigue Strength Ratings*

- 100,000 Cycles: 0-1000 *psi* / 0-6895 kPa / 68 bar
- 300,000 Cycles: 0-800 *psi* / 0-5516 kPa / 55 bar
- 1,000,000 Cycles: 0-700 *psi* / 0-4826 kPa / 48 bar

*Per T3.10.17 NFPA

Filter Collapse Rating

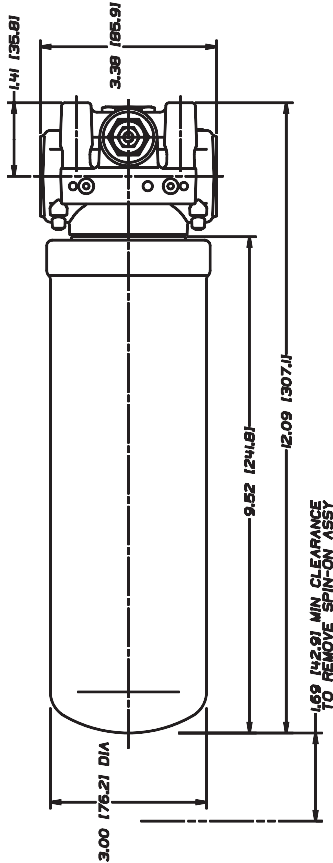
- 290 psid / 20 bar

HMK03 Specification Illustrations

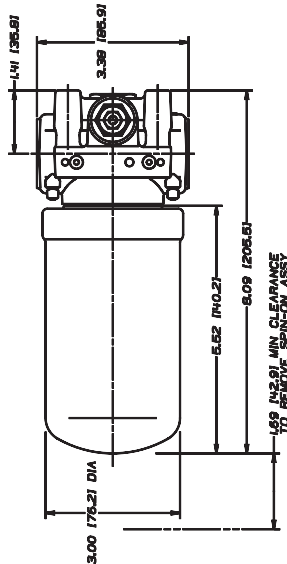
All dimensions are shown in inches [millimeters].

Assembly - Side Views

Long Assembly



Short Assembly

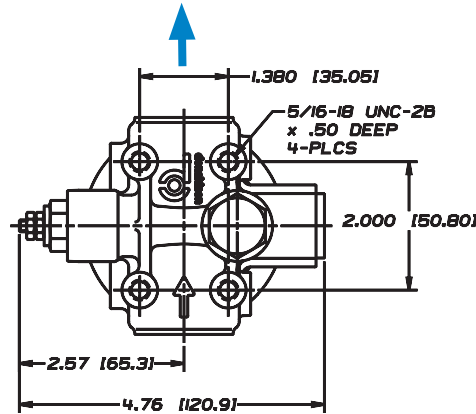


Applications:

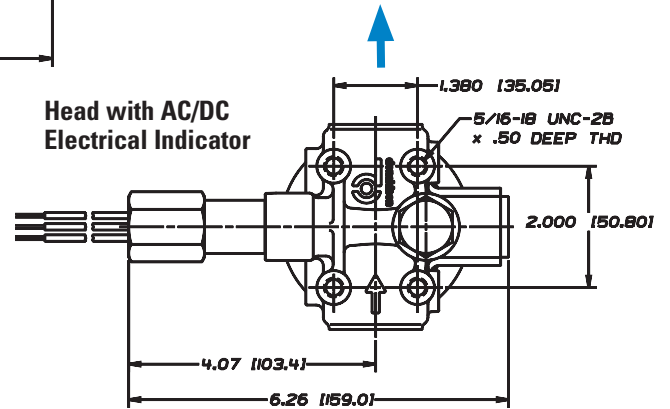
- Pilot Control Circuits
- Refrigeration Compressor Circuits
- Hydrostatic Transmission
- Charge Pumps

Head - Top View with Indicators

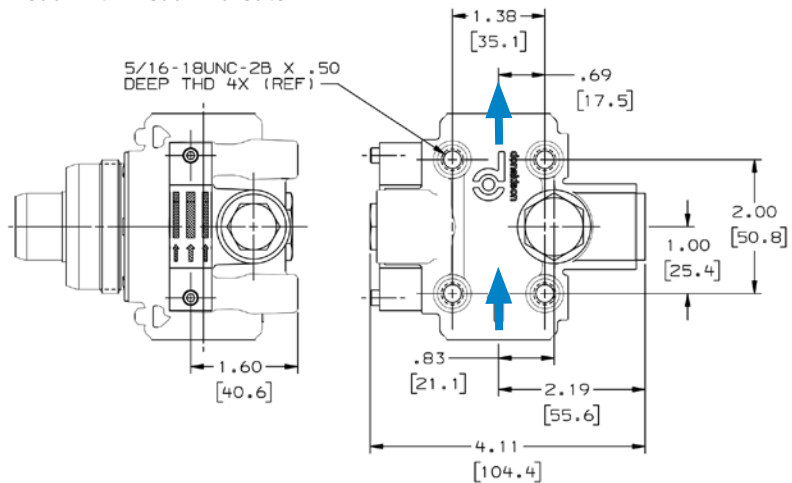
Head with DC Electrical Indicator



Head with AC/DC Electrical Indicator



Head with Visual Indicator





HMK03

Max Flow: 25 gpm (95 lpm)



HMK03 Components

Filter Choices

| Media No. | Media Tech | B _(c) = 1000 Rating | Length (in.) (mm) | | Part No. | Seal Material |
|-----------|------------|--------------------------------|-------------------|-----|----------|---------------|
| No. 1 | Synteq™ | 5 μm | 5.5 | 140 | P170306 | Buna-N® |
| | | | 9.5 | 242 | P170307 | Buna-N |
| No. 2 | Synteq | 9 μm | 5.5 | 140 | P170308 | Buna-N |
| | | | 9.5 | 242 | P170309 | Buna-N |
| No. 2½ | Synteq | 10 μm | 9.5 | 242 | P176107 | Buna-N |
| No. 3 | Synteq | 10 μm | 9.5 | 242 | P173702 | Buna-N |
| No. 4 | Synteq | 10 μm | 5.5 | 140 | P170310 | Buna-N |
| | | | 9.5 | 242 | P170311 | Buna-N |
| No. 9 | Synteq | 23 μm | 5.5 | 140 | P170312 | Buna-N |
| | | | 9.5 | 242 | P170313 | Buna-N |

Filter Notes

- Synteq™ filter media is compatible with petroleum based fluids, most phosphate esters, water oil emulsions, and HWCF (high water content fluids).
- All models have 2"-12 threads
- Buna-N® is a registered trademark of E. I. DuPont de Nemours and Company.



HMK03 Head

| Port Size | Bypass Rating | Indicator | Head Part No. |
|-----------|---------------|-----------|---------------|
| ¾" SAE-12 | No Bypass | None* | P170327 |
| O-Ring | 50 psi | None* | P170773 |
| | 345 kPa | Visual* | P179460 |

*Head is machined to accept optional electrical indicators.
See Indicator list at right for the available choices.

In-Oil Service Indicator Choices

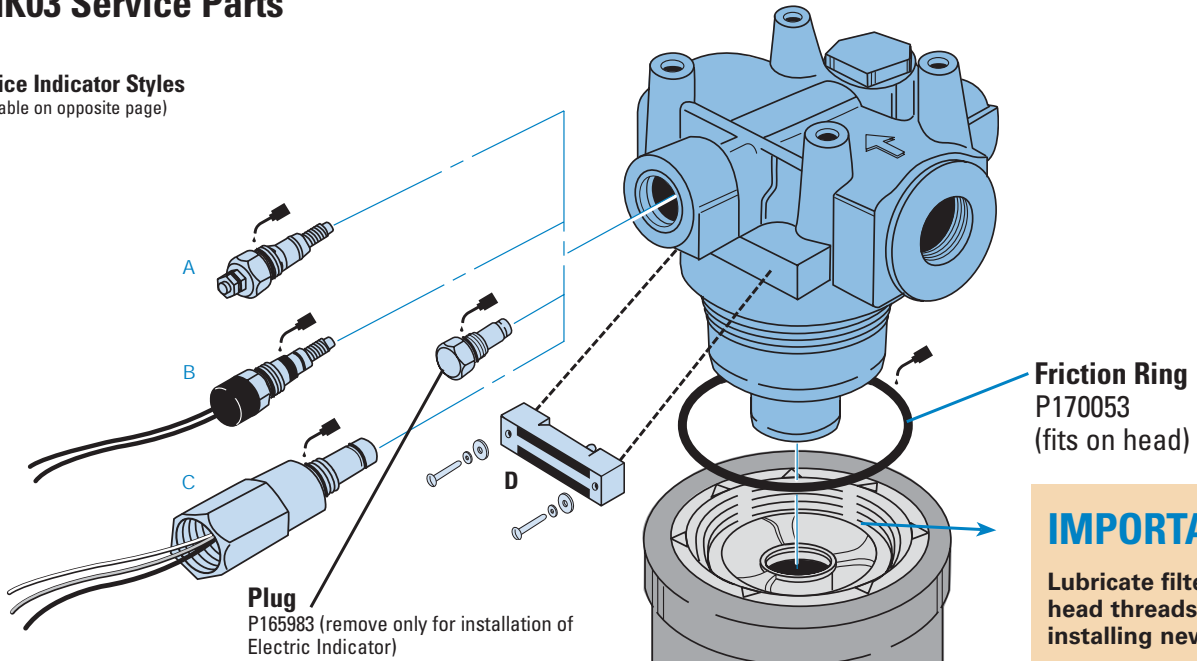
| Use with Bypass Valve Pressure of: | Part No. | Style ² | Description ¹ |
|------------------------------------|----------|--------------------|--------------------------|
| 25 psi / 172.5 kPa | P171143 | B | Electric 2-wire DC |
| | P173944 | C | Electric 3-wire AC/DC |
| 50 psi / 345 kPa | P165194 | A | Electric Single post DC |
| | P171087 | B | Electric 2-wire DC |
| | P174396 | C | Electric 3-wire AC/DC |
| | P165965 | D | Visual |

¹ All electric models have a maximum operating temperature of 250°F/121°C.

² See illustration of indicator styles on next page and complete details on all service indicators on pages 236-238.

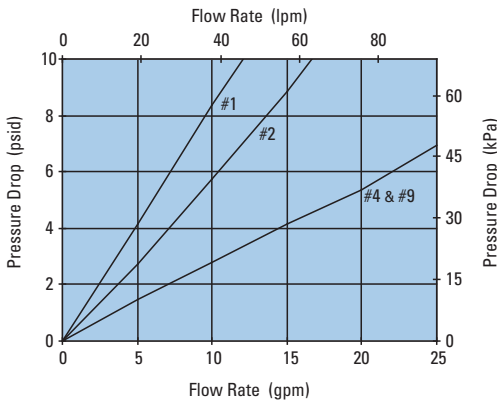
HMK03 Service Parts

Service Indicator Styles
(See table on opposite page)

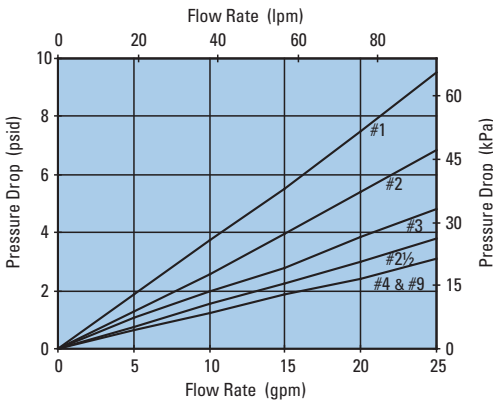


Performance Data

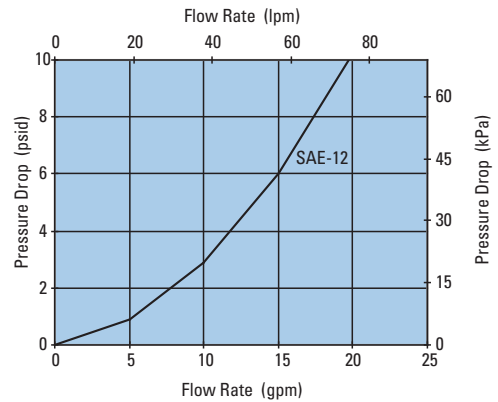
HMK03 Filter Only
(Synthetic, 5.5"/140mm)



HMK03 Filter Only
(Synthetic, 9.5"/242mm)



HMK03 Head Only





HMK04/24

Max Flow: 35 gpm (130 lpm)/60 gpm (230)



HMK04/24 DURAMAX® Spin-On Filters

Working Pressures to: 500 *psi*
3450 kPa
34.5 bar

Rated Static Burst to: 1000 *psi*
6900 kPa
69 bar

| Flow Range to: | HMK04 | HMK24 |
|----------------|----------------|----------------|
| | 35 <i>gpm</i> | 60 <i>gpm</i> |
| | 130 <i>lpm</i> | 230 <i>lpm</i> |



Features

HMK04 (single) and HMK24 (double) Duramax® spin-on filters both feature a die-cast aluminum head, a heavy-duty steel body, with diecast aluminum top plate for added strength. A special head-to-canister O-Ring seal prevents leakage. Buna-N seals are standard; Viton® seals are available on some models.

Since both HMK04 and HMK24 models use the same replacement filters, they make a great team for your application. Both filters feature identical pressure ratings, but HMK24 handles double the flow capacity as HMK04, so there's no need to inventory two different part numbers for replacement filters. A full range of media options are available, using Donaldson's exclusive Synteq™ synthetic media designed especially for liquid filtration. You can also select the exact indicator types and bypass options to suit your application.

Buna-N® Viton® are a registered trademarks of E. I. DuPont de Nemours and Company.

Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- | HMK04 | HMK24 |
|----------------------|---------------------------------|
| • ¾", 1" NPT, | • SAE-20 O-ring |
| • SAE-12, -16 O-ring | • 1¼" SAE 4-Bolt Flange Code 61 |

Assembly Weight

- HMK04 with short filter: 3.9 lbs/1.8 kg
- HMK04 with long filter: 4.8 lbs/2.2 kg
- HMK24: with short filter: 7.8 lbs/3.5 kg
- HMK24: with short filter: 9.6 lbs/4.4 kg

Replacement Filter Lengths

- 6" / 152mm
- 9.4" / 240mm

Standard Bypass Ratings

- 25 *psi*, 50 *psi*, No Bypass

Operating Temperatures

- -20°F to 250°F / -29°C to 121°C (synthetic)
- -20°F to 225°F / -29°C to 107°C (cellulose)

Housing Fatigue Strength Ratings*

- 100,000 Cycles: 0-500 *psi* / 0-3450 kPa / 34.5 bar
- 300,000 Cycles: 0-400 *psi* / 0-2758 kPa / 27.6 bar
- 1,000,000 Cycles: 0-350 *psi* / 0-2415 kPa / 24 bar

*Per T3.10.17 NFPA

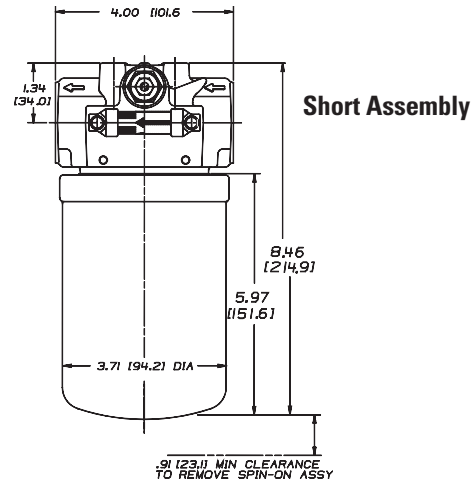
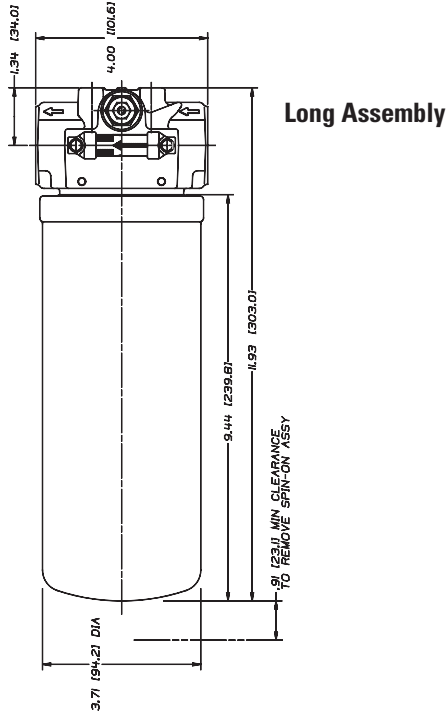
Filter Collapse Rating

- 150 psid / 10 bar
- 300 psid / 20 bar also available

HMK04/24 Specification Illustrations

All dimensions are shown in inches [millimeters].

Assembly - Side Views

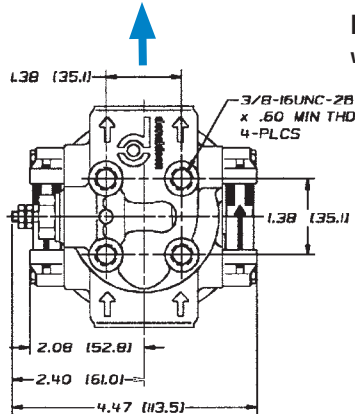


Applications:

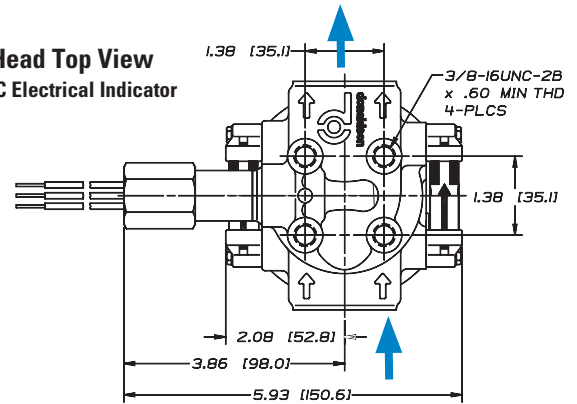
- Return-Lines
- Case Drains
- Side Loop Systems
- Bearing/Gear Lube Systems
- Hydrostatic Charge Pumps
- Power Transmissions
- Cooling Circuits
- Fuel Transfer

Heads - Top & Side Views

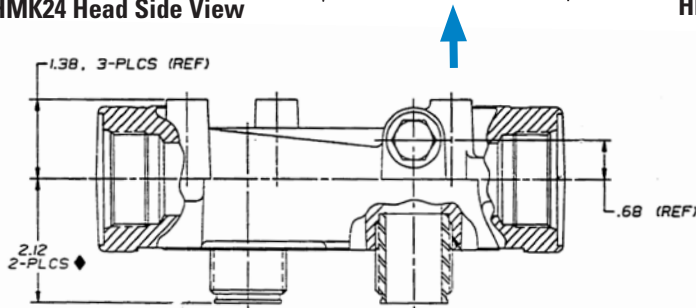
HMK04 Head Top View with DC Electrical Indicator



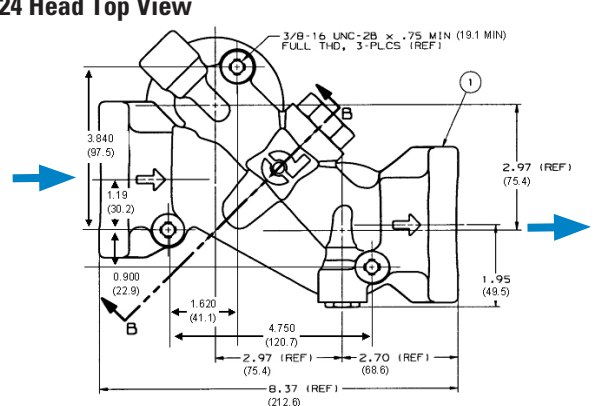
HMK04 Head Top View with AC/DC Electrical Indicator



HMK24 Head Side View



HMK24 Head Top View





HMK04/24

Max Flow: 35 gpm (130 lpm)/60 gm (230)



HMK04/24 Components

Filter Choices for both HMK04 and HMK24

| Media | B _{x10} = 1000 Rating | Media Technology | Length (in.) | | Part No. | |
|-----------|--------------------------------|------------------|------------------|------|----------------------------------|---------|
| No. 1/2 | <4 μm | Synteq™ | 9.4 | 240 | P165185 ¹ Viton® Seal | |
| No. 1 | 5 μm | Synteq | 9.4 | 240 | P167590 | |
| No. 2 | 9 μm | Synteq | 6 | 52 | P165354 | |
| | | | 9.4 | 240 | P165332 | |
| No. 2 1/2 | 10 μm | Synteq | 6 | 152 | P176565 | |
| | | | 9.4 | 240 | P176566 | |
| | | | 300 psi collapse | 9.4 | 240 | P173737 |
| No. 3 | 10 μm | Synteq | 9.4 | 240 | P170950 | |
| | | | 300 psi collapse | 11.6 | 295 | P179343 |
| No. 4 | 10 μm | Synteq | 6 | 152 | P163542 | |
| | | | 300 psi collapse | 9.4 | 240 | P163555 |
| | | | | 6 | 152 | P164375 |
| | | | | 9.4 | 240 | P164378 |
| No. 6 | 13 μm | Synteq | 9.4 | 240 | P164056 ¹ Viton Seal | |
| No. 7 | 33 μm | Synteq | 6 | 152 | P164381 | |
| | | | 9.4 | 240 | P164384 | |
| No. 9 | 23 μm | Synteq | 6 | 152 | P163315 | |
| | | | 9.4 | 240 | P163567 | |
| No. 16 | 22 μm | Synteq | 9.4 | 240 | P164059 ¹ Viton Seal | |
| No. 20 | >50 μm | Synteq | 6 | 152 | P165335 | |
| | | | 9.4 | 240 | P165338 | |
| WA | na | Water Removal | 9.4 | 240 | P560584 | |



Mix and Match to Get What You Need

Donaldson's mix and match system provides the great performance and functional advantages of custom-engineered filters with the convenience and speedy delivery of in-stock parts. Choose your options and build a filter to meet your cleanliness requirements.

Notes

- Refer to table in the Technical Reference Guide for fluid compatibility with our filter media.
- Standard filter collapse rating is 150 psi, except as noted.
- Thread size is 1 3/8"-12 UNF-2B

¹ Filters with seals made of Buna-N® are appropriate for most applications involving petroleum oil. Filters with seals made of Viton® (a fluoroelastomer) are required when using diester, phosphate ester fluids, water glycol, water/oil emulsions and HWCF (high water content fluids) over 150°F. Donaldson offers both types.

Buna-N® Viton® are a registered trademarks of E. I. DuPont de Nemours and Company.

Head Choices for HMK24 (double)



| Port Size | Bypass Rating | Indicator Options ¹ | Part No. |
|-------------------|---------------|--------------------------------|----------|
| SAE-20 O-Ring | None | A,B,C | P179609 |
| 1 1/4" SAE 4-Bolt | | | |
| Code 61 | 50 psi | A,B,C | P179582 |

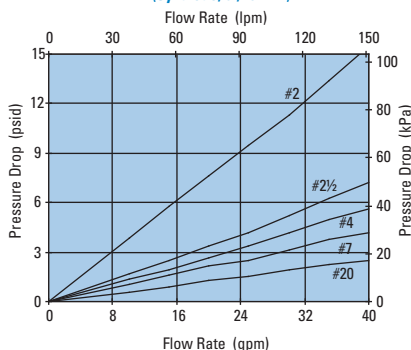
¹ Reference illustration on next page for service indicator styles.

IMPORTANT:

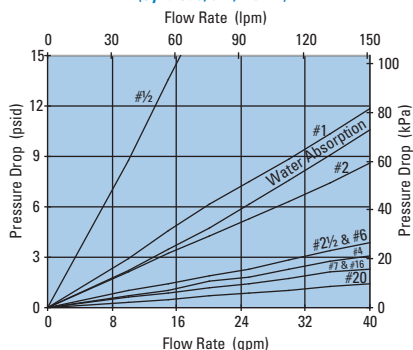
The filter head snout/post must be lubricated before spinning on a new filter to prevent thread damage.

Performance Data

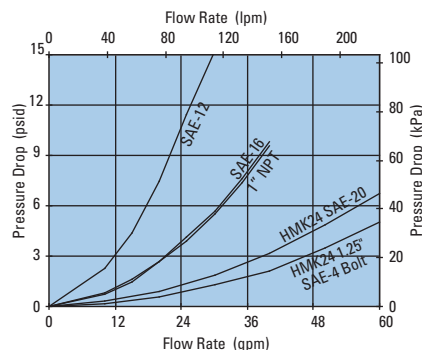
HMK04 Filter Only
(Synthetic, 6"/152mm)



HMK04 Filter Only
(Synthetic, 9.4"/240mm)



HMK04/24 Head Only



Head Choices for HMK04 (single)

| Port Size | Bypass Rating | Standard Indicator Style & Location ^{1,2} | Indicator Options | Head Part No. |
|-------------------------|-------------------------|--|-------------------|---------------|
| ¾" NPT | 25 psi | None | None | P169317 |
| | 172 kPa | D (Visual), Left Side | None | P169310 |
| SAE-12 O-Ring | 25 psi | None | None | P167473 |
| | 172 kPa | D (Visual), Left Side | None | P166387 |
| | No Bypass | D (Visual), Left Side (25 psi) | None | P169320 |
| | | None | None | P165434 |
| SAE-12 O-Ring (3 ports) | No Bypass | D (Visual), Left Side (50 psi) | None | P173750 |
| | 50 psi / 345 kPa | A (Electrical, P161594) | B, C | P167529 |
| 1" NPT | 25 psi | D (Visual), Both Sides | A, B, C | P166086 |
| | 172 kPa | None | None | P169309 |
| | | D (Visual), Left Side | None | P166416 |
| SAE-16 O-Ring | 15 psi / 100 kPa | None | A | P176569 |
| SAE-16 O-Ring | 25 psi / 172 kPa | None | None | P163681 |
| | | D (Visual), Left Side | None | P166417 |
| | | D (Visual), Both Sides | A, B, C | P166088 |
| | | E (Electrical, P177361) | None | P176568 |
| | | A (Electrical, P162400) | B, C | P165537 |
| | No Bypass | D (Visual), Both Sides (25 psi) | A, B, C | P166664 |
| | | A (Electrical, P162400) | B, C | P166902 |
| | 50 psi | D (Visual, Right Side) | All | P179381 |
| | No Bypass | None | None | P164667 |
| | 50 psi / 345 kPa | None | None | P167201 |
| | A (Electrical, P165194) | B, C | P166862 | |
| SAE-16 O-Ring | 5 psi | D (Visual), Both Sides | All | P564850 |
| 1" NPT | No Bypass | D (Visual), Left Side (25 psiD) | None | P564484 |
| 1" NPT | 25 psi | D (Visual), Left Side (25 psiD) | None | P564485 |

IMPORTANT:

The filter head snout/post must be lubricated before spinning on a new filter to prevent thread damage.



Head Notes

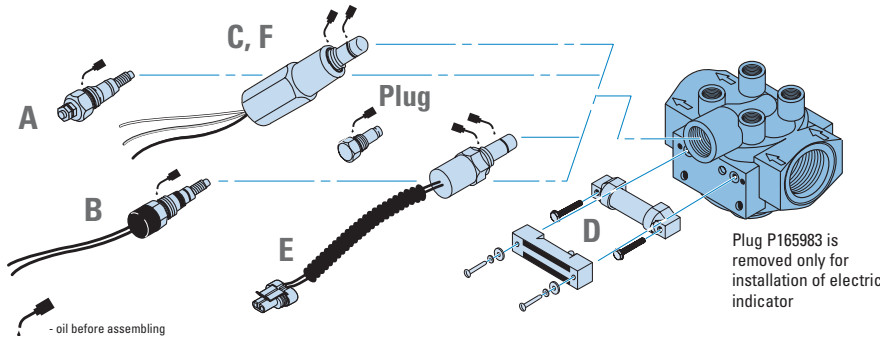
- 1 Reference illustration below for indicator styles.
- 2 Donaldson uses the inlet port as the reference point. "Left side," for instance, means that the indicator mounts on the side of the filter head that is on your left when you face the inlet port.

3-Port Head for Charge Pumps



The **P167529** head is designed with a 50 psi / 3.45 bar third port bypass valve that diverts all bypass flow back to the reservoir, instead of going straight through the head and into the system as it does in 2-ported heads. Unfiltered fluid is NOT allowed into the system in the case of plugged filters. Designed primarily for charge pump applications.

Service Indicator Choices



| Electric Models ¹ | | | Visual Models (non-electric) ² | | |
|------------------------------------|--------------------|--------------------------------|---|--------------------|--------------------|
| Use with Bypass Valve Pressure of: | Indicator Part No. | Style ³ Description | Use with Bypass Valve Pressure of: | Indicator Part No. | Style ³ |
| 5 psi / 34.5 kPa | P163642 | A Single post DC. | 15 psi / 103 kPa | P162642 | D |
| 15 psi / 103 kPa | P163601 | A Single post DC. | 25 psi / 172. kPa | P162696 | D |
| 25 psi / 172.5 kPa | P163839 | A Single post DC. N.C. | 50 psi / 345 kPa | P167580 | D |
| 25 psi / 172.5 kPa | P162400 | A Single post DC. N.O. | n/a (blank plate) | P165984 | n/a |
| 25 psi / 172.5 kPa | P171143 | B DC 2-wire. | NOTE: PSI is marked on the face of the visual indicators. | | |
| 25 psi / 172.5 kPa | P173944 | C AC/DC 3-wire. | | | |
| 50 psi / 345 kPa | P165194 | A Single post DC. N.O. | | | |
| 50 psi / 345 kPa | P167455 | A Single post DC. N.C. | | | |
| 50 psi / 345 kPa | P171087 | B DC 2-wire. | | | |
| 50 psi / 345 kPa | P170926 | E DC 2-wire. | | | |
| 50 psi / 345 kPa | P173893 | F DC 3-wire. | | | |
| 50 psi / 345 kPa | P174396 | C AC/DC 3-wire. | | | |

Indicator Notes

- ¹ All electric models have a maximum operating temperature of 250°F / 121°C.
- ² All non-electric models have a maximum operating temperature of 180°F / 82°C.
- ³ Complete details on all service indicators on pages 236-238.



HMK05/25

Max Flow: 50 gpm (189 lpm)/100 gpm (378 lpm)



HMK05/25 DURAMAX® Spin-On Filters

Working Pressures to: 350 *psi*
2413 kPa
24.1 bar

Rated Static Burst to: 800 *psi*
5520 kPa
55.2 bar

| Flow Range to: | HMK05 | HMK25 |
|----------------|---------------------------------|----------------------------------|
| | 50 <i>gpm</i> 189 <i>lpm</i> | 100 <i>gpm</i> 378 <i>lpm</i> |



Features

HMK05 (single) and HMK25 (double) Duramax spin-on filters are perfect for high-flow applications, featuring a heavy-duty steel body and diecast top plate for added strength. A special head-to-canister O-Ring seal prevents leakage. Buna-N® seals are standard. Viton® seals made of fluorocarbon are available. Since both HMK05 and HMK25 models use the same replacement filters, they make a great team within your application. Both filters feature identical pressure ratings, but the HMK25 double filter head means double flow capability, with two filters to hold more contaminant. So there's no need to inventory two different part numbers for replacement filters.

Take advantage of Donaldson's mix and match system of in-stock heads, housings and media choices – so you can get exactly what you need. Media options include wire mesh and Donaldson's exclusive Synteq™ synthetic media designed especially for liquid filtration.

Viton® and Buna-N® are registered trademarks of E. I. DuPont de Nemours and Company.

Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- | HMK05 | HMK25 |
|-----------------|------------------------------------|
| • 1¼" NPT | • 1½" NPT |
| • SAE-20 O-ring | • SAE-24 O-ring |
| | • 1½" SAE 4-Bolt Flange Code 61 |

Assembly Weight

- 7.5 lbs / 3.4 kg (single)
- 16 lbs / 7.3 kg (double)

Replacement Filter Lengths

- 7.6" / 193mm
- 11.63" / 295.4mm
- 14.2" / 361mm

Standard Bypass Ratings

- 25 *psid* / 1.72 *bar* or No Bypass

Operating Temperatures

- -20°F to 250°F / -29°C to 121°C (synthetic)
- -20°F to 225°F / -29°C to 107°C (cellulose)
- -20°F to 250°F / -29°C to 121°C (wire mesh)

Housing Fatigue Strength Ratings*

- 100,000 Cycles: 0-350 *psi* / 0-2413 kPa / 24.1 bar
- 300,000 Cycles: 0-300 *psi* / 0-2068 kPa / 20.7 bar
- 1,000,000 Cycles: 0-250 *psi* / 0-1734 kPa / 17.3 bar

*Per T3.10.17 NFPA

Filter Collapse Ratings

- 200 *psi* / 13.8 *bar*

Filter Head Construction

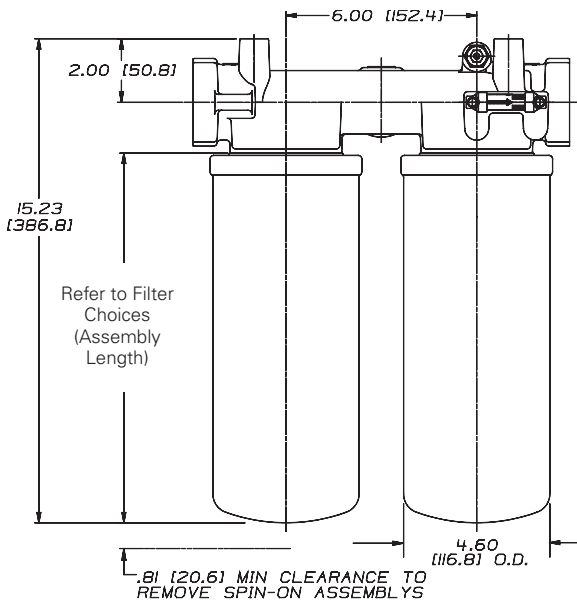
- Standard Head Cast Aluminum
- Ductile Iron Available in HMK25

HMK05/25 Specification Illustrations

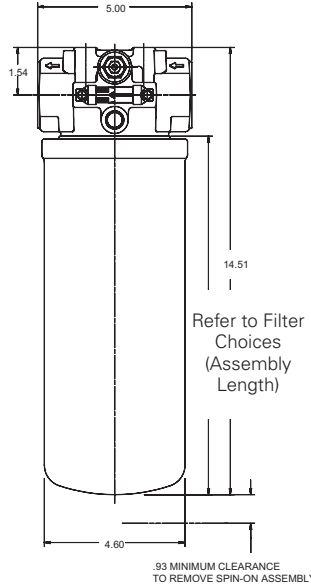
All dimensions are shown in inches [millimeters].

Assembly - Side Views

HMK25



HMK05

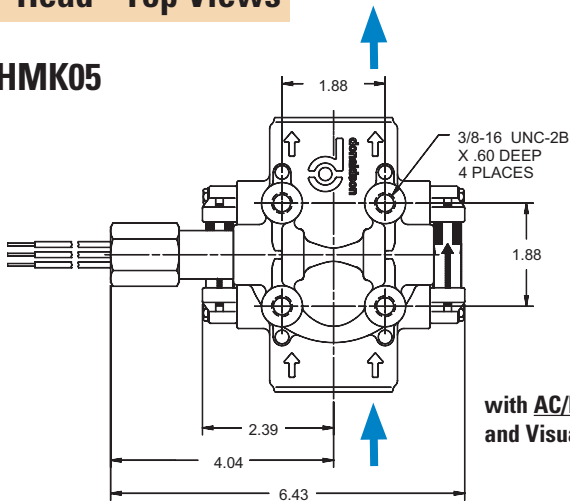


Applications:

- Case Drains
- Fluid Conditioning
- Power Transmissions
- Return-Line & Side Loop Systems
- Hydrostatic Charge Pumps
- Lube Oil Systems
- Cooling Circuits
- Fuel Transfer

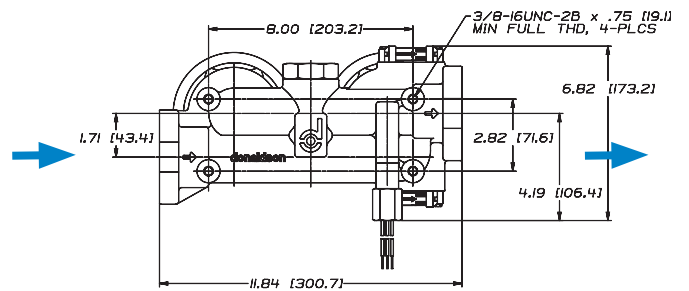
Head - Top Views

HMK05

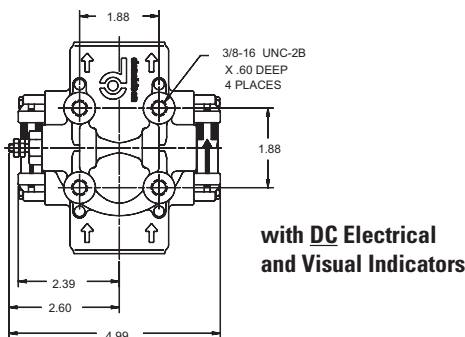


with **AC/DC** Electrical and Visual Indicators

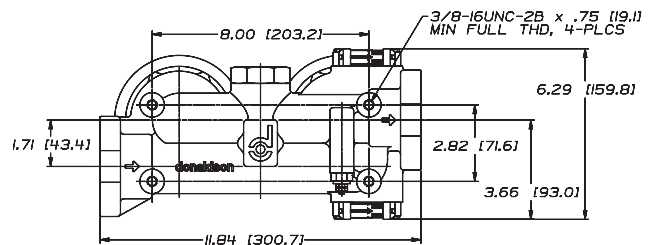
HMK25



with **AC/DC** Electrical and Visual Indicators



with **DC** Electrical and Visual Indicators



with **DC** Electrical and Visual Indicators



HMK05/25

Max Flow: 50 gpm (189 lpm)/100 gpm (378 lpm)



HMK05/25 Components

Filter Choices for HMK05 and HMK25

| Media Number | Media Type | B _{x10} ¹⁰ = 1000 Rating | Length (in./mm) | Part No. |
|--------------|---------------|--|-----------------|------------------------|
| No. ½ | Synteq™ | <4 μm | 14.2/361 | P564468 |
| No. 1 | Synteq | 5 μm | 11.6/294 | P170906 |
| | | | 11.6/294 | P171273; Viton®, Epoxy |
| No. 2 | Synteq | 9 μm | 11.6/294 | P165675 |
| | | | 11.6/294 | P171274; Viton, Epoxy |
| | | | 14.2/361 | P179763 |
| | | | 11.6/294 | P165659 |
| No. 2½ | Synteq | 10 μm | 11.6/294 | P176567 |
| No. 3 | Synteq | 10 μm | 14.2/361 | P170949 |
| No. 4 | Synteq | 10 μm | 7.6/193 | P176207 |
| | | | 11.6/294 | P165659 |
| | | | 11.6/294 | P171275; Viton, Epoxy |
| | | | 11.6/294 | P165569 |
| No. 9 | Synteq | 23 μm | 7.6/193 | P176208 |
| | | | 11.6/294 | P165569 |
| | | | 11.6/294 | P171276; Viton, Epoxy |
| | | | 14.2/361 | P173789 |
| No. 20 | Synteq | >50 μm | 11.6/294 | P165672 |
| | | | 14.2/361 | P170546 |
| No. 149 | Wiremesh | 150 μm nominal | 11.6/294 | P173943 |
| | | | 11.6/294 | P179075 |
| | Water Removal | N/A | 11.6/294 | P179075 |

Filter Notes

- Refer to table in the Technical Reference Guide for fluid compatibility with our filter media.
- Thread size is 1 3/4"-12 UNF-2B
- ¹ Filters with seals made of Buna-N[®] are appropriate for most applications involving petroleum oil. Filters with seals made of Viton[®] (a fluoroelastomer) are required when using diester, phosphate ester fluids, water glycol, water/oil emulsions, and HWCF (high water content fluids) over 150°F. Donaldson offers both types, as shown in the table above. Filters with seals made of Buna-N[®] are appropriate for most applications involving petroleum oil. Viton[®] and Buna-N[®] are registered trademarks of E. I. DuPont de Nemours and Company.

In-Oil Service Indicator Options

Electric Models¹

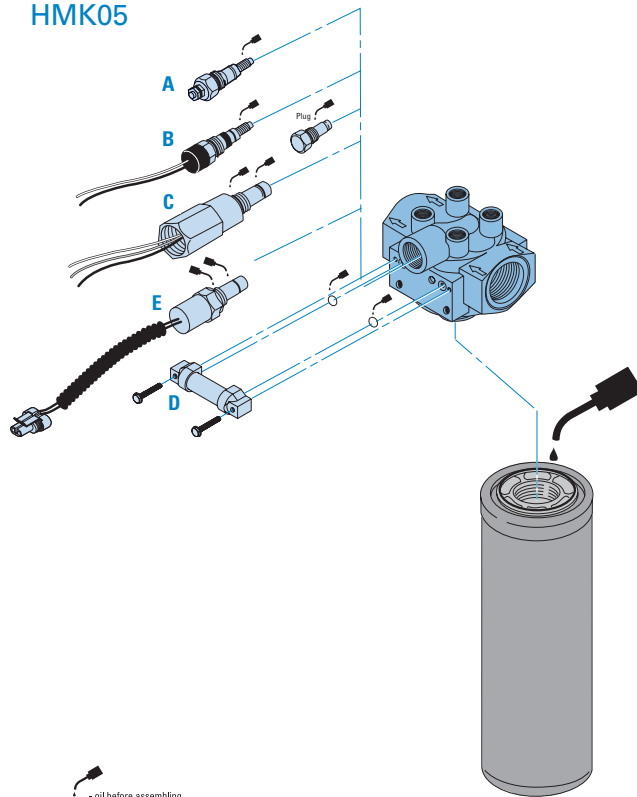
| Use with Bypass Valve Pressure of: | Indicator Part No. | Style ³ | Description |
|------------------------------------|--------------------|--------------------|----------------------|
| 5 psi / 34.5 kPa | P163642 | A | Single post DC |
| 15 psi / 103 kPa | P163601 | A | Single post DC. |
| 25 psi / 172.5 kPa | P163839 | A | Single post DC. N.C. |
| 25 psi / 172.5 kPa | P162400 | A | Single post DC. N.O. |
| 25 psi / 172.5 kPa | P171143 | B | DC 2-wire |
| 25 psi / 172.5 kPa | P173944 | C | AC/DC 3-wire |
| 50 psi / 345 kPa | P165194 | A | Single post DC. N.O. |
| 50 psi / 345 kPa | P167455 | A | Single post DC. N.C |
| 50 psi / 345 kPa | P171087 | B | DC 2-wire |
| 50 psi / 345 kPa | P170926 | E | DC 2-wire |
| 50 psi / 345 kPa | P173893 | F | DC 3-wire |
| 50 psi / 345 kPa | P174396 | C | AC/DC 3-wire |

Visual Models (Non-Electric)²

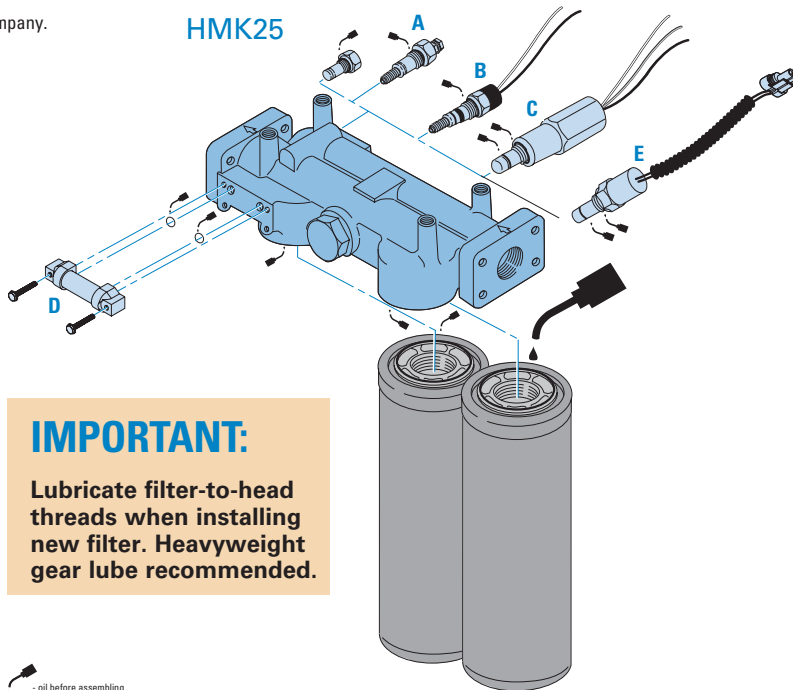
| Use with Bypass Valve Pressure of: | Indicator Part No. | Style ³ |
|------------------------------------|--------------------|--------------------|
| 15 psi / 103 kPa | P162642 | D |
| 25 psi / 172.5 kPa | P162696 | D |
| 50 psi / 345 kPa | P167580 | D |
| n/a | P165984 | (blank plate) |

Service Parts

HMK05



HMK25



IMPORTANT:

Lubricate filter-to-head threads when installing new filter. Heavyweight gear lube recommended.

- oil before assembling

Indicator Notes

- ¹ All electric models have a maximum operating temperature of 250°F/ 114°C.
- ² All non-electric models have a maximum operating temperature of 180°F/ 82°C.
- ³ Indicator styles are illustrated above and detailed on pages 236-238.

Head Choices for HMK05 (single)

| Port Size | Bypass Rating | Standard Indicator Style & Location ¹ | Indicator Options ² | Part No. |
|-----------|------------------|--|--------------------------------|----------|
| 1¼" NPT | 25 psi / 172 KPa | D (Visual), Both Sides (25 psi) | A, B, C, E, F | P167294 |
| | 25 psi / 172 kPa | A (Electrical) (25 psi) | A, B, C, E, F | P167621 |
| 1¼" NPT | 25 psi / 172 KPa | D (Visual), Left Side (25 psi) | D | P167622 |
| SAE-20 | 25 psi / 172 KPa | D (Visual), Both Sides (25 psi) | A, B, C, E, F | P165973 |
| O-Ring | 25 psi / 172 KPa | None | None | P167619 |
| | 50 psi / 345 KPa | D (Visual), Left Side, Blank Plate Right Side | A, B, C, E, F | P561885 |
| | No Bypass | D (Visual), Both Sides (25 psi) | A, B, C, E, F | P166663 |
| | No Bypass | D (Visual), Right Side (25 psi) | D | P564486 |
| | No Bypass | D (Visual), Both Sides (50 psi) | A, B, C, E, F | P564858 |



Single Head

Head Choices for HMK25 (double)

| Port Size | Bypass Rating | Indicator Style & Location ¹ | Indicator Options ² | Part No. |
|-----------------------|------------------|---|--------------------------------|----------|
| 1½" NPT | 25 psi / 172 KPa | D (Visual), Left side only | A,B,C,E,F | P169985 |
| 1½" SAE 4-Bolt | 25 psi / 172 kPa | D (Visual), Both sides | A,B,C,E,F | P167296 |
| Flange | No Bypass | D (Visual), Both Sides | A,B,C,E,F | P169984 |
| 1½" SAE O-Ring | 25 psi / 172 kPa | D (Visual), Both sides | A,B,C,E,F | P167297 |
| 1½" SAE 4-Bolt Flange | 50 psi / 345 kPa | Visual RH | A,B,C,E,F | P560855* |



Dual Head

IMPORTANT:

The filter head snout/post must be lubricated before spinning on a new filter to prevent thread damage.

* Ductile Iron Construction

Head Choice for HMK05 (3rd port return)

| Port Size | Bypass Rating | Indicator Style & Location ¹ | Indicator Options ² | Part No. |
|---|------------------|---|--------------------------------|----------|
| 1¼" SAE 4-Bolt Flange (3rd port: 1" SAE 4-Bolt) | 50 psi / 345 kPa | None | A,B,C,E,F | P561924 |



3-Port Head

The **P561924** head is designed with a 50 psi / 3.45 bar third port bypass valve that diverts all bypass flow back to the reservoir, instead of going straight through the head and into the system as it does in 2-ported heads. Unfiltered fluid is NOT allowed into the system in the case of plugged filters. Designed primarily for charge pump applications.

Head Notes

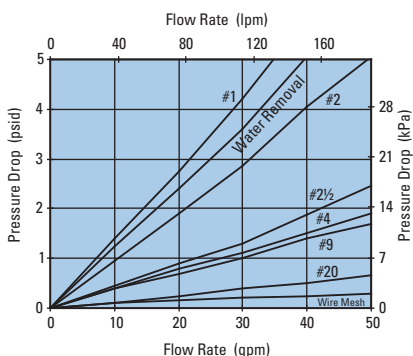
¹ Donaldson uses the inlet port as the reference point. "Left side," for instance, means the indicator mounts on the Left side when you face the inlet port.

² May be purchased separately.

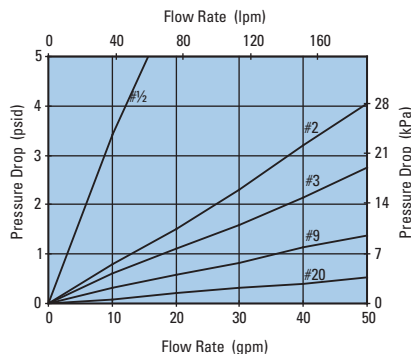
³ Complete details on all service indicators on pages 236-238.

Performance Data

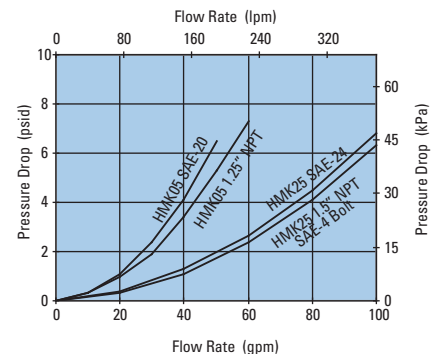
HMK05 Filter Only (Synthetic, 11.6"/294mm)



HMK05 Filter Only (Synthetic, 14.2"/361mm)



HMK05 Head Only





HNK04/05

Max Flow: 35 gpm (130 lpm)/50 gpm (189 lpm)



HNK04/05 DURAMAX[®] Spin-On Filters

Working Pressures to: 500 *psi*
3450 kPa
34.5 bar

Rated Static Burst to: 1000 *psi*
6895 kPa
69 bar

| Flow Range to: | HNK04 | HNK05 |
|----------------|-------|---------------------------------|
| | | 35 <i>gpm</i> 130 <i>lpm</i> |



Features

HNK Duramax[®] filters utilize a RadialSeal[™] design – making servicing easier and providing a more reliable seal without having to torque to specification. A unique head-to-filter interface accepts either a spin-on or aluminum housing with cartridge filter.

- Applications include hydrostatic charge side filtration, pilot circuits, powershift transmissions and mid-pressure kidney loop circuits.
- Utilizes Synteq[™] filter media for high filtration efficiency and higher dust-holding capacity.
- Improved performance including higher burst, greater fatigue strength and longer filter life.
- Multi-purpose design – one head assembly fits both spin-on and cartridge filter.

Beta Rating

- Performance to $\beta_{9(c)}=1000$

Porting Size Options

- HNK04: SAE-12, -16 O-ring
- HNK05: SAE-20 O-ring

Assembly Weight

- HNK04 spin-on: 5.3 lbs / 2.4 kg
- HNK05 spin-on: 7.5 lbs / 3.4 kg

Replacement Spin-On Lengths

- 04 short: 5.97" / 151.7 mm
- 04 long: 9.44" / 239.8 mm
- 05 short: 11.63" / 295.4 mm
- 05 long: 14.24" / 361.7 mm

Replacement Cartridge Length

- 05 short: 10.54" / 267.8 mm

Standard Bypass Ratings

- No Bypass
- 50 psi / 345 kPa / 3.5 bar

Operating Temperatures

- -20° to 250°F (-29° to 121°C)

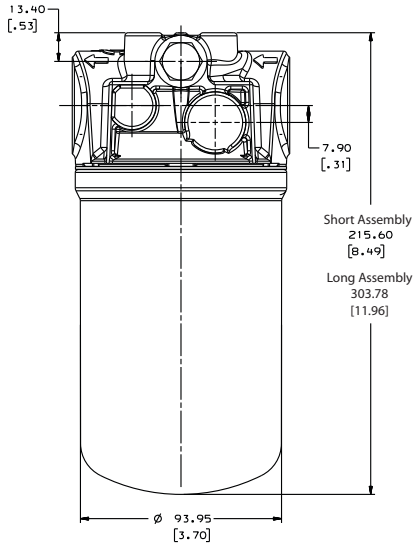
Filter Collapse Ratings

- 235 psi / 1621 kPa / 16.2 bar

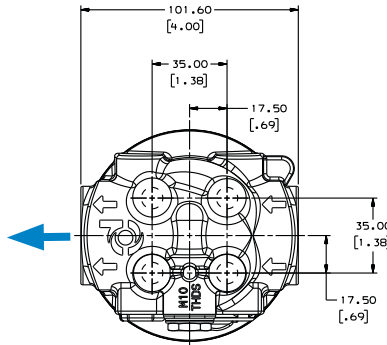
HNK04/05 Specification Illustrations

All dimensions are shown in inches [millimeters].

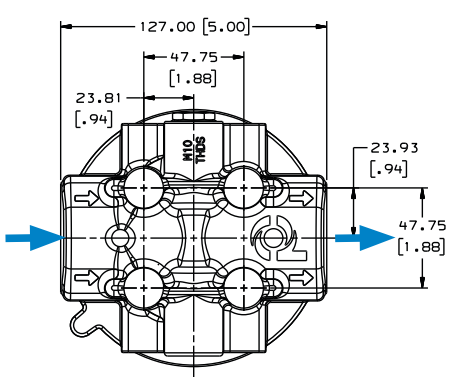
HNK04 Spin-on Assembly - Side View



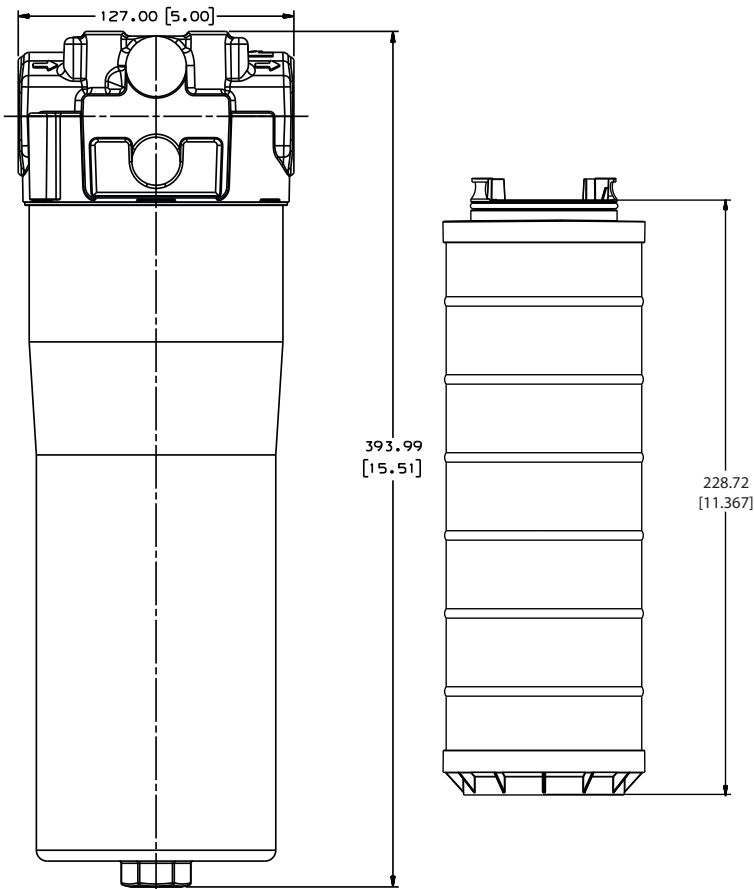
HNK04 Head - Top View



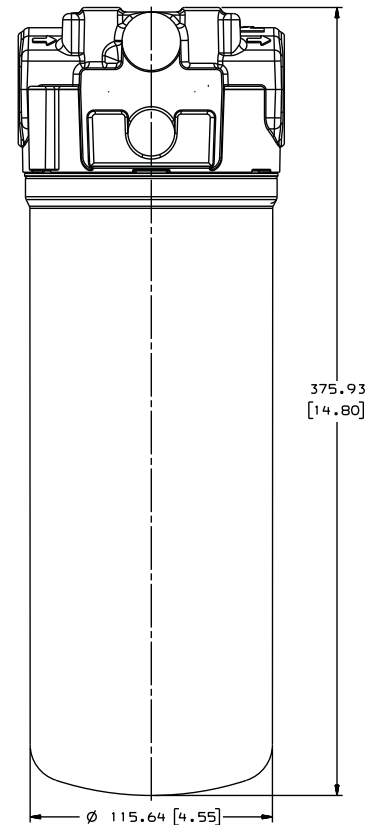
HNK05 Head - Top View



HNK05 Housing Assembly & Cartridge - Side View



HNK05 Spin-on Assembly - Side View





HNK04/05

Max Flow: 35 gpm (130 lpm)/50 gpm (189 lpm)



HNK04/05 Components Head Choices for HNK04

| Port Size | Bypass Rating | Part Number | Indicators | Style | Mounting Threads |
|-----------|------------------|-------------|------------|-----------------|------------------|
| SAE-12 | 50 psi / 3.5 bar | P568856 | none | optional elect. | 3/8-16 UNC |
| SAE-12 | No bypass | P568857 | none | optional elect. | 3/8-16 UNC |
| SAE-16 | 50 psi / 3.5 bar | P568858 | none | optional elect. | 3/8-16 UNC |
| SAE-16 | No bypass | P568859 | none | optional elect. | 3/8-16 UNC |

Head Choices for HNK05

| Port Size | Bypass Rating | Part Number | Indicators | Style | Mounting Threads |
|-----------|------------------|-------------|------------|-----------------|------------------|
| SAE-20 | 50 psi / 3.5 bar | P568860 | none | optional elect. | 3/8-16 UNC |
| SAE-20 | No bypass | P568861 | none | optional elect. | 3/8-16 UNC |

Indicator Choices

| Set Point/ Type | Part No. | Description |
|------------------|----------|-------------------------|
| 50 psi / 345 kPa | P165194 | Electric Single post DC |

HNK04/05 Spin-on Filter Choices

| Media Number | B ₁₀ = 1000 Rating | Length (in./mm) | Part No. | Comments |
|--------------|-------------------------------|-----------------|----------|----------|
| #1 | 5 µm | 5.97/151.7 | P569203 | HNK04 |
| #1 | 5 µm | 9.44/239.8 | P569204 | HNK04 |
| #3 | 10 µm | 5.97/151.7 | P569205 | HNK04 |
| #3 | 10 µm | 9.44/239.8 | P569206 | HNK04 |
| #1 | 5 µm | 11.63/295.4 | P569209 | HNK05 |
| #1 | 5 µm | 14.24/361.7 | P569210 | HNK05 |
| #3 | 10 µm | 11.63/295.4 | P569211 | HNK05 |
| #3 | 10 µm | 14.24/361.7 | P569212 | HNK05 |

HNK05 Housing

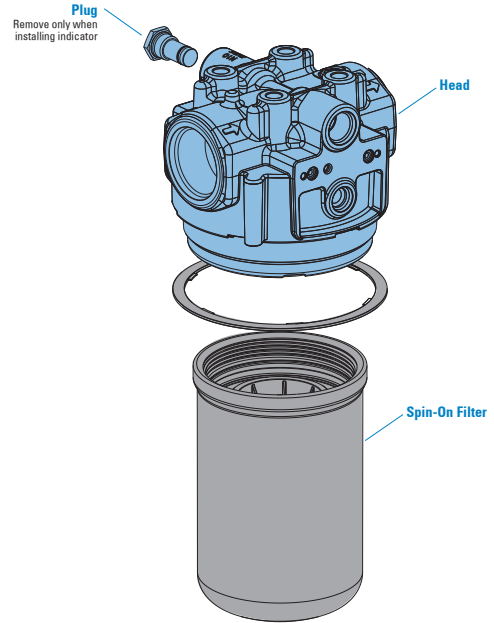
| Length (in./mm) | Part No. | Comments |
|-----------------|----------|----------------------------------|
| 10.54/267.8 | P568848 | HNK05 includes 2 seals (P567364) |

HNK05 Cartridge Filter Choices

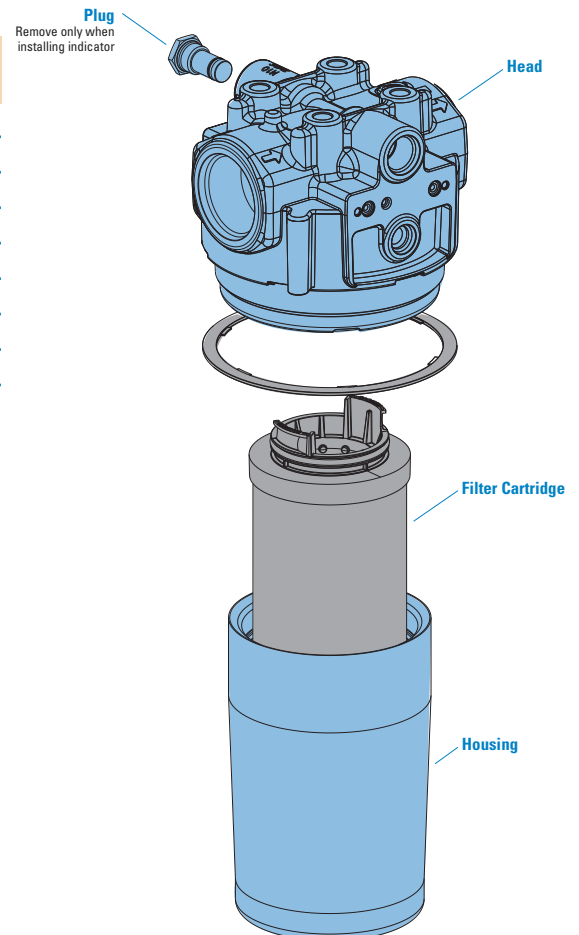
| Media Number | B ₁₀ (c) = 1000 Rating | Length (in./mm) | Part No. | Comments |
|--------------|-----------------------------------|-----------------|----------|----------|
| #2 | 9 µm | 10.54/267.8 | P568850 | HNK05 |
| #3 | 10 µm | 10.54/267.8 | P568852 | HNK05 |

Service Parts

HNK04/05 Spin-On



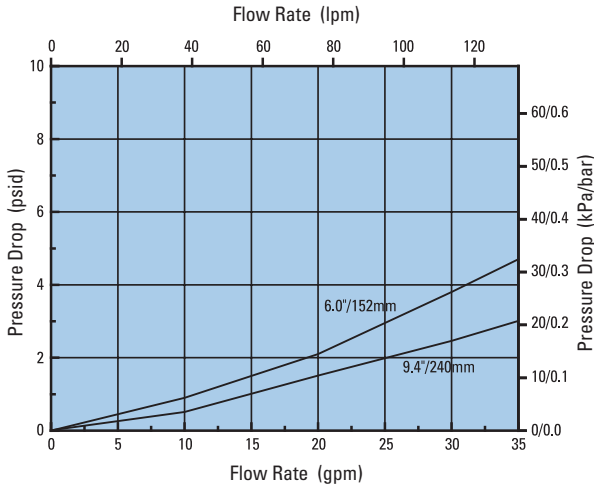
HNK05 Housing & Cartridge



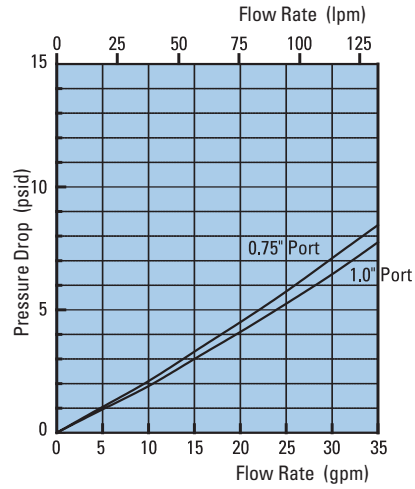


Performance Data

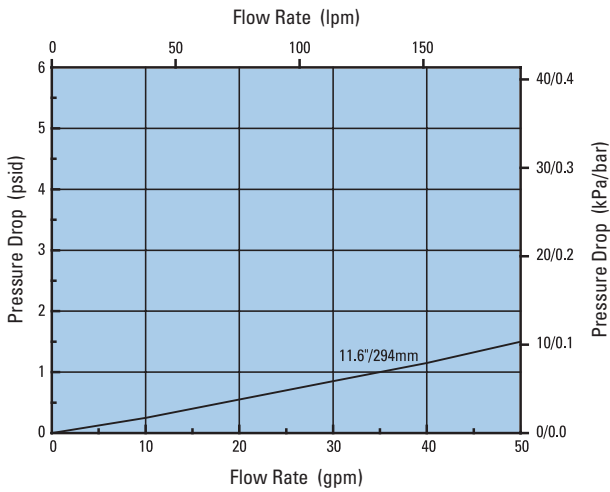
HNK04 Spin-On Filters Only



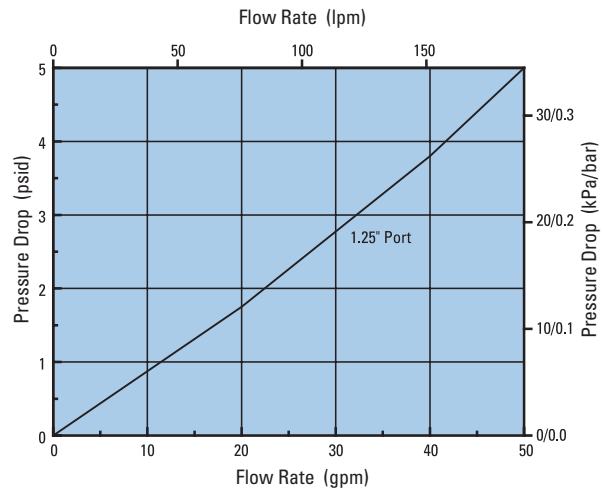
HNK04 Head Only



HNK05 Spin-On Filter Only



HNK05 Head Only



Notes

All flow measurements were made with 150 SSU hydraulic oil at 100°F (37.7°C)



W061

Max Flow: 100 gpm (379 lpm)

W061 In-Line Cartridge Filters

Working Pressures to: 600 *psi*
4137 kPa
41 bar

Rated Static Burst to: 1500 *psi*
10,342 kPa
100 bar

Fatigue Pressure Rating: 300 *psi*
21 bar

Flow Range to: 100 *gpm*
379 *lpm*



Features

The W061 filter assembly contains the popular HF3 filter. Quick filter change outs are accomplished with the use of our easily serviceable ring assembly. Donaldson DT high-performance 4-layer media is offered in a variety of designs. Five different media grades are offered. Donaldson filters core collapse options range from 150/10 bar to 3,000/210 bar psi. The differential pressure indicator line is designed to work with a wide assortment of bypass valves. Thermal lockout and surge control are two key features available in the differential indicators.

- Assembly length code 2 conforms to HF3 specifications
- Wide range of indicator options
- Three housing length options for design flexibility
- Head material: cast iron
- Housing material: steel
- Bleed plug in head

Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- SAE-12, -16, -20 O-ring

Assembly Weight

- 4": 7.9 lbs / 3.6 kg
- 8": 8.9 lbs / 4.0 kg
- 13": 10.2 lbs / 4.6 kg

Replacement Filter Lengths

- 4.59" / 116.7 mm
- 8.22" / 208.8 mm
- 12.91" / 327.8 mm

Standard Bypass Ratings

- No Bypass
- 50 psi / 345 kPa / 3.5 bar

Operating Temperatures

- -20° to 250°F (-29° to 121°C)

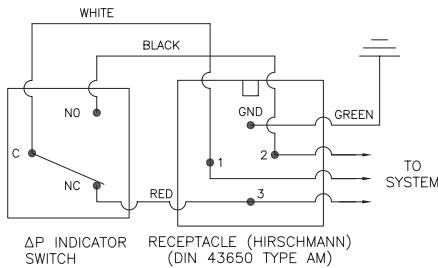
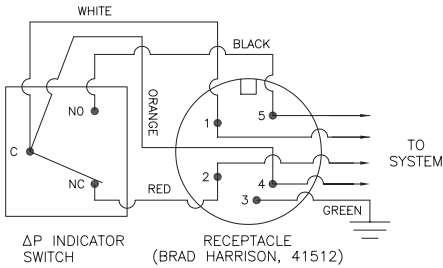
Filter Collapse Ratings

- 150 psi / 1034 kPa / 10.3 bar (standard)

W061 Specification Illustrations

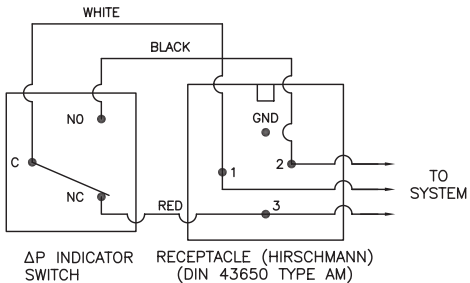
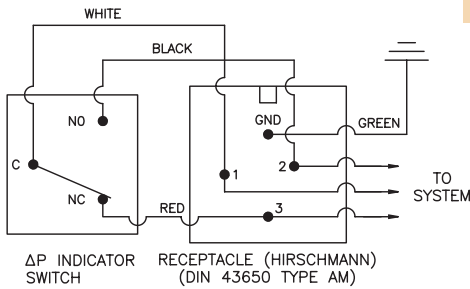
All dimensions are shown in millimeters [inches].

**Indicator Switch
Schematic Wiring Diagram
Aluminum Electrical Housings**



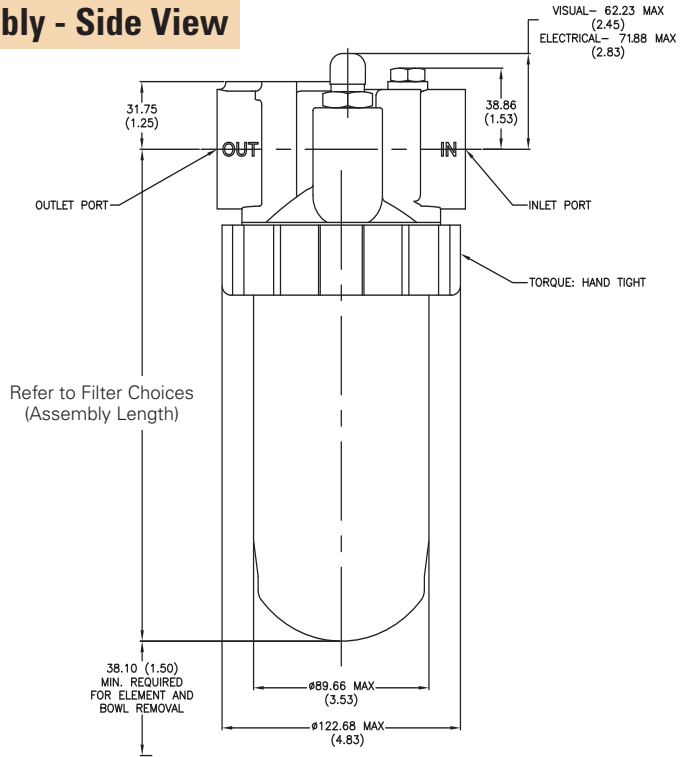
Note: The female plug (connector) is to be furnished by customer.

Plastic Electrical Housings

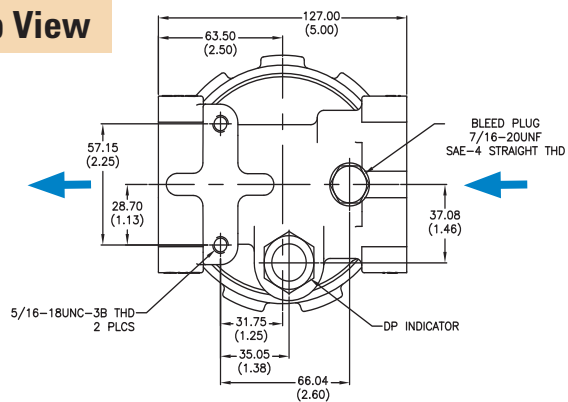


Note: The female plug (connector) is to be furnished by customer.

Assembly - Side View



Head - Top View



Differential Indicators:

Indicators are designed to actuate at approximately 80% bypass valve cracking pressure. It is recommended that an indicator with a bypass setting of 100 psid is used with a non-bypass housing.

Surge Control:

This optional feature is used to dampen pressure surges or spikes to avoid premature actuation of the indicator. Surge control delays the indicator response.

Thermal Lockout:

The Thermal Lockout prevents premature signaling of a bypass condition created by viscous fluid during cold start-ups. Normal indicator actuation capability is resumed once the operating temperature of the fluid reaches approximately 80°F / 27°C.



W061

Max Flow: 100 gpm (379 lpm)



W061 Components

High-Performance DT Filter Choices

| Media Number | Beta _{x(c)} =1000 Rating | Length (in./mm) | Donaldson DT Part No. | Comments |
|--------------|-----------------------------------|-----------------|-----------------------|--------------------------------|
| 2 μm | <4 μm | 4/116.7 | P566204 | DT-9600-4-2UM |
| 5 μm | 5 μm | 4/116.7 | P566205 | DT-9600-4-5UM |
| 8 μm | 8 μm | 4/116.7 | P566206 | DT-9600-4-8UM |
| 14 μm | 14 μm | 4/116.7 | P566207 | DT-9600-4-14UM |
| 25 μm | 25 μm | 4/116.7 | P566208 | DT-9600-4-25UM |
| 5 μm | 5 μm | 4/116 | P566364 | DT-9601-4-5UM |
| 14 μm | 14 μm | 4/116 | P566365 | DT-9601-4-14UM |
| 2 μm | <4 μm | 8/208.8 | P566209 | DT-9600-8-2UM |
| 5 μm | 5 μm | 8/208.8 | P566210 | DT-9600-8-5UM |
| 8 μm | 8 μm | 8/208.8 | P566211 | DT-9600-8-8UM |
| 14 μm | 14 μm | 8/208.8 | P566212 | DT-9600-8-14UM |
| 25 μm | 25 μm | 8/208.8 | P566213 | DT-9600-8-25UM |
| 5 μm | 5 μm | 8/208 | P566366 | DT-9601-8-5UM |
| 14 μm | 14 μm | 8/208 | P566367 | DT-9601-8-14UM |
| 2 μm | <4 μm | 13/327 | P567875 | DX2-9600-8-2UM |
| 5 μm | 5 μm | 8/209 | P565122 | DX2-9600-8-5UM |
| 8 μm | 8 μm | 8/209 | P565123 | DX2-9600-8-8UM |
| 14 μm | 14 μm | 8/209 | P564936 | DX2-9600-8-14UM |
| 2 μm | <4 μm | 13/327.8 | P566214 | DT-9600-13-2UM |
| 5 μm | 5 μm | 13/327.8 | P566215 | DT-9600-13-5UM |
| 8 μm | 8 μm | 13/327.8 | P566216 | DT-9600-13-8UM |
| 14 μm | 14 μm | 13/327.8 | P566217 | DT-9600-13-14UM |
| 25 μm | 25 μm | 13/327.8 | P566218 | DT-9600-13-25UM |
| 5 μm | 5 μm | 13/326.3 | P566368 | DT-9601-13-5UM |
| 14 μm | 14 μm | 13/326.3 | P566369 | DT-9601-13-14UM |
| 2 μm | <4 μm | 13/327 | P567876 | DX2-9600-13-2UM |
| 5 μm | 5 μm | 13/327 | P565188 | DX2-9600-13-5UM |
| 8 μm | 8 μm | 13/327 | P565189 | DX2-9600-13-8UM |
| 14 μm | 14 μm | 13/327 | P565187 | DX2-9600-13-14UM |
| WA | B>30 _(c) = 200 | 8/209 | P569528 | Absorbs 130 ml water @ 25 psid |
| WA | B>30 _(c) = 200 | 13/327 | P569529 | Absorbs 220 ml water @ 25 psid |



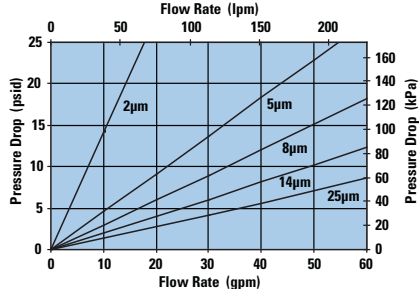
Filter Notes:

- All Donaldson DT and DX2 filters utilize glass fiber media with an epoxy-based resin system for the ultimate in chemical compatibility.
- All Donaldson DT and DX2 filters are potted with epoxy-based adhesives.
- Standard collapse DT designs are double wire-backed using epoxy-coated steel mesh for maximum pleat support and dirt capacity.
- DT high collapse designs are potted into machined aluminum end caps for greater filter integrity in critical applications.
- Viton® seals are standard on all Donaldson DT and DX2 filters.
- DX2 filters utilize nylon mesh for pleat support.

Performance Data

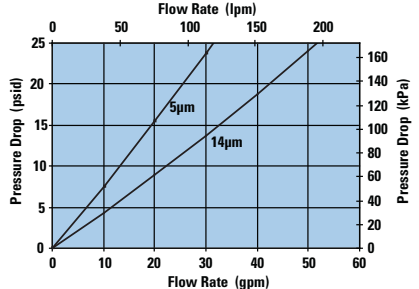
W061 4" DT Filter Only

DT-9600-4, 4"/102mm

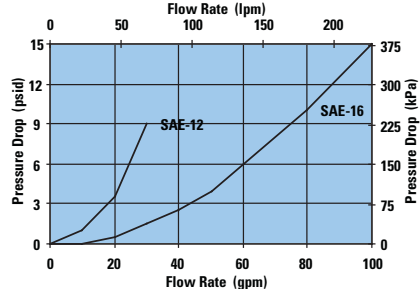


W061 4" DT Filter Only

DT-9601-4, 4"/102mm

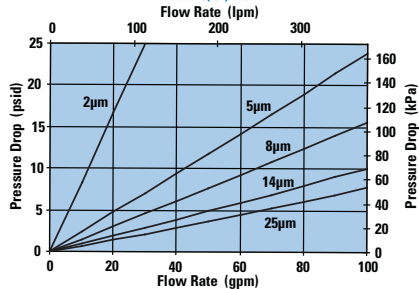


W061 Housing Only



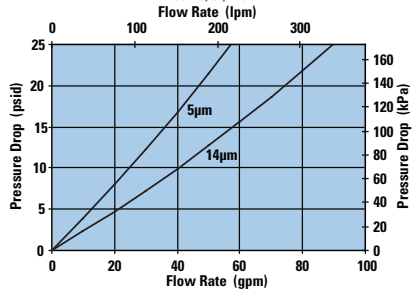
W061 8" DT Filter Only

DT-9600-8, 8"/203mm



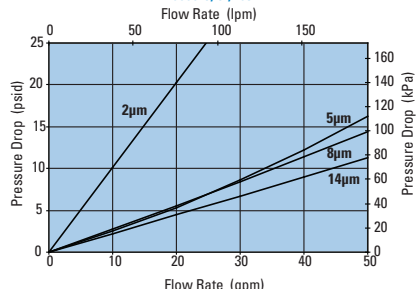
W061 8" DT Filter Only

DT-9601-8, 8"/203mm



W061 8" DX2 Filter Only

DX2-9600-8, 8"/203mm





Housing Ordering Guide

| | | | | | | | |
|-----------------|-----------------|--------------|--------------|--------------|----------------|--------------|--------------|
| Filter Assembly | W061 TABLE 1 | 1 TABLE 2 | A TABLE 3 | 4 TABLE 4 | L N TABLE 5 | B TABLE 6 | 2 TABLE 7 |
|-----------------|-----------------|--------------|--------------|--------------|----------------|--------------|--------------|

Service Filter: Filters ordered separately. See previous page for filter options.

Table 1

| Filter Assembly | |
|-----------------|-------------|
| CODE | DESCRIPTION |
| W061 | Assembly |

Table 2

| Filter Collapse Options | |
|-------------------------|--|
| CODE | DESCRIPTION |
| 1 | 150 psid for housing w/bypass valve |
| 4 | 3000 psid for housing without bypass valve |

Table 3

| Port Size Options | |
|-------------------|---------------|
| CODE | PORT SIZE |
| A | SAE-12 O-ring |
| B | SAE-16 O-ring |
| C | SAE-20 O-ring |

Table 4

| Bypass Setting Options | |
|------------------------|-------------------|
| CODE | BYPASS SETTING |
| 1 | Non-bypass |
| 3 | 25 psid / 172 kPa |
| 4 | 50 psid / 345 kPa |

Table 5 (Primary)

| Indicator Style and Setting | |
|-----------------------------|---|
| CODE | ΔP INDICATOR STYLE & SETTING |
| C | Electrical/visual 15 psid |
| D | Electrical/visual 35 psid |
| E | Electrical/visual 100 psid |
| F | Electrical/visual 15 psid w/TL |
| G | Electrical/visual 35 psid w/TL |
| H | Electrical/visual 15 psid w/12" 3-wire flying lead |
| J | ΔP indicator plug |
| K | Visual indicator 15 psid |
| L | Visual indicator 35 psid |
| M | Visual indicator 35 psid w/ TL and surge |
| N | Electrical/visual 35 psid w/12" 3-wire flying lead |
| O | Visual indicator 100 psid |
| P | Visual indicator 100 psid w/TL and surge |
| Q | Electrical switch 15 psid |
| R | Electrical switch 35 psid |
| S | Electrical/visual 100 psid w/12" 3-wire flying lead |
| T | Electrical switch 100 psid |
| W | Electrical/visual 100 psid w/TL |
| X | Electrical/visual 15 psid w/TL and surge |
| Y | Electrical/visual 35 psid w/TL and surge |
| Z | Electrical/visual 100 psid w/TL and surge |

TL (thermal lockout)

Brad Harrison® is a registered trademark of Woodhead Industries, Inc. Hirschmann® is a registered trademark of Richard Hirschmann of America Inc. Buna-N® and Viton® are registered trademarks of E. I. DuPont de Nemours and Company.

LEAD TIME NOTE:

This product is configured with the specifications and features of your choice. Please contact your Donaldson sales representative for lead time details.

Table 5 (Secondary)

| Receptacle Options | |
|--------------------|-------------------------------|
| CODE | ELECTRICAL STYLE |
| B | Brad Harrison® (5-pin) |
| H | Hirschmann® (4-pin) |
| N | None, for visual ΔP indicator |

Table 6

| Seal Options | |
|--------------|----------|
| CODE | MATERIAL |
| B | Buna-N® |
| V | Viton® |

Table 7

| Assembly & Filter Length | |
|--------------------------|---------------|
| CODE (LGTH) | FILTER LENGTH |
| 1 (7.43") | 4.0" |
| 2 (11.06") | 8.0" |
| 4 (15.82") | 13.0" |

METRIC PORTING AVAILABLE

Change W061 to G061
Porting code B becomes 1" ISO 228 BSSP
Porting code C becomes 1-1/4" ISO 228 BSSP

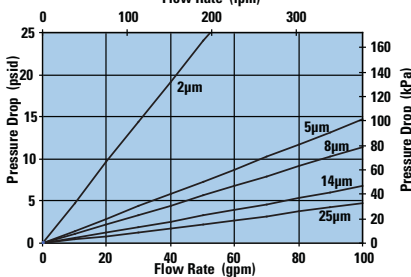
Media Ratings

Western Filter elements have been replaced by Donaldson DT high-performance cartridges.

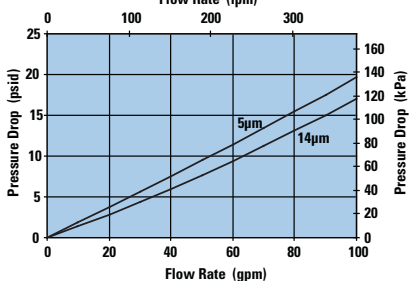
| WESTERN MEDIA CODE | DONALDSON DT MEDIA |
|--------------------|--------------------|
| 01 | DT 2μm |
| 03 | DT 5μm |
| 05 | DT 8μm |
| 10 | DT 14μm |
| 20 | DT 25μm |

For a complete filter interchange, visit crossreference.donaldson.com.

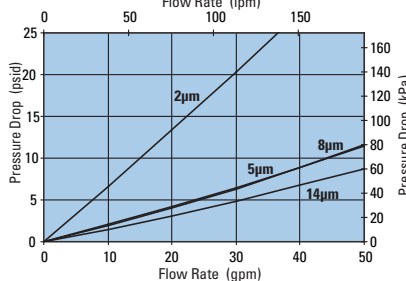
W061 13" DT Filter Only
DT-9600-13, 13"/330mm



W061 13" DT Filter Only
DT-9601-13, 13"/330mm



W061 13" DX2 Filter Only
DX2-9600-13, 13"/330mm





HDK06

Max Flow: 150 gpm (568 lpm)



HDK06 In-Line/Tank Mount Filters

Working Pressures to: 350 *psi*
2413 kPa
24.1 bar

Rated Static Burst to: 500 *psi*
3448 kPa
34.5 bar

Flow Ranges to: 150 *gpm*
568 *lpm*



In-line model shown

Features

HDK06 low pressure filters come in two styles: In-line and tank mount. Both styles feature a die cast aluminum head and steel body for strength and durability; service is made easier with a single, center retention bolt on top of the head. Filter flow is inside to outside. Buna-N® seals are standard.

HDK06 assemblies come complete with our $\beta_{10(c)}=1000$ rated Synteq™ filter cartridge. Other ratings are available, depending on your cleanliness requirements. HDK06 comes with an easy-to-read visual service indicator.

Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Option

- 2½" NPT

Assembly Weight

- 39.25 lbs / 18 kg

Replacement Filter Length

- 16" / 406mm

Standard Bypass Rating

- 25 *psi* / 172.5 kPa / 1.7 bar

Operating Temperatures

- -20°F to 250°F
-29°C to 121°C

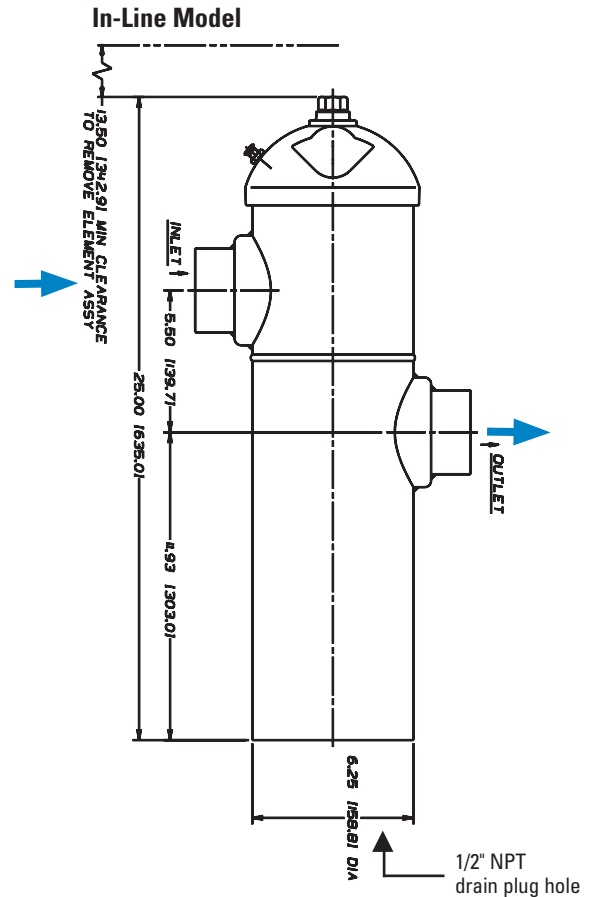
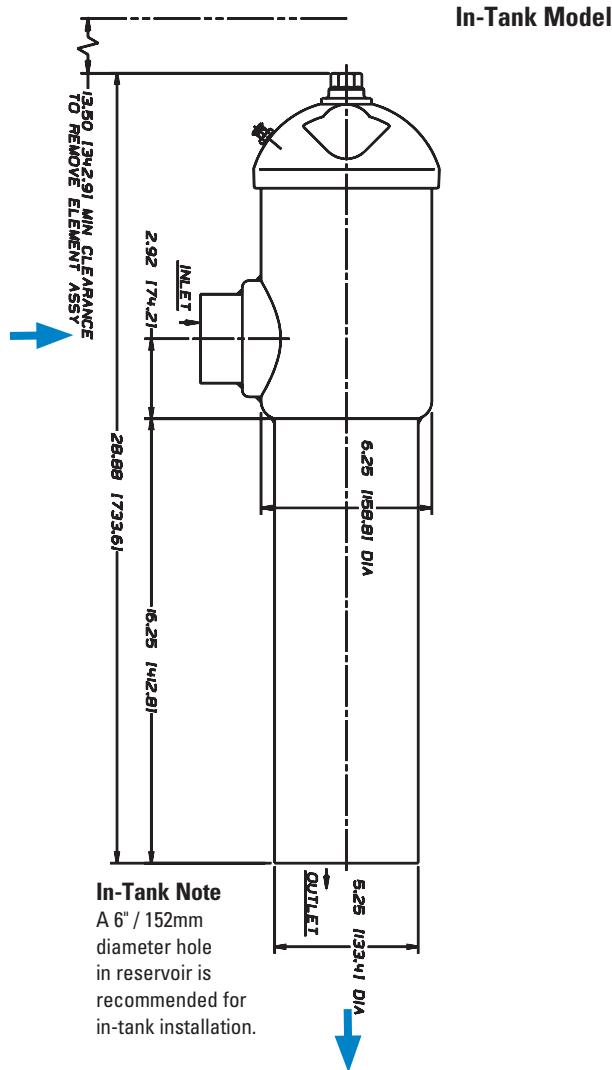
Filter Burst Ratings

- 100 *psid* / 690 kPa / 6.9 bar

HDK06 Specification Illustrations

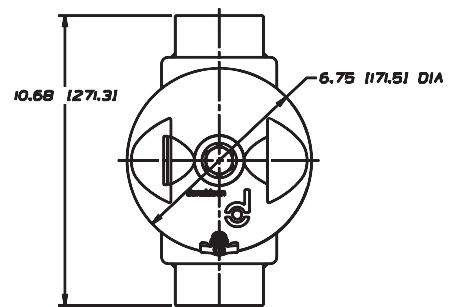
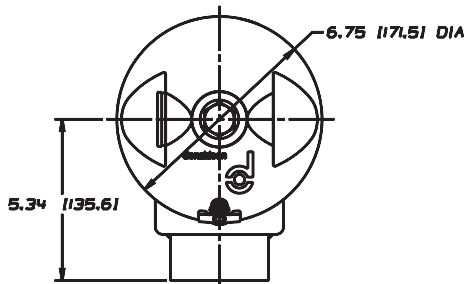
All dimensions are shown in inches [millimeters].

Assembly - Side Views



Head - Top Views

See page 116 for information on how to read the visual service indicators.





HDK06

Max Flow: 150 gpm (568 lpm)



HDK06 Components Assembly Choices

| Style | Part No. | Port Size | Bypass Rating | Indicator | Includes Filter Cartridge |
|---------|----------|-----------|--------------------|-----------|---------------------------|
| In-Tank | K060173 | 2½" NPT | 25 psi / 172.5 kPa | Visual | P176221 |
| In-Line | K060160 | | | | |

Filter Choices

All HDK06 filter cartridges are 16"/406mm in length.

| Media Number | Media Technology | B ₁₀ = 1000 Rating | Part No. |
|--------------|------------------|-------------------------------|----------|
| No. ½ | Synteq™ | <4 µm | P161016 |
| No. 2 | Synteq | 9 µm | P165628 |
| No. 2½ | Synteq | 10 µm | P176221 |
| No. 9 | Synteq | 23 µm | P164699 |
| No. 16 | Synteq | 22 µm | P161571 |
| No. 20 | Synteq | >50 µm | P166597 |

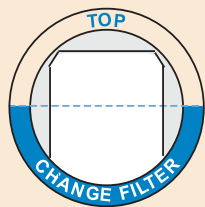
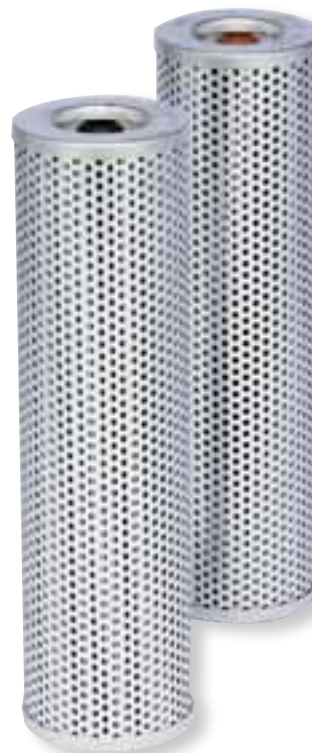
| Media Number | Media Technology | | Part No. |
|--------------|------------------|----------------|----------|
| No. 149 | Wiremesh | 150 µm nominal | P160700 |

Filter Notes

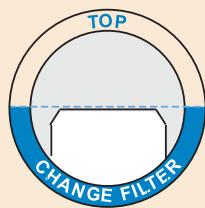
- Standard HDK06 replacement filters have Buna-N® seals, which are appropriate for most applications involving petroleum oil. Filters with seals made of fluorocarbon elastomer (such as Viton® and Fluorel®) are required when using diester, phosphate ester fluids, water glycol, water/oil emulsions, and HWCF (high water content fluids) over 150°F.
- HDK06 filters are inside to outside reverse flow 4.39" (112mm) OD.
- Refer to the table in the Technical Reference Guide for fluid compatibility with our filter media.

Viton® is a registered trademarks of E. I. DuPont de Nemours and Company.

Fluorel® is a registered trademark of 3M Company.



Filter OK



Filter Needs Service

How to Read the Visual Indicator

This simple device will tell you when the filter needs to be changed. Always check when the fluid is at operating temperature and the system is at normal operating flow.

If the top of the white panel is below the lower half of the window, the filter needs servicing.

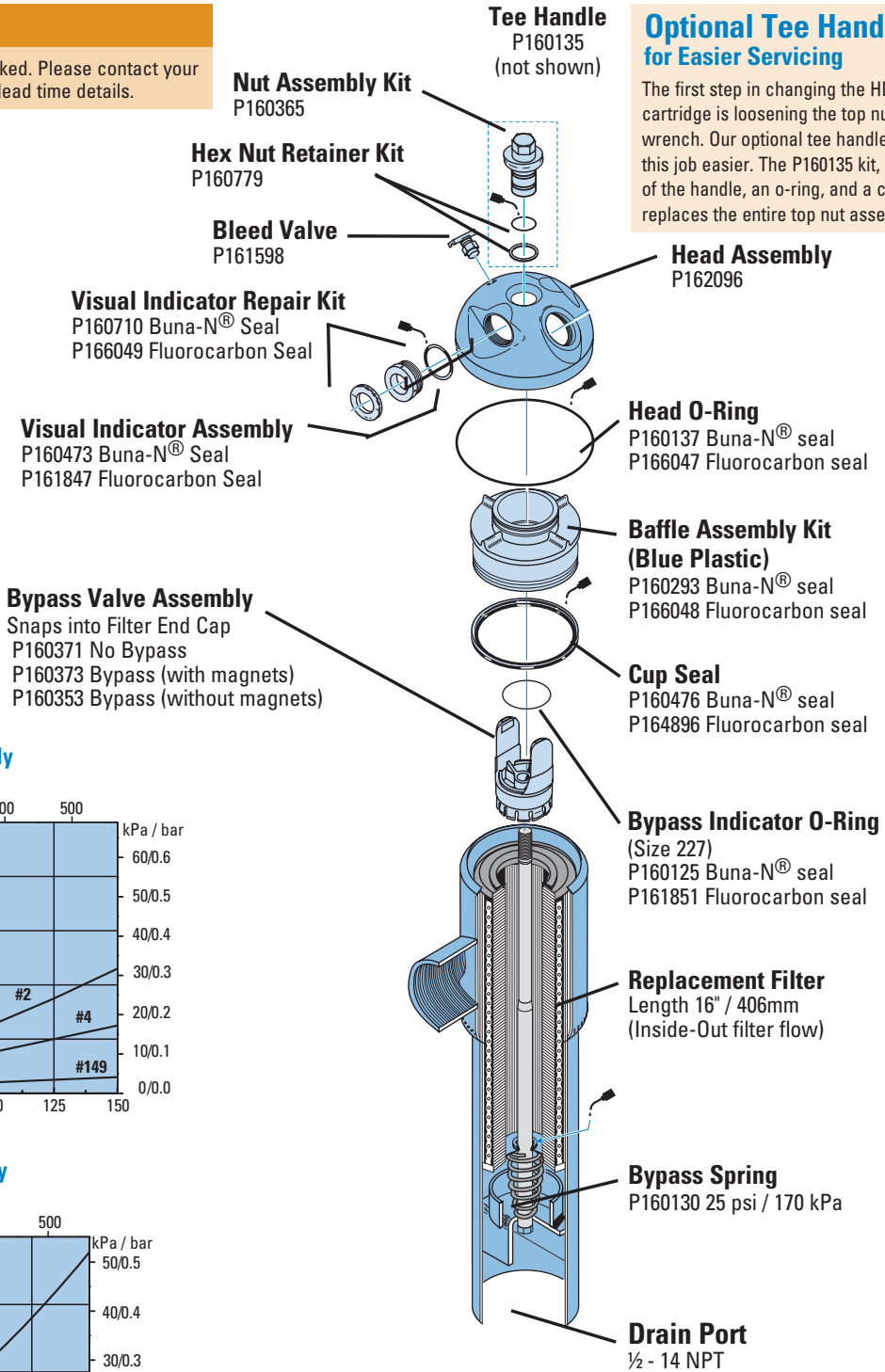
HDK06 Service Parts

SERVICE PARTS NOTE:

Some service parts may not be stocked. Please contact your Donaldson sales representative for lead time details.

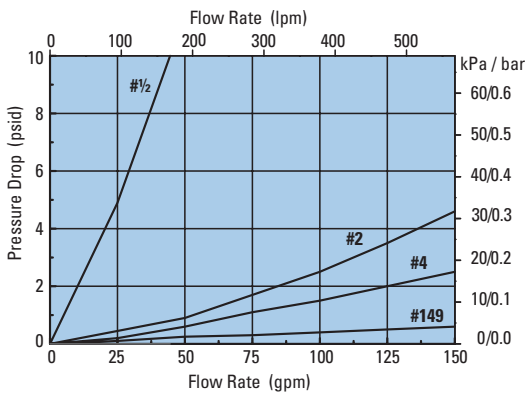
Optional Tee Handle for Easier Servicing

The first step in changing the HDK06 cartridge is loosening the top nut with a wrench. Our optional tee handle makes this job easier. The P160135 kit, comprised of the handle, an o-ring, and a clip ring, replaces the entire top nut assembly.

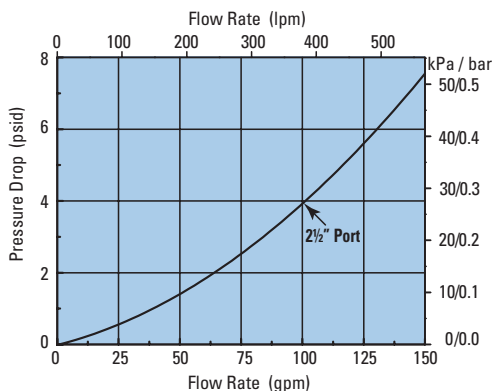


Performance Data

HDK06 Filters Only



HDK06 Head Only



Buna-N® is a registered trademark of E. I. DuPont de Nemours and Company.



W041

Max Flow: 300 gpm (1135 lpm)



W041 In-Line Cartridge Filters

Working Pressures to: 500 *psi*
34.5 bar

Rated Static Burst to: 1500 *psi*
103 bar

Flow Range to: 300 *gpm*
1135 *lpm*



Features

The W041 high flow filter combines the best features of a base-mounted assembly; several inlet port options, top cover filter servicing for ease of maintenance and a wide selection of service indicators. The W041 all-aluminum head design and plated steel cylinder provides a strong, durable, and dependable unit. We offer standard features like deep pleat filters for higher dirt holding capacity and our standard Donaldson DT 4-layer media filter construction. This technology, combined with many other standard features, is ideal for today's applications in pulp and paper, power generation and steel mill applications. Five standard grades of media are offered. Thermal lockout and surge control are two key features available in the differential indicators.

- Large T-handle for fast servicing without tools
- Wide range of indicator options
- Two filter length options for design flexibility
- Base material: aluminum
- Cylinder material: steel
- Cover material: cast iron
- Two drain plugs in base
- Bleed/fill plug in cover

Beta Rating (per ISO 16889)

- Performance to $\beta_{4(c)}=1000$

Porting Size Options

- SAE-24 O-ring
- 2" or 2½" SAE 4-Bolt Flange Code 61

Housing Weight

- 16": 48.5 lbs / 22.0 kg
- 39": 86.2 lbs / 39.2 kg

Replacement Filter Lengths

- 16.74" / 425.3 mm
- 38.62" / 980.9 mm

Standard Bypass Rating

- No Bypass
- 50 *psi* / 345 kPa / 3.5 bar

Operating Temperatures

- -20°F to 250°F / -29° to 121°C

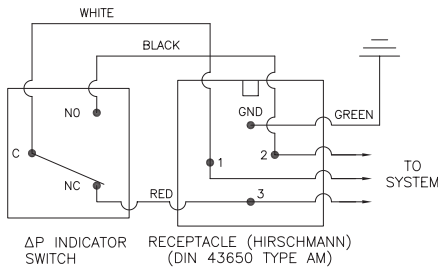
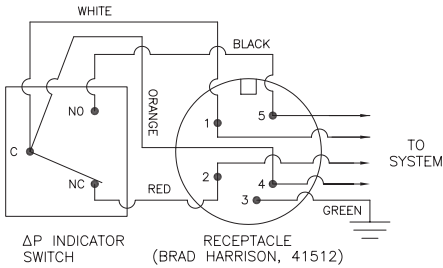
Filter Collapse Pressure

- 150 *psid* / 1034 kPa / 10.3 bar (standard)

W041 Specification Illustrations

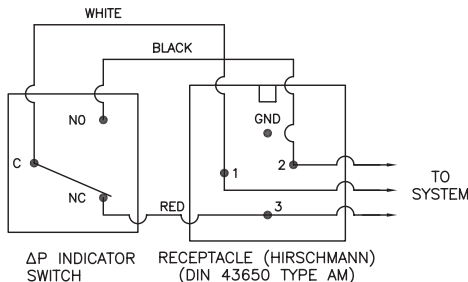
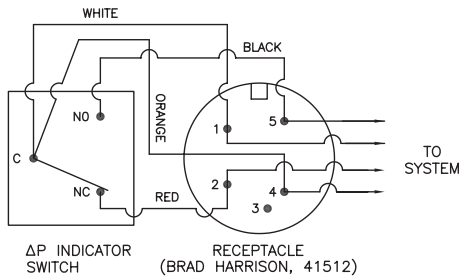
All dimensions are shown in millimeters [inches].

Indicator Switch Schematic Wiring Diagram Aluminum Electrical Housings



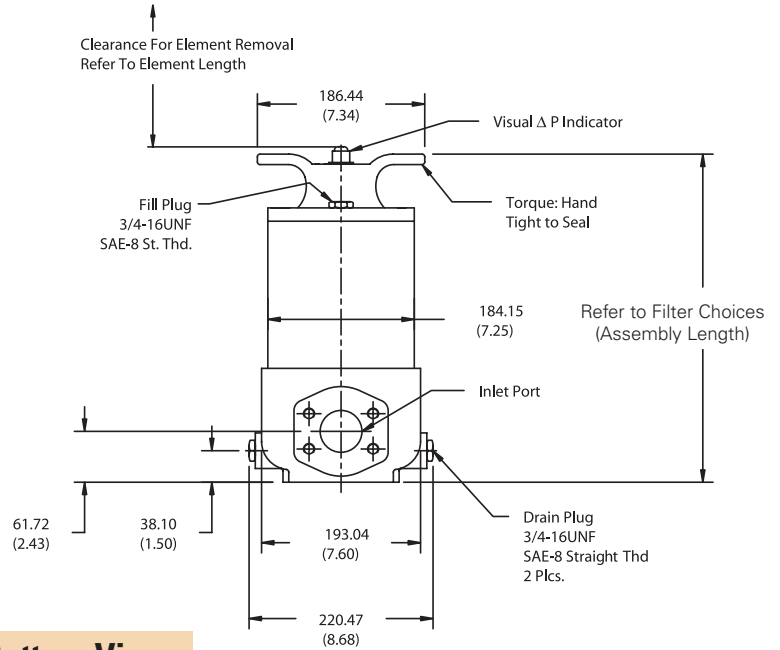
Note: The female plug (connector) is to be furnished by customer.

Plastic Electrical Housings

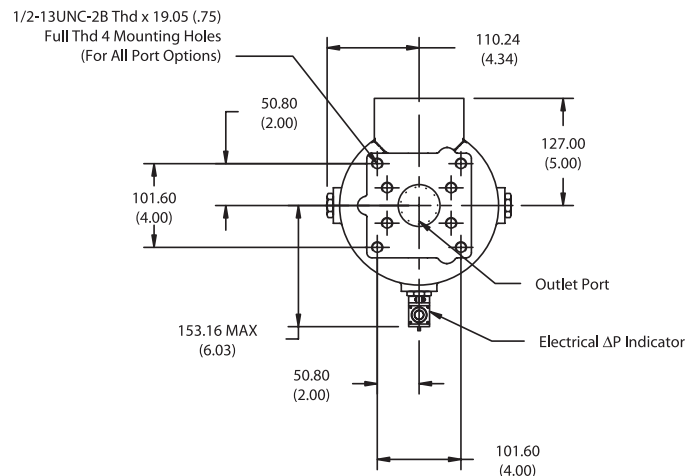


Note: The female plug (connector) is to be furnished by customer.

Assembly - Side View



Head - Bottom View



Differential Indicators:

Indicators are designed to actuate at approximately 80% of bypass valve cracking pressure. It is recommended that an indicator with a bypass setting of 100 psid is used with a non-bypass housing.

Surge Control:

This optional feature is used to dampen pressure surges or spikes to avoid premature actuation of the indicator. Surge control delays the indicator response.

Thermal Lockout:

The Thermal Lockout prevents premature signaling of a bypass condition created by viscous fluid during cold start-ups. Normal indicator actuation capability is resumed once the operating temperature of the fluid reaches approximately 80°F / 27°C.



W041 Components

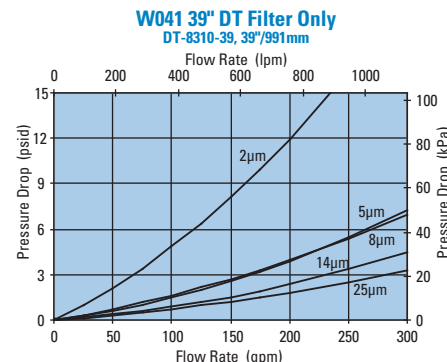
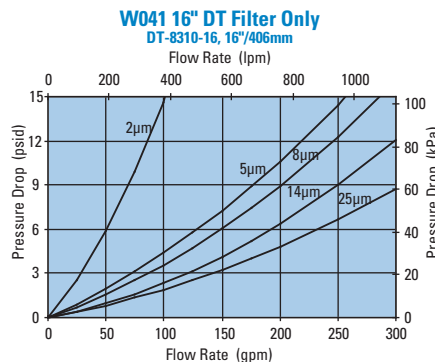
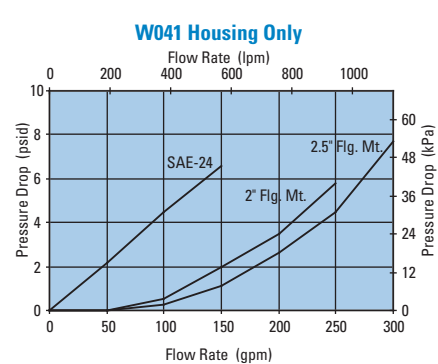
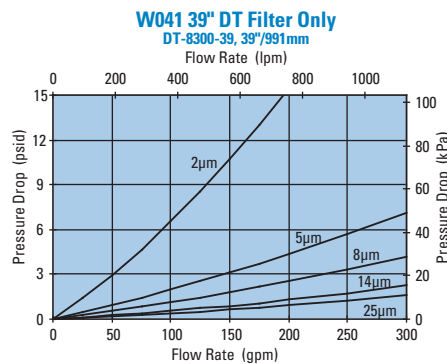
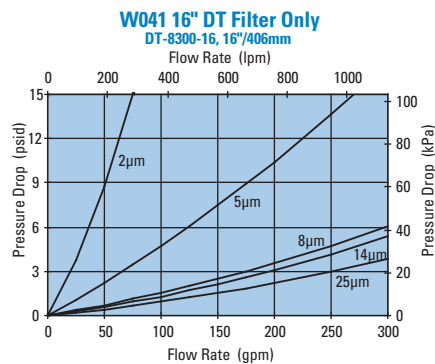
High-Performance DT Filter Choices

| Media Number | B _{x(c)} = 1000 | Length (in./mm) | Donaldson DT Part Number | Comments |
|--------------|---------------------------|-----------------|--------------------------|---------------------------------|
| 2 μm | <4 μm | 16/425.3 | P566239 | DT-8300-16-2UM |
| 5 μm | 5 μm | 16/425.3 | P566240 | DT-8300-16-5UM |
| 8 μm | 8 μm | 16/425.3 | P566241 | DT-8300-16-8UM |
| 14 μm | 14 μm | 16/425.3 | P566242 | DT-8300-16-14UM |
| 25 μm | 25 μm | 16/425.3 | P566243 | DT-8300-16-25UM |
| 2 μm | <4 μm | 39/980.9 | P566244 | DT-8300-39-2UM |
| 5 μm | 5 μm | 39/980.9 | P566245 | DT-8300-39-5UM |
| 8 μm | 8 μm | 39/980.9 | P566246 | DT-8300-39-8UM |
| 14 μm | 14 μm | 39/980.9 | P566247 | DT-8300-39-14UM |
| 25 μm | 25 μm | 39/980.9 | P566248 | DT-8300-39-25UM |
| 2 μm | <4 μm | 16/408.8 | P566249 | DT-8310-16-2UM |
| 5 μm | 5 μm | 16/408.8 | P566250 | DT-8310-16-5UM |
| 8 μm | 8 μm | 16/408.8 | P566251 | DT-8310-16-8UM |
| 14 μm | 14 μm | 16/408.8 | P566252 | DT-8310-16-14UM |
| 25 μm | 25 μm | 16/408.8 | P566253 | DT-8310-16-25UM |
| 2 μm | <4 μm | 39/963.6 | P566254 | DT-8310-39-2UM |
| 5 μm | 5 μm | 39/963.6 | P566255 | DT-8310-39-5UM |
| 8 μm | 8 μm | 39/963.6 | P566256 | DT-8310-39-8UM |
| 14 μm | 14 μm | 39/963.6 | P566257 | DT-8310-39-14UM |
| 25 μm | 25 μm | 39/963.6 | P566258 | DT-8310-39-25UM |
| WA | B>30 _(c) = 200 | 16/408.8 | P569533 | Absorbs 1000 ml water @ 25 psid |
| WA | B>30 _(c) = 200 | 39/963.6 | P569534 | Absorbs 2000 ml water @ 25 psid |

Filter Notes

- All Donaldson DT filters utilize glass fiber media with an epoxy-based resin system for the ultimate in chemical compatibility.
- All Donaldson DT filters are potted and seam-sealed with epoxy-based adhesives.
- Standard collapse designs are double wire-backed using epoxy-coated steel mesh for maximum pleat support and dirt capacity.
- Extended life designs are double wire-backed using epoxy-coated steel mesh.
- Viton® seals are standard on all Donaldson DT filters. Viton® is a registered trademarks of E. I. DuPont de Nemours and Company.

Performance Data





Housing Ordering Guide

Filter Assembly

| | | | | | | |
|-----------------|--------------|--------------|--------------|----------------|--------------|--------------|
| W041 TABLE 1 | 1 TABLE 2 | D TABLE 3 | 4 TABLE 4 | L N TABLE 5 | B TABLE 6 | 5 TABLE 7 |
|-----------------|--------------|--------------|--------------|----------------|--------------|--------------|

Service Filter

Filters ordered separately. See previous page for filter options.

LEAD TIME NOTE:

This product is configured with the specifications and features of your choice. Please contact your Donaldson sales representative for lead time details.

Table 1

| Filter Assembly | |
|-----------------|----------------------|
| CODE | DESCRIPTION |
| W041 | Assembly (L porting) |

Table 2

| Filter Collapse Options | |
|-------------------------|-------------------------------------|
| CODE | DESCRIPTION |
| 1 | 150 psid for housing w/bypass valve |

Table 3

| Port Size Options | |
|-------------------|-------------------------------|
| CODE | PORT SIZE |
| D | SAE-24 O-ring |
| J | 2" SAE 4-Bolt Flange Code 61 |
| K | 2½" SAE 4-Bolt Flange Code 61 |

Table 4

| Bypass Setting Options | |
|------------------------|----------------|
| CODE | BYPASS SETTING |
| 1 | Non-bypass |
| 3 | 25 psid |
| 4 | 50 psid |

Table 5 (Primary)

| Indicator Style and Setting | |
|-----------------------------|---|
| CODE | ΔP INDICATOR STYLE & SETTING |
| A | Visual indicator 70 psid w/TL & surge |
| B | Electrical/visual 70 psid w/TL and surge |
| C | Electrical/visual 15 psid |
| D | Electrical/visual 35 psid |
| E | Electrical/visual 100 psid |
| F | Electrical/visual 15 psid w/TL |
| G | Electrical/visual 35 psid w/TL |
| H | Electrical/visual 15 psid w/12" 3-wire flying lead |
| I | Visual indicator 70 psid |
| J | ΔP indicator plug |
| K | Visual indicator 15 psid |
| L | Visual indicator 35 psid |
| M | Visual indicator 35 psid w/ TL and surge |
| N | Electrical/visual 35 psid w/12" 3-wire flying lead |
| O | Visual indicator 100 psid |
| Q | Electrical switch 15 psid |
| R | Electrical switch 35 psid |
| S | Electrical/visual 100 psid w/12" 3-wire flying lead |
| T | Electrical switch 100 psid |
| U | Electrical switch 70 psid |
| V | Electrical/visual 70 psid w/TL |
| W | Electrical/visual 100 psid w/TL |
| X | Electrical/visual 15 psid w/TL and surge |
| Y | Electrical/visual 35 psid w/TL and surge |
| Z | Electrical/visual 100 psid w/TL and surge |

TL (thermal lockout)

Table 5 (Secondary)

| Receptacle Options | |
|--------------------|-------------------------------|
| CODE | ELECTRICAL STYLE |
| B | Brad Harrison® (5-pin) |
| H | Hirschmann® (4-pin) |
| N | None, for visual ΔP indicator |

Table 6

| Seal Options | |
|--------------|----------|
| CODE | MATERIAL |
| B | Buna-N® |
| V | Viton® |

Table 7

| Assembly & Filter Length | |
|--------------------------|---------------|
| CODE (LENGTH) | FILTER LENGTH |
| 5 (26.45") | 16.0" |
| 8 (48.27") | 39.0" |

METRIC PORTING AVAILABLE

Change W041 or W051 to G041 or G051
Porting code D becomes 1-1/2" ISO 228 BSPP
Porting code J becomes 2" SAE 4 bolt flange with M12 threads
Porting code K becomes 2½" SAE 4 bolt flange with M12 threads

Media Ratings

Western Filter elements have been replaced by Donaldson DT high-performance cartridges.

| WESTERN MEDIA CODE | DONALDSON DT MEDIA |
|--------------------|--------------------|
| 01 | DT 2µm |
| 03 | DT 5µm |
| 05 | DT 8µm |
| 10 | DT 14µm |
| 20 | DT 25µm |

For a complete filter interchange, visit crossreference.donaldson.com.

Brad Harrison® is a registered trademark of Woodhead Industries, Inc.
Hirschmann® is a registered trademark of Richard Hirschmann of America Inc.
Buna-N® and Viton® are registered trademarks of E. I. DuPont de Nemours and Company.



W042

Max Flow: 300 gpm (1135 lpm)



W042 In-Line Cartridge Filters

Working Pressures to: 400 *psi*
27.6 bar

Rated Static Burst to: 1500 *psi*
103 bar

Flow Range to: 300 *gpm*
1135 *lpm*



Features

W042 duplex filters insure continuous filtration is maintained while servicing filters, thus avoiding machine shutdown. The W042 all-aluminum head design and plated steel cylinders provide a strong, durable and dependable unit. We offer standard features like deep pleat filters for higher dirt holding capacity and our standard Donaldson DT 4-layer media filter construction. This technology, combined with many other standard features, is ideal for today's applications in pulp and paper, power generation and steel mill applications. Five standard grades of media are offered. Thermal lockout and surge control are two key features available in the differential indicators.

- Hydrostatically-balanced, cam-operated, positive sealing valve for low torque shifting
- Dual poppet outlet checks for positive isolation during filter replacement
- Large T-handles for fast servicing without tools
- Wide range of indicator options
- Two filter length options for design flexibility
- Base & valve body material: aluminum
- Cylinder material: steel
- Cover material: cast iron
- Two drain plugs in each base
- Bleed/fill plug in each cover

Beta Rating (per ISO 16889)

- Performance to $\beta_{<4(c)}=1000$

Porting Size Option

- 3" SAE 4-Bolt Flange Code 61

Housing Weight

- 16": 234 lbs / 106.4 kg
- 39": 308 lbs / 140 kg

Replacement Filter Lengths

- 16.74" / 425.3 mm
- 36.62" / 980.9 mm

Standard Bypass Rating

- No Bypass
- 50 *psi* / 345 kPa / 3.5 bar

Operating Temperatures

- -20°F to 250°F (-29° to 121°C)

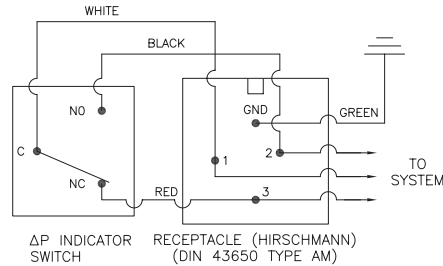
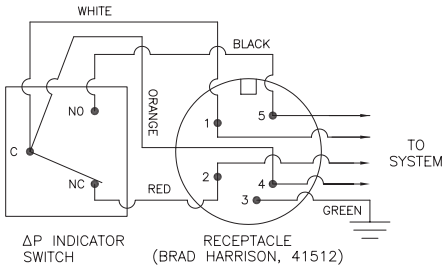
Filter Collapse Pressure

- 150 *psid* / 1034 kPa / 10.3 bar (standard)

W042 Specification Illustrations

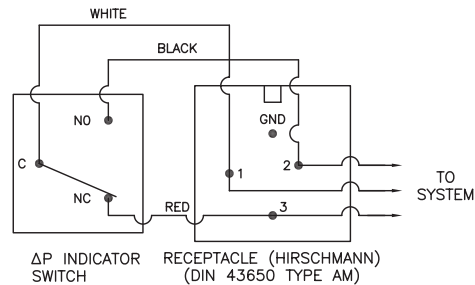
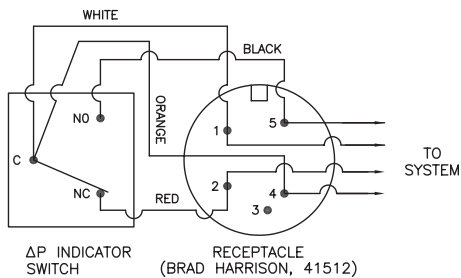
All dimensions are shown in millimeters [inches].

**Indicator Switch
Schematic Wiring Diagram
Aluminum Electrical Housings**



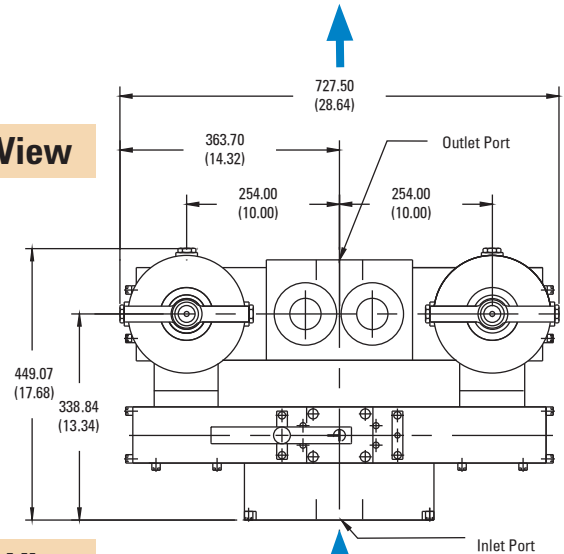
Note: The female plug (connector) is to be furnished by customer.

Plastic Electrical Housings

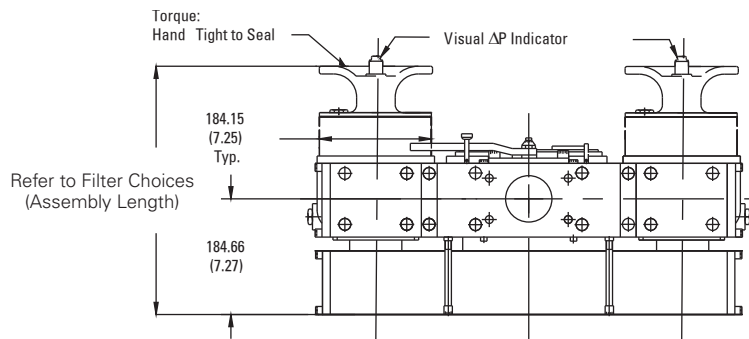


Note: The female plug (connector) is to be furnished by customer.

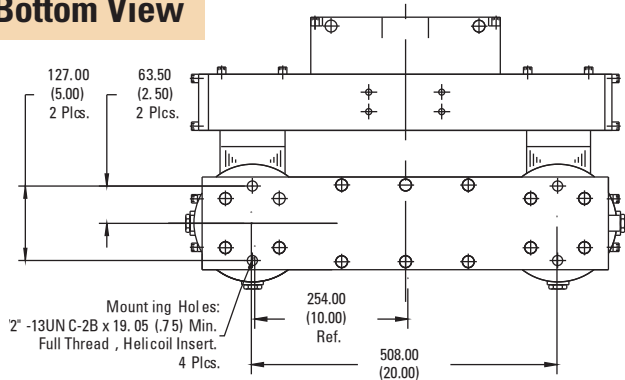
Assembly - Top View



Assembly - Side View



Head - Bottom View



Dimensions: millimeters/(inches)

Differential Indicators:

Indicators are designed to actuate at approximately 80% of bypass valve cracking pressure. It is recommended that an indicator with a bypass setting of 100 psid is used with a non-bypass housing.

Surge Control:

This optional feature is used to dampen pressure surges or spikes to avoid premature actuation of the indicator. Surge control delays the indicator response.

Thermal Lockout:

The Thermal Lockout prevents premature signaling of a bypass condition created by viscous fluid during cold start-ups. Normal indicator actuation capability is resumed once the operating temperature of the fluid reaches approximately 80°F / 27°C.



W042

Max Flow: 300 gpm (1135 lpm)



W042 Components High-Performance DT Filter Choices

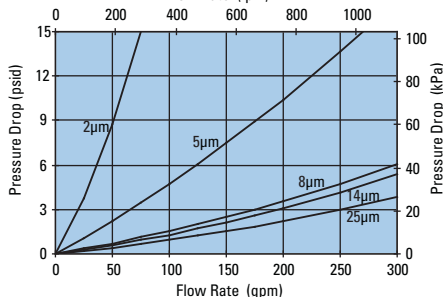
| Media Number | B _{x(c)} = 1000 | Length (in./mm) | Donaldson DT Part Number | Comments |
|--------------|--------------------------|-----------------|--------------------------|---------------------------------|
| 2 μm | <4 μm | 16/425.3 | P566239 | DT-8300-16-2UM |
| 5 μm | 5 μm | 16/425.3 | P566240 | DT-8300-16-5UM |
| 8 μm | 8 μm | 16/425.3 | P566241 | DT-8300-16-8UM |
| 14 μm | 14 μm | 16/425.3 | P566242 | DT-8300-16-14UM |
| 25 μm | 25 μm | 16/425.3 | P566243 | DT-8300-16-25UM |
| 2 μm | <4 μm | 39/980.9 | P566244 | DT-8300-39-2UM |
| 5 μm | 5 μm | 39/980.9 | P566245 | DT-8300-39-5UM |
| 8 μm | 8 μm | 39/980.9 | P566246 | DT-8300-39-8UM |
| 14 μm | 14 μm | 39/980.9 | P566247 | DT-8300-39-14UM |
| 25 μm | 25 μm | 39/980.9 | P566248 | DT-8300-39-25UM |
| 2 μm | <4 μm | 16/408.8 | P566249 | DT-8310-16-2UM |
| 5 μm | 5 μm | 16/408.8 | P566250 | DT-8310-16-5UM |
| 8 μm | 8 μm | 16/408.8 | P566251 | DT-8310-16-8UM |
| 14 μm | 14 μm | 16/408.8 | P566252 | DT-8310-16-14UM |
| 25 μm | 25 μm | 16/408.8 | P566253 | DT-8310-16-25UM |
| 2 μm | <4 μm | 39/963.6 | P566254 | DT-8310-39-2UM |
| 5 μm | 5 μm | 39/963.6 | P566255 | DT-8310-39-5UM |
| 8 μm | 8 μm | 39/963.6 | P566256 | DT-8310-39-8UM |
| 14 μm | 14 μm | 39/963.6 | P566257 | DT-8310-39-14UM |
| 25 μm | 25 μm | 39/963.6 | P566258 | DT-8310-39-25UM |
| WA | B>30(c) = 200 | 16/408.8 | P569533 | Absorbs 1000 ml water @ 25 psid |
| WA | B>30(c) = 200 | 39/963.6 | P569534 | Absorbs 2000 ml water @ 25 psid |

Filter Notes

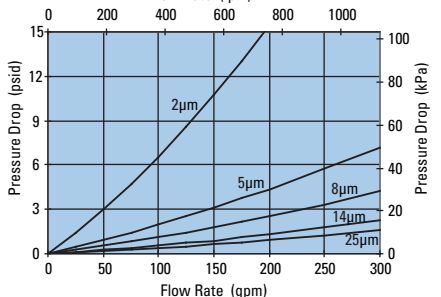
- All Donaldson DT filters utilize glass fiber media with an epoxy-based resin system for the ultimate in chemical compatibility.
- All Donaldson DT filters are potted and seam-sealed with epoxy-based adhesives.
- Standard collapse designs are double wire-backed using epoxy-coated steel mesh for maximum pleat support and dirt capacity.
- Extended life designs are double wire-backed using epoxy-coated steel mesh for maximum pleat support and dirt capacity.
- Viton® seals are standard on all Donaldson DT filters. Viton® is a registered trademarks of E. I. DuPont de Nemours and Company.

Performance Data

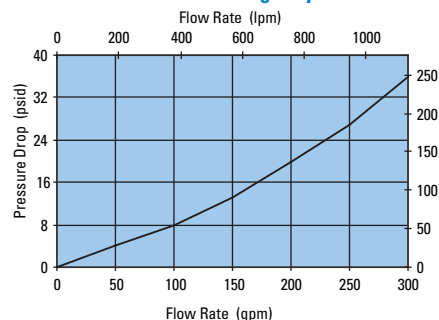
W042 16" DT Filter Only
DT-8300-16, 16"/406mm
Flow Rate (lpm)



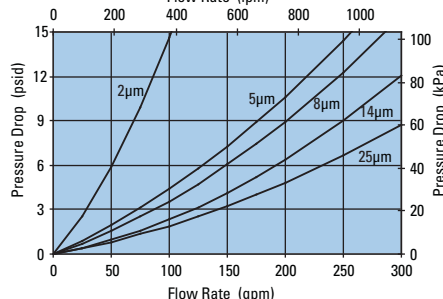
W042 39" DT Filter Only
DT-8300-39, 39"/991mm
Flow Rate (lpm)



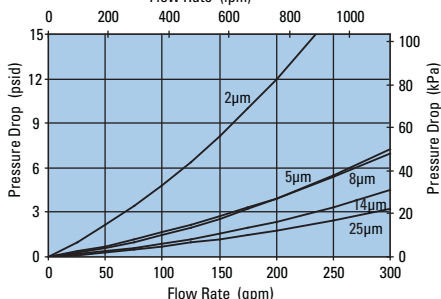
W042 Housing Only



W042 16" DT Filter Only
DT-8310-16, 16"/406mm
Flow Rate (lpm)



W042 39" DT Filter Only
DT-8310-39, 39"/991mm
Flow Rate (lpm)





Housing Ordering Guide

| | | | | | | | |
|-----------------|------------------------|---------------------|---------------------|---------------------|-----------------------|---------------------|---------------------|
| Filter Assembly | W042 TABLE 1 | 1 TABLE 2 | L TABLE 3 | 4 TABLE 4 | L N TABLE 5 | B TABLE 6 | 5 TABLE 7 |
|-----------------|------------------------|---------------------|---------------------|---------------------|-----------------------|---------------------|---------------------|

Service Filter: Filters ordered separately. See previous page for filter options.

LEAD TIME NOTE:

This product is configured with the specifications and features of your choice. Please contact your Donaldson sales representative for lead time details.

Table 1

| Filter Assembly | |
|-----------------|-------------|
| CODE | DESCRIPTION |
| W042 | Assembly |

Table 2

| Filter Collapse Options | |
|-------------------------|-------------------------------------|
| CODE | DESCRIPTION |
| 1 | 150 psid for housing w/bypass valve |

Table 3

| Port Size Options | |
|-------------------|------------------------------|
| CODE | PORT SIZE |
| L | 3" SAE 4-Bolt Flange Code 61 |

Table 4

| Bypass Setting Options | |
|------------------------|----------------|
| CODE | BYPASS SETTING |
| 1 | Non-bypass |
| 3 | 25 psid |
| 4 | 50 psid |

Table 5 (Primary)

| Indicator Style and Setting | |
|-----------------------------|--|
| CODE | ΔP INDICATOR STYLE & SETTING |
| A | Visual indicator 70 psid w/TL & surge |
| B | Electrical/visual 70 psid w/TL and surge |
| C | Electrical/visual 15 psid |
| D | Electrical/visual 35 psid |
| F | Electrical/visual 15 psid w/TL |
| G | Electrical/visual 35 psid w/TL |
| H | Electrical/visual 15 psid w/12" 3-wire flying lead |
| I | Visual indicator 70 psid |
| J | ΔP indicator plug |
| K | Visual indicator 15 psid |
| L | Visual indicator 35 psid |
| M | Visual indicator 35 psid w/ TL and surge |
| N | Electrical/visual 35 psid w/12" 3-wire flying lead |
| P | Visual indicator 100 psid w/TL and surge |
| Q | Electrical switch 15 psid |
| R | Electrical switch 35 psid |
| T | Electrical switch 100 psid |
| U | Electrical switch 70 psid |
| V | Electrical/visual 70 psid w/TL |
| X | Electrical/visual 15 psid w/TL and surge |
| Y | Electrical/visual 35 psid w/TL and surge |

TL (thermal lockout)

Table 5 (Secondary)

| Receptacle Options | |
|--------------------|-------------------------------|
| CODE | ELECTRICAL STYLE |
| B | Brad Harrison® (5-pin) |
| H | Hirschmann® (4-pin) |
| N | None, for visual ΔP indicator |

Table 6

| Seal Options | |
|--------------|----------|
| CODE | MATERIAL |
| B | Buna-N® |
| V | Viton® |

Table 7

| Assembly & Filter Length | |
|--------------------------|---------------|
| CODE (LENGTH) | FILTER LENGTH |
| 5 (25.4") | 16.0" |
| 8 (47.4") | 39.0" |

METRIC PORTING AVAILABLE

Change W042 to G042
Porting code L becomes 3" SAE 4 bolt flange with M16 threads

Media Ratings

Western Filter elements have been replaced by Donaldson DT high-performance cartridges.

| WESTERN MEDIA CODE | DONALDSON DT MEDIA |
|--------------------|--------------------|
| 01 | DT 2 μ m |
| 03 | DT 5 μ m |
| 05 | DT 8 μ m |
| 10 | DT 14 μ m |
| 20 | DT 25 μ m |

For a complete filter interchange, visit crossreference.donaldson.com.

Brad Harrison® is a registered trademark of Woodhead Industries, Inc.
Hirschmann® is a registered trademark of Richard Hirschmann of America Inc.
Buna-N® and Viton® are registered trademarks of E. I. DuPont de Nemours and Company.



HFK08

Max Flow: 300 gpm (1135 lpm)

HFK08 In-Line/Tank Mount Filters

Working Pressures to: 350 *psi*
2413 kPa
24.1 bar

Rated Static Burst to: 500 *psi*
3448 kPa
34.5 bar

Flow Ranges to: 300 *gpm*
1135 *lpm*

Features

HFK08 is available in two styles: in-line and in-tank. Both styles feature a cast aluminum head and steel body for maximum strength and durability. Its single, center retention bolt simplifies servicing. Flow is from inside to outside of the filter cartridge.

Three in-stock HFK08 models offer our proprietary Synteq™ synthetic media designed especially for liquid filtration. A wider range of filter media is available to purchase separately, as are fluor elastomer seals. A visual service indicator is built into the HFK08 head; see the service parts list on page 129.



In-line model shown

Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- 3" NPT
- SAE-20 O-ring

Assembly Weight

- 55.4 lbs / 25.12 kg

Replacement Filter Length

- 18" / 457mm

Standard Bypass Ratings

- 25 *psi* / 172.5 kPa / 1.7 bar

Operating Temperatures

- -20°F to 250°F
-29°C to 121°C

Filter Burst Ratings

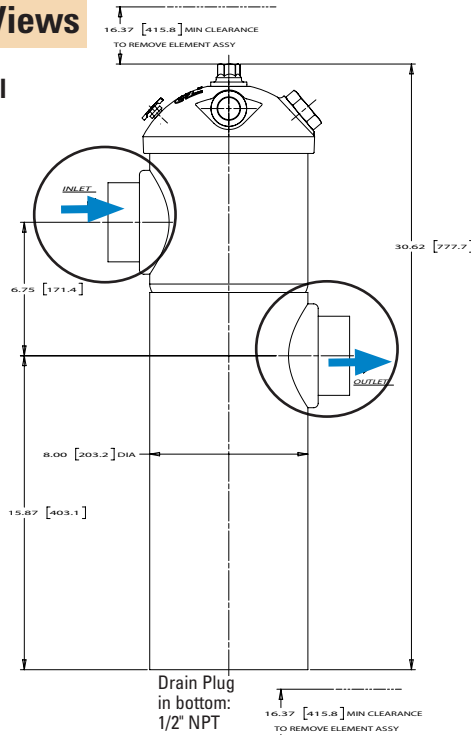
- 75 *psi* / 517 kPa / 5.2 bar (synthetic)
- 100 *psi* / 689 kPa / 6.9 bar (wiremesh)

HFK08 Specification Illustrations

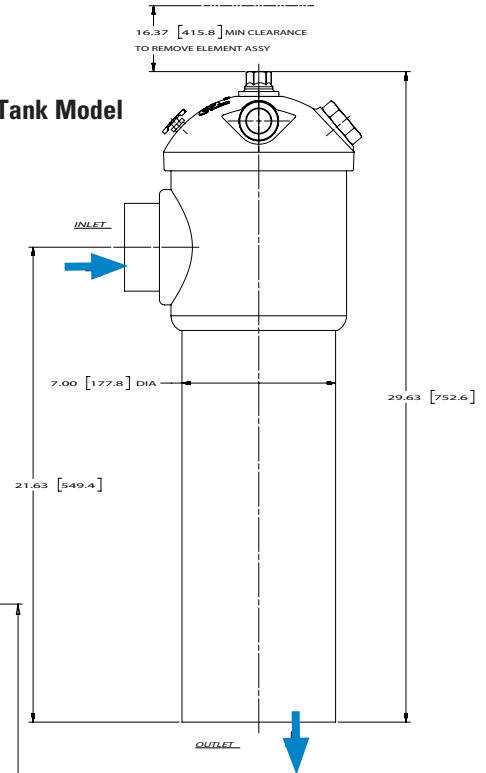
All dimensions are shown in inches [millimeters].

Assembly - Side Views

In-Line Model

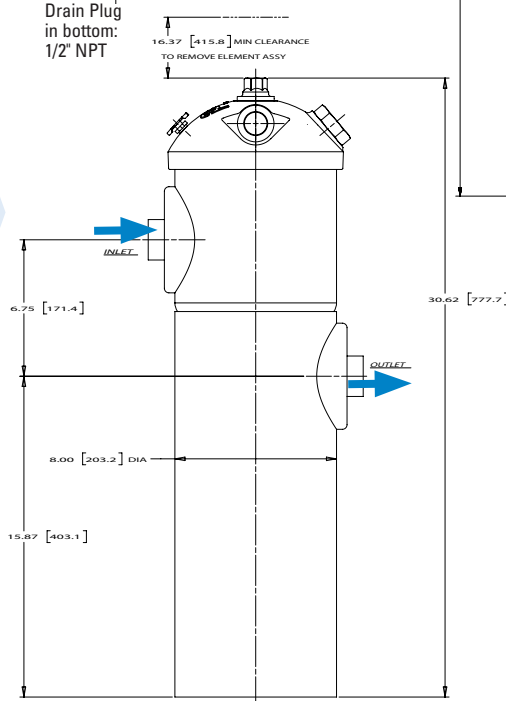


In-Tank Model

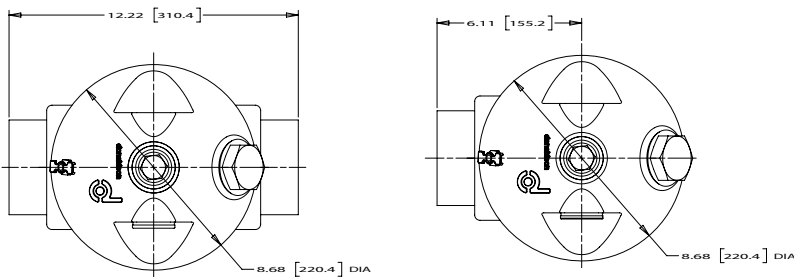


K080087 In-Line Model

Smaller port size (SAE-20) works well for kidney loop filtration.



Head - Top View



Applications:

- Return Lines
- Lube Oil Systems
- Kidney Loop Systems
- Fluid Conditioning
- Suction Lines



HFK08

Max Flow: 300 gpm (1135 lpm)



HFK08 Components

Filter Assemblies

| Port Size | Bypass Rating | Indicator Style ¹ & Location | Assembly Part No. | Media | Length (in./mm) | Filter Part No. |
|-----------|--------------------|---|-------------------|-------|-----------------|---------------------------------|
| 3" NPT | 25 psi / 172.5 kPa | Visual, Left side | K080051, In-Tank | No. 9 | 18"/457mm | P164703 |
| | | Visual, Right side | K080033, In-Line | No. 9 | 18"/457mm | P164703 |
| | | | K080085, In-Line | No. 6 | 18"/457mm | P164407 all seals are Viton® |
| SAE-20 | 25 psi / 172.5 kPa | Visual, Right side | K080087, In-Line | No. ½ | 18"/457mm | P164405 |

Assembly Notes

¹ Donaldson uses the inlet port as the reference point. "Left side," for instance, means that the indicator mounts on the side of the filter head that is on your left when you face the inlet port. Viton® is a registered trademarks of E. I. DuPont de Nemours and Company.

Filter Choices

| Media Number | Media Technology | B _{x10} = 1000 Rating | Part No. |
|--------------|------------------|--------------------------------|-------------------------|
| No. ½ | Synteq™ | <4 µm | P164405 |
| No. 2 | Synteq | 9 µm | P166462 |
| No. 2½ | Synteq | 10 µm | P176222 |
| No. 6 | Synteq | 13 µm | P164407 w/Viton seal |
| No. 9 | Synteq | 23 µm | P164703 |
| No. 44 | Wiremesh | 45 µm nominal | P173573 |
| No. 149 | Wiremesh | 150 µm nominal | P163945 |

Filter Notes

- HFK08 replacement filters have seals made of Buna-N®, except as noted above, which is a material appropriate for most applications involving petroleum oil. Filters with seals made of Viton® (a fluoroelastomer) are required when using diester, phosphate ester fluids, water glycol, water/oil emulsions, and HWCF (high water content fluids) over 150°F.
- Refer to the table in the Technical Reference Guide for fluid compatibility with our filter media.

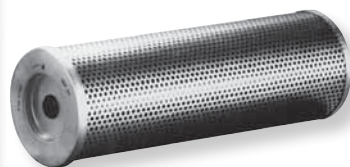


The K080087 model has features that are perfect for kidney loop filtration:

- SAE-20 port size
- 50 gpm/189 lpm flow capacity (enables constant face velocity and prevents sloughing)
- High-efficiency Synteq™ media



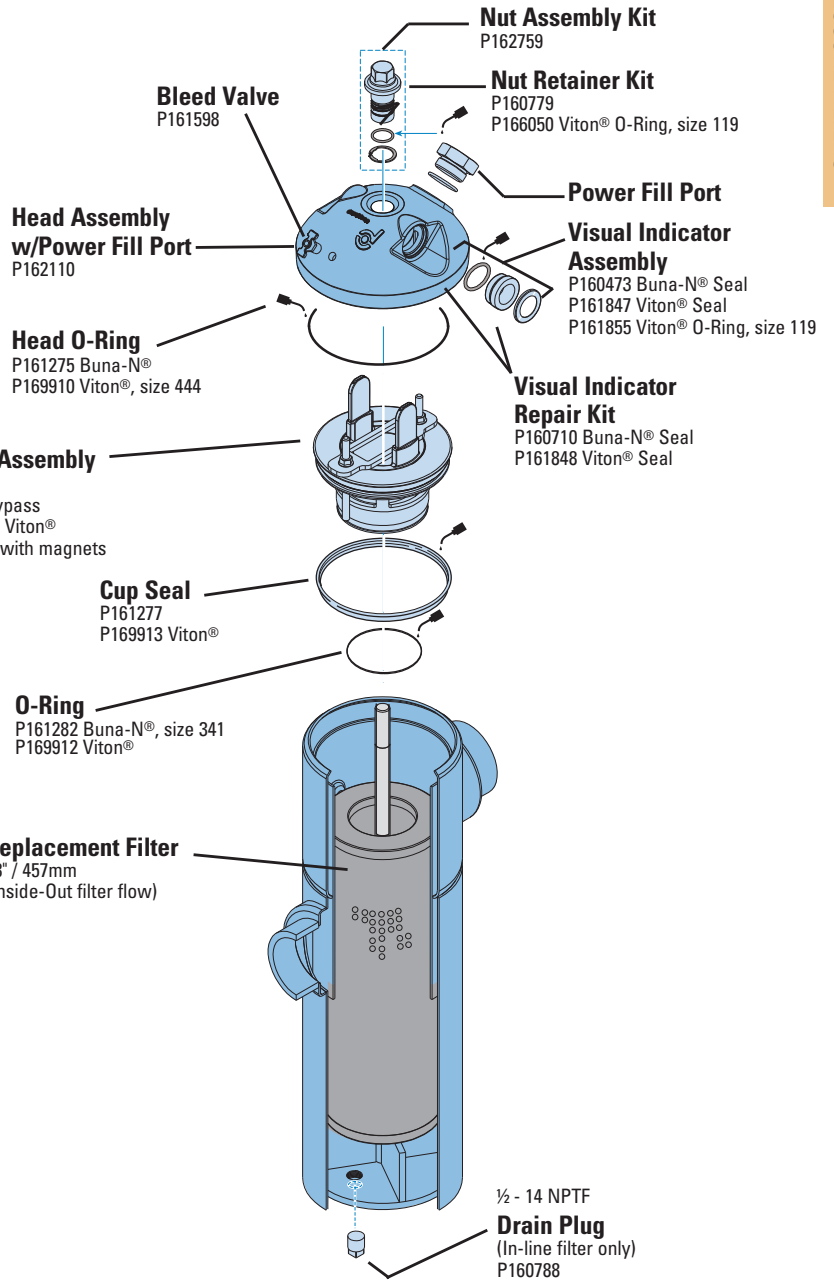
HFK08 replacement filters are available with synthetic or wire mesh media.



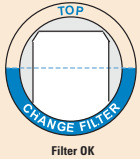
HFK08 Service Parts

SERVICE PARTS NOTE:

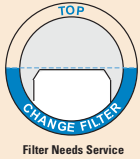
Some service parts may not be stocked. Please contact your Donaldson sales representative for lead time details.



How to Read the Visual Indicator



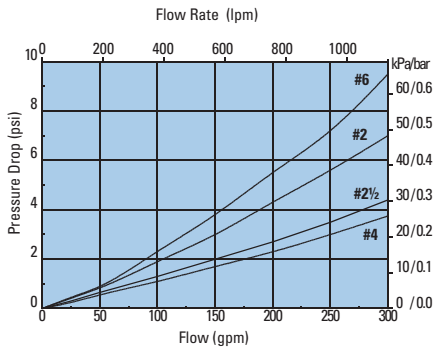
This simple device will tell you when the filter needs to be changed. Always check when the fluid is at operating temperature and the system is at normal operating flow.



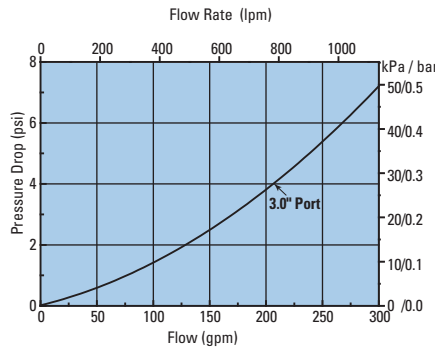
If the top of the white panel is below the lower half of the window, the filter needs servicing.

Performance Data

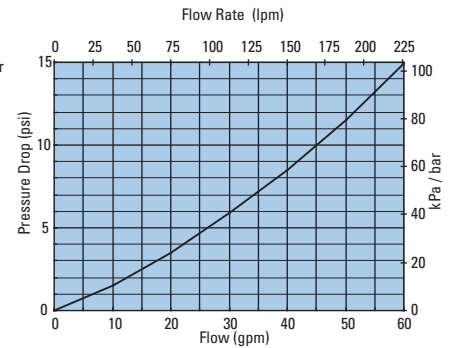
HFK08 Filter Only



HFK08 Filter Only



K080087 Assembly

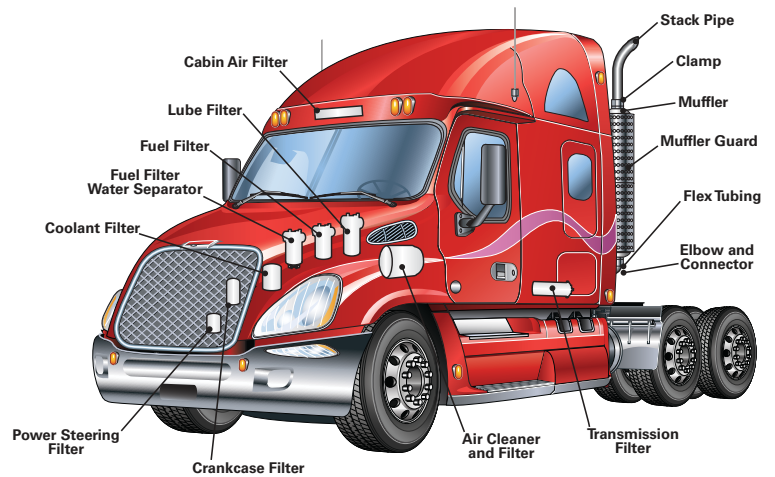
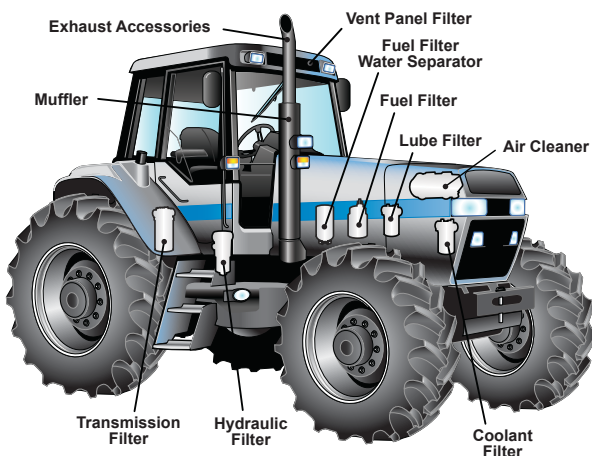
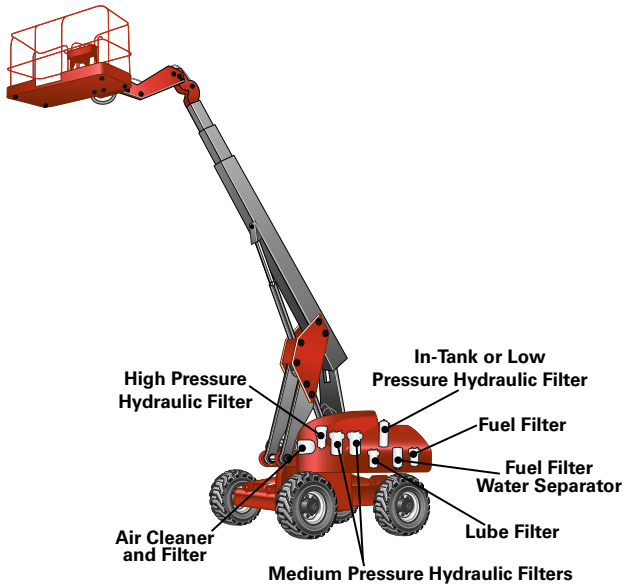
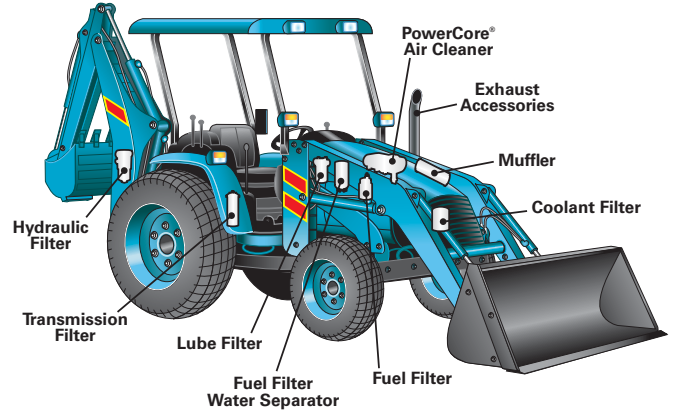
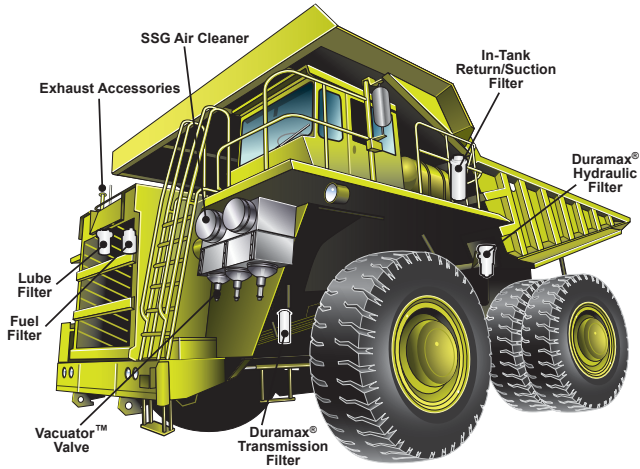


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High Pressure Filters

High pressure filters are positioned between pumps and critical components such as cylinders, motors and valves. They help protect these critical components from catastrophic failure.

Donaldson heavy-duty high pressure filters are rated for working pressures up to 6500 psi (44818 kPa). Various porting sizes and types, including manifold style, are available for a wide range of applications.



Section Index

Max Operating Pressure < 6500 psi (450 bar)

Models arranged from low to maximum flow rates

In-line Cartridge Filters

| | |
|-------------|-----|
| W331 | 132 |
| HPK02 | 136 |
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| W440 | 146 |
| FPK02 | 150 |
| W613 | 156 |
| W322 | 160 |
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| FPK04 | 174 |
| HPK04 | 180 |
| W621 | 188 |
| W451 | 193 |
| W620 | 197 |
| WS620 | 202 |
| HPK05 | 207 |



W331

Max Flow: 6 gpm (23 lpm)

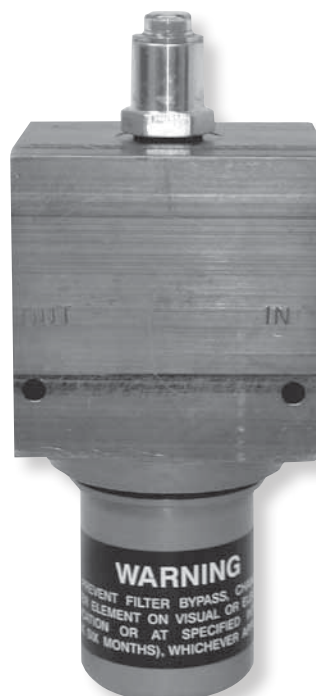
W331 In-Line Cartridge Filters

Working Pressures to: 3000 *psi*
21,000 kPa
210 bar

Rated Static Burst to: 7500 *psi*
51,700 kPa
517 bar

Fatigue Pressure Rating: 1500 *psi*
10,000 kPa
100 bar

Flow Range to: 6 *gpm*
23 *lpm*



Features

The W331 in line filter assembly offers all aluminum construction with a positive sealing poppet type bypass for reliability and zero leakage. Donaldson DT high-performance 4-layer media is offered in five different media grades. The differential pressure indicator line is designed to work with the wide assortment of bypass valves. Thermal lockout and surge control are two key features incorporated in many of the valves.

- Aluminum head and housing
- Compact design for use with servo or proportional valve
- Positive sealing poppet for zero leakage

Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- SAE-8 O-ring

Assembly Weight

- 4.25 lbs / 1.9 kg

Replacement Filter Lengths

- 3.44" / 87.3mm

Standard Bypass Ratings

- 50 psi / 345 kPa / 3.5 bar
- No Bypass

Operating Temperatures

- -45° to 250°F (-43° to 121°C)

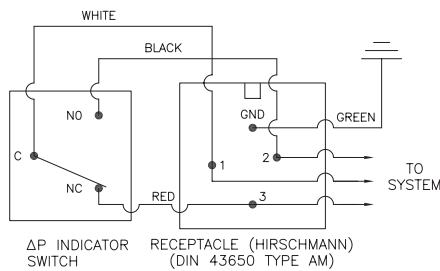
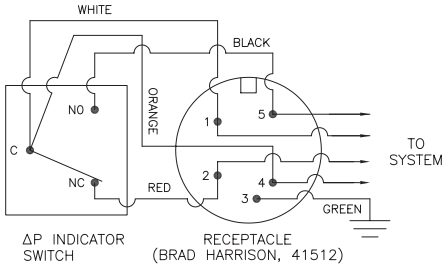
Filter Collapse Ratings

- 150 psi / 1034 kPa / 10.3 bar (standard)
- 3000 psi / 20,700 kPa / 206.8 bar (high collapse)

W331 Specification Illustrations

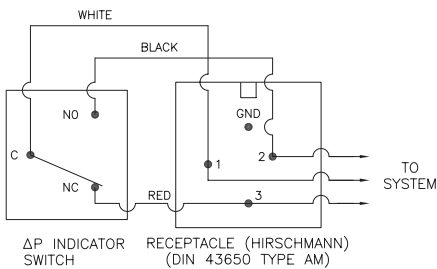
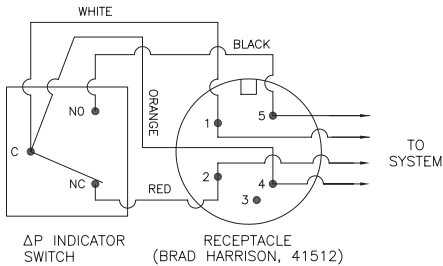
All dimensions are shown in millimeters [inches].

Indicator Switch Schematic Wiring Diagram Aluminum Electrical Housings



Note: The female plug (connector) is to be furnished by customer.

Plastic Electrical Housings



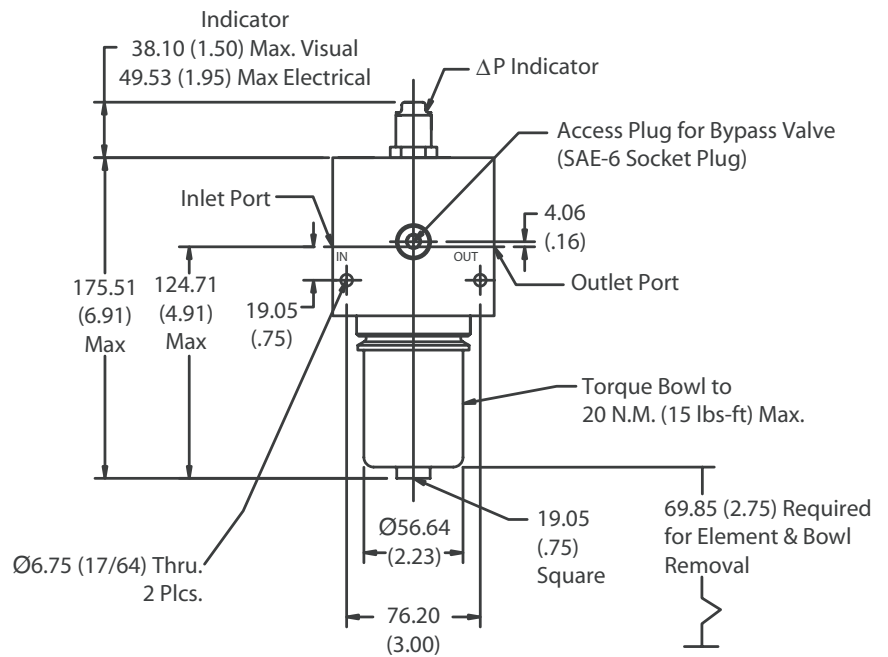
Note: The female plug (connector) is to be furnished by customer.

Differential Indicators: Indicators are designed to actuate at approximately 80% of bypass valve cracking pressure. It is recommended that an indicator with a bypass setting of 100 psid is used with a non-bypass housing.

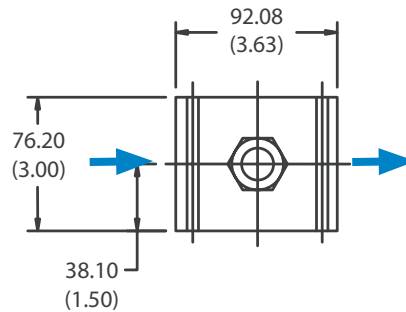
Surge Control: This optional feature is used to dampen pressure surges or spikes to avoid premature actuation of the indicator. Surge control delays the indicator response.

Thermal Lockout: The Thermal Lockout prevents premature signaling of a bypass condition created by viscous fluid during cold start-ups. Normal indicator actuation capability is resumed once the operating temperature of the fluid reaches approximately 80°F / 27°C.

Assembly - Side View



Head - Top View



CAUTION
Before servicing the element, the bleed plug in filter housing must be loosened to relieve pressure



W331

Max Flow: 6 gpm (23 lpm)



W331 Components

Filter Choices

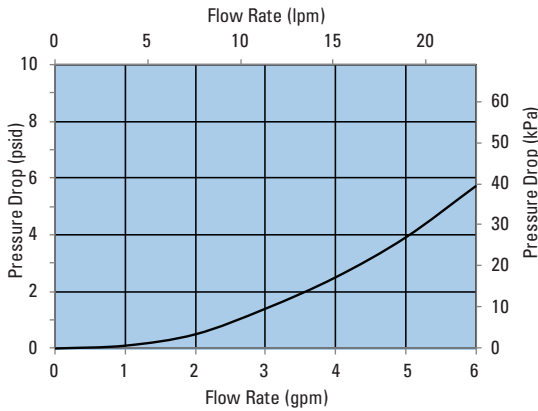
| Media Number | Beta _{x(c)} =1000 Rating | Length (in./mm) | Donaldson Part No. | Comments |
|--------------|-----------------------------------|-----------------|--------------------|--------------------------|
| 5 | 5 | 3.44/87.3 | P572298 | AN6235-3A |
| 8 | 8 | 3.44/87.3 | P572299 | AN6235-3A |
| 14 | 14 | 3.44/87.3 | P572300 | AN6235-3A |
| 5 | 5 | 3.44/87.3 | P572301 | AN6235-3A, High collapse |
| 14 | 14 | 3.44/87.3 | P572302 | AN6235-3A, High collapse |

Filter Notes

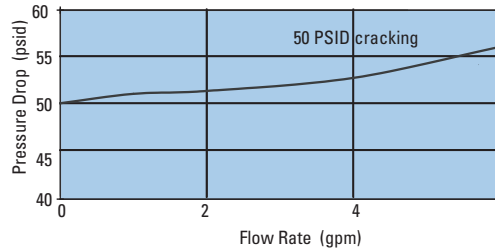
- All Donaldson W331 filters utilize glass fiber media with an epoxy-based resin system for the ultimate in chemical compatibility.
- All Donaldson W331 filters are potted with epoxy-based adhesives.
- Standard collapse W331 designs are double wire-backed using epoxy-coated steel mesh for maximum pleat support and dirt capacity.
- High collapse designs are double wire-backed using stainless steel mesh.
- High collapse designs are also potted into machined aluminum endcaps for greater filter integrity in critical applications.
- Viton® seals are standard on all Donaldson W331 filters. Viton® is a registered trademark of E. I. DuPont de Nemours and Company.

Performance Data

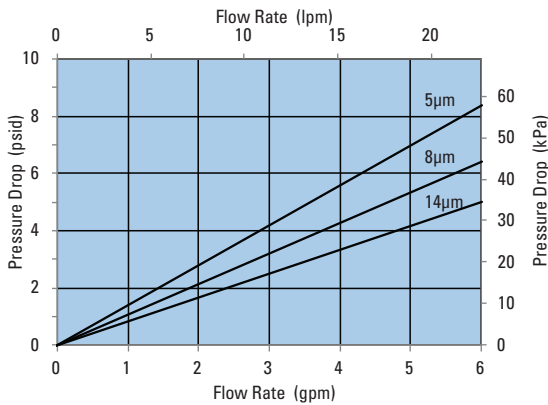
W331 Housing Only



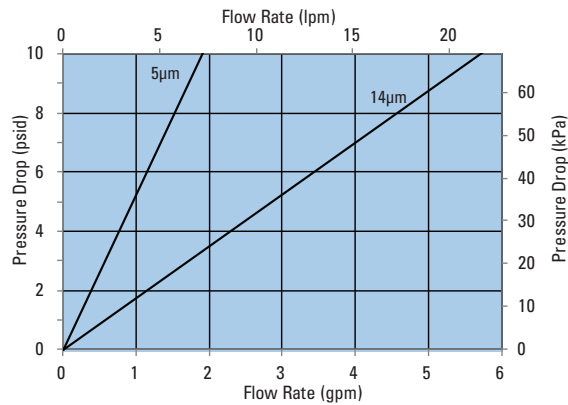
W331 Bypass Valve



W331 Filter Only



W331 High Collapse Filter Only





Housing Ordering Guide

| | | | | | | |
|-----------------|-----------------|--------------|--------------|--------------|----------------|--------------|
| Filter Assembly | W331 TABLE 1 | 1 TABLE 2 | 0 TABLE 3 | 4 TABLE 4 | L N TABLE 5 | B TABLE 6 |
|-----------------|-----------------|--------------|--------------|--------------|----------------|--------------|

Service Filter
Filters ordered separately. See previous page for filter options.

LEAD TIME NOTE:

This product is configured with the specifications and features of your choice. Please contact your Donaldson sales representative for lead time details.

Table 1

| Filter Assembly | |
|-----------------|-------------|
| CODE | DESCRIPTION |
| W331 | Assembly |

Table 2

| Filter Collapse Options | |
|-------------------------|---------------------------------------|
| CODE | DESCRIPTION |
| 1 | 150 psid for housing w/bypass valve |
| 4 | 3000 psi for housing w/o bypass valve |

Table 3

| Port Size Options | |
|-------------------|--------------|
| CODE | PORT SIZE |
| 0 | SAE-8 O-ring |

Table 4

| Bypass Setting Options | |
|------------------------|----------------|
| CODE | BYPASS SETTING |
| 1 | Non-bypass |
| 4 | 50 psid |

Note: Use option 1 code only with 3000 psid collapse filter.

Table 5 (Primary)

| Indicator Style and Setting | |
|-----------------------------|---|
| CODE | ΔP INDICATOR STYLE & SETTING |
| D | Electrical/visual 35 psid |
| E | Electrical/visual 100 psid |
| G | Electrical/visual 35 psid w/TL |
| J | ΔP indicator plug |
| L | Visual indicator 35 psid |
| M | Visual indicator 35 psid w/ TL and surge |
| N | Electrical/visual 35 psid w/12" 3 wire flying lead |
| O | Visual indicator 100 psid |
| P | Visual indicator 100 psid w/ TL and surge |
| R | Electrical switch 35 psid |
| S | Electrical/visual 100 psid w/12" 3 wire flying lead |
| T | Electrical switch 100 psid |
| W | Electrical/visual 100 psid w/TL |
| Y | Electrical/visual 35 psid w/TL and surge |
| Z | Electrical/visual 100 psid w/TL and surge |

TL (thermal lockout)

Table 5 (Secondary)

| Receptacle Options | |
|--------------------|-------------------------------|
| CODE | ELECTRICAL STYLE |
| B | Brad Harrison® (5-pin) |
| H | Hirschmann® (4-pin) |
| N | None, for visual ΔP indicator |

Table 6

| Seal Options | |
|--------------|----------|
| CODE | MATERIAL |
| B | Buna-N® |
| V | Viton® |

METRIC PORTING AVAILABLE

Change W331 to G331
Porting code 0 becomes 1/2"
ISO 228 BSPP

Media Ratings

Western Filter elements have been replaced by Donaldson DT high-performance cartridges.

| WESTERN MEDIA CODE | DONALDSON DT MEDIA |
|--------------------|--------------------|
| 03 | DT 5μm |
| 05 | DT 8μm |
| 10 | DT 14μm |

For a complete filter interchange, visit crossreference.donaldson.com.

Brad Harrison® is a registered trademark of Woodhead Industries, Inc.
Hirschmann® is a registered trademark of Richard Hirschmann of America Inc.
Buna-N® and Viton® are registered trademarks of E. I. DuPont de Nemours and Co.



HPK02

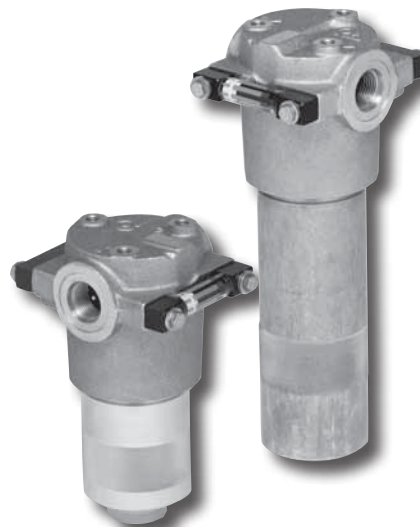
Max Flow: 20 gpm (75 lpm)

HPK02 In-Line Cartridge Filters

Working Pressures to: 2000 *psi*
13,790 kPa
137.9 bar

Rated Static Burst to: 4500 *psi*
31,030 kPa
310.3 bar

Flow Range to: 20 *gpm*
75 *lpm*



Features

The HPK02 is a heavy-duty filter built for high pressure applications, with cast aluminum head and impact-extruded aluminum housing for strength and durability at relatively lightweight.

Take advantage of our mix and match system of in-stock heads, housings and cartridges – so you can get exactly what you need. HPK02 is available with your choice of visual or AC/DC electrical indicators. Likewise, choose the bypass option that's right for your application – 50 psi (3.5 bar) bypass, or no bypass. Seals made of fluorocarbon (such as Viton® and Fluorel®) or Buna-N are available with HPK02.

All HF2-sized HPK02 filters contain Synteq™, our synthetic filter media designed especially for hydraulic filtration.

Viton® is a registered trademark of E. I. DuPont de Nemours and Company.
Fluorel® is a registered trademark of 3M Company.

Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- SAE-12 O-ring

Assembly Weight

- 4.3 lbs / 1.95 kg (short)
- 5.5 lbs / 2.49 kg (long)

Replacement Filter Lengths

- 4.37" / 111mm
- 8.12" / 206mm

Standard Bypass Ratings

- 50 *psi* / 345 kPa / 3.5 bar
- No Bypass

Operating Temperatures

- -45° to 250°F (-43° to 121°C)

Filter Collapse Ratings

- 150 *psi* / 1035 kPa / 10.6 bar (standard)
- 3000 *psi* / 20,700 kPa / 206.9 bar (high collapse)

HPK02 Specification Illustrations

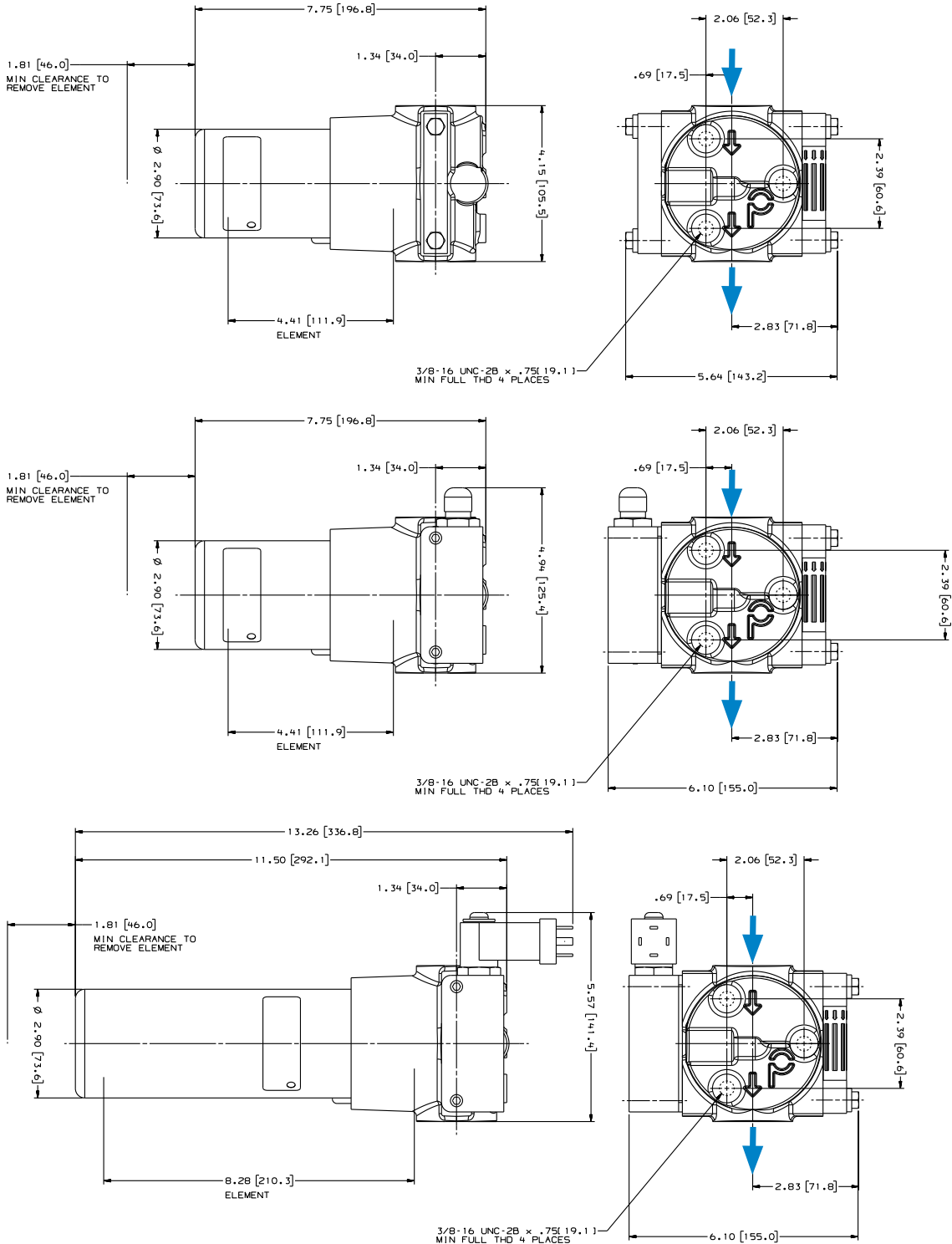
All dimensions are shown in inches [millimeters].

Applications:

- Servo Valve Circuits
- In-Plant & Mobile Equipment
- Power Steering Circuits
- High Pressure Circuits
- Meets HF2 Specification

Assembly - Side View

Head - Top View





HPK02

Max Flow: 20 gpm (75 lpm)

HPK02 Components

Standard Filter Choices

| Media Number | B ₁₀ = 1000 Rating | Length (in./mm) | Part No. | Comments |
|--------------|-------------------------------|-----------------|----------|------------------------------------|
| No. 1 | 5 µm | 4.37/111 | P169429 | Buna-N® Seal |
| | | | P167180 | Fluorocarbon Seal High Collapse |
| | | 8.12/203 | P167838 | Buna-N Seal |
| | | | P167182 | Fluorocarbon Seal High Collapse |
| No. 2 | 9 µm | 4.37/111 | P165041 | Buna-N Seal |
| | | 8.12/203 | P165043 | Buna-N Seal |
| No. 2½ | 10 µm | 4.37/111 | P165006 | Buna-N Seal |
| | | | P167181 | Fluorocarbon Seal High Collapse |
| | | 8.12/203 | P165015 | Buna-N Seal |
| | | | P167183 | Fluorocarbon Seal High Collapse |
| No. 9 | 23 µm | 4.37/111 | P165136 | Buna-N Seal |
| | | 8.12/203 | P165138 | Buna-N Seal |

Filter Notes

- Refer to the table in the Technical Reference Guide for fluid compatibility with our filter media.
- If filtering petroleum-based oil, filters with seals made of Buna-N® are appropriate for most applications.
- If filtering diester, phosphate ester fluids, water glycol, water/oil emulsions, or HWCF over 150°F/83°C, use filters with seals made of fluorocarbon, such as Viton®.
- Donaldson "high collapse" filters, with their steel endcaps and wire-backed media, are rated to withstand up to 3000 psi/ 20,700 kPa before collapsing.
- The fluorocarbon seal/high collapse filters also use epoxy potting and media seam seals for added chemical compatibility.
- Viton® and Buna-N® registered trademarks of E. I. DuPont de Nemours and Company.

Housing Choices

| Length* | Part No. |
|---------|----------|
| short | P167443 |
| long | P167452 |

* See dimensional drawings on page 137.

Head Choices

| Port Size | Bypass Rating | Indicators ¹ | Part No. |
|---------------|----------------|-----------------------------|----------|
| SAE-12 O-Ring | 50 psi/3.5 bar | Visual indicator, left side | P167728 |
| SAE-12 O-Ring | No bypass | Visual indicator, left side | P167730 |

Notes on Indicators

¹ Donaldson uses the inlet port as the reference point. "Left side," for instance, means that the indicator mounts on the side of the filter head that is on your left when you face the inlet port.



High-Performance DT Filter Choices

| Media Number | Beta ₁₀₀₀ Rating | Length (in./mm) | Donaldson DT Part No. | Comments |
|--------------|-----------------------------|-----------------|-----------------------|-------------------------------|
| 2 µm | <4 µm | 4/111.9 | P566194 | DT-9020-4-2UM |
| 5 µm | 5 µm | 4/111.9 | P566195 | DT-9020-4-5UM |
| 8 µm | 8 µm | 4/111.9 | P566196 | DT-9020-4-8UM |
| 14 µm | 14 µm | 4/111.9 | P566197 | DT-9020-4-14UM |
| 25 µm | 25 µm | 4/111.9 | P566198 | DT-9020-4-25UM |
| 2 µm | <4 µm | 8/210.3 | P566199 | DT-9020-8-2UM |
| 5 µm | 5 µm | 8/210.3 | P566200 | DT-9020-8-5UM |
| 8 µm | 8 µm | 8/210.3 | P566201 | DT-9020-8-8UM |
| 14 µm | 14 µm | 8/210.3 | P566202 | DT-9020-8-14UM |
| 25 µm | 25 µm | 8/210.3 | P566203 | DT-9020-8-25UM |
| 5 µm | 5 µm | 4/113.2 | P566335 | DT-9021-4-5UM, High collapse |
| 14 µm | 14 µm | 4/113.2 | P566336 | DT-9021-4-14UM, High collapse |
| 5 µm | 5 µm | 8/207.2 | P566337 | DT-9021-8-5UM, High collapse |
| 14 µm | 14 µm | 8/207.2 | P566338 | DT-9021-8-14UM, High collapse |

Filter Notes

- All Donaldson DT filters utilize glass fiber media with an epoxy-based resin system for the ultimate in chemical compatibility.
- All Donaldson DT filters are potted with epoxy-based adhesives.
- Standard collapse DT designs are double wire-backed using epoxy-coated steel mesh for maximum pleat support and dirt capacity. High collapse designs are double wire-backed using stainless steel mesh.
- High collapse designs are also potted into machined aluminum endcaps for greater filter integrity in critical applications.
- Viton® seals are standard on all Donaldson DT filters. Viton® is a registered trademark of E. I. DuPont de Nemours and Company.

Service Indicator Options

Visual Service Indicators

| Part No. | Use with Bypass Valve Pressure of: | Description |
|----------|------------------------------------|--|
| P569632 | 50 psi / 3.5 bar | 35 psi/2.4 bar indicator kit* auto reset pop-out button |
| P569633 | 90 psi / 6.2 bar | 70 psi/4.8 bar indicator kit* auto reset pop-out button |
| P567988 | 50 psi / 3.5 bar | 35 psi/2.4 bar indicator kit* auto reset pop-out button with thermal lockout and surge control |
| P567989 | 90 psi / 6.2 bar | 70 psi/4.8 bar indicator kit* auto reset pop-out button with thermal lockout and surge control |

AC/DC Visual/Electrical Service Indicators

| Part No. | Use with Bypass Valve Pressure of: | Description |
|----------|------------------------------------|--|
| P569634 | 50 psi / 3.5 bar | 35 psi/2.4 bar indicator kit* Hirschmann receptacle 115 VAC/28 VDC, 2 amps |
| P569635 | 90 psi / 6.2 bar | 70 psi/4.8 bar indicator kit* Hirschmann receptacle 115 VAC/28 VDC, 2 amps |
| P567986 | 50 psi / 3.5 bar | 35 psi/2.4 bar indicator kit* with thermal lockout and surge control, Hirschmann receptacle, 115 VAC/28 VDC, 2 amps, 4 pin DIN 43650 |
| P567987 | 90 psi / 6.2 bar | 70 psi/4.8 bar indicator kit* with thermal lockout and surge control, Hirschmann receptacle, 115 VAC/28 VDC, 2 amps, 4 pin DIN 43650 |

* Note: above choices include indicator and mounting block.

Indicator Service Parts

Replacement Indicators Only

| Part No. | Description |
|----------|---|
| P567458 | Visual/Electrical indicator with thermal lockout and surge, 35 psid/2.4 bar |
| P567459 | Visual/Electrical indicator, with thermal lockout and surge 70 psid/4.8 bar |
| P567456 | Pop-Up Visual Indicator, with thermal lockout and surge 35 psid/2.4 bar |
| P567457 | Pop-Up Visual Indicator, with thermal lockout and surge 70 psid/4.8 bar |
| P569636 | Pop-Up Visual Indicator, 35 psid/2.4 bar |
| P569637 | Pop-Up Visual Indicator, 70 psid/4.8 bar |
| P569638 | Visual/Electrical Indicator, 35 psid/2.4 bar |
| P569639 | Visual/Electrical Indicator, 70 psid/4.8 bar |
| P164315 | Visual Indicator, bar style, 35 psid/2.4 bar |
| P166603 | Visual Indicator, bar style, 70 psid/4.8 bar |
| P166134 | Blanking plate |

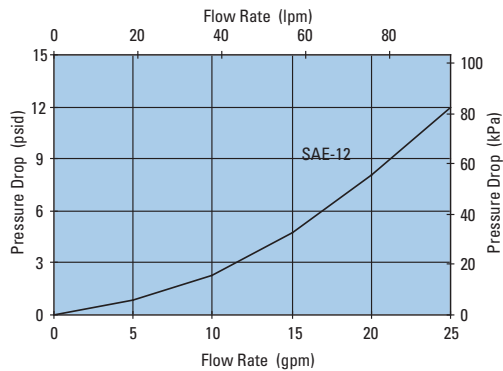


HPK02
Max Flow: 20 gpm (75 lpm)

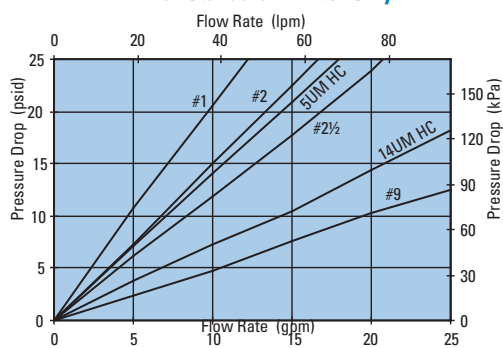


Performance Data

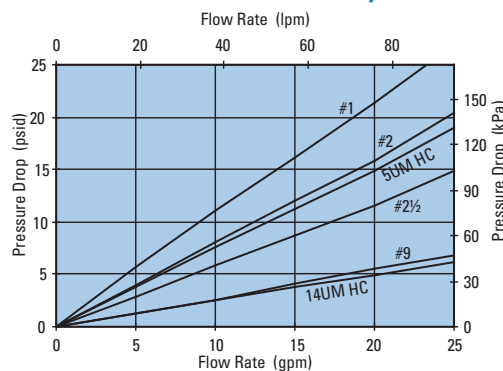
HPK02 Housing Only



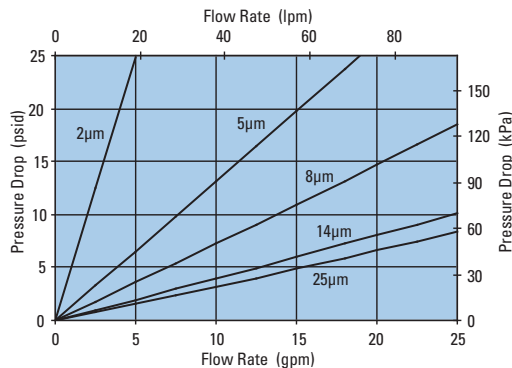
HPK02 Standard 4" Filter Only



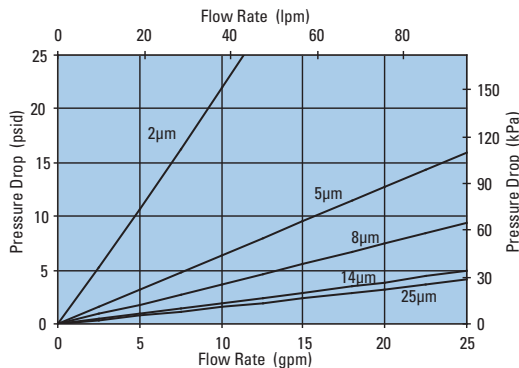
HPK02 Standard 8" Filter Only



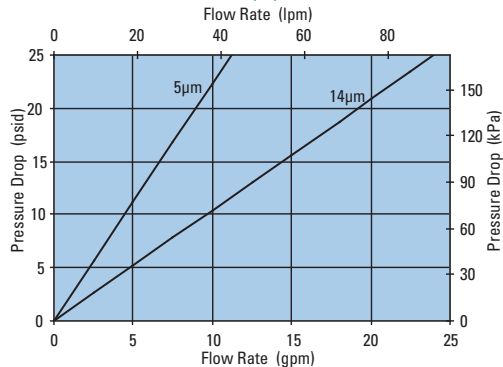
HPK02 4" DT Filter Only
DT-9020-4, 4"/102mm



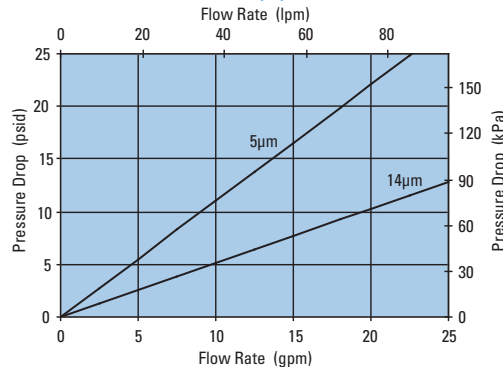
HPK02 8" DT Filter Only
DT-9020-8, 8"/203mm



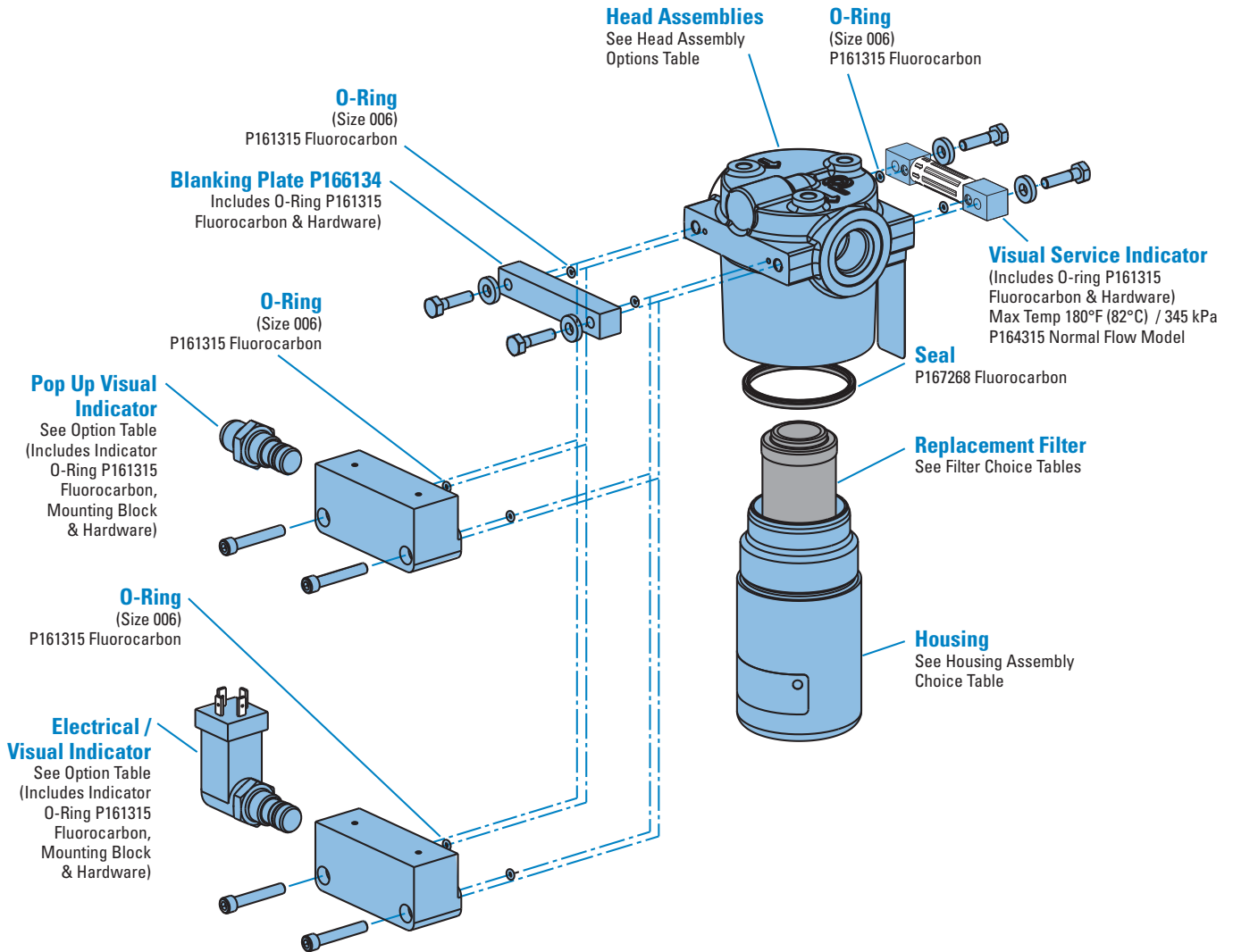
HPK02 4" DT Filter Only
DT-9021-4, 4"/102mm



HPK02 8" DT Filter Only
DT-9021-8, 8"/203mm



HPK02 Service Parts





W341

Max Flow: 20 gpm (75 lpm)

W341 In-Line Cartridge Filters

Working Pressures to: 3000 *psi*
20,700 kPa
207 bar

Rated Static Burst to: 7,500 *psi*
51,700 kPa
517 bar

Fatigue Pressure Rating: 1500 *psi*
10,300 kPa
103 bar

Flow Range to: 20 *gpm*
75 *lpm*



Features

The W341 in line filter assembly offers all aluminum construction with a positive sealing poppet type bypass for reliability and zero leakage. Donaldson DT high-performance 4-layer media is offered in five different media grades. The differential pressure indicator line is designed to work with the wide assortment of bypass valves. Thermal lockout and surge control are two key features incorporated in many of the valves.

- Aluminum head and housing
- Compact design for use with servo or proportional valve
- Positive sealing poppet for zero leakage

Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- SAE-12 O-ring

Assembly Weight

- 7.28": 5.3 lbs / 2.4 kg
- 10.03": 5.7 lbs / 2.6 kg

Replacement Filter Lengths

- 5.06" / 128.6mm
- 7.81" / 198.3mm

Standard Bypass Ratings

- 50 psi / 345 kPa / 3.5 bar
- No Bypass

Operating Temperatures

- -45° to 250°F (-43° to 121°C)

Filter Collapse Ratings

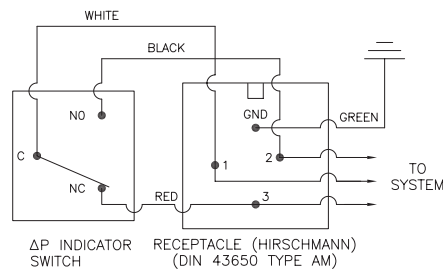
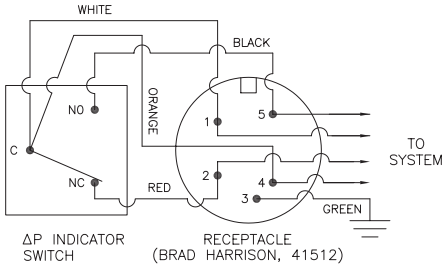
- 150 psi / 1034 kPa / 10.3 bar (standard)
- 3000 psi / 20,700 kPa / 206.8 bar (high collapse)

W341 Specification Illustrations

All dimensions are shown in millimeters [inches].

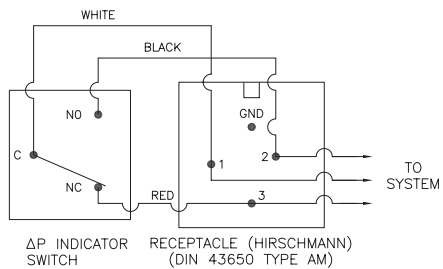
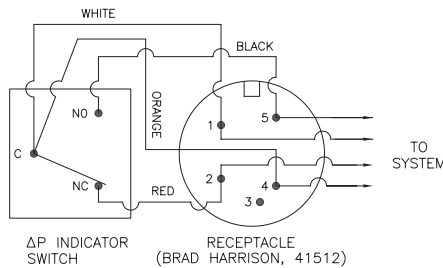
Indicator Switch Schematic Wiring Diagram

Aluminum Electrical Housings



Note: The female plug (connector) is to be furnished by customer.

Plastic Electrical Housings



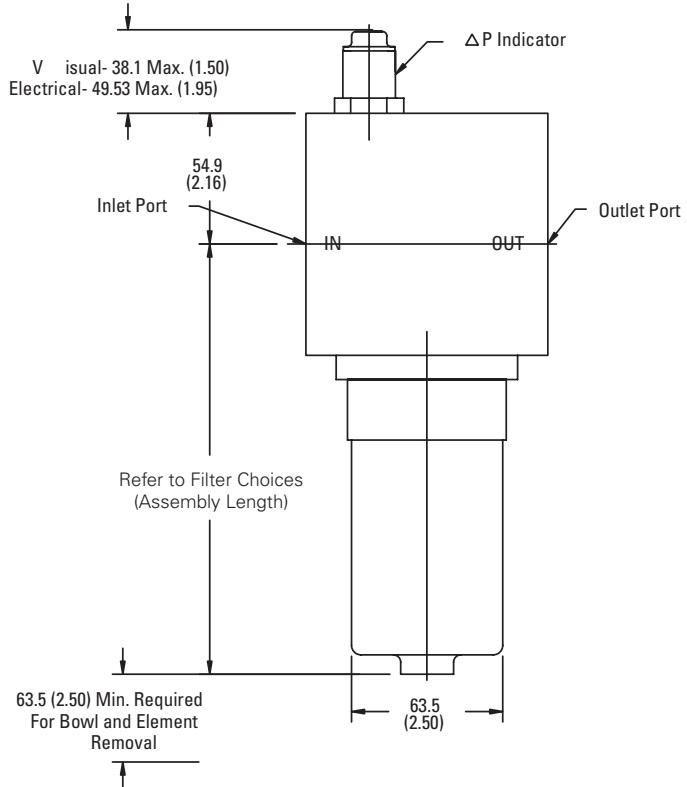
Note: The female plug (connector) is to be furnished by customer.

Differential Indicators: Indicators are designed to actuate at approximately 80% of bypass valve cracking pressure. It is recommended that an indicator with a bypass setting of 100 psid is used with a non-bypass housing.

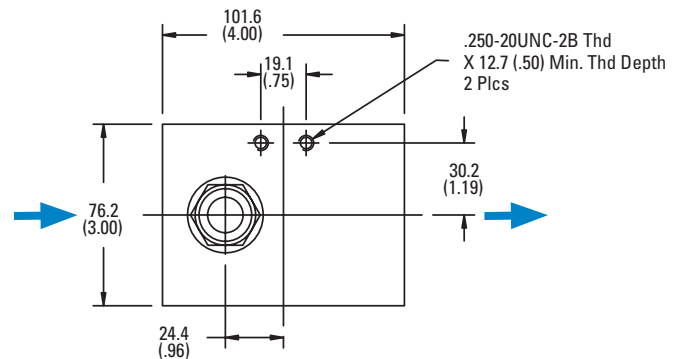
Surge Control: This optional feature is used to dampen pressure surges or spikes to avoid premature actuation of the indicator. Surge control delays the indicator response.

Thermal Lockout: The Thermal Lockout prevents premature signaling of a bypass condition created by viscous fluid during cold start-ups. Normal indicator actuation capability is resumed once the operating temperature of the fluid reaches approximately 80°F / 27°C.

Assembly - Side View



Head - Top View





W341
Max Flow: 20 gpm (75 lpm)



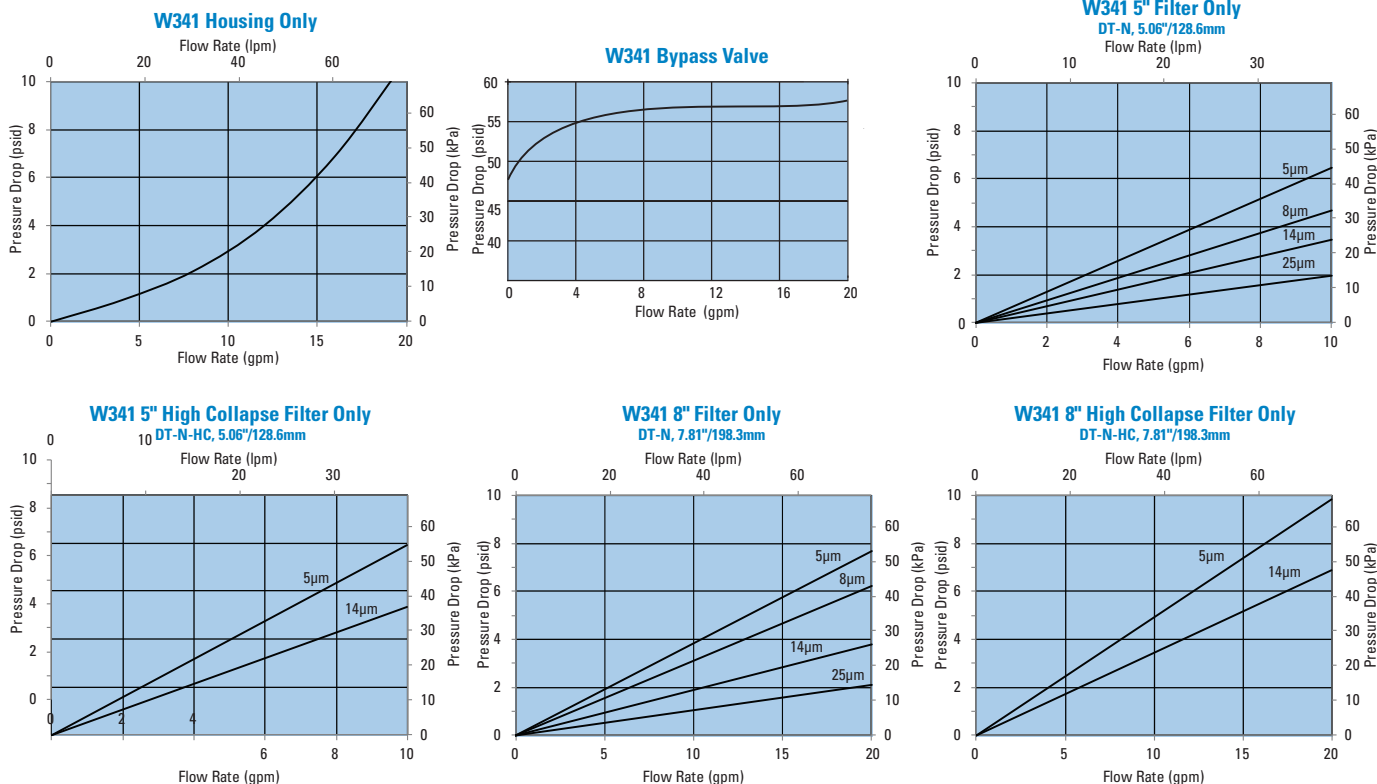
W341 Components High-Performance DT Filter Choices

| Media Number | Beta _(c) =1000 Rating | Length (in./mm) | Donaldson DT Part No. | Comments |
|--------------|----------------------------------|-----------------|-----------------------|-------------------------------|
| 5 | 5 | 5.06/128.6 | P567065 | DT-N-1-5UM |
| 8 | 8 | 5.06/128.6 | P567066 | DT-N-1-8UM |
| 14 | 14 | 5.06/128.6 | P567067 | DT-N-1-14UM |
| 25 | 25 | 5.06/128.6 | P567068 | DT-N-1-25UM |
| 5 | 5 | 7.81/198.3 | P567069 | DT-N-2-5UM |
| 8 | 8 | 7.81/198.3 | P567070 | DT-N-2-8UM |
| 14 | 14 | 7.81/198.3 | P567071 | DT-N-2-14UM |
| 25 | 25 | 7.81/198.3 | P567072 | DT-N-2-25UM |
| 5 | 5 | 5.06/128.6 | P572303 | DT-N-HC-1-5UM, high collapse |
| 14 | 14 | 5.06/128.6 | P572304 | DT-N-HC-1-14UM, high collapse |
| 5 | 5 | 7.81/198.3 | P572305 | DT-N-HC-2-5UM, high collapse |
| 14 | 14 | 7.81/198.3 | P572306 | DT-N-HC-2-14UM, high collapse |

Filter Notes

- All Donaldson DT filters utilize glass fiber media with an epoxy-based resin system for the ultimate in chemical compatibility.
- All Donaldson DT filters are potted with epoxy-based adhesives.
- Standard collapse DT designs are double wire-backed using epoxy-coated steel mesh for maximum pleat support and dirt capacity.
- High collapse designs are double wire-backed using stainless steel mesh.
- High collapse designs are also potted into machined aluminum endcaps for greater filter integrity in critical applications.
- Viton® seals are standard on all Donaldson DT filters. Viton® is a registered trademark of E. I. DuPont de Nemours and Company.

Performance Data





Housing Ordering Guide

| | | | | | | | |
|-----------------|-----------------|--------------|--------------|--------------|----------------|--------------|--------------|
| Filter Assembly | W341 TABLE 1 | 1 TABLE 2 | A TABLE 3 | 1 TABLE 4 | M N TABLE 5 | B TABLE 6 | 1 TABLE 7 |
|-----------------|-----------------|--------------|--------------|--------------|----------------|--------------|--------------|

Service Filter
Filters ordered separately. See previous page for filter options.

LEAD TIME NOTE:

This product is configured with the specifications and features of your choice. Please contact your Donaldson sales representative for lead time details.

Table 1

| Filter Assembly | |
|-----------------|-------------|
| CODE | DESCRIPTION |
| W341 | Assembly |

Table 2

| Filter Collapse Options | |
|-------------------------|--|
| CODE | DESCRIPTION |
| 1 | 150 psid for housing w/bypass valve |
| 4 | 3000 psid for housing without bypass valve |

Table 3

| Port Size Options | |
|-------------------|---------------|
| CODE | PORT SIZE |
| A | SAE-12 O-ring |

Table 4

| Bypass Setting Options | |
|------------------------|----------------|
| CODE | BYPASS SETTING |
| 1 | Non-bypass |
| 4 | 50 psid |

Table 5 (Primary)

| Indicator Style and Setting | |
|-----------------------------|--|
| CODE | ΔP INDICATOR STYLE & SETTING |
| D | Electrical/visual 35 + 5 psid |
| E | Electrical/visual 100 + 12 psid |
| G | Electrical/visual 35 + 5 psid w/TL |
| J | No indicator |
| L | Visual indicator 35 + 5 psid |
| M | Visual indicator 35 + 5 psid w/ TL and surge |
| N | Electrical/visual 35 + 5 psid w/12" 3 wire flying lead |
| O | Visual indicator 100 + 12 psid |
| P | Visual indicator 100 + 12 psid w/ TL and surge |
| R | Electrical switch 35 + 5 psid |
| S | Electrical/visual 100 + 12 psid w/12" 3 wire flying lead |
| T | Electrical switch 100 + 12 psid |
| W | Electrical/visual 100 + 12 psid w/TL |
| Y | Electrical/visual 35 + 5 psid w/TL and surge |
| Z | Electrical/visual 100 + 12 psid |

TL (thermal lockout)

Table 5 (Secondary)

| Receptacle Options | |
|--------------------|-------------------------------|
| CODE | ELECTRICAL STYLE |
| B | Brad Harrison® (5-pin) |
| H | Hirschmann® (4-pin) |
| N | None, for visual ΔP indicator |

Table 6

| Seal Options | |
|--------------|----------|
| CODE | MATERIAL |
| B | Buna-N® |
| V | Viton® |

Table 7

| Assembly & Filter Length | |
|--------------------------|---------------|
| CODE (LGTH) | FILTER LENGTH |
| 1 (7.28") | 4.0" |
| 2 (10.03") | 8.0" |

METRIC PORTING AVAILABLE

Change W341 to G341
Porting code A becomes G-3/4"
ISO 228 BSPP

Media Ratings

Western Filter elements have been replaced by Donaldson DT high-performance cartridges.

| WESTERN MEDIA CODE | DONALDSON DT MEDIA |
|--------------------|--------------------|
| 03 | DT 5μm |
| 05 | DT 8μm |
| 10 | DT 14μm |
| 20 | DT 25μm |

For a complete filter interchange, visit crossreference.donaldson.com.

Brad Harrison® is a registered trademark of Woodhead Industries, Inc.
Hirschmann® is a registered trademark of Richard Hirschmann of America Inc.
Buna-N® and Viton® are registered trademarks of E. I. DuPont de Nemours and Co.



W440

Max Flow: 20 gpm (75 lpm)

W440 In-Line Cartridge Filters

Working Pressures to: 4000 *psi*
27,600 kPa
276 bar

Rated Static Burst to: 10,000 *psi*
69,000 kPa
690 bar

Fatigue Pressure Rating: 2450 *psi*
16,900 kPa
169 bar

Flow Range to: 20 *gpm*
75 *lpm*



Features

The W440 filter assembly can be manifold mounted to the hydraulic system. The size and material configuration are well-suited for today's demanding proportional and servo valve applications. Our standard housing drain plug helps relieve system pressure during filter change-outs. DT 4-layer media is offered in a variety of designs. Five different media grades are offered. Donaldson filters core collapse options range from 150 to 3,000 psi. The differential pressure indicator line is designed to work with a wide assortment of bypass valves. Thermal lockout and surge control are two key features available in the differential indicators.

- Conforms to HF2 specifications
- High collapse filter available for use with non-bypass applications
- Positive sealing poppet bypass for reliability and zero leakage
- Wide range of indicator options
- Compact design for use with servo or proportional valve
- Two housing length options for design flexibility
- Head material: cast iron
- Housing material: steel
- Drain plug in housing

Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- SAE-12 O-ring
- Manifold mounting
Top-ported for subplate mounting
0.69" (17.5 mm) holes,
1.25" (31.8 mm) centers

Assembly Weight

- 4": 8.4 lbs / 3.8 kg
- 8": 10.6 lbs / 4.8 kg

Replacement Filter Lengths

- 4.41" / 111.9mm
- 4.46" / 113.2mm

• 8.16" / 207.2mm

• 8.28" / 210.3mm

Standard Bypass Ratings

- No Bypass
- 50 psi / 345 kPa / 3.5 bar
- 90 psi / 621 kPa / 6.2 bar

Operating Temperatures

- -20° to 250°F (-29° to 121°C)

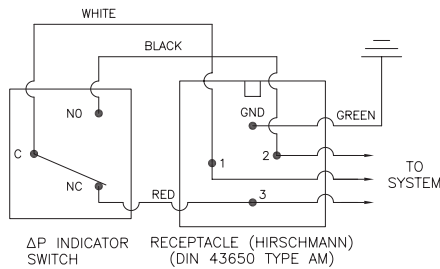
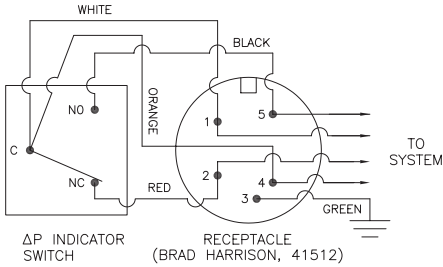
Filter Collapse Ratings

- 150 psi / 1034 kPa / 10.3 bar (standard)
- 3000 psi / 20,700 kPa / 206.8 bar (high collapse)

W440 Specification Illustrations

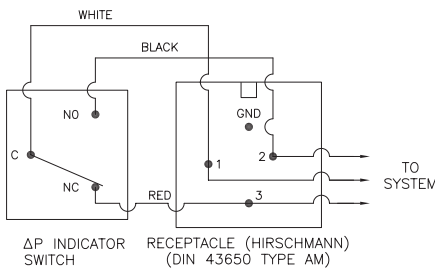
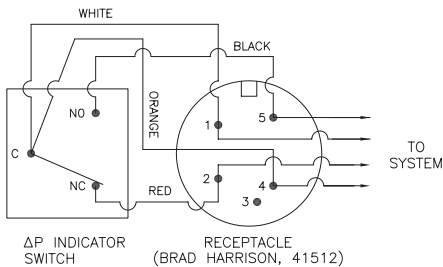
All dimensions are shown in millimeters [inches].

Indicator Switch Schematic Wiring Diagram Aluminum Electrical Housings



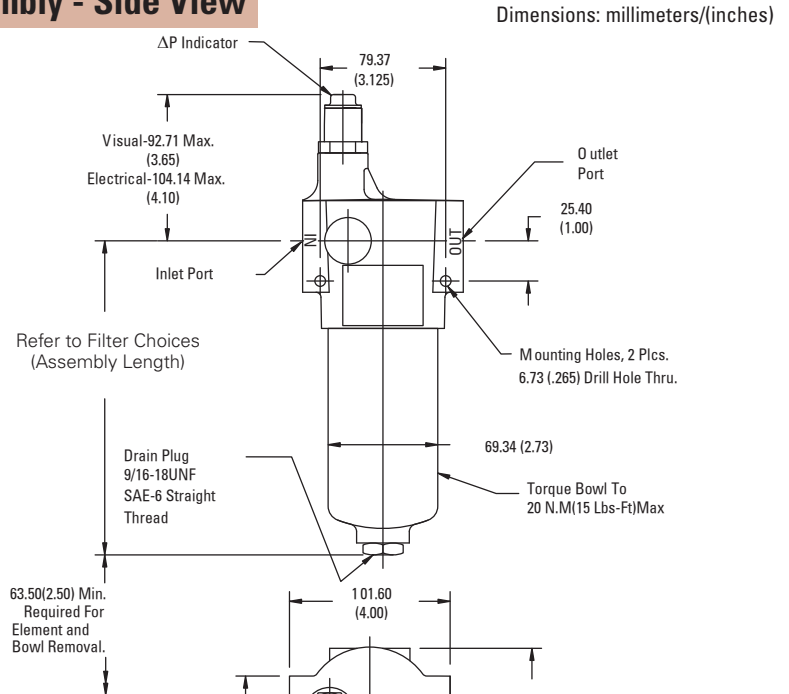
Note: The female plug (connector) is to be furnished by customer.

Plastic Electrical Housings

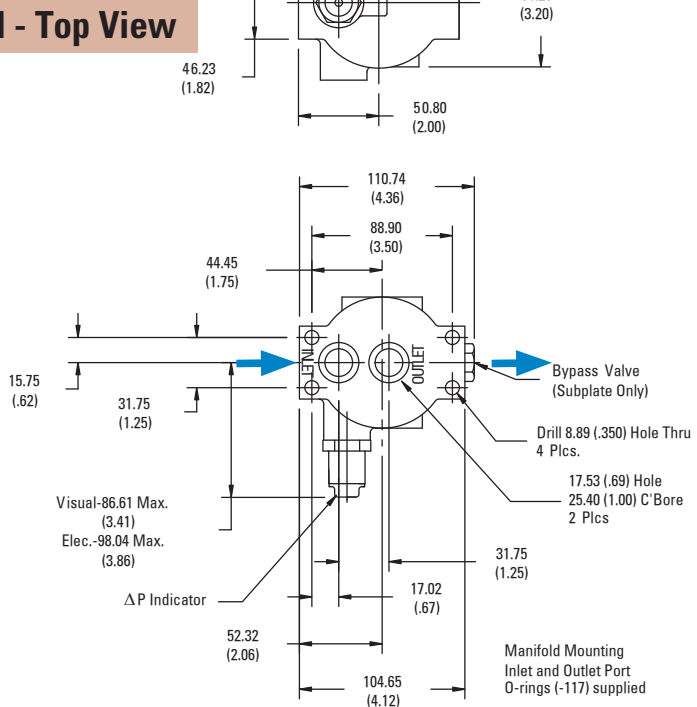


Note: The female plug (connector) is to be furnished by customer.

Assembly - Side View



Head - Top View



Differential Indicators: Indicators are designed to actuate at approximately 80% of bypass valve cracking pressure. It is recommended that an indicator with a bypass setting of 100 psid is used with a non-bypass housing.

Surge Control: This optional feature is used to dampen pressure surges or spikes to avoid premature actuation of the indicator. Surge control delays the indicator response.

Thermal Lockout: The Thermal Lockout prevents premature signaling of a bypass condition created by viscous fluid during cold start-ups. Normal indicator actuation capability is resumed once the operating temperature of the fluid reaches approximately 80°F / 27°C.



W440
Max Flow: 20 gpm (75 lpm)



W440 Components High-Performance DT Filter Choices

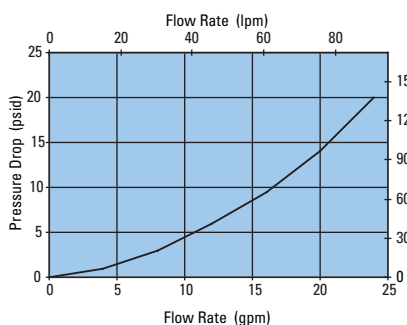
| Media Number | Beta _{x(c)} =1000 Rating | Length (in./mm) | Donaldson DT Part No. | Comments |
|--------------|-----------------------------------|-----------------|-----------------------|-------------------------------|
| 2 μm | <4 μm | 4.41/111.9 | P566194 | DT-9020-4-2UM |
| 5 μm | 5 μm | 4.41/111.9 | P566195 | DT-9020-4-5UM |
| 8 μm | 8 μm | 4.41/111.9 | P566196 | DT-9020-4-8UM |
| 14 μm | 14 μm | 4.41/111.9 | P566197 | DT-9020-4-14UM |
| 25 μm | 25 μm | 4.41/111.9 | P566198 | DT-9020-4-25UM |
| 2 μm | <4 μm | 8.28/210.3 | P566199 | DT-9020-8-2UM |
| 5 μm | 5 μm | 8.28/210.3 | P566200 | DT-9020-8-5UM |
| 8 μm | 8 μm | 8.28/210.3 | P566201 | DT-9020-8-8UM |
| 14 μm | 14 μm | 8.28/210.3 | P566202 | DT-9020-8-14UM |
| 25 μm | 25 μm | 8.28/210.3 | P566203 | DT-9020-8-25UM |
| 5 μm | 5 μm | 4.46/113.2 | P566335 | DT-9021-4-5UM, High collapse |
| 14 μm | 14 μm | 4.46/113.2 | P566336 | DT-9021-4-14UM, High collapse |
| 5 μm | 5 μm | 8.16/207.2 | P566337 | DT-9021-8-5UM, High collapse |
| 14 μm | 14 μm | 8.16/207.2 | P566338 | DT-9021-8-14UM, High collapse |

Filter Notes

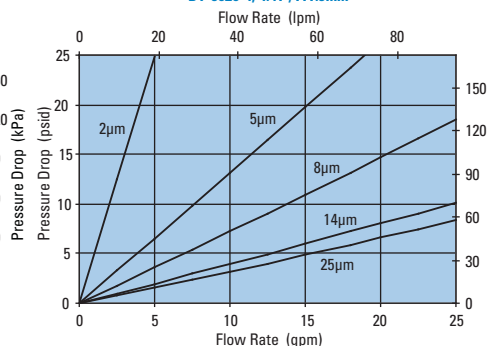
- All Donaldson DT filters utilize glass fiber media with an epoxy-based resin system for the ultimate in chemical compatibility.
- All Donaldson DT filters are potted with epoxy-based adhesives.
- Standard collapse DT designs are double wire-backed using epoxy-coated steel mesh for maximum pleat support and dirt capacity.
- High collapse designs are double wire-backed using stainless steel mesh.
- High collapse designs are also potted into machined aluminum endcaps for greater filter integrity in critical applications.
- Viton® seals are standard on all Donaldson DT filters. Viton® is a registered trademarks of E. I. DuPont de Nemours and Company.

Performance Data

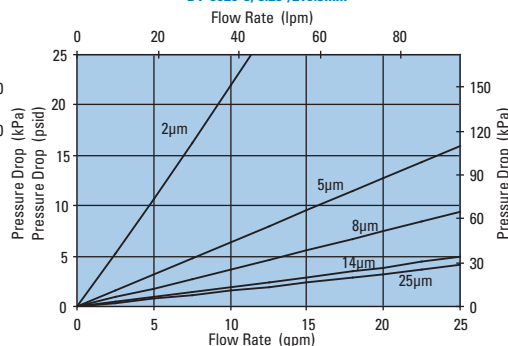
W440 Housing Only



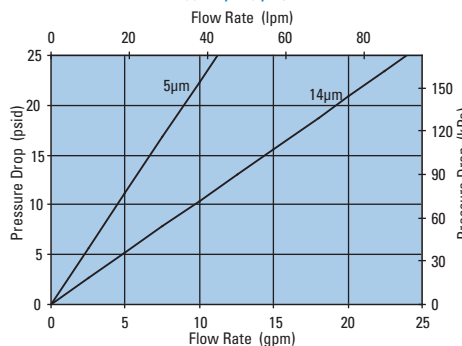
W440 4" DT Filter Only
DT-9020-4, 4.41"/111.9mm



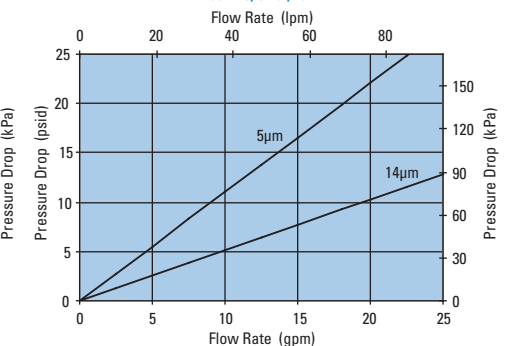
W440 8" DT Filter Only
DT-9020-8, 8.28"/210.3mm



W440 4" DT Filter Only
DT-9021-4, 4.46"/113.2mm



W440 8" DT Filter Only
DT-9021-8, 8.16"/207.2mm





Housing Ordering Guide

| | | | | | | | |
|-----------------|-----------------|--------------|--------------|--------------|----------------|--------------|--------------|
| Filter Assembly | W440 TABLE 1 | 1 TABLE 2 | S TABLE 3 | 1 TABLE 4 | J N TABLE 5 | B TABLE 6 | 1 TABLE 7 |
|-----------------|-----------------|--------------|--------------|--------------|----------------|--------------|--------------|

Service Filter
Filters ordered separately. See previous page for filter options.

LEAD TIME NOTE:
This product is configured with the specifications and features of your choice. Please contact your Donaldson sales representative for lead time details.

Table 1

| Filter Assembly | |
|-----------------|-------------|
| CODE | DESCRIPTION |
| W440 | Assembly |

Table 2

| Filter Collapse Options | |
|-------------------------|---------------------------------------|
| CODE | DESCRIPTION |
| 1 | 150 psid for housing w/bypass valve |
| 4 | 3000 psi for housing w/o bypass valve |

Table 3

| Port Size Options | |
|-------------------|-------------------|
| CODE | PORT SIZE |
| A | SAE-12 O-ring |
| S | Manifold mounting |

Table 4

| Bypass Setting Options | |
|------------------------|----------------|
| CODE | BYPASS SETTING |
| 1 | Non-bypass |
| 4 | 50 psid |
| 6 | 90 psid |

Note: Use option 1 code only with 3000 psid collapse filter.

Table 5 (Primary)

| Indicator Style and Setting | |
|-----------------------------|---|
| CODE | ΔP INDICATOR STYLE & SETTING |
| A | Visual indicator 70 psid w/TL & surge |
| B | Electrical/visual 70 psid w/TL and surge |
| D | Electrical/visual 35 psid |
| E | Electrical/visual 100 psid |
| G | Electrical/visual 35 psid w/TL |
| I | Visual indicator 70 psid |
| J | ΔP indicator plug |
| L | Visual indicator 35 psid |
| M | Visual indicator 35 psid w/ TL and surge |
| N | Electrical/visual 35 psid w/12" 3-wire flying lead |
| O | Visual indicator 100 psid |
| P | Visual indicator 100 psid w/TL and surge |
| R | Electrical switch 35 psid |
| S | Electrical/visual 100 psid w/12" 3-wire flying lead |
| T | Electrical switch 100 psid |
| U | Electrical switch 70 psid |
| W | Electrical/visual 100 psid w/TL |
| Y | Electrical/visual 35 psid w/TL and surge |
| Z | Electrical/visual 100 psid w/TL and surge |

TL (thermal lockout)

Table 5 (Secondary)

| Receptacle Options | |
|--------------------|-------------------------------|
| CODE | ELECTRICAL STYLE |
| B | Brad Harrison® (5-pin) |
| H | Hirschmann® (4-pin) |
| N | None, for visual ΔP indicator |

Table 6

| Seal Options | |
|--------------|----------|
| CODE | MATERIAL |
| B | Buna-N® |
| E | E.P.R. |
| V | Viton® |

Table 7

| Assembly & Filter Length | |
|--------------------------|---------------|
| CODE (LGTH) | FILTER LENGTH |
| 1 (7.18") | 4.0" |
| 2 (10.8") | 8.0"* |

*HF2

METRIC PORTING AVAILABLE
Change W440 to G440
Porting code A becomes G-3/4"
ISO 228 BSPP

Media Ratings

Western Filter elements have been replaced by Donaldson DT high-performance cartridges.

| WESTERN MEDIA CODE | DONALDSON DT MEDIA |
|--------------------|----------------------|
| 01 | DT 2 _μ m |
| 03 | DT 5 _μ m |
| 05 | DT 8 _μ m |
| 10 | DT 14 _μ m |
| 20 | DT 25 _μ m |

For a complete filter interchange, visit crossreference.donaldson.com.

Brad Harrison® is a registered trademark of Woodhead Industries, Inc.
Hirschmann® is a registered trademark of Richard Hirschmann of America Inc.
Buna-N® and Viton® are registered trademarks of E. I. DuPont de Nemours and Company.



FPK02

Max Flow: 25 gpm (95 lpm)

FPK02 In-Line Cartridge Filters

Working Pressures to: 6090 *psi*
42,000 kPa
420 bar

Rated Static Burst to: 9135 *psi*
63,000 kPa
630 bar

Flow Range to: 25 *gpm*
95 *lpm*



Features

The FPK02 is built to withstand pressures upwards of 6000 psi (420 bar). It features a cast iron head and cold-extruded steel housing for ultimate strength and durability. This filter meets the HF2 in-plant automotive specification.

Bypass options include 87 psi/6 bar bypass, bypass with reverse-flow check valve, or no bypass.

Take advantage of our mix and match system of in-stock heads, housings and cartridges, so you can get exactly what you need. You can also choose the media type and configuration that's best for your application. All FPK02 filters contain Synteq™, Donaldson's exclusive synthetic fiber media formulated especially for hydraulic filtration.

Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- SAE-12 O-ring

Assembly Weight

- 4" Assembly: 9.2 lbs / 4.2 kg
- 8" Assembly: 13.2 lbs / 6.0 kg

Replacement Filter Lengths

- 4.41" / 111.9mm
- 4.46" / 113.2mm
- 8.16" / 207.2mm
- 8.28" / 210.3mm

Standard Bypass Ratings

- 87 *psi* / 600 kPa / 6 bar
- 87 *psi* Bypass with reverse-flow check valve
- No Bypass

Operating Temperatures

- -20°F to 250°F / -29°C to 120°C

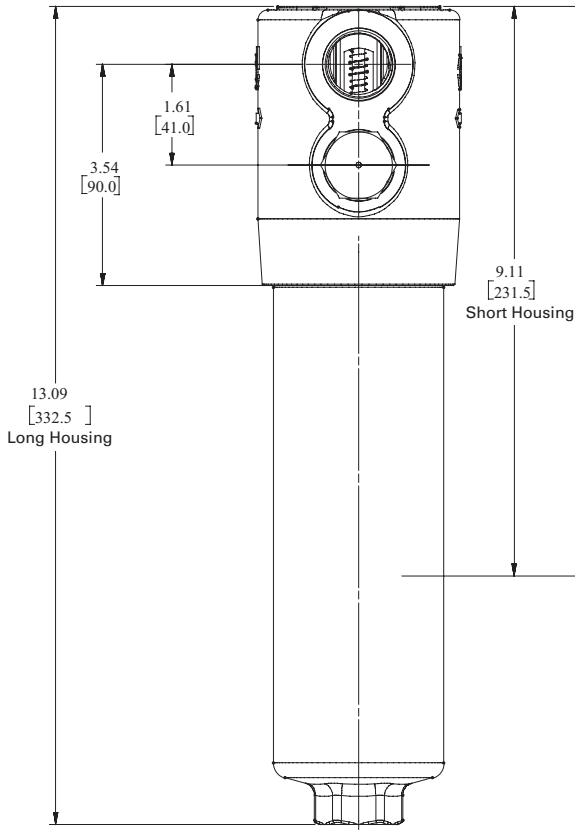
Filter Collapse Ratings

- 290 *psi* / 2000 kPa / 20 bar (standard)
- 3000 *psi* / 20,700 kPa / 207 bar (high collapse)

FPK02 Specification Illustrations

All dimensions are shown in inches [millimeters].

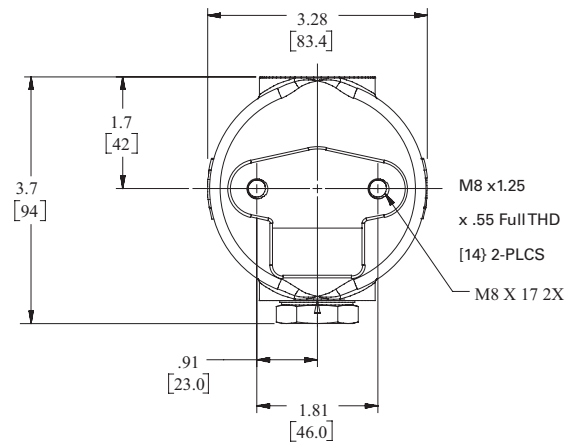
Assembly - Side View



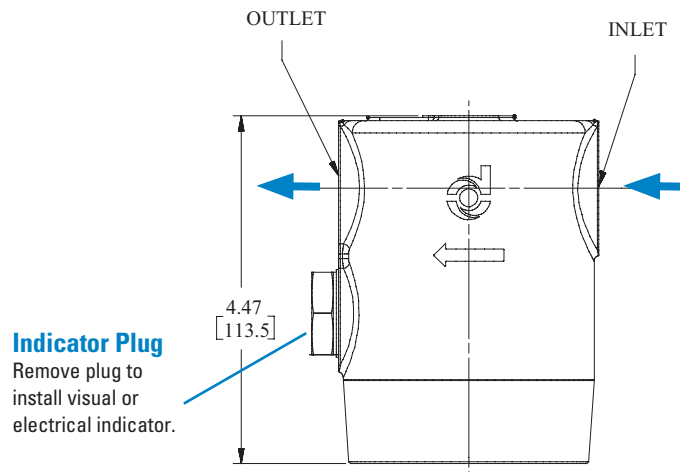
Applications:

- Servo Valve Circuits
- In-Plant & Mobile Equipment
- Power Steering Circuits
- High Pressure Circuits
- Meets HF2 Specification

Head - Top View



Head - Side View



Indicator Plug
Remove plug to install visual or electrical indicator.

All dimensions above are shown in inches [millimeters]



FPK02

Max Flow: 25 gpm (95 lpm)

FPK02 Components Standard Filter Choices

| Media | B _{μ(c)} = 1000 | Length | Part | Comments |
|---------------|--------------------------|----------|---------|-------------------|
| No. 1 | 5 μm | 4.37/111 | P169429 | Buna-N® Seal |
| | | | P167180 | Fluorocarbon Seal |
| | | 8.12/203 | P167838 | Buna-N Seal |
| | | | P167182 | Fluorocarbon Seal |
| High Collapse | | | | |
| No. 2 | 9 μm | 4.37/111 | P165041 | Buna-N Seal |
| | | 8.12/203 | P165043 | Buna-N Seal |
| No. 2½ | 10 μm | 4.37/111 | P165006 | Buna-N Seal |
| | | | P167181 | Fluorocarbon Seal |
| | | 8.12/203 | P165015 | Buna-N Seal |
| | | | P167183 | Fluorocarbon Seal |
| High Collapse | | | | |
| No. 9 | 23 μm | 4.37/111 | P165136 | Buna-N Seal |
| | | 8.12/203 | P165138 | Buna-N Seal |

Filter Notes

- Refer to the table in the Technical Reference Guide for fluid compatibility with our filter media.
- If you're filtering petroleum-based oil, filters with seals made of Buna-N are appropriate for most applications.
- If you're filtering diester, phosphate ester fluids, water glycol, water/oil emulsions, and HWCF over 150°F/83°C, use filters with seals made of fluorocarbon, such as Viton® from DuPont Dow Elastomers, or Fluorel® from 3M Company.
- Donaldson "high collapse" filters, with their steel end caps and wire-backed media, are rated to withstand up to 3000 psi/ 20,700 kPa before collapsing.
- The fluorocarbon seal/high collapse filters also use epoxy potting and media seam seals for added chemical compatibility.
- Viton® and Buna-N® registered trademarks of E. I. DuPont de Nemours and Company.



Housing Choices

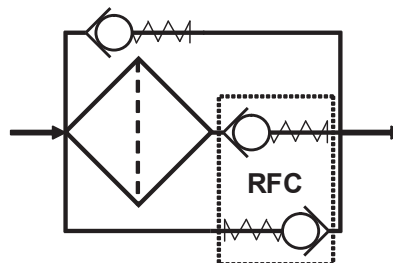
| Length (in.) | Part No. |
|--------------|----------|
| 4" filter | P762769 |
| 8" filter | P762770 |

Head Choices

| Port Size | Bypass Rating | Part No. |
|---------------|-------------------------------|----------|
| SAE-12 O-Ring | 87 psi / 6 bar | P762766 |
| SAE-12 O-Ring | 87 psi / 6 bar | P762767 |
| | with reverse-flow check valve | |
| SAE-12 O-Ring | No Bypass | P762768 |

NOTE: Indicator port is machined and plugged. Replace plug with indicator of choice: P171945 (visual) or P761056 (electrical). See illustration on page 155 for details.

Reverse Flow Check Schematic



High-Performance DT Filter Choices

| Media Number | Beta _(c) =1000 Rating | Length (in./mm) | Donaldson DT Part No. | Comments |
|--------------|----------------------------------|-----------------|-----------------------|-------------------------------|
| 2 µm | <4 µm | 4.41/111.9 | P566194 | DT-9020-4-2UM |
| 5 µm | 5 µm | 4.41/111.9 | P566195 | DT-9020-4-5UM |
| 8 µm | 8 µm | 4.41/111.9 | P566196 | DT-9020-4-8UM |
| 14 µm | 14 µm | 4.41/111.9 | P566197 | DT-9020-4-14UM |
| 25 µm | 25 µm | 4.41/111.9 | P566198 | DT-9020-4-25UM |
| 2 µm | <4 µm | 8.28/210.3 | P566199 | DT-9020-8-2UM |
| 5 µm | 5 µm | 8.28/210.3 | P566200 | DT-9020-8-5UM |
| 8 µm | 8 µm | 8.28/210.3 | P566201 | DT-9020-8-8UM |
| 14 µm | 14 µm | 8.28/210.3 | P566202 | DT-9020-8-14UM |
| 25 µm | 25 µm | 8.28/210.3 | P566203 | DT-9020-8-25UM |
| 5 µm | 5 µm | 4.46/113.2 | P566335 | DT-9021-4-5UM, High collapse |
| 14 µm | 14 µm | 4.46/113.2 | P566336 | DT-9021-4-14UM, High collapse |
| 5 µm | 5 µm | 8.16/207.2 | P566337 | DT-9021-8-5UM, High collapse |
| 14 µm | 14 µm | 8.16/207.2 | P566338 | DT-9021-8-14UM, High collapse |

Filter Notes

- All Donaldson DT filters utilize glass fiber media with an epoxy-based resin system for the ultimate in chemical compatibility.
- All Donaldson DT filters are potted with epoxy-based adhesives.
- Standard collapse DT designs are double wire-backed using epoxy-coated steel mesh for maximum pleat support and dirt capacity.
- High collapse designs are double wire-backed using stainless steel mesh.
- High collapse designs are also potted into machined aluminum endcaps for greater filter integrity in critical applications.
- Viton® seals are standard on all Donaldson DT filters. Viton® is a registered trademark of E. I. DuPont de Nemours and Company.





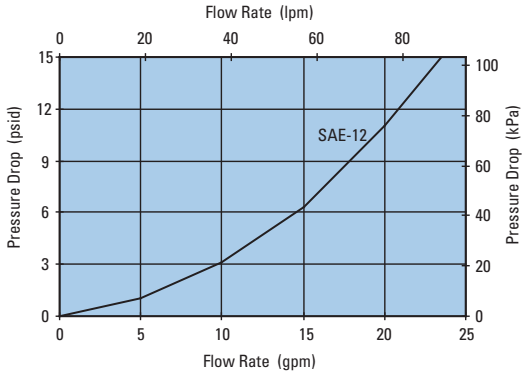
FPK02

Max Flow: 25 gpm (95 lpm)



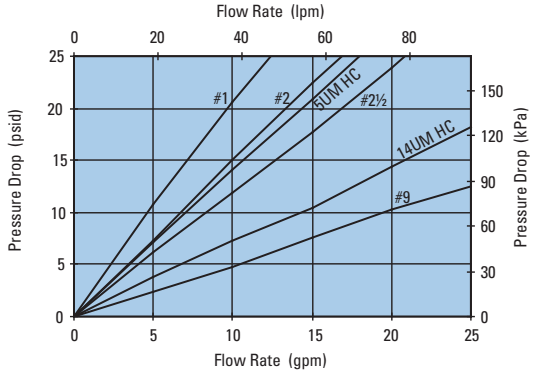
Performance Data

FPK02 Housing Only



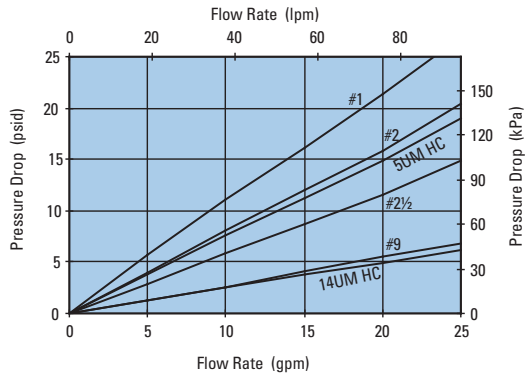
FPK02 Standard 4" Filter Only

4.37"/111mm



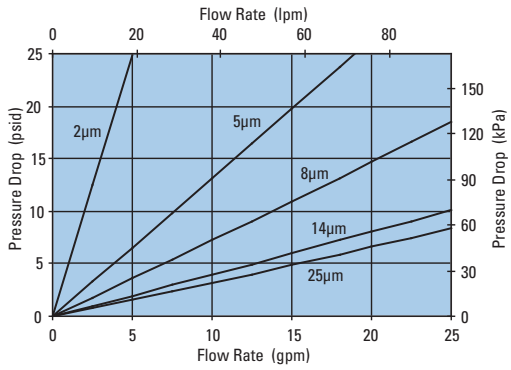
FPK02 Standard 8" Filter Only

8.12"/203mm



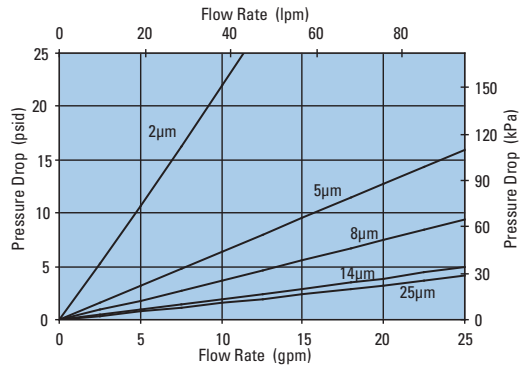
FPK02 4" DT Filter Only

DT-9020-4, 4.41"/111.9mm



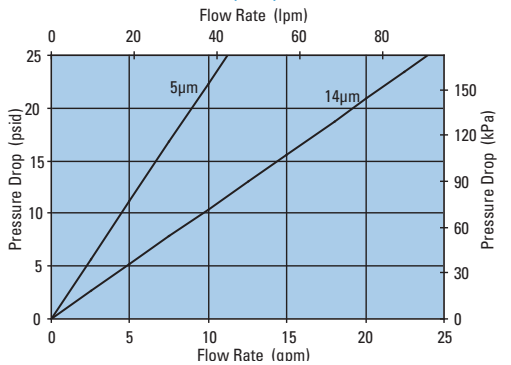
FPK02 8" DT Filter Only

DT-9020-8, 8.28"/210.3mm



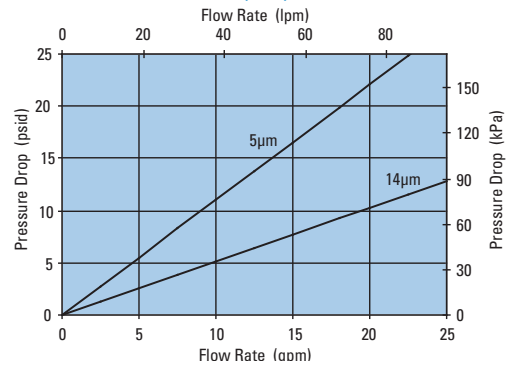
FPK02 4" DT Filter Only

DT-9021-4, 4.46"/113.2mm



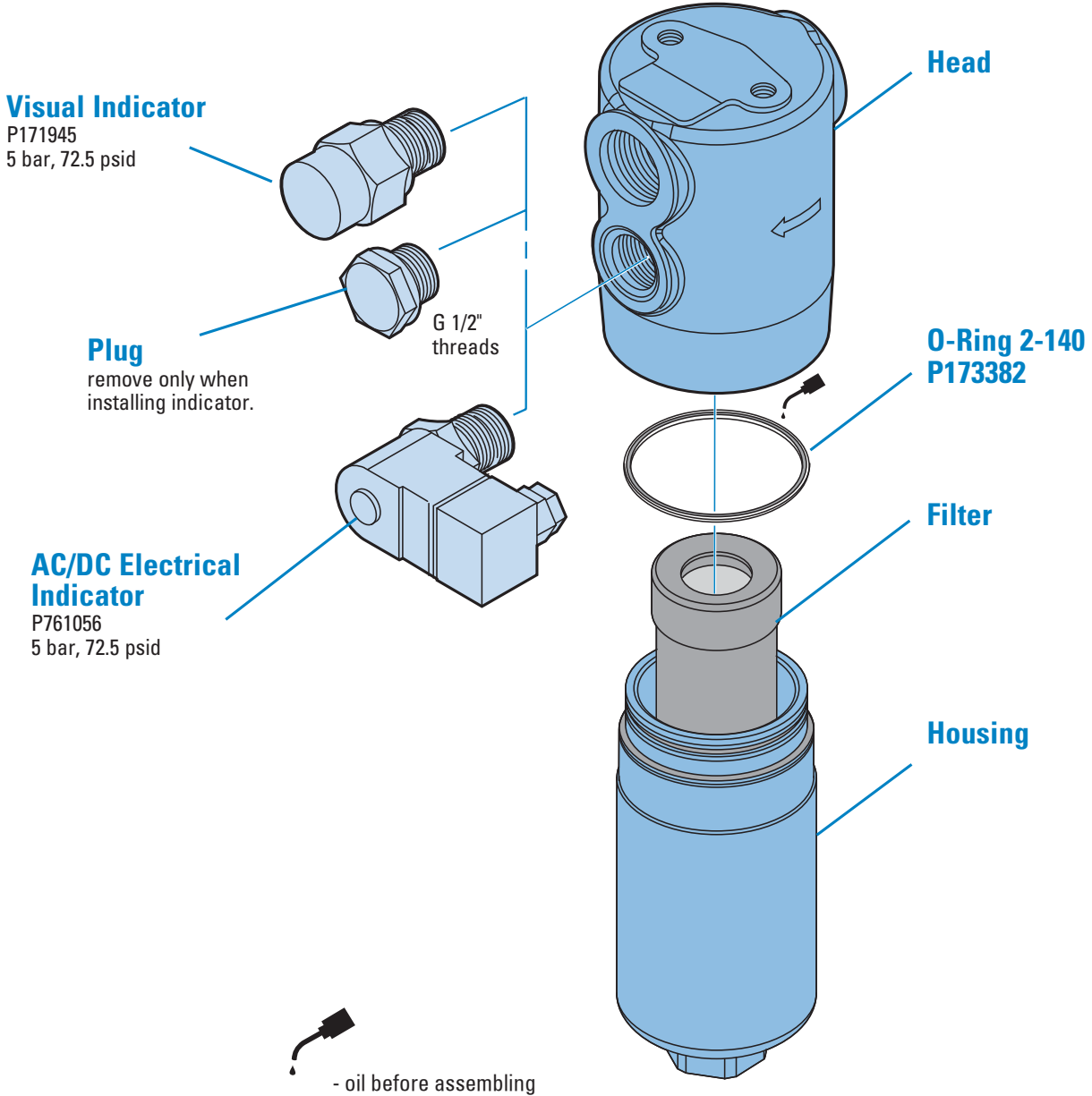
FPK02 8" DT Filter Only

DT-9021-8, 8.16"/207.2mm



FPK02 Service Parts

When installing the FPK02 housing onto an installed head, torque it to 15 ft-lbs./2.1 kg-m.





W613

Max Flow: 35 gpm (130 lpm)

W613 In-Line Cartridge Filters

Working Pressures to: 6500 *psi*
44,800 kPa
448 bar

Rated Static Burst to: 20,000 *psi*
138,000 kPa
1380 bar

Fatigue Pressure Rating: 3250 *psi*
22,400 kPa
224 bar

Flow Range to: 35 *gpm*
130 *lpm*



Features

The W613 with the T-Type port arrangement is an alternative to the W610 L-Type porting. These are offered with the same housing, filter and indicators used in our W610 filter assemblies. Donaldson DT high-performance 4-layer media is offered in five different media grades. The differential pressure indicator line is designed to work with the wide assortment of bypass valves. Thermal lockout and surge control are two key features incorporated in many of the valves.

- Head material: cast iron
- Housing material: steel

Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- SAE- 12, -16 O-ring
- 1" SAE 4-Bolt Flange Code 61 or 62

Assembly Weight

- 8.1": 19.4 lbs / 8.8 kg
- 11.75": 21.5 lbs / 9.8 kg

Replacement Filter Lengths

- 4.41" / 111.9mm
- 4.46" / 113.2mm
- 8.16" / 207.2mm
- 8.28" / 210.3mm

Standard Bypass Ratings

- 90 psi / 621 kPa / 6.2 bar
- 50 psi / 345 kPa / 3.5 bar
- No Bypass

Operating Temperatures

- -20° to 250°F (-29° to 121°C)

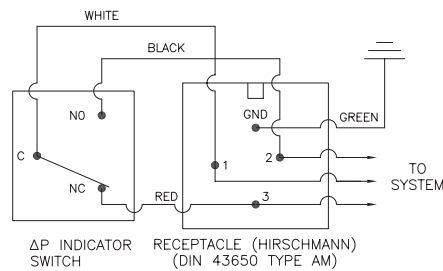
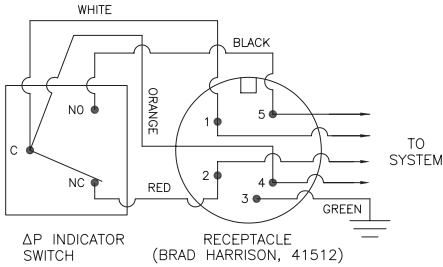
Filter Collapse Ratings

- 150 psi / 1034 kPa / 10.3 bar (standard)
- 3000 psi / 20,700 kPa / 206.8 bar (high collapse)

W613 Specification Illustrations

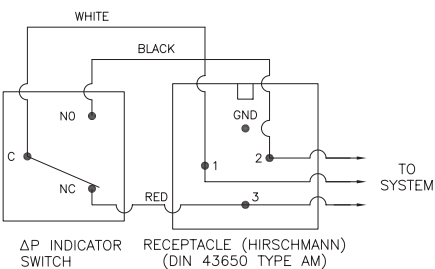
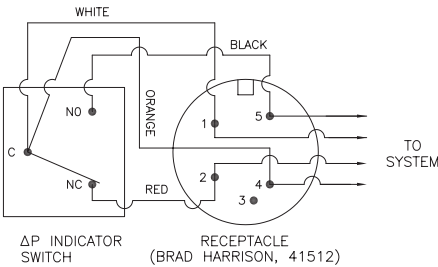
All dimensions are shown in millimeters [inches].

Indicator Switch Schematic Wiring Diagram Aluminum Electrical Housings



Note: The female plug (connector) is to be furnished by customer.

Plastic Electrical Housings



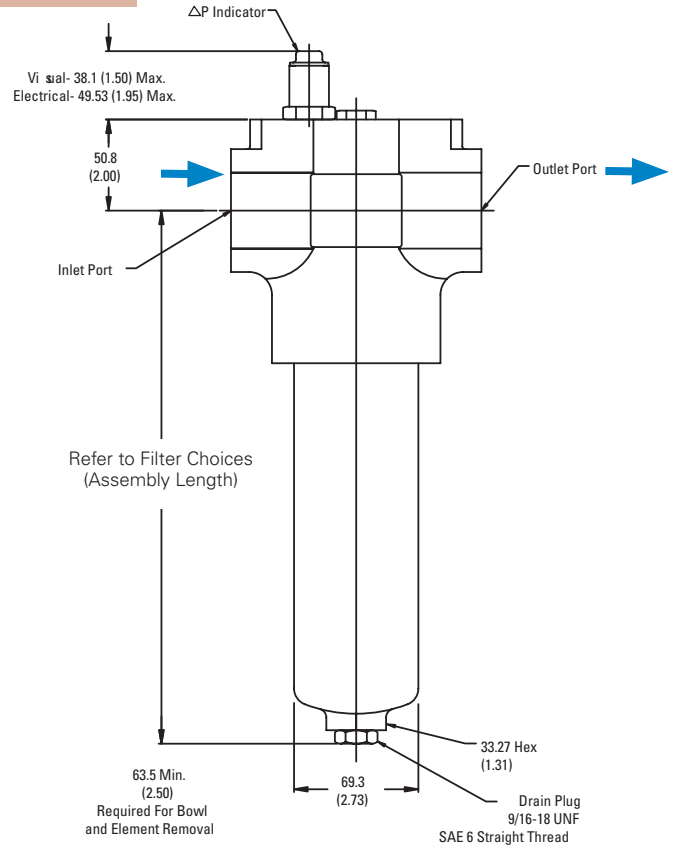
Note: The female plug (connector) is to be furnished by customer.

Differential Indicators: Indicators are designed to actuate at approximately 80% of bypass valve cracking pressure. It is recommended that an indicator with a bypass setting of 100 psid is used with a non-bypass housing.

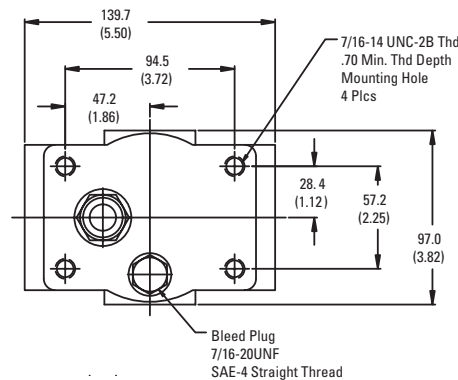
Surge Control: This optional feature is used to dampen pressure surges or spikes to avoid premature actuation of the indicator. Surge control delays the indicator response.

Thermal Lockout: The Thermal Lockout prevents premature signaling of a bypass condition created by viscous fluid during cold start-ups. Normal indicator actuation capability is resumed once the operating temperature of the fluid reaches approximately 80°F / 27°C.

Assembly - Side View



Head - Top View





W613
Max Flow: 35 gpm (130 lpm)



W613 Components High-Performance DT Filter Choices

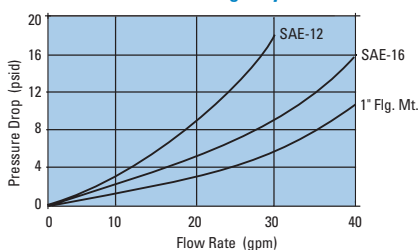
| Media Number | Beta _{w(c)} =1000 Rating | Length (in./mm) | Donaldson DT Part No. | Comments |
|--------------|-----------------------------------|-----------------|-----------------------|-------------------------------|
| 2 μm | <4 μm | 4.41/111.9 | P566391 | DT-9800-4-2UM |
| 5 μm | 5 μm | 4.41/111.9 | P566392 | DT-9800-4-5UM |
| 8 μm | 8 μm | 4.41/111.9 | P566393 | DT-9800-4-8UM |
| 14 μm | 14 μm | 4.41/111.9 | P566394 | DT-9800-4-14UM |
| 25 μm | 25 μm | 4.41/111.9 | P566395 | DT-9800-4-25UM |
| 2 μm | <4 μm | 8.28/210.3 | P566396 | DT-9800-8-2UM |
| 5 μm | 5 μm | 8.28/210.3 | P566397 | DT-9800-8-5UM |
| 8 μm | 8 μm | 8.28/210.3 | P566398 | DT-9800-8-8UM |
| 14 μm | 14 μm | 8.28/210.3 | P566399 | DT-9800-8-14UM |
| 5 μm | 5 μm | 4.46/113.2 | P566406 | DT-9801-4-5UM, High collapse |
| 14 μm | 14 μm | 4.46/113.2 | P566407 | DT-9801-4-14UM, High collapse |
| 5 μm | 5 μm | 8.16/207.2 | P566408 | DT-9801-8-5UM, High collapse |
| 14 μm | 14 μm | 8.16/207.2 | P566409 | DT-9801-8-14UM, High collapse |

Filter Notes

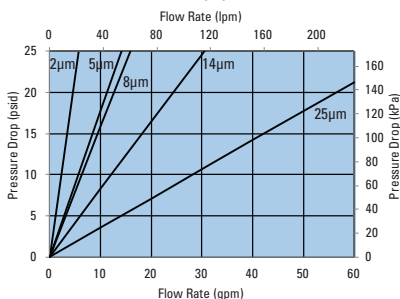
- All Donaldson DT filters utilize glass fiber media with an epoxy-based resin system for the ultimate in chemical compatibility.
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- Standard collapse DT designs are double wire-backed using epoxy-coated steel mesh for maximum pleat support and dirt capacity.
- High collapse designs are double wire-backed using stainless steel mesh.
- High collapse designs are also potted into machined aluminum endcaps for greater filter integrity in critical applications.
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Performance Data

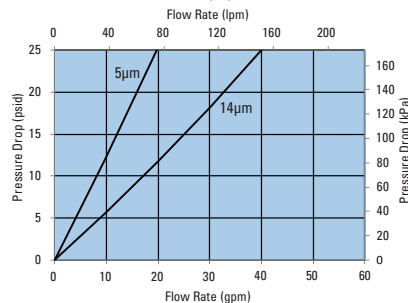
W613 Housing Only



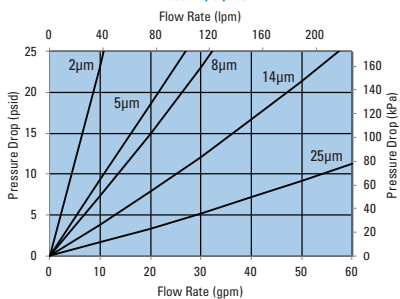
W613 4" DT Filter Only
DT-9800-4, 4"/102mm



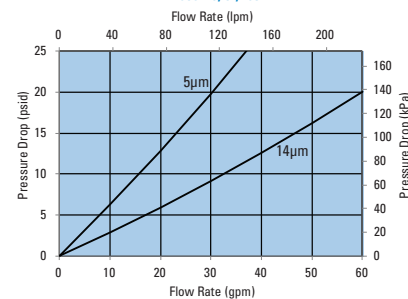
W613 4" DT Filter Only
DT-9801-4, 4"/102mm



W613 8" DT Filter Only
DT-9800-8, 8"/203mm



W613 8" DT Filter Only
DT-9801-8, 8"/203mm





Housing Ordering Guide

| | | | | | | | |
|-----------------|-----------------|--------------|--------------|--------------|----------------|--------------|--------------|
| Filter Assembly | W613 TABLE 1 | 1 TABLE 2 | B TABLE 3 | 4 TABLE 4 | M N TABLE 5 | B TABLE 6 | 2 TABLE 7 |
|-----------------|-----------------|--------------|--------------|--------------|----------------|--------------|--------------|

Service Filter
Filters ordered separately. See previous page for filter options.

LEAD TIME NOTE:

This product is configured with the specifications and features of your choice. Please contact your Donaldson sales representative for lead time details.

Table 1

| Filter Assembly | |
|-----------------|-------------|
| CODE | DESCRIPTION |
| W613 | Assembly |

Table 2

| Filter Collapse Options | |
|-------------------------|--|
| CODE | DESCRIPTION |
| 1 | 150 psid for housing w/bypass valve |
| 4 | 3000 psid for housing without bypass valve |

Table 3

| Port Size Options | |
|-------------------|------------------------------|
| CODE | PORT SIZE |
| A | SAE-12 O-ring |
| B | SAE-16 O-ring |
| F | 1" SAE 4-Bolt Flange Code 61 |
| M | 1" SAE 4-Bolt Flange Code 62 |

Media Ratings

Western Filter elements have been replaced by Donaldson DT high-performance cartridges.

| WESTERN MEDIA CODE | DONALDSON DT MEDIA |
|--------------------|--------------------|
| 01 | DT 2 μ m |
| 03 | DT 5 μ m |
| 05 | DT 8 μ m |
| 10 | DT 14 μ m |
| 20 | DT 25 μ m |

For a complete filter interchange, visit crossreference.donaldson.com.

Table 4

| Bypass Setting Options | |
|------------------------|----------------|
| CODE | BYPASS SETTING |
| 1 | Non-bypass |
| 4 | 50 psid |
| 6 | 90 psid |

Table 5 (Primary)

| Indicator Style and Setting | |
|-----------------------------|--|
| CODE | Δ P INDICATOR STYLE & SETTING |
| A | Visual indicator 70 + 10 psid w/TL and surge |
| B | Electrical/visual 70 + 10 psid w/TL and surge |
| D | Electrical/visual 35 + 5 psid |
| E | Electrical/visual 100 + 12 psid |
| G | Electrical/visual 35 + 5 psid w/TL |
| I | Visual indicator 70 + 10 psid |
| J | No indicator |
| L | Visual indicator 35 + 5 psid |
| M | Visual indicator 35 + 5 psid w/ TL and surge |
| N | Electrical/visual 35 + 5 psid w/12" 3 wire flying lead |
| O | Visual indicator 100 + 12 psid |
| P | Visual indicator 100 + 12 psid w/TL and surge |
| R | Electrical switch 35 + 5 psid |
| S | Electrical/visual 100 + 12 psid w/12" 3 wire flying lead |
| T | Electrical switch 100 + 12 psid |
| U | Electrical switch 70 + 10 psid |
| V | Electrical/visual 70 + 10 psid w/TL |
| W | Electrical/visual 100 + 12 psid w/TL |
| Y | Electrical/visual 35 + 5 psid w/TL and surge |
| Z | Electrical/visual 100 + 12 psid w/TL and surge |

TL (thermal lockout)

Table 5 (Secondary)

| Receptacle Options | |
|--------------------|---------------------------------------|
| CODE | ELECTRICAL STYLE |
| B | Brad Harrison® (5-pin) |
| H | Hirschmann® (4-pin) |
| N | None, for visual Δ P indicator |

Table 6

| Seal Options | |
|--------------|----------|
| CODE | MATERIAL |
| B | Buna-N® |
| V | Viton® |

Table 7

| Assembly & Filter Length | |
|--------------------------|---------------|
| CODE (LGTH) | FILTER LENGTH |
| 1 (8.10") | 4.0" |
| 2 (11.75") | 8.0" |

METRIC PORTING AVAILABLE

Change W613 to G613
Porting code A becomes 3/4" ISO 228 BSPP
Porting code B becomes 1" ISO 228 BSPP
Porting code F becomes 1" SAE 4 bolt flange with M10 mounting threads
Porting code M becomes 1" SAE 4 bolt flange with M12 mounting threads

Brad Harrison® is a registered trademark of Woodhead Industries, Inc.
Hirschmann® is a registered trademark of Richard Hirschmann of America Inc.
Buna-N® and Viton® are registered trademarks of E. I. DuPont de Nemours and Co.



W322

Max Flow: 50 gpm (190 lpm)

W322 In-Line Cartridge Filters

Working Pressures to: 3000 *psi*
20,700 kPa
207 bar

Rated Static Burst to: 7,500 *psi*
51,700 kPa
517 bar

Fatigue Pressure Rating: 2000 *psi*
13,800 kPa
138 bar

Flow Range to: 50 *gpm*
190 *lpm*



Features

The W322 duplex filter assembly provides continuous, uninterrupted filtering of flows up to 50 gpm. The proprietary housing check valves insure leak free maintenance during replacement filter cycle. The high density aluminum material provides for a compact and lightweight filter design. Donaldson DT high-performance 4-layer media is offered in five different media grades. The differential pressure indicator line is designed to work with the wide assortment of bypass valves. Thermal lockout and surge control are two key features incorporated in many of the valves.

- Anodized aluminum head and housing
- Duplex offers continuous filtration
- Two housing length options

Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- SAE-16 O-ring

Assembly Weight

- 6.88": 34 lbs / 15.5 kg
- 9.86": 36 lbs / 16.4 kg

Replacement Filter Lengths

- 4.41" / 111.9mm
- 4.46" / 113.2mm
- 8.16" / 207.2mm
- 8.28" / 210.3mm

Standard Bypass Ratings

- 90 psi / 621 kPa / 6.2 bar
- 50 psi / 345 kPa / 3.5 bar
- No Bypass

Operating Temperatures

- -20° to 250°F (-29° to 121°C)

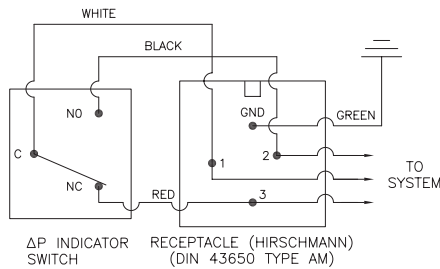
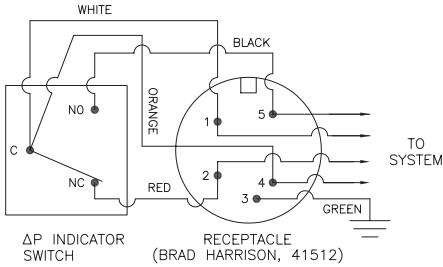
Filter Collapse Ratings

- 150 psi / 1034 kPa / 10.3 bar (standard)
- 3000 psi / 20,700 kPa / 206.8 bar (high collapse)

W322 Specification Illustrations

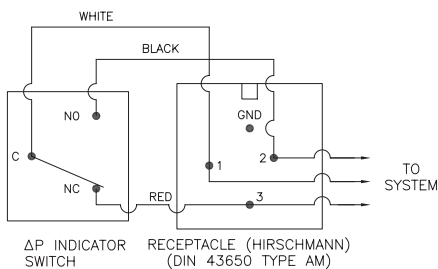
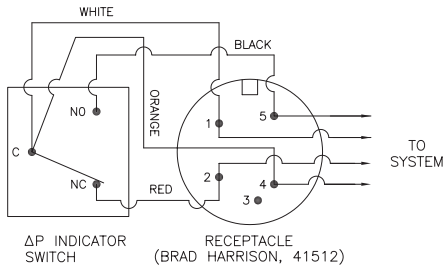
All dimensions are shown in millimeters [inches].

Indicator Switch Schematic Wiring Diagram Aluminum Electrical Housings



Note: The female plug (connector) is to be furnished by customer.

Plastic Electrical Housings



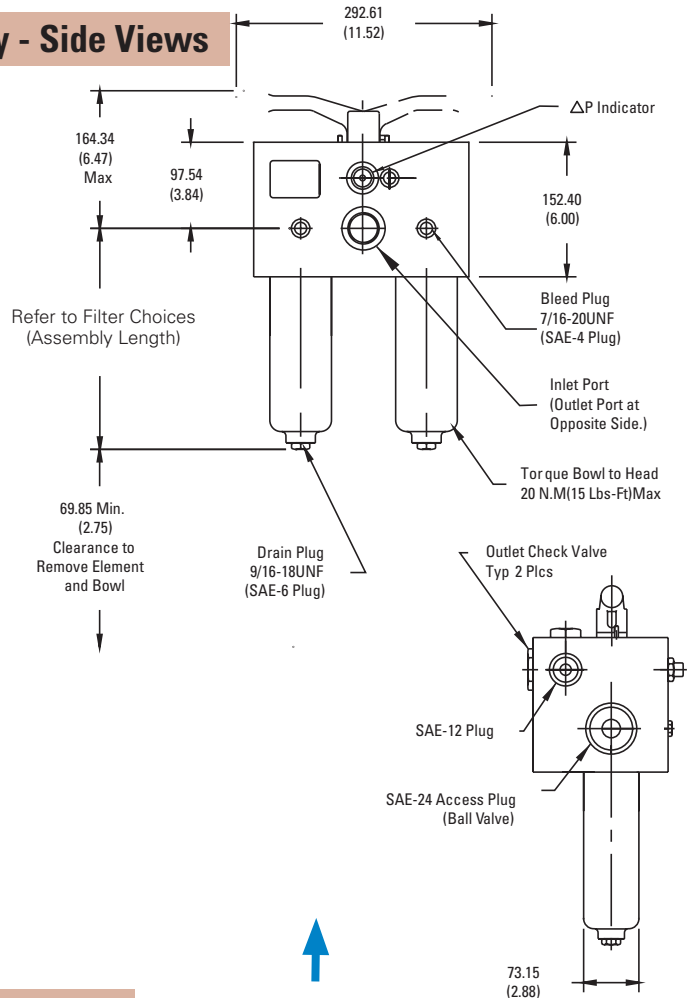
Note: The female plug (connector) is to be furnished by customer.

Differential Indicators: Indicators are designed to actuate at approximately 80% of bypass valve cracking pressure. It is recommended that an indicator with a bypass setting of 100 psid is used with a non-bypass housing.

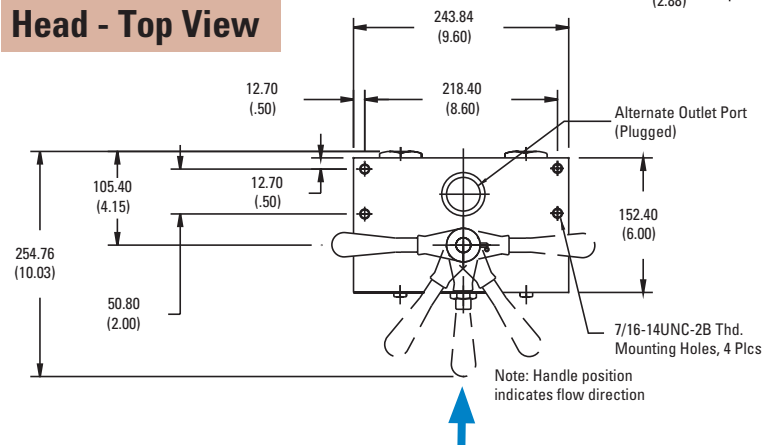
Surge Control: This optional feature is used to dampen pressure surges or spikes to avoid premature actuation of the indicator. Surge control delays the indicator response.

Thermal Lockout: The Thermal Lockout prevents premature signaling of a bypass condition created by viscous fluid during cold start-ups. Normal indicator actuation capability is resumed once the operating temperature of the fluid reaches approximately 80°F / 27°C.

Assembly - Side Views



Head - Top View





W322

Max Flow: 50 gpm (190 lpm)



W322 Components High-Performance DT Filter Choices

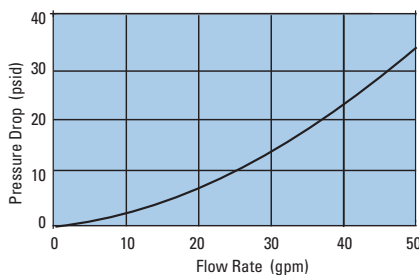
| Media Number | Beta _{w(c)} =1000 Rating | Length (in./mm) | Donaldson DT Part No. | Comments |
|--------------|-----------------------------------|-----------------|-----------------------|-------------------------------|
| 2 μm | <4 μm | 4.41/111.9 | P566391 | DT-9800-4-2UM |
| 5 μm | 5 μm | 4.41/111.9 | P566392 | DT-9800-4-5UM |
| 8 μm | 8 μm | 4.41/111.9 | P566393 | DT-9800-4-8UM |
| 14 μm | 14 μm | 4.41/111.9 | P566394 | DT-9800-4-14UM |
| 25 μm | 25 μm | 4.41/111.9 | P566395 | DT-9800-4-25UM |
| 2 μm | <4 μm | 8.28/210.3 | P566396 | DT-9800-8-2UM |
| 5 μm | 5 μm | 8.28/210.3 | P566397 | DT-9800-8-5UM |
| 8 μm | 8 μm | 8.28/210.3 | P566398 | DT-9800-8-8UM |
| 14 μm | 14 μm | 8.28/210.3 | P566399 | DT-9800-8-14UM |
| 25 μm | 25 μm | 8.28/210.3 | P566400 | DT-9800-8-25UM |
| 5 μm | 5 μm | 4.46/113.2 | P566406 | DT-9801-4-5UM, High collapse |
| 14 μm | 14 μm | 4.46/113.2 | P566407 | DT-9801-4-14UM, High collapse |
| 5 μm | 5 μm | 8.16/207.2 | P566408 | DT-9801-8-5UM, High collapse |
| 14 μm | 14 μm | 8.16/207.2 | P566409 | DT-9801-8-14UM, High collapse |

Filter Notes

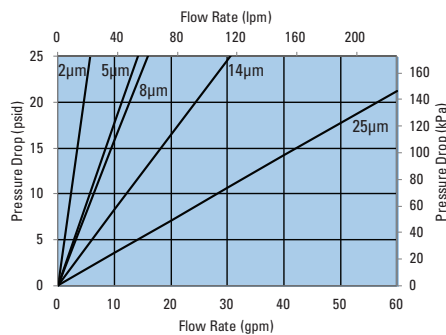
- All Donaldson DT filters utilize glass fiber media with an epoxy-based resin system for the ultimate in chemical compatibility.
- All Donaldson DT filters are potted with epoxy-based adhesives.
- Standard collapse DT designs are double wire-backed using epoxy-coated steel mesh for maximum pleat support and dirt capacity.
- High collapse designs are double wire-backed using stainless steel mesh.
- High collapse designs are also potted into machined aluminum endcaps for greater filter integrity in critical applications.
- Viton® seals are standard on all Donaldson DT filters. Viton® is a registered trademark of E. I. DuPont de Nemours and Company.

Performance Data

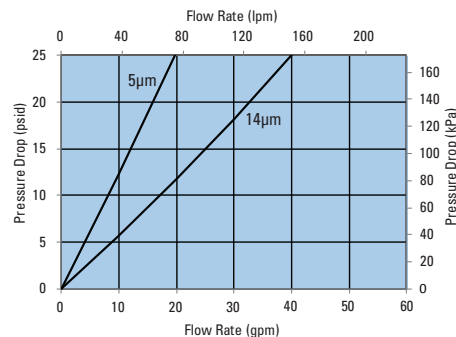
W322 Housing Only



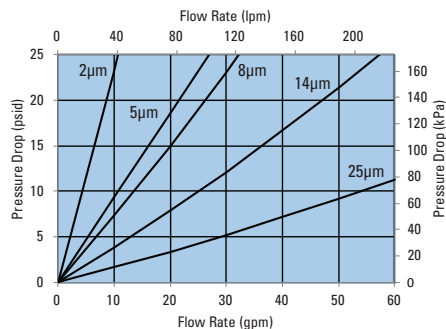
W322 4" DT Filter Only
DT-9800-4, 4"/102mm



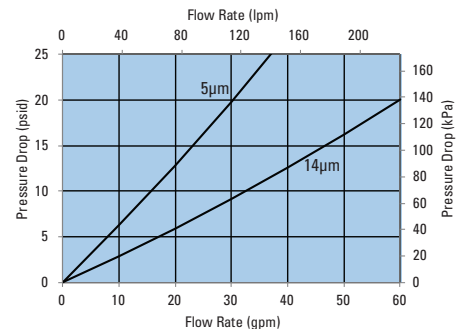
W322 4" DT Filter Only
DT-9801-4, 4"/102mm



W322 8" DT Filter Only
DT-9800-8, 8"/203mm



W322 8" DT Filter Only
DT-9801-8, 8"/203mm





Housing Ordering Guide

| | | | | | | | |
|-----------------|-----------------|--------------|--------------|--------------|------------------|--------------|--------------|
| Filter Assembly | W322 TABLE 1 | 1 TABLE 2 | B TABLE 3 | 4 TABLE 4 | D N TABLE 5 | B TABLE 6 | 2 TABLE 7 |
|-----------------|-----------------|--------------|--------------|--------------|------------------|--------------|--------------|

Service Filter
Filters ordered separately. See previous page for filter options.

LEAD TIME NOTE:

This product is configured with the specifications and features of your choice. Please contact your Donaldson sales representative for lead time details.

Table 1

| Filter Assembly | |
|-----------------|-------------|
| CODE | DESCRIPTION |
| W322 | Assembly |

Table 2

| Filter Collapse Options | |
|-------------------------|--|
| CODE | DESCRIPTION |
| 1 | 150 psid for housing w/bypass valve |
| 4 | 3000 psid for housing without bypass valve |

Table 3

| Port Size Options | |
|-------------------|---------------|
| CODE | PORT SIZE |
| B | SAE-16 O-ring |

Table 4

| Bypass Setting Options | |
|------------------------|----------------|
| CODE | BYPASS SETTING |
| 1 | Non-bypass |
| 4 | 50 psid |
| 6 | 90 psid |

*Note: Use option 1 code only with 3000 psid collapse filter.

Table 5 (Primary)

| Indicator Style and Setting | |
|-----------------------------|---|
| CODE | ΔP INDICATOR STYLE & SETTING |
| A | Visual indicator 70 psid w/TL and surge |
| B | Electrical/visual 70 psid w/TL and surge |
| D | Electrical/visual 35 psid |
| E | Electrical/visual 100 psid |
| G | Electrical/visual 35 psid w/TL |
| I | Visual indicator 70 psid |
| J | ΔP indicator plug |
| L | Visual indicator 35 psid |
| M | Visual indicator 35 psid w/TL and surge |
| N | Electrical/visual 35 psid w/12" 3-wire flying lead |
| O | Visual indicator 100 psid |
| P | Visual indicator 100 psid w/TL and surge |
| R | Electrical switch 35 psid |
| S | Electrical/visual 100 psid w/12" 3-wire flying lead |
| T | Electrical switch 100 psid |
| U | Electrical switch 70 psid |
| V | Electrical/visual 70 psid w/TL |
| W | Electrical/visual 100 psid w/TL |
| Y | Electrical/visual 35 psid w/TL and surge |
| Z | Electrical/visual 100 psid w/TL and surge |

TL (thermal lockout)

Table 5 (Secondary)

| Receptacle Options | |
|--------------------|-------------------------------|
| CODE | ELECTRICAL STYLE |
| B | Brad Harrison® (5-pin) |
| H | Hirschmann® (4-pin) |
| N | None, for visual ΔP indicator |

Table 6

| Seal Options | |
|--------------|----------|
| CODE | MATERIAL |
| B | Buna-N® |
| V | Viton® |

Table 7

| Assembly & Filter Length | |
|--------------------------|---------------|
| CODE (LGTH) | FILTER LENGTH |
| 1 (6.88") | 4.0" |
| 2 (9.86") | 8.00" |

METRIC PORTING AVAILABLE

Change W322 to G322
Porting code B becomes 1"
ISO 228 BSPP

Media Ratings

Western Filter elements have been replaced by Donaldson DT high-performance cartridges.

| WESTERN MEDIA CODE | DONALDSON DT MEDIA |
|--------------------|--------------------|
| 01 | DT 2 μ m |
| 03 | DT 5 μ m |
| 05 | DT 8 μ m |
| 10 | DT 14 μ m |
| 20 | DT 25 μ m |

For a complete filter interchange, visit crossreference.donaldson.com.

Brad Harrison® is a registered trademark of Woodhead Industries, Inc.
Hirschmann® is a registered trademark of Richard Hirschmann of America Inc.
Buna-N® and Viton® are registered trademarks of E. I. DuPont de Nemours and Co.



W350

Max Flow: 50 gpm (190 lpm)

W350 In-Line Cartridge Filters

Working Pressures to: 3000 *psi*
21,000 kPa
210 bar

Rated Static Burst to: 7500 *psi*
51,700 kPa
517 bar

Fatigue Pressure Rating: 1500 *psi*
10,000 kPa
100 bar

Flow Range to: 50 *gpm*
190 *lpm*



Features

The W350 T-type ported series offers flows to 50 gpm (190 lpm) with 3 bypass options and conforms to the HF3 automotive standard. Our standard housing drain plug helps relieve system pressure during filter changeouts. DT 4-layer media is offered in a variety of designs. Five different media grades are offered. Donaldson filters core collapse options range from 150 to 3,000 psi (10 to 210 bar). The differential pressure indicator line is designed to work with the wide assortment of bypass valves. Thermal lockout and surge control are two key features available in the differential indicators.

- Conforms to HF3 specifications
- High collapse filter available for use with non-bypass applications
- Wide range of indicator options
- Two housing length options for design flexibility
- Head material: cast iron
- Housing material: steel
- Drain plug in housing
- Bleed plug in head

Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- SAE-12, -16 O-ring

Assembly Weight

- 4": 20 lbs / 9.07 kg
- 8": 26 lbs / 11.79 kg

Replacement Filter Lengths

- 4.59" / 116.7mm
- 8.22" / 208.8mm

Standard Bypass Ratings

- 90 psi / 621 kPa / 6.2 bar
- 50 psi / 345 kPa / 3.5 bar
- No Bypass

Operating Temperatures

- -20° to 250°F (-29° to 121°C)

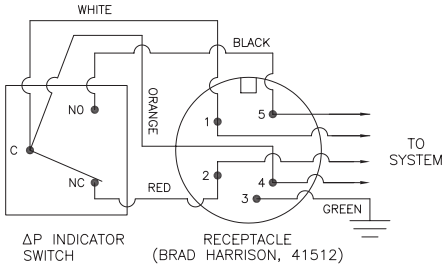
Filter Collapse Ratings

- 150 psi / 1034 kPa / 10.3 bar (standard)
- 3000 psi / 20,700 kPa / 206.8 bar (high collapse)

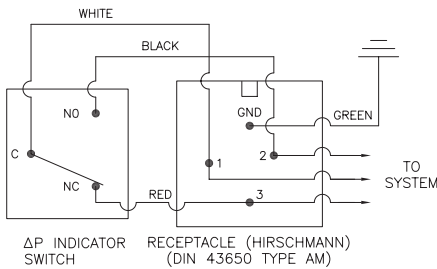
W350 Specification Illustrations

All dimensions are shown in millimeters [inches].

Indicator Switch Schematic Wiring Diagram Aluminum Electrical Housings



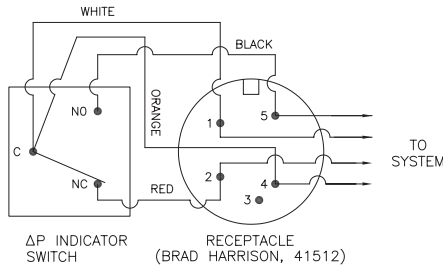
ΔP INDICATOR SWITCH RECEPTACLE (BRAD HARRISON, 41512)



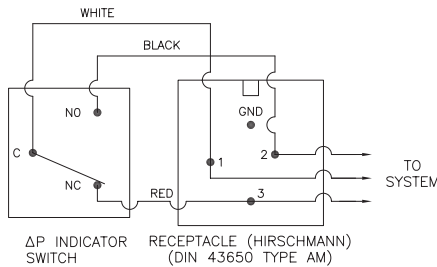
ΔP INDICATOR SWITCH RECEPTACLE (HIRSCHMANN) (DIN 43650 TYPE AM)

Note: The female plug (connector) is to be furnished by customer.

Plastic Electrical Housings



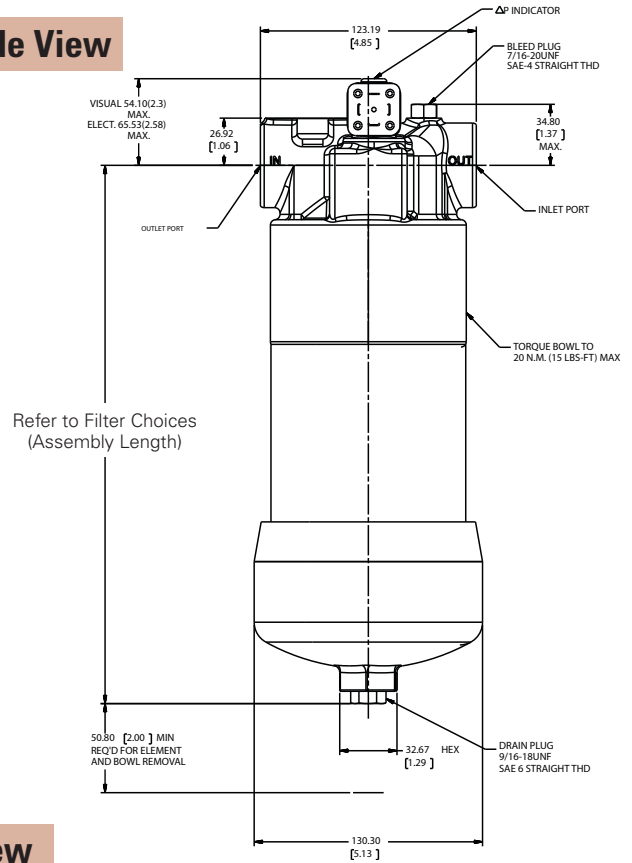
ΔP INDICATOR SWITCH RECEPTACLE (BRAD HARRISON, 41512)



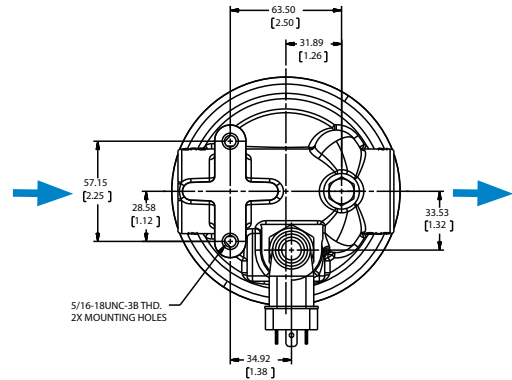
ΔP INDICATOR SWITCH RECEPTACLE (HIRSCHMANN) (DIN 43650 TYPE AM)

Note: The female plug (connector) is to be furnished by customer.

Assembly - Side View



Head - Top View



Differential Indicators:

Indicators are designed to actuate at approximately 80% of bypass valve cracking pressure. It is recommended that an indicator with a bypass setting of 100 psid is used with a non-bypass housing.

Surge Control:

This optional feature is used to dampen pressure surges or spikes to avoid premature actuation of the indicator. Surge control delays the indicator response.

Thermal Lockout:

The Thermal Lockout prevents premature signaling of a bypass condition created by viscous fluid during cold start-ups. Normal indicator actuation capability is resumed once the operating temperature of the fluid reaches approximately 80°F / 27°C.



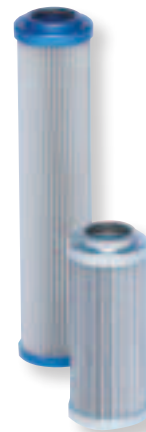
W350
Max Flow: 50 gpm (190 lpm)



W350 Components

High-Performance DT Filter Choices

| Media Number | Beta _{x(c)} =1000 Rating | Length (in./mm) | Donaldson DT Part No. | Comments |
|--------------|-----------------------------------|-----------------|-----------------------|--------------------------------|
| 2 μm | <4 μm | 4/116.7 | P566204 | DT-9600-4-2UM |
| 5 μm | 5 μm | 4/116.7 | P566205 | DT-9600-4-5UM |
| 8 μm | 8 μm | 4/116.7 | P566206 | DT-9600-4-8UM |
| 14 μm | 14 μm | 4/116.7 | P566207 | DT-9600-4-14UM |
| 25 μm | 25 μm | 4/116.7 | P566208 | DT-9600-4-25UM |
| 5 μm | 5 μm | 4/116 | P566364 | DT-9601-4-5UM, High collapse |
| 14 μm | 14 μm | 4/116 | P566365 | DT-9601-4-14UM, High collapse |
| 2 μm | <4 μm | 8/208.8 | P566209 | DT-9600-8-2UM |
| 5 μm | 5 μm | 8/208.8 | P566210 | DT-9600-8-5UM |
| 8 μm | 8 μm | 8/208.8 | P566211 | DT-9600-8-8UM |
| 14 μm | 14 μm | 8/208.8 | P566212 | DT-9600-8-14UM |
| 25 μm | 25 μm | 8/208.8 | P566213 | DT-9600-8-25UM |
| 5 μm | 5 μm | 8/208 | P566366 | DT-9601-8-5UM, High collapse |
| 14 μm | 14 μm | 8/208 | P566367 | DT-9601-8-14UM, High collapse |
| 2 μm | <4 μm | 8/209 | P567875 | DX2-9600-8-2UM |
| 5 μm | 5 μm | 8/209 | P565122 | DX2-9600-8-5UM |
| 8 μm | 8 μm | 8/209 | P565123 | DX2-9600-8-8UM |
| 14 μm | 14 μm | 8/209 | P564936 | DX2-9600-8-14UM |
| WA | B>30 _(c) = 200 | 8/209 | P569528 | Absorbs 130 ml water @ 25 psid |

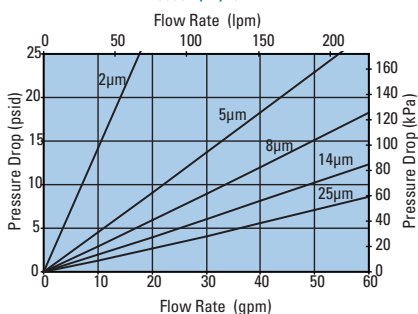


Filter Notes

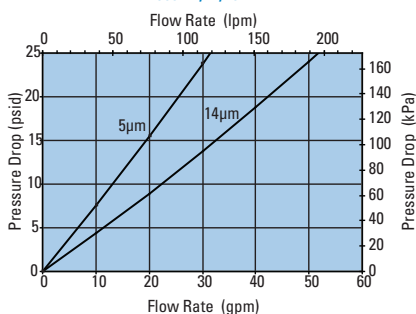
- All Donaldson DT and DX2 filters utilize glass fiber media with an epoxy-based resin system for the ultimate in chemical compatibility.
- All Donaldson DT and DX2 filters are potted with epoxy-based adhesives.
- Standard collapse DT designs are double wire-backed using epoxy-coated steel mesh for maximum pleat support and dirt capacity.
- High collapse designs are double wire-backed using stainless steel mesh.
- High collapse designs are also potted into machined aluminum endcaps for greater filter integrity in critical applications.
- Viton® seals are standard on all Donaldson DT and DX2 filters. Viton® is a registered trademark of E. I. DuPont de Nemours and Company.
- DX2 filters utilize nylon mesh for pleat support.

Performance Data

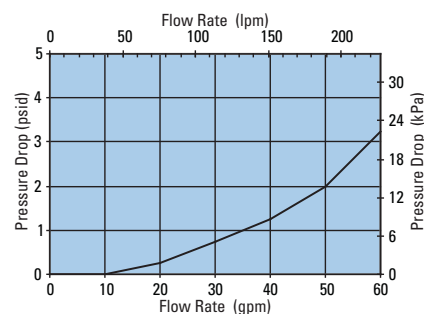
W350 4" DT Filter Only
DT-9600-4, 4"/102mm



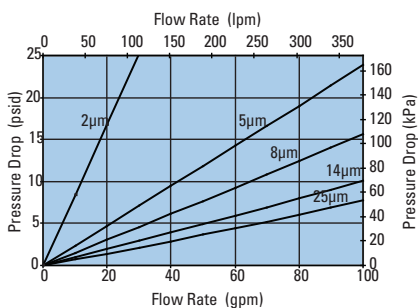
W350 4" DT Filter Only
DT-9601-4, 4"/102mm



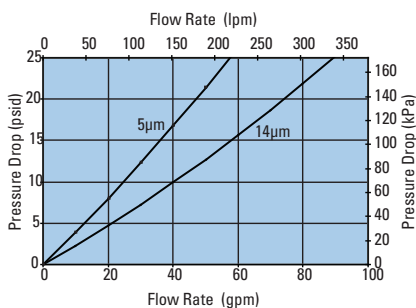
W350 Housing Only



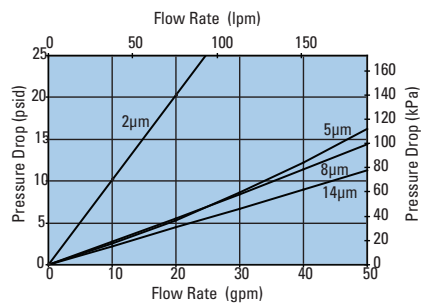
W350 8" DT Filter Only
DT-9600-8, 8"/203mm



W350 8" DT Filter Only
DT-9601-8, 8"/203mm



W350 8" DT Filter Only
DX2-9600-8, 8"/203mm





Housing Ordering Guide

| | | | | | | | |
|-----------------|-----------------|--------------|--------------|--------------|----------------|--------------|--------------|
| Filter Assembly | W350 TABLE 1 | 1 TABLE 2 | B TABLE 3 | 1 TABLE 4 | J N TABLE 5 | B TABLE 6 | 1 TABLE 7 |
|-----------------|-----------------|--------------|--------------|--------------|----------------|--------------|--------------|

Service Filter: Filters ordered separately. See previous page for filter options.

LEAD TIME NOTE:
This product is configured with the specifications and features of your choice. Please contact your Donaldson sales representative for lead time details.

Table 1

| Filter Assembly | |
|-----------------|-------------|
| CODE | DESCRIPTION |
| W350 | Assembly |

Table 2

| Filter Collapse Options | |
|-------------------------|---------------------------------------|
| CODE | DESCRIPTION |
| 1 | 150 psid for housing w/bypass valve |
| 4 | 3000 psi for housing w/o bypass valve |

Table 3

| Port Size Options | |
|-------------------|---------------|
| CODE | PORT SIZE |
| A | SAE-12 O-ring |
| B | SAE-16 O-ring |

Table 4

| Bypass Setting Options | |
|------------------------|----------------|
| CODE | BYPASS SETTING |
| 1 | Non-bypass |
| 3 | 25 psid |
| 4 | 50 psid |
| 6 | 90 psid |

Note: Use option 1 code only with 3000 psid collapse filter.

Table 5 (Primary)

| Indicator Style and Setting | |
|-----------------------------|---|
| CODE | ΔP INDICATOR STYLE & SETTING |
| A | Visual indicator 70 psid w/TL & surge |
| B | Electrical/visual 70 psid w/TL and surge |
| C | Electrical/visual 15 psid |
| D | Electrical/visual 35 psid |
| E | Electrical/visual 100 psid |
| F | Electrical/visual 15 psid w/TL |
| G | Electrical/visual 35 psid w/TL |
| H | Electrical/visual 15 psid w/12" 3-wire flying lead |
| I | Visual indicator 70 psid |
| J | ΔP indicator plug |
| K | Visual indicator 15 psid |
| L | Visual indicator 35 psid |
| M | Visual indicator 35 psid w/ TL and surge |
| N | Electrical/visual 35 psid w/12" 3-wire flying lead |
| O | Visual indicator 100 psid |
| P | Visual indicator 100 psid w/TL and surge |
| Q | Electrical switch 15 psid |
| R | Electrical switch 35 psid |
| S | Electrical/visual 100 psid w/12" 3-wire flying lead |
| T | Electrical switch 100 psid |
| U | Electrical switch 70 psid |
| W | Electrical/visual 100 psid w/TL |
| X | Electrical/visual 15 psid w/TL and surge |
| Y | Electrical/visual 35 psid w/TL and surge |
| Z | Electrical/visual 100 psid w/TL and surge |

TL (thermal lockout)

Table 5 (Secondary)

| Receptacle Options | |
|--------------------|-------------------------------|
| CODE | ELECTRICAL STYLE |
| B | Brad Harrison® (5-pin) |
| H | Hirschmann® (4-pin) |
| N | None, for visual ΔP indicator |

Table 6

| Seal Options | |
|--------------|----------|
| CODE | MATERIAL |
| B | Buna-N® |
| E | E.P.R. |
| V | Viton® |

Table 7

| Assembly & Filter Length | |
|--------------------------|---------------|
| CODE (LENGTH) | FILTER LENGTH |
| 1 (8.5") | 4.0" |
| 2 (12.0") | 8.0" |

METRIC PORTING AVAILABLE

Change W350 to G350
Porting code B becomes G-1"
ISO 228 BSPP

Media Ratings

Western Filter elements have been replaced by Donaldson DT high-performance cartridges.

| WESTERN MEDIA CODE | DONALDSON DT MEDIA |
|--------------------|--------------------|
| 01 | DT 2 μ m |
| 03 | DT 5 μ m |
| 05 | DT 8 μ m |
| 10 | DT 14 μ m |
| 20 | DT 25 μ m |

For a complete filter interchange, visit crossreference.donaldson.com.

Brad Harrison® is a registered trademark of Woodhead Industries, Inc.
Hirschmann® is a registered trademark of Richard Hirschmann of America Inc.
Buna-N® and Viton® are registered trademarks of E. I. DuPont de Nemours and Co.



HPK03

Max Flow: 60 gpm (227 lpm)



HPK03 In-Line Cartridge Filters

Working Pressures to: 3000 *psi*
20,700 kPa
206.9 bar

Rated Static Burst to: 6000 *psi*
41,400 kPa
413.8 bar

Flow Range to: 60 *gpm*
227 *lpm*



Features

The sturdy HPK03 filter is constructed of ductile iron for durability in high pressure applications. Standard housing drain plug means simplified servicing. Housing includes a fluoroelastomer head-to-housing seal. Meets HF3 specification.

Take advantage of our mix and match system of in-stock heads and cartridges—so you can get exactly what you need. HPK03 is available with your choice of visual or AC/DC electrical indicators. Likewise, choose the bypass option that's right for your application—50 psi (3.5 bar) or no bypass. Seals made of fluorocarbon (such as Viton® and Fluorel®) or Buna-N are available with HPK03.

All HPK03 filters contain Synteq™, our synthetic filter media designed especially for hydraulic filtration. Upgraded Donaldson DT filters are also offered for superior performance.

Viton® is a registered trademark of E. I. DuPont de Nemours and Company.
Fluorel® is a registered trademark of 3M Company.

Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- SAE-12, -16 O-ring

Assembly Weight

- 26 lbs / 11.8 kg

Replacement Filter Lengths

- 8.22" / 208.8mm

Standard Bypass Ratings

- 50 *psi* / 345 kPa / 3.5 bar
- No Bypass

Operating Temperatures

- -20°F to 250°F / -29°C to 121°C

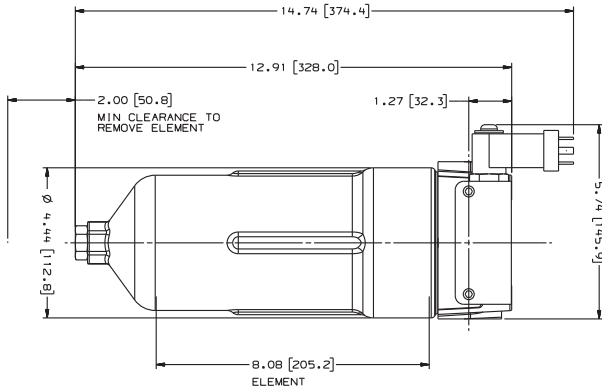
Filter Collapse Ratings

- 200 *psi* / 1380 kPa / 13.8 bar (standard)
- 3000 *psi* / 20,700 kPa / 206.9 bar (high collapse)

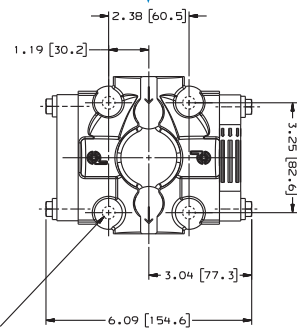
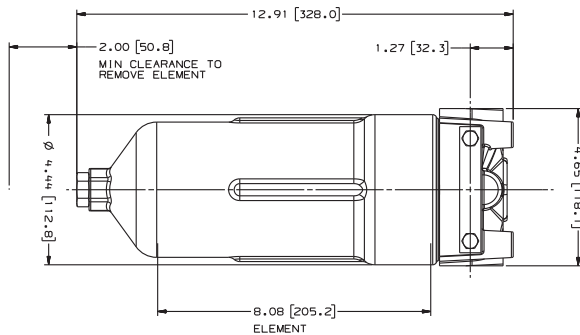
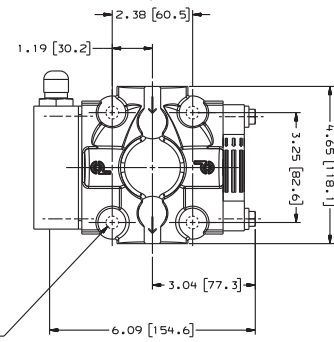
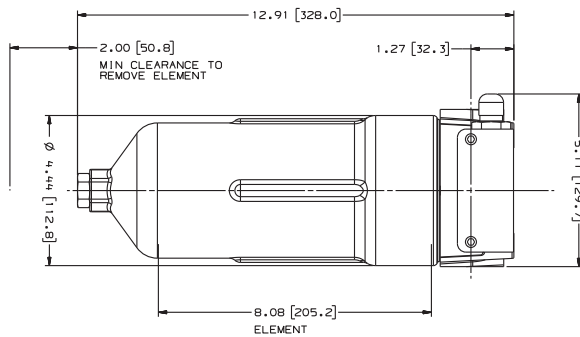
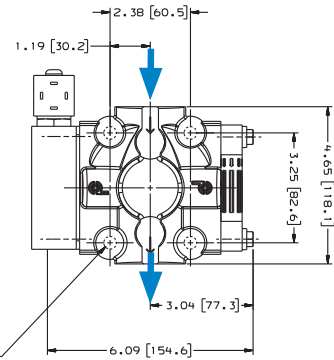
HPK03 Specification Illustrations

All dimensions are shown in inches [millimeters].

Assembly - Side View



Head - Top View





HPK03

Max Flow: 60 gpm (227 lpm)

HPK03 Components

Standard Filter Choices

| Media Number | B _{x(c)} = 1000 Rating | Part No. | Comments |
|--------------|---------------------------------|----------|--|
| No. 1 | 5 µm | P167842 | Buna-N® |
| No. 1 | 5 µm | P167185 | Viton® High Collapse for No Bypass applications. |
| No. 2 | 9 µm | P164594 | Buna-N |
| No. 2½ | 10 µm | P164166 | Buna-N |
| No. 2½ | 10 µm | P167186 | Viton High Collapse for No Bypass applications. |
| No. 9 | 23 µm | P164174 | Buna-N |
| No. 20 | >50 µm | P165319 | Buna-N |
| WA | B>30 _(c) = 200 | P569528 | Buna-N Absorbs 130 ml water @ 25 psid |
| No. 74 | 75 µm nominal | P162233 | Buna-N Seal Wire Mesh Media |

Filter Notes

- SEALS: Filters with seals made of Buna-N® are appropriate for most applications involving petroleum oil. Filters with seals made of Viton® (a fluoroelastomer) are required when using diester, phosphate ester fluids, water glycol, water/oil emulsions, and HWCF (high water content fluids) over 150°F/83°C.
- Refer to table in the Technical Reference Guide for fluid compatibility with our filter media.
- Donaldson high collapse filters are physically designed to withstand up to 3000 psi / 20,700 kPa before collapsing.
- The Viton® high collapse filter versions also use epoxy potting and media seam seals for added chemical compatibility.
- Viton® and Buna-N® registered trademarks of E. I. DuPont de Nemours and Company.



Housing Choices

| Length (in.) | Part No. |
|--------------|----------|
| 8" filter | P179579 |

The **P179579** housing is 10.73 inches (273mm) long and accepts the filter that is 8 inches (203mm) long. It includes a head-to-housing seal.

Head Choices

| Port Size | Bypass Rating | Indicators ¹ | Part No. |
|---------------|------------------|-----------------------------|----------|
| SAE-16 O-Ring | 50 psi / 3.5 bar | Visual indicator, left side | P166353 |
| SAE-12 O-Ring | 50 psi / 3.5 bar | Visual indicator, left side | P170489 |
| SAE-12 O-Ring | No bypass | Visual indicator, left side | P170491 |

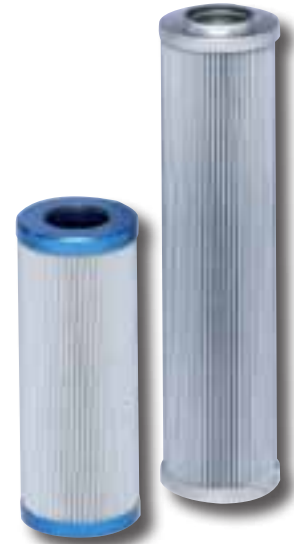
Notes

¹ Donaldson uses the inlet port as the reference point. "Left side," for instance, means that the indicator mounts on the side of the filter head that is on your left when you face the inlet port.



High-Performance DT Filter Choices

| Media Number | Beta ₁₀₀₀ Rating | Length (in./mm) | Donaldson DT Part No. | Comments |
|--------------|-----------------------------|-----------------|-----------------------|-------------------------------|
| 2 µm | <4 µm | 8.22/208.8 | P566209 | DT-9600-8-2UM |
| 5 µm | 5 µm | 8.22/208.8 | P566210 | DT-9600-8-5UM |
| 8 µm | 8 µm | 8.22/208.8 | P566211 | DT-9600-8-8UM |
| 14 µm | 14 µm | 8.22/208.8 | P566212 | DT-9600-8-14UM |
| 25 µm | 25 µm | 8.22/208.8 | P566213 | DT-9600-8-25UM |
| 5 µm | 5 µm | 8.22/208.8 | P566366 | DT-9601-8-5UM, High collapse |
| 14 µm | 14 µm | 8.22/208.8 | P566367 | DT-9601-8-14UM, High collapse |
| 2 µm | <4 µm | 8.22/208.8 | P567875 | DX2-9600-8-2UM |
| 5 µm | 5 µm | 8.22/208.8 | P565122 | DX2-9600-8-5UM |
| 8 µm | 8 µm | 8.22/208.8 | P565123 | DX2-9600-8-8UM |
| 14 µm | 14 µm | 8.22/208.8 | P564936 | DX2-9600-8-14UM |



Filter Notes

- All Donaldson DT and DX2 filters utilize glass fiber media with an epoxy-based resin system for the ultimate in chemical compatibility.
- All Donaldson DT and DX2 filters are potted with epoxy-based adhesives.
- Standard collapse DT designs are double wire-backed using epoxy-coated steel mesh for maximum pleat support and dirt capacity.
- High collapse designs are double wire-backed using stainless steel mesh.
- High collapse designs are also potted into machined aluminum endcaps for greater filter integrity in critical applications.
- Viton® seals are standard on all Donaldson DT and DX2 filters. Viton® is a registered trademark of E. I. DuPont de Nemours and Company.
- DX2 filters utilize nylon mesh for pleat support.

Service Indicator Options

Visual Service Indicators

| Part No. | Use with Bypass Valve Pressure of: | Description |
|----------|------------------------------------|--|
| P569632 | 50 psi / 3.5 bar | 35 psi/2.4 bar indicator kit* auto reset pop-out button |
| P569633 | 90 psi / 6.2 bar | 70 psi/4.8 bar indicator kit* auto reset pop-out button |
| P567988 | 50 psi / 3.5 bar | 35 psi/2.4 bar indicator kit* auto reset pop-out button with thermal lockout and surge control |
| P567989 | 90 psi / 6.2 bar | 70 psi/4.8 bar indicator kit* auto reset pop-out button with thermal lockout and surge control |

AC/DC Visual/Electrical Service Indicators

| Part No. | Use with Bypass Valve Pressure of: | Description |
|----------|------------------------------------|--|
| P569634 | 50 psi / 3.5 bar | 35 psi/2.4 bar indicator kit* Hirschmann receptacle 115 VAC/28 VDC, 2 amps |
| P569635 | 90 psi / 6.2 bar | 70 psi/4.8 bar indicator kit* Hirschmann receptacle 115 VAC/28 VDC, 2 amps |
| P567986 | 50 psi / 3.5 bar | 35 psi/2.4 bar indicator kit* with thermal lockout and surge control, Hirschmann receptacle, 115 VAC/28 VDC, 2 amps, 4 pin DIN 43650 |
| P567987 | 90 psi / 6.2 bar | 70 psi/4.8 bar indicator kit* with thermal lockout and surge control, Hirschmann receptacle, 115 VAC/28 VDC, 2 amps, 4 pin DIN 43650 |

* Note: Above choices include indicator and mounting block.

Indicator Service Parts

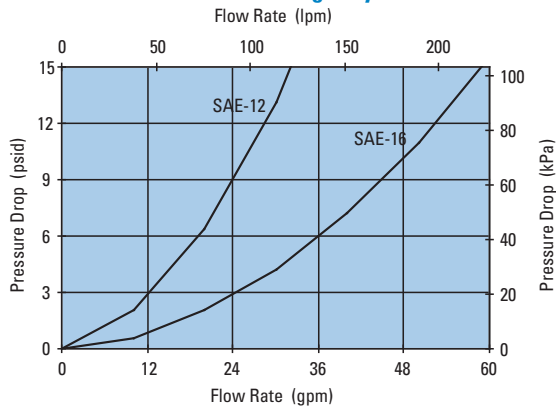
Replacement Indicators Only

| Part No. | Description |
|----------|---|
| P567458 | Visual/Electrical indicator with thermal lockout and surge, 35 psid/2.4 bar |
| P567459 | Visual/Electrical indicator, with thermal lockout and surge 70 psid/4.8 bar |
| P567456 | Pop-Up Visual Indicator, with thermal lockout and surge 35 psid/2.4 bar |
| P567457 | Pop-Up Visual Indicator, with thermal lockout and surge 70 psid/4.8 bar |
| P569636 | Pop-Up Visual Indicator, 35 psid/2.4 bar |
| P569637 | Pop-Up Visual Indicator, 70 psid/4.8 bar |
| P569638 | Visual/Electrical Indicator, 35 psid/2.4 bar |
| P569639 | Visual/Electrical Indicator, 70 psid/4.8 bar |
| P164315 | Visual Indicator, bar style, 35 psid/2.4 bar |
| P166603 | Visual Indicator, bar style, 70 psid/4.8 bar |
| P166134 | Blanking plate |

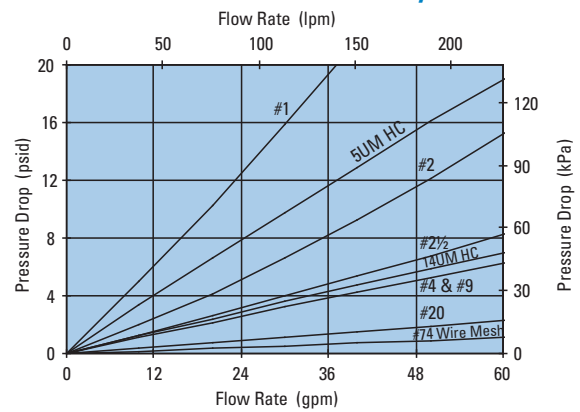


Performance Data

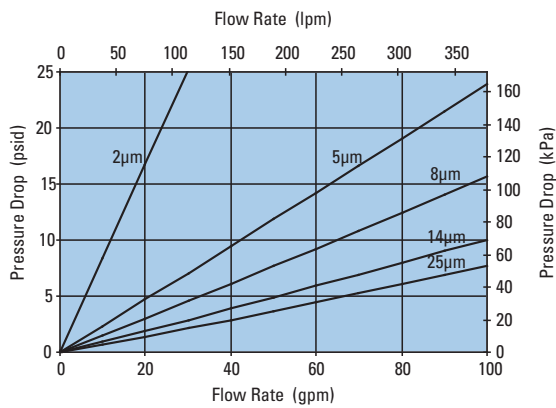
HPK03 Housing Only



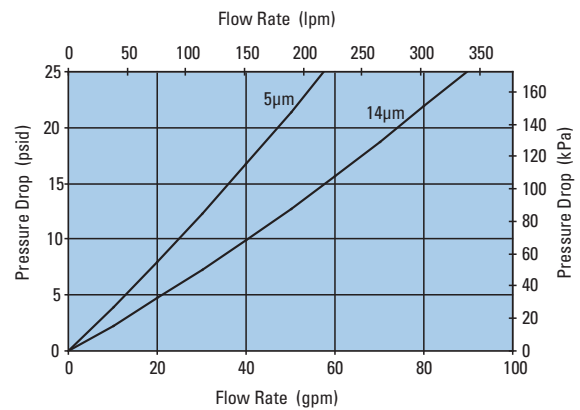
HPK03 8" Standard Filter Only



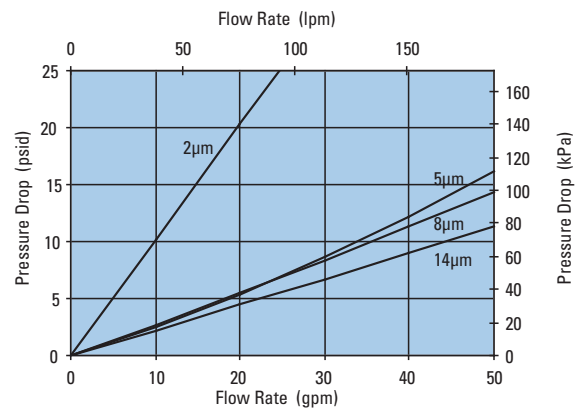
HPK03 8" DT Filter Only
DT-9600-8, 8.22"/208.8mm



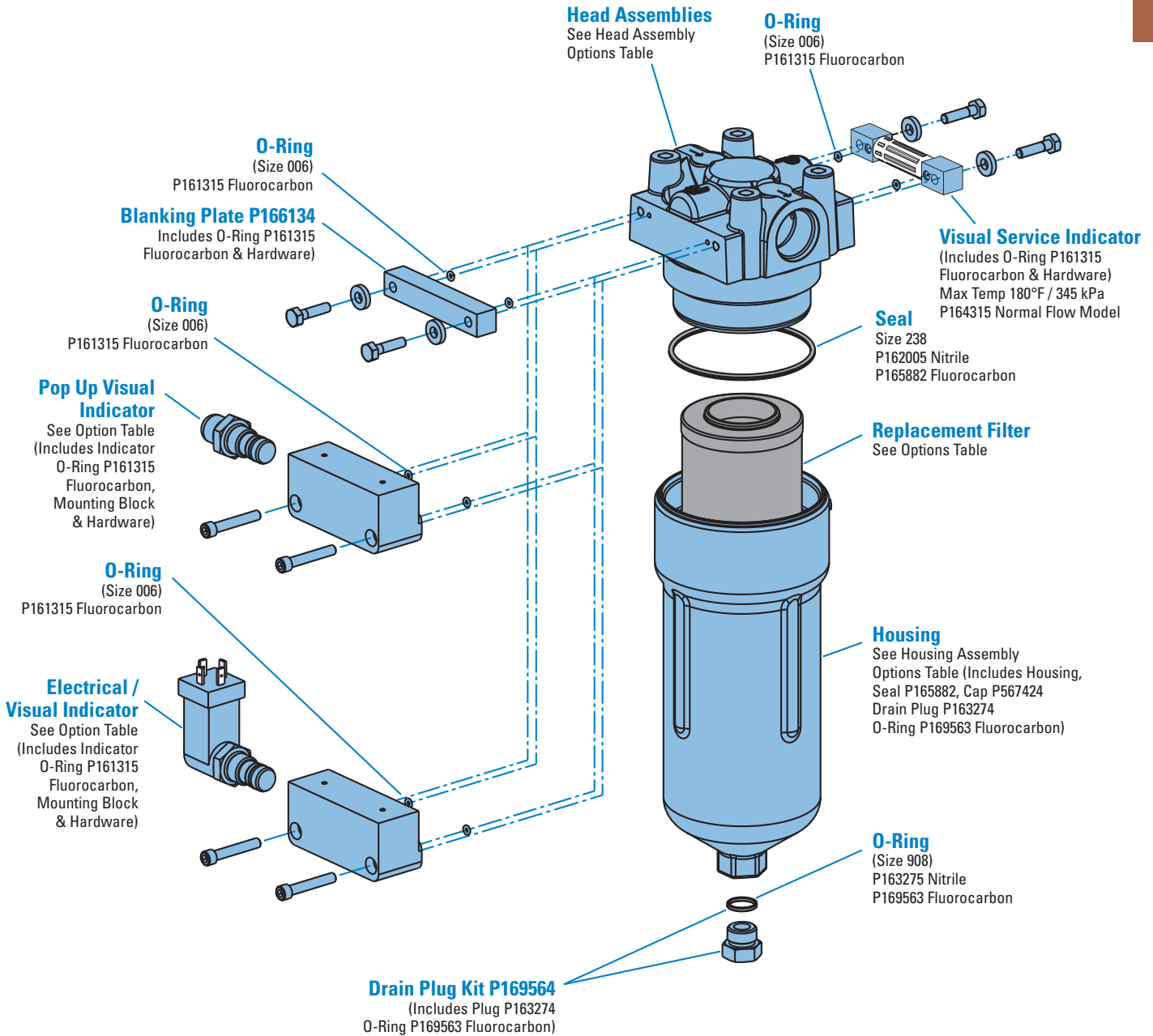
HPK03 8" DT Filter Only
DT-9601-8, 8.22"/208.8mm



W350 8" DX2 Filter Only
DX2-9600-8, 8.22"/208.8mm



HPK03 Service Parts





FPK04

Max Flow: 100 gpm (379 lpm)

FPK04 In-Line Cartridge Filters

Working Pressures to: 4350 *psi*
30,000 *kPa*
300 *bar*

Rated Static Burst to: 9135 *psi*
69,300 *kPa*
6930 *bar*

Flow Range to: 100 *gpm*
379 *lpm*



Features

The FPK04 T-type ported series offers flows to 100 gpm (379 lpm) with a bypass option and conforms to the HF3 automotive standard.

Donaldson Synteq™ media is offered in a variety of designs. Upgraded Donaldson high-performance DT filters are also offered for superior performance. The differential pressure indicator line is designed to work with the bypass valve options.

- Conforms to HF3 specifications
- High collapse filters available for use with non-bypass applications
- Wide range of indicator options
- Three housing length options for design flexibility
- Buna-N® seals standard, Viton® available
- Head material: cast iron
- Housing material: steel

Viton® and Buna-N® are registered trademarks of E. I. DuPont de Nemours and Company.

Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- SAE-20 O-Ring

Assembly Weight

- 4": 26.4 lbs / 12.0 kg
- 8": 33 lbs / 15.0 kg
- 13": 33 lbs / 15.0 kg

Standard Replacement Filter Lengths

- 4.58" / 116.3mm
- 4.62" / 117.3mm
- 8.20" / 208.3mm
- 12.88" / 327.2mm
- 12.93" / 328.4mm

DT Replacement Filter Lengths

- 4.56" / 116mm
- 4.59" / 116.7mm
- 8.19" / 208mm
- 8.22" / 208.8mm
- 8.23" / 209mm
- 12.85" / 326.3mm
- 12.87" / 327mm
- 12.91" / 327.8mm

Standard Bypass Ratings

- No Bypass
- 87 psi / 600 kPa / 6.0 bar

Operating Temperatures

- -4° to 248°F (-20° to 120°C)

Filter Collapse Ratings

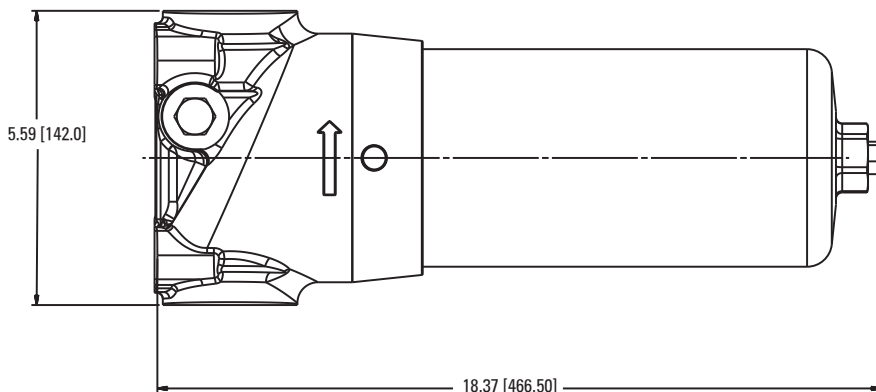
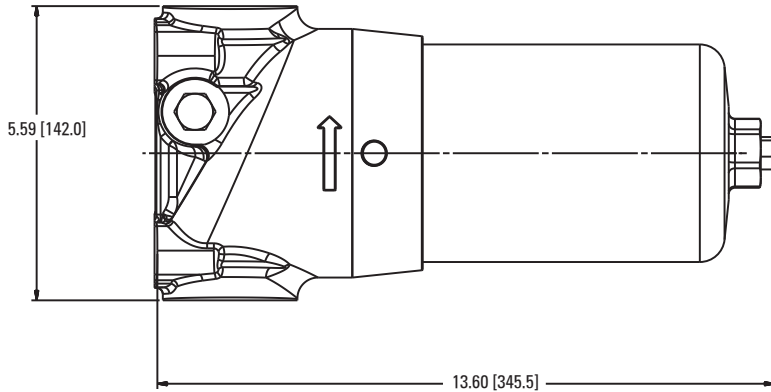
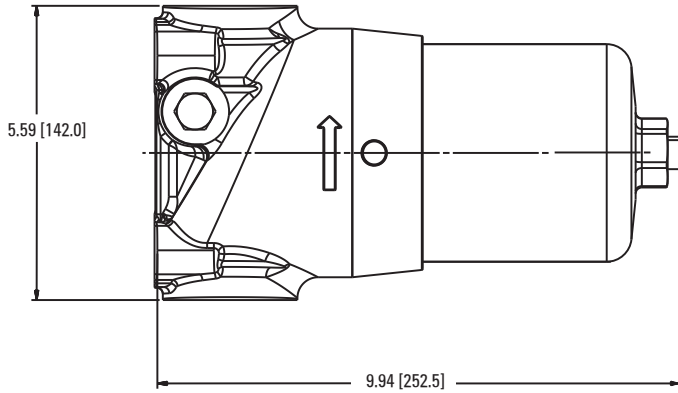
- 150 psi / 1034 kPa / 10.3 bar (standard)
- 3000 psi / 20,700 kPa / 206.8 bar (high collapse)

Buna-N® and Viton® are registered trademarks of E. I. DuPont de Nemours and Company.

FPK04 Specification Illustrations

All dimensions are shown in inches [millimeters].

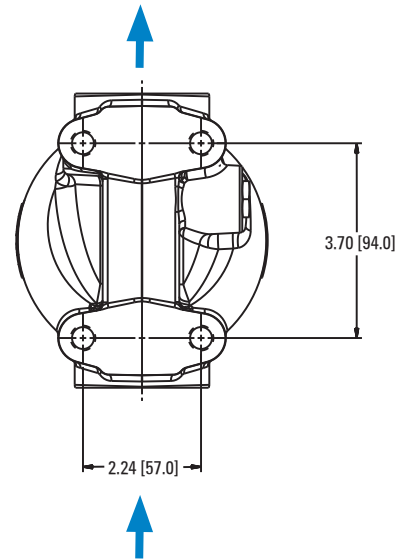
Assembly - Side View



Applications:

- High Pressure Circuits
- In-Plant & Mobile Equipment
- Servo Valve Circuits

Head - Top View





FPK04

Max Flow: 100 gpm (379 lpm)



HIGH PRESSURE FILTERS

FPK04 Components

Standard Filter Choices

| Media Number | Beta _(c) ₁₀₀₀ Rating | Part No. | Length (in./mm) | Series | Comments |
|--------------|--|----------|-----------------|--------|-----------------------------------|
| No. 1 | 5 µm | P169431 | 4.62/117.3 | 9600 | |
| 5 UM | 5 µm | P167184 | 4.58/116.3 | 9601 | Viton®, High collapse |
| No. 2 | 9 µm | P164592 | 4.62/117.3 | 9600 | |
| No. 2½ | 10 µm | P164164 | 4.62/117.3 | 9600 | |
| 14 UM | 14 µm | P167843 | 4.58/116.3 | 9601 | Viton®, High collapse |
| No. 9 | 23 µm | P164172 | 4.62/117.3 | 9600 | |
| No. 9 | 23 µm | P164368 | 4.62/117.3 | 9600 | Viton |
| No. 1 | 6 µm | P167842 | 8.20/208.3 | 9600 | Buna-N |
| 5 UM | 5 µm | P167185 | 8.20/208.3 | 9601 | Viton, High collapse |
| No. 2 | 9 µm | P164594 | 8.20/208.3 | 9600 | Buna-N |
| 14 UM | 14 µm | P167186 | 8.20/208.3 | 9601 | Viton, High collapse |
| No. 9 | 23 µm | P164174 | 8.20/208.3 | 9600 | Buna-N |
| No. 20 | >50 µm | P165319 | 8.20/208.3 | 9600 | Buna-N |
| No. 74 | 75 µm nom. | P162233 | 8.20/208.3 | 9600 | Buna-N, Wire mesh |
| No. 1 | 5 µm | P169432 | 12.93/328.4 | 9600 | Buna-N |
| 5 UM | 5 µm | P167411 | 12.88/327.2 | 9601 | Viton, High collapse |
| No. 2 | 9 µm | P164596 | 12.93/328.4 | 9600 | Buna-N |
| No. 2 | 9 µm | P166254 | 12.93/328.4 | 9600 | Viton |
| No. 2½ | 10 µm | P164168 | 12.93/328.4 | 9600 | Buna-N |
| 14 UM | 14 µm | P167412 | 12.88/327.2 | 9601 | Viton, High collapse |
| No. 4 | 10 µm | P166255 | 12.93/328.4 | 9600 | Viton |
| No. 9 | 23 µm | P164176 | 12.93/328.4 | 9600 | Buna-N |
| WA | B>30(c) = 200 | P569528 | 8.20/208.3 | 9600 | Absorbs 180 ml of water @ 25 psid |
| WA | B>30(c) = 200 | P569529 | 12.93/328.4 | 9600 | Absorbs 220 ml of water @ 25 psid |

Filter Notes

- Refer to the table in the Technical Reference Guide for fluid compatibility with our filter media.
- If you're filtering petroleum-based oil, filters with seals made of Buna-N are appropriate for most applications.
- If you're filtering diester, phosphate ester fluids, water glycol, water/oil emulsions, and HWCF over 150°F/83°C, use filters with seals made of fluorocarbon, such as Viton® from DuPont Dow Elastomers, or Fluorel® from 3M Company.
- Donaldson "high collapse" filters, with their steel end caps and wire-backed media, are rated to withstand up to 3000 psi/ 20,700 kPa before collapsing.
- The fluorocarbon seal/high collapse filters also use epoxy potting and media seam seals for added chemical compatibility.
- Viton® is a registered trademark of E. I. DuPont de Nemours and Company. Fluorel® is a registered trademark of 3M Company.

Head Choices

| Port Size | Bypass Rating | Indicators | Part No. |
|-----------|----------------|--------------|----------|
| SAE-20 | 87 psi / 6 bar | plugged only | P568720 |
| SAE-20 | No bypass | plugged only | P568721 |

Housing Choices

| Filter Length (in.) | Part No. |
|---------------------|----------|
| 4" | P568722 |
| 8" | P568723 |
| 13" | P568724 |

Indicator Choices

| Set Point / Type | Part No. |
|-------------------------|----------|
| 39 psi/2.7 bar ele N.O. | P165194 |
| 39 psi/2.7 bar ele N.C. | P167455 |

Notes

Housings include the head to housing seal.

High-Performance DT Filter Choices

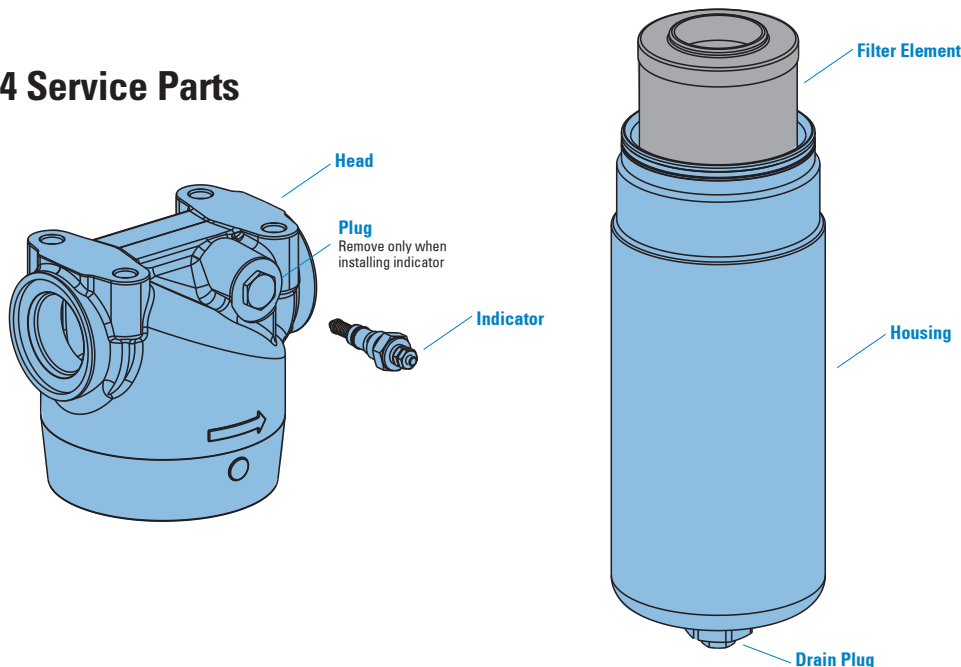
| Media Number | Beta _{v(c)} =1000 Rating | Length (in./mm) | Donaldson DT Part No. | Comments |
|--------------|-----------------------------------|-----------------|-----------------------|--------------------------------|
| 2 μm | <4 μm | 4.59/116.7 | P566204 | DT-9600-4-2UM |
| 5 μm | 5 μm | 4.59/116.7 | P566205 | DT-9600-4-5UM |
| 8 μm | 8 μm | 4.59/116.7 | P566206 | DT-9600-4-8UM |
| 14 μm | 14 μm | 4.59/116.7 | P566207 | DT-9600-4-14UM |
| 25 μm | 25 μm | 4.59/116.7 | P566208 | DT-9600-4-25UM |
| 5 μm | 5 μm | 4.56/116 | P566364 | DT-9601-4-5UM, High collapse |
| 14 μm | 14 μm | 4.56/116 | P566365 | DT-9601-4-14UM, High collapse |
| 2 μm | <4 μm | 8.22/208.8 | P566209 | DT-9600-8-2UM |
| 5 μm | 5 μm | 8.22/208.8 | P566210 | DT-9600-8-5UM |
| 8 μm | 8 μm | 8.22/208.8 | P566211 | DT-9600-8-8UM |
| 14 μm | 14 μm | 8.22/208.8 | P566212 | DT-9600-8-14UM |
| 25 μm | 25 μm | 8.22/208.8 | P566213 | DT-9600-8-25UM |
| 5 μm | 5 μm | 8.19/208 | P566366 | DT-9601-8-5UM, High collapse |
| 14 μm | 14 μm | 8.19/208 | P566367 | DT-9601-8-14UM, High collapse |
| 2 μm | <4 μm | 8.19/208 | P567875 | DX2-9600-8-2UM |
| 5 μm | 5 μm | 8.23/209 | P565122 | DX2-9600-8-5UM |
| 8 μm | 8 μm | 8.23/209 | P565123 | DX2-9600-8-8UM |
| 14 μm | 14 μm | 8.23/209 | P564936 | DX2-9600-8-14UM |
| 2 μm | <4 μm | 12.91/327.8 | P566214 | DT-9600-13-2UM |
| 5 μm | 5 μm | 12.91/327.8 | P566215 | DT-9600-13-5UM |
| 8 μm | 8 μm | 12.91/327.8 | P566216 | DT-9600-13-8UM |
| 14 μm | 14 μm | 12.91/327.8 | P566217 | DT-9600-13-14UM |
| 25 μm | 25 μm | 12.91/327.8 | P566218 | DT-9600-13-25UM |
| 5 μm | 5 μm | 12.85/326.3 | P566368 | DT-9601-13-5UM, High collapse |
| 14 μm | 14 μm | 12.85/326.3 | P566369 | DT-9601-13-14UM, High collapse |
| 5 μm | 5 μm | 12.87/327 | P565188 | DX2-9600-13-5UM |
| 8 μm | 8 μm | 12.87/327 | P565189 | DX2-9600-13-8UM |
| 14 μm | 14 μm | 12.87/327 | P565187 | DX2-9600-13-14UM |

Filter Notes

- All Donaldson DT and DX2 filters utilize glass fiber media with an epoxy-based resin system for the ultimate in chemical compatibility.
- All Donaldson DT and DX2 filters are potted with epoxy-based adhesives.
- Standard collapse DT designs are double wire-backed using epoxy-coated steel mesh for maximum pleat support and dirt capacity.
- High collapse designs are double wire-backed using stainless steel mesh.
- High collapse designs are also potted into machined aluminum endcaps for greater filter integrity in critical applications.
- Viton® seals are standard on all Donaldson DT and DX2 filters. Viton® is a registered trademark of E. I. DuPont de Nemours and Company.
- DX2 filters utilize nylon mesh for pleat support.



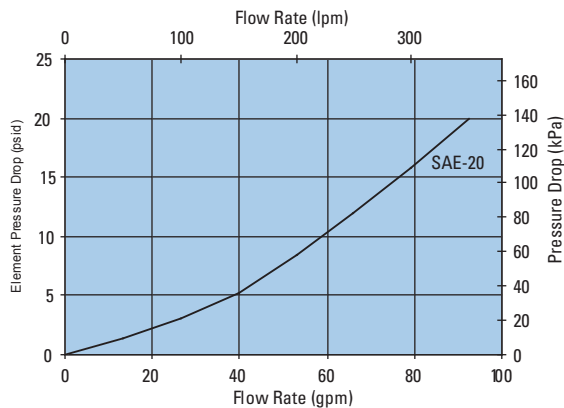
FPK04 Service Parts



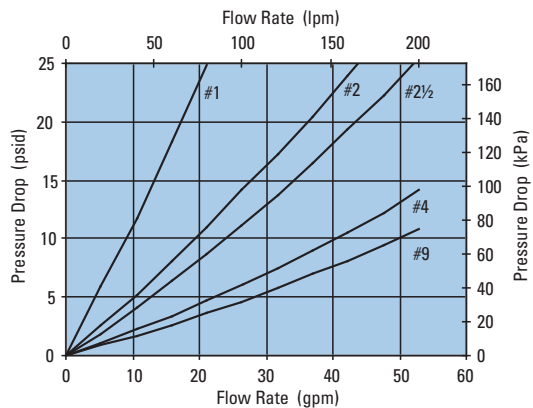


Performance Data

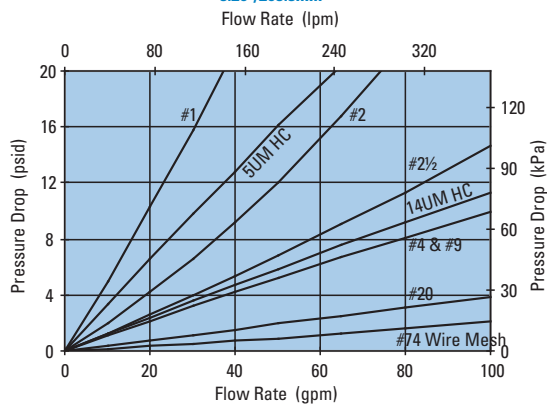
FPK04 Housing Only



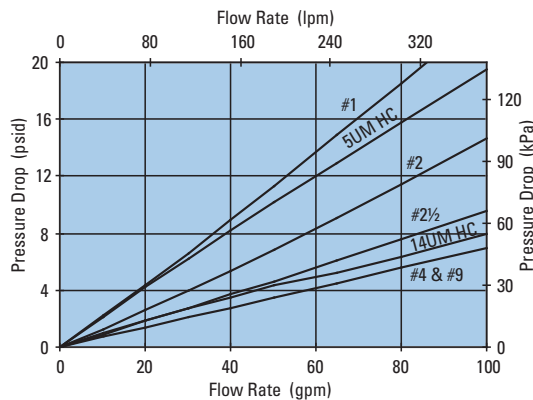
FPK04 4" Standard Filter Only
4.62"/117.3mm



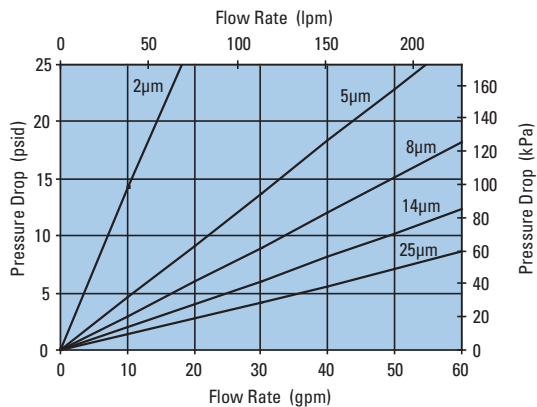
FPK04 8" Standard Filter Only
8.20"/208.3mm



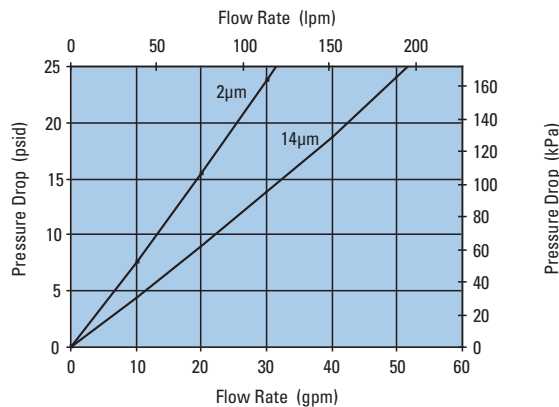
FPK04 13" Standard Filter Only
12.93"/328.4mm



FPK04 4" DT Filter Only
DT-9600-4, 4.59"/116.7mm



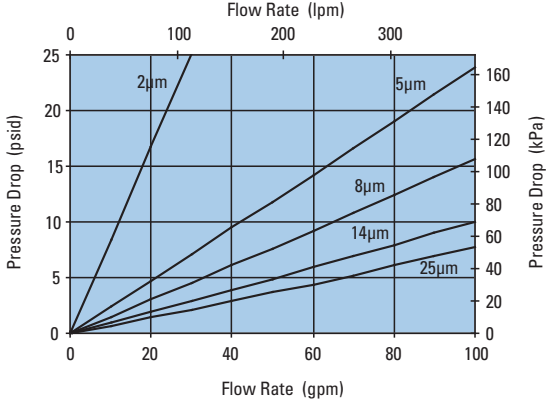
FPK04 4" DT Filter Only
DT-9601-4, 4.57"/116mm



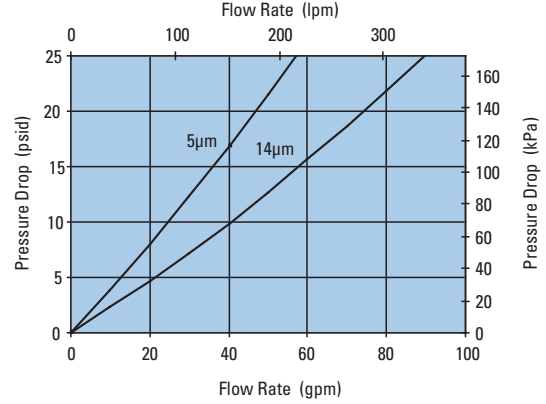


Performance Data

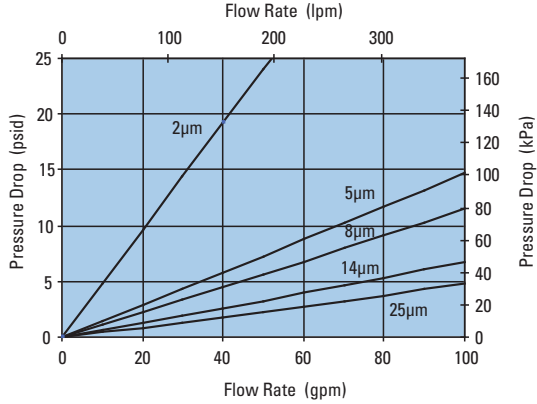
FPK04 8" DT Filter Only
DT-9600-8, 8.22"/208.8mm



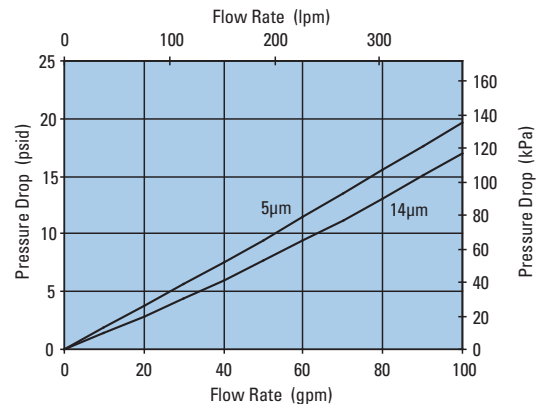
FPK04 8" DT Filter Only
DT-9601-8, 8.19"/208mm



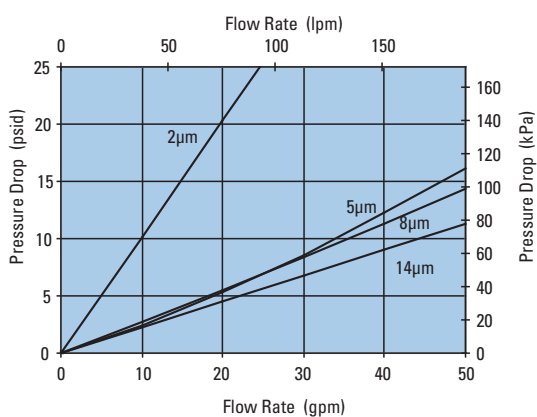
FPK04 13" DT Filter Only
DT-9600-13, 12.91"/327.8mm



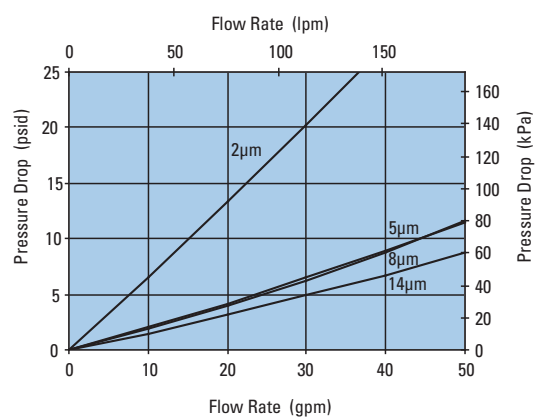
FPK04 13" DT Filter Only
DT-9601-13, 12.91"/327.8mm



FPK04 8" DX2 Filter Only
DX2-9600-8, 8.22"/208.8mm



FPK04 13" DX2 Filter Only
DX2-9600-13, 12.87"/327mm





HPK04

Max Flow: 120 gpm (454 lpm)



HPK04 In-Line Cartridge Filters

Working Pressures to: 6000 *psi*
41,400 kPa
413.8 bar

Rated Static Burst to: 17000 *psi*
117,000 kPa
1170 bar

Flow Range to: 120 *gpm*
454 *lpm*



Features

The HPK04 high pressure filter series is made of ductile iron and steel for strength and durability. Machined bypass valves are case-hardened at critical points to provide maximum strength and reliability. Reverse flow bypass valve allows bi-directional flow through the filter head, and filter changeout is simplified with standard housing drain plug. Meets HF3 specification.

Take advantage of our mix and match system of in-stock heads, housings and cartridges – so you can get exactly what you need. Likewise, choose the media type and configuration that's best for your application. Filter cartridges for HPK04 contain Synteq™, Donaldson's exclusive synthetic fiber media formulated specially for liquid filtration. Upgraded Donaldson high-performance DT filters are also offered for superior performance.

Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- SAE-20 O-ring
- 1¼" or 1½" SAE 4-Bolt Flange
Code 61 or 62

Assembly Weight

- 8" Assembly: 41 lbs / 19 kg
- 13" Assembly: 48 lbs / 22 kg
- 16" Assembly: 52 lbs / 24 kg

Replacement Filter Lengths

- 8" / 203mm
- 13" / 328mm
- 16" / 406mm

Standard Bypass Ratings

- 60 *psi* / 414 kPa / 4.1 bar
- 90 *psi* / 621 kPa / 6.2 bar with
reverse-flow check valve
- No Bypass

Operating Temperatures

- -20°F to 250°F / -27°C to 121°C

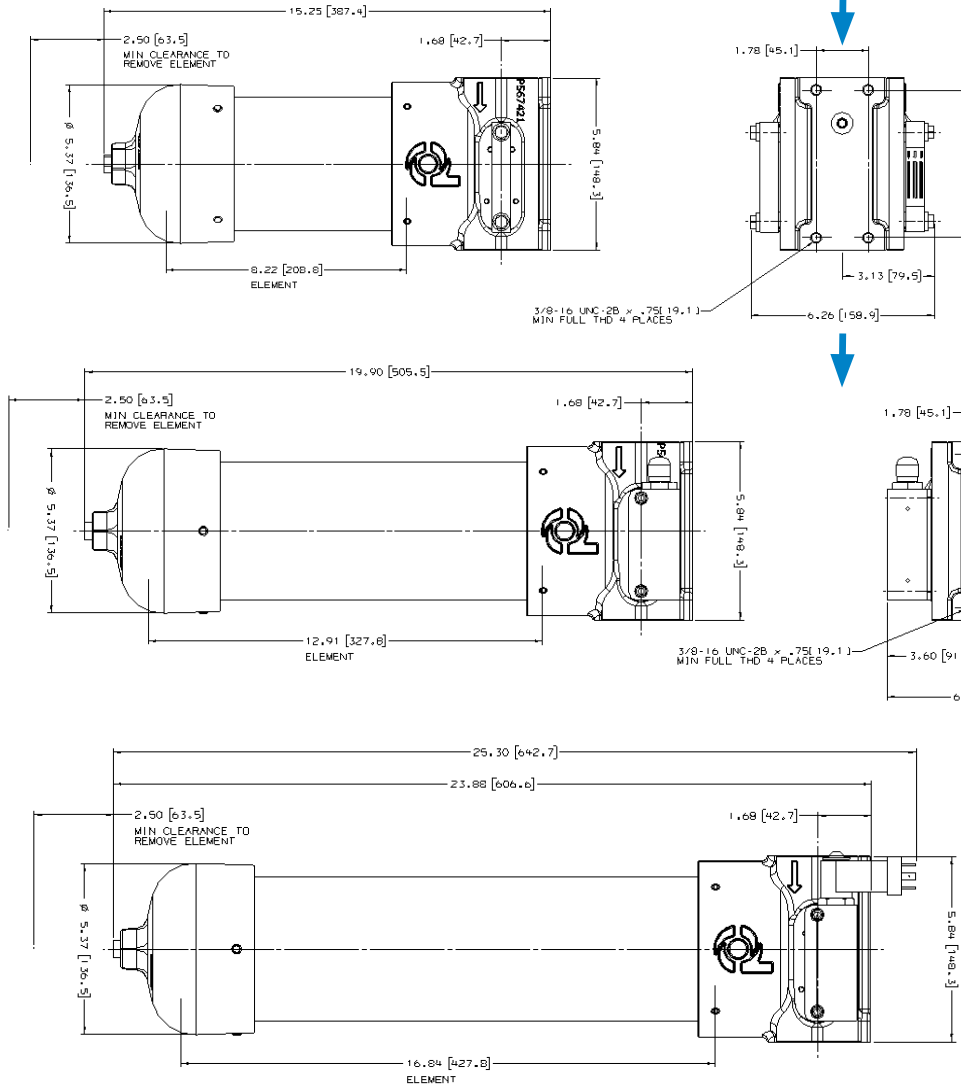
Filter Collapse Ratings

- 200 *psi* / 1380 kPa / 13.8 bar
(standard)
- 3000 *psi* / 20,700 kPa / 206.9 bar
(high collapse)

HPK04 Specification Illustrations

All dimensions are shown in inches [millimeters].

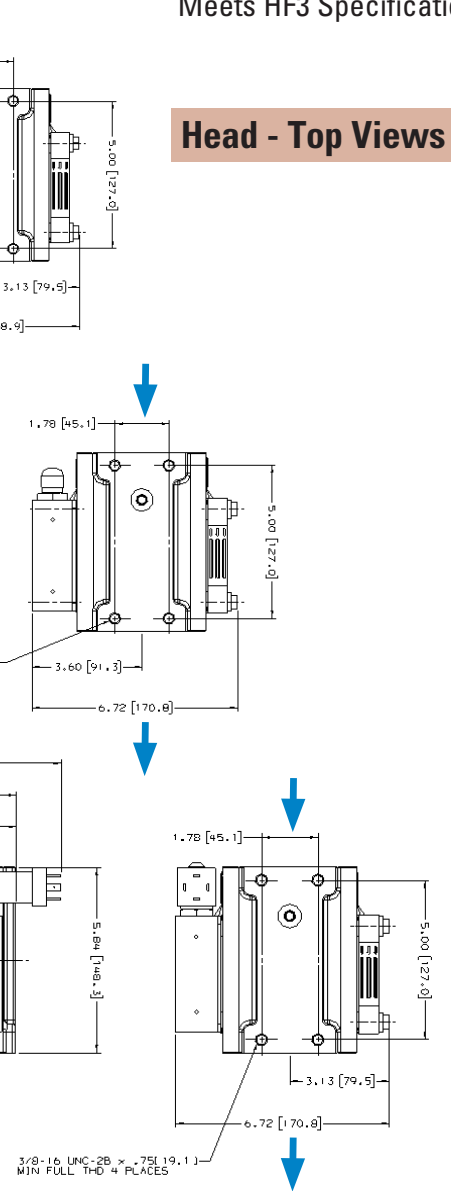
Assembly - Side Views



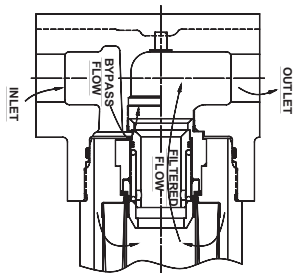
Applications:

- High Pressure Circuits
- Hydrostatic Transmissions
- Servo Valve Circuits
- Meets HF3 Specifications

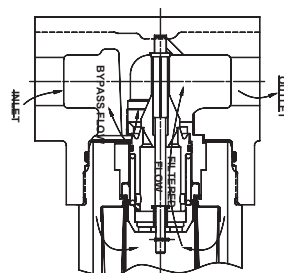
Head - Top Views



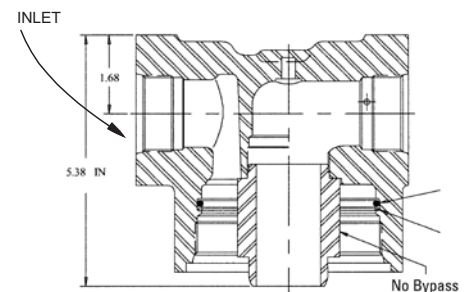
Bypass Valve Alternatives



**60 psi / 414 kPa
Bypass Valve**



**90 psi / 621 kPa
Bypass Valve with
Reverse Flow Check Valve**



No Bypass



HPK04

Max Flow: 120 gpm (454 lpm)

HPK04 Components

Standard Filter Choices

| Media Number | Beta _(c) =1000 Rating | Part No. | Length (in./mm) | Series | Comments |
|--------------|----------------------------------|----------|-----------------|--------|--------------------------------|
| No. 1 | 5 µm | P167842 | 8.20/208.3 | 9600 | Buna-N® |
| 5 UM | 5 µm | P167185 | 8.20/208.3 | 9601 | Viton®, High collapse |
| No. 2 | 9 µm | P164594 | 8.20/208.3 | 9600 | Buna-N |
| No. 2½ | 10 µm | P164166 | 8.20/208.3 | 9600 | Buna-N |
| 14 UM | 14 µm | P167186 | 8.20/208.3 | 9601 | Viton, High collapse |
| No. 9 | 23 µm | P164174 | 8.20/208.3 | 9600 | Buna-N |
| No. 20 | >50 µm | P165319 | 8.20/208.3 | 9600 | Buna-N |
| No. 74 | 75 µm nom. | P162233 | 8.20/208.3 | 9600 | Buna-N, Wire mesh |
| No. 1 | 5 µm | P169432 | 12.93/328.4 | 9600 | Buna-N |
| 5 UM | 5 µm | P167411 | 12.88/327.2 | 9601 | Viton, High collapse |
| No. 2 | 9 µm | P164596 | 12.93/328.4 | 9600 | Buna-N |
| No. 2 | 9 µm | P166254 | 12.93/328.4 | 9600 | Viton |
| No. 2½ | 10 µm | P164168 | 12.93/328.4 | 9600 | Buna-N |
| 14 UM | 14 µm | P167412 | 12.88/327.2 | 9601 | Viton, High collapse |
| No. 4 | 10 µm | P166255 | 12.93/328.4 | 9600 | Viton |
| No. 9 | 23 µm | P164176 | 12.93/328.4 | 9600 | Buna-N |
| No. 1 | 5 µm | P169433 | 16.84/427.7 | 9600 | Buna-N |
| 5 UM | 5 µm | P167187 | 16.83/427.5 | 9601 | Viton, High collapse |
| No. 2 | 9 µm | P164598 | 16.84/427.7 | 9600 | Buna-N |
| No. 2½ | 10 µm | P164170 | 16.84/427.7 | 9600 | Buna-N |
| No. 2½ | 10 µm | P164367 | 16.84/427.7 | 9600 | Viton |
| 14 UM | 14 µm | P167188 | 16.83/427.5 | 9601 | Viton, High collapse |
| No. 9 | 23 µm | P164178 | 16.84/427.7 | 9600 | Buna-N |
| WA | B>30 _(c) = 200 | P569528 | 8.20/208.3 | 9600 | Absorbs 180 ml water @ 25 psid |
| WA | B>30 _(c) = 200 | P569529 | 12.93/328.4 | 9600 | Absorbs 220 ml water @ 25 psid |
| WA | B>30 _(c) = 200 | P569530 | 16.83/427.5 | 9600 | Absorbs 300 ml water @ 25 psid |

Filter Notes

- **SEALS:** Filters with seals made of Buna-N® are appropriate for most applications involving petroleum oil. Filters with seals made of Viton® (a fluoroelastomer) are required when using diester, phosphate ester fluids, water glycol, water/oil emulsions, and HWCF (high water content fluids) over 150°F/83°C.
- The Viton seal, high collapse filters also use epoxy potting and media seam seals for added chemical compatibility.
- Donaldson high collapse filters are physically designed to withstand up to 3000 psi/ 20,700 kPa before collapsing.
- Viton® and Buna-N® are registered trademarks of E. I. DuPont de Nemours and Company.

Housing Choices

| Length (in./mm) | Part No. |
|-----------------|----------|
| 8/203 | P567650 |
| 13/330 | P567649 |
| 16/406 | P567648 |



Head assemblies include head to housing seal.

Head Choices

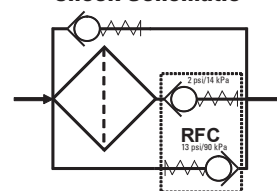
| Port Size | Working Pressure | Bypass Rating | Indicators ¹ | Part No. |
|---|------------------|--|--|----------|
| 1½" SAE 4-Bolt (Code 61) with SAE-20 O-Ring | 3000 psi/207 bar | 50 psi/3.5 bar | Visual left side, blank plate right side | P567639 |
| 1½" SAE 4-Bolt (Code 61) with SAE-20 O-Ring | 3000 psi/207 bar | 90 psi/6.2 bar with reverse flow check valve | Visual left side, blank plate right side | P567640 |
| 1½" SAE 4-Bolt (Code 61) with SAE-20 O-Ring | 3000 psi/207 bar | no bypass | Visual left side, blank plate right side | P567641 |
| 1½" SAE 4-Bolt (Code 62) | 6000 psi/414 bar | 50 psi/3.5 bar | Visual left side, blank plate right side | P567642 |
| 1½" SAE 4-Bolt (Code 62) | 6000 psi/414 bar | 90 psi/6.2 bar with reverse flow check valve | Visual left side, blank plate right side | P567643 |
| 1¼" SAE 4-Bolt (Code 62) | 6000 psi/414 bar | 90 psi/6.2 bar with reverse flow check valve | Visual left side, blank plate right side | P567644 |

Notes on Indicators

¹ Donaldson uses the inlet port as the reference point. "Left side," for instance, means that the indicator mounts on the side of the filter head that is on your left when you face the inlet port.

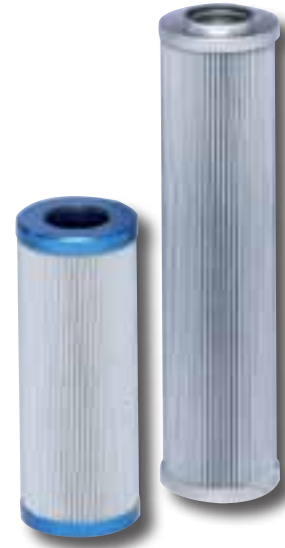
Reverse Flow

Check Schematic



High-Performance DT Filter Choices

| Media Number | Beta ₁₀₀₀ Rating | Length (in./mm) | Donaldson DT Part No. | Comments |
|--------------|-----------------------------|-----------------|-----------------------|--------------------------------|
| 2 µm | <4 µm | 4/116.7 | P566204 | DT-9600-4-2UM |
| 5 µm | 5 µm | 4/116.7 | P566205 | DT-9600-4-5UM |
| 8 µm | 8 µm | 4/116.7 | P566206 | DT-9600-4-8UM |
| 14 µm | 14 µm | 4/116.7 | P566207 | DT-9600-4-14UM |
| 25 µm | 25 µm | 4/116.7 | P566208 | DT-9600-4-25UM |
| 5 µm | 5 µm | 4/116 | P566364 | DT-9601-4-5UM, High collapse |
| 14 µm | 14 µm | 4/116 | P566365 | DT-9601-4-14UM, High collapse |
| 2 µm | <4 µm | 8/208.8 | P566209 | DT-9600-8-2UM |
| 5 µm | 5 µm | 8/208.8 | P566210 | DT-9600-8-5UM |
| 8 µm | 8 µm | 8/208.8 | P566211 | DT-9600-8-8UM |
| 14 µm | 14 µm | 8/208.8 | P566212 | DT-9600-8-14UM |
| 25 µm | 25 µm | 8/208.8 | P566213 | DT-9600-8-25UM |
| 5 µm | 5 µm | 8/208 | P566366 | DT-9601-8-5UM, High collapse |
| 14 µm | 14 µm | 8/208 | P566367 | DT-9601-8-14UM, High collapse |
| 2 µm | <4 µm | 8/208 | P567875 | DX2-9600-8-2UM |
| 5 µm | 5 µm | 8/209 | P565122 | DX2-9600-8-5UM |
| 8 µm | 8 µm | 8/209 | P565123 | DX2-9600-8-8UM |
| 14 µm | 14 µm | 8/209 | P564936 | DX2-9600-8-14UM |
| 2 µm | <4 µm | 13/327.8 | P566214 | DT-9600-13-2UM |
| 5 µm | 5 µm | 13/327.8 | P566215 | DT-9600-13-5UM |
| 8 µm | 8 µm | 13/327.8 | P566216 | DT-9600-13-8UM |
| 14 µm | 14 µm | 13/327.8 | P566217 | DT-9600-13-14UM |
| 25 µm | 25 µm | 13/327.8 | P566218 | DT-9600-13-25UM |
| 5 µm | 5 µm | 13/326.3 | P566368 | DT-9601-13-5UM, High collapse |
| 14 µm | 14 µm | 13/326.3 | P566369 | DT-9601-13-14UM, High collapse |
| 5 µm | 5 µm | 13/327 | P565188 | DX2-9600-13-5UM |
| 8 µm | 8 µm | 13/327 | P565189 | DX2-9600-13-8UM |
| 14 µm | 14 µm | 13/327 | P565187 | DX2-9600-13-14UM |
| 5 µm | 5 µm | 16/427 | P565196 | DX2-9600-16-5UM |
| 8 µm | 8 µm | 16/427 | P565197 | DX2-9600-16-8UM |
| 14 µm | 14 µm | 16/427 | P565195 | DX2-9600-16-14UM |



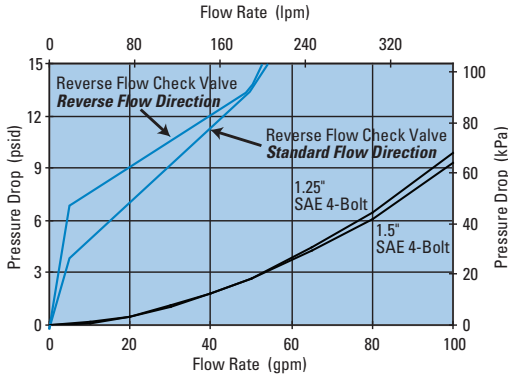
Filter Notes

- All Donaldson DT and DX2 filters utilize glass fiber media with an epoxy-based resin system for the ultimate in chemical compatibility.
- All Donaldson DT and DX2 filters are potted with epoxy-based adhesives.
- Standard collapse DT designs are double wire-backed using epoxy-coated steel mesh for maximum pleat support and dirt capacity.
- High collapse designs are double wire-backed using stainless steel mesh.
- High collapse designs are also potted into machined aluminum endcaps for greater filter integrity in critical applications.
- Viton® seals are standard on all Donaldson DT and DX2 filters.
- DX2 filters utilize nylon mesh for pleat support.

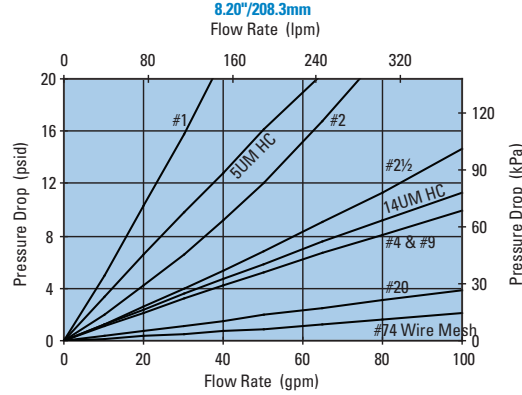


Performance Data

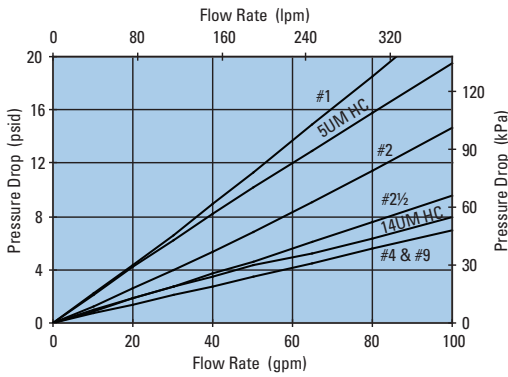
HPK04 Housing Only



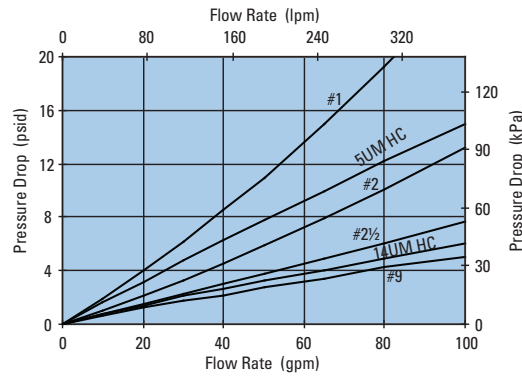
HPK04 8" Standard Filter Only



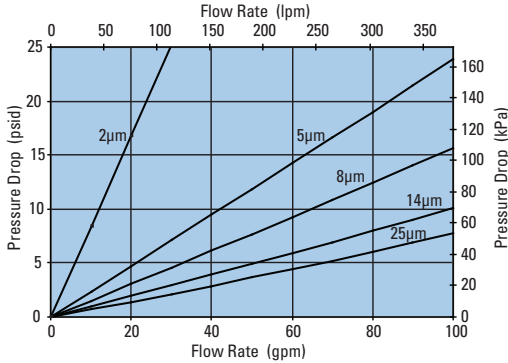
HPK04 13" Standard Filter Only



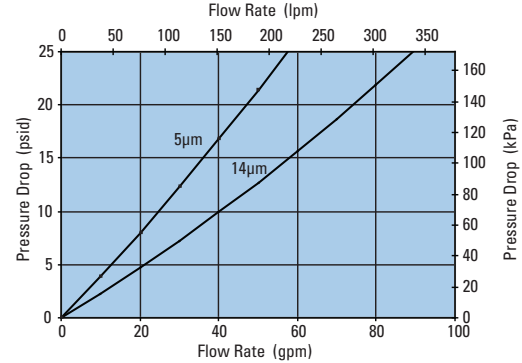
HPK04 16" Standard Filter Only



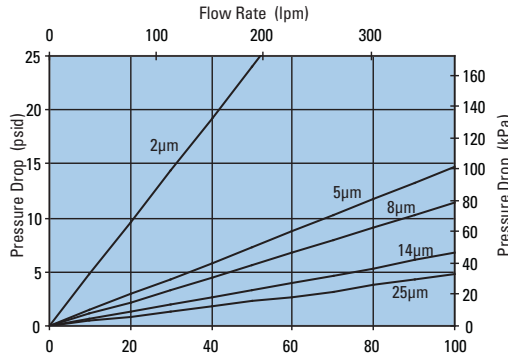
HPK04 8" DT Filter Only



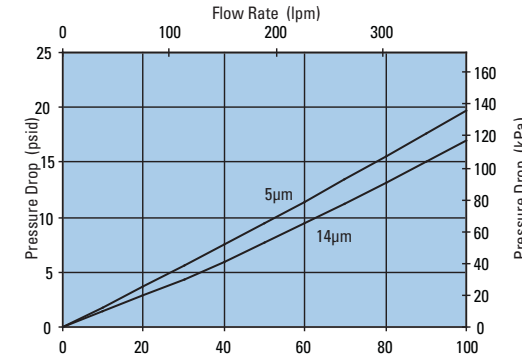
HPK04 8" DT Filter Only



HPK04 13" DT Filter Only



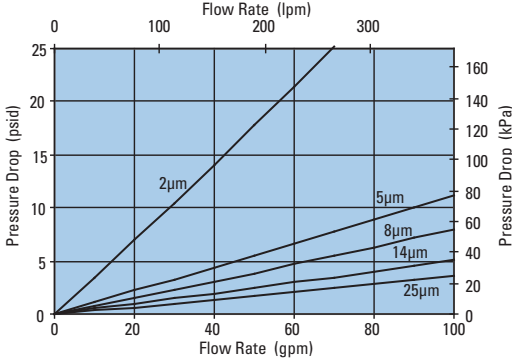
HPK04 13" DT Filter Only



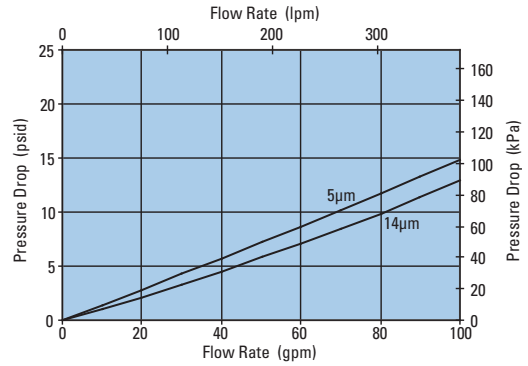


Performance Data

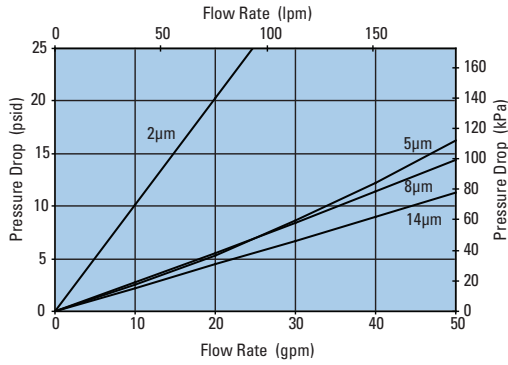
HPK04 16" DT Filter Only
DT-9600-16, 16.84"/427.8mm



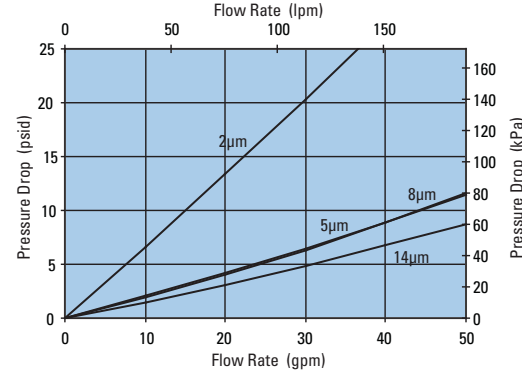
HPK04 16" DT Filter Only
DT-9601-16, 16.82"/427.1mm



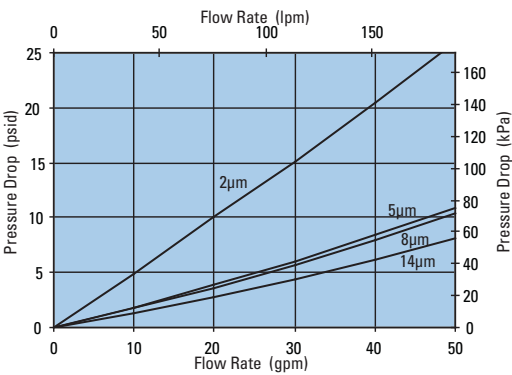
HPK04 8" DX2 Filter Only
DX2-9600-8, 8.19"/208mm



HPK04 13" DX2 Filter Only
DX2-9600-13, 12.87"/327mm



HPK04 16" DX2 Filter Only
DX2-9600-16, 16.81"/427mm





HPK04

Max Flow: 120 gpm (454 lpm)



HPK04 Components

Service Indicator Options

Visual Service Indicators

| Part No. | Use with Bypass Valve Pressure of: | Description |
|----------|------------------------------------|--|
| P569632 | 50 psi / 3.5 bar | 35 psi/2.4 bar indicator kit* auto reset pop-out button |
| P569633 | 90 psi / 6.2 bar | 70 psi/4.8 bar indicator kit* auto reset pop-out button |
| P567988 | 50 psi / 3.5 bar | 35 psi/2.4 bar indicator kit* auto reset pop-out button with thermal lockout and surge control |
| P567989 | 90 psi / 6.2 bar | 70 psi/4.8 bar indicator kit* auto reset pop-out button with thermal lockout and surge control |

AC/DC Visual/Electrical Service Indicators

| Part No. | Use with Bypass Valve Pressure of: | Description |
|----------|------------------------------------|--|
| P569634 | 50 psi / 3.5 bar | 35 psi/2.4 bar indicator kit* Hirschmann receptacle 115 VAC/28 VDC, 2 amps |
| P569635 | 90 psi / 6.2 bar | 70 psi/4.8 bar indicator kit* Hirschmann receptacle 115 VAC/28 VDC, 2 amps |
| P567986 | 50 psi / 3.5 bar | 35 psi/2.4 bar indicator kit* with thermal lockout and surge control, Hirschmann receptacle, 115 VAC/28 VDC, 2 amps, 4 pin DIN 43650 |
| P567987 | 90 psi / 6.2 bar | 70 psi/4.8 bar indicator kit* with thermal lockout and surge control, Hirschmann receptacle, 115 VAC/28 VDC, 2 amps, 4 pin DIN 43650 |

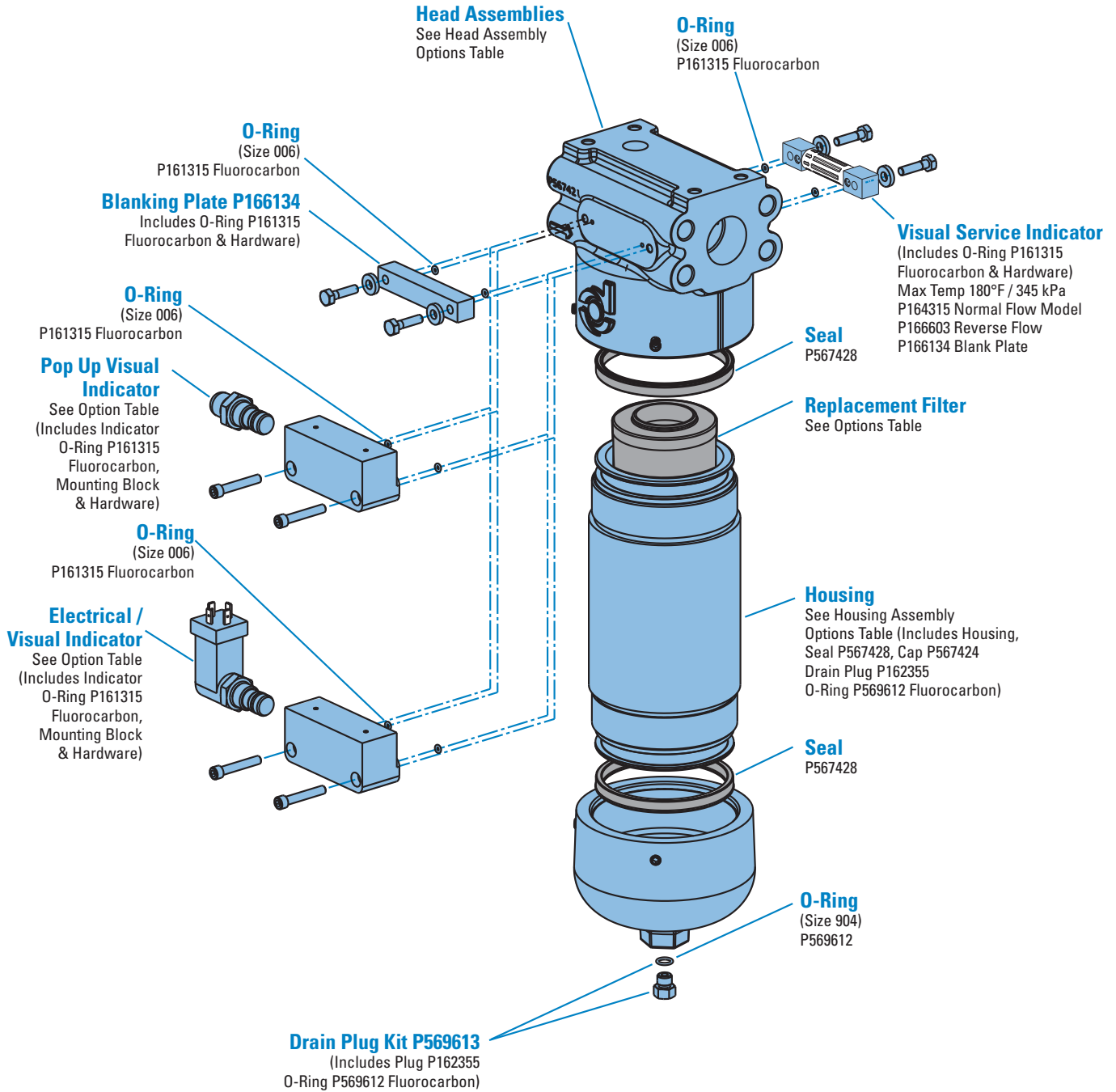
* Note: Above choices include indicator and mounting block.

Indicator Service Parts

Replacement Indicators Only

| Part No. | Description |
|----------|---|
| P567458 | Visual/Electrical indicator with thermal lockout and surge, 35 psid/2.4 bar |
| P567459 | Visual/Electrical indicator, with thermal lockout and surge 70 psid/4.8 bar |
| P567456 | Pop-Up Visual Indicator, with thermal lockout and surge 35 psid/2.4 bar |
| P567457 | Pop-Up Visual Indicator, with thermal lockout and surge 70 psid/4.8 bar |
| P569636 | Pop-Up Visual Indicator, 35 psid/2.4 bar |
| P569637 | Pop-Up Visual Indicator, 70 psid/4.8 bar |
| P569638 | Visual/Electrical Indicator, 35 psid/2.4 bar |
| P569639 | Visual/Electrical Indicator, 70 psid/4.8 bar |
| P164315 | Visual Indicator, bar style, 35 psid/2.4 bar |
| P166603 | Visual Indicator, bar style, 70 psid/4.8 bar |
| P166134 | Blanking plate |

HPK04 Service Parts





W621

Max Flow: 120 gpm (454 lpm)

W621 In-Line Cartridge Filters

Working Pressures to: 6000 *psi*
41,400 kPa
414 bar

Rated Static Burst to: 15,000 *psi*
103,400 kPa
1034 bar

Fatigue Pressure Rating: 4000 *psi*
27,600 kPa
276 bar

Flow Range to: 120 *gpm*
454 *lpm*



Features

The W621 filter assembly is manufactured to meet the HF3 specification. This T-type head design offers an option to the W620 L-type port option. Our standard housing drain plug helps relieve system pressure during filter change outs. Donaldson DT high-performance 4-layer media is offered in five different media grades. The differential pressure indicator line is designed to work with the wide assortment of bypass valves. Thermal lockout and surge control are two key features incorporated in many of the valves.

- Conforms to HF3 specifications
- Head material: cast iron
- Three housing lengths available
- Housing material: steel

Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- SAE-20, -24 O-ring
- 1¼" or 1½" SAE 4-Bolt Flange
Code 61 or 62

Assembly Weight

- 8.04": 60 lbs / 27.22 kg
- 11.67": 68 lbs / 30.84 kg
- 16.39": 75 lbs / 34.02 kg

Replacement Filter Lengths

- 4" / 101.6mm
- 8" / 203.2mm
- 13" / 330.2mm

Standard Bypass Ratings

- 90 psi / 621 kPa / 6.2 bar
- 50 psi / 345 kPa / 3.5 bar
- No Bypass

Operating Temperatures

- -20° to 250°F (-29° to 121°C)

Filter Collapse Ratings

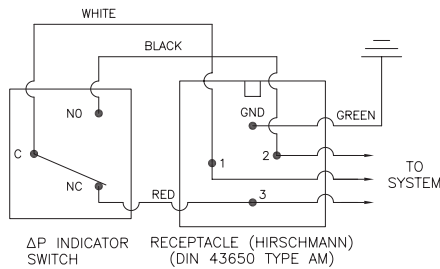
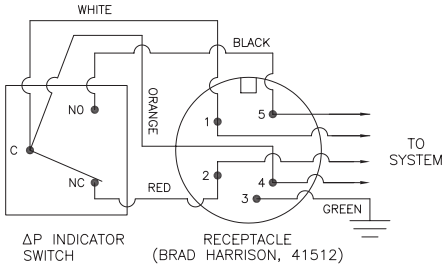
- 150 psi / 1034 kPa / 10.3 bar (standard)
- 3000 psi / 20,700 kPa / 206.8 bar (high collapse)

W621 Specification Illustrations

All dimensions are shown in millimeters [inches].

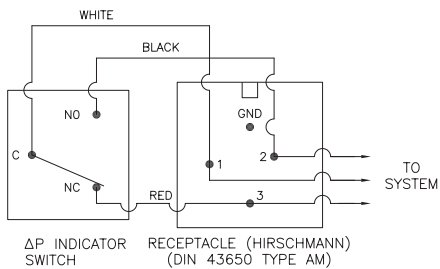
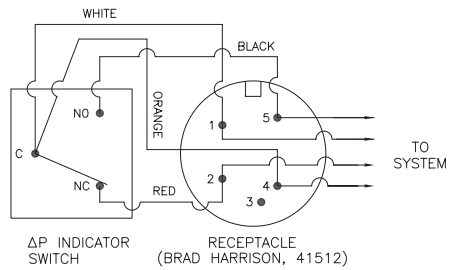
Indicator Switch Schematic Wiring Diagram

Aluminum Electrical Housings



Note: The female plug (connector) is to be furnished by customer.

Plastic Electrical Housings



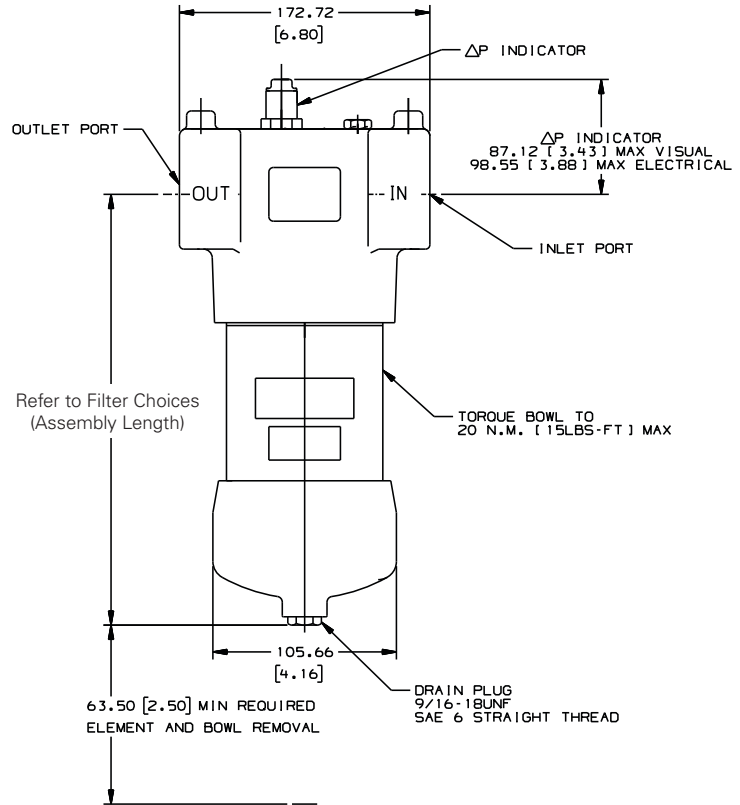
Note: The female plug (connector) is to be furnished by customer.

Differential Indicators: Indicators are designed to actuate at approximately 80% of bypass valve cracking pressure. It is recommended that an indicator with a bypass setting of 100 psid is used with a non-bypass housing.

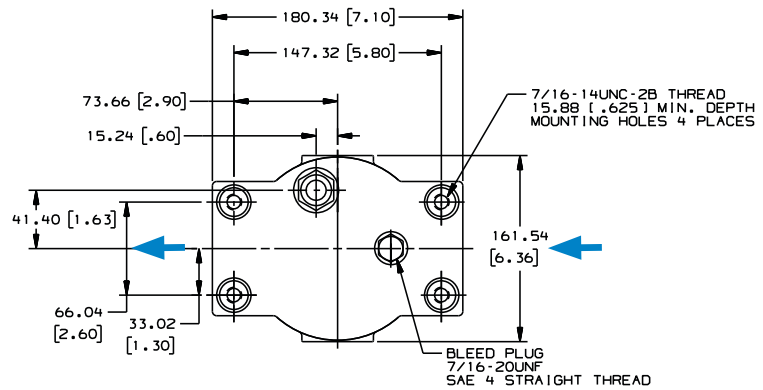
Surge Control: This optional feature is used to dampen pressure surges or spikes to avoid premature actuation of the indicator. Surge control delays the indicator response.

Thermal Lockout: The Thermal Lockout prevents premature signaling of a bypass condition created by viscous fluid during cold start-ups. Normal indicator actuation capability is resumed once the operating temperature of the fluid reaches approximately 80°F / 27°C.

Assembly - Side View



Head - Top View





W621

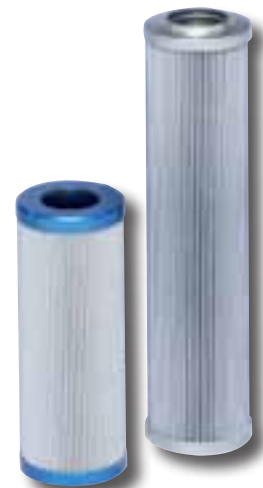
Max Flow: 120 gpm (454 lpm)



W621 Components

High-Performance DT Filter Choices

| Media Number | Beta _{x(c)} =1000 Rating | Length (in./mm) | Donaldson DT Part No. | Comments |
|--------------|-----------------------------------|-----------------|-----------------------|--------------------------------|
| 2 µm | <4 µm | 4/116.7 | P566204 | DT-9600-4-2UM |
| 5 µm | 5 µm | 4/116.7 | P566205 | DT-9600-4-5UM |
| 8 µm | 8 µm | 4/116.7 | P566206 | DT-9600-4-8UM |
| 14 µm | 14 µm | 4/116.7 | P566207 | DT-9600-4-14UM |
| 25 µm | 25 µm | 4/116.7 | P566208 | DT-9600-4-25UM |
| 5 µm | 5 µm | 4/116 | P566364 | DT-9601-4-5UM, High collapse |
| 14 µm | 14 µm | 4/116 | P566365 | DT-9601-4-14UM, High collapse |
| 2 µm | <4 µm | 8/208.8 | P566209 | DT-9600-8-2UM |
| 5 µm | 5 µm | 8/208.8 | P566210 | DT-9600-8-5UM |
| 8 µm | 8 µm | 8/208.8 | P566211 | DT-9600-8-8UM |
| 14 µm | 14 µm | 8/208.8 | P566212 | DT-9600-8-14UM |
| 25 µm | 25 µm | 8/208.8 | P566213 | DT-9600-8-25UM |
| 5 µm | 5 µm | 8/208 | P566366 | DT-9601-8-5UM, High collapse |
| 14 µm | 14 µm | 8/208 | P566367 | DT-9601-8-14UM, High collapse |
| 2 µm | <4 µm | 8/208 | P567875 | DX2-9600-8-2UM |
| 5 µm | 5 µm | 8/209 | P565122 | DX2-9600-8-5UM |
| 8 µm | 8 µm | 8/209 | P565123 | DX2-9600-8-8UM |
| 14 µm | 14 µm | 8/209 | P564936 | DX2-9600-8-14UM |
| 2 µm | <4 µm | 13/327.8 | P566214 | DT-9600-13-2UM |
| 5 µm | 5 µm | 13/327.8 | P566215 | DT-9600-13-5UM |
| 8 µm | 8 µm | 13/327.8 | P566216 | DT-9600-13-8UM |
| 14 µm | 14 µm | 13/327.8 | P566217 | DT-9600-13-14UM |
| 25 µm | 25 µm | 13/327.8 | P566218 | DT-9600-13-25UM |
| 5 µm | 5 µm | 13/326.3 | P566368 | DT-9601-13-5UM, High collapse |
| 14 µm | 14 µm | 13/326.3 | P566369 | DT-9601-13-14UM, High collapse |
| 5 µm | 5 µm | 13/327 | P565188 | DX2-9600-13-5UM |
| 8 µm | 8 µm | 13/327 | P565189 | DX2-9600-13-8UM |
| 14 µm | 14 µm | 13/327 | P565187 | DX2-9600-13-14UM |



Filter Notes

- All Donaldson DT and DX2 filters utilize glass fiber media with an epoxy-based resin system for the ultimate in chemical compatibility.
- All Donaldson DT and DX2 filters are potted with epoxy-based adhesives.
- Standard collapse DT designs are double wire-backed using epoxy-coated steel mesh for maximum pleat support and dirt capacity.
- High collapse designs are double wire-backed using stainless steel mesh.
- High collapse designs are also potted into machined aluminum endcaps for greater filter integrity in critical applications.
- Viton® seals are standard on all Donaldson DT and DX2 filters. Viton® is a registered trademark of E. I. DuPont de Nemours and Company.
- DX2 filters utilize nylon mesh for pleat support.



Housing Ordering Guide

| | | | | | | | |
|-----------------|-----------------|--------------|--------------|--------------|------------------|--------------|--------------|
| Filter Assembly | W621 TABLE 1 | 1 TABLE 2 | C TABLE 3 | 4 TABLE 4 | D B TABLE 5 | B TABLE 6 | 2 TABLE 7 |
|-----------------|-----------------|--------------|--------------|--------------|------------------|--------------|--------------|

Service Filter
Filters ordered separately. See previous page for filter options.

LEAD TIME NOTE:

This product is configured with the specifications and features of your choice. Please contact your Donaldson sales representative for lead time details.

Table 1

| Filter Assembly | |
|-----------------|-------------|
| CODE | DESCRIPTION |
| W621 | Assembly |

Table 2

| Filter Collapse Options | |
|-------------------------|--|
| CODE | DESCRIPTION |
| 1 | 150 psid for housing w/bypass valve |
| 4 | 3000 psid for housing without bypass valve |

Table 3

| Port Size Options | |
|-------------------|--------------------------------------|
| CODE | PORT SIZE |
| C | SAE-20 O-ring |
| D | SAE-24 O-ring |
| E | 1-1/2" 4-Bolt Flange Code 61 |
| G | 1-1/4" 4-Bolt Flange Code 61 |
| Q | 1-1/4" 4-Bolt Flange Code 62 |
| R | 1-1/2" SAE 4 -Bolt Flange Code 62 |

Table 4

| Bypass Setting Options | |
|------------------------|----------------|
| CODE | BYPASS SETTING |
| 1 | Non-bypass |
| 4 | 50 psid |
| 6 | 90 psid |

Note: Use option 1 code only with 3000 psid collapse filter.

Table 5 (Primary)

| Indicator Style and Setting | |
|-----------------------------|---|
| CODE | ΔP INDICATOR STYLE & SETTING |
| A | Visual indicator 70 psid w/TL and surge |
| B | Electrical/visual 70 psid w/TL and surge |
| D | Electrical/visual 35 psid |
| E | Electrical/visual 100 psid |
| G | Electrical/visual 35 psid w/TL |
| I | Visual indicator 70 psid |
| J | ΔP indicator plug |
| L | Visual indicator 35 psid |
| M | Visual indicator 35 psid w/ TL and surge |
| N | Electrical/visual 35 psid w/12" 3-wire flying lead |
| O | Visual indicator 100 psid |
| P | Visual indicator 100 psid w/ TL and surge |
| R | Electrical switch 35 psid |
| S | Electrical/visual 100 psid w/12" 3-wire flying lead |
| T | Electrical switch 100 psid |
| U | Electrical switch 70 psid |
| W | Electrical/visual 100 psid w/TL |
| Y | Electrical/visual 35 psid w/TL and surge |
| Z | Electrical/visual 100 psid w/TL and surge |

TL (thermal lockout)

METRIC PORTING AVAILABLE

Change W621 to G621
Porting code C becomes G1-1/4" ISO 228 BSPP
Porting code D becomes G1-1/2" ISO 228 BSPP
Porting code E becomes 1-1/2" SAE 4 bolt flange with M12 mounting threads
Porting code G becomes 1-1/4" SAE 4 bolt flange with M10 mounting threads
Porting code Q becomes 1-1/4" SAE 4 bolt flange with M14 mounting threads
Porting code R becomes 1-1/2" SAE 4 bolt flange with M16 mounting threads

Table 5 (Secondary)

| Receptacle Options | |
|--------------------|-------------------------------|
| CODE | ELECTRICAL STYLE |
| B | Brad Harrison® (5-pin) |
| H | Hirschmann® (4-pin) |
| N | None, for visual ΔP indicator |

Table 6

| Seal Options | |
|--------------|----------|
| CODE | MATERIAL |
| B | Buna-N® |
| E | E.P.R. |
| V | Viton® |

Table 7

| Assembly & Filter Length | |
|--------------------------|---------------|
| CODE (LGTH) | FILTER LENGTH |
| 1 (8.04") | 4.0" |
| 2 (11.67")* | 8.0"* |
| 4 (16.39") | 13.0" |

*HF3

Media Ratings

Western Filter elements have been replaced by Donaldson DT high-performance cartridges.

| WESTERN MEDIA CODE | DONALDSON DT MEDIA |
|--------------------|--------------------|
| 01 | DT 2μm |
| 03 | DT 5μm |
| 05 | DT 8μm |
| 10 | DT 14μm |
| 20 | DT 25μm |

For a complete filter interchange, visit crossreference.donaldson.com.

Brad Harrison® is a registered trademark of Woodhead Industries, Inc.
Hirschmann® is a registered trademark of Richard Hirschmann of America Inc.
Buna-N® and Viton® are registered trademarks of E. I. DuPont de Nemours and Co.



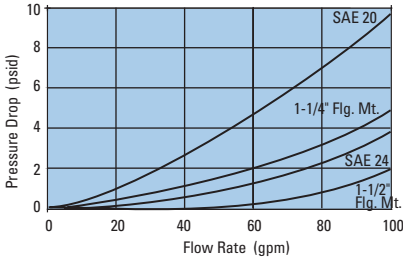
W621

Max Flow: 120 gpm (454 lpm)

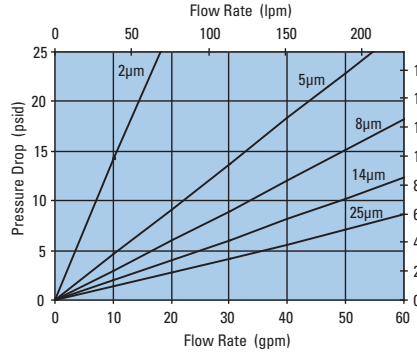


Performance Data

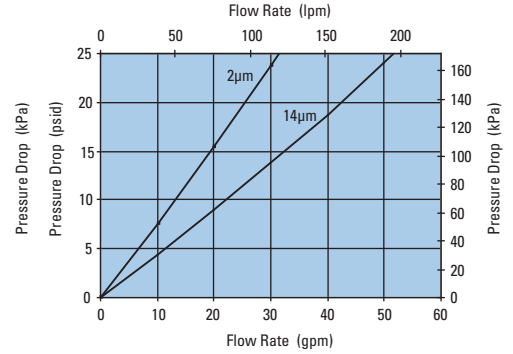
W621 Housing Only



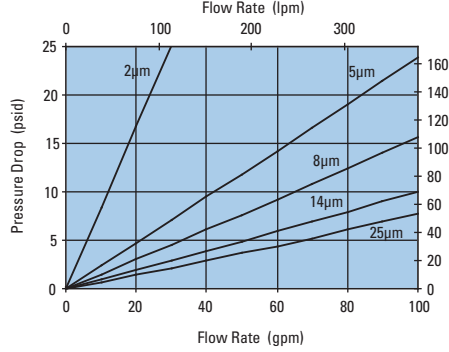
W621 4" DT Filter Only
DT-9600-4, 4.59"/116.7mm



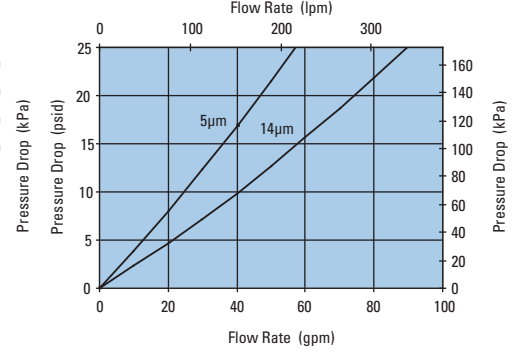
W621 4" DT Filter Only
DT-9601-4, 4.57"/116mm



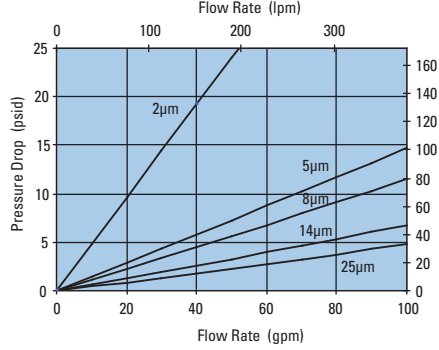
W621 8" DT Filter Only
DT-9600-8, 8.22"/208.8mm



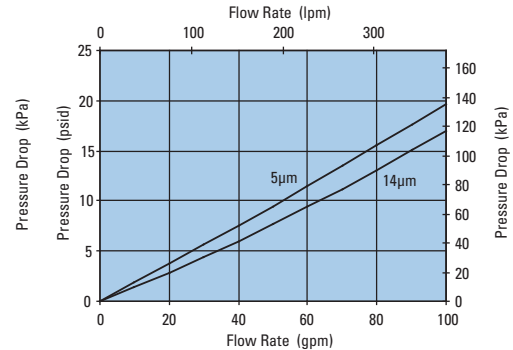
W621 8" DT Filter Only
DT-9601-8, 8.19"/208mm



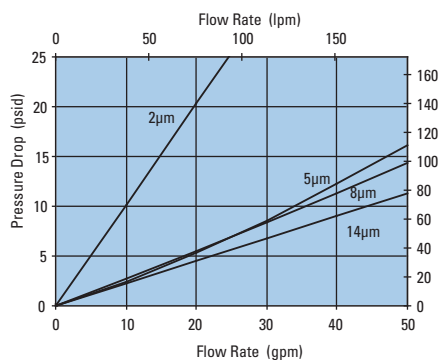
W621 13" DT Filter Only
DT-9600-13, 12.913"/327.8mm



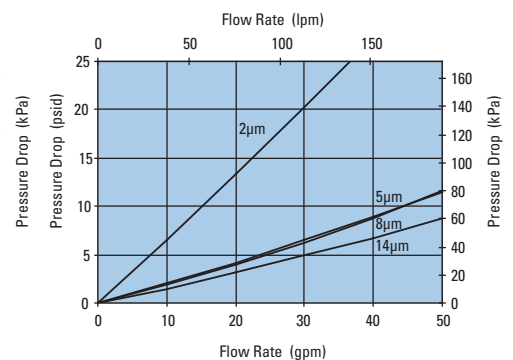
W621 13" DT Filter Only
DT-9601-13, 12.85"/326.3mm



W621 8" DX2 Filter Only
DX2-9600-8, 8.23"/209mm



W621 13" DX2 Filter Only
DX2-9600-13, 12.87"/327mm



W451 In-Line Cartridge Filters

Working Pressures to: 4000 *psi*
31,000 kPa
310 bar

Rated Static Burst to: 13,500 *psi*
93,100 kPa
931 bar

Fatigue Pressure Rating: 3000 *psi*
20,700 kPa
207 bar

Flow Range to: 150 *gpm*
568 *lpm*



Features

The W451 base-mounted filter series provides for easy servicing featuring top cover access for filter changeout. The ductile iron filter head design provides for SAE ports along with optional space saving manifold mounting. This product features the popular HF4 automotive filter. DT 4-layer media is offered in a variety of designs. Five different media grades are offered. Filter core collapse options range from 150 to 3,000 psi. The differential pressure indicator line is designed to work with the wide assortment of bypass valves. Thermal lockout and surge control are two key features available in all of the indicators.

- Conforms to HF4 specifications
- High collapse filter available for use with non-bypass applications
- Wide range of indicator options
- Three housing length options for design flexibility
- Base & cover material: cast iron
- Cylinder material: steel
- Drain plug in base
- Bleed/fill plug in cover

Beta Rating (per ISO 16889)

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- SAE-20 O-ring
- 1½" SAE 4-Bolt Flange Code 61 or 62
- Manifold Mounting

Assembly Weight

- 9": 56 lbs / 25.4 kg
- 18": 82 lbs / 37.5 kg
- 27": 109 lbs / 49.5 kg

Replacement Filter Lengths

- 9.12" / 231.8mm
- 18.20" / 462.3mm
- 27.66" / 702.5mm

Standard Bypass Ratings

- No Bypass
- 50 psi / 345 kPa / 3.5 bar
- 90 psi / 621 kPa / 6.2 bar

Operating Temperatures

- -45° to 250°F (-43° to 121°C)

Filter Collapse Ratings

- 150 psi / 1034 kPa / 10.3 bar (standard)
- 3000 psi / 20,700 kPa / 206.8 bar (high collapse)



W451
Max Flow: 150 gpm (568 lpm)

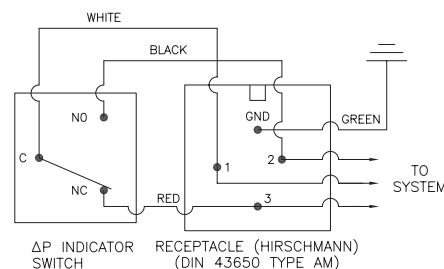
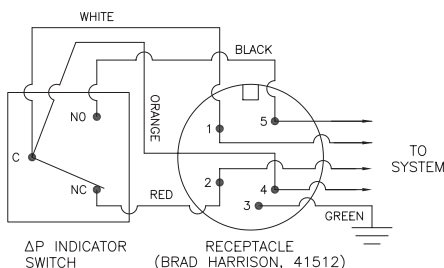


W451 Specification Illustrations

All dimensions are shown in millimeters [inches].

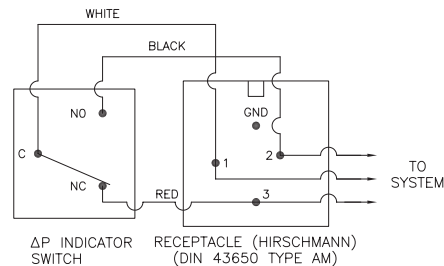
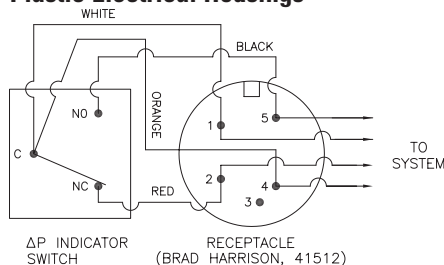
Indicator Switch Schematic Wiring Diagram

Aluminum Electrical Housings



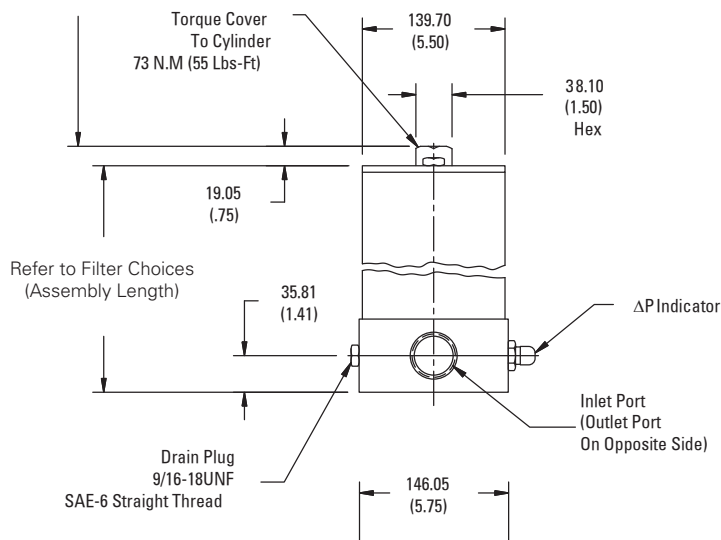
Note: The female plug (connector) is to be furnished by customer.

Plastic Electrical Housings

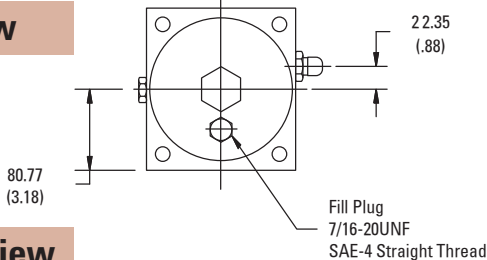


Note: The female plug (connector) is to be furnished by customer.

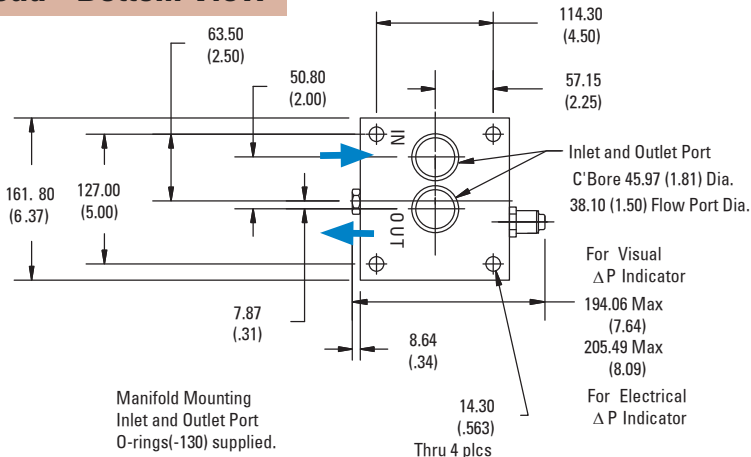
Assembly - Side View



Head - Side View



Head - Bottom View



Differential Indicators:

Indicators are designed to actuate at approximately 80% of bypass valve cracking pressure. It is recommended that an indicator with a bypass setting of 100 psid is used with a non-bypass housing.

Surge Control:

This optional feature is used to dampen pressure surges or spikes to avoid premature actuation of the indicator. Surge control delays the indicator response.

Thermal Lockout:

The Thermal Lockout prevents premature signaling of a bypass condition created by viscous fluid during cold start-ups. Normal indicator actuation capability is resumed once the operating temperature of the fluid reaches approximately 80°F / 27°C.



W451 Components High-Performance DT Filter Choices

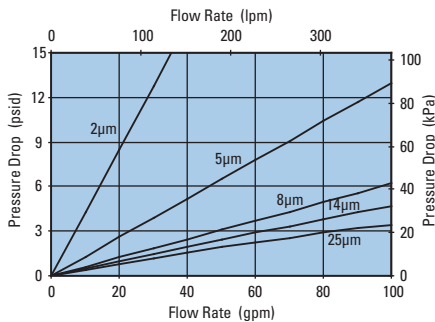
| Media Number | Beta _{x(c)} =1000 Rating | Length (in./mm) | Donaldson DT Part No. | Comments |
|--------------|-----------------------------------|-----------------|-----------------------|--------------------------------|
| 5 μm | 5 μm | 9/231.8 | P566270 | DT-HF4-9-5UM |
| 8 μm | 8 μm | 9/231.8 | P566271 | DT-HF4-9-8UM |
| 14 μm | 14 μm | 9/231.8 | P566272 | DT-HF4-9-14UM |
| 25 μm | 25 μm | 9/231.8 | P566273 | DT-HF4-9-25UM |
| 5 μm | 5 μm | 18/462.3 | P566274 | DT-HF4-18-5UM |
| 8 μm | 8 μm | 18/462.3 | P566275 | DT-HF4-18-8UM |
| 14 μm | 14 μm | 18/462.3 | P566276 | DT-HF4-18-14UM |
| 25 μm | 25 μm | 18/462.3 | P566277 | DT-HF4-18-25UM |
| 5 μm | 5 μm | 27/702.5 | P566278 | DT-HF4-27-5UM |
| 8 μm | 8 μm | 27/702.5 | P566279 | DT-HF4-27-8UM |
| 14 μm | 14 μm | 27/702.5 | P566280 | DT-HF4-27-14UM |
| 25 μm | 25 μm | 27/702.5 | P566281 | DT-HF4-27-25UM |
| 5 μm | 5 μm | 9/233.5 | P566412 | DT-HF4HC-9-5UM, High collapse |
| 14 μm | 14 μm | 9/233.5 | P566413 | DT-HF4HC-9-14UM, High collapse |
| WA | B>30 _(c) = 200 | 9/233.5 | P569527 | Absorbs 250 ml water @ 25 psid |

Filter Notes

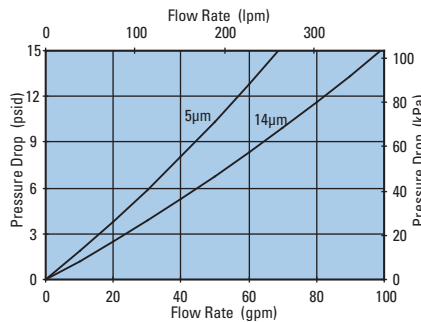
- All Donaldson DT filters utilize glass fiber media with an epoxy-based resin system for the ultimate in chemical compatibility.
- All Donaldson DT filters are potted with epoxy-based adhesives.
- Standard collapse DT designs are double wire-backed using epoxy-coated steel mesh for maximum pleat support and dirt capacity.
- High collapse designs are double wire-backed using stainless steel mesh.
- High collapse designs are also potted into machined aluminum end caps for greater filter integrity in critical applications.
- Viton® seals are standard on all Donaldson DT filters. Viton® is a registered trademark of E. I. DuPont de Nemours and Company.

Performance Data

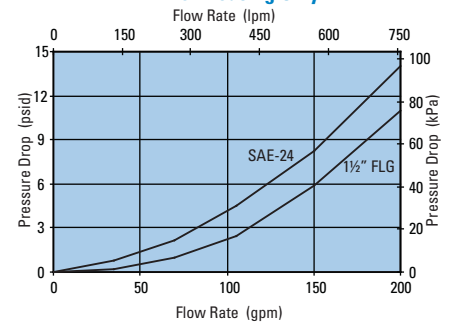
W451 9" DT Filter Only
DT-HF-9, 9.13"/231.8mm



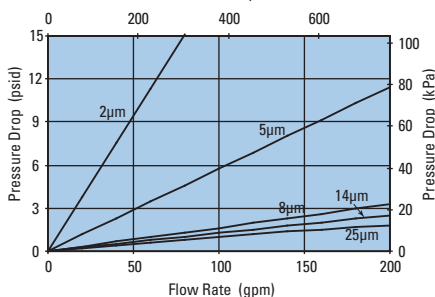
W451 9" DT High Collapse Filter Only
DT-HF4HC-9, 9.19"/233.5mm



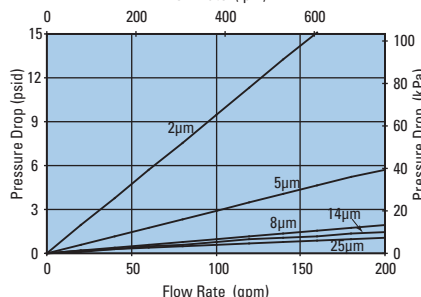
W451 Housing Only



W451 18" DT Filter Only
DT-HF4-18, 18.20"/462.3mm



W451 27" DT Filter Only
DT-HF4-27, 27.66"/702.5mm





W451

Max Flow: 150 gpm (568 lpm)



Housing Ordering Guide

Filter Assembly

W451

TABLE 1

1

TABLE 2

D

TABLE 3

4

TABLE 4

J | N

TABLE 5

B

TABLE 6

3

TABLE 7

Service Filter

Filters ordered separately. See previous page for filter options.

LEAD TIME NOTE:

This product is configured with the specifications and features of your choice. Please contact your Donaldson sales representative for lead time details.

Table 1

| Filter Assembly | |
|-----------------|-------------|
| CODE | DESCRIPTION |
| W451 | Assembly |

Table 2

| Filter Collapse Options | |
|-------------------------|---------------------------------------|
| CODE | DESCRIPTION |
| 1 | 150 psid for housing w/bypass valve |
| 4 | 3000 psi for housing w/o bypass valve |

Table 3

| Port Size Options | |
|-------------------|------------------------------|
| CODE | PORT SIZE |
| D | SAE-24 O-ring |
| E | 1½" 4-Bolt Flange Code 61 |
| R | 1½" 4-Bolt Flange Code 62 |
| S | Manifold Mounting |

Table 4

| Bypass Setting Options | |
|------------------------|----------------|
| CODE | BYPASS SETTING |
| 1 | Non-bypass |
| 4 | 50 psid |
| 6 | 90 psid |

Note: Use option 1 code only with 3000 psid collapse filter.

Table 5 (Primary)

| Indicator Style and Setting | |
|-----------------------------|---|
| CODE | ΔP INDICATOR STYLE & SETTING |
| A | Visual indicator 70 psid w/TL and surge |
| B | Electrical/visual 70 psid w/TL and surge |
| D | Electrical/visual 35 psid |
| E | Electrical/visual 100 psid |
| G | Electrical/visual 35 psid w/TL |
| I | Visual indicator 70 psid |
| J | ΔP indicator plug |
| L | Visual indicator 35 psid |
| M | Visual indicator 35 psid w/ TL and surge |
| N | Electrical/visual 35 psid w/12" 3-wire flying lead |
| O | Visual indicator 100 psid |
| P | Visual indicator 100 psid w/TL and surge |
| R | Electrical switch 35 psid |
| S | Electrical/visual 100 psid w/12" 3-wire flying lead |
| T | Electrical switch 100 psid |
| U | Electrical switch 70 psid |
| W | Electrical/visual 100 psid w/TL |
| Y | Electrical/visual 35 psid w/TL and surge |
| Z | Electrical/visual 100 psid w/TL and surge |

TL (thermal lockout)

METRIC PORTING AVAILABLE

Change W451 to G451
 Porting code D becomes 1-1/2" ISO 228 BSPP
 Porting code E becomes 1-1/2" SAE 4 bolt flange with M12 mounting threads
 Porting code R becomes 1-1/2" SAE 4 bolt flange with M16 mounting threads

Table 5 (Secondary)

| Receptacle Options | |
|--------------------|-------------------------------|
| CODE | ELECTRICAL STYLE |
| B | Brad Harrison® (5-pin) |
| H | Hirschmann® (4-pin) |
| N | None, for visual ΔP indicator |

Table 6

| Seal Options | |
|--------------|----------|
| CODE | MATERIAL |
| B | Buna-N® |
| E | E.P.R. |
| V | Viton® |

Table 7

| Assembly & Filter Length | |
|--------------------------|---------------|
| CODE (LGTH) | FILTER LENGTH |
| 3 (15.31") | 9.0" |
| 6 (24.70") | 18.0"* |
| 7 (34.00") | 27.0" |

Note: Code lengths 6, 7 & 8 media filters may be stacked using connector part # P167324.

Media Ratings

Western Filter elements have been replaced by Donaldson DT high-performance cartridges.

| WESTERN MEDIA CODE | DONALDSON DT MEDIA |
|--------------------|--------------------|
| 03 | DT 5μm |
| 05 | DT 8μm |
| 10 | DT 14μm |
| 20 | DT 25μm |

For a complete filter interchange, visit crossreference.donaldson.com.

Brad Harrison® is a registered trademark of Woodhead Industries, Inc.
 Hirschmann® is a registered trademark of Richard Hirschmann of America Inc.
 Buna-N® and Viton® are registered trademarks of E. I. DuPont de Nemours and Co.

W620 In-Line Cartridge Filters

Working Pressures to: 6000 *psi*
41,400 kPa
414 bar

Rated Static Burst to: 15,000 *psi*
103,400 kPa
1034 bar

Fatigue Pressure Rating: 3000 *psi*
20,700 kPa
207 bar

Flow Range to: 150 *gpm*
568 *lpm*



Features

The W620 filter assembly contains the popular HF3 filter. It offers a reverse flow bypass valve option available for hydrostatic transmissions. Donaldson DT high-performance 4-layer media is offered in five different media grades. The differential pressure indicator line is designed to work with the wide assortment of bypass valves. Thermal lockout and surge control are two key features incorporated in many of the valves.

- Conforms to HF3 specifications
- Head material: cast iron
- Housing material: steel
- Reverse flow bypass valve option available

Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- SAE-16, -20, 24 O-ring
- 1¼" SAE 4-Bolt Flange Code 61 or 62
- 1½" SAE 4-Bolt Flange Code 61

Assembly Weight

- 9": 26 lbs / 11.79 kg
- 13": 33 lbs / 14.97 kg
- 18": 42 lbs / 19.05 kg
- 22": 48 lbs / 21.77 kg

Replacement Filter Lengths

- 4" / 101.6mm
- 8" / 203.2mm
- 13" / 330.2mm
- 16" / 406.4mm

Standard Bypass Ratings

- 90 psi / 621 kPa / 6.2 bar
- 50 psi / 345 kPa / 3.5 bar
- No Bypass

Operating Temperatures

- -20° to 250°F (-29° to 121°C)

Filter Collapse Ratings

- 150 psi / 1034 kPa / 10.3 bar (standard)
- 3000 psi / 20,700 kPa / 206.8 bar (high collapse)



W620
Max Flow: 150 gpm (568 lpm)

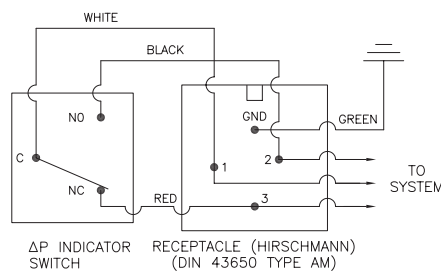
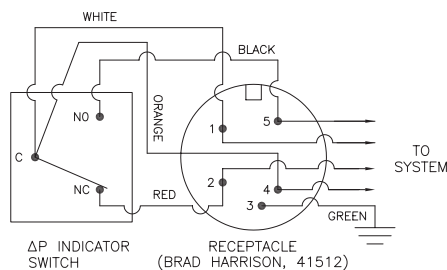


W620 Specification Illustrations

All dimensions are shown in millimeters [inches].

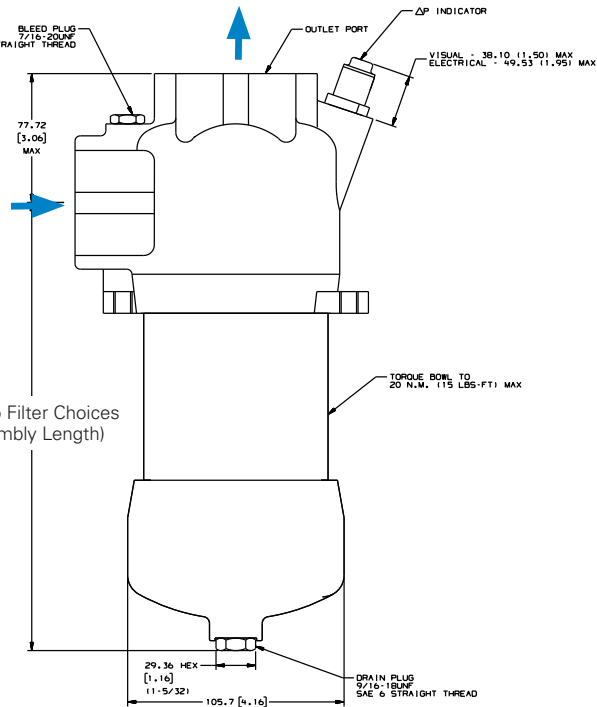
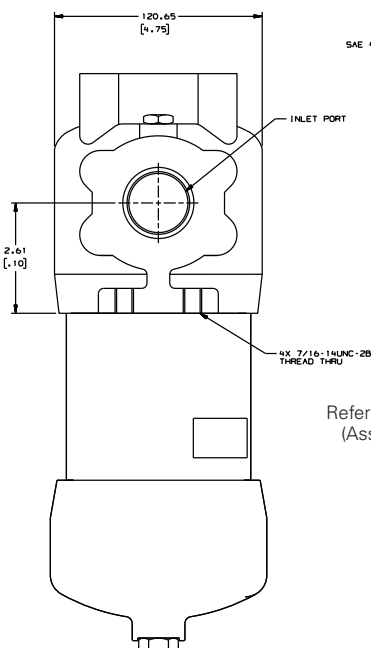
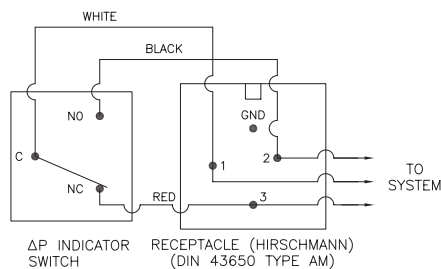
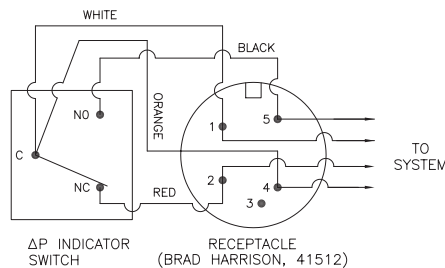
Indicator Switch Schematic Wiring Diagram Aluminum Electrical Housings

Assembly - Side View

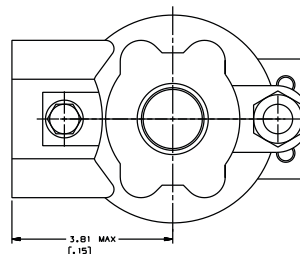


Note: The female plug (connector) is to be furnished by customer.

Plastic Electrical Housings



Head - Top View



Note: The female plug (connector) is to be furnished by customer.

Differential Indicators: Indicators are designed to actuate at approximately 80% of bypass valve cracking pressure. It is recommended that an indicator with a bypass setting of 100 psid is used with a non-bypass housing.

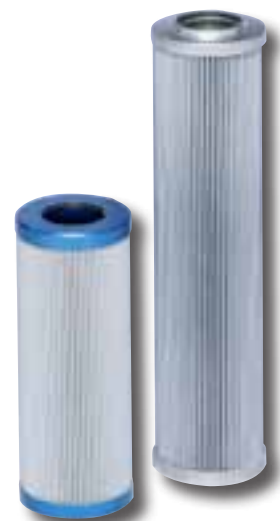
Surge Control: This optional feature is used to dampen pressure surges or spikes to avoid premature actuation of the indicator. Surge control delays the indicator response.

Thermal Lockout: The Thermal Lockout prevents premature signaling of a bypass condition created by viscous fluid during cold start-ups. Normal indicator actuation capability is resumed once the operating temperature of the fluid reaches approximately 80°F / 27°C.

W620 Components

High-Performance DT Filter Choices

| Media Number | Beta ₁₀₀₀ Rating | Length (in./mm) | Donaldson DT Part No. | Comments |
|--------------|-----------------------------|-----------------|-----------------------|--------------------------------|
| 2 µm | <4 µm | 4/116.7 | P566204 | DT-9600-4-2UM |
| 5 µm | 5 µm | 4/116.7 | P566205 | DT-9600-4-5UM |
| 8 µm | 8 µm | 4/116.7 | P566206 | DT-9600-4-8UM |
| 14 µm | 14 µm | 4/116.7 | P566207 | DT-9600-4-14UM |
| 25 µm | 25 µm | 4/116.7 | P566208 | DT-9600-4-25UM |
| 5 µm | 5 µm | 4/116 | P566364 | DT-9601-4-5UM, High collapse |
| 14 µm | 14 µm | 4/116 | P566365 | DT-9601-4-14UM, High collapse |
| 2 µm | <4 µm | 8/208.8 | P566209 | DT-9600-8-2UM |
| 5 µm | 5 µm | 8/208.8 | P566210 | DT-9600-8-5UM |
| 8 µm | 8 µm | 8/208.8 | P566211 | DT-9600-8-8UM |
| 14 µm | 14 µm | 8/208.8 | P566212 | DT-9600-8-14UM |
| 25 µm | 25 µm | 8/208.8 | P566213 | DT-9600-8-25UM |
| 5 µm | 5 µm | 8/208 | P566366 | DT-9601-8-5UM, High collapse |
| 14 µm | 14 µm | 8/208 | P566367 | DT-9601-8-14UM, High collapse |
| 2 µm | <4 µm | 8/208 | P567875 | DX2-9600-8-2UM |
| 5 µm | 5 µm | 8/209 | P565122 | DX2-9600-8-5UM |
| 8 µm | 8 µm | 8/209 | P565123 | DX2-9600-8-8UM |
| 14 µm | 14 µm | 8/209 | P564936 | DX2-9600-8-14UM |
| 2 µm | <4 µm | 13/327.8 | P566214 | DT-9600-13-2UM |
| 5 µm | 5 µm | 13/327.8 | P566215 | DT-9600-13-5UM |
| 8 µm | 8 µm | 13/327.8 | P566216 | DT-9600-13-8UM |
| 14 µm | 14 µm | 13/327.8 | P566217 | DT-9600-13-14UM |
| 25 µm | 25 µm | 13/327.8 | P566218 | DT-9600-13-25UM |
| 5 µm | 5 µm | 13/326.3 | P566368 | DT-9601-13-5UM, High collapse |
| 14 µm | 14 µm | 13/326.3 | P566369 | DT-9601-13-14UM, High collapse |
| 5 µm | 5 µm | 13/327 | P565188 | DX2-9600-13-5UM |
| 8 µm | 8 µm | 13/327 | P565189 | DX2-9600-13-8UM |
| 14 µm | 14 µm | 13/327 | P565187 | DX2-9600-13-14UM |
| 5 µm | 5 µm | 16/427 | P565196 | DX2-9600-16-5UM |
| 8 µm | 8 µm | 16/427 | P565197 | DX2-9600-16-8UM |
| 14 µm | 14 µm | 16/427 | P565195 | DX2-9600-16-14UM |



Filter Notes

- All Donaldson DT and DX2 filters utilize glass fiber media with an epoxy-based resin system for the ultimate in chemical compatibility.
- All Donaldson DT and DX2 filters are potted with epoxy-based adhesives.
- Standard collapse DT designs are double wire-backed using epoxy-coated steel mesh for maximum pleat support and dirt capacity.
- High collapse designs are double wire-backed using stainless steel mesh.
- High collapse designs are also potted into machined aluminum endcaps for greater filter integrity in critical applications.
- Viton® seals are standard on all Donaldson DT and DX2 filters. Viton® is a registered trademark of E. I. DuPont de Nemours and Company.
- DX2 filters utilize nylon mesh for pleat support.



W620

Max Flow: 150 gpm (568 lpm)



Housing Ordering Guide

Filter Assembly

W620

1

B

4

L|N

B

2

TABLE 1

TABLE 2

TABLE 3

TABLE 4

TABLE 5

TABLE 6

TABLE 7

Service Filter

Filters ordered separately. See previous page for filter options.

LEAD TIME NOTE:

This product is configured with the specifications and features of your choice. Please contact your Donaldson sales representative for lead time details.

Table 1

| Filter Assembly | |
|-----------------|-------------|
| CODE | DESCRIPTION |
| W620 | Assembly |

Table 2

| Filter Collapse Options | |
|-------------------------|---------------------------------------|
| CODE | DESCRIPTION |
| 1 | 150 psid for housing w/bypass valve |
| 4 | 3000 psi for housing w/o bypass valve |

Table 3

| Port Size Options | |
|-------------------|------------------------------|
| CODE | PORT SIZE |
| B | SAE-16 O-ring |
| C | SAE-20 O-ring |
| D | SAE-24 O-ring |
| E | 1½" 4 Bolt Flange Code 61 |
| G | 1¼" 4-Bolt Flange Code 61 |
| Q | 1¼" 4-Bolt Flange Code 62 |

Table 4

| Bypass Setting Options | |
|------------------------|---------------------------------|
| CODE | BYPASS SETTING |
| 1 | Non-bypass |
| 4 | 50 psid |
| 6 | 90 psid |
| 7 | 90 psid w/reverse flow valve |
| 8 | Non-bypass w/reverse flow valve |
| 9 | 50 psid w/reverse flow valve |

Note: Use option 1 & 8 only with 3000 psid collapse filter.

Table 5 (Primary)

| Indicator Style and Setting | |
|-----------------------------|---|
| CODE | ΔP INDICATOR STYLE & SETTING |
| A | Visual indicator 70 psid w/TL & surge |
| B | Electrical/visual 70 psid w/TL & surge |
| D | Electrical/visual 35 psid |
| E | Electrical/visual 100 psid |
| G | Electrical/visual 35 psid w/TL |
| I | Visual indicator 70 psid |
| J | ΔP indicator plug |
| L | Visual indicator 35 psid |
| M | Visual indicator 35 psid w/ TL and surge |
| N | Electrical/visual 35 psid w/12" 3 wire flying lead |
| O | Visual indicator 100 psid |
| P | Visual indicator 100 psid w/TL and surge |
| R | Electrical switch 35 psid |
| S | Electrical/visual 100 psid w/12" 3 wire flying lead |
| T | Electrical switch 100 psid |
| U | Electrical switch 70 psid |
| W | Electrical/visual 100 psid w/TL |
| Y | Electrical/visual 35 psid w/TL and surge |
| Z | Electrical/visual 100 psid w/TL and surge |

TL (thermal lockout)

Table 5 (Secondary)

| Receptacle Options | |
|--------------------|-------------------------------|
| CODE | ELECTRICAL STYLE |
| B | Brad Harrison® (5-pin) |
| H | Hirschmann® (4-pin) |
| N | None, for visual ΔP indicator |

Table 6

| Seal Options | |
|--------------|----------|
| CODE | MATERIAL |
| B | Buna-N® |
| E | E.P.R. |
| V | Viton® |

Table 7

| Assembly & Filter Length | |
|--------------------------|---------------|
| CODE (LGTH) | FILTER LENGTH |
| 1 (9.0") | 4.0" |
| 2 (13.0")* | 8.0"* |
| 4 (18.0") | 13.0" |
| 5 (22.0") | 16.0" |

*HF3

METRIC PORTING AVAILABLE

Change W620 to G620
 Porting code B becomes 1" ISO 228 BSPP
 Porting code C becomes 1-1/4" ISO 228 BSPP
 Porting code D becomes 1-1/2" ISO 228 BSPP
 Porting code E becomes 1-1/2" SAE 4 bolt flange with M12 mounting threads
 Porting code G becomes 1-1/4" SAE 4 bolt flange with M10 mounting threads
 Porting code Q becomes 1-1/4" SAE 4 bolt flange with M14 mounting threads

Media Ratings

Western Filter elements have been replaced by Donaldson DT high-performance cartridges.

| WESTERN MEDIA CODE | DONALDSON DT MEDIA |
|--------------------|--------------------|
| 01 | DT 2μm |
| 03 | DT 5μm |
| 05 | DT 8μm |
| 10 | DT 14μm |
| 20 | DT 25μm |

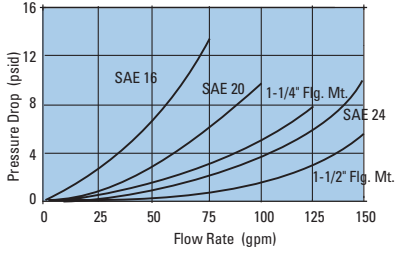
For a complete filter interchange, visit crossreference.donaldson.com.

Brad Harrison® is a registered trademark of Woodhead Industries, Inc.
 Hirschmann® is a registered trademark of Richard Hirschmann of America Inc.
 Buna-N® and Viton® are registered trademarks of E. I. DuPont de Nemours and Co.

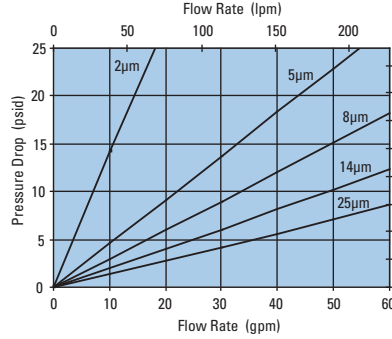


Performance Data

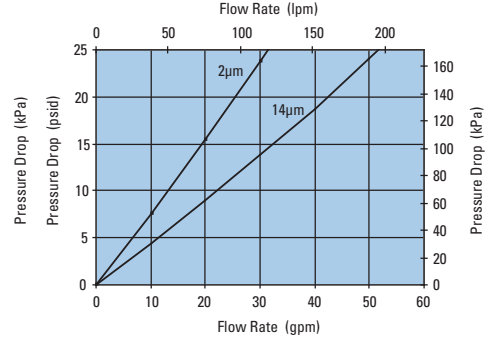
W620 Housing Only



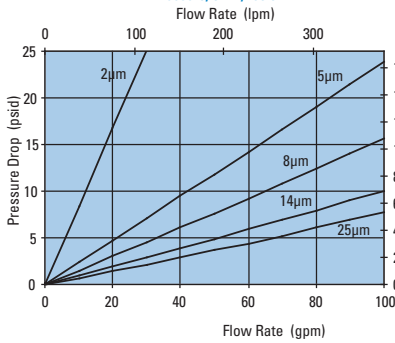
W620 4" DT Filter Only
DT-9600-4, 4.59"/116.7mm



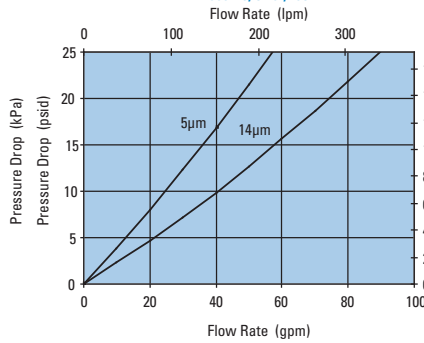
W620 4" DT Filter Only
DT-9601-4, 4.59"/116.2mm



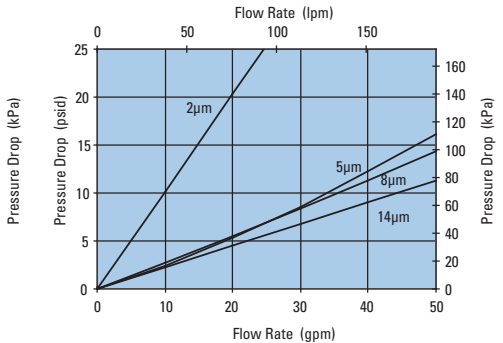
W620 8" DT Filter Only
DT-9600-8, 8.22"/208.8mm



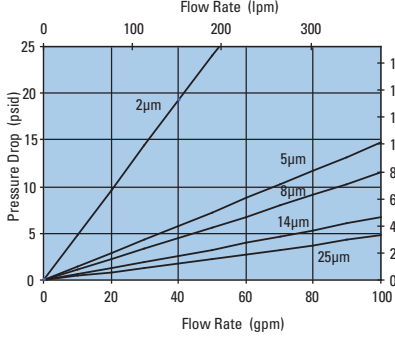
W620 8" DT Filter Only
DT-9601-8, 8.19"/208mm



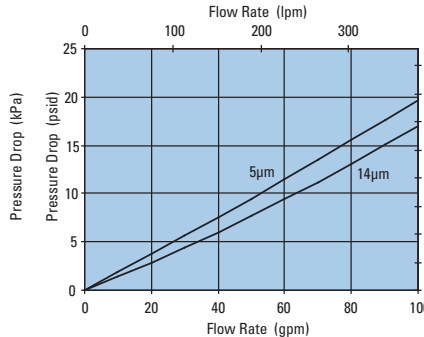
W620 8" DX2 Filter Only
DX2-9600-8, 8.19"/208mm



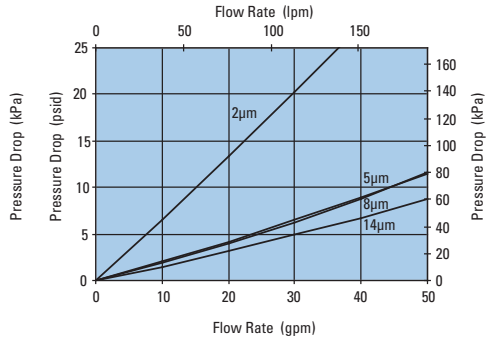
W620 13" DT Filter Only
DT-9600-13, 12.91"/327.8mm



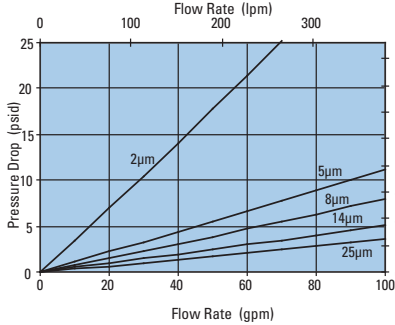
W620 13" DT Filter Only
DT-9601-13, 12.85"/326.3mm



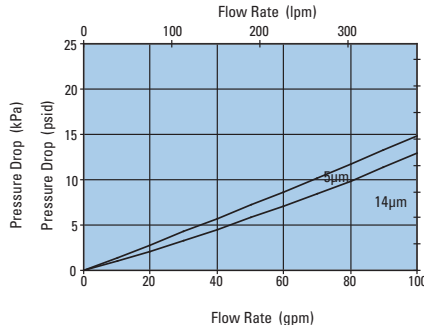
W620 13" DX2 Filter Only
DX2-9600-13, 12.87"/327mm



W620 16" DT Filter Only
DT-9600-16, 16.84"/427.8mm



W620 16" DT Filter Only
DT-9601-16, 16.82"/427.1mm





WS620

Max Flow: 150 gpm (568 lpm)



WS620 In-Line Cartridge Filters

Working Pressures to: 6000 *psi*
41,400 kPa
414 bar

Rated Static Burst to: 15,000 *psi*
103,400 kPa
1034 bar

Fatigue Pressure Rating: 3000 *psi*
20,700 kPa
207 bar

Flow Range to: 150 *gpm*
568 *lpm*



Features

The WS620 filter assembly is manufactured to meet the HF3 specification. The flange mounted design is an ideal choice for direct mounting to the hydraulic system. Our standard housing drain plug helps relieve system pressure during filter change outs. Donaldson DT high-performance 4-layer media is offered in five different media grades. The differential pressure indicator line is designed to work with the wide assortment of bypass valves. Thermal lockout and surge control are two key features incorporated in many of the valves.

- Conforms to HF3 specifications
- Head material: cast iron
- Manifold mounting
- Housing material: steel

Beta Rating

- Performance to $\beta_{<4(c)}=1000$

Porting Size Options

- Manifold mounting

Assembly Weight

- 11.8": 37 lbs / 16.78 kg
- 15.5": 43 lbs / 19.50 kg
- 20.2": 52 lbs / 23.59 kg
- 24.1": 59 lbs / 26.76 kg

Replacement Filter Lengths

- 4" / 101.6mm
- 8" / 203.2mm
- 13" / 330.2mm
- 16" / 406.4mm

Standard Bypass Ratings

- 90 psi / 621 kPa / 6.2 bar
- 50 psi / 345 kPa / 3.5 bar
- No Bypass

Operating Temperatures

- -20° to 250°F (-29° to 121°C)

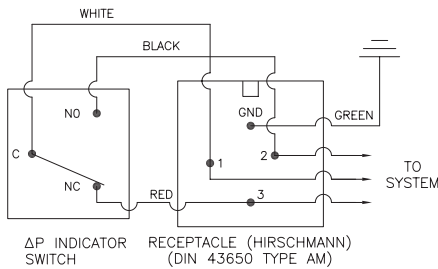
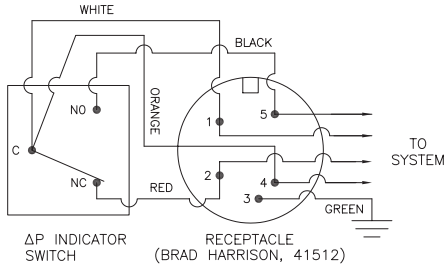
Filter Collapse Ratings

- 150 psi / 1034 kPa / 10.3 bar (standard)
- 3000 psi / 20,700 kPa / 206.8 bar (high collapse)

WS620 Specification Illustrations

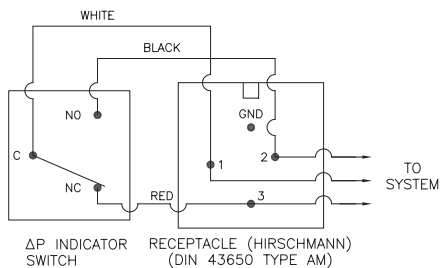
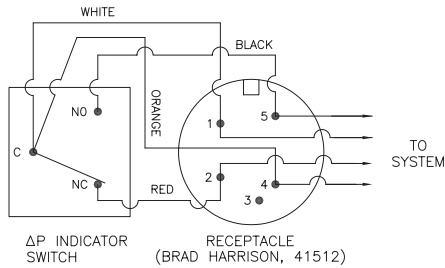
All dimensions are shown in millimeters [inches].

Indicator Switch Schematic Wiring Diagram Aluminum Electrical Housings



Note: The female plug (connector) is to be furnished by customer.

Plastic Electrical Housings



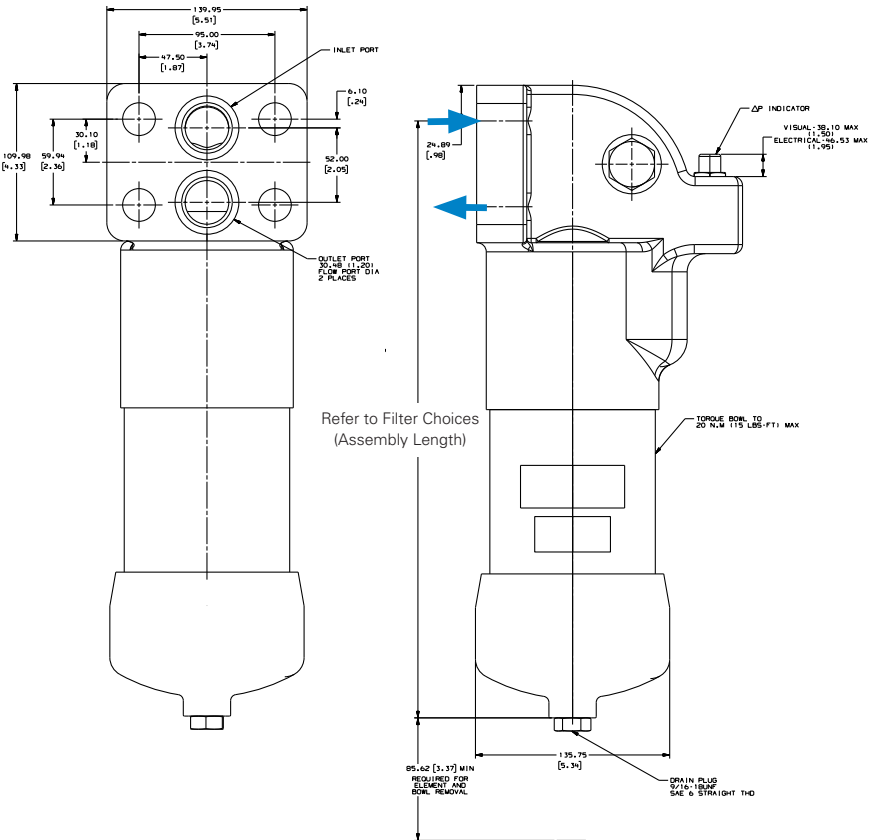
Note: The female plug (connector) is to be furnished by customer.

Differential Indicators: Indicators are designed to actuate at approximately 80% of bypass valve cracking pressure. It is recommended that an indicator with a bypass setting of 100 psid is used with a non-bypass housing.

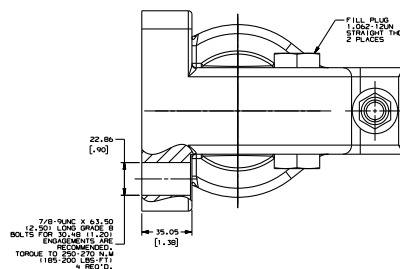
Surge Control: This optional feature is used to dampen pressure surges or spikes to avoid premature actuation of the indicator. Surge control delays the indicator response.

Thermal Lockout: The Thermal Lockout prevents premature signaling of a bypass condition created by viscous fluid during cold start-ups. Normal indicator actuation capability is resumed once the operating temperature of the fluid reaches approximately 80°F / 27°C.

Assembly - Side View



Head - Top View





WS620

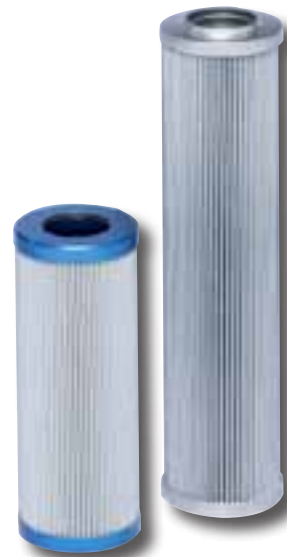
Max Flow: 150 gpm (568 lpm)



WS620 Components

High-Performance DT Filter Choices

| Media Number | Beta _{w(c)} =1000 Rating | Length (in./mm) | Donaldson DT Part No. | Comments |
|--------------|-----------------------------------|-----------------|-----------------------|--------------------------------|
| 2 µm | <4 µm | 4/116.7 | P566204 | DT-9600-4-2UM |
| 5 µm | 5 µm | 4/116.7 | P566205 | DT-9600-4-5UM |
| 8 µm | 8 µm | 4/116.7 | P566206 | DT-9600-4-8UM |
| 14 µm | 14 µm | 4/116.7 | P566207 | DT-9600-4-14UM |
| 25 µm | 25 µm | 4/116.7 | P566208 | DT-9600-4-25UM |
| 5 µm | 5 µm | 4/116 | P566364 | DT-9601-4-5UM, High collapse |
| 14 µm | 14 µm | 4/116 | P566365 | DT-9601-4-14UM, High collapse |
| 2 µm | <4 µm | 8/208.8 | P566209 | DT-9600-8-2UM |
| 5 µm | 5 µm | 8/208.8 | P566210 | DT-9600-8-5UM |
| 8 µm | 8 µm | 8/208.8 | P566211 | DT-9600-8-8UM |
| 14 µm | 14 µm | 8/208.8 | P566212 | DT-9600-8-14UM |
| 25 µm | 25 µm | 8/208.8 | P566213 | DT-9600-8-25UM |
| 5 µm | 5 µm | 8/208 | P566366 | DT-9601-8-5UM, High collapse |
| 14 µm | 14 µm | 8/208 | P566367 | DT-9601-8-14UM, High collapse |
| 2 µm | <4 µm | 8/208 | P567875 | DX2-9600-8-2UM |
| 5 µm | 5 µm | 8/209 | P565122 | DX2-9600-8-5UM |
| 8 µm | 8 µm | 8/209 | P565123 | DX2-9600-8-8UM |
| 14 µm | 14 µm | 8/209 | P564936 | DX2-9600-8-14UM |
| 2 µm | <4 µm | 13/327.8 | P566214 | DT-9600-13-2UM |
| 5 µm | 5 µm | 13/327.8 | P566215 | DT-9600-13-5UM |
| 8 µm | 8 µm | 13/327.8 | P566216 | DT-9600-13-8UM |
| 14 µm | 14 µm | 13/327.8 | P566217 | DT-9600-13-14UM |
| 25 µm | 25 µm | 13/327.8 | P566218 | DT-9600-13-25UM |
| 5 µm | 5 µm | 13/326.3 | P566368 | DT-9601-13-5UM, High collapse |
| 14 µm | 14 µm | 13/326.3 | P566369 | DT-9601-13-14UM, High collapse |
| 5 µm | 5 µm | 13/327 | P565188 | DX2-9600-13-5UM |
| 8 µm | 8 µm | 13/327 | P565189 | DX2-9600-13-8UM |
| 14 µm | 14 µm | 13/327 | P565187 | DX2-9600-13-14UM |
| 5 µm | 5 µm | 16/427 | P565196 | DX2-9600-16-5UM |
| 8 µm | 8 µm | 16/427 | P565197 | DX2-9600-16-8UM |
| 14 µm | 14 µm | 16/427 | P565195 | DX2-9600-16-14UM |



Filter Notes

- All Donaldson DT and DX2 filters utilize glass fiber media with an epoxy-based resin system for the ultimate in chemical compatibility.
- All Donaldson DT and DX2 filters are potted with epoxy-based adhesives.
- Standard collapse DT designs are double wire-backed using epoxy-coated steel mesh for maximum pleat support and dirt capacity.
- High collapse designs are double wire-backed using stainless steel mesh.
- High collapse designs are also potted into machined aluminum endcaps for greater filter integrity in critical applications.
- Viton® seals are standard on all Donaldson DT and DX2 filters. Viton® is a registered trademark of E. I. DuPont de Nemours and Company.
- DX2 filters utilize nylon mesh for pleat support.



Housing Ordering Guide

| | | | | | | | |
|-----------------|------------------|--------------|--------------|--------------|------------------|--------------|--------------|
| Filter Assembly | WS620 TABLE 1 | 1 TABLE 2 | S TABLE 3 | 4 TABLE 4 | D H TABLE 5 | B TABLE 6 | 2 TABLE 7 |
|-----------------|------------------|--------------|--------------|--------------|------------------|--------------|--------------|

Service Filter: Filters ordered separately. See previous page for filter options.

LEAD TIME NOTE:
This product is configured with the specifications and features of your choice. Please contact your Donaldson sales representative for lead time details.

Table 1

| Filter Assembly | |
|-----------------|-------------|
| CODE | DESCRIPTION |
| WS620 | Assembly |

Table 2

| Filter Collapse Options | |
|-------------------------|---------------------------------------|
| CODE | DESCRIPTION |
| 1 | 150 psid for housing w/bypass valve |
| 4 | 3000 psi for housing w/o bypass valve |

Table 3

| Port Size Options | |
|-------------------|-------------------|
| CODE | PORT SIZE |
| S | Manifold Mounting |

Table 4

| Bypass Setting Options | |
|------------------------|---------------------------------|
| CODE | BYPASS SETTING |
| 1 | Non-bypass |
| 4 | 50 psid |
| 6 | 90 psid |
| 7 | 90 psid w/reverse flow valve |
| 8 | Non-bypass w/reverse flow valve |
| 9 | 50 psid w/reverse flow valve |

Note: Use option 1 & 8 only with 3000 psid collapse filter.

Table 5 (Primary)

| Indicator Style and Setting | |
|-----------------------------|---|
| CODE | ΔP INDICATOR STYLE & SETTING |
| A | Visual indicator 70 psid w/TL and surge |
| B | Electrical/visual 70 psid w/TL and surge |
| D | Electrical/visual 35 psid |
| E | Electrical/visual 100 psid |
| G | Electrical/visual 35 psid w/TL |
| I | Visual indicator 70 psid |
| J | ΔP indicator plug |
| L | Visual indicator 35 psid |
| M | Visual indicator 35 psid w/ TL and surge |
| N | Electrical/visual 35 psid w/12" 3-wire flying lead |
| O | Visual indicator 100 psid |
| P | Visual indicator 100 psid w/TL and surge |
| R | Electrical switch 35 psid |
| S | Electrical/visual 100 psid w/12" 3-wire flying lead |
| T | Electrical switch 100 psid |
| U | Electrical switch 70 psid |
| V | Electrical/visual 70 psid w/TL |
| W | Electrical/visual 100 psid w/TL |
| Y | Electrical/visual 35 psid w/TL and surge |
| Z | Electrical/visual 100 psid w/TL and surge |

TL (thermal lockout)

Table 5 (Secondary)

| Receptacle Options | |
|--------------------|-------------------------------|
| CODE | ELECTRICAL STYLE |
| B | Brad Harrison® (5-pin) |
| H | Hirschmann® (4-pin) |
| N | None, for visual ΔP indicator |

Table 6

| Seal Options | |
|--------------|----------|
| CODE | MATERIAL |
| B | Buna-N® |
| E | E.P.R. |
| V | Viton® |

Table 7

| Assembly & Filter Length | |
|--------------------------|---------------|
| CODE (LGTH) | FILTER LENGTH |
| 1 (11.8") | 4.0" |
| 2 (15.5")* | 8.0"* |
| 4 (20.2") | 13.0" |
| 5 (24.1") | 16.0" |

*HF3

Media Ratings

Western Filter elements have been replaced by Donaldson DT high-performance cartridges.

| WESTERN MEDIA CODE | DONALDSON DT MEDIA |
|--------------------|--------------------|
| 01 | DT 2μm |
| 03 | DT 5μm |
| 05 | DT 8μm |
| 10 | DT 14μm |
| 20 | DT 25μm |

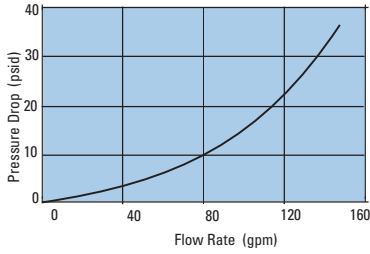
For a complete filter interchange, visit crossreference.donaldson.com.

Brad Harrison® is a registered trademark of Woodhead Industries, Inc.
Hirschmann® is a registered trademark of Richard Hirschmann of America Inc.
Buna-N® and Viton® are registered trademarks of E. I. DuPont de Nemours and Co.

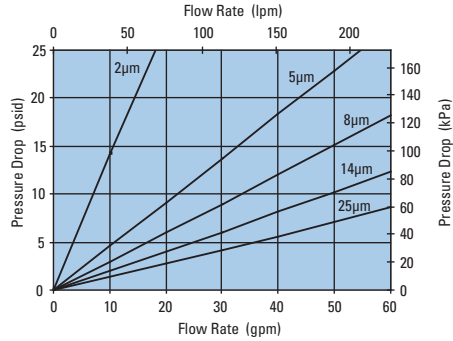


Performance Data

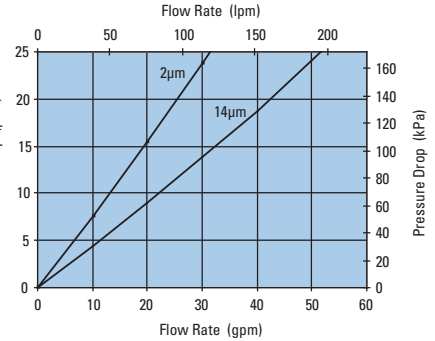
WS620 Housing Only



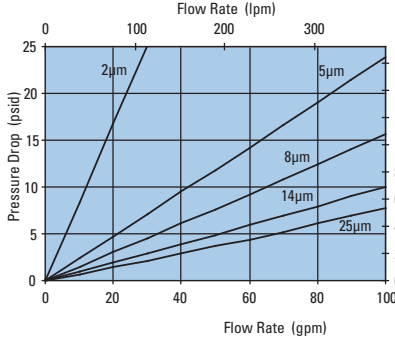
WS620 4" DT Filter Only
DT-9600-4, 4.59"/116.7mm



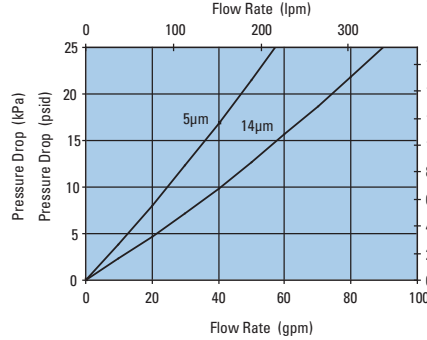
WS620 4" DT Filter Only
DT-9601-4, 4.59"/116.2mm



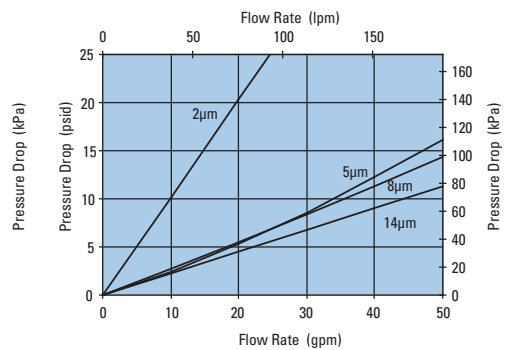
WS620 8" DT Filter Only
DT-9600-8, 8.22"/208.8mm



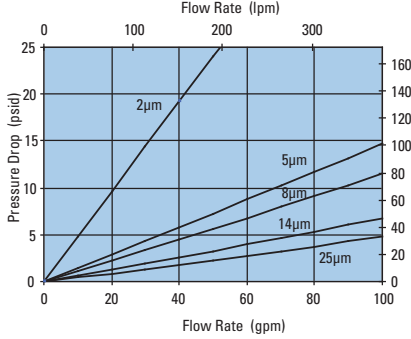
WS620 8" DT Filter Only
DT-9601-8, 8.19"/208mm



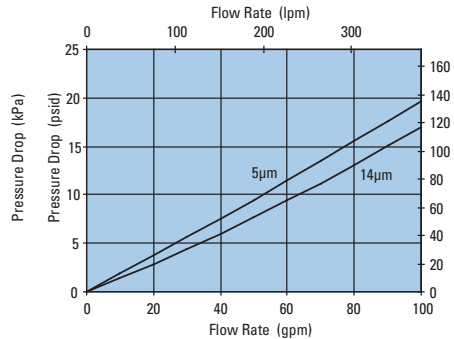
WS620 8" DX2 Filter Only
DX2-9600-8, 8.19"/208mm



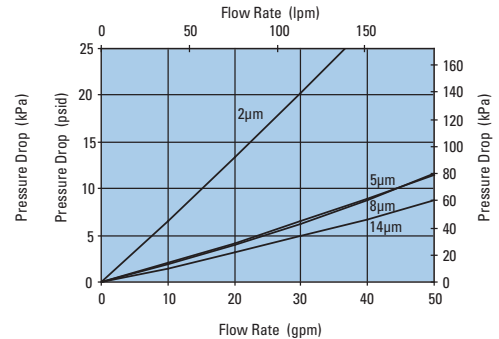
WS620 13" DT Filter Only
DT-9600-13, 12.91"/327.8mm



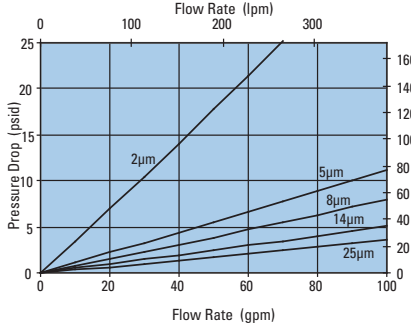
WS620 13" DT Filter Only
DT-9601-13, 12.85"/326.3mm



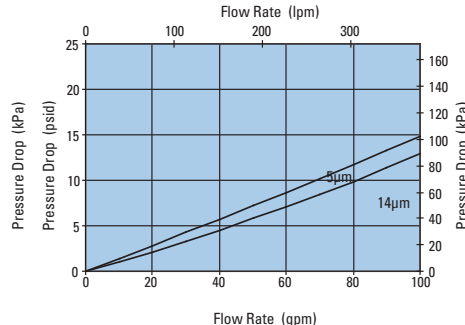
WS620 13" DX2 Filter Only
DX2-9600-13, 12.87"/327mm



WS620 16" DT Filter Only
DT-9600-16, 16.84"/427.8mm



WS620 16" DT Filter Only
DT-9601-16, 16.82"/427.1mm



HPK05 In-Line Cartridge Filters

Working Pressures to: 3000 *psi*
20,700 kPa
206.9 bar

Rated Static Burst to: 6000 *psi*
41,400 kPa
413.8 bar

Flow Range to: 200 *gpm*
757 *lpm*



Features

The HPK05 high pressure filter series is made of ductile iron and steel for strength and durability. Machined bypass valves are case-hardened at critical points to provide maximum strength and reliability.

Reverse flow bypass valve allows bi-directional flow through the filter head, with head-up or head-down mounting capabilities. Available with your choice of visual or AC/DC electrical service indicator; choose Viton® or Buna-N® seals. The HPK05 filters contain Synteq™, Donaldson’s exclusive synthetic fiber media formulated especially for hydraulic filtration. Upgraded Donaldson high-performance DT filters are also offered for superior performance.

Viton® and Buna-N® are registered trademarks of E. I. DuPont de Nemours and Company.

Beta Rating

- Performance to $\beta_{4(c)}=1000$

Porting Size Options

- 2" SAE 4-Bolt Flange Code 61

Assembly Weight

- 63 lbs / 28.5

Replacement Filter Length

- 25.53"/648mm
- 25.9"/657.9mm

Standard Bypass Ratings

- 60 *psi* / 414 kPa / 4.1 bar with reverse-flow check valve
- No Bypass

Operating Temperatures

- -20°F to 250°F / -29°C to 121°C

Filter Collapse Ratings

- 200 *psi* / 1380 kPa / 13.8 bar (standard)
- 3000 *psi* / 20,700 kPa / 206.9 bar (high collapse)



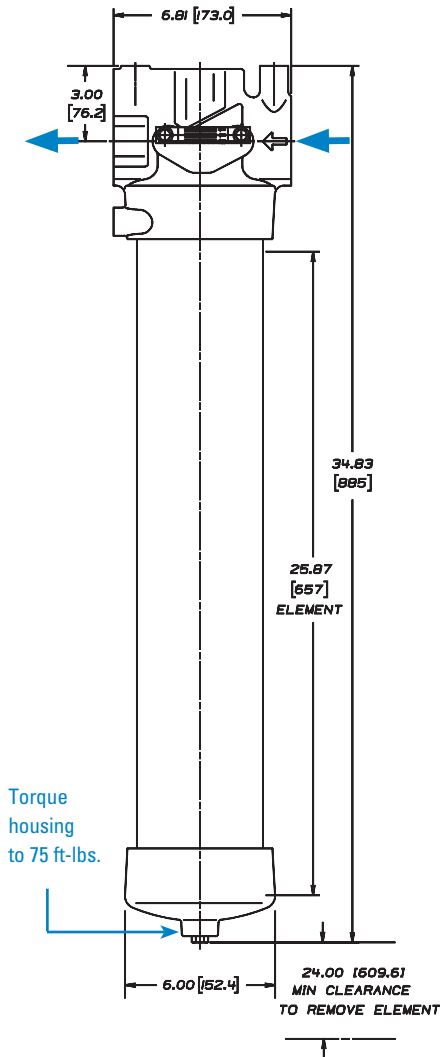
HPK05
 Max Flow: 200 gpm (757 lpm)



HPK05 Specification Illustrations

All dimensions are shown in inches [millimeters].

Assembly - Side View

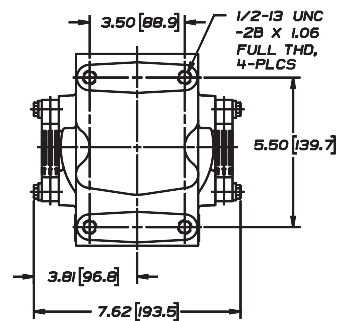


Applications:

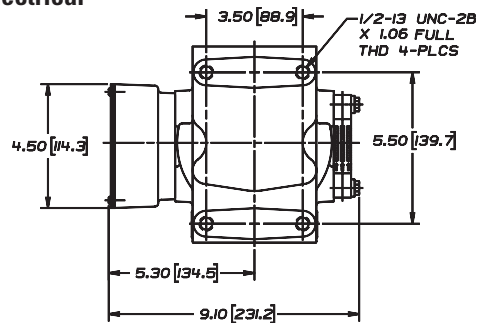
- High Pressure Circuits
- In-Plant & Mobile Equipment
- Hydrostatic Transmissions
- Centralized Lube Systems

Head - Top View

With 2 Visual Indicators

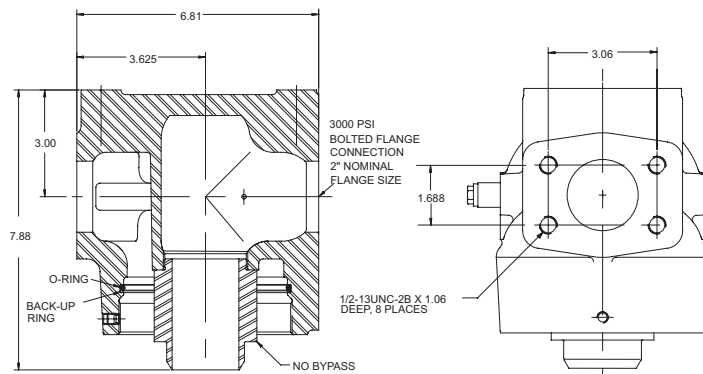
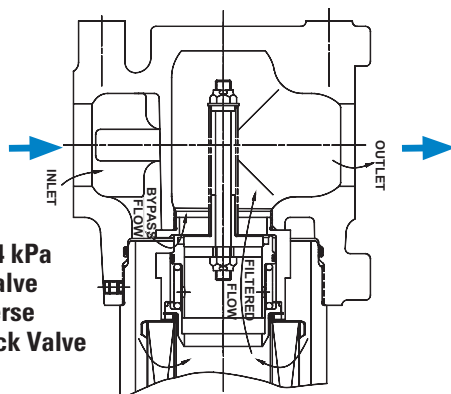


With Visual & Electrical Indicators



Bypass Valve Alternatives

60 psi /414 kPa
 Bypass Valve
 with Reverse
 Flow Check Valve



No Bypass

HPK05 Components Assembly Choices

| Port Size ⁴ | Bypass Rating | Indicator Style/Location ¹ | Assembly Number | Media Number | Filter Part No. |
|-----------------------------------|----------------------------|---------------------------------------|-----------------|--------------|----------------------|
| 2" SAE 4-Bolt Flange (Code 61) | 60 psi / 414 kPa / 4.1 bar | Visual, Left side | K052024 | No. 9 | P164229 |
| | Reverse flow check valve | | | | |
| | No Bypass | Visual & Electrical ² | K052039 | No. 9 | P171037 ³ |

Assembly Notes

- Donaldson uses the inlet port as the reference point. "Left side," for instance, means that the indicator mounts on the side of the filter head that is on your left when you face the inlet port.
- Visual indicator is mounted on left side of the head; electrical indicator (P173929- 72 psid) is mounted on the right side.
- Rated as high collapse (3000 psi / 20700 kPa); has Viton® seals.

Standard Filter Choices with Synteq™ Media Technology

| Media Number | B _{x(c)} =1000 Rating | Length (in./mm) | Part No. | Seal & Comments |
|--------------|--------------------------------|-----------------|----------------|-----------------|
| No. 1 | 5 µm | 25.5 / 648 | P167841 | Buna-N® |
| No. 2 | 9 µm | 25.5 / 648 | P164585 | Buna-N |
| No. 2½ | 10 µm | 25.5 / 648 | P164227 | Buna-N |
| | | | P164435 | Viton® |
| | | | Built to order | |
| No. 9 | 23 µm | 25.5 / 648 | P164229 | Buna-N |

Filter Notes

- Filters with seals made of Buna-N are appropriate for most applications involving petroleum oil. Filters with seals made of fluoroelastomer (such as Viton® or Fluorel®) are required when using diester, phosphate ester fluids, water glycol, water/oil emulsions, and HWCF (high water content fluids) over 150°F/83°C. (Viton® is a registered trademark of DuPont Dow Elastomers and Fluorel is a registered trademark of the 3M Company.)
- Donaldson high collapse filters, with their steel end caps and reinforcing wire-backed media, are rated to withstand up to 3000 psi / 20,700 kPa before collapsing.
- Refer to table in the Technical Reference Guide for fluid compatibility with our filter media.
- Buna-N® and Viton® are registered trademarks of E. I. DuPont de Nemours and Company.

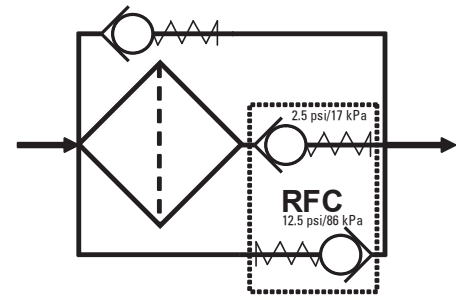
High-Performance DT Filter Choices

| Media Number | Beta _{x(c)} =1000 Rating | Length (in./mm) | Donaldson DT Part No. | Comments |
|--------------|-----------------------------------|-----------------|-----------------------|--------------------------------|
| 2.5 µm | <4 µm | 25.9/657.9 | P566449 | DT-9400-26-2UM |
| 5 µm | 5 µm | 25.9/657.9 | P566450 | DT-9400-26-5UM |
| 8 µm | 8 µm | 25.9/657.9 | P566451 | DT-9400-26-8UM |
| 14 µm | 14 µm | 25.9/657.9 | P566452 | DT-9400-26-14UM |
| 25 µm | 25 µm | 25.9/657.9 | P566453 | DT-9400-26-25UM |
| 5 µm | 5 µm | 25.9/657.9 | P566642 | DT-9901-26-5UM, High collapse |
| 14 µm | 14 µm | 26/657.2 | P566643 | DT-9901-26-14UM, High collapse |

Filter Notes

- All Donaldson DT filters utilize glass fiber media with an epoxy-based resin system for the ultimate in chemical compatibility.
- All Donaldson DT filters are potted with epoxy-based adhesives.
- Standard collapse DT designs are double wire-backed using epoxy-coated steel mesh for maximum pleat support and dirt capacity.
- High collapse designs are double wire-backed using stainless steel mesh.
- High collapse designs are also potted into machined aluminum endcaps for greater filter integrity in critical applications.
- Viton® seals are standard on all Donaldson DT filters.

Reverse Flow Check Schematic





HPK05

Max Flow: 200 gpm (757 lpm)



Service Indicator Options

Visual Service Indicators

| Part No. | Use with Bypass Valve Pressure of: | Description |
|----------|------------------------------------|--|
| P569632 | 50 psi / 3.5 bar | 35 psi/2.4 bar indicator kit* auto reset pop-out button |
| P569633 | 90 psi / 6.2 bar | 70 psi/4.8 bar indicator kit* auto reset pop-out button |
| P567988 | 50 psi / 3.5 bar | 35 psi/2.4 bar indicator kit* auto reset pop-out button with thermal lockout and surge control |
| P567989 | 90 psi / 6.2 bar | 70 psi/4.8 bar indicator kit* auto reset pop-out button with thermal lockout and surge control |

AC/DC Visual/Electrical Service Indicators

| Part No. | Use with Bypass Valve Pressure of: | Description |
|----------|------------------------------------|--|
| P569634 | 50 psi / 3.5 bar | 35 psi/2.4 bar indicator kit* Hirschmann receptacle 115 VAC/28 VDC, 2 amps |
| P569635 | 90 psi / 6.2 bar | 70 psi/4.8 bar indicator kit* Hirschmann receptacle 115 VAC/28 VDC, 2 amps |
| P567986 | 50 psi / 3.5 bar | 35 psi/2.4 bar indicator kit* with thermal lockout and surge control, Hirschmann receptacle, 115 VAC/28 VDC, 2 amps, 4 pin DIN 43650 |
| P567987 | 90 psi / 6.2 bar | 70 psi/4.8 bar indicator kit* with thermal lockout and surge control, Hirschmann receptacle, 115 VAC/28 VDC, 2 amps, 4 pin DIN 43650 |

* Note: Above choices include indicator and mounting block.

Indicator Service Parts

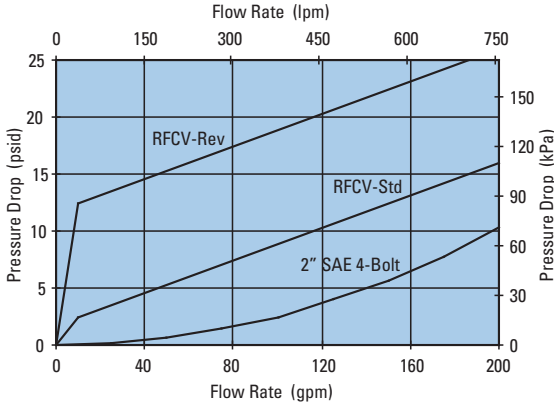
Replacement Indicators Only

| Part No. | Description |
|----------|---|
| P567458 | Visual/Electrical indicator with thermal lockout and surge, 35 psid/2.4 bar |
| P567459 | Visual/Electrical indicator, with thermal lockout and surge 70 psid/4.8 bar |
| P567456 | Pop-Up Visual Indicator, with thermal lockout and surge 35 psid/2.4 bar |
| P567457 | Pop-Up Visual Indicator, with thermal lockout and surge 70 psid/4.8 bar |
| P569636 | Pop-Up Visual Indicator, 35 psid/2.4 bar |
| P569637 | Pop-Up Visual Indicator, 70 psid/4.8 bar |
| P569638 | Visual/Electrical Indicator, 35 psid/2.4 bar |
| P569639 | Visual/Electrical Indicator, 70 psid/4.8 bar |
| P164315 | Visual Indicator, bar style, 35 psid/2.4 bar |
| P166603 | Visual Indicator, bar style, 70 psid/4.8 bar |
| P166134 | Blanking plate |

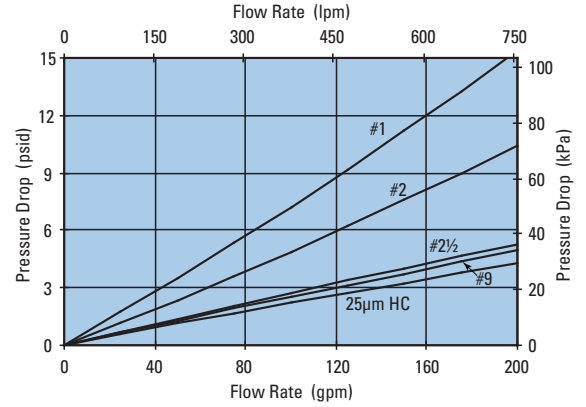


Performance Data

HPK05 Housing Only

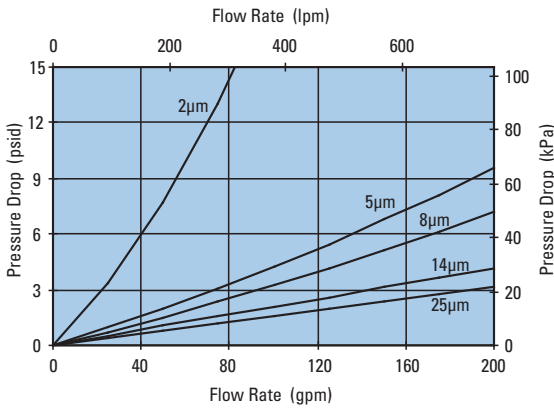


HPK05 26" Standard Filter Only



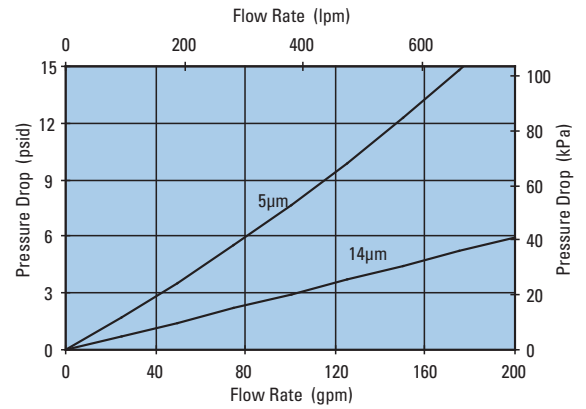
HPK05 26" DT Filter Only

DT-9400-26, 26"/660mm



HPK05 26" DT Filter Only

DT-9901-26, 26"/660mm

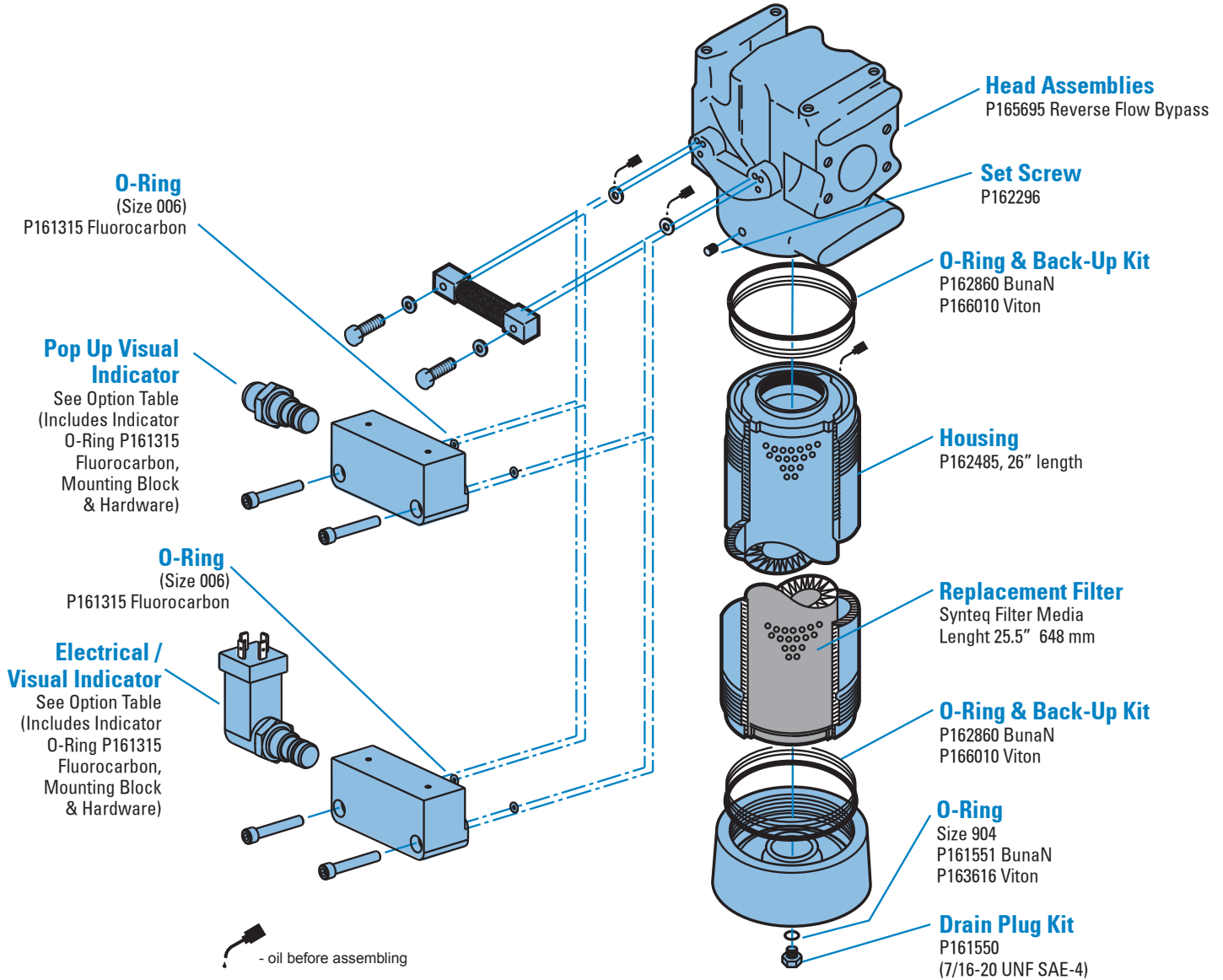




HPK05
Max Flow: 200 gpm (757 lpm)



HPK05 Service Parts

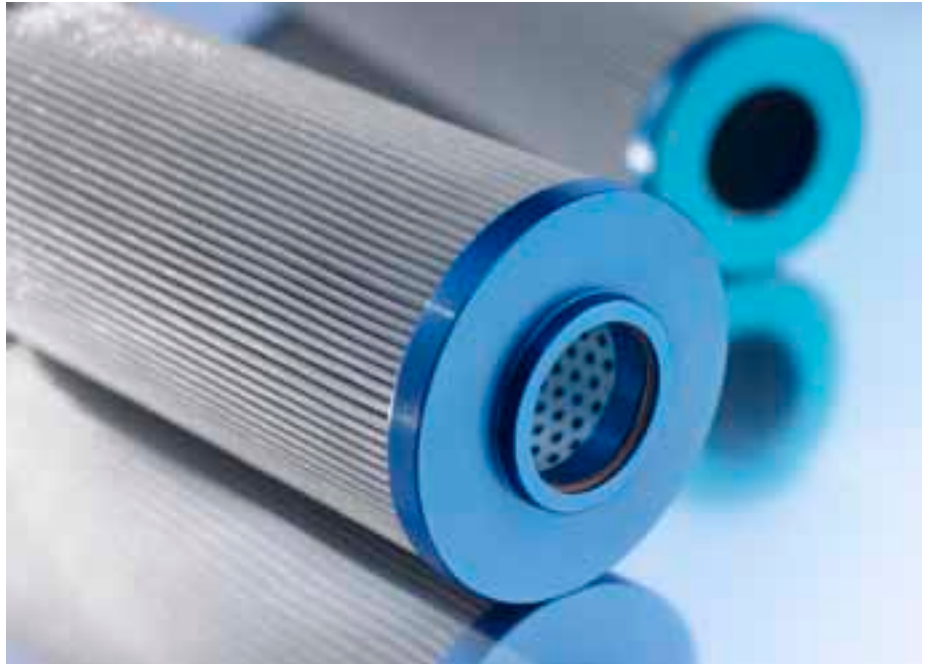


• Buna-N® and Viton® are registered trademarks of E. I. DuPont de Nemours and Company.



High-Performance DT Hydraulic Cartridges

Using Donaldson Synteq™ media technology, DT filters extend filter life, allow higher initial cleanliness and provide superior system protection.



Manufacturer's Code Index

| | |
|------------------------------|-------------------------|
| BDWN.....Baldwin | NORM.....Norman |
| BSCH.....Bosch | Ultraporous |
| EPPE.....Eppensteiner | PALL.....Pall |
| FAIR.....Fairey Arlon | PORO.....Porous Media |
| FINN.....Finn Equipment | PRKR.....Parker |
| FLTC.....Filtrec/Main Filter | PTI.....PTI |
| FNEQ.....Finn Filter | PUPR.....Purolator |
| FTGD.....Fleetguard | SPTC.....Separation |
| HCHN.....Hydac/Hycon | Technologies |
| HEIL.....Heil | SRDR.....Schroeder |
| HLKO.....Hilco | STFF.....Stauff |
| HYPO.....Hy Pro | UFI.....UFI |
| INMN.....Internormen | VKRS.....Vickers |
| KDON.....Kaydon | WESF.....Western Filter |
| MHLE.....Mahle | Wix.....Wix |
| MOOG.....Moog | Zinga.....Zinga |
| MPPF.....MP Filtri | |

Numberfinder Index

| | |
|-----------|-----------|
| 0.....216 | G.....221 |
| 1.....217 | H.....222 |
| 2.....218 | K.....230 |
| 3.....218 | M.....230 |
| 5.....219 | N.....230 |
| 6.....219 | P.....230 |
| 7.....219 | R.....231 |
| 8.....219 | S.....232 |
| 9.....219 | V.....234 |
| A.....220 | W.....234 |
| B.....220 | X.....234 |
| D.....220 | Y.....234 |
| E.....220 | |
| F.....221 | |

For the most current part interchanges and application information, visit crossreference.donaldson.com



Donaldson has the Industry's Largest Selection of Replacement Filters

In stock and ready to ship!

For a complete list of replacement part numbers, visit
crossreference.donaldson.com



High-performance DT filters provide superior hydraulic system protection.

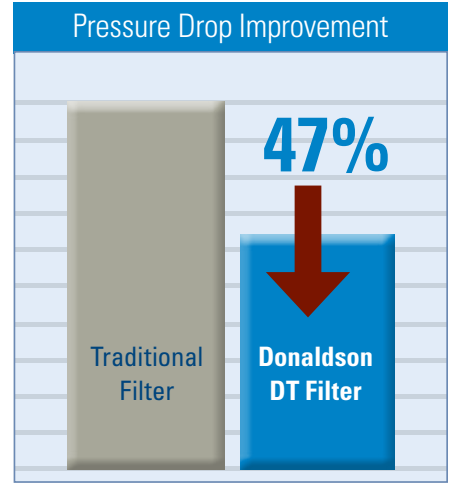
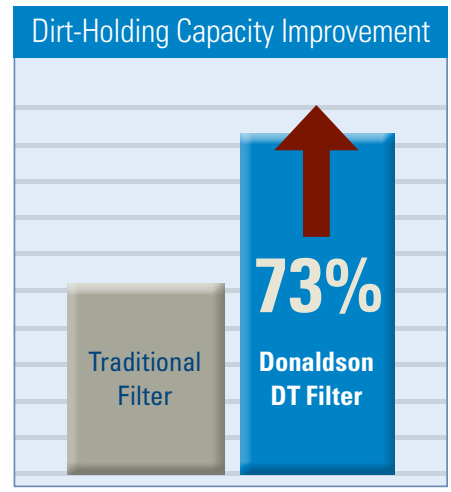
Premium Uptime Protection

Every hydraulic system has suspended particles in its fluid. Contaminants grind and wear at the surface of moving parts, introducing even more particles into the system. These contaminants cause more than 70% of all hydraulic system downtime.

Donaldson high-performance DT cartridge filters provide better protection from the particles and contaminants that reduce the effectiveness of lubricant and hydraulic fluid. Using Donaldson Synteq™ media technology, these filters extend filter life, allow higher initial cleanliness and provide superior system protection.

Donaldson DT filters are ideally suited for a variety of demanding applications, including:

- heavy-duty mobile equipment
- in-plant hydraulics
- transmissions
- bearing lube oil systems

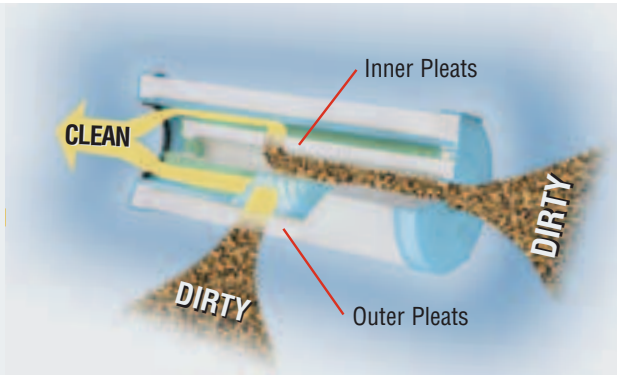


Donaldson DT filters are stocked and ready to ship!

DT DX² Coreless Filters

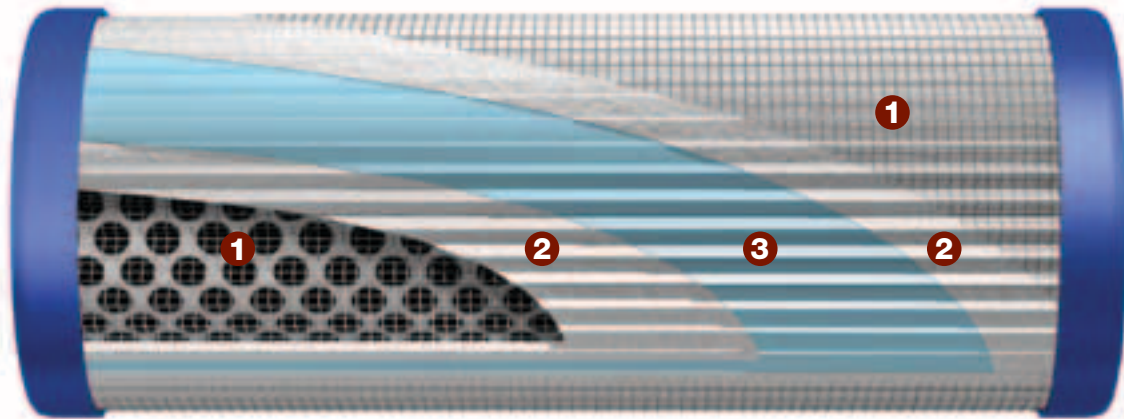
Unlike traditional filters, this high-performance filtration solution features an innovative 2-in-1 filter design that increases dirt-holding capacity by 91% compared to traditional filters. It has all the features of a coreless design –without the expense of housing modifications. These filters are environmentally friendly and fully disposable – reducing waste and disposal costs. Increased dirt holding capacity extends filter life and reduces maintenance costs.

DX2 filters are available in HF3 (9600) style filters.



See How Donaldson DT Filters Work

DT cartridge filters feature an advanced pleat pack design that provides higher initial cleanliness and dirt holding capacity.



1 Epoxy-Coated Steel Support Mesh (Upstream and Downstream Sides)

- Provides excellent pleat support and spacing, which allows for maximum effective media area
- Protects against media damage during handling and installation

2 Media Support Layers (Upstream and Downstream Sides)

- Optimizes media support
- Protects media during pressure surges

3 Synteq™ Media Technology

Donaldson-developed Synteq synthetic filter media has smooth, rounded fibers for low resistance to fluid flow. Synteq media is ideal for filtering synthetic fluids, water glycols, water/oil emulsions, HWCF (high water content fluids) and petroleum-based fluids.



- High-efficiency media grades with performance to $\beta < 4(c) = 1000$ (per ISO 16889)
- Exceptionally low flow resistance
- Consistent performance throughout filter life
- Excellent fluid compatibility

Donaldson DT replacement filters are engineered to fit many competitive applications, including:

| | |
|---------------------|--|
| Fairey Arlon | 170, 270, 370 |
| Hydac | 0030D, 0060D/R, 0075D, 0110D/R, 0140D, 0160D/R, 0240D/R, 0280D, 0330D/R, 0660D/R, 0850R, 0950R, 1300R, 2600R |
| Pall | 2544, 8200, 8300, 8310, 8314, 8800, 8900, 8904, 9020, 9021, 9024, 9100, 9101, 9104, 9400, 9404, 9600, 9601, 9604, 9650, 9651, 9800, 9801, 9804, 9901 |
| Parker | 25P, 31P, 61P, RF2/IL2 |
| PTI/Mahle | 015/Pi X105, 025/Pi X108, 030/Pi X111, 050/Pi X115, 080/Pi X130, 120/Pi X145 |
| Schroeder | A, K, KK, KKK, N, NN |



DT High-Performance Filters

Numberfinder Cross Reference



| Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code |
|-----------|---------|-----------|-----------|---------|-----------|---------------|---------|-----------|---------------|---------|-----------|------------------|---------|-----------|
| 0 | | | | | | | | | | | | | | |
| 01250487 | P566652 | .HCHN | 02060615 | P566220 | .HCHN | 02062360 | P567021 | .HCHN | 0060R010BN3HC | P566963 | .HCHN | 0160D003BH | P566694 | .HCHN |
| 01250488 | P566660 | .HCHN | 02060616 | P566221 | .HCHN | 02062362 | P567023 | .HCHN | 0060R010BN4HC | P566963 | .HCHN | 0160D003BH3HC | P566694 | .HCHN |
| 01250490 | P566668 | .HCHN | 02060617 | P566222 | .HCHN | 02062363 | P567024 | .HCHN | 0060R010BNHC | P566963 | .HCHN | 0160D003BHHC | P566694 | .HCHN |
| 01250491 | P566672 | .HCHN | 02060618 | P566223 | .HCHN | 02062364 | P567025 | .HCHN | 0060R020BN3HC | P566964 | .HCHN | 0160D003BN | P566666 | .HCHN |
| 01253050 | P566691 | .HCHN | 02060637 | P566245 | .HCHN | 02062365 | P567026 | .HCHN | 0060R020BN4HC | P566964 | .HCHN | 0160D003BN3HC | P566666 | .HCHN |
| 01253074 | P566697 | .HCHN | 02060638 | P566246 | .HCHN | 02062366 | P567027 | .HCHN | 0060R020BNHC | P566964 | .HCHN | 0160D003BN4HC | P566666 | .HCHN |
| 01253082 | P566699 | .HCHN | 02060639 | P566247 | .HCHN | 02062367 | P567028 | .HCHN | 0075D003BN3HC | P566654 | .HCHN | 0160D003BNHC | P566666 | .HCHN |
| 01253106 | P566703 | .HCHN | 02060640 | P566248 | .HCHN | 02062368 | P567029 | .HCHN | 0075D003BN4HC | P566654 | .HCHN | 0160D005BH4HC | P566694 | .HCHN |
| 01260885 | P566673 | .HCHN | 02060676 | P566406 | .HCHN | 02062370 | P567031 | .HCHN | 0075D003BNHC | P566654 | .HCHN | 0160D005BN | P566667 | .HCHN |
| 01260899 | P566683 | .HCHN | 02060677 | P566407 | .HCHN | 02062371 | P567032 | .HCHN | 0075D005BN3HC | P566655 | .HCHN | 0160D005BN3HC | P566667 | .HCHN |
| 01262934 | P566964 | .HCHN | 02060775 | P566410 | .HCHN | 02062410 | P566368 | .HCHN | 0075D005BN4HC | P566655 | .HCHN | 0160D005BN4HC | P566667 | .HCHN |
| 01262957 | P566971 | .HCHN | 02060778 | P566411 | .HCHN | 02062494 | P566862 | .HCHN | 0075D005BNHC | P566655 | .HCHN | 0160D005BNHC | P566667 | .HCHN |
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| 01267806 | P571239 | .HCHN | 02060807 | P566387 | .HCHN | 0030D003BHHC | P566686 | .HCHN | 0100R010BNHC | P566967 | .HCHN | 0160D010BNHC | P566668 | .HCHN |
| 01268866 | P571241 | .HCHN | 02060810 | P566388 | .HCHN | 0030D003BN | P566646 | .HCHN | 0075D003BH | P566690 | .HCHN | 0160D020BN | P566669 | .HCHN |
| 01268882 | P567091 | .HCHN | 02060815 | P566389 | .HCHN | 0030D003BN3HC | P566646 | .HCHN | 0110D003BH3HC | P566690 | .HCHN | 0160D003BN3HC | P566669 | .HCHN |
| 01268885 | P567099 | .HCHN | 02060818 | P566390 | .HCHN | 0030D003BN4HC | P566646 | .HCHN | 0110D003BHHC | P566690 | .HCHN | 0160D020BN4HC | P566669 | .HCHN |
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| 01269153 | P567097 | .HCHN | 02060870 | P566232 | .HCHN | 0030D020BN3HC | P566649 | .HCHN | 0110D010BN4HC | P566661 | .HCHN | 01NR100010V310BP | P571240 | .INMN |
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| 02060432 | P566276 | .HCHN | 02060933 | P566408 | .HCHN | 0060D003BNHC | P566650 | .HCHN | 0110R005BNHC | P566966 | .HCHN | 0240D003BHHC | P566696 | .HCHN |
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| 02060589 | P566252 | .HCHN | 02060955 | P566400 | .HCHN | 0060D010BN4HC | P566652 | .HCHN | 0140D003BNHC | P566662 | .HCHN | 0240D010BH4HC | P566697 | .HCHN |
| 02060590 | P566253 | .HCHN | 02060985 | P566226 | .HCHN | 0060D010BNHC | P566652 | .HCHN | 0140D005BN3HC | P566663 | .HCHN | 0240D010BHHC | P566697 | .HCHN |
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| 02060608 | P566216 | .HCHN | 02061090 | P566405 | .HCHN | 0060R003BN4HC | P566961 | .HCHN | 0140D010BN3HC | P566664 | .HCHN | 0240D020BN3HC | P566673 | .HCHN |
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| 02060610 | P566218 | .HCHN | 02 | | | | | | | | | | | |



| Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code |
|----------------------|---------|-----------|-----------------------|---------|-----------|--------------------------|---------|-----------|----------------------|---------|-----------|------------------|---------|-----------|
| 0240R005BN3HC..... | P566978 | .HCHN | 04P21153VG16EO..... | P567093 | .INMN | 0850R005BN4HC..... | P566990 | .HCHN | 10704D12BN..... | P566197 | .HCHN | 11113D12BN..... | P566217 | .HCHN |
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| 0280D005BH4HC..... | P566698 | .HCHN | 0500D003BH4HC..... | P568717 | .HCHN | 0950R010BNHC..... | P566995 | .HCHN | 10813D25BN..... | P566498 | .HCHN | 11213D25BN..... | P566639 | .HCHN |
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| 0280D020BN..... | P566677 | .HCHN | 0660D003BH..... | P566702 | .HCHN | 126884..... | P567096 | .HCHN | 10839D25BN..... | P566513 | .HCHN | 11308D25BN..... | P566400 | .HCHN |
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| 0330D003BHHC..... | P566700 | .HCHN | 0660D003BNHC..... | P566682 | .HCHN | 1269116..... | P566636 | .HCHN | 11000H10SLA000M..... | P571240 | ...EPPE | 11313D25BN..... | P566405 | .HCHN |
| 0330D003BN..... | P566678 | .HCHN | 0660D005BH4HC..... | P566702 | .HCHN | 1269117..... | P566637 | .HCHN | 11000H20SLA000P..... | P571241 | ...EPPE | 11416D03BN..... | P566250 | .HCHN |
| 0330D003BN3HC..... | P566678 | .HCHN | 0660D005BN..... | P566683 | .HCHN | 1269118..... | P566638 | .HCHN | 11000H20SLA000V..... | P571241 | ...EPPE | 11416D06BN..... | P566251 | .HCHN |
| 0330D003BN4HC..... | P566678 | .HCHN | 0660D005BN3HC..... | P566683 | .HCHN | 1269119..... | P566639 | .HCHN | 11000H3SLA000P..... | P571238 | ...EPPE | 11416D12BN..... | P566252 | .HCHN |
| 0330D003BNHC..... | P566678 | .HCHN | 0660D005BN4HC..... | P566683 | .HCHN | 1000RN003BN3HC..... | P571238 | .HCHN | 11000H3SLA000V..... | P571238 | ...EPPE | 11416D25BN..... | P566253 | .HCHN |
| 0330D005BH4HC..... | P566700 | .HCHN | 0660D005BNHC..... | P566683 | .HCHN | 1000RN003BN4HC..... | P571238 | .HCHN | 11000H3XLA000M..... | P571238 | ...EPPE | 11439D03BN..... | P566255 | .HCHN |
| 0330D005BN..... | P566679 | .HCHN | 0660D010BH..... | P566703 | .HCHN | 1000RN006BN3HC..... | P571239 | .HCHN | 11000H6SLA000P..... | P571239 | ...EPPE | 11439D06BN..... | P566256 | .HCHN |
| 0330D005BN3HC..... | P566679 | .HCHN | 0660D010BH3HC..... | P566703 | .HCHN | 1000RN006BN4HC..... | P571239 | .HCHN | 11000H6SLA000V..... | P571239 | ...EPPE | 11439D12BN..... | P566257 | .HCHN |
| 0330D005BN4HC..... | P566679 | .HCHN | 0660D010BHHC..... | P566703 | .HCHN | 1000RN025BN3HC..... | P571241 | .HCHN | 11000H6SLA000M..... | P571239 | ...EPPE | 11439D25BN..... | P566258 | .HCHN |
| 0330D005BNHC..... | P566679 | .HCHN | 0660D010BN..... | P566684 | .HCHN | 1000RN025BN4HC..... | P571241 | .HCHN | 11013D03BN..... | P566445 | .HCHN | 11608D03BN..... | P566460 | .HCHN |
| 0330D010BH..... | P566701 | .HCHN | 0660D010BN3HC..... | P566684 | .HCHN | 1000RNBN3HC..... | P571240 | .HCHN | 11013D06BN..... | P566446 | .HCHN | 11608D06BN..... | P566461 | .HCHN |
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| 0330D010BHHC..... | P566701 | .HCHN | 0660D010BNHC..... | P566684 | .HCHN | 10110LAH10SLA0006P..... | P566967 | ...EPPE | 11013D25BN..... | P566448 | .HCHN | 11608D25BN..... | P566463 | .HCHN |
| 0330D010BN..... | P566680 | .HCHN | 0660D020BN..... | P566685 | .HCHN | 10110LAH10SLA0006PO..... | P566967 | ...EPPE | 11026D03BN..... | P566450 | .HCHN | 11613D03BN..... | P566465 | .HCHN |
| 0330D010BN3HC..... | P566680 | .HCHN | 0660D020BN3HC..... | P566685 | .HCHN | 101300LAH10SL0006P..... | P566999 | ...EPPE | 11026D06BN..... | P566451 | .HCHN | 11613D06BN..... | P566466 | .HCHN |
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| 0330D020BN..... | P566681 | .HCHN | 0660EAH034F1..... | P566702 | ...PUPR | 102600H6SLA000P..... | P567002 | ...EPPE | 11039D03BN..... | P566455 | .HCHN | 11616D03BN..... | P566470 | .HCHN |
| 0330D020BN3HC..... | P566681 | .HCHN | 0660EAH124F1..... | P566703 | ...PUPR | 102AT00431A..... | P566686 | ...VKRS | 11039D06BN..... | P566456 | .HCHN | 11616D06BN..... | P566471 | .HCHN |
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| 0330D020BNHC..... | P566681 | .HCHN | 0660R003BN4HC..... | P566985 | .HCHN | 10608D06BN..... | P566236 | .HCHN | 11039D25BN..... | P566458 | .HCHN | 11616D25BN..... | P566473 | .HCHN |
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| 0330R003BN4HC..... | P566981 | .HCHN | 0660R005BN3HC..... | P566986 | .HCHN | 10608D25BN..... | P566238 | .HCHN | 11104D03BN..... | P566205 | .HCHN | 11713D06BN..... | P566481 | .HCHN |
| 0330R003BNHC..... | P566981 | .HCHN | 0660R005BN4HC..... | P566986 | .HCHN | 10616D03BN..... | P566240 | .HCHN | 11104D06BN..... | P566206 | .HCHN | 11713D12BN..... | P566482 | .HCHN |
| 0330R005BN3HC..... | P566982 | .HCHN | 0660R010BN..... | P566987 | .HCHN | 10616D06BN..... | P566241 | .HCHN | 11104D12BN..... | P566207 | .HCHN | 11716D03BN..... | P566485 | .HCHN |
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| 0330R010BN..... | P566983 | .HCHN | 0660R010BNHC..... | P566987 | .HCHN | 10639D03BN..... | P566245 | .HCHN | 11108D03BH..... | P566366 | .HCHN | 11716D25BN..... | P566488 | .HCHN |
| 0330R010BN3HC..... | P566983 | .HCHN | 0660R010BN4HC..... | P566987 | .HCHN | 10639D06BN..... | P566246 | .HCHN | 11108D06BN..... | P566211 | .HCHN | 11716D03BN..... | P566489 | .HCHN |
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| 0330R020BN3HC..... | P566984 | .HCHN | 0660R020BN4HC..... | P566988 | .HCHN | 10639D25BN..... | P566248 | .HCHN | 11108D17BH..... | P566367 | .HCHN | 11808D025BN..... | P566228 | .HCHN |
| 0330R020BN4HC..... | P566984 | .HCHN | 0660R020BNHC..... | P566988 | .HCHN | 10660LAH10SL0006P..... | P566987 | ...EPPE | 11108D25BN..... | P566213 | .HCHN | 11808D03BH..... | P566387 | .HCHN |
| 0330R0220BN4HC..... | P566984 | .HCHN | 0850R003BN3HC..... | P566989 | .HCHN | 10660LAH20SL0006P..... | P566988 | ...EPPE | 11113D03BH..... | P566368 | .HCHN | 11808D05BN..... | P566226 | .HCHN |
| 04P121053VG16EO..... | | | | | | | | | | | | | | |



DT High-Performance Filters

Numberfinder Cross Reference



| Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | |
|-----------------|---------|-----------|------------------|---------|-----------|-----------|---------|-----------|-----------|---------------|-----------|-----------|----------|-----------|---------|
| 11816D03BN | P566230 | .HCHN | 170Z123H | P567008 | ...FAIR | 2055902 | | P566650 | .HCHN | 2062447 | P566502 | .HCHN | 270Z121 | P567014 | ...FAIR |
| 11816D05BN | P566231 | .HCHN | 170Z205A | P567011 | ...FAIR | 2055903 | | P566651 | .HCHN | 2062448 | P566503 | .HCHN | 270Z121A | P567014 | ...FAIR |
| 11816D12BN | P566232 | .HCHN | 170Z210A | P567012 | ...FAIR | 2055904 | | P566652 | .HCHN | 2062451 | P566481 | .HCHN | 270Z121H | P567014 | ...FAIR |
| 11816D17BH | P566390 | .HCHN | 170Z220 | P567009 | ...FAIR | 2055905 | | P566653 | .HCHN | 2063872 | P566470 | .HCHN | 270Z122A | P567015 | ...FAIR |
| 11816D25BN | P566233 | .HCHN | 170Z220A | P567009 | ...FAIR | 2055906 | | P566658 | .HCHN | 2064246 | P566483 | .HCHN | 270Z122H | P567015 | ...FAIR |
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| 1300R003BN3HC | P570312 | .HCHN | 170Z221 | P567010 | ...FAIR | 2055908 | | P566660 | .HCHN | 2065004 | P566279 | .HCHN | 270Z123H | P567016 | ...FAIR |
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| 1300R005BN3HC | P566998 | .HCHN | 170Z223A | P567012 | ...FAIR | 2055930 | | P566664 | .HCHN | 2065955 | P566457 | .HCHN | 270Z221A | P567018 | ...FAIR |
| 1300R005BN4HC | P570312 | .HCHN | 170Z223H | P567012 | ...FAIR | 2055931 | | P566665 | .HCHN | 2066531 | P566642 | .HCHN | 270Z221H | P567018 | ...FAIR |
| 1300R005BNHC | P566998 | .HCHN | 181005P25E000P | P567084 | ...EPPE | 2055958 | | P566688 | .HCHN | 2066677 | P566498 | .HCHN | 270Z222A | P567019 | ...FAIR |
| 1300R010BN | P566999 | .HCHN | 181008P25E000P | P567088 | ...EPPE | 2055960 | | P566689 | .HCHN | 2066681 | P566490 | .HCHN | 270Z222H | P567019 | ...FAIR |
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| 1300R010BN4HC | P570313 | .HCHN | 181045P25E000P | P567104 | ...EPPE | 2055984 | | P566694 | .HCHN | 2067969 | P566511 | .HCHN | 27KZ1 | P568818 | ...SRDR |
| 1300R010BNHC | P566999 | .HCHN | 181105P10E000P | P567083 | ...EPPE | 2055986 | | P566695 | .HCHN | 2069396 | P566467 | .HCHN | 27KZ10 | P566280 | ...SRDR |
| 1300R020BN3HC | P567000 | .HCHN | 181108P10E000P | P567087 | ...EPPE | 2055988 | | P566696 | .HCHN | 2070196 | P566507 | .HCHN | 27KZ25 | P566281 | ...SRDR |
| 1300R020BN4HC | P567000 | .HCHN | 181111P10E000P | P567091 | ...EPPE | 2055990 | | P566697 | .HCHN | 2070502 | P566460 | .HCHN | 27KZ3 | P566279 | ...SRDR |
| 1300R020BNHC | P567000 | .HCHN | 181115P10E000P | P567095 | ...EPPE | 2055987 | | P566692 | .HCHN | 2070503 | P566473 | .HCHN | 27KZ5 | P566278 | ...SRDR |
| 1400EAH034F1 | P566335 | ...PUPR | 181130P10E000P | P567099 | ...EPPE | 2056389 | | P566693 | .HCHN | 2070819 | P566506 | .HCHN | 27KZ10 | P566413 | ...SRDR |
| 1457311911 | P567103 | ...BSCH | 181145P10E000P | P567103 | ...EPPE | 2056396 | | P566698 | .HCHN | 2073488 | P566279 | .HCHN | 27KZ3 | P566412 | ...SRDR |
| 1457431108 | P567087 | ...BSCH | 182105H3SLE000P | P567081 | ...EPPE | 2056398 | | P566699 | .HCHN | 2073700 | P566456 | .HCHN | | | |
| 1457431907 | P567083 | ...BSCH | 182108H3SLE000P | P567085 | ...EPPE | 2056416 | | P566702 | .HCHN | 2080D03BN | P567085 | .HCHN | | | |
| 1457431909 | P567095 | ...BSCH | 182111H3SLE000P | P567089 | ...EPPE | 2056418 | | P566703 | .HCHN | 2080D05BN | P567086 | .HCHN | | | |
| 1457431910 | P567099 | ...BSCH | 182115H3SLE000P | P567093 | ...EPPE | 2056437 | | P566700 | .HCHN | 2080D10BN | P567087 | .HCHN | | | |
| 14VZ10 | P567079 | ...SRDR | 182130H3SLE000P | P567097 | ...EPPE | 2056439 | | P566701 | .HCHN | 2080D20BN | P567088 | .HCHN | | | |
| 14VZ10V | P567079 | ...SRDR | 182145H3SLE000P | P567101 | ...EPPE | 2056541 | | P566646 | .HCHN | 2100D03BN | P567089 | .HCHN | | | |
| 14VZ25 | P567080 | ...SRDR | 184130H20SLE000P | P567100 | ...EPPE | 2056542 | | P566647 | .HCHN | 2100D10BN | P567091 | .HCHN | | | |
| 14VZ25V | P567080 | ...SRDR | 185105H6SLE000P | P567082 | ...EPPE | 2056543 | | P566649 | .HCHN | 2100D20BN | P567092 | .HCHN | | | |
| 14VZ3 | P567077 | ...SRDR | 185108H6SLE000P | P567086 | ...EPPE | 2056688 | | P566686 | .HCHN | 2110D05BN | P567090 | .HCHN | | | |
| 14VZ3V | P567077 | ...SRDR | 185111H6SLE000P | P567090 | ...EPPE | 2056690 | | P566687 | .HCHN | 2150D03BN | P567093 | .HCHN | | | |
| 14VZ5 | P567078 | ...SRDR | 185115H6SLE000P | P567094 | ...EPPE | 2057041 | | P566997 | .HCHN | 2150D06BN | P567094 | .HCHN | | | |
| 14VZ5V | P567078 | ...SRDR | 185130H6SLE000P | P567098 | ...EPPE | 2059098 | | P566970 | .HCHN | 2150D10BN | P567095 | .HCHN | | | |
| 16B300H3LL428UP | P566240 | ...EPPE | 185145H6SLE000P | P567102 | ...EPPE | 2059102 | | P566979 | .HCHN | 2150D25BN | P567096 | .HCHN | | | |
| 16QCL10V | P566263 | ...SRDR | 1HF411H10SLA000P | P566272 | ...EPPE | 2059105 | | P566987 | .HCHN | 2300D03BN | P567097 | .HCHN | | | |
| 16QCL25V | P566264 | ...SRDR | 1HF411H10SLC000P | P566413 | ...EPPE | 2059107 | | P566994 | .HCHN | 2300D10BN | P567099 | .HCHN | | | |
| 16QCL3V | P566261 | ...SRDR | 1HF41H20SLA000P | P566273 | ...EPPE | 2059108 | | P566995 | .HCHN | 2300D25BN | P567100 | .HCHN | | | |
| 16QCL5V | P566262 | ...SRDR | 1HF41H3SLA000P | P566270 | ...EPPE | 2059111 | | P566999 | .HCHN | 2450D03BN | P567101 | .HCHN | | | |
| 16QPMZ10V | P566252 | ...SRDR | 1HF41H6SLC000P | P566412 | ...EPPE | 2059112 | | P567000 | .HCHN | 2450D06BN | P567102 | .HCHN | | | |
| 16QPMZ1V | P566249 | ...SRDR | 1HF41H6SLD000P | P566412 | ...EPPE | 2059294 | | P566482 | .HCHN | 2450D10BN | P567103 | .HCHN | | | |
| 16QPMZ25V | P566253 | ...SRDR | | | | 20502BN | | P567084 | .HCHN | 2450D25BN | P567104 | .HCHN | | | |
| 16QPMZ3V | P566250 | ...SRDR | | | | 2050D03BN | | P567081 | .HCHN | 2600R003BN3HC | P567001 | .HCHN | | | |
| 16QPMZ5V | P566251 | ...SRDR | | | | 2050D05BN | | P567082 | .HCHN | 2600R003BN4HC | P567001 | .HCHN | | | |
| 16OZ10V | P566252 | ...SRDR | | | | 2050D10BN | | P567083 | .HCHN | 2600R005BN3HC | P570314 | .HCHN | | | |
| 16OZ1V | P566249 | ...SRDR | | | | 2060430 | | P566274 | .HCHN | 2600R003BN4HC | P567001 | .HCHN | | | |
| 16OZ25V | P566253 | ...SRDR | | | | 2060652 | | P566445 | .HCHN | 2600R005BN3HC | P567002 | .HCHN | | | |
| 16OZ3V | P566250 | ...SRDR | | | | 2060653 | | P566446 | .HCHN | 2600R010BN3HC | P567003 | .HCHN | | | |
| 16OZ5V | P566251 | ...SRDR | | | | 2060654 | | P566447 | .HCHN | 2600R010BN4HC | P567004 | .HCHN | | | |
| 170L105A | P567007 | ...FAIR | | | | 2060655 | | P566448 | .HCHN | 2600R010BN3HC | P567001 | .HCHN | | | |
| 170L120A | P567005 | ...FAIR | | | | 2060656 | | P566450 | .HCHN | 2600R005BN3HC | P567002 | .HCHN | | | |
| 170L121A | P567006 | ...FAIR | | | | 2060657 | | P566451 | .HCHN | 2600R005BN4HC | P567002 | .HCHN | | | |
| 170L122A | P567007 | ...FAIR | | | | 2060658 | | P566452 | .HCHN | 2600R010BN3HC | P567003 | .HCHN | | | |
| 170L123 | P567008 | ...FAIR | | | | 2060659 | | P566453 | .HCHN | 2600R010BN4HC | P567004 | .HCHN | | | |
| 170L123A | P567008 | ...FAIR | | | | 2060660 | | P566454 | .HCHN | 2600R010BN3HC | P570315 | .HCHN | | | |
| 170L205A | P567011 | ...FAIR | | | | 2060661 | | P566455 | .HCHN | 2600R010BN4HC | P570315 | .HCHN | | | |
| 170L210A | P567012 | ...FAIR | | | | 2060662 | | P566456 | .HCHN | 2600R010BN3HC | P567003 | .HCHN | | | |
| 170L220A | P567009 | ...FAIR | | | | 2060663 | | P566457 | .HCHN | 2600R020BN3HC | P567004 | .HCHN | | | |
| 170L221A | P567010 | ...FAIR | | | | 2060664 | | P566458 | .HCHN | 2600R020BN4HC | P567004 | .HCHN | | | |
| 170L222A | P567011 | ...FAIR | | | | 2060665 | | P566459 | .HCHN | 2600R020BNHC | P567004 | .HCHN | | | |
| 170L223A | P567012 | ...FAIR | | | | 2060666 | | P566460 | .HCHN | 270L101A | P567014 | ...FAIR | | | |
| 170L224A | P567013 | ...FAIR | | | | 2060667 | | P566461 | .HCHN | 270L120A | P567013 | ...FAIR | | | |
| 170L225A | P567014 | ...FAIR | | | | 2060668 | | P566462 | .HCHN | 270L122A | P567015 | ...FAIR | | | |
| 170L226A | P567015 | ...FAIR | | | | 2060669 | | P566463 | .HCHN | 270L123A | P567016 | ...FAIR | | | |
| 170L227A | P567016 | ...FAIR | | | | 2060670 | | P566464 | .HCHN | 270L124A | P567017 | ...FAIR | | | |
| 170L228A | P567017 | ...FAIR | | | | 2060671 | | P566465 | .HCHN | 270L125A | P567018 | ...FAIR | | | |
| 170L229A | P567018 | ...FAIR | | | | 2060672 | | P566466 | .HCHN | 270L126A | P567019 | ...FAIR | | | |
| 170L230A | P567019 | ...FAIR | | | | 2060673 | | P566467 | .HCHN | 270L127A | P567020 | ...FAIR | | | |
| 170L231A | P567020 | ...FAIR | | | | 2060674 | | P566468 | .HCHN | 270L128A | P567021 | ...FAIR | | | |
| 170L232A | P567021 | ...FAIR | | | | 2060675 | | P566469 | .HCHN | 270L129A | P567022 | ...FAIR | | | |
| 170L233A | P567022 | ...FAIR | | | | 2060676 | | P566470 | .HCHN | 270L130A | P567023 | ...FAIR | | | |
| 170L234A | P567023 | ...FAIR | | | | 2060677 | | P566471 | .HCHN | 270L131A | P567024 | ...FAIR | | | |
| 170L235A | P567024 | ...FAIR | | | | 2060678 | | P566472 | .HCHN | 270L132A | P567025 | ...FAIR | | | |
| 170L236A | P567025 | ...FAIR | | | | 2060679 | | P566473 | .HCHN | 270L133A | P567026 | ...FAIR | | | |
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| 170L238A | P567027 | ...FAIR | | | | 2060681 | | P566475 | .HCHN | 270L135A | P567028 | ...FAIR | | | |
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| 170L243A | P567032 | ...FAIR | | | | 2060686 | | P566480 | .HCHN | 270L140A | P567033 | ...FAIR | | | |
| 170L244A | | | | | | | | | | | | | | | |



| Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code |
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| 370Z223H | P567028 | FAIR | 60204D03BN | P567013 | HCHN | 930100 | P566208 | PRKR | 926888Q | P566222 | PRKR | 932610Q | P566195 | PRKR |
| 370Z320A | P567029 | FAIR | 60204D05BN | P567014 | HCHN | 930192 | P566397 | PRKR | 926890Q | P566221 | PRKR | 932611Q | P566196 | PRKR |
| 370Z320H | P567029 | FAIR | 60208D03BN | P567017 | HCHN | 930198 | P566397 | PRKR | 926988Q | P566226 | PRKR | 932612Q | P566197 | PRKR |
| 370Z321A | P567030 | FAIR | 60208D05BN | P567018 | HCHN | 930268 | P566397 | PRKR | 926990Q | P566227 | PRKR | 932614Q | P566335 | PRKR |
| 370Z321H | P567030 | FAIR | 60208D10BN | P567019 | HCHN | 931017 | P567043 | PRKR | 926992Q | P566225 | PRKR | 932615Q | P566336 | PRKR |
| 370Z322A | P567031 | FAIR | 60208D20BN | P567020 | HCHN | 932016 | P567044 | PRKR | 926994Q | P566231 | PRKR | 932616Q | P566200 | PRKR |
| 370Z322H | P567031 | FAIR | 60304D03BN | P567021 | HCHN | 932362 | P567033 | PRKR | 926996Q | P566232 | PRKR | 932617Q | P566201 | PRKR |
| 370Z323A | P567032 | FAIR | 60304D05BN | P567022 | HCHN | 932362 | P567034 | PRKR | 926998Q | P566230 | PRKR | 932618Q | P566202 | PRKR |
| 370Z323H | P567032 | FAIR | 60304D10BN | P567023 | HCHN | 932368 | P567035 | PRKR | 927169Q | P566365 | PRKR | 932620Q | P566337 | PRKR |
| 3960GGB08 | P566210 | SPTC | 60304D20BN | P567024 | HCHN | 932369 | P567034 | PRKR | 927170Q | P566364 | PRKR | 932621Q | P566338 | PRKR |
| 390QLZ10V | P566268 | SRDR | 60308D03BN | P567025 | HCHN | 9327444 | P566397 | PUPR | 927175Q | P566367 | PRKR | 932622Q | P567041 | PRKR |
| 390QLZ25V | P566269 | SRDR | 60308D05BN | P567026 | HCHN | 9327445 | P566397 | PUPR | 927176Q | P566366 | PRKR | 932623Q | P567042 | PRKR |
| 390QLZ3V | P566266 | SRDR | 60308D10BN | P567027 | HCHN | 932409 | P567035 | PRKR | 927181Q | P566369 | PRKR | 932624Q | P567043 | PRKR |
| 390QLZ5V | P566267 | SRDR | 60308D20BN | P567028 | HYPO | 932410 | P567039 | PRKR | 927182Q | P566368 | PRKR | 932628Q | P567045 | PRKR |
| 390PMLZ10V | P566257 | SRDR | 60312D03BN | P567029 | HCHN | 932467 | P567039 | PRKR | 927661Q | P566237 | PRKR | 932629Q | P567046 | PRKR |
| 390PMLZ1V | P566254 | SRDR | 60312D05BN | P567030 | HCHN | 932470 | P567038 | PRKR | 927663Q | P566235 | PRKR | 932630Q | P567047 | PRKR |
| 390PMLZ25V | P566258 | SRDR | 60312D10BN | P567031 | HCHN | 932472 | P567038 | PRKR | 927723Q | P566337 | PRKR | 932634Q | P567049 | PRKR |
| 390PMLZ3V | P566255 | SRDR | 60312D20BN | P567032 | HCHN | 934234 | P567003 | PRKR | 927725Q | P566335 | PRKR | 932635Q | P567050 | PRKR |
| 390PMLZ5V | P566256 | SRDR | | | | 934236 | P566999 | PRKR | 927861Q | P566236 | PRKR | 932636Q | P567051 | PRKR |
| 390Z10V | P566247 | SRDR | | | | 934477 | P566997 | PRKR | 928142Q | P566371 | PRKR | 932640Q | P567053 | PRKR |
| 390Z10V | P566257 | SRDR | | | | 934478 | P566998 | PRKR | 928143Q | P566370 | PRKR | 932641Q | P567054 | PRKR |
| 390Z1V | P566244 | SRDR | | | | 934479 | P567000 | PRKR | 928150Q | P566388 | PRKR | 932642Q | P567055 | PRKR |
| 390Z1V | P566254 | SRDR | | | | 934570 | P567001 | PRKR | 928152Q | P566387 | PRKR | 932647Q | P566206 | PRKR |
| 390Z25V | P566248 | SRDR | | | | 934571 | P567002 | PRKR | 928154Q | P566390 | PRKR | 932650Q | P566206 | PRKR |
| 390Z25V | P566258 | SRDR | | | | 934572 | P567004 | PRKR | 928156Q | P566389 | PRKR | 932651Q | P566207 | PRKR |
| 390Z3V | P566245 | SRDR | | | | 935112 | P569091 | PRKR | 928642Q | P566336 | PRKR | 932653Q | P566210 | PRKR |
| 390Z3V | P566255 | SRDR | | | | 935112 | P569092 | PRKR | 928643Q | P566338 | PRKR | 932654Q | P566211 | PRKR |
| 390Z5V | P566246 | SRDR | | | | 935113 | P569093 | PRKR | 929099Q | P566238 | PRKR | 932655Q | P566212 | PRKR |
| 390Z5V | P566256 | SRDR | | | | 935114 | P569094 | PRKR | 929882Q | P566450 | PRKR | 932658Q | P566492 | PRKR |
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| | | | | | | 935219 | P567084 | PRKR | 929893Q | P566451 | PRKR | 932669Q | P566271 | PRKR |
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| | | | | | | 982131 | P567055 | PRKR | 930198Q | P566398 | PRKR | 932873Q | P566256 | PRKR |
| | | | | | | 983061 | P567051 | PRKR | 930218Q | P566475 | PRKR | 932874Q | P566247 | PRKR |
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| | | | | | | 925582Q | P566195 | PRKR | 930220Q | P566478 | PRKR | 932875Q | P566248 | PRKR |
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DT High-Performance Filters

Numberfinder Cross Reference



| Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code |
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| 9332030 | P566496 | ..PRKR | 9640513150 | P567097 | ..PUPR | D651G10A | P566276 | ..FLTC | DHD240G03B | P566670 | ...FLTC | DHD660H03B | P566702 | ...FLTC |
| 9332040 | P566497 | ..PRKR | 9640513151 | P567099 | ...PTI | D651G10AV | P566276 | ..FLTC | DHD240G03V | P566670 | ...FLTC | DHD660H03V | P566702 | ...FLTC |
| 9332050 | P566498 | ..PRKR | 9640513151 | P567099 | ..PUPR | D651G25A | P566277 | ..FLTC | DHD240G05B | P566671 | ...FLTC | DHD660H10B | P566703 | ...FLTC |
| 9332100 | P566500 | ..PRKR | 9640513152 | P567100 | ...PTI | D651G25AV | P566277 | ..FLTC | DHD240G05V | P566671 | ...FLTC | DHD660H10V | P566703 | ...FLTC |
| 9332110 | P566501 | ..PRKR | 9640513152 | P567100 | ..PUPR | D652G01A | P568818 | ..FLTC | DHD240G10B | P566672 | ...FLTC | DMD001E05B | P567090 | ...FLTC |
| 9332120 | P566502 | ..PRKR | 9640514103 | P567103 | ...PTI | D652G03A | P566278 | ..FLTC | DHD240G10V | P566672 | ...FLTC | DMD001E20B | P567096 | ...FLTC |
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| 9332180 | P566505 | ..PRKR | 9640514151 | P567102 | ...PTI | D652G06A | P566279 | ..FLTC | DHD240G20V | P566673 | ...FLTC | | | |
| 9332190 | P566506 | ..PRKR | 9640514152 | P567104 | ..PUPR | D652G06AV | P566279 | ..FLTC | DHD240H03B | P566696 | ...FLTC | | | |
| 9332200 | P566507 | ..PRKR | 9VZ10 | P567075 | ..SRDR | D652G10A | P566280 | ..FLTC | DHD240H03V | P566696 | ...FLTC | | | |
| 9332210 | P566508 | ..PRKR | 9VZ10V | P567075 | ..SRDR | D652G10AV | P566280 | ..FLTC | DHD240H10B | P566697 | ...FLTC | | | |
| 9332340 | P566486 | ..PRKR | 9VZ25 | P567076 | ..SRDR | D652G25A | P566281 | ..FLTC | DHD240H10V | P566697 | ...FLTC | | | |
| 9332390 | P566196 | ..PRKR | 9VZ25V | P567076 | ..SRDR | D652G25AV | P566281 | ..FLTC | DHD280G03B | P566674 | ...FLTC | | | |
| 9332460 | P566201 | ..PRKR | 9VZ3 | P567073 | ..SRDR | D720G03AV | P567041 | ..FLTC | DHD280G03V | P566674 | ...FLTC | | | |
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| 9332650 | P566457 | ..PRKR | | | | D721G10AV | P567047 | ..FLTC | DHD280G20V | P566677 | ...FLTC | | | |
| 9332660 | P566458 | ..PRKR | | | | D721G25AV | P567048 | ..FLTC | DHD280H03B | P566698 | ...FLTC | | | |
| 9332950 | P566228 | ..PRKR | A31375 | P566397 | MOOG | D732G10AV | P567055 | ..FLTC | DHD280H03V | P566698 | ...FLTC | | | |
| 9333020 | P566233 | ..PRKR | A32155 | P566397 | MOOG | D921G03A | P567017 | ..FLTC | DHD280H10B | P566699 | ...FLTC | | | |
| 9333630 | P566460 | ..PRKR | A37011 | P566397 | MOOG | D921G25A | P567020 | ..FLTC | DHD280H10V | P566699 | ...FLTC | | | |
| 9333640 | P566462 | ..PRKR | ABZF0000101XMA | P566691 | ..BSCH | D930G03A | P567021 | ..FLTC | DHD30G05B | P566647 | ...FLTC | | | |
| 9333650 | P566463 | ..PRKR | ABZF00040101XMA | P566652 | ..BSCH | D930G06A | P567022 | ..FLTC | DHD30G05V | P566647 | ...FLTC | | | |
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| 9333780 | P566481 | ..PRKR | AN62354A | P566198 | ..PUPR | D931G03A | P567025 | ..FLTC | DHD30G10V | P566648 | ...FLTC | | | |
| 9334860 | P566278 | ..PRKR | AZ10 | P569093 | ..SRDR | D931G06A | P567026 | ..FLTC | DHD30G20B | P566649 | ...FLTC | | | |
| 9334870 | P566279 | ..PRKR | AZ10V | P569093 | ..SRDR | D931G10A | P567027 | ..FLTC | DHD30G20V | P566649 | ...FLTC | | | |
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| 9334890 | P566281 | ..PRKR | AZ25V | P569094 | ..SRDR | D932G06A | P567030 | ..FLTC | DHD30H05B | P566686 | ...FLTC | | | |
| 9335770 | P566336 | ..PRKR | AZ3 | P569091 | ..SRDR | D932G10A | P567031 | ..FLTC | DHD30H10B | P566687 | ...FLTC | | | |
| 9335790 | P566338 | ..PRKR | AZ3V | P569091 | ..SRDR | D932G25A | P567032 | ..FLTC | DHD30H10V | P566687 | ...FLTC | | | |
| 9337820 | P566402 | ..PRKR | AZ5 | P569092 | ..SRDR | DHD030H03B | P566686 | ...FLTC | DHD330G03B | P566678 | ...FLTC | | | |
| 9337840 | P566403 | ..PRKR | AZ5V | P569092 | ..SRDR | DHD110G03B | P566658 | ...FLTC | DHD330G03V | P566678 | ...FLTC | | | |
| 9337860 | P566404 | ..PRKR | | | | DHD110G03V | P566659 | ...FLTC | DHD330G05B | P566679 | ...FLTC | | | |
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| 9339200 | P566712 | ..PRKR | B645722 | P566397 | MOOG | DHD110G05V | P566660 | ...FLTC | DHD330G20B | P566680 | ...FLTC | | | |
| 9339210 | P566713 | ..PRKR | | | | DHD110G10B | P566660 | ...FLTC | DHD330H03B | P566700 | ...FLTC | | | |
| 9341210 | P566266 | ..PRKR | | | | DHD110G10V | P566661 | ...FLTC | DHD330H03V | P566700 | ...FLTC | | | |
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| 9341240 | P566269 | ..PRKR | DF601805 | P566705 | KDON | DHD110G20V | P566661 | ...FLTC | DHD330H30B | P566701 | ...FLTC | | | |
| 9341800 | P566710 | ..PRKR | D111G10A | P566197 | ...FLTC | DHD110H03V | P566690 | ...FLTC | DHD330H30V | P566701 | ...FLTC | | | |
| 9343080 | P566261 | ..PRKR | D112G03A | P566200 | ...FLTC | DHD110H10B | P566691 | ...FLTC | DHD500G03B | P568713 | ...FLTC | | | |
| 9343090 | P566262 | ..PRKR | D112G10AV | P566202 | ...FLTC | DHD140G03B | P566662 | ...FLTC | DHD500G03V | P568713 | ...FLTC | | | |
| 9343100 | P566263 | ..PRKR | D140G03AV | P566205 | ...FLTC | DHD140G03V | P566662 | ...FLTC | DHD500G05B | P568714 | ...FLTC | | | |
| 9343110 | P566264 | ..PRKR | D140G03BV | P566364 | ...FLTC | DHD140G05B | P566663 | ...FLTC | DHD500G05V | P568714 | ...FLTC | | | |
| 9344510 | P567036 | ..PRKR | D140G06AV | P566206 | ...FLTC | DHD140G05V | P566663 | ...FLTC | DHD500G10B | P568715 | ...FLTC | | | |
| 9351910 | P566406 | ..PRKR | D140G10AV | P566207 | ...FLTC | DHD140G10B | P566664 | ...FLTC | DHD500G10V | P568715 | ...FLTC | | | |
| 9351920 | P566407 | ..PRKR | D140G10BV | P566365 | ...FLTC | DHD140G10V | P566664 | ...FLTC | DHD500G20B | P568716 | ...FLTC | | | |
| 9351930 | P566408 | ..PRKR | D140G25A | P566208 | ...FLTC | DHD140G20B | P566665 | ...FLTC | DHD500G20V | P568716 | ...FLTC | | | |
| 9351940 | P566409 | ..PRKR | D140G25AV | P566208 | ...FLTC | DHD140G20V | P566665 | ...FLTC | DHD60G03B | P566650 | ...FLTC | | | |
| 9600EAH034N1 | P566364 | ..PUPR | D141G10A | P566212 | ...FLTC | DHD140H03B | P566692 | ...FLTC | DHD60G03V | P566650 | ...FLTC | | | |
| 9600EAH034N2 | P566366 | ..PUPR | D143G25A | P566223 | ...FLTC | DHD140H03V | P566692 | ...FLTC | DHD60G05B | P566651 | ...FLTC | | | |
| 9800EAH034N1 | P566408 | ..PUPR | D143G25AV | P566223 | ...FLTC | DHD140H10B | P566693 | ...FLTC | DHD60H03B | P566688 | ...FLTC | | | |
| 9800EAH122N3 | P566404 | ..PUPR | D650G01A | P568816 | ...FLTC | DHD140H10V | P566693 | ...FLTC | DHD60H03V | P566688 | ...FLTC | | | |
| 9640509105 | P567084 | ...PTI | D650G03A | P566270 | ...FLTC | DHD160G03B | P566666 | ...FLTC | DHD60H10B | P566689 | ...FLTC | | | |
| 9640509150 | P567081 | ...PTI | D650G03B | P566412 | ...FLTC | DHD160G03V | P566666 | ...FLTC | DHD60H10V | P566689 | ...FLTC | | | |
| 9640509151 | P567083 | ..PUPR | D650G06A | P566271 | ...FLTC | DHD160G05B | P566667 | ...FLTC | | | | | | |
| | | | D650G10A | P566272 | ...FLTC | DHD160G05V | P566667 | ...FLTC | | | | | | |

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| Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code |
|------------|---------|-----------|------------|---------|-----------|------------|---------|-----------|------------|---------|-----------|-------------|---------|-----------|
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| E0411B2C10 | P566237 | .WESF | E2051B5C05 | P566231 | .WESF | E4051B3C20 | P566273 | .WESF | E6021B4C05 | P566216 | .WESF | EPB31NFD | P566208 | ..UFI |
| E0411B2C20 | P566238 | .WESF | E2051B5C10 | P566232 | .WESF | E4051B6C01 | P566817 | .WESF | E6021B4C10 | P566217 | .WESF | EPB31NHA | P566364 | ..UFI |
| E0411B5C01 | P566239 | .WESF | E2054B2H03 | P566387 | .WESF | E4051B6C03 | P566274 | .WESF | E6021B4C20 | P566218 | .WESF | EPB31NHC | P566365 | ..UFI |
| E0411B5C03 | P566240 | .WESF | E2054B2H10 | P566388 | .WESF | E4051B6C05 | P566275 | .WESF | E6021B4E03 | P566378 | .WESF | EPB32NFC | P566212 | ..UFI |
| E0411B5C05 | P566241 | .WESF | E2054B5H03 | P566389 | .WESF | E4051B6C10 | P566276 | .WESF | E6021B4E05 | P566379 | .WESF | ER0952B4C05 | P566994 | .WESF |
| E0411B5C10 | P566242 | .WESF | E2054B5H10 | P566390 | .WESF | E4051B6C20 | P566277 | .WESF | E6021B4E10 | P566380 | .WESF | ER0952B4C10 | P566995 | .WESF |
| E0411B8C20 | P566243 | .WESF | E2100B1C03 | P569091 | .WESF | E4051B7C01 | P568818 | .WESF | E6021B5C01 | P566219 | .WESF | ER112B2C10 | P566967 | .WESF |
| E0411B8E01 | P566260 | .WESF | E2100B1C10 | P569093 | .WESF | E4051B7C03 | P566278 | .WESF | E6021B5C03 | P566220 | .WESF | ER1302B6C10 | P566999 | .WESF |
| E0411B8E03 | P566261 | .WESF | E2681B2C03 | P566475 | .WESF | E4051B7C05 | P566279 | .WESF | E6021B5C05 | P566221 | .WESF | ER162B1C10 | P566971 | .WESF |
| E0411B8E05 | P566262 | .WESF | E2681B2C05 | P566476 | .WESF | E4051B7C10 | P566280 | .WESF | E6021B5C10 | P566222 | .WESF | ER242B2C10 | P566979 | .WESF |
| E0411B8L01 | P566249 | .WESF | E2681B2C10 | P566477 | .WESF | E4051B7C20 | P566281 | .WESF | E6021B5C20 | P566223 | .WESF | ER2602B8C10 | P567003 | .WESF |
| E0411B8L03 | P566250 | .WESF | E2681B4C03 | P566480 | .WESF | E4051V3C01 | P568816 | .WESF | E6021B5E03 | P566383 | .WESF | ER332B2C10 | P566983 | .WESF |
| E0411B8L05 | P566251 | .WESF | E2681B4C05 | P566481 | .WESF | E4051V3C03 | P566270 | .WESF | E6021B5E05 | P566384 | .WESF | ER662B2C10 | P566987 | .WESF |
| E0411B8L10 | P566252 | .WESF | E2681B4C10 | P566482 | .WESF | E4051V3C05 | P566271 | .WESF | E6021B5E10 | P566385 | .WESF | | | |
| E0411B8L20 | P566253 | .WESF | E2681B5C03 | P566485 | .WESF | E4051V3C10 | P566272 | .WESF | E6021V1C03 | P566205 | .WESF | | | |
| E0411B8C01 | P566244 | .WESF | E2681B5C05 | P566486 | .WESF | E4051V3C20 | P566273 | .WESF | E6021V2C01 | P566209 | .WESF | | | |
| E0411B8C03 | P566245 | .WESF | E2681B5C10 | P566487 | .WESF | E4051V6C01 | P568817 | .WESF | E6021V2C03 | P566210 | .WESF | | | |
| E0411B8C05 | P566246 | .WESF | E2682B2C03 | P566460 | .WESF | E4051V6C03 | P566274 | .WESF | E6021V2C05 | P566211 | .WESF | | | |
| E0411B8C10 | P566247 | .WESF | E2682B2C05 | P566461 | .WESF | E4051V6C05 | P566275 | .WESF | E6021V2C10 | P566212 | .WESF | | | |
| E0411B8E20 | P566248 | .WESF | E2682B2C10 | P566462 | .WESF | E4051V6C10 | P566276 | .WESF | E6021V2C20 | P566213 | .WESF | | | |
| E0411B8E01 | P566265 | .WESF | E2682B4C03 | P566465 | .WESF | E4051V6C20 | P566277 | .WESF | E6021V2E03 | P566373 | .WESF | | | |
| E0411B8E03 | P566266 | .WESF | E2682B4C05 | P566466 | .WESF | E4051V7C01 | P568818 | .WESF | E6021V2E05 | P566374 | .WESF | | | |
| E0411B8E05 | P566267 | .WESF | E2682B4C10 | P566467 | .WESF | E4051V7C03 | P566278 | .WESF | E6021V2E10 | P566375 | .WESF | | | |
| E0411B8E10 | P566268 | .WESF | E2682B5C03 | P566470 | .WESF | E4051V7C05 | P566279 | .WESF | E6021V4C01 | P566214 | .WESF | | | |
| E0411B8L01 | P566254 | .WESF | E2682B5C05 | P566471 | .WESF | E4051V7C10 | P566280 | .WESF | E6021V4C03 | P566215 | .WESF | | | |
| E0411B8L03 | P566255 | .WESF | E2682B5C10 | P566472 | .WESF | E4051V7C20 | P566281 | .WESF | E6021V4C05 | P566216 | .WESF | | | |
| E0411B8L05 | P566256 | .WESF | E2683B5E01 | P566260 | .WESF | E4054B3H03 | P566412 | .WESF | E6021V4C10 | P566217 | .WESF | | | |
| E0411B8L10 | P566257 | .WESF | E2683B5E03 | P566261 | .WESF | E4054B3H10 | P566413 | .WESF | E6021V4C20 | P566218 | .WESF | | | |
| E0411B8L20 | P566258 | .WESF | E2683B5E05 | P566262 | .WESF | E4054V3H03 | P566412 | .WESF | E6021V4E03 | P566378 | .WESF | | | |
| E0411V5C03 | P566240 | .WESF | E2683B5E10 | P566263 | .WESF | E4054V3H10 | P566413 | .WESF | E6021V4E05 | P566379 | .WESF | | | |
| E0411V5C05 | P566241 | .WESF | E2683B8E01 | P566264 | .WESF | E6011B1C03 | P566392 | .WESF | E6021V4E10 | P566380 | .WESF | | | |
| E0411V5C10 | P566242 | .WESF | E2683B8E03 | P566265 | .WESF | E6011B1C05 | P566393 | .WESF | E6021V5C01 | P566219 | .WESF | | | |
| E0411V5C20 | P566243 | .WESF | E2683B8E05 | P566266 | .WESF | E6011B1C10 | P566394 | .WESF | E6021V5C03 | P566220 | .WESF | | | |
| E0411V5E01 | P566260 | .WESF | E2683B8E01 | P566267 | .WESF | E6011B2C03 | P566397 | .WESF | E6021V5C05 | P566221 | .WESF | | | |
| E0411V5E03 | P566261 | .WESF | E2683B8E03 | P566268 | .WESF | E6011B2C05 | P566398 | .WESF | E6021V5C10 | P566222 | .WESF | | | |
| E0411V5E05 | P566262 | .WESF | E2683B8E20 | P566269 | .WESF | E6011B2C10 | P566399 | .WESF | E6021V5C20 | P566223 | .WESF | | | |
| E0411V5E10 | P566263 | .WESF | E2691B2C03 | P566490 | .WESF | E6011B4C03 | P566402 | .WESF | E6021V5E03 | P566383 | .WESF | | | |
| E0411V5L01 | P566249 | .WESF | E2691B2C05 | P566491 | .WESF | E6011B4C05 | P566403 | .WESF | E6021V5E05 | P566384 | .WESF | | | |
| E0411V5L03 | P566250 | .WESF | E2691B2C10 | P566492 | .WESF | E6011B4C10 | P566404 | .WESF | E6021V5E10 | P566385 | .WESF | | | |
| E0411V5L05 | P566251 | .WESF | E2691B4C03 | P566495 | .WESF | E6011V1C03 | P566392 | .WESF | E6024B1H03 | P566364 | .WESF | | | |
| E0411V5L10 | P566252 | .WESF | E2691B4C05 | P566496 | .WESF | E6011V1C05 | P566393 | .WESF | E6024B1H10 | P566365 | .WESF | | | |
| E0411V5L20 | P566253 | .WESF | E2691B4C10 | P566497 | .WESF | E6011V1C10 | P566394 | .WESF | E6024B2H03 | P566366 | .WESF | | | |
| E0411V8C01 | P566244 | .WESF | E2691B5C03 | P566500 | .WESF | E6011V2C03 | P566397 | .WESF | E6024B2H10 | P566367 | .WESF | | | |
| E0411V8C03 | P566245 | .WESF | E2691B5C05 | P566501 | .WESF | E6011V2C05 | P566398 | .WESF | E6024B4H03 | P566368 | .WESF | | | |
| E0411V8C05 | P566246 | .WESF | E2691B5C10 | P566502 | .WESF | E6011V2C10 | P566399 | .WESF | E6024B4H10 | P566369 | .WESF | | | |
| E0411V8C10 | P566247 | .WESF | E2961B5E03 | P566383 | .WESF | E6011V4C03 | P566402 | .WESF | E6024B5H03 | P566370 | .WESF | | | |
| E0411V8E01 | P566265 | .WESF | E3044B1H03 | P566335 | .WESF | E6011V4C05 | P566403 | .WESF | E6024B5H10 | P566371 | .WESF | | | |
| E0411V8E03 | P566266 | .WESF | E3044B1H10 | P566336 | .WESF | E6011V4C10 | P566404 | .WESF | E6024V1H03 | P566364 | .WESF | | | |
| E0411V8E05 | P566267 | .WESF | E3044B1H15 | P566336 | .WESF | E6014B1H03 | P566406 | .WESF | E6024V1H10 | P566365 | .WESF | | | |
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| E0411V8L01 | P566254 | .WESF | E3044B2H10 | P566338 | .WESF | E6014B2H03 | P566408 | .WESF | E6024V2H10 | P566367 | .WESF | | | |
| E0411V8L03 | P566255 | .WESF | E3044B2H15 | P566338 | .WESF | E6014B2H10 | P566409 | .WESF | E6024V4H03 | P566368 | .WESF | | | |
| E0411V8L05 | P566256 | .WESF | E3044V1H03 | P566335 | .WESF | E6014B4H03 | P566410 | .WESF | E6024V4H10 | P566369 | .WESF | | | |
| E0411V8L10 | P566257 | .WESF | E3044V1H10 | P566336 | .WESF | E6014B4H10 | P566411 | .WESF | E6024V5H03 | P566370 | .WESF | | | |
| E0411V8L20 | P566258 | .WESF | E3044V1H15 | P566336 | .WESF | E6014V1H03 | P566406 | .WESF | E6024V5H10 | P566371 | .WESF | | | |
| E0411B5E10 | P566263 | .WESF | E3044V2H03 | P566337 | .WESF | E6014V1H10 | P566407 | .WESF | EPB21NFA | P566392 | ..UFI | | | |
| E0602B1C03 | P566650 | .WESF | E3044V2H15 | P566338 | .WESF | E6014V2H03 | P566408 | .WESF | EPB21NFB | P566393 | ..UFI | | | |
| E0602B1C05 | P566651 | .WESF | E3045B1H03 | P566335 | .WESF | E6014V2H10 | P566409 | .WESF | EPB21NFC | P566394 | ..UFI | | | |
| E0602B1C10 | P566652 | .WESF | E3045B1H10 | P566336 | .WESF | E6014V4H03 | P566410 | .WESF | EPB21NFD | P566395 | ..UFI | | | |
| E0604B1H03 | P566688 | .WESF | E3045B2H03 | P566337 | .WESF | E6014V4H10 | P566411 | .WESF | EPB21NHA | P566406 | ..UFI | | | |
| E0604B1H10 | P566689 | .WESF | E3045B2H10 | P566338 | .WESF | E6021B1C03 | P566205 | .WESF | EPB21NHC | P566407 | ..UFI | | | |
| E0662B2C03 | P566682 | .WESF | E3045V1H03 | P566335 | .WESF | E6021B2C01 | P566209 | .WESF | EPB22FFA | P566397 | ..UFI | | | |
| E0662B2C05 | P566683 | .WESF | E3045V1H10 | P566336 | .WESF | E6021B2C03 | P566210 | .WESF | EPB22NFA | P566397 | ..UFI | | | |
| E0662B2C10 | P566684 | .WESF | E3045V2H03 | P566337 | .WESF | E6021B2C05 | P566211 | .WESF | EPB22NFB | P566398 | ..UFI | | | |
| E0664B2H03 | P566702 | .WESF | E3045V2H10 | P566338 | .WESF | E6021B2C10 | P566212 | .WESF | EPB22NFC | P566399 | ..UFI | | | |
| E0664B2H10 | P566703 | .WESF | E4051B3C01 | P568816 | .WESF | E6021B2C20 | P566213 | .WESF | EPB22NFD | P566400 | ..UFI | | | |
| E2051B2C03 | P566225 | .WESF | E4051B3C05 | P566226 | .WESF | E6021B2E03 | P566373 | .WESF | EPB22NHA | P566408 | ..UFI | | | |
| E2051B2C05 | P566226 | .WESF | E4051B3C10 | P566227 | .WESF | E6021B2E05 | P566374 | .WESF | EPB22NHC | P566409 | ..UFI | | | |
| E2051B2C10 | P566227 | .WESF | E4051B3C05 | P566227 | .WESF | E6021B2E10 | P566375 | .WESF | EPB31NFA | P566205 | ..UFI | | | |
| | | | | | | E6021B4C01 | P566214 | .WESF | EPB31NFB | P566206 | ..UFI | | | |

F

| | | |
|--------------|---------|--------|
| F170015GFB | P567005 | ..PTI |
| F170015HFB | P567006 | ..PTI |
| F170030HFB | P567009 | ..PTI |
| F170030HFB | P567010 | ..PTI |
| F270030GFB | P567017 | ..PTI |
| F270030HFB | P567018 | ..PTI |
| F270030JFB | P567020 | ..PTI |
| F270030KFB | P567019 | ..PTI |
| F370015GFB | P567021 | ..PTI |
| F370015HFB | P567022 | ..PTI |
| F370015JFB | P567024 | ..PTI |
| F370015KFB | P567023 | ..PTI |
| F370030GFB | P567025 | ..PTI |
| F370030HFB | P567026 | ..PTI |
| F370030JFB | P567028 | ..PTI |
| F370030KFB | P567027 | ..PTI |
| F370050GFB | P567029 | ..PTI |
| F370050HFB | P567030 | ..PTI |
| F370050JFB | P567032 | ..PTI |
| F370050KFB | P567031 | ..PTI |
| FC5012F003BS | P567093 | ..FINN |
| FC5012F005BS | P567094 | ..FINN |
| FC5012F010BS | P567095 | ..FINN |
| FC5012F025BS | P567096 | ..FINN |
| FC5012Q003BS | P567093 | ..PRKR |
| FC5012Q005BS | P567094 | ..PRKR |
| FC5014F003BS | P567101 | ..FINN |
| FC7008Q010BK | P566222 | ..PRKR |
| FC7008Q020BK | P566223 | ..PRKR |
| FC7102Q003BS | P566397 | |



DT High-Performance Filters

Numberfinder Cross Reference



| Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code |
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| G02630 | P571238 | .PRKR | H370Z2020BN | P567028 | .HCHN | H91008003BH | P566631 | .HCHN | HC0101FDP36HY514 | P568862 | ...PALL | HC2196FKN6H | P566966 | ...PALL |
| G02828 | P567083 | .PRKR | H370Z3010BN | P567030 | .HCHN | H91008005BH | P566632 | .HCHN | HC0101FDP36Z | P566710 | ...PALL | HC2196FKN6Z | P566966 | ...PALL |
| G02829 | P567084 | .PRKR | | | | H91008010BH | P566633 | .HCHN | HC0101FDS18H | P566707 | ...PALL | HC2196FKP4H | P566961 | ...PALL |
| G02830 | P567081 | .PRKR | H8067 | P566457 | BDWWN | H91008020BH | P566634 | .HCHN | HC0101FDS18Z | P566707 | ...PALL | HC2196FKP4Z | P566961 | ...PALL |
| G02831 | P567083 | .PRKR | H8111 | P566397 | BDWWN | | | | HC0101FDS36H | P566712 | ...PALL | HC2196FKP6H | P566965 | ...PALL |
| G02832 | P567084 | .PRKR | | | | H9111 | P566397 | BDWWN | HC0101FDS36Z | P566712 | ...PALL | HC2196FKP6Z | P566965 | ...PALL |
| G02836 | P567087 | .PRKR | H820013003BN | P566465 | .HCHN | | | | HC0101FDT18H | P566708 | ...PALL | HC2196FKS4H | P566963 | ...PALL |
| G02837 | P567088 | .PRKR | H820013005BN | P566466 | .HCHN | H940013003BN | P566445 | .HCHN | HC0101FDT18Z | P566708 | ...PALL | HC2196FKS4Z | P566963 | ...PALL |
| G02838 | P567085 | .PRKR | H820013010BN | P566467 | .HCHN | H940013005BN | P566446 | .HCHN | HC0101FDT36H | P566713 | ...PALL | HC2196FKS6H | P566967 | ...PALL |
| G02839 | P567087 | .PRKR | H820013020BN | P566468 | .HCHN | H940013010BN | P566447 | .HCHN | HC0101FDT36Z | P566713 | ...PALL | HC2196FKS6Z | P566967 | ...PALL |
| G02840 | P567088 | .PRKR | H820016003BN | P566470 | .HCHN | H940013020BN | P566448 | .HCHN | HC0101FDZ18H | P566704 | ...PALL | HC2196FKT4H | P566964 | ...PALL |
| G02844 | P567091 | .PRKR | H820016005BN | P566471 | .HCHN | H940026003BN | P566450 | .HCHN | HC0101FDZ18Z | P566704 | ...PALL | HC2196FKT4Z | P566964 | ...PALL |
| G02845 | P567092 | .PRKR | H820016010BN | P566472 | .HCHN | H940026005BN | P566451 | .HCHN | HC0101FDZ36H | P566709 | ...PALL | HC2196FKT6H | P566968 | ...PALL |
| G02846 | P567089 | .PRKR | H820016020BN | P566473 | .HCHN | H940026010BN | P566452 | .HCHN | HC0101FDZ36Z | P566709 | ...PALL | HC2196FKT6Z | P566968 | ...PALL |
| G02852 | P567095 | .PRKR | H82008003BN | P566460 | .HCHN | H940026020BN | P566453 | .HCHN | HC0101FKN18H | P566706 | ...PALL | | | |
| G02853 | P567096 | .PRKR | H82008005BN | P566461 | .HCHN | H940039003BN | P566455 | .HCHN | HC0101FKN18Z | P566706 | ...PALL | HC2206FDN3H | P566651 | ...PALL |
| G02854 | P567093 | .PRKR | H82008010BN | P566462 | .HCHN | H940039005BN | P566456 | .HCHN | HC0101FKN36H | P566711 | ...PALL | HC2206FDN3Z | P566651 | ...PALL |
| G02855 | P567095 | .PRKR | H82008020BN | P566463 | .HCHN | H940039010BN | P566457 | .HCHN | HC0101FKN36Z | P566711 | ...PALL | HC2206FDN6H | P566659 | ...PALL |
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| G02860 | P567099 | .PRKR | H830016003BN | P566240 | .HCHN | H940039020BN | P566458 | .HCHN | HC0101FKP18HY514 | P568570 | ...PALL | HC2206FDN8H | P566663 | ...PALL |
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| G02868 | P567103 | .PRKR | H830016020BN | P566243 | .HCHN | H960013010BN | P566217 | .HCHN | HC0101FKP36HY514 | P568862 | ...PALL | HC2206FDP3Z | P566650 | ...PALL |
| G02869 | P567104 | .PRKR | H830039003BN | P566245 | .HCHN | H960016010BN | P566222 | .HCHN | HC0101FKP36Z | P566710 | ...PALL | HC2206FDP8H | P566662 | ...PALL |
| G02870 | P567101 | .PRKR | H830039005BN | P566246 | .HCHN | H96004010BN | P566207 | .HCHN | HC0101FKS18H | P566707 | ...PALL | HC2206FDP8Z | P566662 | ...PALL |
| G02872 | P567104 | .PRKR | H830039010BN | P566247 | .HCHN | H96004020BN | P566208 | .HCHN | HC0101FKS18Z | P566707 | ...PALL | HC2206FDS3H | P566652 | ...PALL |
| G03368 | P567023 | .PRKR | H830039020BN | P566248 | .HCHN | H96008010BN | P566212 | .HCHN | HC0101FKS36H | P566712 | ...PALL | HC2206FDS3Z | P566652 | ...PALL |
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| G03371 | P567027 | .PRKR | H831016005BN | P566251 | .HCHN | H960113003BH | P566368 | .HCHN | HC0101FKT18H | P566708 | ...PALL | HC2206FDS6Z | P566660 | ...PALL |
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| Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code |
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| Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code |
|--------------|---------|-----------|--------------|---------|-----------|--------------|---------|-----------|--------------|---------|-----------|--------------|---------|-----------|
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| HC9600FKS13H | P566217 | PALL | HC9601FDP4Z | P566364 | PALL | HC9650FDS8Z | P566227 | PALL | HC9700FDN18Z | P566275 | PALL | HC9800FDS8H | P566399 | PALL |
| HC9600FKS13Z | P566217 | PALL | HC9601FDP8H | P566366 | PALL | HC9650FDT16H | P566233 | PALL | HC9700FDN27H | P566279 | PALL | HC9800FDS8Z | P566399 | PALL |
| HC9600FKS16H | P566222 | PALL | HC9601FDP8Z | P566366 | PALL | HC9650FDT16Z | P566233 | PALL | HC9700FDN27Z | P566279 | PALL | HC9800FDT13H | P566405 | PALL |
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| HC9600FKS4H | P566207 | PALL | HC9601FDT13Z | P566369 | PALL | HC9650FDT8Z | P566228 | PALL | HC9700FDN9Z | P566271 | PALL | HC9800FDT4H | P566395 | PALL |
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| HC9600FKS8H | P566212 | PALL | HC9601FDT16Z | P566371 | PALL | HC9650FDZ16Z | P566229 | PALL | HC9700FDP18Z | P566274 | PALL | HC9800FDT8H | P566400 | PALL |
| HC9600FKS8Z | P566212 | PALL | HC9601FDT4H | P566365 | PALL | HC9650FDZ8H | P566224 | PALL | HC9700FDP27H | P566278 | PALL | HC9800FDT8Z | P566400 | PALL |
| HC9600FKT13H | P566218 | PALL | HC9601FDT4Z | P566365 | PALL | HC9650FDZ8Z | P566224 | PALL | HC9700FDP27Z | P566278 | PALL | HC9800FDZ13H | P566401 | PALL |
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| HC9600FUZ4Z | P566204 | PALL | HC9650FDP16H | P566230 | PALL | HC9651FUP8H | P566387 | PALL | HC9800FDP13Z | P566402 | PALL | HC9800FUS13Z | P566404 | PALL |
| HC9600FUZ8H | P566209 | PALL | HC9650FDP16Z | P566230 | PALL | HC9651FUP8Z | P566387 | PALL | HC9800FDP13Z | P566402 | PALL | HC9800FUS8H | P566399 | PALL |
| HC9600FUZ8Z | P566209 | PALL | HC9650FDP8H | P566225 | PALL | HC9651FUT16H | P566390 | PALL | HC9800FDP4H | P566392 | PALL | HC9800FUS8Z | P566399 | PALL |
| HC9601FDP13H | P566368 | PALL | HC9650FDP8Z | P566225 | PALL | HC9651FUT16Z | P566390 | PALL | HC9800FDP4Z | P566392 | PALL | HC9800FUT13H | P566405 | PALL |
| HC9601FDP13Z | P566368 | PALL | HC9650FDP8Z | P566225 | PALL | HC9651FUT8H | P566388 | PALL | HC9800FDP4Z | P566392 | PALL | HC9800FUT13Z | P566405 | PALL |
| HC9601FDP16H | P566370 | PALL | HC9650FDS16H | P566232 | PALL | HC9651FUT8Z | P566388 | PALL | HC9800FDP8Z | P566397 | PALL | HC9800FUT4H | P566395 | PALL |
| HC9601FDP16Z | P566370 | PALL | HC9650FDS16Z | P566232 | PALL | HC9651FUT8Z | P566388 | PALL | HC9800FDS13H | P566404 | PALL | HC9800FUT4Z | P566395 | PALL |
| | | | | | | | | | HC9800FDS13Z | P566404 | PALL | HC9800FUT8H | P566400 | PALL |



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| Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code |
|--------------|---------|-----------|--------------|---------|-----------|--------------|---------|-----------|----------------|---------|-----------|--------------|---------|-----------|
| HC9800FUT8Z | P566400 | PALL | HC9901FUT26H | P566643 | PALL | HP0653A03AH | P566337 | MPFP | HP101318L183MB | P568570 | HYPO | HP16RNL512MB | P566971 | HYPO |
| HC9800FUZ13H | P566401 | PALL | HC9901FUT26Z | P566643 | PALL | HP0653A03AN | P566200 | MPFP | HP101318L186MB | P568570 | HYPO | HP16RNL512MV | P566971 | HYPO |
| HC9800FUZ13Z | P566401 | PALL | | | | HP0653A06AN | P566201 | MPFP | HP101318L363MB | P568862 | HYPO | HP16RNL525MB | P566972 | HYPO |
| HC9800FUZ4H | P566391 | PALL | HE8308LL12B | P566237 | PORO | HP0653A10AH | P566338 | MPFP | HP101318L363MV | P568862 | HYPO | HP16RNL525MV | P566972 | HYPO |
| HC9800FUZ4Z | P566391 | PALL | HE8316LL12B | P566242 | PORO | HP0653A10AN | P566202 | MPFP | HP101318L366MB | P568862 | HYPO | HP16RNL53MB | P566969 | HYPO |
| HC9800FUZ8H | P566396 | PALL | HE8339LL03B | P566245 | PORO | HP0653A25AN | P566203 | MPFP | | | | HP16RNL53MV | P566969 | HYPO |
| HC9800FUZ8Z | P566396 | PALL | HE8339LL25B | P566248 | PORO | | | | HP101L1812MB | P566707 | HYPO | HP16RNL56MB | P566970 | HYPO |
| | | | HE9204HL03V | P566335 | PORO | HP06DHL412MB | P566689 | HYPO | HP101L1812MV | P566707 | HYPO | HP16RNL56MV | P566970 | HYPO |
| HC9801FDP13H | P566410 | PALL | HE9616LL03B | P566220 | PORO | HP06DHL412MV | P566689 | HYPO | HP101L1825MB | P566708 | HYPO | HP16RNL812MB | P566979 | HYPO |
| HC9801FDP13Z | P566410 | PALL | | | | HP06DHL43MB | P566688 | HYPO | HP101L1825MV | P566708 | HYPO | HP16RNL812MV | P566979 | HYPO |
| HC9801FDP4H | P566406 | PALL | HF28658 | P566983 | FTGD | HP06DHL43MV | P566688 | HYPO | HP101L183MB | P566705 | HYPO | HP16RNL825MB | P566980 | HYPO |
| HC9801FDP4Z | P566406 | PALL | | | | HP06DHL712MB | P566691 | HYPO | HP101L186MB | P566706 | HYPO | HP16RNL825MV | P566980 | HYPO |
| HC9801FDP8H | P566408 | PALL | HF30077 | P566461 | FTGD | HP06DHL712MV | P566691 | HYPO | HP101L186MV | P566706 | HYPO | HP16RNL83MB | P566977 | HYPO |
| HC9801FDP8Z | P566408 | PALL | HF30218 | P566660 | FTGD | HP06DHL73MB | P566690 | HYPO | HP101L3612MB | P566712 | HYPO | HP16RNL83MV | P566977 | HYPO |
| HC9801FDT13H | P566411 | PALL | HF3030KFB | P566212 | PTI | HP06DHL73MV | P566690 | HYPO | HP101L3612MV | P566712 | HYPO | HP16RNL86MB | P566978 | HYPO |
| HC9801FDT13Z | P566411 | PALL | HF30346 | P566457 | FTGD | HP06DHL812MB | P566693 | HYPO | HP101L3625MB | P566713 | HYPO | HP16RNL86MV | P566978 | HYPO |
| HC9801FDT4H | P566407 | PALL | HF30442 | P566397 | FTGD | HP06DHL812MV | P566693 | HYPO | HP101L3625MV | P566713 | HYPO | | | |
| HC9801FDT4Z | P566407 | PALL | HF30693 | P566653 | FTGD | HP06DHL83MB | P566692 | HYPO | HP101L363MB | P566710 | HYPO | HP170L1012MB | P567047 | HYPO |
| HC9801FDT8H | P566409 | PALL | HF30748 | P566213 | FTGD | HP06DHL83MV | P566692 | HYPO | HP101L363MV | P566710 | HYPO | HP170L1012MV | P567047 | HYPO |
| HC9801FDT8Z | P566409 | PALL | HF30758 | P567020 | FTGD | | | | HP101L366MB | P566711 | HYPO | HP170L1025MB | P567048 | HYPO |
| HC9801FKP13H | P566410 | PALL | | | | HP06DNL412MB | P566652 | HYPO | HP101L366MV | P566711 | HYPO | HP170L1025MV | P567048 | HYPO |
| HC9801FKP13Z | P566410 | PALL | HF4L10VQ | P566271 | PRKR | HP06DNL412MV | P566652 | HYPO | | | | HP170L103MB | P567045 | HYPO |
| HC9801FKP8H | P566408 | PALL | HF4L15VQ | P566272 | PRKR | HP06DNL425MB | P566653 | HYPO | HP102L1812MB | P566707 | HYPO | HP170L106MB | P567046 | HYPO |
| HC9801FUP13H | P566410 | PALL | HF4L25VQ | P566273 | PRKR | HP06DNL425MV | P566653 | HYPO | HP102L1825MB | P566708 | HYPO | HP170L512MB | P567043 | HYPO |
| HC9801FUP13Z | P566410 | PALL | HF4L3VQ | P566270 | PRKR | HP06DNL43MB | P566650 | HYPO | | | | HP170L525MB | P567044 | HYPO |
| HC9801FUP4H | P566406 | PALL | | | | HP06DNL43MV | P566650 | HYPO | HP1200L1510M | P567103 | HYPO | HP170L525MV | P567044 | HYPO |
| HC9801FUP4Z | P566406 | PALL | HF6112 | P567027 | FTGD | HP06DNL46MB | P566651 | HYPO | HP1200L1525M | P567104 | HYPO | HP170L53MB | P567041 | HYPO |
| HC9801FUP8H | P566408 | PALL | HF6113 | P567024 | FTGD | HP06DNL46MV | P566651 | HYPO | HP1200L153M | P567101 | HYPO | HP170L56MB | P567042 | HYPO |
| HC9801FUP8Z | P566408 | PALL | HF6114 | P567032 | FTGD | HP06DNL712MB | P566660 | HYPO | HP1200L156M | P567102 | HYPO | HP170L56MV | P567042 | HYPO |
| HC9801FUT13H | P566411 | PALL | HF6846 | P566687 | FTGD | HP06DNL712MV | P566660 | HYPO | | | | HP17L212MB | P567007 | HYPO |
| HC9801FUT13Z | P566411 | PALL | | | | HP06DNL725MB | P566661 | HYPO | HP150L410M | P567083 | HYPO | HP17L225MB | P567008 | HYPO |
| HC9801FUT4H | P566407 | PALL | HF7008 | P566245 | FTGD | HP06DNL725MV | P566661 | HYPO | HP150L425M | P567084 | HYPO | HP17L23MB | P567005 | HYPO |
| HC9801FUT4Z | P566407 | PALL | HF7010 | P566247 | FTGD | HP06DNL73MB | P566658 | HYPO | HP150L43M | P567081 | HYPO | HP17L26MB | P567006 | HYPO |
| HC9801FUT8H | P566409 | PALL | HF7062 | P566457 | FTGD | HP06DNL73MV | P566658 | HYPO | HP150L46M | P567082 | HYPO | HP17L412MB | P567011 | HYPO |
| HC9801FUT8Z | P566409 | PALL | HF7104 | P566397 | FTGD | HP06DNL76MB | P566659 | HYPO | | | | HP17L425MB | P567012 | HYPO |
| | | | HF7722 | P567056 | FTGD | HP06DNL76MV | P566659 | HYPO | HP16DHL1412MB | P566699 | HYPO | HP17L43MB | P567009 | HYPO |
| HC9901FDP13H | P566640 | PALL | HF7724 | P567052 | FTGD | HP06DNL812MB | P566664 | HYPO | HP16DHL1412MV | P566699 | HYPO | HP17L46MB | P567010 | HYPO |
| HC9901FDP13Z | P566640 | PALL | HF7725 | P567052 | FTGD | HP06DNL812MV | P566664 | HYPO | HP16DHL143MB | P566698 | HYPO | | | |
| HC9901FDP26H | P566642 | PALL | HF7813 | P567044 | FTGD | HP06DNL825MB | P566665 | HYPO | HP16DHL143MV | P566698 | HYPO | HP20L412MB | P566197 | HYPO |
| HC9901FDP26Z | P566642 | PALL | HF7814 | P567047 | FTGD | HP06DNL825MV | P566665 | HYPO | HP16DHL1512MB | P566695 | HYPO | HP20L412MV | P566197 | HYPO |
| HC9901FDP39H | P566644 | PALL | HF7815 | P567045 | FTGD | HP06DNL83MB | P566662 | HYPO | HP16DHL1512MV | P566695 | HYPO | HP20L41MB | P566194 | HYPO |
| HC9901FDP39Z | P566644 | PALL | | | | HP06DNL83MV | P566662 | HYPO | HP16DHL153MB | P566694 | HYPO | HP20L41MV | P566194 | HYPO |
| HC9901FDS13H | P566641 | PALL | HK010BN | P566272 | HCHN | HP06DNL86MB | P566663 | HYPO | HP16DHL812MB | P566697 | HYPO | HP20L425MB | P566198 | HYPO |
| HC9901FDS13Z | P566641 | PALL | HK020BN | P566273 | HCHN | HP06DNL86MV | P566663 | HYPO | HP16DHL812MV | P566697 | HYPO | HP20L425MV | P566198 | HYPO |
| HC9901FDS39H | P566645 | PALL | HXX003BH | P566412 | HCHN | | | | HP16DHL83MB | P566696 | HYPO | HP20L43MB | P566195 | HYPO |
| HC9901FDS39Z | P566645 | PALL | HKX010BH | P566413 | HCHN | HP06RNL412MB | P566963 | HYPO | HP16DHL83MV | P566696 | HYPO | HP20L46MB | P566196 | HYPO |
| HC9901FDT26H | P566643 | PALL | HP016DHL53MV | P566694 | HYPO | HP06RNL412MV | P566963 | HYPO | HP16DNL1412MB | P566676 | HYPO | HP20L46MV | P566196 | HYPO |
| HC9901FDT26Z | P566643 | PALL | | | | HP06RNL425MB | P566964 | HYPO | HP16DNL1412MV | P566676 | HYPO | HP20L812MB | P566202 | HYPO |
| HC9901FKP13H | P566640 | PALL | HP03DHL412MB | P566687 | HYPO | HP06RNL425MV | P566964 | HYPO | HP16DNL1425MB | P566677 | HYPO | HP20L812MV | P566202 | HYPO |
| HC9901FKP13Z | P566640 | PALL | HP03DHL412MV | P566687 | HYPO | HP06RNL43MB | P566961 | HYPO | HP16DNL1425MV | P566677 | HYPO | HP20L825MB | P566203 | HYPO |
| HC9901FKP26H | P566642 | PALL | HP03DHL43MB | P566686 | HYPO | HP06RNL43MV | P566961 | HYPO | HP16DNL143MB | P566674 | HYPO | HP20L825MV | P566203 | HYPO |
| HC9901FKP26Z | P566642 | PALL | HP03DHL43MV | P566686 | HYPO | HP06RNL46MB | P566962 | HYPO | HP16DNL143MV | P566674 | HYPO | HP20L83MB | P566200 | HYPO |
| HC9901FKP39H | P566644 | PALL | | | | HP06RNL46MV | P566962 | HYPO | HP16DNL146MB | P566675 | HYPO | HP20L83MV | P566200 | HYPO |
| HC9901FKP39Z | P566644 | PALL | HP03DNL412MB | P566648 | HYPO | HP06RNL712MB | P566967 | HYPO | HP16DNL146MV | P566675 | HYPO | HP20L86MB | P566201 | HYPO |
| HC9901FKS13H | P566641 | PALL | HP03DNL412MV | P566648 | HYPO | HP06RNL712MV | P566967 | HYPO | HP16DNL512MB | P566668 | HYPO | HP20L86MV | P566201 | HYPO |
| HC9901FKS13Z | P566641 | PALL | HP03DNL425MB | P566649 | HYPO | HP06RNL725MB | P566968 | HYPO | HP16DNL512MV | P566668 | HYPO | HP20L88UM | P566201 | HYPO |
| HC9901FKS39H | P566645 | PALL | HP03DNL425MV | P566649 | HYPO | HP06RNL725MV | P566968 | HYPO | HP16DNL525MB | P566669 | HYPO | | | |
| HC9901FKS39Z | P566645 | PALL | HP03DNL43MB | P566646 | HYPO | HP06RNL73MB | P566965 | HYPO | HP16DNL525MV | P566669 | HYPO | HP21L415MB | P566336 | HYPO |
| HC9901FKT26H | P566643 | PALL | HP03DNL43MV | P566646 | HYPO | HP06RNL73MV | P566965 | HYPO | HP16DNL53MB | P566666 | HYPO | HP21L415MV | P566336 | HYPO |
| HC9901FKT26Z | P566643 | PALL | HP03DNL46MB | P566647 | HYPO | HP06RNL76MB | P566966 | HYPO | HP16DNL53MV | P566666 | HYPO | HP21L42MB | P566335 | HYPO |
| HC9901FUP13H | P566640 | PALL | HP03DNL46MV | P566647 | HYPO | HP06RNL76MV | P566966 | HYPO | HP16DNL56MB | P566667 | HYPO | HP21L42MV | P566335 | HYPO |
| HC9901FUP13Z | P566640 | PALL | | | | | | | HP16DNL56MV | P566667 | HYPO | HP21L815MB | P566338 | HYPO |
| HC9901FUP26H | P566642 | PALL | HP0652A03AH | P566335 | MPFP | HP075NL710MB | P566656 | HYPO | HP16DNL812MB | P566672 | HYPO | HP21L815MV | P566338 | HYPO |
| HC9901FUP26Z | P566642 | PALL | HP0652A03AN | P566195 | MPFP | HP075NL710MV | P566656 | HYPO | HP16DNL812MV | P566672 | HYPO | HP21L82MB | P566337 | HYPO |
| HC9901FUP39H | P566644 | PALL | HP0652A06AN | P566196 | MPFP | HP075NL720MB | P566657 | HYPO | HP16DNL825MB | P566673 | HYPO | HP21L82MV | P566337 | HYPO |
| HC9901FUP39Z | P566644 | PALL | HP0652A10AH | P566336 | MPFP | HP075NL720MV | P566657 | HYPO | HP16DNL825MV | P566673 | HYPO | | | |
| HC9901FUS13H | P566641 | PALL | HP0652A10AN | P566197 | MPFP | HP075NL73MB | P566654 | HYPO | HP16DNL83MB | P566670 | HYPO | HP21L825MB | P566337 | HYPO |
| HC9901FUS13Z | P566641 | PALL | HP0652A25AN | P566198 | MPFP | HP075NL73MV | P566654 | HYPO | HP16DNL83MV | P566670 | HYPO | HP21L825MV | P566337 | HYPO |
| HC9901FUS39H | P566645 | PALL | | | | | | | HP16DNL86MB | P566671 | HYPO | | | |
| HC9901FUS39Z | P566645 | PALL | | | | | | | HP16DNL86MV | P566671 | HYPO | | | |



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|---------------|---------|-----------|-------------|---------|-----------|-----------|---------|-----------|-----------|---------|-----------|--------------|-----------|-----------|------|
| HP94L1312MB | P566447 | .HYPO | HPAL512MB | P569093 | .HYPO | HYU177 | P566223 | NORM | MP11015 | P567044 | .MPFF | NZ5V | P567066 | .SRDR | |
| HP94L1325MB | P566448 | .HYPO | HPAL525MB | P569094 | .HYPO | HYU616 | P566689 | NORM | MP11129 | P566987 | .MPFF | P | P83250HFB | P566246 | .PTI |
| HP94L133MV | P566445 | .HYPO | HPAL53MB | P569091 | .HYPO | HYU650 | P566680 | NORM | MP11401 | P567049 | .MPFF | | P83250JFB | P566248 | .PTI |
| HP94L2612MB | P566452 | .HYPO | HPAL53MB | P569093 | .HYPO | HYU657 | P566987 | NORM | MP12001 | P567081 | .MPFF | | P83250KFB | P566247 | .PTI |
| HP94L2625MB | P566453 | .HYPO | HPK3L912MV | P566413 | .HYPO | | | | MP12002 | P567083 | .MPFF | | P89200GFB | P566510 | .PTI |
| HP94L263MV | P566450 | .HYPO | HPK3L93MV | P566412 | .HYPO | | | | MP12003 | P567084 | .MPFF | | P89200JFB | P566513 | .PTI |
| HP94L3912MB | P566457 | .HYPO | | | | | | | MP12007 | P567085 | .MPFF | | P96030HFB | P566226 | .PTI |
| HP94L3912MV | P566457 | .HYPO | | | | | | | MP12008 | P567087 | .MPFF | | P96030HFV | P566226 | .PTI |
| HP94L3925MB | P566458 | .HYPO | HPKL1812MB | P566276 | .HYPO | | | | MP12009 | P567088 | .MPFF | | P97100GFB | P566274 | .PTI |
| HP94L3925MV | P566458 | .HYPO | HPKL1812MV | P566276 | .HYPO | | | | MP12012 | P567089 | .MPFF | | P97100HFV | P566275 | .PTI |
| HP94L393MV | P566455 | .HYPO | HPKL181MB | P568817 | .HYPO | | | | MP12014 | P567091 | .MPFF | | P98030GGB | P566397 | .PTI |
| HP94L393MV | P566455 | .HYPO | HPKL181MV | P568817 | .HYPO | | | | MP12015 | P567092 | .MPFF | P98050GUB | P566410 | .PTI | |
| HP94L396MB | P566456 | .HYPO | HPKL1825MB | P566277 | .HYPO | | | | MP12025 | P567097 | .MPFF | PG015GH | P567082 | .PTI | |
| | | | HPKL1825MV | P566277 | .HYPO | | | | MP12026 | P567099 | .MPFF | PG015HH | P567082 | .PTI | |
| HP95RNL1412MB | P566995 | .HYPO | HPKL183MB | P566274 | .HYPO | | | | MP12027 | P567100 | .MPFF | PG015JH | P567084 | .PTI | |
| HP95RNL1412MV | P566995 | .HYPO | HPKL183MV | P566274 | .HYPO | | | | MP12031 | P567101 | .MPFF | PG015KH | P567083 | .PTI | |
| HP95RNL1425MB | P566996 | .HYPO | HPKL186MB | P566275 | .HYPO | | | | MP12032 | P567102 | .MPFF | PG015VH | P567081 | .PTI | |
| HP95RNL1425MV | P566996 | .HYPO | HPKL186MV | P566275 | .HYPO | | | | MP12033 | P567104 | .MPFF | PG025CH | P567087 | .PTI | |
| HP95RNL143MB | P566993 | .HYPO | HPKL2712MB | P566280 | .HYPO | | | | MP1307 | P567020 | .MPFF | PG025GH | P567085 | .PTI | |
| HP95RNL143MV | P566993 | .HYPO | HPKL271MB | P568818 | .HYPO | | | | MP15003 | P567067 | .MPFF | PG025JH | P567088 | .PTI | |
| HP95RNL146MB | P566994 | .HYPO | HPKL2725MB | P566281 | .HYPO | | | | MP3288 | P567103 | .MPFF | PG025KH | P567087 | .PTI | |
| HP95RNL146MV | P566994 | .HYPO | HPKL2725MV | P566281 | .HYPO | | | | MP3294 | P567082 | .MPFF | PG030GH | P567090 | .PTI | |
| HP95RNL1812MB | P566999 | .HYPO | HPKL273MB | P566278 | .HYPO | | | | MP3607 | P566497 | .MPFF | PG030HH | P567090 | .PTI | |
| HP95RNL1812MV | P566999 | .HYPO | HPKL276MB | P566279 | .HYPO | | | | MP3808 | P567042 | .MPFF | PG030JH | P567092 | .PTI | |
| HP95RNL1812MV | P566999 | .HYPO | HPKL912MB | P566272 | .HYPO | | | | MP3822 | P567045 | .MPFF | PG030KH | P567091 | .PTI | |
| HP95RNL1825MV | P567000 | .HYPO | HPKL912MV | P566272 | .HYPO | | | | MP3824 | P567046 | .MPFF | PG030VH | P567089 | .PTI | |
| HP95RNL183MB | P566997 | .HYPO | HPKL91MB | P568816 | .HYPO | | | | MP3825 | P567046 | .MPFF | PG050DH | P567093 | .PTI | |
| HP95RNL183MV | P566997 | .HYPO | HPKL925MB | P566273 | .HYPO | | | | MP3826 | P567047 | .MPFF | PG050GH | P567094 | .PTI | |
| HP95RNL186MB | P566998 | .HYPO | HPKL925MV | P566273 | .HYPO | | | | MP3827 | P567047 | .MPFF | PG050HH | P567094 | .PTI | |
| HP95RNL186MV | P566998 | .HYPO | HPKL93MB | P566270 | .HYPO | | | | MP3828 | P567048 | .MPFF | PG050JH | P567096 | .PTI | |
| HP95RNL3612MB | P567003 | .HYPO | HPKL93MV | P566270 | .HYPO | | | | MP3828 | P567048 | .MPFF | PG050KH | P567095 | .PTI | |
| HP95RNL3612MV | P567003 | .HYPO | HPKL96MB | P566271 | .HYPO | | | | MP3828 | P567048 | .MPFF | PG050VH | P567093 | .PTI | |
| HP95RNL3625MB | P567004 | .HYPO | HPKL96MV | P566271 | .HYPO | | | | MP3890 | P567086 | .MPFF | PG080CH | P567100 | .PTI | |
| HP95RNL3625MV | P567004 | .HYPO | HPNL1012MB | P567071 | .HYPO | | | | MP3911 | P566457 | .MPFF | PG080GH | P567098 | .PTI | |
| HP95RNL363MB | P567001 | .HYPO | HPNL1012MV | P567071 | .HYPO | | | | MP4040 | P567090 | .MPFF | PG080HH | P567098 | .PTI | |
| HP95RNL363MV | P567001 | .HYPO | HPNL1025MB | P567072 | .HYPO | | | | MP4040 | P567050 | .MPFF | PG080JH | P567100 | .PTI | |
| HP95RNL366MB | P567002 | .HYPO | HPNL1025MV | P567072 | .HYPO | | | | MP4050 | P567051 | .MPFF | PG080KH | P567099 | .PTI | |
| HP95RNL366MV | P567002 | .HYPO | HPNL103MB | P567069 | .HYPO | | | | MP4052 | P567052 | .MPFF | PG080VH | P567097 | .PTI | |
| | | | HPNL103MV | P567069 | .HYPO | | | | MP4058 | P567053 | .MPFF | PG120GH | P567102 | .PTI | |
| HP96L1312MB | P566380 | .HYPO | HPNL106MB | P567070 | .HYPO | | | | MP4060 | P567054 | .MPFF | PG120HH | P567102 | .PTI | |
| HP96L1312MV | P566380 | .HYPO | HPNL106MV | P567070 | .SRDR | | | | MP4061 | P567054 | .MPFF | PG120JH | P567104 | .PTI | |
| HP96L131MB | P566377 | .HYPO | HPNL106MV | P567070 | .SRDR | | | | MP4062 | P567055 | .MPFF | PG120KH | P567103 | .PTI | |
| HP96L131MV | P566377 | .HYPO | HPNL512MB | P567067 | .HYPO | | | | MP4063 | P567055 | .MPFF | PG120VH | P567101 | .PTI | |
| HP96L1325MB | P566381 | .HYPO | HPNL512MV | P567067 | .HYPO | | | | MP4064 | P567056 | .MPFF | PH71801C | P566705 | .HLKO | |
| HP96L1325MV | P566381 | .HYPO | HPNL525MB | P567068 | .HYPO | | | | MP4065 | P567056 | .MPFF | PH71803C | P566706 | .HLKO | |
| HP96L133MB | P566378 | .HYPO | HPNL525MV | P567068 | .HYPO | | | | MP4065 | P567056 | .MPFF | PH71805C | P566707 | .HLKO | |
| HP96L133MV | P566378 | .HYPO | HPNL53MB | P567065 | .HYPO | | | | MP4374 | P567033 | .MPFF | PH71810C | P566708 | .HLKO | |
| HP96L136MB | P566379 | .HYPO | HPNL53MV | P567065 | .HYPO | | | | MP4376 | P567034 | .MPFF | PH71812C | P566705 | .HLKO | |
| HP96L136MV | P566379 | .HYPO | HPNL56MB | P567066 | .HYPO | | | | MP5147 | P567098 | .MPFF | P11005KSMIC3 | P567081 | .MHLE | |
| HP96L1612MB | P566385 | .HYPO | HPNL56MV | P567066 | .HYPO | | | | MP8001 | P569093 | .MPFF | P11015MIC25 | P567093 | .MHLE | |
| HP96L1612MV | P566385 | .HYPO | HPVL1412MB | P567079 | .HYPO | | | | MP8002 | P569094 | .MPFF | P11130MIC10 | P567100 | .MHLE | |
| HP96L161MB | P566382 | .HYPO | HPVL1412MV | P567079 | .HYPO | | | | MP8003 | P566971 | .MPFF | P113100RN | P571240 | .MHLE | |
| HP96L161MV | P566382 | .HYPO | HPVL1425MB | P567080 | .HYPO | | | | MP9705 | P566683 | .MPFF | P113100RVN | P571240 | .MHLE | |
| HP96L1625MB | P566386 | .HYPO | HPVL1425MV | P567080 | .HYPO | | | | MPAL512MB | P569094 | .HYPO | P12105SM3 | P567081 | .MHLE | |
| HP96L1625MV | P566386 | .HYPO | HPVL143MB | P567077 | .HYPO | | | | | | | P12108SM3 | P567085 | .MHLE | |
| HP96L163MB | P566383 | .HYPO | HPVL143MV | P567077 | .HYPO | | | | | | | P12108SMX3 | P567085 | .MHLE | |
| HP96L163MV | P566383 | .HYPO | HPVL146MB | P567078 | .HYPO | | | | | | | P121100RN | P571238 | .MHLE | |
| HP96L166MB | P566384 | .HYPO | HPVL146MV | P567078 | .HYPO | | | | | | | P12115SM3 | P567093 | .MHLE | |
| HP96L166MV | P566384 | .HYPO | HPVL93MB | P567073 | .HYPO | | | | | | | P12115SM6 | P567094 | .MHLE | |
| HP96L1812MB | P566375 | .HYPO | HPVL93MV | P567073 | .HYPO | | | | | | | P12130SMX3 | P567093 | .MHLE | |
| HP96L1812MV | P566375 | .HYPO | HPVL96MB | P567074 | .HYPO | | | | | | | P12130SMX3 | P567098 | .MHLE | |
| HP96L181MV | P566372 | .HYPO | HPVL96MV | P567074 | .HYPO | | | | | | | P12145SM3 | P567097 | .MHLE | |
| HP96L1825MB | P566376 | .HYPO | | | | | | | | | | | | | |
| HP96L1825MV | P566376 | .HYPO | HU8900FUP8H | P566490 | .PALL | | | | | | | | | | |
| HP96L183MB | P566373 | .HYPO | HU8900FUP8Z | P566490 | .PALL | | | | | | | | | | |
| HP96L183MV | P566373 | .HYPO | HU8900FUZ8H | P566489 | .PALL | | | | | | | | | | |
| HP96L185MV | P566373 | .HYPO | HU8900FUZ8Z | P566489 | .PALL | | | | | | | | | | |
| HP96L186MB | P566374 | .HYPO | | | | | | | | | | | | | |
| HP96L186MV | P566374 | .HYPO | HYU1035 | P566685 | NORM | | | | | | | | | | |



DT High-Performance Filters

Numberfinder Cross Reference



| Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code |
|-------------|---------|-----------|------------|---------|-----------|--------------|---------|-----------|--------------|---------|-----------|---------------|---------|-----------|
| RF2AH0910A | P567035 | FAIR | RHR60G05V | P566962 | FLTC | S1310HN | P566411 | Zinga | SBF0111DZ3B | P566690 | SRDR | SBF0331DZ10V | P566701 | SRDR |
| RF2AH0925A | P567036 | FAIR | RHR60G10B | P566963 | FLTC | S1310LN | P566404 | Zinga | SBF0111DZ3V | P566690 | SRDR | SBF0331DZ3B | P566700 | SRDR |
| RF2AH1803A | P567037 | FAIR | RHR60G10V | P566963 | FLTC | S1320LN | P566405 | Zinga | | | | SBF0331DZ3V | P566700 | SRDR |
| RF2AH1810A | P567039 | FAIR | RHR60G20B | P566964 | FLTC | SA080E10B | P567027 | STFF | SBF0160DS15B | P566669 | SRDR | SBF0660DS15B | P566685 | SRDR |
| RF2AH1825A | P567040 | FAIR | RHR60G20V | P566964 | FLTC | SA100E10B | P567031 | STFF | SBF0160DS15V | P566669 | SRDR | SBF0660DS15V | P566685 | SRDR |
| RHR0160G05V | P566970 | FLTC | RHR660G03B | P566985 | FLTC | SBF0030DS15B | P566649 | SRDR | SBF0160DS1B | P566666 | SRDR | SBF0660DS1B | P566682 | SRDR |
| RHR110G03B | P566965 | FLTC | RHR660G03V | P566985 | FLTC | SBF0030DS15V | P566649 | SRDR | SBF0160DS1V | P566666 | SRDR | SBF0660DS1V | P566682 | SRDR |
| RHR110G03V | P566965 | FLTC | RHR660G05B | P566986 | FLTC | SBF0030DS1B | P566646 | SRDR | SBF0160DZ10B | P566668 | SRDR | SBF0660DZ10B | P566684 | SRDR |
| RHR110G05B | P566966 | FLTC | RHR660G05V | P566986 | FLTC | SBF0030DS1V | P566646 | SRDR | SBF0160DZ25B | P566669 | SRDR | SBF0660DZ10V | P566684 | SRDR |
| RHR110G05V | P566966 | FLTC | RHR660G10B | P566987 | FLTC | SBF0030DZ10B | P566648 | SRDR | SBF0160DZ25V | P566669 | SRDR | SBF0660DZ25B | P566685 | SRDR |
| RHR110G10B | P566967 | FLTC | RHR660G10V | P566987 | FLTC | SBF0030DZ10V | P566648 | SRDR | SBF0160DZ3B | P566666 | SRDR | SBF0660DZ25V | P566685 | SRDR |
| RHR110G10V | P566967 | FLTC | RHR660G20B | P566988 | FLTC | SBF0030DZ25B | P566649 | SRDR | SBF0160DZ3V | P566666 | SRDR | SBF0660DZ3B | P566682 | SRDR |
| RHR110G20B | P566968 | FLTC | RHR660G20V | P566988 | FLTC | SBF0030DZ25V | P566649 | SRDR | SBF0160DZ5B | P566667 | SRDR | SBF0660DZ3V | P566682 | SRDR |
| RHR110G20V | P566968 | FLTC | | | | SBF0030DZ3B | P566646 | SRDR | SBF0160DZ5V | P566667 | SRDR | SBF0660DZ5B | P566683 | SRDR |
| RHR1300G03B | P566997 | FLTC | RHR850G03B | P566989 | FLTC | SBF0030DZ3B | P566646 | SRDR | SBF0160RZ10B | P566971 | SRDR | SBF0660DZ5V | P566683 | SRDR |
| RHR1300G03V | P570312 | FLTC | RHR850G03V | P566989 | FLTC | SBF0030DZ5B | P566647 | SRDR | SBF0160RZ10V | P566971 | SRDR | SBF0660RZ10B | P566987 | SRDR |
| RHR1300G05B | P566997 | FLTC | RHR850G05B | P566990 | FLTC | SBF0030DZ5V | P566647 | SRDR | SBF0160RZ25B | P566972 | SRDR | SBF0660RZ10V | P566987 | SRDR |
| RHR1300G05V | P570312 | FLTC | RHR850G05V | P566990 | FLTC | SBF0031DZ10B | P566687 | SRDR | SBF0160RZ25V | P566972 | SRDR | SBF0660RZ25B | P566988 | SRDR |
| RHR1300G05B | P566998 | FLTC | RHR850G10B | P566991 | FLTC | SBF0031DZ10V | P566687 | SRDR | SBF0160RZ3B | P566969 | SRDR | SBF0660RZ25V | P566988 | SRDR |
| RHR1300G05V | P566998 | FLTC | RHR850G10V | P566991 | FLTC | SBF0031DZ25B | P566688 | SRDR | SBF0160RZ3V | P566969 | SRDR | SBF0660RZ3B | P566985 | SRDR |
| RHR1300G10B | P566999 | FLTC | RHR850G20B | P566992 | FLTC | SBF0031DZ3V | P566686 | SRDR | SBF0160RZ5B | P566970 | SRDR | SBF0660RZ3V | P566985 | SRDR |
| RHR1300G10B | P570313 | FLTC | RHR850G20V | P566992 | FLTC | | | | SBF0160RZ5V | P566970 | SRDR | SBF0660RZ5B | P566986 | SRDR |
| RHR1300G10V | P566999 | FLTC | | | | SBF0060DS15B | P566653 | SRDR | SBF0161DZ10B | P566695 | SRDR | SBF0660RZ5V | P566986 | SRDR |
| RHR1300G10V | P570313 | FLTC | RHR950G03B | P566993 | FLTC | SBF0060DS15V | P566653 | SRDR | SBF0161DZ10V | P566695 | SRDR | SBF0661DZ10B | P566703 | SRDR |
| RHR1300G20B | P567000 | FLTC | RHR950G03V | P566993 | FLTC | SBF0060DS1B | P566650 | SRDR | SBF0161DZ3B | P566694 | SRDR | SBF0661DZ10V | P566703 | SRDR |
| RHR1300G20V | P567000 | FLTC | RHR950G05B | P566994 | FLTC | SBF0060DS1V | P566650 | SRDR | SBF0161DZ3V | P566694 | SRDR | SBF0661DZ3B | P566702 | SRDR |
| RHR160G03B | P566969 | FLTC | RHR950G05V | P566994 | FLTC | SBF0060DZ10B | P566652 | SRDR | | | | SBF0661DZ3V | P566702 | SRDR |
| RHR160G03V | P566969 | FLTC | RHR950G10B | P566995 | FLTC | SBF0060DZ10V | P566652 | SRDR | SBF0240DS1B | P566670 | SRDR | SBF0850RZ10B | P566991 | SRDR |
| RHR160G05B | P566970 | FLTC | RHR950G10V | P566995 | FLTC | SBF0060DZ25B | P566653 | SRDR | SBF0240DS1V | P566670 | SRDR | SBF0850RZ10V | P566991 | SRDR |
| RHR160G10B | P566971 | FLTC | RHR950G20B | P566996 | FLTC | SBF0060DZ25V | P566653 | SRDR | SBF0240DZ10B | P566672 | SRDR | SBF0850RZ25B | P566992 | SRDR |
| RHR160G10V | P566971 | FLTC | RHR950G20V | P566996 | FLTC | SBF0060DZ3B | P566650 | SRDR | SBF0240DZ10V | P566672 | SRDR | SBF0850RZ25V | P566992 | SRDR |
| RHR160G20B | P566972 | FLTC | RKH0903A | P566270 | FAIR | SBF0060DZ3V | P566650 | SRDR | SBF0240DZ25B | P566673 | SRDR | SBF0850RZ5B | P566990 | SRDR |
| RHR160G20V | P566972 | FLTC | RKH0906A | P566271 | FAIR | SBF0060DZ5B | P566651 | SRDR | SBF0240DZ25V | P566673 | SRDR | SBF0850RZ5V | P566990 | SRDR |
| | | | RKH0912A | P566272 | FAIR | SBF0060DZ5V | P566651 | SRDR | SBF0240RZ10B | P566670 | SRDR | | | |
| | | | RKH0925A | P566273 | FAIR | SBF0060RZ10B | P566963 | SRDR | SBF0240RZ10V | P566670 | SRDR | SBF0950RZ10B | P566995 | SRDR |
| | | | RKH1803A | P566274 | FAIR | SBF0060RZ10V | P566963 | SRDR | SBF0240RZ25B | P566671 | SRDR | SBF0950RZ10V | P566995 | SRDR |
| | | | RKH1806A | P566275 | FAIR | SBF0060RZ25B | P566964 | SRDR | SBF0240RZ5B | P566671 | SRDR | SBF0950RZ25B | P566996 | SRDR |
| | | | RKH1812A | P566276 | FAIR | SBF0060RZ25V | P566964 | SRDR | SBF0240RZ5V | P566671 | SRDR | SBF0950RZ25V | P566996 | SRDR |
| | | | RKH1825A | P566277 | FAIR | SBF0060RZ3B | P566961 | SRDR | SBF0240RZ10B | P566979 | SRDR | | | |
| | | | RKH2703A | P566278 | FAIR | SBF0060RZ3B | P566961 | SRDR | SBF0240RZ25B | P566979 | SRDR | SBF100014Z15B | P567056 | SRDR |
| | | | RKH2706A | P566279 | FAIR | SBF0060RZ5B | P566962 | SRDR | SBF0240RZ25V | P566980 | SRDR | SBF100014Z15V | P567056 | SRDR |
| | | | RKH2712A | P566280 | FAIR | SBF0060RZ5V | P566962 | SRDR | SBF0240RZ3B | P566977 | SRDR | SBF100014Z1B | P567055 | SRDR |
| | | | RKH2725A | P566281 | FAIR | | | | SBF0240RZ3V | P566977 | SRDR | SBF100014Z1V | P567055 | SRDR |
| | | | RKXH0903A | P566412 | FAIR | SBF0061DZ10B | P566689 | SRDR | SBF0240RZ5B | P566980 | SRDR | SBF100014Z3B | P567053 | SRDR |
| | | | RKXH0915A | P566413 | FAIR | SBF0061DZ10V | P566689 | SRDR | SBF0240RZ5V | P566978 | SRDR | SBF100014Z3V | P567053 | SRDR |
| | | | RTE48G03B | P566270 | STFF | SBF0061DZ3B | P566688 | SRDR | SBF0241DZ10B | P566697 | SRDR | SBF100014Z5B | P567054 | SRDR |
| | | | RTE48G05B | P566271 | STFF | SBF0061DZ3V | P566688 | SRDR | SBF0241DZ10V | P566697 | SRDR | SBF100014Z5V | P567054 | SRDR |
| | | | RTE48G10B | P566272 | STFF | | | | SBF0241DZ25B | P566696 | SRDR | SBF10007Z10B | P567051 | SRDR |
| | | | RTE48G25B | P566273 | STFF | SBF0110DS1B | P566658 | SRDR | SBF0241DZ3V | P566696 | SRDR | SBF10007Z10V | P567051 | SRDR |
| | | | | | | SBF0110DS1V | P566658 | SRDR | | | | SBF10007Z25V | P567052 | SRDR |
| | | | | | | SBF0110DZ10B | P566660 | SRDR | SBF0330DS1B | P566678 | SRDR | SBF10007Z3B | P567049 | SRDR |
| | | | | | | SBF0110DZ10V | P566660 | SRDR | SBF0330DS1V | P566678 | SRDR | SBF10007Z3V | P567049 | SRDR |
| | | | | | | SBF0110DZ25B | P566661 | SRDR | SBF0330DZ10B | P566680 | SRDR | SBF10007Z5B | P567050 | SRDR |
| | | | | | | SBF0110DZ25V | P566661 | SRDR | SBF0330DZ10V | P566680 | SRDR | | | |
| | | | | | | SBF0110DZ3B | P566658 | SRDR | SBF0330DZ25B | P566681 | SRDR | SBF100218Z10B | P567039 | SRDR |
| | | | | | | SBF0110DZ3V | P566658 | SRDR | SBF0330DZ5B | P566678 | SRDR | SBF100218Z10V | P567039 | SRDR |
| | | | | | | SBF0110RZ25B | P566659 | SRDR | SBF0330DZ5B | P566679 | SRDR | SBF100218Z25B | P567040 | SRDR |
| | | | | | | SBF0110RZ25V | P566659 | SRDR | SBF0330DZ5V | P566679 | SRDR | SBF100218Z3B | P567037 | SRDR |
| | | | | | | SBF0110RZ3B | P566965 | SRDR | SBF0330RZ10B | P566983 | SRDR | SBF100218Z3V | P567037 | SRDR |
| | | | | | | SBF0110RZ3V | P566965 | SRDR | SBF0330RZ10V | P566983 | SRDR | SBF100218Z5B | P567038 | SRDR |
| | | | | | | SBF0110RZ5B | P566966 | SRDR | SBF0330RZ25B | P566984 | SRDR | SBF100218Z5V | P567038 | SRDR |
| | | | | | | SBF0110RZ5V | P566966 | SRDR | SBF0330RZ25V | P566984 | SRDR | SBF10029Z10B | P567035 | SRDR |
| | | | | | | SBF0111DZ10B | P566691 | SRDR | SBF0330RZ3B | P566981 | SRDR | SBF10029Z10V | P567035 | SRDR |
| | | | | | | SBF0111DZ10V | P566691 | SRDR | SBF0330RZ5B | P566982 | SRDR | SBF10029Z25B | P567036 | SRDR |
| | | | | | | | | | SBF0330RZ5V | P566982 | SRDR | SBF10029Z25V | P567036 | SRDR |
| | | | | | | | | | SBF0331DZ10B | P566701 | SRDR | SBF10029Z3B | P567033 | SRDR |
| | | | | | | | | | | | | | | |

| S | | |
|---------|---------|-------|
| S0403HN | P566406 | Zinga |
| S0403LN | P566392 | Zinga |
| S0406LN | P566393 | Zinga |
| S0410HN | P566407 | Zinga |
| S0410LN | P566394 | Zinga |
| S0420LN | P566395 | Zinga |
| S0803HN | P566408 | Zinga |
| S0803LN | P566397 | Zinga |
| S0806LN | P566398 | Zinga |
| S0810HN | P566409 | Zinga |
| S0810LN | P566399 | Zinga |
| S0820LN | P566400 | Zinga |
| S1303HN | P566410 | Zinga |
| S1303LN | P566402 | Zinga |
| S1306LN | P566403 | Zinga |



| Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code |
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| SBF10029Z5B..... | P567034 | .SRDR | SBF83008Z25V..... | P566238 | .SRDR | SBF890039Z3B..... | P566510 | .SRDR | SBF90208Z25B..... | P566203 | .SRDR | SBF960016Z25V..... | P566223 | .SRDR |
| SBF10029Z5V..... | P567034 | .SRDR | SBF83008Z3V..... | P566235 | .SRDR | SBF890039Z3V..... | P566510 | .SRDR | SBF90208Z25V..... | P566203 | .SRDR | SBF960016Z3B..... | P566220 | .SRDR |
| | | | SBF83008Z5V..... | P566236 | .SRDR | SBF890039Z5B..... | P566511 | .SRDR | SBF90208Z3B..... | P566200 | .SRDR | SBF960016Z3V..... | P566220 | .SRDR |
| SBF10505Z10BV..... | P567043 | .SRDR | | | | SBF890008Z25B..... | P566493 | .SRDR | SBF90208Z5B..... | P566201 | .SRDR | SBF960016Z5B..... | P566221 | .SRDR |
| SBF10505Z10V..... | P567043 | .SRDR | SBF880013S1..... | P566480 | .SRDR | SBF890008Z25V..... | P566493 | .SRDR | SBF90208Z5V..... | P566201 | .SRDR | SBF96004Z10B..... | P566207 | .SRDR |
| SBF10505Z25V..... | P567044 | .SRDR | SBF880013S3..... | P566481 | .SRDR | SBF891413Z10B..... | P566522 | .SRDR | SBF90214Z10B..... | P566336 | .SRDR | SBF96004Z10V..... | P566207 | .SRDR |
| SBF1050Z10BV..... | P567047 | .SRDR | SBF880013S7..... | P566482 | .SRDR | SBF891413Z10V..... | P566522 | .SRDR | SBF90214Z3B..... | P566335 | .SRDR | SBF96004Z11V..... | P566204 | .SRDR |
| SBF1050Z10V..... | P567047 | .SRDR | SBF880013Z10B..... | P566482 | .SRDR | SBF891413Z1B..... | P566519 | .SRDR | SBF90214Z3V..... | P566335 | .SRDR | SBF96004Z25B..... | P566208 | .SRDR |
| SBF1050Z25V..... | P567048 | .SRDR | SBF880013Z10V..... | P566482 | .SRDR | SBF891413Z1V..... | P566519 | .SRDR | SBF90218Z10B..... | P566338 | .SRDR | SBF96004Z25V..... | P566208 | .SRDR |
| SBF1300RZ10B..... | P566999 | .SRDR | SBF880013Z1B..... | P566479 | .SRDR | SBF891413Z25B..... | P566523 | .SRDR | SBF90218Z10V..... | P566338 | .SRDR | SBF96004Z3B..... | P566205 | .SRDR |
| SBF1300RZ10V..... | P566999 | .SRDR | SBF880013Z2V..... | P566483 | .SRDR | SBF891413Z25V..... | P566523 | .SRDR | SBF90218Z3B..... | P566337 | .SRDR | SBF96004Z3V..... | P566205 | .SRDR |
| SBF1300RZ25B..... | P567000 | .SRDR | SBF880013Z3B..... | P566480 | .SRDR | SBF891413Z3B..... | P566520 | .SRDR | SBF90218Z3V..... | P566337 | .SRDR | SBF96004Z5B..... | P566206 | .SRDR |
| SBF1300RZ25V..... | P567000 | .SRDR | SBF880013Z3V..... | P566480 | .SRDR | SBF891413Z3V..... | P566520 | .SRDR | | | | SBF96004Z5V..... | P566206 | .SRDR |
| | | | SBF880013Z5B..... | P566481 | .SRDR | SBF891413Z5B..... | P566521 | .SRDR | SBF940013S1..... | P566445 | .SRDR | SBF96008Z10B..... | P566212 | .SRDR |
| SBF2235Z10V..... | P567099 | .SRDR | SBF880013Z5V..... | P566481 | .SRDR | SBF891413Z5V..... | P566521 | .SRDR | SBF940013S1..... | P566448 | .SRDR | SBF96008Z10V..... | P566212 | .SRDR |
| SBF25449Z10V..... | P569233 | .SRDR | SBF880016S1..... | P566485 | .SRDR | SBF891416Z10B..... | P566536 | .SRDR | SBF940013S3..... | P566446 | .SRDR | SBF96008Z1B..... | P566209 | .SRDR |
| SBF25449Z25V..... | P569234 | .SRDR | SBF880016S3..... | P566486 | .SRDR | SBF891416Z10V..... | P566536 | .SRDR | SBF940013S7..... | P566447 | .SRDR | SBF96008Z21V..... | P566209 | .SRDR |
| SBF25449Z3V..... | P569231 | .SRDR | SBF880016S7..... | P566487 | .SRDR | SBF891416Z1V..... | P566524 | .SRDR | SBF940013Z10B..... | P566447 | .SRDR | SBF96008Z25B..... | P566213 | .SRDR |
| SBF25449Z5V..... | P569232 | .SRDR | SBF880016Z10B..... | P566487 | .SRDR | SBF891416Z21V..... | P566524 | .SRDR | SBF940013Z10V..... | P566447 | .SRDR | SBF96008Z25V..... | P566213 | .SRDR |
| SBF2600RZ10B..... | P567003 | .SRDR | SBF880016Z10V..... | P566487 | .SRDR | SBF891416Z2B..... | P566534 | .SRDR | SBF940013Z2B..... | P566448 | .SRDR | SBF96008Z3B..... | P566210 | .SRDR |
| SBF2600RZ10V..... | P567003 | .SRDR | SBF880016Z1B..... | P566484 | .SRDR | SBF891416Z25B..... | P566535 | .SRDR | SBF940013Z2V..... | P566448 | .SRDR | SBF96008Z3V..... | P566210 | .SRDR |
| SBF2600RZ25B..... | P567004 | .SRDR | SBF880016Z2B..... | P566488 | .SRDR | SBF891416Z25V..... | P566535 | .SRDR | SBF940013Z3B..... | P566445 | .SRDR | SBF96008Z5B..... | P566211 | .SRDR |
| SBF2600RZ25V..... | P567004 | .SRDR | SBF880016Z2V..... | P566488 | .SRDR | SBF891426Z10B..... | P566541 | .SRDR | SBF940013Z5B..... | P566446 | .SRDR | SBF96008Z5V..... | P566211 | .SRDR |
| | | | SBF880016Z3B..... | P566485 | .SRDR | SBF891426Z10V..... | P566541 | .SRDR | SBF940013Z5V..... | P566446 | .SRDR | | | |
| | | | SBF880016Z3V..... | P566485 | .SRDR | SBF891426Z1V..... | P566538 | .SRDR | SBF940026S1..... | P566453 | .SRDR | SBF960113Z10B..... | P566369 | .SRDR |
| SBF600018Z10B..... | P566707 | .SRDR | SBF880016Z5B..... | P566486 | .SRDR | SBF891426Z25B..... | P566542 | .SRDR | SBF940026S3..... | P566451 | .SRDR | SBF960113Z3B..... | P566368 | .SRDR |
| SBF600018Z10V..... | P566707 | .SRDR | SBF88008S1B..... | P566475 | .SRDR | SBF891426Z25V..... | P566542 | .SRDR | SBF940026S7..... | P566452 | .SRDR | SBF960116Z10B..... | P566371 | .SRDR |
| SBF600018Z1B..... | P566704 | .SRDR | SBF88008S3B..... | P566476 | .SRDR | SBF891426Z3B..... | P566539 | .SRDR | SBF940026Z10B..... | P566452 | .SRDR | SBF960116Z10V..... | P566371 | .SRDR |
| SBF600018Z1V..... | P566704 | .SRDR | SBF88008S7..... | P566477 | .SRDR | SBF891426Z3V..... | P566539 | .SRDR | SBF940026Z10V..... | P566452 | .SRDR | SBF960116Z3B..... | P566370 | .SRDR |
| SBF600018Z25B..... | P566708 | .SRDR | SBF88008Z10B..... | P566477 | .SRDR | SBF891426Z5B..... | P566540 | .SRDR | SBF940026Z1B..... | P566449 | .SRDR | SBF960116Z3V..... | P566370 | .SRDR |
| SBF600018Z25V..... | P566708 | .SRDR | SBF88008Z10V..... | P566477 | .SRDR | SBF891426Z5V..... | P566540 | .SRDR | SBF940026Z1V..... | P566449 | .SRDR | SBF960116Z5B..... | P566370 | .SRDR |
| SBF600018Z3B..... | P566705 | .SRDR | SBF88008Z25B..... | P566478 | .SRDR | SBF891439Z10B..... | P566546 | .SRDR | SBF940026Z2B..... | P566453 | .SRDR | SBF96014Z10B..... | P566365 | .SRDR |
| SBF600018Z3V..... | P566705 | .SRDR | SBF88008Z25V..... | P566478 | .SRDR | SBF891439Z10V..... | P566546 | .SRDR | SBF940026Z2B..... | P566453 | .SRDR | SBF96014Z10V..... | P566365 | .SRDR |
| SBF600018Z5B..... | P566706 | .SRDR | SBF88008Z5B..... | P566476 | .SRDR | SBF891439Z1V..... | P566543 | .SRDR | SBF940026Z3B..... | P566450 | .SRDR | SBF96014Z210B..... | P566365 | .SRDR |
| SBF600018Z5V..... | P566706 | .SRDR | SBF88008Z5V..... | P566476 | .SRDR | SBF891439Z25B..... | P566547 | .SRDR | SBF940026Z3V..... | P566450 | .SRDR | SBF96014Z210V..... | P566365 | .SRDR |
| SBF600036Z10B..... | P566712 | .SRDR | SBF890013Z10B..... | P566497 | .SRDR | SBF891439Z25V..... | P566544 | .SRDR | SBF940026Z5B..... | P566451 | .SRDR | SBF96014Z310B..... | P566364 | .SRDR |
| SBF600036Z10V..... | P566712 | .SRDR | SBF890013Z10V..... | P566497 | .SRDR | SBF891439Z3B..... | P566544 | .SRDR | SBF940026Z5V..... | P566451 | .SRDR | SBF96014Z310V..... | P566364 | .SRDR |
| SBF600036Z1B..... | P566709 | .SRDR | SBF890013Z1B..... | P566494 | .SRDR | SBF891439Z3V..... | P566544 | .SRDR | SBF940026Z7B..... | P566453 | .SRDR | SBF96014Z310V..... | P566364 | .SRDR |
| SBF600036Z1V..... | P566709 | .SRDR | SBF890013Z2V..... | P566498 | .SRDR | SBF891439Z5B..... | P566545 | .SRDR | SBF940039S1..... | P566458 | .SRDR | SBF96014Z310V..... | P566367 | .SRDR |
| SBF600036Z25B..... | P566713 | .SRDR | SBF890013Z2B..... | P566498 | .SRDR | SBF891439Z5V..... | P566545 | .SRDR | SBF940039S3..... | P566456 | .SRDR | SBF96018Z10B..... | P566366 | .SRDR |
| SBF600036Z25V..... | P566713 | .SRDR | SBF890013Z3B..... | P566495 | .SRDR | SBF89148210B..... | P566517 | .SRDR | SBF940039S7..... | P566457 | .SRDR | SBF96018Z10V..... | P566366 | .SRDR |
| SBF600036Z3B..... | P566710 | .SRDR | SBF890013Z3V..... | P566495 | .SRDR | SBF89148210V..... | P566517 | .SRDR | SBF940039Z10B..... | P566457 | .SRDR | SBF96018Z210B..... | P566366 | .SRDR |
| SBF600036Z5B..... | P566711 | .SRDR | SBF890016Z10B..... | P566502 | .SRDR | SBF8914821B..... | P566514 | .SRDR | SBF940039Z10V..... | P566457 | .SRDR | SBF96018Z210V..... | P566366 | .SRDR |
| SBF600036Z5V..... | P566711 | .SRDR | SBF890016Z10V..... | P566502 | .SRDR | SBF8914821V..... | P566514 | .SRDR | SBF940039Z210B..... | P566457 | .SRDR | SBF96018Z25B..... | P566227 | .SRDR |
| | | | SBF890016Z1B..... | P566499 | .SRDR | SBF89148225B..... | P566518 | .SRDR | SBF940039Z210V..... | P566454 | .SRDR | SBF96018Z25V..... | P566227 | .SRDR |
| | | | SBF890016Z210B..... | P566502 | .SRDR | SBF891482Z5B..... | P566518 | .SRDR | SBF940039Z3B..... | P566455 | .SRDR | SBF96018Z310B..... | P566367 | .SRDR |
| | | | SBF890016Z210V..... | P566502 | .SRDR | SBF891482Z5V..... | P566518 | .SRDR | SBF940039Z3V..... | P566455 | .SRDR | SBF96018Z310V..... | P566367 | .SRDR |
| | | | SBF890016Z2B..... | P566503 | .SRDR | SBF891482Z5V..... | P566516 | .SRDR | SBF940039Z5B..... | P566456 | .SRDR | SBF96018Z3B..... | P566366 | .SRDR |
| | | | SBF890016Z3B..... | P566500 | .SRDR | SBF891482Z5V..... | P566516 | .SRDR | | | | SBF96018Z3V..... | P566366 | .SRDR |
| | | | SBF890016Z3V..... | P566500 | .SRDR | | | | SBF960013Z10B..... | P566217 | .SRDR | SBF96018Z5B..... | P566227 | .SRDR |
| | | | SBF890016Z5B..... | P566501 | .SRDR | SBF90204Z10B..... | P566197 | .SRDR | SBF960013Z10V..... | P566217 | .SRDR | SBF96508Z10B..... | P566224 | .SRDR |
| | | | SBF890016Z5V..... | P566501 | .SRDR | SBF90204Z10V..... | P566197 | .SRDR | SBF960013Z210B..... | P566214 | .SRDR | SBF96508Z10V..... | P566224 | .SRDR |
| | | | SBF890026Z10B..... | P566507 | .SRDR | SBF90204Z1B..... | P566194 | .SRDR | SBF960013Z25B..... | P566218 | .SRDR | SBF96508Z25B..... | P566228 | .SRDR |
| | | | SBF890026Z10V..... | P566507 | .SRDR | SBF90204Z210B..... | P566194 | .SRDR | SBF960013Z3B..... | P566218 | .SRDR | SBF96508Z25V..... | P566228 | .SRDR |
| | | | SBF890026Z25B..... | P566508 | .SRDR | SBF90204Z210V..... | P566194 | .SRDR | SBF960013Z5B..... | P566216 | .SRDR | SBF96508Z3B..... | P566225 | .SRDR |
| | | | SBF890026Z25V..... | P566508 | .SRDR | SBF90204Z25B..... | P566198 | .SRDR | SBF960013Z5V..... | P566218 | .SRDR | SBF96508Z5B..... | P566225 | .SRDR |
| | | | SBF890026Z3B..... | P566505 | .SRDR | SBF90204Z25V..... | P566198 | .SRDR | SBF960013Z7B..... | P566215 | .SRDR | SBF96508Z5V..... | P566226 | .SRDR |
| | | | SBF890026Z3V..... | P566505 | .SRDR | SBF90204Z3B..... | P566195 | .SRDR | SBF960013Z7V..... | P566215 | .SRDR | | | |
| | | | SBF890026Z5B..... | P566506 | .SRDR | SBF90204Z3V..... | P566195 | .SRDR | SBF960013Z5B..... | P566216 | .SRDR | | | |
| | | | SBF890026Z5V..... | P566506 | .SRDR | SBF90204Z5B..... | P566196 | .SRDR | SBF960013Z5V..... | P566216 | .SRDR | | | |
| | | | SBF890039Z10B..... | P566512 | .SRDR | SBF90204Z5V..... | P566196 | .SRDR | SBF960016Z10B..... | P566222 | .SRDR | | | |
| | | | SBF890039Z10V..... | P566512 | .SRDR | SBF90204Z5V..... | P566196 | .SRDR | SBF960016Z10V..... | P566222 | .SRDR | | | |
| | | | SBF890039Z25B..... | P566513 | .SRDR | SBF90208Z10B..... | P566202 | .SRDR | SBF960016Z11V..... | P566219 | .SRDR | | | |
| | | | SBF890039Z25V..... | P566513 | .SRDR | SBF90208Z10V..... | P566202 | .SRDR | SBF960016Z1210B..... | P566219 | .SRDR | | | |
| | | | SBF890039Z25V..... | P566513 | .SRDR | SBF90208Z10V..... | P566199 | .SRDR | SBF960016Z1210V..... | P566219 | .SRDR | | | |



DT High-Performance Filters

Numberfinder Cross Reference



| Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | Mfgs. No. | Our No. | Mfg. Code | | | | | | | | | | | | |
|---------------|---------|-----------|-------------|---------|-----------|------------|---------|-----------|------------|---------|-----------|------------|---------|-----------|------------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|--|
| SBF9651823B | P566387 | .SRDR | SL014D20B | P567084 | ...STFF | ST1453 | P567089 | ...SPTC | V3RB2C05 | P566671 | ..VKRS | Y | | | | | | | | | | | | | | |
| SBF9651823V | P566387 | .SRDR | SL014E03B | P567081 | ...STFF | ST1454 | P567101 | ...SPTC | V3RB2C10 | P566672 | ..VKRS | | | | Y0803LN | P566235 | ..Zinga | | | | | | | | | |
| SBF980013Z10B | P566404 | .SRDR | SL014E05B | P567082 | ...STFF | ST1457 | P567104 | ...SPTC | V3RB2C20 | P566673 | ..VKRS | | | | Y0806LN | P566236 | ..Zinga | | | | | | | | | |
| SBF980013Z10V | P566404 | .SRDR | SL014E20V | P567084 | ...STFF | ST1512 | P567096 | ...SPTC | V3RB2H03 | P566696 | ..VKRS | | | | Y0812LN | P566237 | ..Zinga | | | | | | | | | |
| SBF980013Z1B | P566401 | .SRDR | SL020D10V | P567087 | ...STFF | ST1515 | P567092 | ...SPTC | V3RB2H10 | P566697 | ..VKRS | | | | Y0825LN | P566238 | ..Zinga | | | | | | | | | |
| SBF980013Z1V | P566401 | .SRDR | SL020D20V | P567088 | ...STFF | ST1516 | P567093 | ...SPTC | V3RB4C03 | P566674 | ..VKRS | | | | Y1603LN | P566240 | ..Zinga | | | | | | | | | |
| SBF980013Z25B | P566405 | .SRDR | SL020E03B | P567085 | ...STFF | ST1522 | P567084 | ...SPTC | V3RB4C05 | P566675 | ..VKRS | | | | Y1606LN | P566241 | ..Zinga | | | | | | | | | |
| SBF980013Z25V | P566405 | .SRDR | SL020E03V | P567085 | ...STFF | ST1529 | P567098 | ...SPTC | V3RB4C20 | P566677 | ..VKRS | | | | Y1612LN | P566242 | ..Zinga | | | | | | | | | |
| SBF980013Z3B | P566402 | .SRDR | SL020E05B | P567086 | ...STFF | ST1530 | P567086 | ...SPTC | V3RB4H03 | P566698 | ..VKRS | | | | Y1625LN | P566243 | ..Zinga | | | | | | | | | |
| SBF980013Z3V | P566402 | .SRDR | SL020E20V | P567088 | ...STFF | ST1531 | P567090 | ...SPTC | V3RB4H10 | P566699 | ..VKRS | | | | Y3903LN | P566245 | ..Zinga | | | | | | | | | |
| SBF980013Z5B | P566403 | .SRDR | SL020W10V | P567087 | ...STFF | ST1532 | P567094 | ...SPTC | V6011B2V03 | P566397 | ..VKRS | Y3903LND | P566255 | ..Zinga | | | | | | | | | | | | |
| SBF980013Z5V | P566403 | .SRDR | SL030D10V | P567091 | ...STFF | ST1533 | P567098 | ...SPTC | V6011B4C03 | P566402 | ..VKRS | Y3906LN | P566246 | ..Zinga | | | | | | | | | | | | |
| SBF98004Z10B | P566394 | .SRDR | SL030D20V | P567092 | ...STFF | ST1534 | P567102 | ...SPTC | V6011B4C05 | P566403 | ..VKRS | Y3906LND | P566256 | ..Zinga | | | | | | | | | | | | |
| SBF98004Z10V | P566394 | .SRDR | SL030E03V | P567089 | ...STFF | ST438P | P567051 | ...SPTC | V6011B4C10 | P566404 | ..VKRS | Y3912LN | P566247 | ..Zinga | | | | | | | | | | | | |
| SBF98004Z1B | P566391 | .SRDR | SL030E05B | P567090 | ...STFF | ST440P | P567055 | ...SPTC | V6011B4C20 | P566405 | ..VKRS | Y3912LND | P566257 | ..Zinga | | | | | | | | | | | | |
| SBF98004Z1V | P566391 | .SRDR | SL030E20V | P567092 | ...STFF | ST453P | P567041 | ...SPTC | V6011B4H03 | P566410 | ..VKRS | Y3925LN | P566248 | ..Zinga | | | | | | | | | | | | |
| SBF98004Z25B | P566395 | .SRDR | SL045D10V | P567095 | ...STFF | ST461P | P567053 | ...SPTC | V6011B4H10 | P566411 | ..VKRS | Y3925LND | P566258 | ..Zinga | | | | | | | | | | | | |
| SBF98004Z25V | P566395 | .SRDR | SL045D20B | P567093 | ...STFF | ST566P | P567047 | ...SPTC | W | | | | | | | | | | | | | | | | | |
| SBF98004Z3B | P566392 | .SRDR | SL045D20V | P567096 | ...STFF | ST567P | P567045 | ...SPTC | | | | | | | W0403HN | P566364 | ..Zinga | W0403LN | P566205 | ..Zinga | | | | | | |
| SBF98004Z3V | P566392 | .SRDR | SL045E03V | P567093 | ...STFF | ST7722 | P567056 | ...SPTC | | | | | | | W0406LN | P566206 | ..Zinga | W0410HN | P566365 | ..Zinga | | | | | | |
| SBF98004Z5B | P566393 | .SRDR | SL045E05B | P567094 | ...STFF | ST7724 | P567052 | ...SPTC | | | | | | | W0410LN | P566207 | ..Zinga | W0420LN | P566208 | ..Zinga | | | | | | |
| SBF98004Z5V | P566393 | .SRDR | SL045E10B | P567095 | ...STFF | ST7736 | P567043 | ...SPTC | | | | | | | W0803HN | P566366 | ..Zinga | W0803LN | P566210 | ..Zinga | | | | | | |
| SBF98008S1B | P566397 | .SRDR | SL045E20B | P567096 | ...STFF | ST7737 | P567042 | ...SPTC | | | | | | | W0806LN | P566211 | ..Zinga | W0810HN | P566367 | ..Zinga | | | | | | |
| SBF98008Z10B | P566399 | .SRDR | SL090D10V | P567099 | ...STFF | V | | | | | | | | | W0810LN | P566212 | ..Zinga | | | | | | | | | |
| SBF98008Z10V | P566399 | .SRDR | SL090D20V | P567100 | ...STFF | | | | | | | | | | V0172B1C03 | P567005 | ..VKRS | W0820LN | P566213 | ..Zinga | W1303HN | P566368 | ..Zinga | | | |
| SBF98008Z1B | P566396 | .SRDR | SL090E03V | P567097 | ...STFF | | | | | | | | | | V0172B1C05 | P567006 | ..VKRS | W1303LN | P566215 | ..Zinga | W1306LN | P566216 | ..Zinga | | | |
| SBF98008Z1V | P566396 | .SRDR | SL090E05B | P567098 | ...STFF | | | | | | | | | | V0172B1C10 | P567007 | ..VKRS | W1310HN | P566369 | ..Zinga | W1310LN | P566217 | ..Zinga | | | |
| SBF98008Z25B | P566400 | .SRDR | SL090E10B | P567099 | ...STFF | | | | | | | V0172B2C03 | P567009 | ..VKRS | W1320LN | P566218 | ..Zinga | W1603HN | P566370 | ..Zinga | | | | | | |
| SBF98008Z25V | P566400 | .SRDR | SL090E20V | P567100 | ...STFF | | | | | | | V0172B2C05 | P567010 | ..VKRS | W1603LN | P566220 | ..Zinga | W1606LN | P566221 | ..Zinga | | | | | | |
| SBF98008Z3B | P566397 | .SRDR | SL090E20V | P567100 | ...STFF | | | | | | | V0172B2C10 | P567011 | ..VKRS | W1610HN | P566371 | ..Zinga | W1610LN | P566222 | ..Zinga | | | | | | |
| SBF98008Z3V | P566397 | .SRDR | SP010E10V | P566197 | ...STFF | | | | | | | V0242B2C10 | P566672 | ..VKRS | W1620LN | P566223 | ..Zinga | WG243 | P567067 | ...FLTC | | | | | | |
| SBF98008Z5B | P566398 | .SRDR | SP010F03B | P566335 | ...STFF | | | | | | | V0272B1C03 | P567013 | ..VKRS | WG243 | P567067 | ...FLTC | WG568 | P567065 | ...FLTC | | | | | | |
| SBF98008Z5V | P566398 | .SRDR | SP020E03B | P566200 | ...STFF | | | | | | | V0272B1C05 | P567019 | ..VKRS | WG568 | P567065 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | |
| SBF98008ZV | P566398 | .SRDR | SP020E10B | P566202 | ...STFF | V0272B2C03 | P567017 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SBF980113Z10B | P566411 | .SRDR | SP020E20V | P566203 | ...STFF | V0272B2C10 | P567019 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SBF980113Z10V | P566411 | .SRDR | SP020F03V | P566337 | ...STFF | V0272B2C20 | P567020 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SBF980113Z3B | P566410 | .SRDR | SP020F10V | P566338 | ...STFF | V0372B1C03 | P567021 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SBF980113Z3V | P566410 | .SRDR | SP020F20V | P566338 | ...STFF | V0372B1C05 | P567022 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SBF98014Z10B | P566407 | .SRDR | SP030E003B | P566397 | ...STFF | V0372B1C10 | P567023 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SBF98014Z10V | P566407 | .SRDR | SP030E010B | P566397 | ...STFF | V0372B1C20 | P567024 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SBF98014Z1B | P566406 | .SRDR | SP030E03B | P566397 | ...STFF | V0372B2C03 | P567025 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SBF98014Z1V | P566406 | .SRDR | SP030E05B | P566397 | ...STFF | V0372B2C05 | P567026 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SBF98014Z3B | P566406 | .SRDR | SP030E10B | P566457 | ...STFF | V0372B2C10 | P567027 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SBF98014Z3V | P566406 | .SRDR | SP030E20V | P566457 | ...STFF | V0372B2C20 | P567028 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SBF98018Z10B | P566409 | .SRDR | SP020E10V | P566202 | ...STFF | V0372B3C05 | P567030 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SBF98018Z10V | P566409 | .SRDR | SP020E20V | P566203 | ...STFF | V0372B3C10 | P567031 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SBF98018Z3B | P566408 | .SRDR | SP020F03V | P566337 | ...STFF | V0372B3C20 | P567032 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SBF98018Z3V | P566408 | .SRDR | SP020F10V | P566338 | ...STFF | V0372B3C03 | P567029 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SBF98018ZV | P566408 | .SRDR | SP020F20V | P566338 | ...STFF | V0411B8C03 | P566245 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SBF990113Z3B | P566640 | .SRDR | SP0411B8C05 | P566246 | ..VKRS | V0411B8C05 | P566246 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SBF990113Z3V | P566640 | .SRDR | SP0411B8C10 | P566247 | ..VKRS | V0411B8C10 | P566247 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SBF990126Z3B | P566642 | .SRDR | SP0411B8C20 | P566248 | ..VKRS | V0411B8L01 | P566254 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SBF990126Z3V | P566642 | .SRDR | SP0411B8L01 | P566254 | ..VKRS | V0603B3H05 | P566686 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SBF990139Z3B | P566644 | .SRDR | ST1221 | P566652 | ..FTGD | V3045V1H03 | P566335 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SBF990139Z3V | P566644 | .SRDR | ST1265 | P566983 | ..FTGD | V3045V1H10 | P566336 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SBFAB29667 | P569233 | .SRDR | ST1355 | P567100 | ...SPTC | V3045V1H15 | P566336 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SBFH4Z10B | P566272 | .SRDR | ST1405 | P567083 | ...SPTC | V3045V2H03 | P566337 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SBFH4Z25B | P566273 | .SRDR | ST1406 | P567087 | ...SPTC | V3045V2H10 | P566338 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SBFH4Z3B | P566270 | .SRDR | ST1407 | P567091 | ...SPTC | V3RB1C03 | P566666 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SBFH4Z5B | P566271 | .SRDR | ST1408 | P567095 | ...SPTC | V3RB1C05 | P566667 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SE008F10B | P566687 | ...STFF | ST1409 | P567099 | ...SPTC | V3RB1C10 | P566668 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SE014G05B | P566651 | ...STFF | ST1448 | P567088 | ...SPTC | V3RB1C20 | P566669 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SE030C10B | P566691 | ...STFF | ST1449 | P567096 | ...SPTC | V3RB1H03 | P566694 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SE045G03B | P566666 | ...STFF | ST1450 | P567083 | ...SPTC | V3RB1H10 | P566695 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SE070F03B | P566696 | ...STFF | ST1452 | P567085 | ...SPTC | V3RB2C03 | P566670 | ..VKRS | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SE070F10B | P566697 | ...STFF | | | | | | | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SE070G10B | P566672 | ...STFF | | | | | | | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SE160H03B | P566702 | ...STFF | | | | | | | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SE160H10B | P566703 | ...STFF | | | | | | | WG735 | P567067 | ...FLTC | WG735 | P567067 | ...FLTC | | | | | | | | | | | | |
| SL014D1 | | | | | | | | | | | | | | | | | | | | | | | | | | |

Accessories

Donaldson offers an extensive line of accessories for hydraulic circuits, lines and reservoirs that will help you maintain proper ISO cleanliness levels.



Section Index

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T.R.A.P.™ Breather Technology (Thermally Reactive Advanced Protection)

T.R.A.P. breathers provide fast-acting protection against airborne moisture and particulate contamination. It stops solid particulate down to 3 µm at 97% efficiency as well as prevents moisture from entering the reservoir. Water-holding capacity is regenerated with every oil return phase for long service life. Its self-regenerating capability enables extended life.

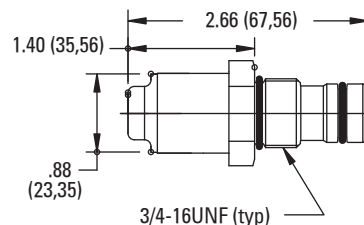
Learn more on page 264.

Filter Service Indicators

Visual Service Indicators

| Part No. | Use with Bypass Valve Pressure of: | Description | Where Used |
|----------|------------------------------------|--|----------------------------|
| P569632 | 50 psi / 3.5 bar | 35 psi/2.4 bar indicator kit* auto reset pop-out button | HPK02, HPK03, HPK04, HPK05 |
| P569633 | 90 psi / 6.2 bar | 70 psi/4.8 bar indicator kit* auto reset pop-out button | HPK02, HPK03, HPK04, HPK05 |
| P567988 | 50 psi / 3.5 bar | 35 psi/2.4 bar indicator kit* auto reset pop-out button with thermal lockout and surge control | HPK02, HPK03, HPK04, HPK05 |
| P567989 | 90 psi / 6.2 bar | 70 psi/4.8 bar indicator kit* auto reset pop-out button with thermal lockout and surge control | HPK02, HPK03, HPK04, HPK05 |

Visual (mechanical) Indicators (with auto reset pop-out button)



Differential Indicators and Switches

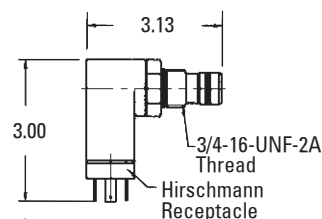
AC/DC Visual/Electrical Service Indicators

| Part No. | Use with Bypass Valve Pressure of: | Description | Where Used |
|----------|------------------------------------|--|----------------------------|
| P569634 | 50 psi / 3.5 bar | 35 psi/2.4 bar indicator kit* Hirschmann receptacle 115 VAC/28 VDC, 2 amps | HPK02, HPK03, HPK04, HPK05 |
| P569635 | 90 psi / 6.2 bar | 70 psi/4.8 bar indicator kit* Hirschmann receptacle 115 VAC/28 VDC, 2 amps | HPK02, HPK03, HPK04, HPK05 |
| P567986 | 50 psi / 3.5 bar | 35 psi/2.4 bar indicator kit* with thermal lockout and surge control, Hirschmann receptacle, 115 VAC/28 VDC, 2 amps, 4 pin DIN 43650 | HPK02, HPK03, HPK04, HPK05 |
| P567987 | 90 psi / 6.2 bar | 70 psi/4.8 bar indicator kit* with thermal lockout and surge control, Hirschmann receptacle, 115 VAC/28 VDC, 2 amps, 4 pin DIN 43650 | HPK02, HPK03, HPK04, HPK05 |

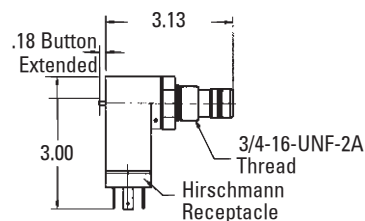
* Note: Above choices include indicator and mounting block.

AC/DC/Electrical Indicators (with aluminum electrical housing)

Electric ΔP indicator



Electric ΔP indicator with pop-up visual button and manual reset



Replacement Indicators (Visual and Differential)

| Part No. | Description |
|----------|---|
| P567458 | Visual/Electrical indicator with thermal lockout and surge, 35 psid/2.4 bar |
| P567459 | Visual/Electrical indicator, with thermal lockout and surge 70 psid/4.8 bar |
| P567456 | Pop-Up Visual Indicator, with thermal lockout and surge 35 psid/2.4 bar |
| P567457 | Pop-Up Visual Indicator, with thermal lockout and surge 70 psid/4.8 bar |
| P569636 | Pop-Up Visual Indicator, 35 psid/2.4 bar |
| P569637 | Pop-Up Visual Indicator, 70 psid/4.8 bar |
| P569638 | Visual/Electrical Indicator, 35 psid/2.4 bar |
| P569639 | Visual/Electrical Indicator, 70 psid/4.8 bar |
| P164315 | Visual Indicator, bar style, 35 psid/2.4 bar |
| P166603 | Visual Indicator, bar style, 70 psid/4.8 bar |
| P166134 | Blanking plate |

Electrical Filter Service Indicators

All electric models have a maximum operating temperature of 250°F/ 114°C.

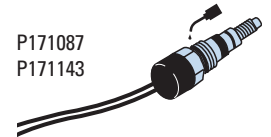
| Part No. | Use with Bypass Valve Pressure of: | Description | Where Used | Illustration |
|----------|------------------------------------|---|---|--------------|
| P162400 | 25 psi/ 172 kPa | DC/single post. Normally open. | HBK04, HBK05, HMK04/24, HMK05/25 | Style A |
| P163601 | 15 psi/ 103 kPa | DC/single post. Normally open. | HBK04, HBK05, HMK04/24, HMK05/25 | Style A |
| P163642 | 5 psi/ 34 kPa | DC/single post. Normally open. | HBK04, HBK05, HMK04/24, HMK05/25 | Style A |
| P163839 | 25 psi/ 172 kPa | DC/single post. Normally closed. | HBK04, HBK05, HMK04/24, HMK05/25 | Style A |
| P165194 | 50 psi/ 345 kPa | DC/single post. Normally open. | HMK03, HMK04/24, HMK05/25, FPK04 | Style A |
| P167455 | 50 psi/ 345 kPa | DC/single post. Normally closed. | HMK04/24, HMK05/25, FPK04 | Style A |
| P170926 | 50 psi/ 345 kPa | DC 2-wire. Normally closed. Gold contacts. Microprocessor compatible. | HMK04/24, HMK05/25 | Style E |
| P171087 | 50 psi/ 345 kPa | DC 2-wire. Packard Weatherpack connector. Normally open. | HMK03, HMK04/24, HMK05/25 | Style B |
| P171143 | 25 psi/ 172 kPa | DC 2-wire. Cannon connector. Normally open. | HBK04, HBK05, HMK03, HMK04/24, HMK05/25 | Style B |
| P171966 | 22 psi/ 150 kPa | AC/DC. 0.5A resistive, 0.2A inductive. Normally open. | FIK | at right |
| P173893 | 50 psi/ 345 kPa | DC 3-wire. Gold alloy contacts. Microprocessor compatible. White: normally open; red: normally closed; black: common. | HMK04/24, HMK05/25 | Style F |
| P173944 | 25 psi/ 172 kPa | AC/DC 3-wire. Silver alloy contacts. White: normally open; red: normally closed; black: common. | HBK04, HBK05, HMK03, HMK04/24, HMK05/25 | Style C |
| P174396 | 50 psi/ 345 kPa | AC/DC 3-wire. Silver alloy contacts. White: normally open; red: normally closed; black: common. | HMK03, HMK04/24, HMK05/25 | Style C |
| P761056 | 87 psi/ 592 kPa | AC/DC Normally open or closed. 30 VAC or 30 VDC max. 0.5A resistive, 0.2A inductive. | FPK02 | page 155 |

Style A



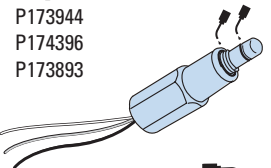
P162400
P163601
P163642
P163839
P165194
P167455

Style B



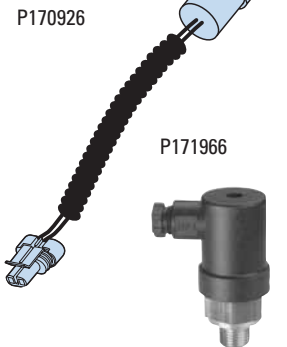
P171087
P171143

Styles C & F



P173944
P174396
P173893

Style E

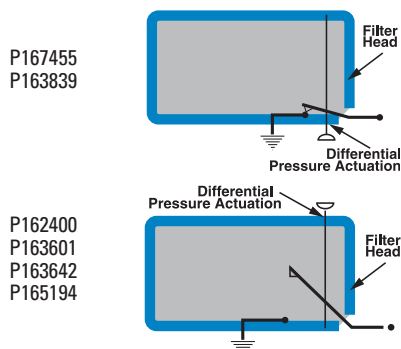


P170926

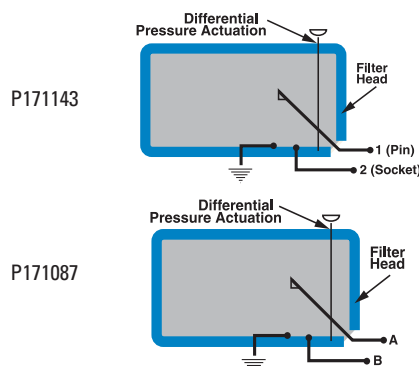
P171966

Electrical Schematics

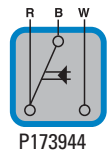
Style A: Single Post DC Indicator (Maximum: 200 mA DC @ 30 VDC)



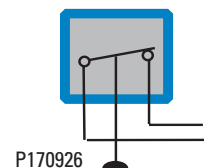
Style B: DC 2-Wire Indicator (Maximum: 200 mA DC @ 30 VDC)



Style C, F: AC/DC 3-Wire Indicator (Maximums: 2 amps @ 24 VDC or 2 amps @ 110 VAC)



Style E: DC 2-Wire Indicator (Maximum: 100 mA DC @ 30 VDC)

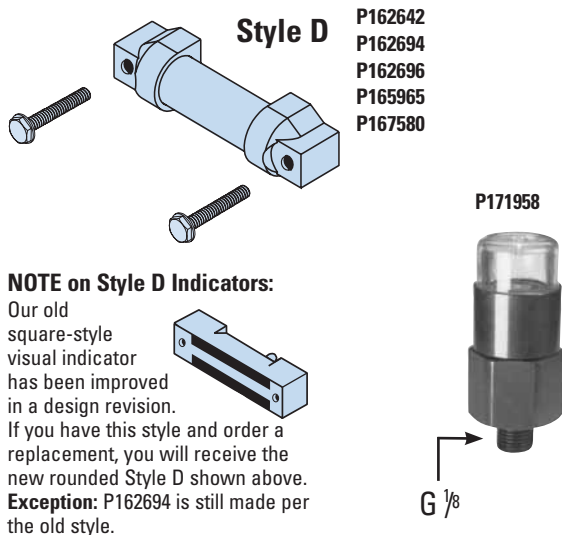


Visual Service Indicators

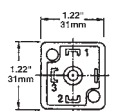
Visual Electrical Indicators

All non-electric models have a maximum operating temperature of 180°F/ 82°C.

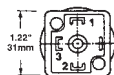
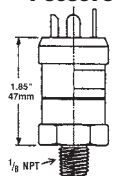
| Part No. | Use with Bypass Valve Pressure of: | Where Used | Illustration |
|----------|------------------------------------|----------------------------------|---------------------|
| P162642 | 15 psi/103 kPa | HBK04, HBK05, HMK04/24, HMK05/25 | Style D |
| P162694 | 5 psi/34 kPa | HBK04, HBK05 | Style D (old style) |
| P162696 | 25 psi/172 kPa | HBK04, HBK05, HMK04/24, HMK05/25 | Style D |
| P164315 | 50 psi/345 kPa | HPK02, HPK03, HPK04, HPK05 | page 141 |
| P165965 | 25 psi/345 kPa | HMK03 | Style D |
| P166603 | 50 psi/345 kPa (reverse flow) | HPK04 | page 185 |
| P167580 | 50 psi/345 kPa | HMK04/24, HMK05/25 | Style D |
| P171958 | 17 psi/116 kPa | FIK | at left |
| P171945 | 72 psi/493 kPa | FPK02 | page 155 |



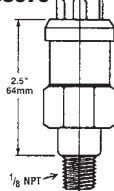
#1 Common; #2 Normally Closed;
#3 Normally Open



P563978



P563979



Instructions

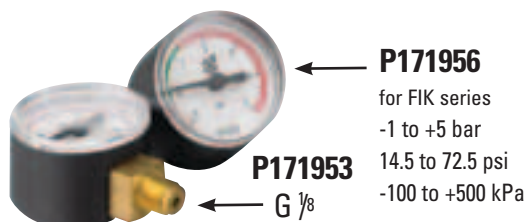
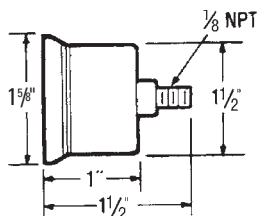
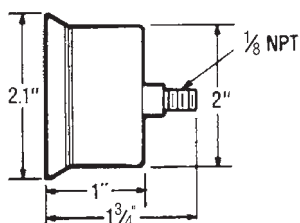
1. Remove DIN adaptor
2. Remove small brass screw
3. Using 1/8" allen wrench adjust clockwise to increase set point/ counter-clockwise to decrease set point
4. NO / NC

| Part No. | Pressure Range | Function |
|----------|----------------------------|----------|
| P563978 | 5 to 30 PSI Field Adj. | Return |
| P563979 | -5 to 15 in. Hg Field Adj. | Suction |

Adjustment screw located in center of elec. prongs

Visual Pressure Gauges

| Part No. | Pressure Range | Function |
|----------|-----------------------------------|----------|
| P563296 | 0 to 100 PSI Numeric Scale | Return |
| P563297 | 0 to 100 PSI Color Coded (15 PSI) | Return |
| P563298 | 0 to 100 PSI Color Coded (25 PSI) | Return |
| P563299 | 0 to -20 Hg | Suction |
| P563300 | 0 to 30 PSI Color Coded (15 PSI) | Return |



In-Line Accessories

- Pressure gauges for monitoring system pressure
- Hoses and test points for sampling oil and determining ISO cleanliness levels
- Flanges to connect components
- Valves for system control



In-Line Pressure Gauges

Specifications

- Stainless steel (304SS)
- Phosphor bronze bourdon tube
- Acrylic lenses
- Built-in snubber
- Glycerin Filled



Features

Donaldson Pressure Gauge Liquid-filled (PGL) series gauges are mechanical bourdon tube pressure gauges. Each gauge has a glycerin filled stainless steel bezel and case that is robust and will not discolor or rust. The bourdon tube and movement is constructed from brass and bronze alloys. PGL series gauges are easy to install for continuous readings with face diameters of 2½" (63 mm) and 4" (100 mm).

Operating Temperature

- 30°F to 160°F (-1°C to 71°C)

Accuracy

- +/- 3% of full scale

Scale

- *psi*
- *bar*

Dial Sizes

- 2½" (63 mm) and 4" (100 mm)

Mounting

- Stem, Panel, Front Flange

Thread Type

- 2½" size ¼" NPT, ¼" SAE, ¼" BSP
- 4" ½" NPT

In-Line Pressure Gauges

Pressure Range Options

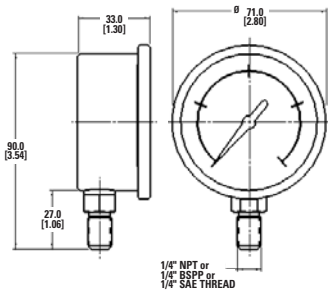
| PGL-A | 30 Hg-20 psi | 0-30 in. Hg | 0-30 psi | 0-60 psi | 0-100 psi | 0-160 psi | 0-300 psi | 0-500 psi | 0-600 psi | 0-1000 psi | 0-1500 psi | 0-2000 psi | 0-3000 psi | 0-4000 psi | 0-5000/345-psi | 0-6000 psi | 0-10000 psi |
|--------------|--------------|-------------|----------|----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|------------|----------------|------------|-------------|
| 2½" Stem | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 2½" SAE Stem | | | | | | | | | • | • | • | • | • | • | • | • | |
| 2½" Panel | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| 4" Stem | | | | | | | | • | • | • | • | • | • | • | • | • | |
| 4" Panel | | | | | | | | • | • | • | • | • | • | • | • | • | |

Front Flange Options

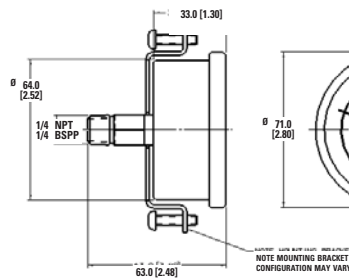
| Donaldson Part No. | Description | Dial Size |
|--------------------|--------------|----------------|
| P562699 | PGL-A-63-FF | 2-1/2" (63 mm) |
| P562671 | PGL-A-100-FF | 4" (100 mm) |

2½" Diameter Gauges

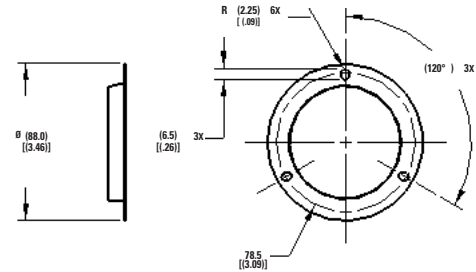
Stem Mount



Panel Mount



With Front Flange



2½" Stem Mount

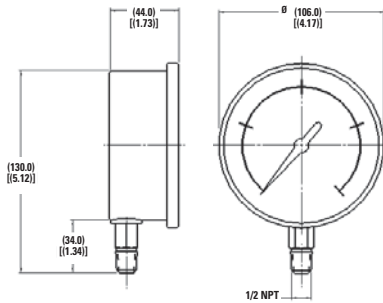
| Donaldson Part No. | Description | Pressure Range (psi/bar) | Thread Type |
|--------------------|-------------------------|--------------------------|-------------|
| P562718 | PGL-A-63-N-B-30-CS | -30" Hg + 20/1 | 1/4" NPT |
| P562719 | PGL-A-63-N-B-30-S | 0 - 30/2 | 1/4" NPT |
| P562721 | PGL-A-63-N-B-30-VS | 0 - 30" Hg Vac | 1/4" NPT |
| P562733 | PGL-A-63-N-B-60-S | 0 - 60/4 | 1/4" NPT |
| P562705 | PGL-A-63-N-B-100-S | 0 - 100/7 | 1/4" NPT |
| P562709 | PGL-A-63-N-B-160-S | 0 - 160/11 | 1/4" NPT |
| P562717 | PGL-A-63-N-B-300-S | 0 - 300/20 | 1/4" NPT |
| P562727 | PGL-A-63-N-B-500-S | 0 - 500/35 | 1/4" NPT |
| P562731 | PGL-A-63-N-B-600-S | 0 - 600/40 | 1/4" NPT |
| P562703 | PGL-A-63-N-B-1000-S | 0 - 1,000/70 | 1/4" NPT |
| P562707 | PGL-A-63-N-B-1500-S | 0 - 1,500/100 | 1/4" NPT |
| P562711 | PGL-A-63-N-B-2000-S | 0 - 2,000/125 | 1/4" NPT |
| P562713 | PGL-A-63-N-B-3000-S | 0 - 3,000/200 | 1/4" NPT |
| P562723 | PGL-A-63-N-B-4000-S | 0 - 4,000/275 | 1/4" NPT |
| P562725 | PGL-A-63-N-B-5000/345-S | 0 - 5,000/350 | 1/4" NPT |
| P562729 | PGL-A-63-N-B-6000-S | 0 - 6,000/400 | 1/4" NPT |
| P562701 | PGL-A-63-N-B-10,000-S | 0 - 10,000/700 | 1/4" NPT |
| P562696 | PGL-A-63-B-B-1500-S | 0 - 1,500/100 | 1/4" BSP |
| P562739 | PGL-A-63-S-B-500-S | 0 - 500/35 | 1/4" SAE |
| P562734 | PGL-A-63-S-B-1000-S | 0 - 1,000/70 | 1/4" SAE |
| P562735 | PGL-A-63-S-B-1500-S | 0 - 1,500/100 | 1/4" SAE |
| P562736 | PGL-A-63-S-B-2000-S | 0 - 2,000/125 | 1/4" SAE |
| P562737 | PGL-A-63-S-B-3000-S | 0 - 3,000/200 | 1/4" SAE |
| P562738 | PGL-A-63-S-B-5000/345-S | 0 - 5,000/350 | 1/4" SAE |
| P562740 | PGL-A-63-S-B-6000-S | 0 - 6,000/400 | 1/4" SAE |

2½" Panel Mount

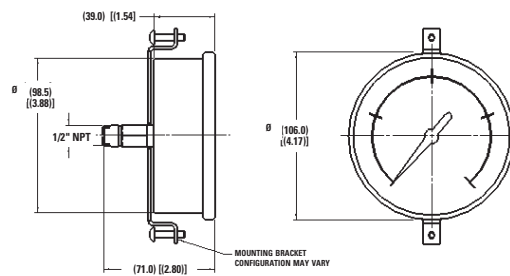
| Donaldson Part No. | Description | Pressure Range (psi/bar) | Thread Type |
|--------------------|-------------------------|--------------------------|-------------|
| P562720 | PGL-A-63-N-B-30-VP | 0 - 30" Hg Vac | 1/4" NPT |
| P562732 | PGL-A-63-N-B-60-P | 0 - 60/4 | 1/4" NPT |
| P562704 | PGL-A-63-N-B-100-P | 0 - 100/7 | 1/4" NPT |
| P562708 | PGL-A-63-N-B-160-P | 0 - 160/11 | 1/4" NPT |
| P562716 | PGL-A-63-N-B-300-P | 0 - 300/20 | 1/4" NPT |
| P562726 | PGL-A-63-N-B-500-P | 0 - 500/35 | 1/4" NPT |
| P562730 | PGL-A-63-N-B-600-P | 0 - 600/40 | 1/4" NPT |
| P562702 | PGL-A-63-N-B-1000-P | 0 - 1,000/70 | 1/4" NPT |
| P562706 | PGL-A-63-N-B-1500-P | 0 - 1,500/100 | 1/4" NPT |
| P562710 | PGL-A-63-N-B-2000-P | 0 - 2,000/125 | 1/4" NPT |
| P562712 | PGL-A-63-N-B-3000-P | 0 - 3,000/200 | 1/4" NPT |
| P562722 | PGL-A-63-N-B-4000-P | 0 - 4,000/275 | 1/4" NPT |
| P562724 | PGL-A-63-N-B-5000/345-P | 0 - 5,000/350 | 1/4" NPT |
| P562728 | PGL-A-63-N-B-6000-P | 0 - 6,000/400 | 1/4" NPT |
| P562700 | PGL-A-63-N-B-10,000-P | 0 - 10,000/700 | 1/4" NPT |
| P562697 | PGL-A-63-B-B-3000-P | 0 - 3,000/200 | 1/4" BSP |
| P562698 | PGL-A-63-B-B-4000-P | 0 - 4,000/275 | 1/4" BSP |

4" Diameter Gauges

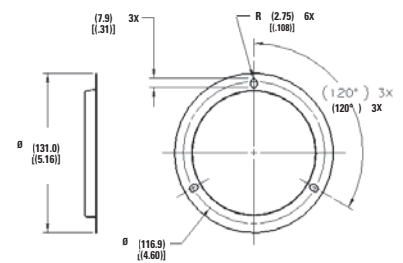
Stem Mount



Panel Mount



With Front Flange



4" Stem Mount

| Donaldson Part No. | Description | Pressure Range (psi/bar) | Thread Type |
|--------------------|------------------------|--------------------------|-------------|
| P562683 | PGL-A-100-N-B-300-S | 0 - 300/20 | 1/2" NPT |
| P562688 | PGL-A-100-N-B-600-S | 0 - 600/40 | 1/2" NPT |
| P562675 | PGL-A-100-N-B-1000-S | 0 - 1,000/70 | 1/2" NPT |
| P562677 | PGL-A-100-N-B-1500-S | 0 - 1,500/100 | 1/2" NPT |
| P562679 | PGL-A-100-N-B-2000-S | 0 - 2,000/125 | 1/2" NPT |
| P562681 | PGL-A-100-N-B-3000-S | 0 - 3,000/200 | 1/2" NPT |
| P562685 | PGL-A-100-N-B-5000 | 0 - 5,000/350 | 1/2" NPT |
| P562686 | PGL-A-100-N-B-6000-S | 0 - 6,000/400 | 1/2" NPT |
| P562673 | PGL-A-100-N-B-10,000-S | 0 - 10,000/700 | 1/2" NPT |

4" Panel Mount

| Donaldson Part No. | Description | Pressure Range (psi/bar) | Thread Type |
|--------------------|------------------------|--------------------------|-------------|
| P562682 | PGL-A-100-N-B-300-P | 0 - 300/20 | 1/2" NPT |
| P562687 | PGL-A-100-N-B-600-P | 0 - 600/40 | 1/2" NPT |
| P562674 | PGL-A-100-N-B-1000-P | 0 - 1,000/70 | 1/2" NPT |
| P562676 | PGL-A-100-N-B-1500-P | 0 - 1,500/100 | 1/2" NPT |
| P562678 | PGL-A-100-N-B-2000-P | 0 - 2,000/125 | 1/2" NPT |
| P562680 | PGL-A-100-N-B-3000-P | 0 - 3,000/200 | 1/2" NPT |
| P562684 | PGL-A-100-N-B-5000 | 0 - 5,000/350 | 1/2" NPT |
| P562672 | PGL-A-100-N-B-10,000-P | 0 - 10,000/700 | 1/2" NPT |

Test Points

Specifications

- Working Pressure: 9000 *psi* /630 *bar*
- Seals: Buna-N®
- Caps: Plastic or metal
- Leak-free connection at full pressure

Buna-N® is a registered trademark of E. I. DuPont de Nemours and Company.



Features

Test points can be used as a connection into the hydraulic system on the suction side, pressure side or return. They allow connection for pressure and temperature transducers and provide ports for fluid sampling (so you can monitor cleanliness and keep your system operating optimally). If you have filters installed in hard-to-access locations, test points and hose assemblies can be used to plumb up a bulkhead to read pressure differentials.

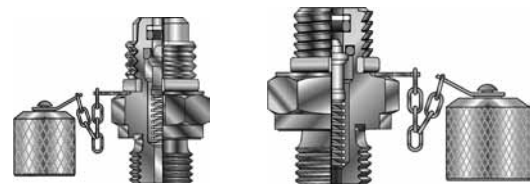
For Test Point Adapters, see page 244.

For Test Point Hose Assemblies, see page 245.

TPP-1215



TPM-1620



Styles

- Pressure and/or Temperature

Applications

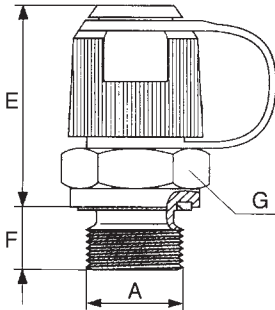
- Fluid or gas

Temperature Range

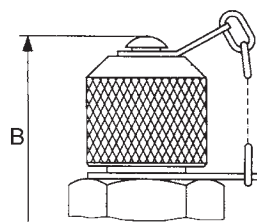
- Metal cap:
-22°F to 248°F / -30°C to 120°C
- Plastic cap:
-22°F to 212°F / -30°C to 100°C

TPM/TPP-1215 Assembly Views M12x1.5 Thread

Plastic Cap



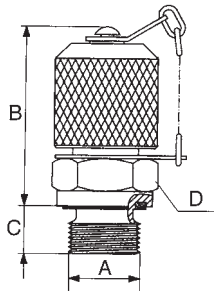
Metal Cap



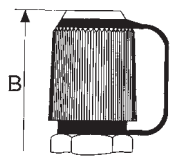
| Donaldson Part No. | Description | Working Pressure psi/bar | A Thread Type | E (in./mm) | F (in./mm) | G (in./mm) | Cap |
|--------------------|--------------|--------------------------|-----------------------|------------|------------|------------|---------|
| P563192 | TPM-1215-04G | 9000/630 | 1/4" BSPP, Form G | 1.30/33 | .33/8.5 | 0.55/14 | Metal |
| P563197 | TPP-1215-02N | 5800/400 | 1/8" NPTF | 1.14/29 | .47/12 | 0.55/14 | Plastic |
| P563193 | TPM-1215-04N | 9000/630 | 1/4" NPTF | 1.14/29 | .59/15 | 0.55/14 | Metal |
| P563199 | TPP-1215-03S | 9000/630 | 3/8"-24 UNF (#3 SAE) | 1.42/36 | .39/10 | 0.87/22 | Plastic |
| P563206 | TPP-1215-04S | 9000/630 | 7/16"-20 UNF (#4 SAE) | 1.26/32 | .35/9 | 0.67/17 | Plastic |
| P563207 | TPP-1215-06S | 9000/630 | 9/16"-18 UNF (#6 SAE) | 1.22/31 | .39/10 | 0.75/19 | Plastic |

TPM/TPP-1620 Assembly Views M16x2 Thread

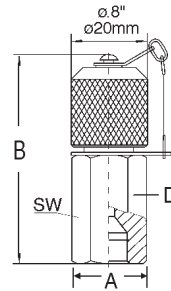
TPM Metal Cap



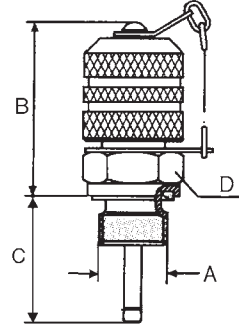
TPP Plastic Cap



JIC Style

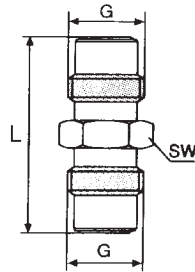


Pressure/Temperature



| Donaldson Part No. | Description | Working Pressure psi/bar | A Thread Type | B (in./mm) | C (in./mm) | D (mm) | Cap |
|--------------------|--------------|--------------------------|-----------------------|------------|------------|--------|-------|
| P563210 | TPM-1620-02B | 5800/400 | ISO 228-G 1/8" BSPP | 1.5/38 | 0.31/8 | 17 | Metal |
| P563215 | TPM-1620-04B | 9000/630 | ISO 228-G 1/4" BSPP | 1.42/36 | 0.39/10 | 19 | Metal |
| P563987 | TPM-1620-06B | 9000/630 | ISO 228-G 3/8" BSPP | 1.42/36 | 0.39/10 | 22 | Metal |
| P563219 | TPM-1620-04J | 8100/600 | #4 37° JIC Female | 2.17/55 | - | 17 | Metal |
| P563231 | TPM-1620-06J | 4500/315 | #6 37° JIC Female | 2.26/57.5 | - | 19 | Metal |
| P563212 | TPM-1620-02N | 5800/400 | 1/8" NPTF | 1.3/33 | 0.51/13 | 17 | Metal |
| P563220 | TPM-1620-04N | 9000/630 | 1/4" NPTF | 1.3/33 | 0.65/16.5 | 17 | Metal |
| P563224 | TPM-1620-04S | 9000/630 | 7/16"-20 UNF (#4 SAE) | 1.46/37 | 0.35/9 | 17 | Metal |
| P563232 | TPM-1620-06S | 9000/630 | 9/16"-18 UNF (#6 SAE) | 1.42/36 | 0.39/10 | 19 | Metal |

Test Point Adapters



A variety of adapters to suit your application.

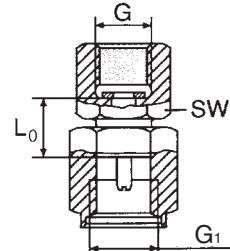


Hose Union Gauge

| Donaldson Part No. | Description | G Thread | psi/bar | L (in./mm) | SW (in./mm) |
|--------------------|-------------|-----------|----------|------------|-------------|
| P563263 | AHU-1215 | M12 x 1.5 | 9000/630 | 1.14/29 | .55/14 |
| P563264 | AHU-1620 | M16 x 2 | 9000/630 | 1.65/42 | .67/17 |

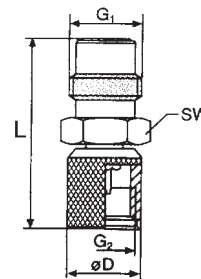
Direct Gauge Adapter

| Donaldson Part No. | Description | G Int. Thread | G ₁ Thread | psi/bar | L ₀ (in./mm) | SW (in./mm) |
|--------------------|--------------|---------------|-----------------------|----------|-------------------------|-------------|
| P563808 | ADG-1215-04N | 1/4" NPT | M12 x 1.5 | 9000/630 | 1.14/29 | .55/14 |
| P563809 | ADG-1620-04N | 1/4" NPT | M16 x 2 | 9000/630 | .55/14 | .75/19 |



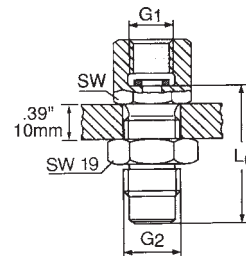
Series Converter

| Donaldson Part No. | Description | G ₁ Thread | G ₂ Thread | ØD (in./mm) | L (in./mm) | SW (in./mm) |
|--------------------|-------------|-----------------------|-----------------------|-------------|------------|-------------|
| P563265 | ASC-1215 | M16 x 2 | M12 x 1.5 | .67/17 | 1.30/33 | .67/17 |
| P563266 | ASC-1620 | M12 x 1.5 | M16 x 2 | .79/20 | 1.04/26.5 | .67/17 |



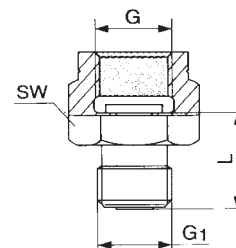
Bulkhead Gauge Adapter

| Donaldson Part No. | Description | G ₁ Thread | G ₂ Thread | L (in./mm) | SW (in./mm) |
|--------------------|--------------|-----------------------|-----------------------|------------|-------------|
| P563800 | ABH-1215-04N | 1/4" NPT | 1215M 12 x 1.5 | 1.52/39.5 | .75/27 |
| P563807 | ASC-1620-04N | 1/4" NPT | 1620/M16 x 2 | 1.52/38.5 | .75/19 |



Pressure Gauge Connection

| Donaldson Part No. | Description | G Thread | G ₁ Thread | psi/bar | L (in./mm) | SW (in./mm) |
|--------------------|--------------|----------|-----------------------|----------|------------|-------------|
| P563262 | AHG-1215-04N | 1/4" NPT | M12 x 1.5 | 9000/630 | .71/18 | .74/19 |



Test Point Hose Assemblies

Specifications

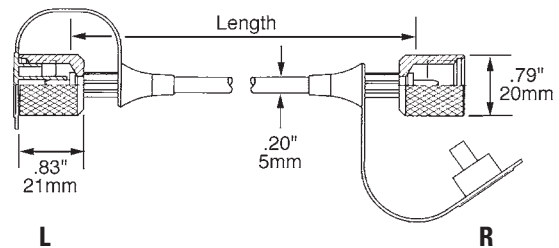
- Working Pressure to: 9000 *psi* / 630 bar
- Temperature Range: -4°F to 212°F / -20°C to 100°C
- Length: 12" to 180" / 305 to 4570



Features

Donaldson test point hoses are made of Polyamide II core with polyester braid reinforcement and Polyamid11 cover. They are suitable for use with petroleum-based fluids. Hoses are standard straight on both ends and include plastic dust caps.

For hydraulic filters installed in hard-to-access locations, hose assemblies and test points can be used to plumb up a bulkhead to read pressure differentials.



1215 Series M12x1.5 Thread

| Donaldson Part No. | Description | Length (in/mm) |
|--------------------|-------------------|----------------|
| P563240 | H-1215-B-0101-012 | 12/305 |
| P563243 | H-1215-B-0101-024 | 24/610 |
| P563244 | H-1215-B-0101-036 | 36/915 |
| P563245 | H-1215-B-0101-048 | 48/1220 |
| P563246 | H-1215-B-0101-072 | 72/1830 |
| P563247 | H-1215-B-0101-096 | 96/2440 |
| P563248 | H-1215-B-0101-120 | 120/3050 |
| P563249 | H-1215-B-0101-180 | 80/4570 |

1620 Series M16x2 Thread

| Donaldson Part No. | Description | Length (in/mm) |
|--------------------|-------------------|----------------|
| P563250 | H-1620-B-0101-012 | 12/305 |
| P563251 | H-1620-B-0101-018 | 18/460 |
| P563252 | H-1620-B-0101-024 | 24/610 |
| P563254 | H-1620-B-0101-036 | 36/915 |
| P563255 | H-1620-B-0101-048 | 48/1220 |
| P563256 | H-1620-B-0101-072 | 72/1830 |
| P563257 | H-1620-B-0101-096 | 96/2440 |
| P563259 | H-1620-B-0101-120 | 120/3050 |
| P563260 | H-1620-B-0101-144 | 144/3660 |
| P563261 | H-1620-B-0101-180 | 180/4570 |

In-Line Check Valves

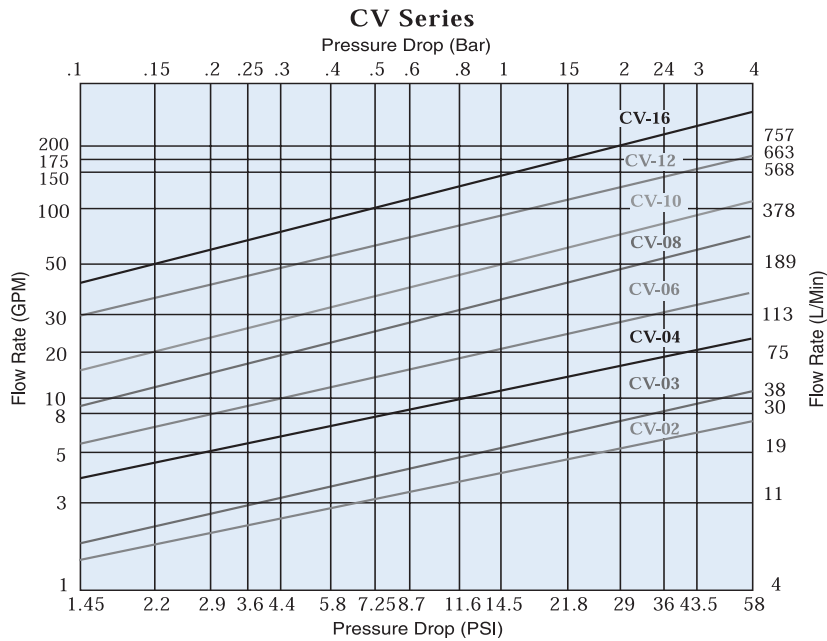
Specifications

- Working Pressure to: 9000 *psi* / 630 bar
- Flow Range: 200 *gpm* 757 *lpm*



Features

Steel constructed check valves are compatible with all non-corrosive liquids. Valves contain no elastomeric seals. Restricted orifice (.062) option available on some models.



**The above chart is based on
Hydraulic Oil 100 SUS, S.G. = 0.86**

Sizes

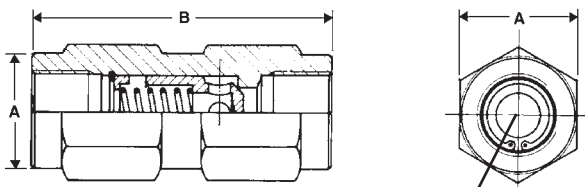
- 1/4", 3/8", 1/2", 3/4", 1", 1 1/4", 1 1/2" and 2" NPT
- #4, #6, #8, #12, #16, #20, #24 and #32 SAE

Opening Pressure (Cracking)

- 5 *psi* / 0.34 bar or 65 *psi* / 4.5 bar

In-Line Check Valve Options

| Donaldson Part No. | Reference | Max Working Pressure (psi/bar) | Max. Rated Flow (gpm/lpm) | Opening Pressure (psi/bar) | Port | A (in./mm) | B (in./mm) |
|--------------------|-----------|--------------------------------|---------------------------|----------------------------|------------|------------|------------|
| P562297 | CV-02P-5 | 4350/300 | 6/23 | 5/0.34 | 1/4" NPT | 0.75/19 | 2.17/55 |
| P562298 | CV-02P-65 | 4350/300 | 6/23 | 65/4.5 | 1/4" NPT | 0.75/19 | 2.17/55 |
| P562299 | CV-02S-5 | 4350/300 | 6/23 | 5/0.34 | #4 SAE | 0.75/19 | 2.17/55 |
| P562301 | CV-03P-5 | 4350/300 | 10/38 | 5/0.34 | 3/8" NPT | 0.98/25 | 2.68/68 |
| P562302 | CV-03P-65 | 4350/300 | 10/38 | 65/4.5 | 3/8" NPT | 0.98/25 | 2.68/68 |
| P562303 | CV-03S-5 | 4350/300 | 10/38 | 5/0.34 | #6 SAE | 0.75/19 | 2.29/58 |
| P562305 | CV-04P-5 | 4350/300 | 16/60 | 5/0.34 | 1/2" NPT | 1.06/27 | 2.95/75 |
| P562306 | CV-04P-65 | 4350/300 | 16/60 | 65/4.5 | 1/2" NPT | 1.06/27 | 2.95/75 |
| P562307 | CV-04S-5 | 4350/300 | 16/60 | 5/0.34 | #8 SAE | 0.98/25 | 2.72/69 |
| P562308 | CV-04S-65 | 4350/300 | 16/60 | 65/4.5 | #8 SAE | 0.98/25 | 2.72/69 |
| P562309 | CV-06P-5 | 4350/300 | 25/94 | 5/0.34 | 3/4" NPT | 1.38/35 | 3.48/88 |
| P562311 | CV-06P-65 | 4350/300 | 25/94 | 65/4.5 | 3/4" NPT | 1.38/35 | 3.48/88 |
| P562312 | CV-06S-5 | 4350/300 | 25/94 | 5/0.34 | #12 SAE | 1.38/35 | 3.48/88 |
| P562313 | CV-06S-65 | 4350/300 | 25/94 | 65/4.5 | #12 SAE | 1.38/35 | 3.48/88 |
| P562314 | CV-08P-5 | 4350/300 | 45/169 | 5/0.34 | 1" NPT | 1.61/41 | 4.33/110 |
| P562316 | CV-08P-65 | 4350/300 | 45/169 | 65/4.5 | 1" NPT | 1.61/41 | 4.33/110 |
| P562317 | CV-08S-5 | 4350/300 | 45/169 | 5/0.34 | #16 SAE | 1.61/41 | 4.33/110 |
| P563307 | CV-08S-65 | 4350/300 | 45/169 | 65/4.5 | #16 SAE | 1.61/41 | 4.33/110 |
| P562319 | CV-10P-5 | 4350/300 | 95/357 | 5/0.34 | 1-1/4" NPT | 2.16/55 | 4.72/120 |
| P562320 | CV-10P-65 | 4350/300 | 95/357 | 65/4.5 | 1-1/4" NPT | 2.16/55 | 4.72/120 |
| P562321 | CV-10S-5 | 4350/300 | 95/357 | 5/0.34 | #20 SAE | 2.16/55 | 4.72/120 |
| P562322 | CV-10S-65 | 4350/300 | 95/357 | 65/4.5 | #20 SAE | 2.16/55 | 4.72/120 |
| P562323 | CV-12P-5 | 4350/300 | 130/489 | 5/0.34 | 1-1/2" NPT | 2.56/65 | 5.43/138 |
| P562324 | CV-12P-65 | 4350/300 | 130/489 | 65/4.5 | 1-1/2" NPT | 2.56/65 | 5.43/138 |
| P562325 | CV-12S-5 | 4350/300 | 130/489 | 5/0.34 | #24 SAE | 2.56/65 | 5.43/138 |
| P562326 | CV-12S-65 | 4350/300 | 130/489 | 65/4.5 | #24 SAE | 2.56/65 | 5.43/138 |
| P562327 | CV-16P-5 | 2900/200 | 200/752 | 5/0.34 | 2" NPT | 2.56/65 | 5.43/138 |
| P562328 | CV-16P-65 | 2900/200 | 200/752 | 65/4.5 | 2" NPT | 2.56/65 | 5.43/138 |



Optional Orifice

Ball Valves - Low Pressure

Specifications

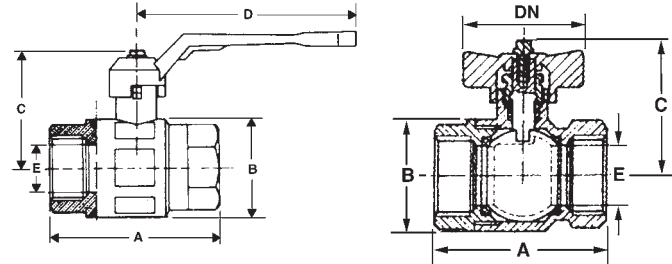
- Hot pressed brass body and ball OT 58
- Materials (ball and body): BV Series chromium plated
- Steel handle
- Teflon[®] seals (ball and stem)

Teflon[®] is a registered trademark of E. I. DuPont de Nemours and Company.



Features

Low pressure ball valves are rated for water, oil or gas (WOG) applications. Two-way/two-position, quarter turn operation. Full-ported sizes from 1/4" to 2" NPT. T-handle available on some models. Suitable for temperatures from -22°F to 350°F (-30°C to 162°C).



| Donaldson Part No. | Description | Max. Working Pressure (psi/bar) | Port Thread | A (in./mm) | B (in./mm) | C (in./mm) | D (in./mm) | E (in./mm) |
|--------------------|-------------|---------------------------------|-------------|------------|------------|------------|------------|------------|
| P562331 | BV-04-N | 710/49 | 1/4" NPT | 1.89/48 | 0.98/25 | 1.69/43 | 3.15/80 | 0.40/10 |
| P562333 | BV-06-N | 710/49 | 3/8" NPT | 1.89/48 | 0.98/25 | 1.69/43 | 3.15/80 | 0.40/10 |
| P562336 | BV-08-N | 710/49 | 1/2" NPT | 2.00/51 | 1.22/31 | 1.77/45 | 3.15/80 | 0.60/15 |
| P563311 | BV-12-N | 570/39 | 3/4" NPT | 2.24/57 | 1.46/37 | 2.36/60 | 4.44/113 | 0.80/20 |
| P562338 | BV-16-N | 570/39 | 1" NPT | 2.75/70 | 1.81/46 | 2.48/63 | 4.44/113 | 1.00/25 |
| P562339 | BV-20-N | 430/30 | 1-1/4" NPT | 3.15/80 | 2.24/57 | 3.11/79 | 5.43/138 | 1.25/32 |
| P562341 | BV-24-N | 430/30 | 1-1/2" NPT | 3.66/93 | 2.75/70 | 3.27/83 | 5.43/138 | 1.57/40 |
| P562343 | BV-32-N | 360/25 | 2" NPT | 4.41/112 | 3.31/84 | 3.94/100 | 6.22/158 | 1.97/50 |
| P562345 | BV-40-N | 260/18 | 2-1/2" NPT | 5.31/135 | 3.82/97 | 3.98/101 | 7.75/197 | 2.12/54 |
| P562346 | BV-48-N | 230/16 | 3" NPT | 6.25/159 | 4.80/122 | 5.08/129 | 9.84/250 | 2.56/65 |

Ball Valves - Medium/High Pressure

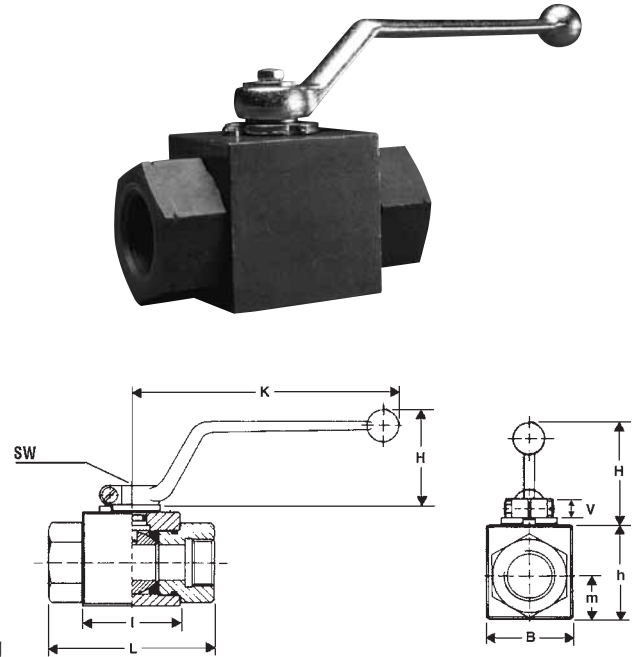
Specifications

- Steel body
- Brass ball with chrome plating (MBV-04 thru MBV-16)
- Steel ball with chrome plating (HBV, MBV-20 thru MBV-32)
- Steel zinc stem (MBV)
- Delrin ball seal
- Stem seal: Buna-N® (MBV); Viton (HBV)
- Aluminum handles on HBV larger sizes

Buna-N® is a registered trademark of E. I. DuPont de Nemours and Company.

Features

Medium duty (MBV) and high pressure (HBV) ball valves are compatible with petroleum-based fluids. Two-way, two-position valves are suited for on/off control. Optional locking tabs provide added safety. Valves come standard with bent handles; straight handles are available for some models. Operating temperatures from -22°F to 212°F / -30°C to 100°C.



Medium Duty Ball Valves - MBV

| Donaldson Part No. | Description | Port Thread | Pressure (psi/bar) | L (in./mm) | I (in./mm) | B (in./mm) | H (in./mm) | h (in./mm) | m (in./mm) | V (in./mm) | SW (in./mm) | K (in./mm) |
|--------------------|-------------|----------------|--------------------|------------|------------|------------|------------|------------|------------|------------|-------------|------------|
| P562387 | MBV-04-N | 1/4" NPT | 7250/500 | 2.7/69 | 1.4/36 | 1.0/26 | 1.7/43 | 1.3/32 | 0.5/12.5 | 0.4/11 | 0.4/9 | 4.6/118 |
| P562388 | MBV-04-S | 7/16"-20 SAE | 7250/500 | 2.7/69 | 1.4/36 | 1.0/26 | 1.7/43 | 1.3/32 | 0.5/12.5 | 0.4/11 | 0.4/9 | 4.6/118 |
| P563308 | MBV-06-N | 3/8" NPT | 7250/500 | 3.1/79 | 1.7/43 | 1.3/32 | 1.7/43 | 1.5/38 | 0.7/17.5 | 0.4/11 | 0.4/9 | 4.6/118 |
| P562389 | MBV-06-S | 9/16"-18 SAE | 7250/500 | 3.1/79 | 1.7/43 | 1.3/32 | 1.7/43 | 1.5/38 | 0.7/17.5 | 0.4/11 | 0.4/9 | 4.6/118 |
| P562390 | MBV-08-N | 1/2" NPT | 7250/500 | 4.1/104 | 1.9/48 | 1.4/35 | 1.7/43 | 1.6/40 | 0.75/19 | 0.4/11 | 0.4/9 | 4.6/118 |
| P563309 | MBV-08-S | 3/4"-16 SAE | 7250/500 | 4.1/104 | 1.9/48 | 1.4/35 | 1.7/43 | 1.6/40 | 0.75/19 | 0.4/11 | 0.4/9 | 4.6/118 |
| P562391 | MBV-12-N | 3/4" NPT | 5800/400 | 4.3/109 | 2.4/62 | 1.9/49 | 2.3/58 | 2.2/57 | 1.0/24.5 | 0.6/14 | 0.6/14 | 7.2/182 |
| P562392 | MBV-12-S | 1-1/16"-12 SAE | 5800/400 | 4.3/109 | 2.4/62 | 1.9/49 | 2.3/58 | 2.2/57 | 1.0/24.5 | 0.6/14 | 0.6/14 | 7.2/182 |
| P562394 | MBV-16-N | 1" NPT | 4500/310 | 4.6/117 | 2.6/66 | 2.3/58 | 2.3/58 | 2.6/65 | 1.2/29.5 | 0.6/14 | 0.6/14 | 7.2/182 |
| P562395 | MBV-16-S | 1-5/16"-12 SAE | 4500/310 | 4.6/117 | 2.6/66 | 2.3/58 | 2.3/58 | 2.6/65 | 1.2/29.5 | 0.6/14 | 0.6/14 | 7.2/182 |
| P562396 | MBV-20-N | 1-1/4" NPT | 4500/310 | 4.3/110 | 3.2/80 | 3.0/76 | 2.3/58 | 3.3/84 | 1.5/38 | 0.6/15 | 0.7/17 | 8.5/218 |
| P562397 | MBV-20-S | 1-5/8"-12 SAE | 4500/310 | 4.3/110 | 3.2/80 | 3.0/76 | 2.3/58 | 3.3/84 | 1.5/38 | 0.6/15 | 0.7/17 | 8.5/218 |
| P562398 | MBV-24-N | 1-1/2" NPT | 3625/250 | 5.1/130 | 3.3/85 | 3.6/92 | 2.3/58 | 3.9/99 | 1.8/46 | 0.6/15 | 0.7/17 | 8.5/218 |
| P563310 | MBV-24-S | 1-7/8"-12 SAE | 3625/250 | 5.1/130 | 3.3/85 | 3.6/92 | 2.3/58 | 3.9/99 | 1.8/46 | 0.6/15 | 0.7/17 | 8.5/218 |
| P562399 | MBV-32-N | 2" NPT | 3625/250 | 5.5/140 | 3.9/100 | 4.2/106 | 2.3/58 | 4.4/111 | 2.1/53 | 0.6/15 | 0.7/17 | 8.5/218 |

High Pressure Ball Valves

| Donaldson Part No. | Description | Port Thread | Pressure (psi/bar) | L (in./mm) | I (in./mm) | B (in./mm) | H (in./mm) | h (in./mm) | m (in./mm) | V (in./mm) | SW (in./mm) | K (in./mm) |
|--------------------|-------------|----------------|--------------------|------------|------------|------------|------------|------------|------------|------------|-------------|------------|
| P562356 | HBV-04-N | 1/4" NPT | 7250/500 | 2.7/69 | 1.4/36 | 1.0/26 | 1.7/43 | 1.3/32 | 0.5/12.5 | 0.4/11 | 0.4/9 | 4.6/118 |
| P562357 | HBV-04-S | 7/16"-20 SAE | 7250/500 | 2.7/69 | 1.4/36 | 1.0/26 | 1.7/43 | 1.3/32 | 0.5/12.5 | 0.4/11 | 0.4/9 | 4.6/118 |
| P562358 | HBV-06-N | 3/8" NPT | 7250/500 | 3.1/79 | 1.7/43 | 1.3/32 | 1.7/43 | 1.5/38 | 0.7/17.5 | 0.4/11 | 0.4/9 | 4.6/118 |
| P562359 | HBV-06-S | 9/16"-18 SAE | 7250/500 | 3.1/79 | 1.7/43 | 1.3/32 | 1.7/43 | 1.5/38 | 0.7/17.5 | 0.4/11 | 0.4/9 | 4.6/118 |
| P562360 | HBV-08-N | 1/2" NPT | 7250/500 | 4.1/104 | 1.9/48 | 1.4/35 | 1.7/43 | 1.6/40 | 0.75/19 | 0.4/11 | 0.4/9 | 4.6/118 |
| P562361 | HBV-08-S | 3/4"-16 SAE | 7250/500 | 4.1/104 | 1.9/48 | 1.4/35 | 1.7/43 | 1.6/40 | 0.75/19 | 0.4/11 | 0.4/9 | 4.6/118 |
| P562362 | HBV-12-N | 3/4" NPT | 5800/400 | 4.3/109 | 2.4/62 | 1.9/49 | 2.3/58 | 2.2/57 | 1.0/24.5 | 0.6/14 | 0.6/14 | 7.2/182 |
| P562363 | HBV-12-S | 1-1/16"-12 SAE | 5800/400 | 4.3/109 | 2.4/62 | 1.9/49 | 2.3/58 | 2.2/57 | 1.0/24.5 | 0.6/14 | 0.6/14 | 7.2/182 |
| P562364 | HBV-16-N | 1" NPT | 4500/310 | 4.6/117 | 2.6/66 | 2.3/58 | 2.3/58 | 2.6/65 | 1.2/29.5 | 0.6/14 | 0.6/14 | 7.2/182 |
| P562365 | HBV-16-S | 1-5/16"-12 SAE | 4500/310 | 4.6/117 | 2.6/66 | 2.3/58 | 2.3/58 | 2.6/65 | 1.2/29.5 | 0.6/14 | 0.6/14 | 7.2/182 |
| P562368 | HBV-20-N | 1-1/4" NPT | 4500/310 | 4.3/110 | 3.2/80 | 3.0/76 | 2.3/58 | 3.3/84 | 1.5/38 | 0.6/15 | 0.7/17 | 8.5/218 |
| P562369 | HBV-20-S | 1-5/8"-12 SAE | 4500/310 | 4.3/110 | 3.2/80 | 3.0/76 | 2.3/58 | 3.3/84 | 1.5/38 | 0.6/15 | 0.7/17 | 8.5/218 |

Replacement Parts for High Pressure Ball Valves

Handles

| Donaldson Part No. | Description | Style | Valve Size |
|--------------------|-------------|-------------|------------|
| P562376 | HBVH-040608 | Bent Handle | 04, 06, 08 |
| P562377 | HBVH-1216 | Bent Handle | 12, 16 |
| P562378 | HBVH-202432 | Bent Handle | 20, 24, 32 |

Lock Device Kits

| Donaldson Part No. | Description | Valve Size |
|--------------------|-------------|------------|
| P562332 | LD-1 | 04, 06, 08 |
| P562335 | LD-2 | 12, 16 |
| P562340 | LD-3 | 20, 24, 32 |

For use on MBV, HBV and 3W-HBV

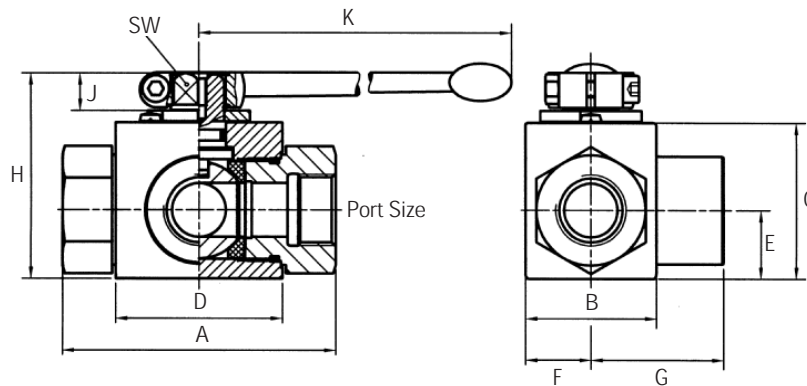
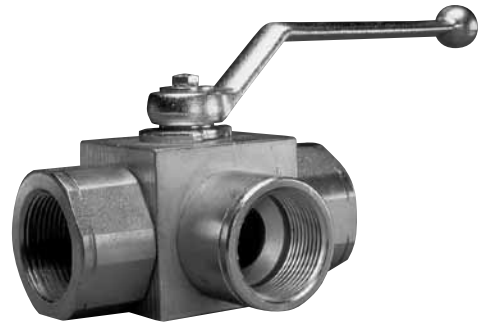
Seal Kit

| Donaldson Part No. | Description | Valve Size |
|--------------------|-------------|------------|
| P562379 | HBV-SK-04 | 04 |
| P562380 | HBV-SK-06 | 06 |
| P562629 | HBV-SK-08 | 08 |
| P562630 | HBV-SK-12 | 12 |
| P562381 | HBV-SK-16 | 16 |
| P562382 | HBV-SK-20 | 20 |
| P562383 | HBV-SK-24 | 24 |

Three-Way Selector Ball Valve

Specifications

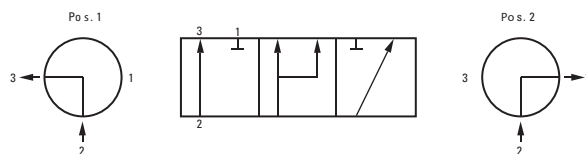
- Maximum pressure 7250 *psi* / 500 bar
- Steel construction
- Operating temperature -22°F to 212°F / -30°C to 100°C



| Donaldson Reference Part No. | Port Size | Max Pressure | A (in./mm) | B (in./mm) | C (in./mm) | D (in./mm) | E (in./mm) | F (in./mm) | G (in./mm) | H (in./mm) | J (in./mm) | K (in./mm) | SW (in./mm) |
|------------------------------|---------------------------|-----------------------|-------------|------------|--------------|-------------|--------------|--------------|--------------|-------------|--------------|--------------|-------------|
| P562342 | 3W-HBV-08-N 1/2" NPT | 7250 psi 50000 kPa | 4.09 104 | 1.50 38 | 1.57 40 | 1.89 48 | 0.75 19 | 0.69 17.5 | 1.63 41.5 | 2.13 54 | 0.43 11 | 4.53 115 | 0.3 9 |
| P562344 | 3W-HBV-12-N 3/4" NPT | 4500 psi 31028 kPa | 4.02 102 | 2.05 52 | 2.24 57 | 2.44 62 | 0.96 24.5 | 0.96 24.5 | 1.87 47.5 | 2.95 75 | 0.55 14 | 7.87 200 | 0.55 14 |
| P562404 | 3W-HBV-16-N 1" NPT | 4500 psi 31028 kPa | 4.69 119 | 2.40 61 | 2.56 65 | 2.60 66 | 1.16 29.5 | 1.14 29 | 2.22 56.5 | 3.27 83 | 0.55 14 | 7.87 200 | 0.55 14 |
| P562405 | 3W-HBV-16-S SAE-16 | 4500 psi 31028 kPa | 4.72 120 | 2.80 71 | 3.33 84.5 | 3.19 81 | 1.54 39 | 1.54 39 | 2.36 60 | 4.17 106 | 0.65 16.5 | 12.60 320 | 0.67 17 |
| P562406 | 3W-HBV-20-N 1-1/4" NPT | 5000psi 34500 kPa | 4.72 120 | 2.80 71 | 3.33 84.5 | 3.19 81 | 1.54 39 | 1.54 39 | 2.36 60 | 4.17 106 | 0.65 16.5 | 12.60 320 | 0.67 17 |
| P562407 | 3W-HBV-24-N 1-1/2" NPT | 5000 psi 34500 kPa | 5.51 140 | 3.74 95 | 4.17 106 | 4.09 104 | 2.09 53 | 2.09 53 | 2.76 70 | 5.00 127 | 0.65 16.5 | 12.60 320 | 0.67 17 |

Operation:

Open cross-over (no zero position)
Pressure inlet only from port 2

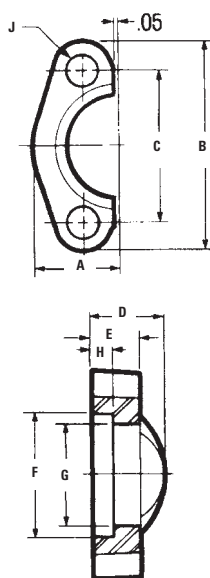


Split Flanges

Specifications

- Code 61 and Code 62
- Buna-N® O-Ring

Each kit includes:
 2 split flange halves
 4 hex head mounting bolts
 and lockwashers
 1 Buna-N® O-Ring



Buna-N® is a registered trademark of E. I. DuPont de Nemours and Company.

Code 61

| Donaldson Part No. | Reference | Flange Size | Dimensions (in./mm) | | | | | | | | | Mounting Hardware | | |
|--------------------|-----------|-------------|---------------------|------|-------|------|------|-------|-------|-------|----------|-------------------|--------------------|--------------------------|
| | | | A | B | C | D | E | F | G | H | J (Dia.) | O-Ring | Hex Head Cap Screw | Maximum Working Pressure |
| P563042 | L-12SF-3 | 0.75 | 0.98 | 2.56 | 1.875 | 0.88 | 0.56 | 1.531 | 1.265 | 0.245 | 0.406 | -214 | 3/8"-16x11/4 | 5000 34500kPa |
| | | 19 | 25 | 65 | 48 | 22 | 14 | 39 | 32 | 6 | 10 | | | |
| P563044 | L-16SF-3 | 1.00 | 1.11 | 2.75 | 2.062 | 0.94 | 0.62 | 1.781 | 1.515 | 0.295 | 0.406 | -219 | 3/8"-16x11/4 | 5000 34500kPa |
| | | 25 | 28 | 70 | 52 | 24 | 16 | 45 | 38 | 7 | 10 | | | |
| P563047 | L-20SF-3 | 1.25 | 1.39 | 3.12 | 2.312 | 0.88 | 0.56 | 2.031 | 1.720 | 0.295 | 0.469 | -222 | 7/16"-14x11/2 | 4000 psi 27580 kPa |
| | | 32 | 35 | 79 | 59 | 22 | 14 | 52 | 44 | 7 | 12 | | | |
| P563050 | L-24SF-3 | 1.50 | 1.58 | 3.69 | 2.750 | 1.00 | 0.62 | 2.406 | 2.000 | 0.295 | 0.531 | -225 | 1/2"-13x11/2 | 3000 psi 20685 kPa |
| | | 38 | 40 | 94 | 70 | 25 | 16 | 61 | 51 | 8 | 13 | | | |
| P563053 | L-32SF-3 | 2.00 | 1.86 | 4.00 | 3.062 | 1.03 | 0.62 | 2.844 | 2.470 | 0.355 | 0.531 | -228 | 1/2"-13x11/2 | 3000 psi 20685 kPa |
| | | 51 | 47 | 102 | 78 | 26 | 16 | 72 | 63 | 9 | 13 | | | |
| P563056 | L-40SF-3 | 2.50 | 2.09 | 4.50 | 3.500 | 1.50 | 0.75 | 3.344 | 2.950 | 0.355 | 0.531 | -232 | 1/2"-13x13/4 | 2500 psi 17240 kPa |
| | | 64 | 53 | 114 | 89 | 38 | 19 | 85 | 75 | 9 | 13 | | | |

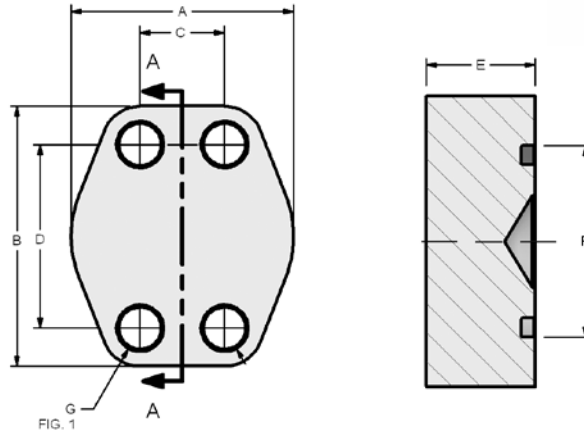
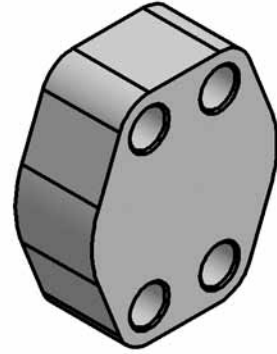
Code 62

| Donaldson Part No. | Reference | Flange Size (in./mm) | Dimensions (in./mm) | | | | | | | | | Mounting Hardware | | |
|--------------------|-----------|----------------------|---------------------|------------|------------|------------|------------|------------|------------|------------|-------------------|-------------------|--------------------|--------------------------|
| | | | A (in./mm) | B (in./mm) | C (in./mm) | D (in./mm) | E (in./mm) | F (in./mm) | G (in./mm) | H (in./mm) | J (Dia.) (in./mm) | O-Ring | Hex Head Cap Screw | Maximum Working Pressure |
| P563046 | L-16SFX-6 | 1.00 | 1.33 | 3.19 | 2.250 | 1.31 | 0.94 | 1.906 | 1.530 | 0.355 | 0.469 | -219 | 7/16"-14x13/4 | 6000 psi 41370kPa |
| | | 25 | 34 | 81 | 57 | 33 | 24 | 48 | 39 | 9 | 12 | | | |
| P563049 | L-20SFX-6 | 1.25 | 1.48 | 3.75 | 2.625 | 1.50 | 1.06 | 2.156 | 1.750 | 0.385 | 0.531 | -222 | 1/2"-13x13/4 | 6000 psi 41370kPa |
| | | 32 | 38 | 95 | 67 | 38 | 27 | 55 | 44 | 10 | 13 | | | |
| P563051 | L-24SFX-6 | 1.50 | 1.83 | 4.44 | 3.125 | 1.69 | 1.19 | 2.531 | 2.030 | 0.475 | 0.656 | -225 | 5/8"-11x21/4 | 6000 psi 41370kPa |
| | | 38 | 46 | 113 | 79 | 43 | 30 | 64 | 52 | 12 | 17 | | | |
| P563054 | L-32SFX-6 | 2.00 | 2.20 | 5.25 | 3.812 | 2.06 | 1.44 | 3.156 | 2.660 | 0.475 | 0.781 | -228 | 3/4"-10x23/4 | 6000 psi 41370kPa |
| | | 51 | 56 | 133 | 97 | 52 | 37 | 80 | 68 | 12 | 20 | | | |

Blanking Flanges

Specifications

- Code 61 and 62
- O-Ring



Blanking Flanges, Code 61

| Donaldson Part No. | Reference | Pad Size | Dimensions (in./mm) | | | | | | | Mounting Hardware | |
|--------------------|--------------|-------------|---------------------|-----------|----------|----------|---------|----------|----------|-------------------|---------------|
| | | | A | B | C | D | E | F | G | O-Ring | SHCS |
| P563061 | LIB-16-16-30 | 1"/25mm | 2.313/59 | 2.750/70 | 1.031/26 | 2.063/52 | 0.88/22 | 1.560/40 | 0.406/10 | -219 | 3/8"-16x1.75 |
| P563063 | LIB-20-20-30 | 1-1/4"/32mm | 2.875/73 | 3.125/79 | 1.188/30 | 2.313/59 | 0.94/24 | 1.750/44 | 0.469/12 | -222 | 7/16"-14x1.75 |
| P563065 | LIB-24-24-30 | 1-1/2"/38mm | 3.250/83 | 3.688/94 | 1.406/36 | 2.750/70 | 1.19/30 | 2.115/54 | 0.531/13 | -225 | 1/2"-13x2.25 |
| P563067 | LIB-32-32-30 | 2"/51mm | 3.813/97 | 4.000/102 | 1.688/43 | 3.063/78 | 1.44/37 | 2.490/63 | 0.531/13 | -228 | 1/2"-13x2.50 |

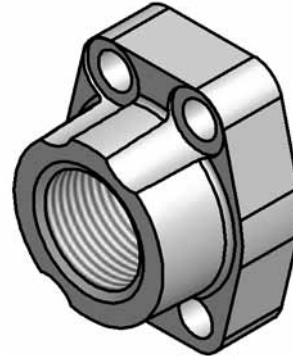
Blanking Flanges, Code 62

| Donaldson Part No. | Reference | Pad Size | Dimensions (in./mm) | | | | | | | Mounting Hardware | |
|--------------------|--------------|-------------|---------------------|----------|----------|----------|---------|----------|----------|-------------------|--------------|
| | | | A | B | C | D | E | F | G | O-Ring | SHCS |
| P563064 | LIB-20-20-60 | 1-1/4"/32mm | 3.060/78 | 3.750/95 | 1.250/32 | 2.625/67 | 1.43/36 | 1.750/44 | 0.531/13 | -222 | 1/2"-13x2.50 |

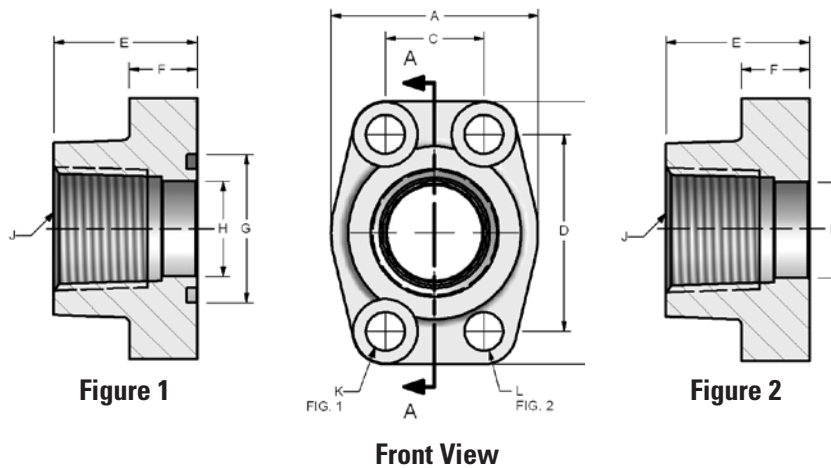
4-Bolt NPTF Threaded Flange

Specifications

- Code 61 and 62
- NPT Thread
- Buna-N® O-Ring
- Mounting hardware and O-Ring included on O-Ring models
- Maximum temperature with O-Ring 250°F / 121°C



Buna-N® is a registered trademark of E. I. DuPont de Nemours and Company.



Code 61 NPTF Thread, O-Ring (Figure 1)

| Donaldson Part No. | Desc. | Port Size | Pad Size | A | B | C | Dimensions (in./mm) | | | G | H | J NPTF | K (dia.) Drill | Mounting Hardware O-Ring | SHCS |
|--------------------|--------------|-----------|----------|------|------|-------|---------------------|------|------|-------|-------|-------------|----------------|--------------------------|-----------------|
| P563088 | LI-12-12P-30 | 0.75 | 0.75 | 1.97 | 2.56 | 0.875 | 1.875 | 1.42 | 0.71 | 1.250 | 0.752 | 3/4"-14 | 0.406 | -214 | 3/8"-16 x 1.25 |
| | | 19 | 19 | 50 | 65 | 22 | 48 | 36 | 18 | 32 | 19 | 10 | | | |
| P563093 | LI-16-16P-30 | 1.00 | 1.00 | 2.17 | 2.75 | 1.031 | 2.062 | 1.50 | 0.71 | 1.560 | 1.002 | 1"-11.5 | 0.406 | -219 | 3/8"-16 x 1.50 |
| | | 25 | 25 | 55 | 70 | 26 | 52 | 38 | 18 | 40 | 25 | 10 | | | |
| P563100 | LI-20-20P-30 | 1.25 | 1.25 | 2.68 | 3.12 | 1.188 | 2.312 | 1.61 | 0.83 | 1.750 | 1.252 | 1-1/4"-11.5 | 0.469 | -222 | 7/16"-14 x 1.50 |
| | | 32 | 32 | 68 | 79 | 30 | 59 | 41 | 21 | 44 | 32 | 12 | | | |
| P563107 | LI-24-24P-30 | 1.50 | 1.50 | 3.07 | 3.66 | 1.406 | 2.750 | 1.77 | 0.98 | 2.115 | 1.502 | 1-1/2"-11.5 | 0.531 | -225 | 1/2"-13 x 1.75 |
| | | 38 | 38 | 78 | 93 | 36 | 70 | 45 | 25 | 54 | 38 | 13 | | | |
| P563113 | LI-32-32P-30 | 2.00 | 2.00 | 3.54 | 4.00 | 1.688 | 3.062 | 1.77 | 0.98 | 2.490 | 2.002 | 2"-11.5 | 0.531 | -228 | 1/2"-13 x 1.75 |
| | | 51 | 51 | 90 | 102 | 43 | 78 | 45 | 25 | 63 | 51 | 13 | | | |
| P563117 | LI-40-40P-30 | 2.50 | 2.50 | 4.09 | 4.49 | 2.000 | 3.500 | 1.97 | 0.98 | 2.995 | 2.502 | 2-1/2"-8 | 0.531 | -232 | 1/2"-13 x 2.25 |
| | | 64 | 64 | 104 | 114 | 51 | 89 | 50 | 25 | 76 | 64 | 13 | | | |
| P563118 | LI-48-48P-30 | 3.00 | 3.00 | 4.88 | 5.28 | 2.438 | 4.188 | 1.97 | 1.06 | 3.615 | 3.002 | 3"-8 | 0.656 | -237 | 5/8"-11 x 2.50 |
| | | 76 | 76 | 124 | 134 | 62 | 106 | 50 | 27 | 92 | 76 | 17 | | | |

4-Bolt NPTF Threaded Flange

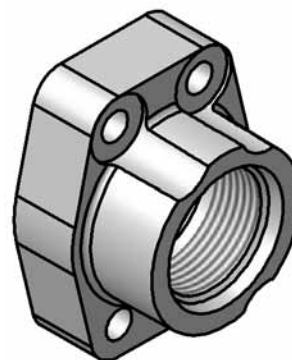
Code 61 NPTF Thread, Flat Face (Figure 2)

| Donaldson Part No. | Description | Port Size | Pad Size | Dimensions (in./mm) | | | | | | | | | J NPTF | L Tap UNC-2B |
|--------------------|---------------|-----------|----------|---------------------|------|-------|-------|------|------|-------|-------|-------------|----------|--------------|
| | | | | A | B | C | D | E | F | G | H | | | |
| P563163 | LIC-16-16P-30 | 1.00 | 1.00 | 2.17 | 2.75 | 1.031 | 2.062 | 1.50 | 0.71 | 1.560 | 1.002 | 1"-11.5 | 3/8"-16 | |
| | | 25 | 25 | 55 | 70 | 26 | 52 | 38 | 18 | 40 | 25 | | | |
| P563166 | LIC-20-20P-30 | 1.25 | 1.25 | 2.68 | 3.12 | 1.188 | 2.312 | 1.61 | 0.83 | 1.750 | 1.252 | 1-1/4"-11.5 | 7/16"-14 | |
| | | 32 | 32 | 68 | 79 | 30 | 59 | 41 | 21 | 44 | 32 | | | |
| P563171 | LIC-32-32P-30 | 2.00 | 2.00 | 3.54 | 4.00 | 1.688 | 3.062 | 1.77 | 0.98 | 2.490 | 2.002 | 2"-11.5 | 1/2"-13 | |
| | | 51 | 51 | 90 | 102 | 43 | 78 | 45 | 25 | 63 | 51 | | | |

Code 62 NPTF Thread, O-Ring (Figure 1)

| Donaldson Part No. | Description | Port Size | Pad Size | Dimensions (in./mm) | | | | | | | | | J NPTF | K (Dia.) Drill | Mounting Hardware | |
|--------------------|--------------|-----------|----------|---------------------|------|-------|-------|------|------|-------|-------|------------|--------|----------------|-------------------|--|
| | | | | A | B | C | D | E | F | G | H | O-Ring | | | SHCS | |
| P563094 | LI-16-16P-60 | 1.00 | 1.00 | 2.56 | 3.19 | 1.093 | 2.250 | 1.65 | 0.98 | 1.560 | 1.002 | 1-11.5 | 0.492 | -219 | 7/16"-14 x 1.50 | |
| | | 25 | 25 | 65 | 81 | 28 | 57 | 42 | 25 | 40 | 25 | | 12 | | | |
| P563101 | LI-20-20P-60 | 1.25 | 1.25 | 3.07 | 3.75 | 1.250 | 2.625 | 1.77 | 1.06 | 1.750 | 1.252 | 1-1/4-11.5 | 0.531 | -222 | 1/2"-13 x 1.50 | |
| | | 32 | 32 | 78 | 95 | 32 | 67 | 45 | 27 | 44 | 32 | | 13 | | | |
| P563108 | LI-24-24P-60 | 1.50 | 1.50 | 3.70 | 4.41 | 1.437 | 3.125 | 1.97 | 1.18 | 2.115 | 1.502 | 1-1/2-11.5 | 0.656 | -225 | 5/8"-11 x 1.75 | |
| | | 38 | 38 | 94 | 112 | 36 | 79 | 50 | 30 | 54 | 38 | | 17 | | | |

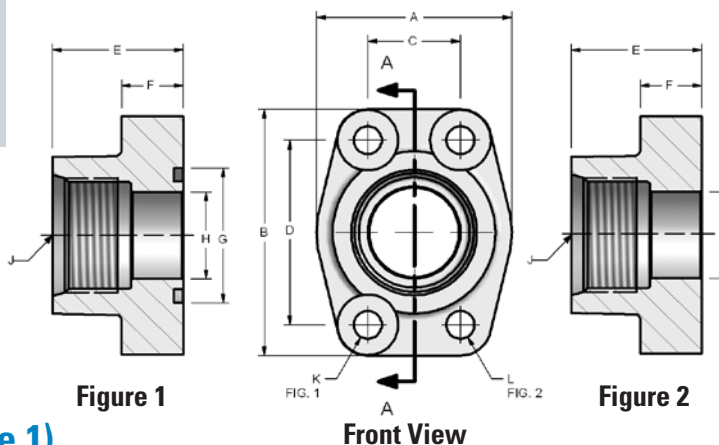
4-Bolt SAE Threaded Flange



Specifications

- Code 61 and 62
- SAE Straight Thread
- Buna-N® O-Ring
- Mounting hardware and O-Ring included on O-Ring models
- Maximum temperature with O-Ring 250°F/ 121°C

Buna-N® is a registered trademark of E. I. DuPont de Nemours and Company.



Code 61 Straight Thread, O-Ring (Figure 1)

| Donaldson Part No. | Reference | Port Size | Pad Size | Dimensions (in./mm) | | | | | | | | J UN/UNF-2B | K (Dia.) Drill | Mounting Hardware | |
|--------------------|--------------|-----------|----------|---------------------|----------|----------|----------|---------|---------|----------|----------|-------------|----------------|-------------------|-----------------|
| | | | | A | B | C | D | E | F | G | H | | | O-Ring | SHCS |
| P563090 | LI-12-12S-30 | 0.75/19 | 0.75/19 | 1.97/50 | 2.56/65 | 0.875/22 | 1.875/48 | 1.42/36 | 0.71/18 | 1.250/32 | 0.752/19 | 1 1/16"-12 | 0.406/10 | -214 | 3/8"-16 x 1.25 |
| P563095 | LI-16-16S-30 | 1.00/25 | 1.00/25 | 2.17/55 | 2.75/70 | 1.031/26 | 2.062/52 | 1.50/38 | 0.71/18 | 1.560/40 | 1.002/25 | 1 5/16"-12 | 0.406/10 | -219 | 3/8"-16 x 1.50 |
| P563102 | LI-20-20S-30 | 1.25/32 | 1.25/32 | 2.68/68 | 3.12/79 | 1.188/30 | 2.312/59 | 1.61/41 | 0.83/21 | 1.750/44 | 1.252/32 | 1 5/8"-12 | 0.469/12 | -222 | 7/16"-14 x 1.50 |
| P563109 | LI-24-24S-30 | 1.50/38 | 1.50/38 | 3.07/78 | 3.66/93 | 1.406/36 | 2.750/70 | 1.77/45 | 0.98/25 | 2.115/54 | 1.502/38 | 1 7/8"-12 | 0.531/13 | -225 | 1/2"-13 x 1.75 |
| P563115 | LI-32-32S-30 | 2.00/51 | 2.00/51 | 3.54/90 | 4.00/102 | 1.688/43 | 3.062/78 | 1.77/45 | 0.98/25 | 2.490/63 | 2.002/51 | 2 1/2"-12 | 0.531/13 | -228 | 1/2"-13 x 1.75 |

Code 61 Straight Thread, Flat Face (Figure 2)

| Donaldson Part No. | Reference | Port Size | Pad Size | Dimensions (in./mm) | | | | | | | | J UN/UNF-2B | L Tap UNC-2B |
|--------------------|---------------|-----------|----------|---------------------|---------|----------|----------|---------|---------|----------|----------|-------------|--------------|
| | | | | A | B | C | D | E | F | G | H | | |
| P563162 | LIC-12-12S-30 | 0.75/19 | 0.75/19 | 1.97/50 | 2.56/65 | 0.875/22 | 1.875/48 | 1.42/36 | 0.71/18 | 1.250/32 | 0.752/19 | 1 1/16"-12 | 3/8"-16 |
| P563165 | LIC-16-16S-30 | 1.00/25 | 1.00/25 | 2.17/55 | 2.75/70 | 1.031/26 | 2.062/52 | 1.50/38 | 0.71/18 | 1.560/40 | 1.002/25 | 1 5/16"-12 | 3/8"-16 |
| P563168 | LIC-20-20S-30 | 1.25/32 | 1.25/32 | 2.68/68 | 3.12/79 | 1.188/30 | 2.312/59 | 1.61/41 | 0.83/21 | 1.750/44 | 1.252/32 | 1 5/8"-12 | 7/16"-14 |

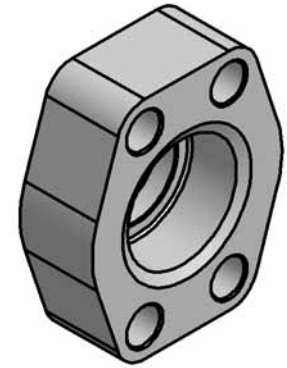
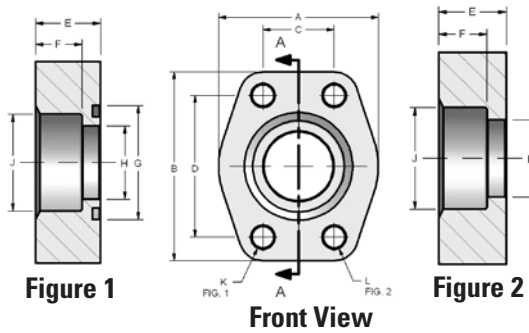
Code 62 Straight Thread, O-Ring (Figure 1)

| Donaldson Part No. | Reference | Port Size | Pad Size | Dimensions (in./mm) | | | | | | | | J UN/UNF-2B | K (Dia.) Drill | Mounting Hardware | |
|--------------------|--------------|-----------|----------|---------------------|----------|----------|----------|---------|---------|----------|----------|-------------|----------------|-------------------|-----------------|
| | | | | A | B | C | D | E | F | G | H | | | O-Ring | SHCS |
| P563096 | LI-16-16S-60 | 1.00/25 | 1.00/25 | 2.56/65 | 3.19/81 | 1.093/28 | 2.250/57 | 1.65/42 | 0.98/25 | 1.560/40 | 1.002/25 | 1 5/16"-12 | 0.492/12 | -219 | 7/16"-14 x 1.50 |
| P563103 | LI-20-20S-60 | 1.25/32 | 1.25/32 | 3.07/78 | 3.75/95 | 1.250/32 | 2.625/67 | 1.77/45 | 1.06/27 | 1.750/44 | 1.252/32 | 1 5/8"-12 | 0.531/13 | -222 | 1/2"-13 x 1.75 |
| P563110 | LI-24-24S-60 | 1.50/38 | 1.50/38 | 3.70/94 | 4.41/112 | 1.437/36 | 3.125/79 | 1.97/50 | 1.18/30 | 2.115/54 | 1.502/38 | 1 7/8"-12 | 0.656/17 | -225 | 5/8"-11 x 2.25 |

Flat Socket Weld Flange

Specifications

- Code 61 and 62



Code 61, O-Ring (Figure 1)

| Donaldson Part No. | Desc. | Pipe Size | Pad Size | Dimensions (in./mm) | | | | | | | | | | Mounting Hardware | |
|--------------------|--------------|-----------|----------|---------------------|-----------|----------|-----------|---------|----------|----------|----------|----------|----------|-------------------|---------------|
| | | | | A | B | C | D | E | F | G | H | J | K | O-Ring | SHCS |
| P563119 | LI-08-08W-30 | 0.50/13 | 0.50/13 | 1.813/46 | 2.125/54 | 0.688/17 | 1.500/38 | 0.75/19 | 0.560/14 | 1.000/25 | 0.502/13 | 0.855/22 | 0.344/9 | -210 | 5/16"-18x1.5 |
| P563120 | LI-12-12W-30 | 0.75/19 | 0.75/19 | 2.063/52 | 2.563/65 | 0.875/22 | 1.875/48 | 0.75/19 | 0.560/14 | 1.250/32 | 0.752/19 | 1.062/27 | 0.406/10 | -214 | 3/8"-16x1.5 |
| P563121 | LI-16-16W-30 | 1.00/25 | 1.00/25 | 2.313/59 | 2.750/70 | 1.031/26 | 2.063/52 | 0.88/22 | 0.630/16 | 1.560/40 | 1.002/25 | 1.328/34 | 0.406/10 | -219 | 3/8"-16x1.75 |
| P563122 | LI-20-20W-30 | 1.25/32 | 1.25/32 | 2.875/73 | 3.125/79 | 1.188/30 | 2.313/59 | 0.94/24 | 0.690/18 | 1.750/44 | 1.252/32 | 1.672/42 | 0.469/12 | -222 | 7/16"-14x1.75 |
| P563123 | LI-24-24W-30 | 1.50/38 | 1.50/38 | 3.250/83 | 3.688/94 | 1.406/36 | 2.750/70 | 1.19/30 | 0.750/19 | 2.115/54 | 1.502/38 | 1.922/49 | 0.531/13 | -225 | 1/2"-13x2.25 |
| P563124 | LI-32-32W-30 | 2.00/51 | 2.00/51 | 3.813/97 | 4.000/102 | 1.688/43 | 3.063/78 | 1.38/35 | 0.875/22 | 2.495/63 | 2.002/51 | 2.406/61 | 0.531/13 | -228 | 1/2"-13x2.5 |
| P563127 | LI-48-48W-30 | 3.00/76 | 3.00/76 | 5.156/131 | 5.313/135 | 2.438/62 | 4.188/106 | 2.12/54 | 1.250/32 | 3.615/92 | 3.002/76 | 3.547/90 | 0.656/17 | -237 | 5/8"-11x3.5 |

Code 61, Flat Face (Figure 2)

| Donaldson Part No. | Desc. | Pipe Size | Pad Size | Dimensions (in./mm) | | | | | | | | | | L UNC-2B |
|--------------------|---------------|-----------|----------|---------------------|-----------|----------|----------|---------|----------|----------|----------|----------|----------|----------|
| | | | | A | B | C | D | E | F | G | H | J | | |
| P563176 | LIC-12-12W-30 | 0.75/19 | 0.75/19 | 2.063/52 | 2.563/65 | 0.875/22 | 1.875/48 | 0.75/19 | 0.560/14 | 1.250/32 | 0.752/19 | 1.062/27 | 3/8"-16 | |
| P563177 | LIC-16-16W-30 | 1.00/25 | 1.00/25 | 2.313/59 | 2.750/70 | 1.031/26 | 2.063/52 | 0.88/22 | 0.630/16 | 1.560/40 | 1.002/25 | 1.328/34 | 3/8"-16 | |
| P563178 | LIC-20-20W-30 | 1.25/32 | 1.25/32 | 2.875/73 | 3.125/79 | 1.188/30 | 2.313/59 | 0.94/24 | 0.690/18 | 1.750/44 | 1.252/32 | 1.672/42 | 7/16"-14 | |
| P563179 | LIC-24-24W-30 | 1.50/38 | 1.50/38 | 3.250/83 | 3.688/94 | 1.406/36 | 2.750/70 | 1.19/30 | 0.750/19 | 2.115/54 | 1.502/38 | 1.922/49 | 1/2"-13 | |
| P563180 | LIC-32-32W-30 | 2.00/51 | 2.00/51 | 3.813/97 | 4.000/102 | 1.688/43 | 3.063/78 | 1.38/35 | 0.875/22 | 2.490/63 | 2.002/51 | 2.406/61 | 1/2"-13 | |
| P563181 | LIC-40-40W-30 | 2.50/64 | 2.50/64 | 4.281/109 | 4.500/114 | 2.000/51 | 3.500/89 | 1.75/44 | 1.000/25 | 2.995/76 | 2.502/64 | 2.906/74 | 1/2"-13 | |

Reservoir Accessories

- Suction strainers protect pumps from damage
- Diffusers for effectively reducing aeration, foaming, turbulence and noise caused by return lines
- Sight and level gauges available, including standard length, screw-in styles in plastic and steel for use in a variety of applications
- Plugs, caps and vents for small power units and gearboxes
- Filler breathers and caps in chrome, zinc epoxy-coated weatherproof finishes and corrosion-resistance technopolymer – lockable, dipsticks and side-mount versions available



T.R.A.P.[™] Breather Technology (Thermally Reactive Advanced Protection)

T.R.A.P. breathers provide fast-acting protection against airborne moisture and particulate contamination. It stops solid particulate down to 3 μm at 97% efficiency as well as prevents moisture from entering the reservoir. Water-holding capacity is regenerated with every oil return phase for long service life. Its self-regenerating capability enables extended life.

Learn more on page 264.

Suction Strainers

Flow Range: 0-300 *gpm* / 0-1,140 *lpm*

Outlet Port Size: 3/8" NPT to 4" NPT

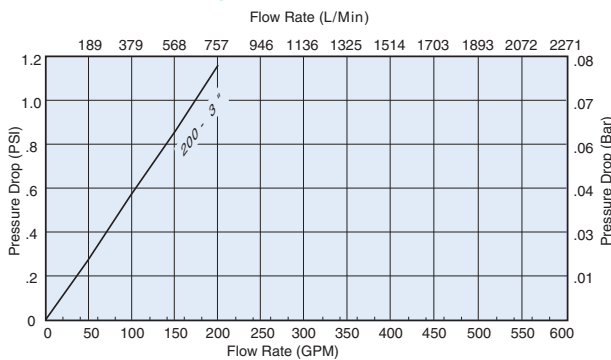
- Stainless Steel Mesh
- Steel or nylon fittings
- Operating temperatures:
Steel fitting to 250°F / 121°C
Nylon fitting to 210°F / 100°C
- Relief valve available



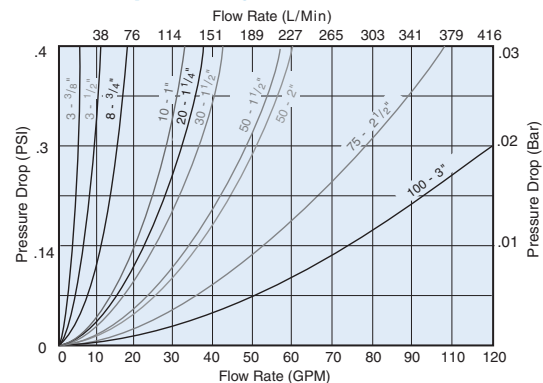
Features

Donaldson suction strainers are zinc-plated, with stainless steel mesh screens and rugged steel core centers epoxy bonded to heavy gauge connector and end caps. Suction strainers filter petroleum-based hydraulic fluids, phosphate esters, water glycols, lubricating oils, coolants, fuels and water in fluid reservoirs, sumps and similar applications. They are cleanable and reusable. Clean by swishing in non-caustic solvent, then blow dry from inner diameter to outer diameter with compressed air.

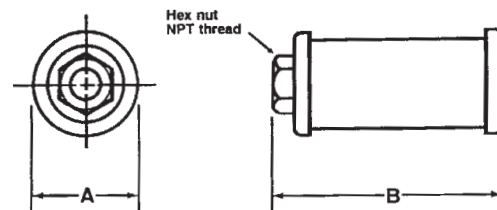
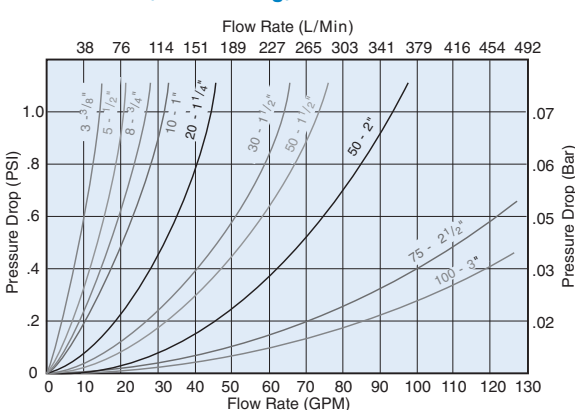
SEC (Steel Fitting) 200-300



PEC (Nylon Fitting) 3-100



SEH/SEC (Steel Fitting) 3-100



Note: PEC and SEH model strainers have hex nut style outlet fittings. SEC model strainers have pipe coupling style (round) outlet fittings. All styles have NPT threads inside.

Suction Strainer Choices

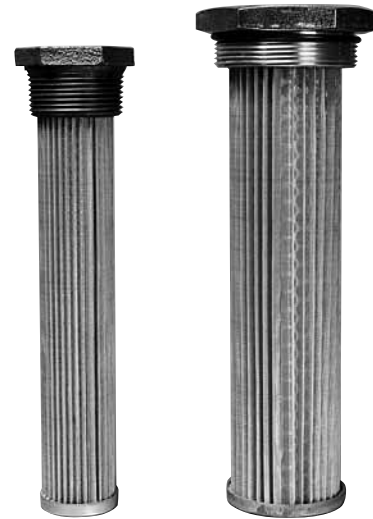
| | Donaldson Part No. | Description | Relief Valve Setting | Outlet Pipe Size | Wire Mesh Size | Dim. A (in./mm) | Dim. B (in./mm) | Screen Area (sq. in./sq. cm) | Max. Flow (gpm/lpm) | |
|---------------|--------------------|----------------------|----------------------|------------------|----------------|-----------------|-----------------|------------------------------|---------------------|------|
| NYLON FITTING | P562235 | PEC-3-3/8-100 | n/a | 3/8" NPT | 100 | 1.9/48 | 2.7/69 | 20/129 | 3/11 | |
| | P562240 | PEC-5-1/2-100 | n/a | 1/2" NPT | 100 | 1.9/48 | 4.3/109 | 25/161 | 5/19 | |
| | P562245 | PEC-8-3/4-100 | n/a | 3/4" NPT | 100 | 2.7/69 | 4.3/109 | 40/258 | 8/30 | |
| | P562246 | PEC-8-3/4-100-RV3 | 3 psid/0.2 bar | 3/4" NPT | 100 | 2.7/69 | 4.3/109 | 40/258 | 8/30 | |
| | P562244 | PEC-8-1-100 | n/a | 1" NPT | 100 | 2.7/69 | 4.3/109 | 40/258 | 8/30 | |
| | P562226 | PEC-10-1-100 | n/a | 1" NPT | 100 | 2.7/69 | 5.6/142 | 70/452 | 10/38 | |
| | P562227 | PEC-10-1-100-RV3 | 3 psid/0.2 bar | 1" NPT | 100 | 2.7/69 | 5.6/142 | 70/452 | 10/38 | |
| | P562228 | PEC-20-1.1/4-100 | n/a | 1-1/4" NPT | 100 | 3.4/86 | 5.6/142 | 128/826 | 20/75 | |
| | P562229 | PEC-20-1.1/4-100-RV3 | 3 psid/0.2 bar | 1-1/4" NPT | 100 | 3.4/86 | 5.6/142 | 128/826 | 20/75 | |
| | P562231 | PEC-20-1.1/4-200 | n/a | 1-1/4" NPT | 200 | 3.4/86 | 5.6/142 | 128/826 | 20/75 | |
| | P562232 | PEC-30-1.1/2-100 | n/a | 1-1/2" NPT | 100 | 3.4/86 | 5.6/142 | 128/826 | 30/113 | |
| | P562233 | PEC-30-1.1/2-100-RV3 | 3 psid/0.2 bar | 1-1/2" NPT | 100 | 3.4/86 | 5.6/142 | 128/826 | 30/113 | |
| | P562236 | PEC-50-1.1/2-100 | n/a | 1-1/2" NPT | 100 | 4/102 | 8/203 | 200/1290 | 50/188 | |
| | P562237 | PEC-50-1.1/2-100-RV3 | 3 psid/0.2 bar | 1-1/2" NPT | 100 | 4/102 | 8/203 | 200/1290 | 50/188 | |
| | P562238 | PEC-50-2-100 | n/a | 2" NPT | 100 | 4/102 | 10.4/264 | 200/1290 | 50/188 | |
| | P562239 | PEC-50-2-100-RV3 | 3 psid/0.2 bar | 2" NPT | 100 | 4/102 | 10.4/264 | 200/1290 | 50/188 | |
| | P562242 | PEC-75-2.1/2-100 | n/a | 2-1/2" NPT | 100 | 5.2/132 | 8.5/216 | 316/2039 | 75/282 | |
| | P562243 | PEC-75-2.1/2-100-RV3 | 3 psid/0.2 bar | 2-1/2" NPT | 100 | 5.2/132 | 8.5/216 | 316/2039 | 75/282 | |
| | P562223 | PEC-100-3-100 | n/a | 3" NPT | 100 | 5.2/132 | 11.5/292 | 379/2445 | 100/376 | |
| | P562224 | PEC-100-3-100-RV3 | 3 psid/0.2 bar | 3" NPT | 100 | 5.2/132 | 11.5/292 | 379/2445 | 100/376 | |
| | P562225 | PEC-100-3-100-SST | n/a | 3" NPT | 100 | 5.2/132 | 11.5/292 | 379/2445 | 100/376 | |
| | STEEL FITTING | P562221 | SEH-3-3/8-100 | n/a | 3/8" NPT | 100 | 1.9/48 | 2.5/64 | 34/219 | 3/11 |
| | | P169012 | SEH-5-1/2-100 | n/a | 1/2" NPT | 100 | 2.63/67 | 3.1/79 | 62/400 | 5/19 |
| | | P563305 | SEH-5-1/2-100-RV3 | 3 psid/0.2 bar | 1/2" NPT | 100 | 2.7/69 | 3.1/79 | 62/400 | 5/19 |
| | | P169013 | SEH-8-3/4-100 | n/a | 3/4" NPT | 100 | 2.63/67 | 3.55/90 | 68/439 | 8/30 |
| P173910 | | SEH-8-3/4-100-RV3 | 3 psid/0.2 bar | 3/4" NPT | 100 | 2.63/67 | 3.55/90 | 68/439 | 8/30 | |
| P169014 | | SEH-10-1-100 | n/a | 1" NPT | 100 | 2.63/67 | 5.35/136 | 110/710 | 10/38 | |
| P173911 | | SEH-10-1-100-RV3 | 3 psid/0.2 bar | 1" NPT | 100 | 2.63/67 | 5.35/136 | 110/710 | 10/38 | |
| P169015 | | SEH-20-1.1/4-100 | n/a | 1-1/4" NPT | 100 | 3.38/86 | 6.85/174 | 162/1045 | 20/75 | |
| P173912 | | SEH-20-1.1/4-100-RV3 | 3 psid/0.2 bar | 1-1/4" NPT | 100 | 3.38/86 | 6.85/174 | 162/1045 | 20/75 | |
| P169016 | | SEH-30-1.1/2-100 | n/a | 1-1/2" NPT | 100 | 3.38/86 | 8.01/203 | 225/1452 | 30/113 | |
| P173913 | | SEH-30-1.1/2-100-RV3 | 3 psid/0.2 bar | 1-1/2" NPT | 100 | 3.38/86 | 8.01/203 | 225/1452 | 30/113 | |
| P169017 | | SEH-50-1.1/2-100 | n/a | 1-1/2" NPT | 100 | 3.94/100 | 9.8/249 | 340/2194 | 50/188 | |
| P173914 | | SEH-50-1.1/2-100-RV3 | 3 psid/0.2 bar | 1-1/2" NPT | 100 | 3.94/100 | 9.8/249 | 340/2194 | 50/188 | |
| P562222 | | SEH-50-1.1/2-60 | n/a | 1-1/2" NPT | 60 | 3.94/100 | 9.8/249 | 340/2194 | 50/188 | |
| P169018 | | SEH-50-2-100 | n/a | 2" NPT | 100 | 3.94/100 | 9.8/249 | 340/2194 | 50/188 | |
| P173915 | | SEH-50-2-100-RV3 | 3 psid/0.2 bar | 2" NPT | 100 | 3.94/100 | 9.8/249 | 340/2194 | 50/188 | |
| P169019 | | SEC-75-2.1/2-100 | n/a | 2-1/2" NPT | 100 | 5.12/130 | 10.1/257 | 400/2581 | 75/282 | |
| P173916 | | SEC-75-2.1/2-100-RV3 | 3 psid/0.2 bar | 2-1/2" NPT | 100 | 5.12/130 | 10.1/257 | 400/2581 | 75/282 | |
| P169020 | | SEC-100-3-100 | n/a | 3" NPT | 100 | 5.12/130 | 11.78/299 | 500/3226 | 100/376 | |
| P173917 | | SEC-100-3-100-RV3 | 3 psid/0.2 bar | 3" NPT | 100 | 5.12/130 | 11.78/299 | 500/3226 | 100/376 | |
| P562211 | | SEC-100-3-60 | n/a | 3" NPT | 60 | 5.12/130 | 11.78/299 | 500/3226 | 100/376 | |
| P562212 | | SEC-100-3-60-RV3 | 3 psid/0.2 bar | 3" NPT | 60 | 5.12/130 | 11.78/299 | 500/3226 | 100/376 | |
| P562213 | | SEC-200-3-100 | n/a | 3" NPT | 100 | 8.1/206 | 11.3/287 | 965/6226 | 200/752 | |
| P562214 | | SEC-300-4-100 | n/a | 4" NPT | 100 | 8.1/206 | 15/381 | 1370/8839 | 300/1128 | |
| P171861 | | FIOA 20 | n/a | G3/8" | 90 | 2.05/52 | 3.03/77 | 29/184 | 2.7/10 | |
| P171869 | | FIOA 50 | n/a | G3/4" | 90 | 2.95/75 | 3.74/95 | 54/348 | 6.6/25 | |
| P171877 | | FIOA 90 | n/a | G1" | 90 | 2.95/75 | 5.55/141 | 86/554 | 12.0/45 | |
| P171885 | | FIOA 130 | n/a | G1 1/4" | 90 | 3.74/95 | 7.24/184 | | 17.3/65 | |
| P171889 | | FIOA 175 | n/a | G1 1/2" | 90 | 5.51/140 | 4.45/113 | 183/1178 | 22.6/85 | |

Tank Mounted Strainers

Flow Range: 0-100 gpm / 0-380 lpm

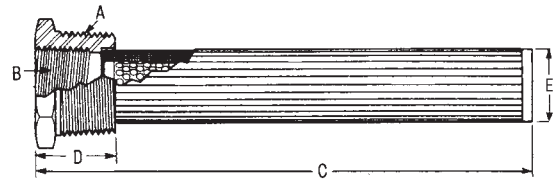
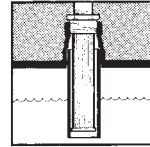
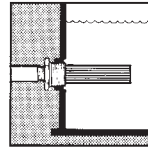
Outlet Port Size: 3/8" NPT to 1 1/4" NPT
or SAE-8 to SAE-20

- 140 Micron Stainless Steel Mesh
- Steel SAE bushing
- Cast iron NPT bushing
- Operating temperatures to 250°F / 121°C
- Relief valve available



Features

Tank mounted strainers offer easy installation. Access to reservoir interior is not needed. You can mount these units through a sidewall or through the tank top and into a standpipe.



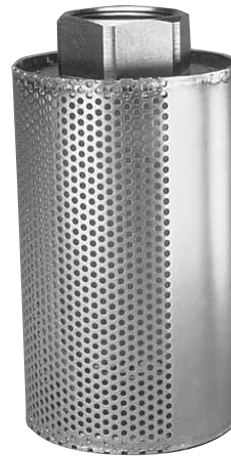
| Donaldson Part No. | Description | Relief Valve Setting | Wire Mesh Size | Dim. A | Dim. B | Dim. C (in./mm) | Dim. D (in./mm) | Dim. E (in./mm) | Screen Area (sq. in./sq. cm) | Max. Flow (gpm/lpm) |
|--------------------|----------------|----------------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------------------|---------------------|
| P562270 | TM-3-100 | n/a | 100 | 3/4" NPT | 1/2" NPT | 4/102 | 0.97/25 | 0.87/22 | 29/187 | 3/11 |
| P562274 | TM-5-100 | n/a | 100 | 1" NPT | 1/2" NPT | 5.34/136 | 1.06/27 | 1.17/30 | 35/226 | 5/19 |
| P562275 | TM-5-100-RV5 | 5 psid/0.35 bar | 100 | 1" NPT | 1/2" NPT | 5.34/136 | 1.06/27 | 1.17/30 | 35/226 | 5/19 |
| P562256 | TM-10-100 | n/a | 100 | 1-1/4" NPT | 3/4" NPT | 8.17/208 | 1.2/30 | 1.36/35 | 64/413 | 10/38 |
| P562257 | TM-10-100-RV5 | 5 psid/0.35 bar | 100 | 1-1/4" NPT | 3/4" NPT | 8.17/208 | 1.2/30 | 1.36/35 | 64/413 | 10/38 |
| P562259 | TM-10-60-RV5 | 5 psid/0.35 bar | 60 | 1-1/4" NPT | 3/4" NPT | 8.17/208 | 1.2/30 | 1.36/35 | 64/413 | 10/38 |
| P562260 | TM-15-100 | n/a | 100 | 1-1/2" NPT | 1" NPT | 8.2/208 | 1.22/31 | 1.66/42 | 86/555 | 15/56 |
| P562264 | TM-15-100-RV5 | 5 psid/0.35 bar | 100 | 1-1/2" NPT | 1" NPT | 8.2/208 | 1.22/31 | 1.66/42 | 86/555 | 15/56 |
| P562265 | TM-15-200-RV5 | 5 psid/0.35 bar | 200 | 1-1/2" NPT | 1" NPT | 8.2/208 | 1.22/31 | 1.66/42 | 86/555 | 15/56 |
| P562266 | TM-25-100 | n/a | 100 | 2" NPT | 1-1/4" NPT | 9.04/230 | 1.35/34 | 2.12/54 | 125/806 | 25/94 |
| P562267 | TM-25-100-RV5 | 5 psid/0.35 bar | 100 | 2" NPT | 1-1/4" NPT | 9.04/230 | 1.35/34 | 2.12/54 | 125/806 | 25/94 |
| P562269 | TM-25-200-RV5 | 5 psid/0.35 bar | 200 | 2" NPT | 1-1/4" NPT | 9.04/230 | 1.35/34 | 2.12/54 | 125/806 | 25/94 |
| P562271 | TM-50-100 | n/a | 100 | 3" NPT | 2" NPT | 9.7/246 | 1.7/43 | 3/76 | 260/1677 | 50/188 |
| P562272 | TM-50-100-RV3 | 3 psid/0.2 bar | 100 | 3" NPT | 2" NPT | 9.7/246 | 1.7/43 | 3/76 | 260/1677 | 50/188 |
| P562273 | TM-50-100-RV5 | 5 psid/0.35 bar | 100 | 3" NPT | 2" NPT | 9.7/246 | 1.7/43 | 3/76 | 260/1677 | 50/188 |
| P563306 | TM-100-100 | n/a | 100 | 4" NPT | 3" NPT | 11.3/287 | 1.8/46 | 4/102 | 315/2032 | 100/376 |
| P562255 | TM-100-100-RV5 | 5 psid/0.35 bar | 100 | 4" NPT | 3" NPT | 11.3/287 | 1.8/46 | 4/102 | 315/2032 | 100/376 |
| P562253 | STM-5-100 | n/a | 100 | 1-5/16" - 12 UN | 3/4" - 16 UN | 5.34/136 | 1.06/27 | 1.17/30 | 35/226 | 5/19 |
| P562254 | STM-5-100-RV5 | 5 psid/0.35 bar | 100 | 1-5/16" - 12 UN | 3/4" - 16 UN | 5.34/136 | 1.06/27 | 1.17/30 | 35/226 | 5/19 |
| P562247 | STM-10-100 | n/a | 100 | 1-5/8" - 12 UN | 1-1/16" - 12 UN | 8.17/208 | 1.2/30 | 1.36/35 | 64/413 | 10/38 |
| P562248 | STM-10-100-RV5 | 5 psid/0.35 bar | 100 | 1-5/8" - 12 UN | 1-1/16" - 12 UN | 8.17/208 | 1.2/30 | 1.36/35 | 64/413 | 10/38 |
| P562249 | STM-15-100 | n/a | 100 | 1-7/8" - 12 UN | 1-5/16" - 12 UN | 8.2/208 | 1.22/31 | 1.66/42 | 86/555 | 15/56 |
| P562250 | STM-15-100-RV5 | 5 psid/0.35 bar | 100 | 1-7/8" - 12 UN | 1-5/16" - 12 UN | 8.2/208 | 1.22/31 | 1.66/42 | 86/555 | 15/56 |
| P562251 | STM-25-100 | n/a | 100 | 2-1/2" - 12 UN | 1-5/8" - 12 UN | 9.04/230 | 1.35/34 | 2.12/54 | 125/806 | 25/94 |
| P562252 | STM-25-100-RV5 | 5 psid/0.35 bar | 100 | 2-1/2" - 12 UN | 1-5/8" - 12 UN | 9.04/230 | 1.35/34 | 2.12/54 | 125/806 | 25/94 |

Diffusers

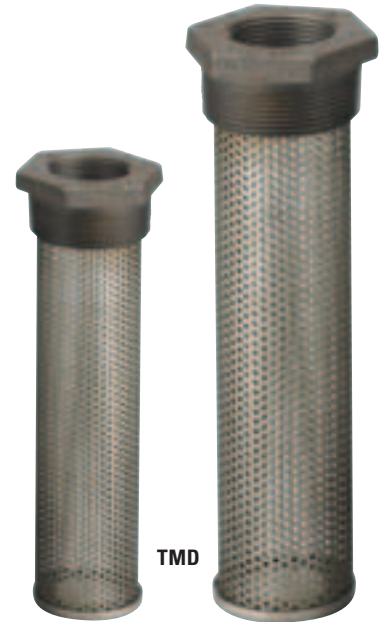
Specifications

- Perforated Steel
- Cast iron bushings (TMD-tank mount)
- Zinc-plated steel (DFD-return line)
- Operating temperatures to 250°F / 121°C

Flow Range: 0-450 gpm / 0-1,710 lpm



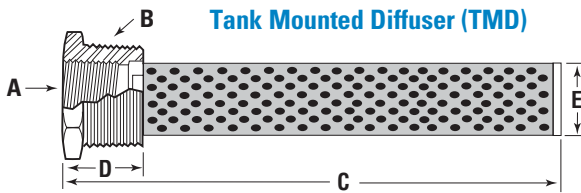
DFD



TMD

Features

Diffusers are highly effective in reducing aeration, foaming, turbulence and noise caused by return lines. Reservoir baffles can usually be eliminated, provided that the holes in the tube are positioned facing away from the pump suction inlet and below the reservoir oil level. Can be vertically or horizontally mounted with discharge side directed away from suction and preferably toward a tank wall or bottom.

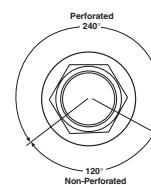


TMD - Tank Mount Diffusers

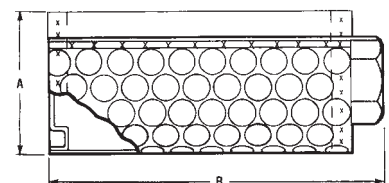
| Donaldson Part No. | Desc. | Rated Flow gpm/l/min | Dim. A Pipe Size | Dim. B Pipe Size | C (in./mm) | D (in./mm) | E (in./mm) |
|--------------------|--------|----------------------|------------------|------------------|------------|------------|------------|
| P562281 | TMD-5 | 5/19 | 1/2" NPT | 1" NPT | 5.34/135 | 1.06/28 | 1.17/29 |
| P562282 | TMD-10 | 10/38 | 3/4" NPT | 1-1/4" NPT | 8.17/207 | 1.2/30 | 1.36/34 |
| P562283 | TMD-15 | 15/59 | 1" NPT | 1-1/2" NPT | 8.2/208 | 1.22/31 | 1.66/42 |
| P562284 | TMD-25 | 25/95 | 1-1/4" NPT | 2" NPT | 9.04/229 | 1.35/34 | 2.12/53 |
| P562285 | TMD-50 | 50/189 | 2" NPT | 3" NPT | 9.7/246 | 1.7/43 | 3.0/76 |

DFD - Line Mount Diffusers

| Donaldson Part No. | Desc. | Rated Flow gpm/l/min | Pipe Size | A (in./mm) | B (in./mm) |
|--------------------|---------|----------------------|------------|------------|------------|
| P562287 | DFD-30 | 33/125 | 3/4" NPT | 3.4/86.3 | 3.0/76 |
| P562288 | DFD-60 | 53/201 | 1" NPT | 3.4/86.3 | 4.2/107 |
| P562289 | DFD-90 | 93/342 | 1-1/4" NPT | 3.4/86.3 | 6.5/165 |
| P562290 | DFD-120 | 126/479 | 1-1/2" NPT | 4.5/114.3 | 6.6/168 |
| P562291 | DFD-200 | 209/794 | 2" NPT | 4.5/114.3 | 10.3/262 |
| P562292 | DFD-250 | 300/1140 | 2-1/2" NPT | 5.25/133.4 | 13.0/330 |
| P562293 | DFD-300 | 450/1748 | 3" NPT | 5.25/133.4 | 15.5/394 |



Line Mounted Diffuser (DFD)



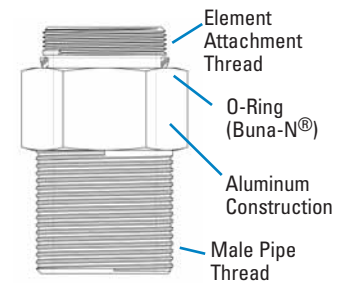
Breathers

Breathers are available in a variety of styles, materials and sizes. Breathers provide clean airflow into reservoirs and other storage containers where there is an exchange of air during changing fluid levels. In high moisture environments or applications with large changes in machine attitudes, breather caps with pressure relief and vacuum breakers limit air exchange and provide a positive suction head at the pump inlet.



Threaded Adapters for Creating Tank Breathers

| Donaldson Part No. | LHA Part No. | Male Pipe Thread | Element Attachment Thread | Length (in./mm) | Material |
|--------------------|--------------|------------------|---------------------------|-----------------|---------------|
| P173544 | GBF-15 | 3/4" NPT | 1"-12 UN | 2.50/64 | Aluminum |
| P173545 | GBF-50/60 | 1-1/4" NPT | 1-1/2"-16 UN | 3.00/76 | Aluminum |
| P562627 | GBF-10 | 3/4" NPT | 1-1/8"-16 UN | 1.65/42 | Steel |
| P562628 | ABGBA | Bayonet Fitting | 1-1/8"-16 UN | 1.36/35 | Technopolymer |
| P570353 | NA | Bayonet Fitting | 1-1/2"-16 UN | 2.74/695 | Technopolymer |



Buna-N® is a registered trademark of E. I. DuPont de Nemours and Company.

Direct Replacements for Schroeder Breathers

A replacement for Schroeder part ABF-3/10 is available as a breather+adapter set. For other Schroeder replacements and as an alternative on the ABF-3/10, you may purchase adapters and spin-on filters as separate items.

| Schroeder Part No. | Donaldson Spin-On Breather + Adapter Set | Adapter | Spin-On Breather |
|--------------------|--|---------|------------------|
| ABF-3/10 | P564425 | P562627 | P564424 |
| ABF-3/10-F | NA | P562628 | P564424 |
| MBF-3-M-P20 | NA | P173545 | P550386 |
| MBF-10-M-P20 | NA | P173545 | P550388 |

Replacement for Schroeder ABF3/10

P564425 Spin-On Breather & Adapter
P564424 Spin-On Breather only

Specifications:

Diameter: 3.69" / 93.7mm
Height: 3.6" / 91mm
Threads on adaptor: 3/4"-14 NPT



Spin-On Breather Filters

| Donaldson Part No. | Use with Adapter | Micron Rating | Length (in./mm) | Diameter (in./mm) | Flow (scfm/gpm/lpm) |
|--------------------|--------------------|----------------|-----------------|-------------------|---------------------|
| P564424 | P562627 or P562628 | 10 micron nom. | 3.6/91 | 3.7/94 | 15/112/421 |
| P556005 | P562627 or P562628 | 10 micron nom. | 5.4/137 | 3.7/94 | 23/172/647 |
| P551551 | P173544 | 10 micron nom. | 5.4/137 | 3.7/94 | 23/172/647 |
| P560693 | P173544 | 10 micron abs. | 5.4/137 | 3.7/94 | 23/172/647 |
| P564357 | P173544 | 5 micron abs. | 7.9/200 | 3.7/94 | 28/216/812 |
| P179089 | P173544 | 10 micron abs. | 7.9/200 | 3.7/94 | 28/216/812 |
| P169430 | P173545 | 3 micron abs. | 6.7/170 | 5.0/127 | 35/262/985 |
| P167832 | P173545 | 3 micron abs. | 10.7/272 | 5.0/127 | 42/314/1181 |
| P550386 | P173545 | 3 micron nom. | 6.7/170 | 5.0/127 | 35/262/985 |
| P550250 | P173545 | 3 micron nom. | 10.7/272 | 5.0/127 | 42/314/1181 |
| P167162 | P173545 | 5 micron abs. | 6.7/170 | 5.0/127 | 59/440/1654 |
| P165762 | P173545 | 5 micron abs. | 10.7/272 | 5.0/127 | 64/479/1801 |
| P550388 | P173545 | 10 micron nom. | 6.7/170 | 5.0/127 | 59/440/1654 |
| P550251 | P173545 | 10 micron nom. | 10.7/272 | 5.0/127 | 64/479/1801 |
| P165875 | P173545 | 10 micron abs. | 6.7/170 | 5.0/127 | 59/440/1654 |
| P165876 | P173545 | 10 micron abs. | 10.7/272 | 5.0/127 | 64/479/1801 |

T.R.A.P.™ Breather

Flow Rates to: 45 cfm
1270 lpm

Particulate Removal to: 3 μm

Moisture Removal: Reversible
Adsorption



Features

Donaldson breathers with Thermally Reactive Advanced Protection (T.R.A.P.™) provide fast-acting protection for hydraulic reservoirs against airborne moisture and particulate contamination. Donaldson T.R.A.P. technology strip moisture vapor from intake air and expel the moisture back to the atmosphere. Moisture is prevented from entering and is actually “pumped” out with each flow cycle. T.R.A.P. media regenerates its water-holding capacity, which leads to longer service life – 3 to 4 times the life of conventional desiccant breathers.

- Electronic Indicator**
 Actuated by pressure differential, flashes red to indicate changeout is needed. Indicator setting, 1 psid/6.9 kPa. Indicator power source: 3V lithium battery CR2032.
- Mechanical Indicator Kits**
 Install kit between reservoir and T.R.A.P. breather. Lock-up style indicator with manual reset. Highly visible, bright red band shows when restriction limit is reached. Indicator setting, 20" H₂O/5.0 kPa.
- Oil Splash and Mist Containment**
 Keeps oil inside reservoir.
- Easy To Install**
 Lightweight—simply hand tighten.
- Rugged Design**
 Effective to -40°F (-40°C). Robust housing protects media. Because it withstands high vibration, T.R.A.P. is suitable for both stationary and mobile applications.

Operating Temperature

- -40°F to 200°F / -40°C to 93°C
- Intermittent operation to 250°F / 121°C

Particulate Removal Efficiency

- 3 μm at 97%

Connection Sizes

- 1" and 3/4" NPT, 3/4" BSP Bayonet
- 1/4" and 3/8" NPT, 9/16"-18UN

Flow Rates

- 45 cfm / 1274 lpm
- 25 cfm / 708 lpm
- 3 cfm / 85 lpm

Indicator Setpoint

- 1 psid / 6.9 kPa

Materials

- Large - ABS
- Medium - Steel
- Mini - Glass-filled Nylon

Self-Regenerating T.R.A.P. Breather Choices

| Donaldson Part Number | Description | Connection | Maximum Flow (cfm/lpm) | Indicator | Moisture Removal | Oil/Splash Containment | Diameter (in./mm) | Total Height (in./mm) |
|-----------------------|------------------|----------------|------------------------|----------------|------------------|------------------------|-------------------|-----------------------|
| X920006 | X-Large-Urethane | 1½" NPT Female | 67/1893 | std mechanical | Yes | No | 6.50/165 | 16/407 |
| P566151 | Large-ABS | 1" NPT | 45/1274 | opt mechanical | Yes | Yes | 4.50/114 | 4.52/115 |
| P566156 | Large-ABS | Bayonet | 45/1274 | none | Yes | Yes | 4.50/114 | 6.56/166.5 |
| P564669 | Large-ABS | 1" NPT | 45/1274 | electronic | Yes | Yes | 4.50/114 | 4.52/115 |
| P565616 | Large-ABS | Bayonet | 45/1274 | electronic | Yes | Yes | 4.50/114 | 6.56/166.5 |
| P565857 | Medium-Steel | ¾" NPT | 25/708 | opt mechanical | Yes | Yes | 3.18/80.8 | 2.87/72.9 |
| P565858 | Medium-Steel | Bayonet | 25/708 | none | Yes | Yes | 3.18/80.8 | 1.70/43.2 |
| P566037 | Medium-Steel | ¾" BSP | 25/708 | none | Yes | Yes | 3.18/80.8 | 2.87/72.9 |
| P566174 | Mini-Nylon | 9/16"-18 UNF | 3/85 | none | Yes | Yes | 1.65/41.9 | 2.18/55.4 |
| P567390 | Mini-Nylon | 3/8" NPT | 3/85 | none | Yes | Yes | 1.65/41.9 | 2.18/55.4 |
| P567392 | Mini-Nylon | ¼" NPT | 3/85 | none | Yes | Yes | 1.65/41.9 | 2.18/55.4 |

Mini Particulate Breathers

| | | | | | | | | |
|---------|------------|--------------|------|------|----|-----|-----------|-----------|
| P567931 | Mini-Nylon | 9/16"-18 UNF | 3/85 | none | No | Yes | 1.65/41.9 | 2.18/55.4 |
| P567932 | Mini-Nylon | 3/8" NPT | 3/85 | none | No | Yes | 1.65/41.9 | 2.18/55.4 |
| P567933 | Mini-Nylon | ¼" NPT | 3/85 | none | No | Yes | 1.65/41.9 | 2.18/55.4 |

Mechanical Indicator Kit - For use with P566151 & P565857* (*requires customer-supplied ¾"x1" NPT reducer)

| | | | | | | | | |
|---------|--------------------------|-----------------|--|--------------------------|--|--|-----|-----------|
| P566168 | Mechanical Indicator Kit | 1" NPT coupling | | 20" H2O/5 kPa trip point | | | n/a | 2.41/61.2 |
|---------|--------------------------|-----------------|--|--------------------------|--|--|-----|-----------|

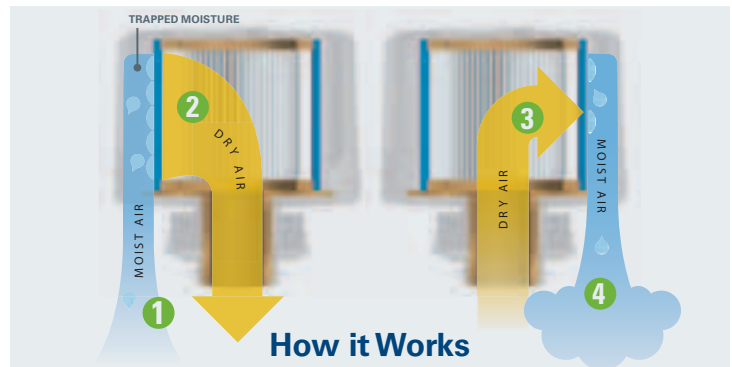
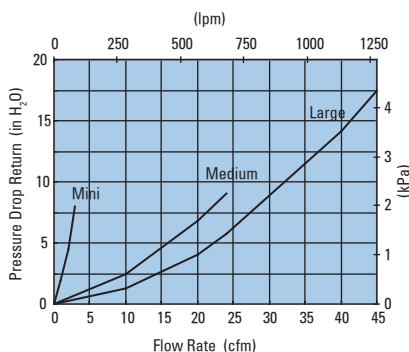
Bayonet Style Filler Basket / Flange Kits - For use with bayonet style T.R.A.P. Breathers

| | | | | | | | | |
|---------|-----------------|-------------------------|--|--|--|--|-----------|-----------|
| P566321 | 3" SS basket | 6-bolt 2.81/71.4 circle | | | | | 3.38/85.9 | 3.66/93.1 |
| P563874 | 4" Nylon basket | 6-bolt 2.81/71.4 circle | | | | | 3.38/85.9 | 4.59/117 |
| P563453 | 6" SS basket | 6-bolt 2.81/71.4 circle | | | | | 3.38/85.9 | 6.74/172 |

T.R.A.P. Breather Sizing

| Trap Model | Hydraulic System (gal/l) | In-plant Lube (gal/l) | Outside (gal/l) |
|------------|--------------------------|-----------------------|-----------------|
| Standard | 100/375 | 500/1875 | 250/938 |
| Metal | 40/150 | 200/750 | 100/375 |
| Mini | 4/15 | 20/75 | 10/38 |

T.R.A.P. Performance Data



INTAKE CYCLE (INHALATION)

- The circuit "breathes in" air containing moisture vapor.
- The T.R.A.P. breather strips moisture and particulate from the incoming air, allowing only clean, dry air to enter the circuit.

OUTFLOW CYCLE (EXHALATION)

- During the "exhalation" cycle, The T.R.A.P. breather allows unrestricted airflow outward.
- The outflow of dry air picks up the moisture collected by the T.R.A.P. Breather during intake, and "blows it back out" – fully regenerating the breather's water-holding capacity.

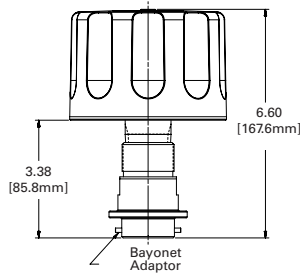
T.R.A.P.™ Breather Specifications

See page 322 for more details on the X920006 X-Large Urethane breather.

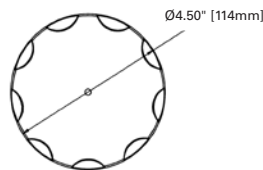
Standard P565616

P566156 (no indicator version)

Available with or without electronic indicator

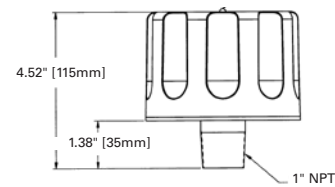


Top View

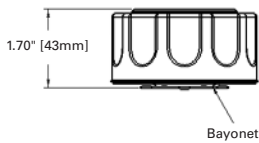


P564669 (optional mechanical)

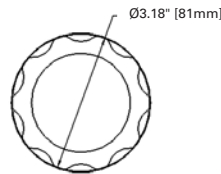
P566151 (no indicator version)



Metal P565858

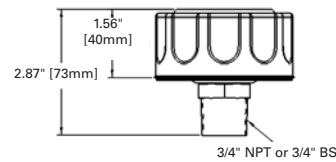


Top View



P565857 (3/4" NPT version, optional mechanical)

P566037 (3/4" BSP version)

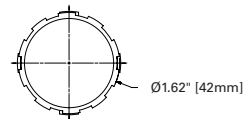
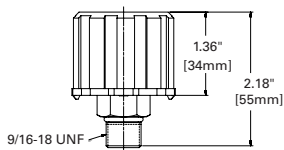


Mini P566174

P567390

P567392

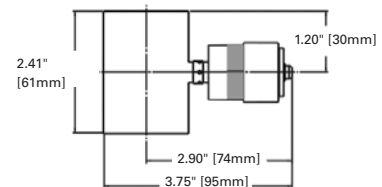
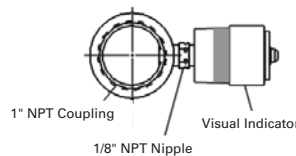
Top View



Mechanical Indicator Kit P566168

Suitable for use with P566151 and P565857*

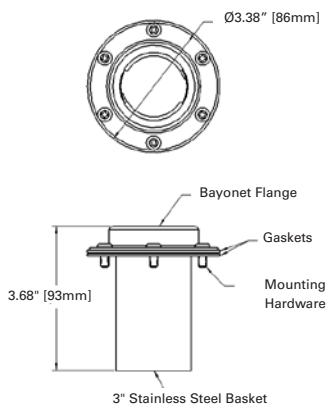
*Requires additional 3/4" x 1" reducer bushing (supplied by customer)



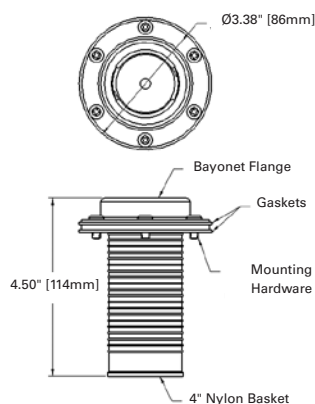
Bayonet Style Filler Basket/Flange Kits

Use with any bayonet style T.R.A.P. Breather

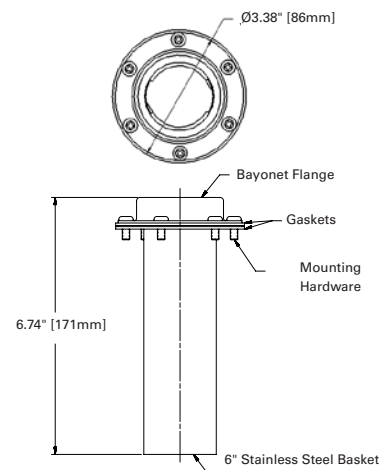
P566321



P563874



P563453



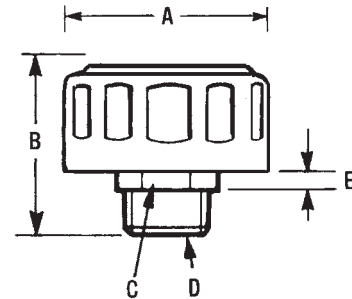
ABS, MBS Series

Specifications

- Chrome plated, epoxy coated or zinc plated steel cap
- Airflow to 30 cfm/850 lpm
- Compatible with petroleum based fluids
- Temperature to 212°F / 100°C
- 1/2", 3/4" and 1" NPT on ABS
- 1/4" and 3/8" NPT on MBS

Options

- 3, 10 and 40 micron (ABS), 10 and 40 micron (MBS)
- Dipstick available on some ABS models
- Zinc and epoxy coated weather-proof cap versions



| Donaldson Part No. | Reference | Micron Rating | Airflow Capacity (cfm/lpm) | A (in./mm) | B (in./mm) | C (in./mm) | D | E (in./mm) | Finish |
|--------------------|--------------|---------------|----------------------------|------------|------------|------------|----------|------------|--------------------|
| P562510 | MBS-10-N04 | 10 µm | 10/283 | 1.85/47 | 2.0/51 | .75/19 | 1/4" NPT | .2/5 | Chrome Plated |
| P562511 | MBS-10-N06 | 10 µm | 10/283 | 1.85/47 | 2.0/51 | .75/19 | 3/8" NPT | .2/5 | Chrome Plated |
| P562512 | MBS-40-N04 | 40 µm | 10/283 | 1.85/47 | 2.0/51 | .75/19 | 1/4" NPT | .2/5 | Chrome Plated |
| P562514 | MBS-40-N06 | 40 µm | 10/283 | 1.85/47 | 2.0/51 | .75/19 | 3/8" NPT | .2/5 | Chrome Plated |
| P562516 | MBS-Z-10-N06 | 10 µm | 10/283 | 1.85/47 | 2.0/51 | .75/19 | 3/8" NPT | .2/5 | Zinc Plated |
| P562517 | ABS-03-N12 | 3 µm | 30/850 | 3.15/80 | 2.8/71 | 1.18/30 | 3/4" NPT | .5/13 | Chrome Plated |
| P562518 | ABS-10-B12 | 10 µm | 30/850 | 3.15/80 | 2.8/71 | 1.18/30 | 3/4" BSP | .5/13 | Chrome Plated |
| P562519 | ABS-10-N08 | 10 µm | 30/850 | 3.15/80 | 2.8/71 | 1.18/30 | 1/2" NPT | .5/13 | Chrome Plated |
| P562520 | ABS-10-N12 | 10 µm | 30/850 | 3.15/80 | 2.8/71 | 1.18/30 | 3/4" NPT | .5/13 | Chrome Plated |
| P562521 | ABS-10-N16 | 10 µm | 30/850 | 3.15/80 | 2.8/71 | 1.18/30 | 1" NPT | .5/13 | Chrome Plated |
| P562522 | ABS-40-N08 | 40 µm | 30/850 | 3.15/80 | 2.8/71 | 1.18/30 | 1/2" NPT | .5/13 | Chrome Plated |
| P562523 | ABS-40-N12 | 40 µm | 30/850 | 3.15/80 | 2.8/71 | 1.18/30 | 3/4" NPT | .5/13 | Chrome Plated |
| P562524 | ABS-40-N16 | 40 µm | 30/850 | 3.15/80 | 2.8/71 | 1.18/30 | 1" NPT | .5/13 | Chrome Plated |
| P562525 | ABS-W-03-N12 | 3 µm | 30/850 | 3.15/80 | 2.8/71 | 1.18/30 | 3/4" NPT | .5/13 | Epoxy Coated Black |
| P562526 | ABS-W-10-N08 | 10 µm | 30/850 | 3.15/80 | 2.8/71 | 1.18/30 | 1/2" NPT | .5/13 | Epoxy Coated Black |
| P562527 | ABS-W-10-N12 | 10 µm | 30/850 | 3.15/80 | 2.8/71 | 1.18/30 | 3/4" NPT | .5/13 | Epoxy Coated Black |
| P562528 | ABS-W-10-N16 | 10 µm | 30/850 | 3.15/80 | 2.8/71 | 1.18/30 | 1" NPT | .5/13 | Epoxy Coated Black |
| P563901 | ABS-W-40-B12 | 40 µm | 30/850 | 3.15/80 | 2.8/71 | 1.18/30 | 3/4" BSP | .5/13 | Epoxy Coated Black |
| P562529 | ABS-W-40-N12 | 40 µm | 30/850 | 3.15/80 | 2.8/71 | 1.18/30 | 3/4" NPT | .5/13 | Epoxy Coated Black |
| P562530 | ABS-W-40-N16 | 40 µm | 30/850 | 3.15/80 | 2.8/71 | 1.18/30 | 1" NPT | .5/13 | Epoxy Coated Black |
| P562531 | ABS-Z-10-N16 | 10 µm | 30/850 | 3.15/80 | 2.8/71 | 1.18/30 | 1" NPT | .5/13 | Zinc Plated |
| P562532 | ABS-Z-40-N08 | 40 µm | 30/850 | 3.15/80 | 2.8/71 | 1.18/30 | 1/2" NPT | .5/13 | Zinc Plated |
| P562533 | ABS-Z-40-N12 | 40 µm | 30/850 | 3.15/80 | 2.8/71 | 1.18/30 | 3/4" NPT | .5/13 | Zinc Plated |

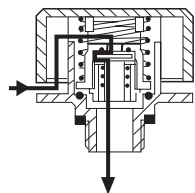
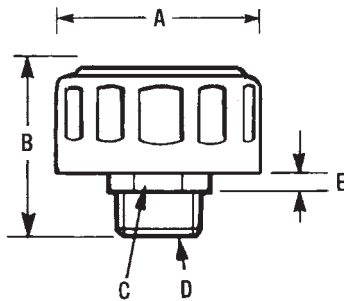
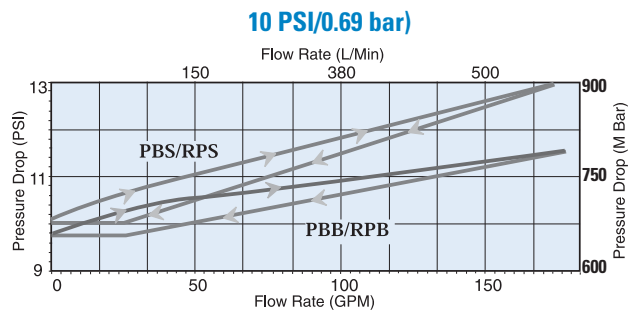
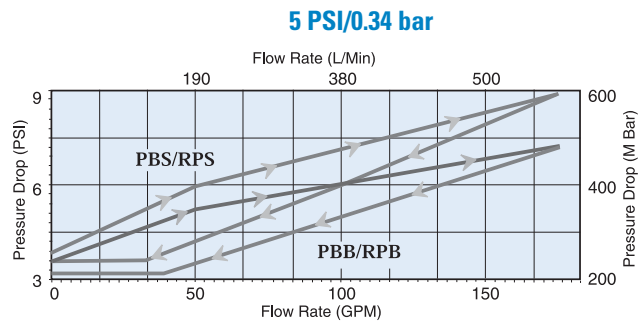
PBS Series Pressure Filler Breather Cap - Screw In Style



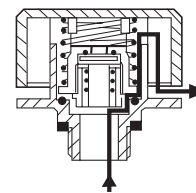
Specifications

- Chrome plated or epoxy coated steel cap
- Air intake valve opens at 0.435 *psi* / 3 *kPa*
- Compatible with petroleum based fluids
- Temperature range
-22°F to +240°F / -30°C to 115°C
- Buna-N® gaskets standard
- 10 and 40 micron available
- Relief valve settings at 5 *psi* / 0.34 bar or 10 *psi* / 0.69 bar full rate flow

Buna-N® is a registered trademark of E. I. DuPont de Nemours and Company.



Air intake in the reservoir through vacuum breaker when pressure decreases (.435 psi)



Venting to atmosphere through relief valve to maintain a 5 or 10 psi full rated flow

| Donaldson Part No. | Description | Micron Rating | Airflow Capacity (cfm/lpm) | Relief Valve Setting (psi/bar) | Dim. A (in./mm) | Dim. B (in./mm) | Dim. C (in./mm) | Dim. D (in./mm) | Dim. E (in./mm) | Finish |
|--------------------|-----------------|---------------|----------------------------|--------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|--------------------|
| P563362 | PBS-10-10-N12 | 10 µm | 30/850 | 10/0.69 | 3.15 / 80 | 2.8 / 71 | 1.18 / 30 | 3/4" NPT | .5 / 13 | Chrome Plated |
| P563363 | PBS-10-10-N16 | 10 µm | 30/850 | 10/0.69 | 3.15 / 80 | 2.8 / 71 | 1.18 / 30 | 1" NPT | .5 / 13 | Chrome Plated |
| P563365 | PBS-10-5-N12 | 10 µm | 30/850 | 5/0.34 | 3.15 / 80 | 2.8 / 71 | 1.18 / 30 | 3/4" NPT | .5 / 13 | Chrome Plated |
| P563366 | PBS-10-5-N16 | 10 µm | 30/850 | 5/0.34 | 3.15 / 80 | 2.8 / 71 | 1.18 / 30 | 1" NPT | .5 / 13 | Chrome Plated |
| P563367 | PBS-40-10-N12 | 40 µm | 30/850 | 10/0.69 | 3.15 / 80 | 2.8 / 71 | 1.18 / 30 | 3/4" NPT | .5 / 13 | Chrome Plated |
| P563368 | PBS-40-5-N12 | 40 µm | 30/850 | 5/0.34 | 3.15 / 80 | 2.8 / 71 | 1.18 / 30 | 3/4" NPT | .5 / 13 | Chrome Plated |
| P563369 | PBS-40-5-N16 | 40 µm | 30/850 | 5/0.34 | 3.15 / 80 | 2.8 / 71 | 1.18 / 30 | 1" NPT | .5 / 13 | Chrome Plated |
| P563370 | PBS-W-10-5-N12 | 10 µm | 30/850 | 5/0.34 | 3.15 / 80 | 2.8 / 71 | 1.18 / 30 | 3/4" NPT | .5 / 13 | Epoxy Coated Black |
| P563371 | PBS-W-40-10-N12 | 40 µm | 30/850 | 10/0.69 | 3.15 / 80 | 2.8 / 71 | 1.18 / 30 | 3/4" NPT | .5 / 13 | Epoxy Coated Black |
| P563372 | PBS-W-40-5-N12 | 40 µm | 30/850 | 5/0.34 | 3.15 / 80 | 2.8 / 71 | 1.18 / 30 | 3/4" NPT | .5 / 13 | Epoxy Coated Black |

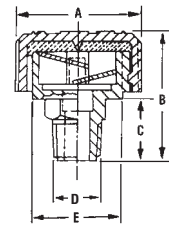
Filler Breather Caps

Specifications

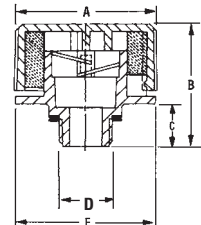
- High impact-resistant technopolymer construction
- Cap diameters 1.22"/31mm, 1.65"/42 mm, 2.24"/57 mm and 2.75"/70 mm
- Compatible with petroleum and water based fluids
- Temperature range
-22°F to +240°F / -30°C to +115°C
- Displacements to 250 gpm/946 lpm without baffle
- Displacements to 144 gpm/547 lpm with anti-splash baffle



CPS / DPS / LPS



BPS / RPS

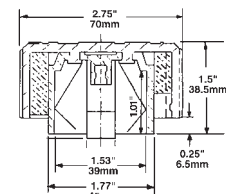


| Donaldson Part No. | Description* | Micron Rating | Airflow Capacity (cfm/lpm) | Relief Valve Setting (psi/bar) | Dim. A (in./mm) | Dim. B (in./mm) | Dim. C (in./mm) | Dim. D (in.) | Dim. E (in./mm) |
|--------------------|--------------|---------------|----------------------------|--------------------------------|-----------------|-----------------|-----------------|--------------|-----------------|
| P562494 | DPS-40-N04 | 40 µm | 4.9/139 | n/a | 1.65/42 | 2.05/52 | .71/18 | 1/4" NPT | 1.2/30 |
| P562495 | DPS-40-N04-A | 40 µm | 2.1/59 | n/a | 1.65/42 | 2.05/52 | .71/18 | 1/4" NPT | 1.2/30 |
| P563614 | DPS-40-N06 | 40 µm | 11.7/331 | n/a | 1.65/42 | 2.05/52 | .71/18 | 3/8" NPT | 1.2/30 |
| P562497 | DPS-40-N06-A | 40 µm | 5/142 | n/a | 1.65/42 | 2.05/52 | .71/18 | 3/8" NPT | 1.2/30 |
| P562502 | DPS-40-N12 | 40 µm | 12.5/354 | n/a | 1.65/42 | 2.05/52 | .71/18 | 3/4" NPT | 1.2/30 |
| P562503 | DPS-40-N12-A | 40 µm | 5.4/153 | n/a | 1.65/42 | 2.05/52 | .71/18 | 3/4" NPT | 1.2/30 |
| P562483 | CPS-40-N12 | 40 µm | 27/765 | n/a | 2.24/57 | 1.85/47 | .87/22 | 3/4" NPT | 1.53/39 |
| P562484 | CPS-40-N12-A | 40 µm | 13.5/382 | n/a | 2.24/57 | 1.85/47 | .87/22 | 3/4" NPT | 1.53/39 |
| P562480 | BPS-10-N12-A | 10 µm | 19.3/547 | n/a | 2.75/70 | 2.48/63 | .83/21 | 3/4" NPT | 2.68/68 |
| P562481 | BPS-40-N12 | 40 µm | 33.4/946 | n/a | 2.75/70 | 2.48/63 | .83/21 | 3/4" NPT | 2.68/68 |
| P562482 | BPS-40-N12-A | 40 µm | 19.3/547 | n/a | 2.75/70 | 2.48/63 | .83/21 | 3/4" NPT | 2.68/68 |
| P562492 | RPS-40-5-N12 | 40 µm | 30/850 | 5/0.34 | 2.75/70 | 2.48/63 | .83/21 | 3/4" NPT | 2.68/68 |

* -A = anti-splash

| Donaldson Part No. | Desc. | Micron Rating | Airflow Capacity (cfm./lpm) | Dim. A (in./mm) | Dim. B (in./mm) | Dim. C (in./mm) | Dim. D (in./mm) | Comment |
|--------------------|--------|---------------|-----------------------------|-----------------|-----------------|-----------------|-----------------|-------------------------|
| P562476 | ABO-10 | 10 µm | 30/850 | 2.75/70 | 1.5/39 | .25/7 | 1.77/45 | Fits over 1.50" OD tube |
| P562477 | ABO-40 | 40 µm | 30/850 | 2.75/70 | 1.5/39 | .25/7 | 1.77/45 | Fits over 1.50" OD tube |

ABO



Filler Breather Assemblies

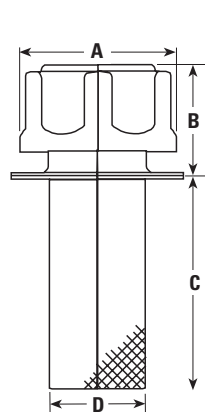
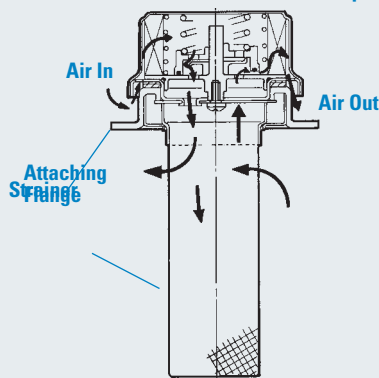
Features

- Removable 500 µm mesh strainer. (Except model P171848, which has a non-removable strainer.)
- 10 µm air breather/filter.
- Models P171855 & P171848 include drilled flanges with attaching screws.

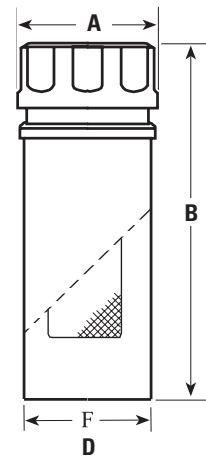
How it Works

As fluid levels rise and fall inside the reservoir, air flows in and out through the strainer and breather as shown below. The breather filter inside the cap removes contaminants as small as 10 µm from the air to keep airborne contaminant from entering the fluid. The strainer removes large particles from fluid as it is added to the reservoir.

Breather Filter is inside cap



P171848
P171855
P171856



P171859
P171860

Filler Breather Specifications

| Part No. | FLANGE SPECIFICATIONS | | | | Flow (gpm/lpm) | FILLER BREATHER SPECIFICATIONS | | | |
|-----------|-----------------------|----------------|--------------------|-------------|----------------|--------------------------------|------------|------------|------------|
| | Outer Dia. (in./mm) | No. of Holes | Hole Dia. (in./mm) | Bolt Circle | | A (in./mm) | B (in./mm) | C (in./mm) | D (in./mm) |
| P171848 | 2.01/51 | 3 | .22/5.5 | 1.61/41 | 70/270 | 1.81/45 | 1.38/35 | 2.48/63 | 1.1/28 |
| P171855 | 3.31/84 | 6 | .22/5.5 | 2.88/73 | 124/470 | 2.76/70 | 1.81/46 | 3.94/100 | 1.5/38 |
| P171856 | 3.31/84 | n/a | n/a | | 124/470 | 2.76/70 | 1.81/46 | 3.94/100 | 1.15/38 |
| P171859 | | n/a - weldable | | | 124/470 | 2.76/70 | 7.09/180 | 2.50/64 | |
| P171860 * | | n/a - weldable | | | 124/470 | 2.76/70 | 7.09/180 | 2.50/64 | |

* For pressurized reservoirs at 5.8 psi/0.4 bar relief pressure.

Filler Cap Only (Replacement)

P173292 — fits P171855, P171856, P171859

P173364 for pressurized reservoir — fits P171860

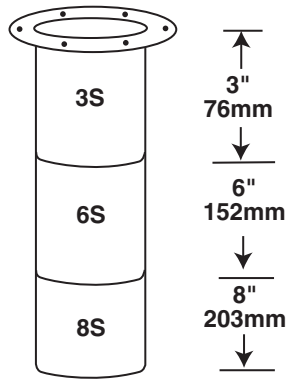
ABB Series Filler Breathers - Bayonet Style

Specifications

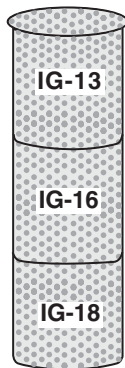
- Chrome plated, epoxy coated or zinc plated steel caps
- Airflow to 30 cfm/850 lpm
- Compatible with petroleum based fluids
- 30 mesh technopolymer basket
- Self tapping screws for flange mount
- Cork gaskets
- 3, 10, or 40 micron



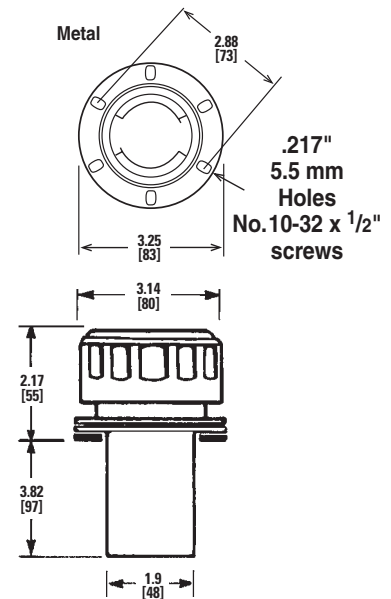
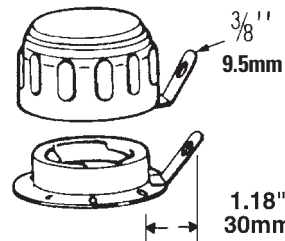
30 MESH STAINLESS STEEL BASKETS



INNER GUARDS



LOCKING TABS (AB ONLY)

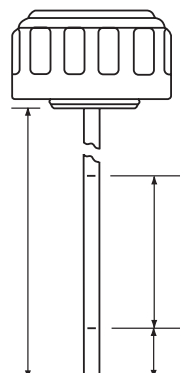
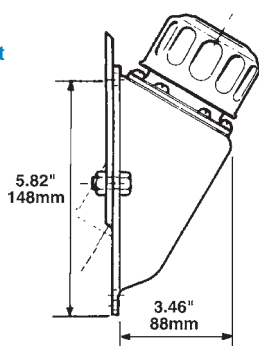


| Donaldson Part No. | Reference | Features | Micron Rating | Finish |
|--------------------|----------------|----------------------------------|---------------|---------------------|
| P562610 | ABB-W-03-8S-IG | 8" STAINLESS BASKET, INNER GUARD | 3 µm | Epoxy Coated, Black |
| P562611 | ABB-W-10-3S | 3" STAINLESS BASKET | 10 µm | Epoxy Coated, Black |
| P562612 | ABB-W-10-3S-LT | 3" STAINLESS BASKET, LOCK TAB | 10 µm | Epoxy Coated, Black |
| P562614 | ABB-W-10-N | NYLON BASKET | 10 µm | Epoxy Coated, Black |
| P562616 | ABB-W-10-N-R | NYLON BASKET, BUNA-N® GASKET | 10 µm | Epoxy Coated, Black |
| P562618 | ABB-W-40-3S | 3" STAINLESS BASKET | 40 µm | Epoxy Coated, Black |
| P562619 | ABB-W-40-6S | 6" STAINLESS BASKET | 40 µm | Epoxy Coated, Black |
| P562620 | ABB-W-40-N | NYLON BASKET | 40 µm | Epoxy Coated, Black |
| P562623 | ABB-Z-40-3S | 3" STAINLESS BASKET | 40 µm | Zinc Plated |
| P562624 | ABB-Z-40-3S-LT | 3" STAINLESS BASKET, LOCK TAB | 40 µm | Zinc Plated |
| P562625 | ABB-Z-40-N | NYLON BASKET | 40 µm | Zinc Plated |
| P562626 | ABB-Z-40-N-R | NYLON BASKET, BUNA-N GASKET | 40 µm | Zinc Plated |

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Side Mount

Can be used with all Bayonet and Threaded Flange Breathers (except MBB & Pressurized Breathers). Maximum torque for fastening 112 in. lbs. with washers.



Dipsticks available for some models. See Features section on assembly tables.

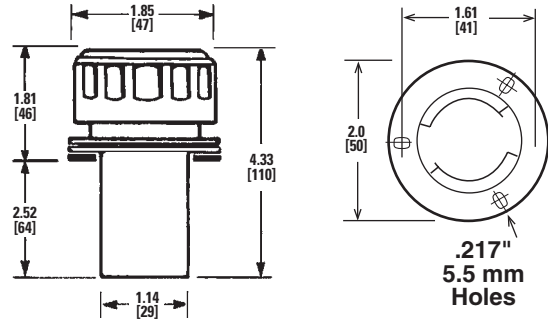
Chrome ABB Series Filler Breathers - Bayonet Style

Airflow to 30 cfm/850 lpm

| Donaldson Part No. | Description | Features | Micron Rating |
|--------------------|----------------|--|---------------|
| P562573 | ABB-03-N | NYLON BASKET | 3 µm |
| P562574 | ABB-10 | FLANGE, SCREWS & GASKET, NO BASKET | 10 µm |
| P562575 | ABB-10-3S | 3" STAINLESS BASKET | 10 µm |
| P562576 | ABB-10-3S-LT | 3" STAINLESS BASKET, LOCK TAB | 10 µm |
| P562577 | ABB-10-3S-R | 3" STAINLESS BASKET, BUNA-N GASKET | 10 µm |
| P562578 | ABB-10-3S-SMB | 3" STAINLESS BASKET, SIDE MOUNT KIT | 10 µm |
| P562579 | ABB-10-6S | 6" STAINLESS BASKET | 10 µm |
| P562580 | ABB-10-6S-LT | 6" STAINLESS BASKET, LOCK TAB | 10 µm |
| P562581 | ABB-10-6S-R | 6" STAINLESS BASKET, BUNA-N GASKET | 10 µm |
| P562582 | ABB-10-8S | 8" STAINLESS BASKET | 10 µm |
| P562583 | ABB-10-8S-D-IG | 8" STAINLESS BASKET, DIPSTICK, INNER GUARD | 10 µm |
| P562584 | ABB-10-N | NYLON BASKET | 10 µm |
| P562585 | ABB-10-N-LT | NYLON BASKET, LOCK TAB | 10 µm |
| P562587 | ABB-10-N-R | NYLON BASKET, BUNA-N GASKET | 10 µm |
| P562589 | ABB-40 | FLANGE, SCREWS & GASKET, NO BASKET | 40 µm |
| P562590 | ABB-40-3S | 3" STAINLESS BASKET | 40 µm |
| P562592 | ABB-40-3S-R | 3" STAINLESS BASKET, BUNA-N GASKET | 40 µm |
| P562593 | ABB-40-3S-SMB | 3" STAINLESS BASKET, SIDE MOUNT KIT | 40 µm |
| P562594 | ABB-40-6S | 6" STAINLESS BASKET | 40 µm |
| P562595 | ABB-40-6S-D | 6" STAINLESS BASKET, DIPSTICK | 40 µm |
| P562596 | ABB-40-6S-LT | 6" STAINLESS BASKET, LOCK TAB | 40 µm |
| P562598 | ABB-40-8S | 8" STAINLESS BASKET | 40 µm |
| P562599 | ABB-40-8S-D | 8" STAINLESS BASKET, DIPSTICK | 40 µm |
| P562600 | ABB-40-8S-LT | 8" STAINLESS BASKET, LOCK TAB | 40 µm |
| P562601 | ABB-40-CWOF | CAP ONLY | 40 µm |
| P562602 | ABB-40-LT | LOCK TAB, NO BASKET | 40 µm |
| P562603 | ABB-40-N | NYLON BASKET | 40 µm |
| P562605 | ABB-40-N-LT | NYLON BASKET, LOCK TAB | 40 µm |
| P562608 | ABB-40-N-R | NYLON BASKET, BUNA-N GASKET | 40 µm |
| P562609 | ABB-40-N-SMB | NYLON BASKET, SIDE MOUNT KIT | 40 µm |

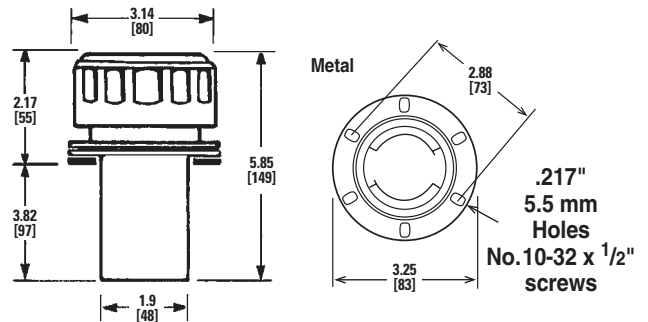
Mini Filler Breather

| Donaldson Part No. | Description | Micron Rating | Airflow Capacity (cfm/lpm) | Finish |
|--------------------|-------------|---------------|----------------------------|--------|
| P562561 | MBB-10-N | 10 µm | 10/283 | Chrome |
| P562562 | MBB-40-N | 40 µm | 10/283 | Chrome |



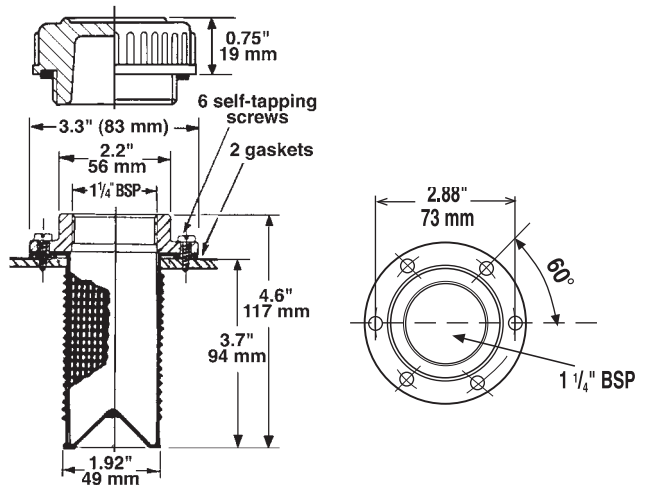
Non-Vent Filler Cap, Bayonet

| Donaldson Part No. | Description | Feature | Finish |
|--------------------|-------------|---------------------------------------|---------------------|
| P562563 | NVB-00-3S | FILLER CAP ASSY W/3" STAINLESS BASKET | Chrome |
| P562564 | NVB-00-N | FILLER CAP ASSY W/ NYLON BASKET | Chrome |
| P562565 | NVB-W-00-8S | FILLER CAP ASSY W/8" STAINLESS BASKET | Epoxy coated, Black |



Non-Vent Filler Cap, Threaded

| Donaldson Part No. | Description | Feature | Finish |
|--------------------|-------------|---------------------------------|---------------------|
| P562550 | NVT-00-N | FILLER CAP ASSY W/ NYLON BASKET | Black Technopolymer |



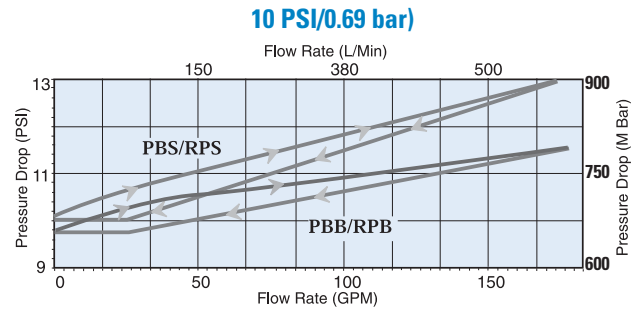
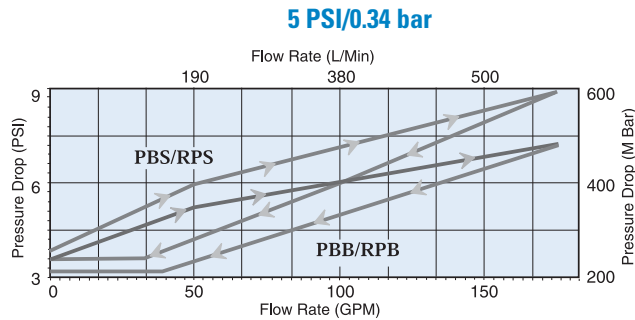
Filler Breathers

Specifications

- High impact black technopolymer
- Temperature range -22°F to +240°F / -30°C to +115 °C
- 2.75" diameter cap
- Available with bayonet or threaded flange
- Airflow to 30 cfm/850 lpm
- Compatible with petroleum and water based fluids
- 30 mesh technopolymer basket

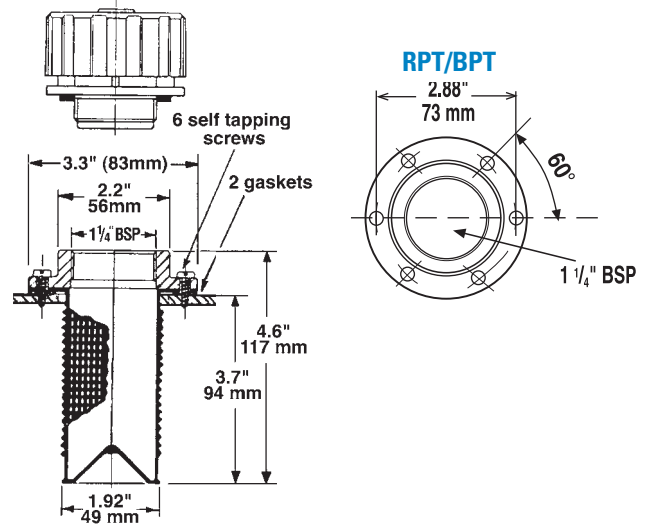
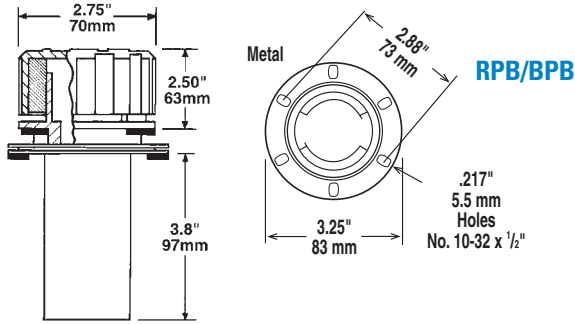
Options

- Dipstick 3"/76 mm, 6"/152 mm and 8"/ 203 mm stainless steel baskets



Bayonet Style (RPB) (BPB)

| Donaldson Part No. | Description | Feature | Micron Rating | Airflow Capacity (cfm/lpm) | Relief Valve Setting (psi/bar) |
|--------------------|-------------------|-----------------------------|---------------|----------------------------|--------------------------------|
| P562552 | RPB-10-5-N | NYLON BASKET | 10 µm | 30/850 | 5/0.34 |
| P562553 | RPB-10-5-N-D-TAD | NYLON BASKET, DIPSTICK | 10 µm | 30/850 | 5/ 0.34 |
| P562554 | RPB-40-5-3S | 3" STAINLESS BASKET | 40 µm | 30/850 | 5/0.34 |
| P562555 | RPB-40-5-6S | 6" STAINLESS BASKET | 40 µm | 30/850 | 5/0.34 |
| P562556 | RPB-40-5-N | NYLON BASKET | 40 µm | 30/850 | 5/0.34 |
| P562534 | BPB-10-A CAP ONLY | BREATHER CAP | 10 µm | 30/850 | N/A |
| P562536 | BPB-10-N-A | BREATHER | 10 µm | 30/850 | N/A |
| P563813 | BPB-40 CAP ONLY | BREATHER CAP | 40 µm | 30/850 | N/A |
| P562537 | BPB-40-3S | BREATHER W/3" STEEL BASKET | 40 µm | 30/850 | N/A |
| P562538 | BPB-40-3S-A | BREATHER | 40 µm | 30/850 | N/A |
| P562539 | BPB-40-6S-D | FILLER BREATHER W/DIP STICK | 40 µm | 30/850 | N/A |
| P562540 | BPB-40-A CAP ONLY | BREATHER CAP | 40 µm | 30/850 | N/A |
| P562541 | BPB-40-N | BREATHER | 40 µm | 30/850 | N/A |
| P562542 | BPB-40-N-A | BREATHER | 40 µm | 30/850 | N/A |
| P562544 | BPB-40-N-SMB | BREATHER W/SIDE MOUNT KIT | 40 µm | 30/850 | N/A |

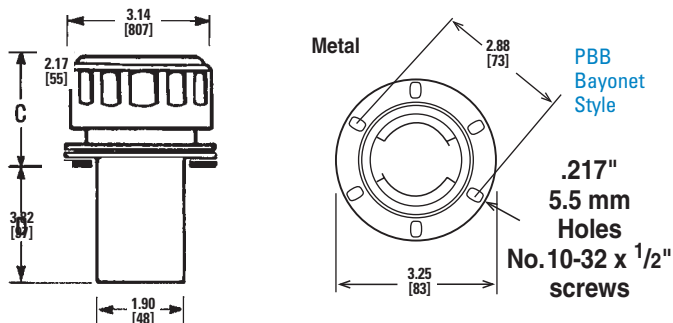


PBB Series Pressure Filler Breather Cap - Bayonet Style

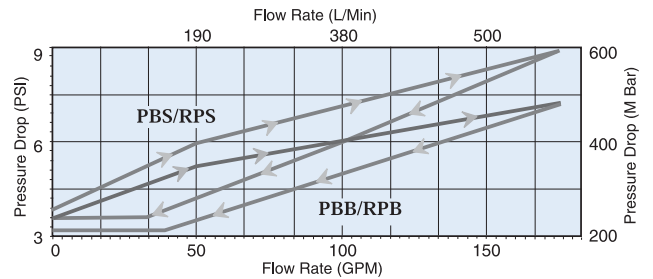
Specifications

- Chrome plated, epoxy coated or zinc plated steel cap
- Air intake valve opens at 0.435 psi/3 kPa
- Compatible with petroleum based fluids
- Temperature range -22°F to +240°F / -30°C to 115°C
- Buna-N® gaskets standard
- 10 and 40 micron available
- Relief valve settings at 5 or 10 psi/0.34 or 0.69 bar full rate flow

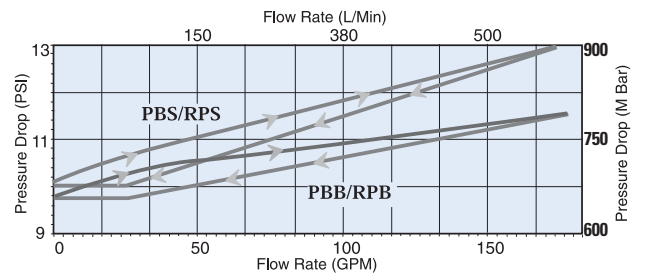
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5 psi/0.34 bar

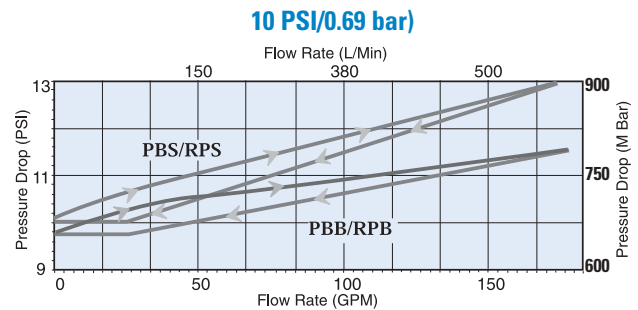
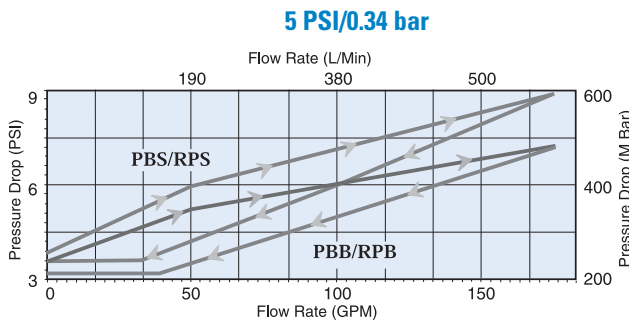


10 psi/0.69 bar



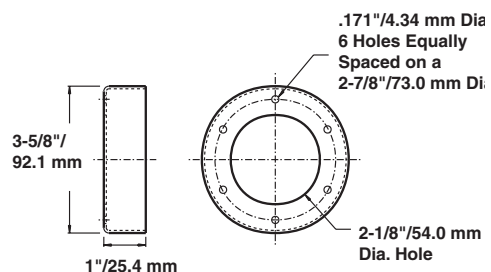
PBB Series Pressure Filler Breather Cap - Bayonet Style

| Donaldson Part No. | Description | Feature | Micron Rating | Airflow Capacity (cfm/lpm) | Relief Valve Setting (psi/mm) | Finish |
|--------------------|-----------------|------------------------------------|---------------|----------------------------|-------------------------------|---------------------|
| P563346 | PBB-10-5-3S | 3" STAINLESS BASKET | 10 µm | 30/850 | 5/0.34 | Chrome |
| P563347 | PBB-10-5-6S | 6" STAINLESS BASKET | 10 µm | 30/850 | 5/0.34 | Chrome |
| P563348 | PBB-10-5-N | NYLON BASKET | 10 µm | 30/850 | 5/0.34 | Chrome |
| P563349 | PBB-10-5-N-LT | NYLON BASKET, LOCK TAB | 10 µm | 30/850 | 5/0.34 | Chrome |
| P563350 | PBB-40-10-N | NYLON BASKET | 40 µm | 30/850 | 10/0.69 | Chrome |
| P563351 | PBB-40-5 | FLANGE, SCREWS & GASKET, NO BASKET | 40 µm | 30/850 | 5/0.34 | Chrome |
| P563352 | PBB-40-5-3S | 3" STAINLESS BASKET | 40 µm | 30/850 | 5/0.34 | Chrome |
| P563353 | PBB-40-5-6S | 6" STAINLESS BASKET | 40 µm | 30/850 | 5/0.34 | Chrome |
| P563354 | PBB-40-5-8S | 8" STAINLESS BASKET | 40 µm | 30/850 | 5/0.34 | Chrome |
| P563355 | PBB-40-5-N | NYLON BASKET | 40 µm | 30/850 | 5/0.34 | Chrome |
| P563356 | PBB-W-10-5-N | NYLON BASKET | 10 µm | 30/850 | 5/0.34 | Epoxy Coated, Black |
| P563357 | PBB-W-10-5-N-LT | NYLON BASKET, LOCK TAB | 10 µm | 30/850 | 5/0.34 | Epoxy Coated, Black |
| P563358 | PBB-W-40-5-3S | 3" STAINLESS BASKET | 40 µm | 30/850 | 5/0.34 | Epoxy Coated, Black |
| P563360 | PBB-Z-10-10-N | NYLON BASKET | 10 µm | 30/850 | 10/0.69 | Zinc Plated |
| P563361 | PBB-Z-10-5-N | NYLON BASKET | 10 µm | 30/850 | 5/0.34 | Zinc Plated |
| P563326 | | 3" STAINLESS BASKET ONLY | | | | |
| P563465 | | 6" STAINLESS BASKET ONLY | | | | |
| P563466 | | 8" STAINLESS BASKET ONLY | | | | |
| P563322 | | 4" NYLON BASKET ONLY | | | | |



Weld Risers for Filler Breathers

| Donaldson Part No. | Description | Height (in./mm) |
|--------------------|-------------|-----------------|
| P562668 | WR-5565 | 1"/25.4 |



Steel stamped construction
 Predrilled holes align
 with standard breather
 tank flanges
 Provides for easy installation
 of filler breathers

ARV™ Active Reservoir Vent™

The Donaldson Active Reservoir Vent™ (ARV™) is an effective dry air purging system for minimizing water contamination in fluids. It continuously supplies dry air to reservoirs and other vented components. Slight pressurization of the reservoir head space with dry air prevents ingress of humidity, therefore eliminating a common source of water contamination. In addition, as dry air sweeps over the surface of the oil, water evaporates and the oil dries to beneficial low levels. Through efficient and user-friendly water contamination control, the ARV's unique dry air purging system provides a wide range of benefits, including longer component life, extended fluid change intervals, and greater system uptime and reliability.



Do you have challenges with water in oil?

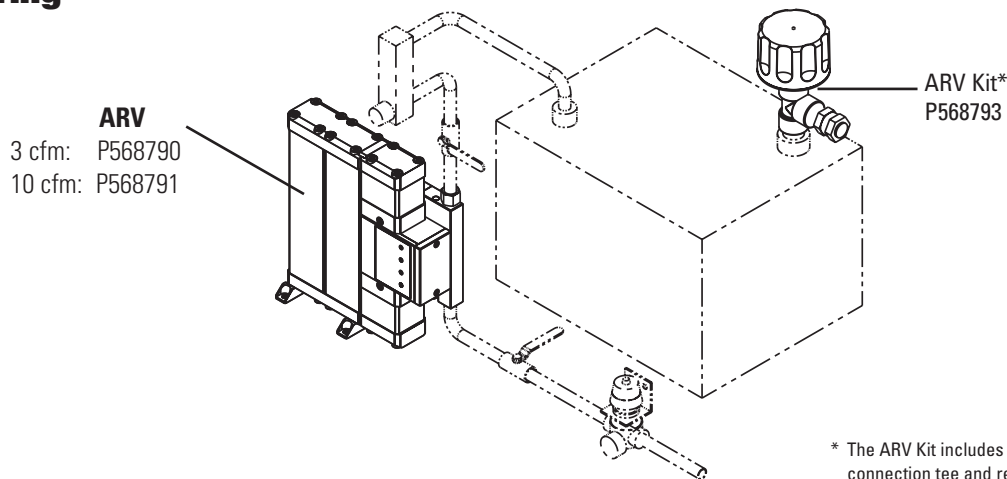
- Is your operation in a high humidity environment?
- Do you operate around wash water, spray down maintenance, or marine and off-shore environments?
- Do you get regular condensation in your reservoirs?
- Are you using a desiccant breather now?
 - How often do you change your desiccant?
 - Do you require frequent service maintenance / short life with your desiccant?
 - Are you concerned that your desiccant is saturated with water until it is too late?

Water is a frequent and damaging contaminant in hydraulic and lubrication systems, and water contamination causes a host of problems including corrosion, component seizure, microbial growth, additive dumping, and accelerated oil oxidation. The ARV will help prevent the chain of damage caused by water contamination.

| Features | Benefits |
|---|--|
| Purges wet, humid air from reservoir head space | Greater uptime, longer bearing life, lower energy consumption, fewer parts replacement, and greater machine efficiency |
| Minimal annual maintenance | Low maintenance costs |
| Prefilter and afterfilter for particle removal | Added protection from particulate wear |
| Applications | |
| Hydraulic System Reservoirs | Small Storage tanks |
| Gear boxes | Multiple Tanks |
| Lube System Reservoirs | Lube Rooms |

ARV™ Active Reservoir Vent™

Ordering



* The ARV Kit includes the T.R.A.P. breather assembly, connection tee and relief vent.

Specifications

ARV

| Part Number | Flow Rate (scfm /lpm) | Recommended for Reservoir Size (gallons/liters) | NPTF Connection (inches) | Dimensions (in./mm) | | | Weight (lbs/kg) |
|-------------|-----------------------|---|--------------------------|---------------------|------------|-----------|-----------------|
| | | | | Height | Width | Depth | |
| P568790 | 3 / 85 | up to 2,700 / 10,271 | 1/2" | 13.7 / 348 | 11.8 / 300 | 4.7 / 120 | 15 / 6.8 |
| P568791 | 10 / 283 | up to 9,000 / 34,069 | 1/2" | 34.8 / 884 | 11.8 / 300 | 4.7 / 120 | 33 / 14.9 |

- Electrical Requirements: 110 V/50-60 Hz AC, Approx. 4 W
- Medium: Compressed air/nitrogen
- Operating Pressure: 60 to 100 psig
- Medium Temperature: maximum = 122°F
- Ambient Temperature: minimum = 39°F; maximum = 122°F

ARV Kit** Breather Assembly

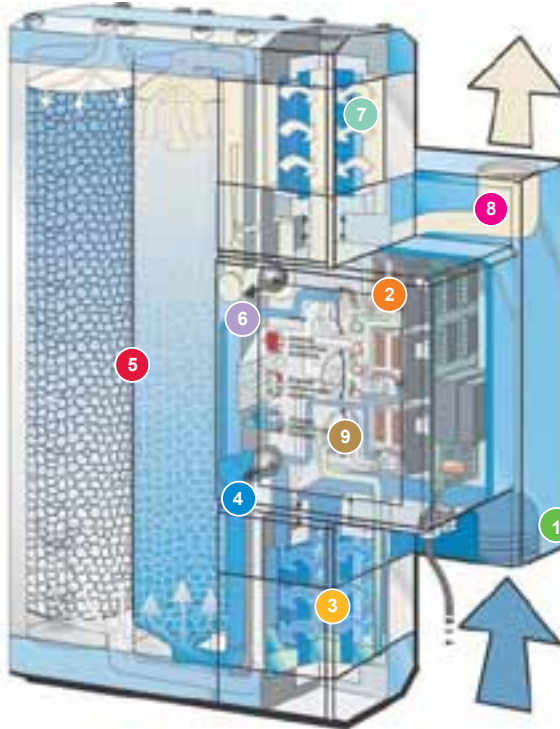
| Part Number | Flow Rate (scfm) | Recommended for Reservoir Size (gallons/liters) | NPTM Connection (inches) | T.R.A.P. Breather Assembly (in./mm) | | |
|-------------|------------------|---|--------------------------|-------------------------------------|-----------|-----------|
| | | | | Height | Width | Depth |
| P568793 | up to 10 | up to 9,000 / 34,049 | 1 | 9 / 229 | 6.5 / 165 | 4.5 / 120 |

** Kit includes breather assembly, connection and relief vent.

Replacement/Maintenance Parts & Schedule

| Description | Recommended Change Interval | Part Number |
|--|-----------------------------|-----------------------------------|
| T.R.A.P.™ reservoir breather | 6 months | P564669 |
| Service Kit (includes prefilter element, afterfilter element, desiccant cartridges, set of seals) for ARV adsorption dryer | 1 year | ARV-3: P568796 ARV-10: P568797 |

How the Active Reservoir Vent Works



- 1 Dryer Inlet
- 2 Processor Control
- 3 Prefilter
- 4 Lower Shuttle Valve
- 5 Desiccant Cartridges
- 6 Upper Shuttle Valve
- 7 Afterfilter
- 8 Dryer Outlet
- 9 Condensate Drain

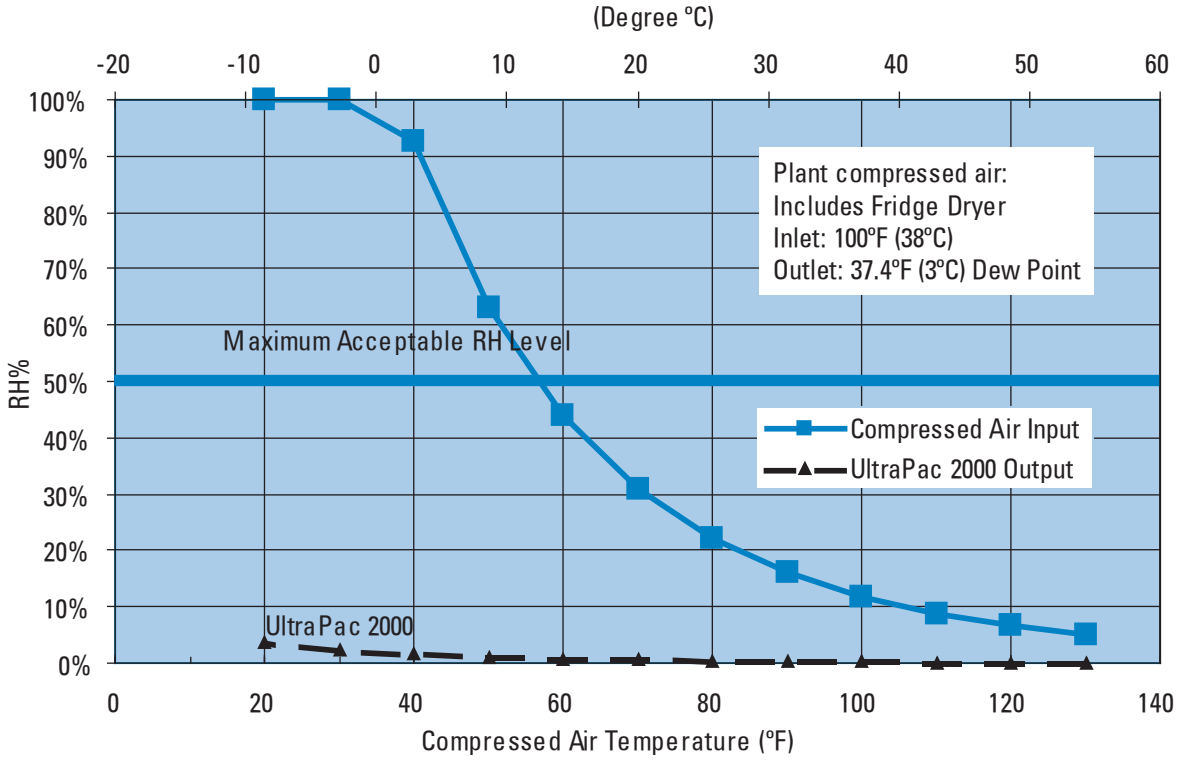
Small, Compact Point-of-Use Dryers

Heatless desiccant dryers, like all adsorption type dryers, use a desiccant to adsorb the water vapor in the airstream. In the most commonly used twin-tower design, one tower dries the air from the compressor, while the desiccant in the other tower is being regenerated to provide continuous operation. In the heatless desiccant dryer design, no internal or external heaters are used. Regeneration is achieved by using a partial stream of the dried air, expanding it to atmospheric pressure, and running it through the desiccant bed that is being regenerated. The standard regenerative desiccant dryer at 100 psig has a standard pressure dew point rating of $-40^{\circ}\text{F}/^{\circ}\text{C}$ and a dew point down to -100°F (-73°C) is available as an option.



Performance Data

Donaldson Active Reservoir Vent Performance



Sight Glasses

Specifications

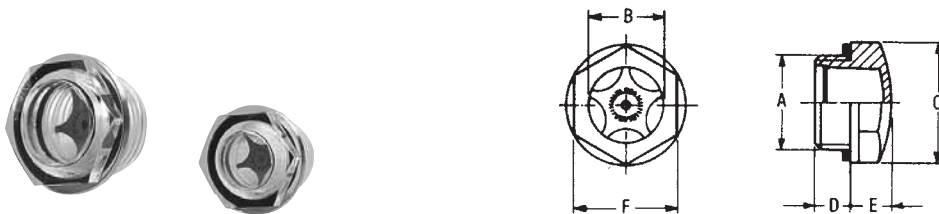
- Transparent polyamid lens
- Shock resistant
- Anodized aluminum reflector
- Operating temperature 210°F / 100°C
- Buna-N® seal
- For use with mineral, petroleum and water-based fluids
- Any contact with alcohol or solvents must be avoided
- Design HFTX

Buna-N® is a registered trademark of E. I. DuPont de Nemours and Company.



Features

Leak-free sight glasses come in plastic or metal with a variety of threads, seals and lenses. In low visibility areas, prism lens sight glasses are a good solution for quick and accurate readings. In applications involving high pressure or temperatures, steel sight glasses are preferred. Locking nuts provide mounting into sheet metal with minimum thickness and without welding.



| Donaldson Part No. | Description | A -Thread Size | B | Dimensions (in./mm) | | | |
|--------------------|-------------|-----------------|---------|---------------------|--------|--------|---------|
| | | | | C | D | E | F |
| P562419 | SG-04 | 1/4" BSP | .35/9 | .71/18 | .28/7 | .24/6 | .59/15 |
| P562420 | SG-06 | 3/8" BSP | .43/11 | .87/22 | .32/8 | .28/7 | .75/19 |
| P562421 | SG-08 | 1/2" BSP | .55/14 | 1.02/26 | .32/8 | .32/8 | .87/22 |
| P562423 | SG-08-S | 3/4" - 16 UN | .51/13 | 1.02/26 | .59/15 | .32/8 | .87/22 |
| P562426 | SG-12 | 3/4" BSP | .79/20 | 1.22/31 | .35/9 | .39/10 | 1.06/27 |
| P562427 | SG-12-S | 1-1/16" - 12 UN | .75/19 | 1.38/35 | .59/15 | .39/10 | 1.18/30 |
| P562428 | SG-16 | 1" BSP | 1.00/25 | 1.58/40 | .43/11 | .39/10 | 1.34/34 |
| P562430 | SG-20 | 1-1/4" BSP | 1.18/30 | 1.85/47 | .47/12 | .51/13 | 1.61/41 |

Prism Sight Glasses

Specifications

- Prism lenses: special translucent polyamide technopolymer
- For low light applications
- Body: special black polyamide technopolymer
- Available in 3/4" and 1" NPT sizes
- Resistant to solvents, oils, greases, alkaline acids
- Avoid alcohol and detergents containing alcohol
- Flat Buna-N® seal

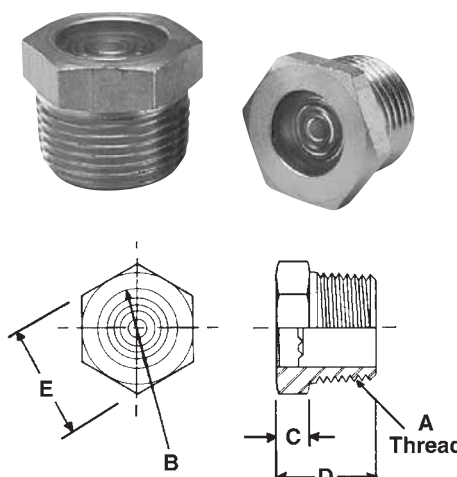


Buna-N® is a registered trademark of E. I. DuPont de Nemours and Company.

| Donaldson Part No. | Description | A - Thread Size | B | Dimensions (in./mm) | | | |
|--------------------|-------------|-----------------|---------|---------------------|---------|----------|---------|
| | | | | C | D | E | F |
| P562417 | PSG-12 | 3/4" NPT | 0.70/18 | 1.38/35 | 0.40/10 | 0.33/8.5 | 1.26/32 |
| P562418 | PSG-16 | 1" NPT | 0.90/23 | 1.70/43 | 0.43/11 | 0.36/9 | 1.50/38 |

Specifications

- All nickel-plated steel construction
- Glass prism lenses hermetically sealed
- Leak-proof service
- Greater mechanical strength
- Easy installation
- Reflects light in the presence of any liquid
- Maximum operating temp. 500°F / 260°C
- Suitable for petroleum and water based fluids



| Donaldson Part No. | Description | A - Thread Size | B | Dimensions (in./mm) | | |
|--------------------|-------------|-----------------|---------|---------------------|---------|---------|
| | | | | C | D | E |
| P562408 | SVM-04 | 1/4" NPT | 0.34/8 | 0.19/5 | 0.44/11 | 0.63/16 |
| P562409 | SVM-06 | 3/8" NPT | 0.44/11 | 0.22/6 | 0.5/13 | 0.75/19 |
| P562410 | SVM-08 | 1/2" NPT | 0.56/14 | 0.22/6 | 0.56/14 | 0.94/24 |
| P562411 | SVM-12 | 3/4" NPT | 0.75/19 | 0.31/8 | 0.63/16 | 1.06/27 |
| P562412 | SVM-16 | 1" NPT | 0.94/24 | 0.31/8 | 0.94/24 | 1.38/35 |
| P562413 | SVM-20 | 1-1/4" NPT | 1.19/30 | 0.41/10 | 0.81/21 | 1.75/44 |
| P562414 | SVM-24 | 1-1/2" NPT | 1.44/37 | 0.41/10 | 0.81/21 | 2.00/51 |
| P562415 | SVM-32 | 2" NPT | 1.88/48 | 0.41/10 | 0.88/22 | 2.50/64 |

Fluid Level Gauges

Specifications

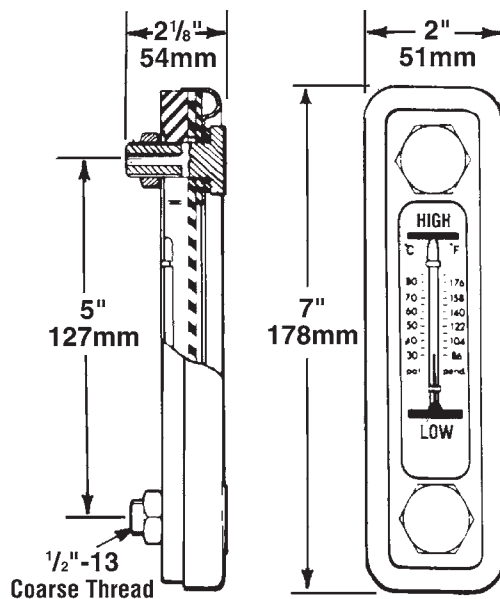
- Steel frame
- Acrylic lens
- Steel zinc plated bolts
- 5" (127 mm) mounting bolt centers
- Maximum wall thickness: 1/2"/12.7 mm
- Maximum temperature:
SLT 225°F / 107°C; SLG 180°F / 80°C

Features

Donaldson offers a wide variety of fluid level gauges that let you accurately measure fluid levels in your tanks and reservoirs. Gauges are made with transparent lens material and are suitable for lubricants, mineral, petroleum and water based fluids. They offer 180° visibility of fluid level.



SLT-1214
P562433



| Donaldson Part No. | Desc. | Feature | Seals |
|--------------------|----------|--|----------|
| P562433 | SLT-1214 | 5"/127 mm Level Gauge w/ Red Thermometer, Chrome Steel Frame | Neoprene |

Bolt torque: 15 ft.-lbs./20 Nt-m. Do not exceed 20 ft.-lbs./27 Nt-m.

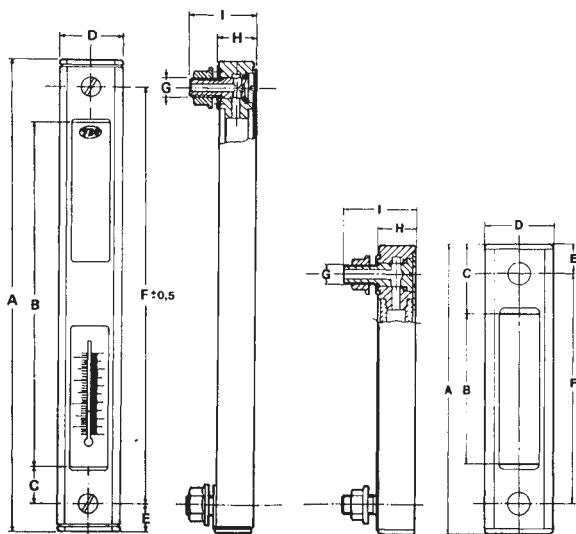
Fluid Level Gauges

Specifications

- Transparent lens material
- Buna-N[®] seals
- Maximum working pressure for pressurized tanks:
14.5 psi / 1 bar / 100 kPa.
- Oil level and temperature or oil level only
- Temperature scale:
35° to 210°F / 0° to 100°C.



Buna-N[®] is a registered trademark of E. I. DuPont de Nemours and Company.



Bolt torque: 10 ft.-lbs/Nt-m.
Inside nut for tightening directly on the tank.
Suggested mounting hole diameter: 11mm or 13mm.

Oil Level/Temperature Gauge Specifications (35° - 210°F / 0° - 100°C)

(shown above left)

| Part No. | Dimensions (in./mm) | | | | | | | | | |
|----------|---------------------|----------|----------|---------|----------|--------|------------|--------|---------|--|
| | A | B | C | D | E | F | G-Thread | H | I | |
| P171920 | 6.22/158 | 3.22/82 | .89/22.5 | 1.57/40 | .61/15.5 | 5/127 | M12 x 1.75 | .78/20 | 1.57/40 | |
| P171922 | 11.22/285 | 8.23/209 | .89/22.5 | 1.57/40 | .61/15.5 | 10/254 | M12 x 1.75 | .78/20 | 1.57/40 | |

Oil Level Gauge Specifications

(shown above right)

| Part No. | Dimensions (in./mm) | | | | | | | | | |
|----------|---------------------|---------|----------|---------|----------|-------|------------|--------|---------|--|
| | A | B | C | D | E | F | G-Thread | H | I | |
| P171918 | 6.22/158 | 3.23/82 | .89/22.5 | 1.57/40 | .61/15.5 | 5/127 | M12 x 1.75 | .78/20 | 1.57/40 | |
| P171913 | 4.21/107 | 1.22/31 | .89/22.5 | 1.57/40 | .61/15.5 | 3/76 | M10 x 1.5 | .78/20 | 1.57/40 | |

Fluid Level Gauges

Specifications

- Ultrasonically welded polyamide
- Suitable for pressurized reservoirs
- Maximum operating temperature: 212°F / 100°C
- Scale: 32°F to 212°F / 0°C to 100°C
- Maximum wall thickness:
LG-3 - 1/2"/12.7 mm,
LG-5/LG-10 - 3/8"/8.3 mm
- Buna-N® O-ring seals
- Zinc plated bolts
- Metric bolts

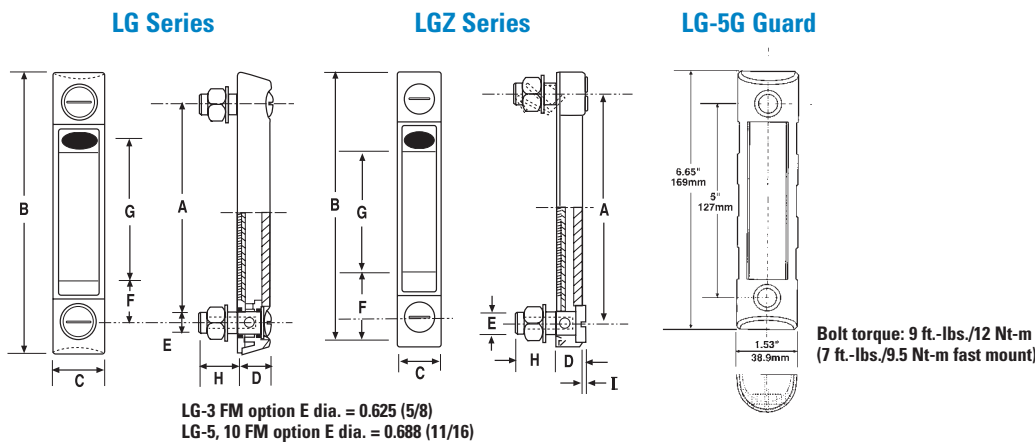


Note: Any contact with alcohol, alcohol-based washing fluids, or petroleum distillates must be avoided. Do not chamfer tank mounting holes. Not for water-glycol applications

Buna-N® is a registered trademark of E. I. DuPont de Nemours and Company.

Options:

- 1/2"-13 bolts (LG-5)
- Protective guard (LG-5)
- Viton seals
- Red and blue thermometers
- Alcohol resistant version
- Fast mount kit (requires no internal access or threads to mount)



Fluid Level Gauge Guard (LG-5 Series only)

| Donaldson Part No. | Description | Feature | Bolt Center A (in./mm) | B (in./mm) | C (in./mm) | D (in./mm) |
|--------------------|-------------|-----------------------------|------------------------|------------|------------|------------|
| P562453 | LG-G | 5"/127 mm Level Gauge Guard | 5.00/127 | 6.65/169 | 1.53/39 | .98/25 |

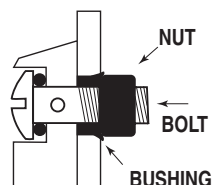
Transparent Polyamide Fluid Level Gauges

| Donaldson Part No. | Description | Feature | Bolt Center | | | Dimensions (in./mm) | | | | | | |
|--------------------|-------------|--|-------------|-----------|---------|---------------------|-------------|---------------|----------|-----------|--------|----------|
| | | | A | B | C | D | Hole Dia. E | Bolt Size | F | G | H | I |
| P562438 | LG-3 | 3" Level Gauge | 3.00/76 | 4.17/106 | 1.06/27 | .63/16 | .42/10 | M10 x 1.5 | .71/18 | 1.31/33 | .83/21 | |
| P562440 | LG-3-FM | 3" Level Gauge w/ Fast Mount kit | 3.00/76 | 4.17/106 | 1.06/27 | .63/16 | .625/16 | M10 x 1.5 | .71/18 | 1.31/33 | .83/21 | |
| P562441 | LG-3-T | 3" Level Gauge w/ Red Thermometer | 3.00/76 | 4.17/106 | 1.06/27 | .63/16 | .42/10 | M10 x 1.5 | .71/18 | 1.31/33 | .83/21 | |
| P562442 | LG-3-TB | 3" Level Gauge w/ Blue Thermometer | 3.00/76 | 4.17/106 | 1.06/27 | .63/16 | .42/10 | M10 x 1.5 | .71/18 | 1.31/33 | .83/21 | |
| P562454 | LG-Z-3 | 3" Level Gauge | 3.00/76 | 3.90/99 | .90/22 | .57/14.5 | .42/10 | M10 x 1.5 | .70/18 | 1.30/33.6 | .90/23 | 0.06/1.5 |
| P562444 | LG-5 | 5" Level Gauge | 5.00/127 | 6.34/161 | 1.22/31 | .71/18 | .47/12 | M12 x 1.75 | .90/23 | 2.91/74 | .90/23 | |
| P562445 | LG-5-13 | 5" Level Gauge w/ 1/2" -13 bolt kit | 5.00/127 | 6.34/161 | 1.22/31 | .71/18 | .50/13 | 1/2" - 13 UNC | .90/23 | 2.91/74 | .90/23 | |
| P562447 | LG-5-FM | 5" Level Gauge w/ Fast Mount kit | 5.00/127 | 6.34/161 | 1.22/31 | .71/18 | .688/17.5 | M12 x 1.75 | .90/23 | 2.91/74 | .90/23 | |
| P562448 | LG-5-T | 5" Level Gauge w/ Red Thermometer | 5.00/127 | 6.34/161 | 1.22/31 | .71/18 | .47/12 | M12 x 1.75 | .90/23 | 2.91/74 | .90/23 | |
| P562449 | LG-5-T-13 | 5" Level Gauge w/ Red Thermometer & 1/2"-13 bolt kit | 5.00/127 | 6.34/161 | 1.22/31 | .71/18 | .50/13 | 1/2" - 13 UNC | .90/23 | 2.91/74 | .90/23 | |
| P562450 | LG-5-TB | 5" Level Gauge w/ Blue Thermometer | 5.00/127 | 6.34/161 | 1.22/31 | .71/18 | .47/12 | M12 x 1.75 | .90/23 | 2.91/74 | .90/23 | |
| P562451 | LG-5-T-FM | 5" Level Gauge w/ Red Thermometer & Fast Mount kit | 5.00/127 | 6.34/161 | 1.22/31 | .71/18 | .688/17.5 | M12 x 1.75 | .90/23 | 2.91/74 | .90/23 | |
| P563913 | LG-5-T-G | 5" Level Gauge w/ Red Thermometer & Guard | 5.00/127 | 6.34/161 | 1.22/31 | .71/18 | .47/12 | M12 x 1.75 | .90/23 | 2.91/74 | .90/23 | |
| P562452 | LG-5-T-SS | 5" Level Gauge w/ Red Thermometer, Stainless Bolt kit | 5.00/127 | 6.34/161 | 1.22/31 | .71/18 | .47/12 | M12 x 1.75 | .90/23 | 2.91/74 | .90/23 | |
| P562456 | LG-Z-5 | 5" Level Gauge | 5.00/127 | 5.9/150 | .90/22 | .57/14.5 | .47/12 | M12 x 1.75 | .93/23.5 | 2.90/73.7 | .90/23 | 0.06/1.5 |
| P562458 | LG-Z-5-V | 5" Level Gauge w/ Viton seals | 5.00/127 | 5.9/150 | .90/22 | .57/14.5 | .47/12 | M12 x 1.75 | .93/23.5 | 2.90/73.7 | .90/23 | 0.06/1.5 |
| P562434 | LG-10 | 10" Level Gauge | 10.00/254 | 11.42/290 | 1.38/35 | .71/18 | .47/12 | M12 x 1.75 | 1.02/26 | 7.60/193 | .90/23 | |
| P562435 | LG-10-LF | 10" Level Gauge w/ Level Float | 10.00/254 | 11.42/290 | 1.38/35 | .71/18 | .47/12 | M12 x 1.75 | 1.02/26 | 7.60/193 | .90/23 | |
| P562436 | LG-10-T | 10" Level Gauge w/ Red Thermometer | 10.00/254 | 11.42/290 | 1.38/35 | .71/18 | .47/12 | M12 x 1.75 | 1.02/26 | 7.60/193 | .90/23 | |
| P562437 | LG-10-TB | 10" Level Gauge w/ Blue Thermometer | 10.00/254 | 11.42/290 | 1.38/35 | .71/18 | .47/12 | M12 x 1.75 | 1.02/26 | 7.60/193 | .90/23 | |
| P563909 | LG-10-TB-SS | 10" Level Gauge w/ Blue Thermometer & Stainless Bolt kit | 10.00/254 | 11.42/290 | 1.38/35 | .71/18 | .47/12 | M12 x 1.75 | 1.02/26 | 7.60/193 | .90/23 | |

Fast-Mount Kits

| Donaldson Part No. | Description |
|--------------------|-----------------|
| P563513 | LG-3/3T |
| P563514 | LG-5/5T, 10/10T |

Fast Mount Assembly Instructions



Installation: Tighten nuts on bolts to the point where nuts are snug against bushings. Apply one drop of thread lock to last exposed thread at end of bolts. Mount on tank and tighten to 7 ft.-lbs./1kg-m. (**DO NOT OVER-TIGHTEN**).

Removal: Loosen bolts and remove. (**IMPORTANT: THREAD LOCK PREVENTS OVER-LOOSENING OF BOLTS TO POINT WHERE NUTS DROP OFF INTO TANK.**)

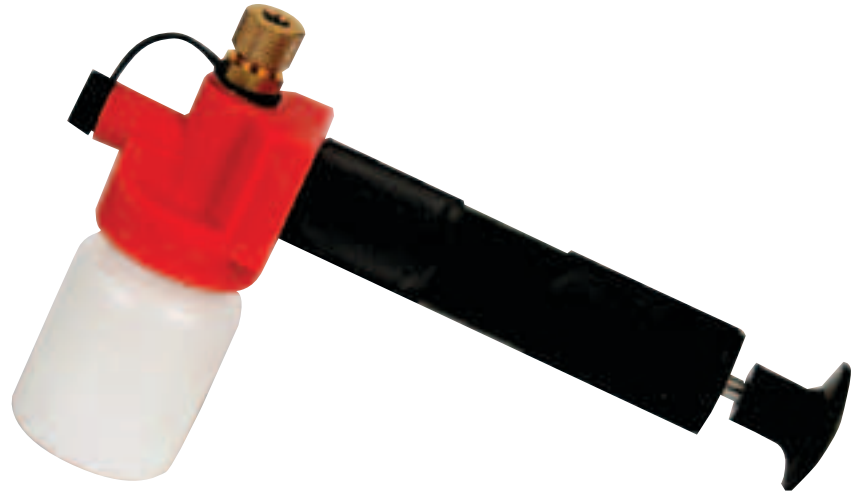
What Can the Donaldson Fluid Analysis Program Do For You?

Fluid analysis is a snapshot of what is happening inside your equipment. It tells you the condition of the lubricant and identifies component wear and contamination in virtually any application so that you can:

- Identify opportunities for optimizing filtration performance
- Safely extend drain intervals
- Minimize downtime by identifying minor problems before they become major failures
- Maximize asset reliability
- Extend equipment life

Test Kits and Sampling Products Outside of North America

The fluid sampling program featured in this section is used by North American customers. If you're located outside of North America, we recommend you contact your local Donaldson distributor about the fluid sampling kits available.



Section Index

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| Analysis Program Overview..... | 288 |
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| Portable Oil Diagnostic System . | 297 |

Suggested Sampling Intervals and Methods

Fluid analysis is most effective when samples are representative of typical operating conditions. Always take samples at regularly scheduled intervals and from the same sampling point each time. How critical a piece of equipment is to production should be a major consideration for determining sampling frequency.

| | | |
|-------------|-------------------------------------|---|
| Hydraulic | 250-500 hours | By vacuum pump through oil fill port of system reservoir at mid-level |
| Gearboxes | 750 hours | By vacuum pump through oil level plug or dipstick retaining tube |
| Compressors | Monthly or at least every 500 hours | By vacuum pump through oil fill port of system reservoir at mid-level |
| Turbines | Monthly or at least every 500 hours | By vacuum pump through oil level plug or dipstick retaining tube |

Fluid Analysis Products

The Donaldson Advanced Fluid Analysis Kit is designed to monitor component wear, contamination and fluid condition.

Benefits of the Fluid Analysis Program

- Partnership with a total filtration solutions provider
- High quality testing by an ISO 17025 A2LA accredited laboratory
- Results available immediately upon sample processing completion
- Innovative data management tools that will help you affect change in daily maintenance practices.

| Fluid Sampling Products | Part No. |
|--|----------|
| Fluid Analysis Service | X009330 |
| <ul style="list-style-type: none"> • 24 Metals by ICP • Water by Karl Fischer, ppm • Viscosity at 40°C or 100°C • Oxidation/Nitration by FTIR • Total Acid Number • ISO Particle Count/Particle Quantifier | |
| Sample Extraction Pump | P176431 |
| Sample Extraction Tubing | P176433 |

Sending Samples to your Donaldson Laboratory

Step 1

Fill out the Component Registration Form and include it with your sample in the shipping container provided. Use this form only when sampling a component for the first time or when submitting changes in component or fluid information already submitted to the laboratory.

Step 2

Fill out the sample jar label completely and accurately, including unit ID, time on both the fluid and the unit and whether or not fluid has been added or changed.

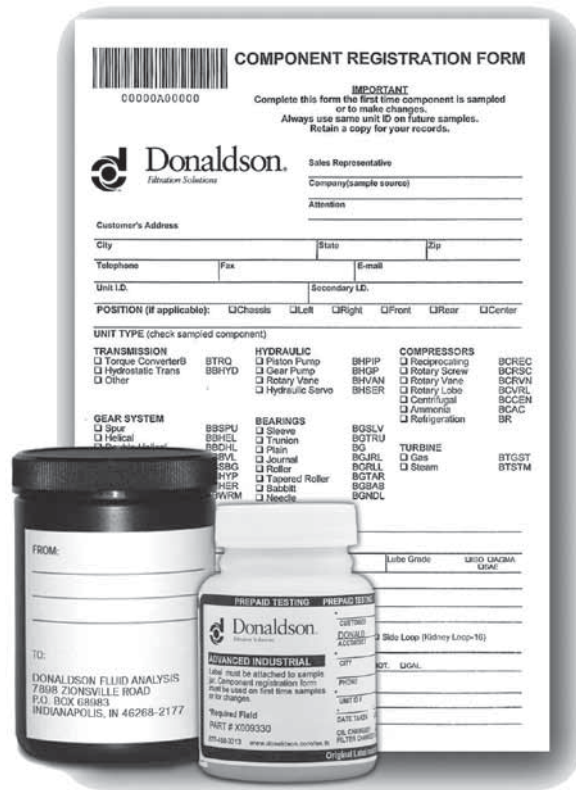
Step 3

Complete the return address shipping label and apply it to the shipping container. Use only a trackable shipping service such as UPS or FedEx to send samples to the laboratory at:

Donaldson Fluid Analysis Laboratory
7898 Zionsville Road
Indianapolis, IN 46268-2177

Step 4

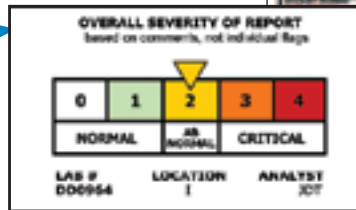
Set up your account and receive your username and password for easy access to your test results by calling the laboratory's Customer Service at 877-458-3313. Go to www.donaldson.com, click on Industrial Hydraulics, and locate View Fluid Analysis Reports. Log in with your assigned username and password given to you by the laboratory.



www.donaldson.com/en/ih/fluidAnalysis.html

Test Results / Reports from Your Sample

Your Donaldson test report color codes individual results by severity for a better understanding of the overall severity of the report. It also provides a graphical representation of the cleanliness level of the fluid with a photo micropatch accompanied by the Target ISO Chart done on each sample.




With Donaldson, you're also on track for total program management with problem summary reports, sample processing turnaround tracking and data mining capabilities that allow you to affect positive change in your daily maintenance practices.

- Get test results almost immediately – online
- Identify significant trends in fluid cleanliness
- Use management reports to pinpoint problems with critical units
- Identify bottlenecks in sample turnaround time
- Influence equipment purchasing decisions
- Access your information from anywhere there is an internet connection

Test Points, Adapter and Hose Assemblies

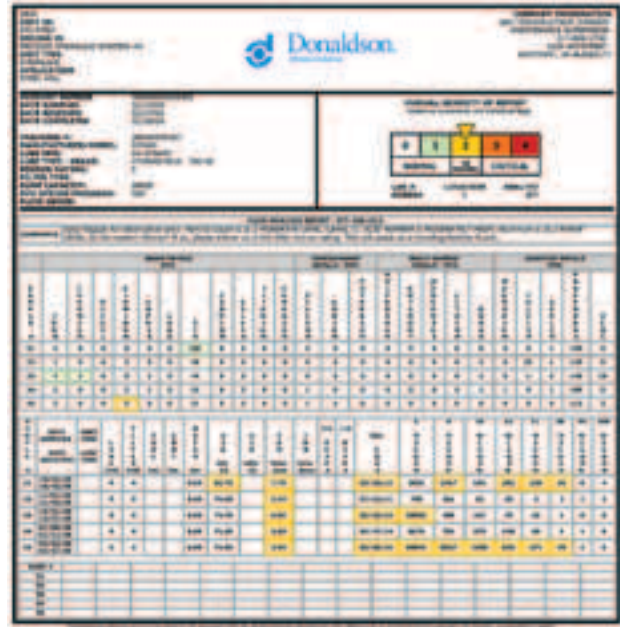
If you have filters installed in hard-to-access locations, test points and hose assemblies can be used to plumb up a bulkhead to read pressure differentials.

See the Accessories Section to view extensive offering!



How to Read the Donaldson Fluid Analysis Report

Reading a fluid analysis report can be an overwhelming and sometimes seemingly impossible task without an understanding of the basic fundamentals for interpreting laboratory results and recommendations. Referring to the report descriptions and explanations below will help you better understand your results and, ultimately, better manage a productive, cost-saving reliability program.



Customer, Equipment and Sample Information

The information submitted with a sample is as important to who is reading the report as it is to the analyst interpreting the test results and making recommendations. Know your equipment and share this information with your laboratory. Accurate, thorough and complete lube and equipment information not only allows for in-depth analysis, but can eliminate confusion and the difficulties that can occur when interpreting results.

Unit, Lube, Turnaround Time and Account

information are listed on the left side of the report emphasizing the data most critical to laboratory processing and data interpretation. Details such as what kind of compressor, gearbox, engine, etc. influences flagging parameters and depth of analysis.

Second ID is each customer's opportunity to uniquely identify units being tested and their location.

Application identifies in what type of environment the equipment operates and is useful in determining exposure to possible contaminants.

Make note of the difference between the Date Sampled and the Date Received by the lab. Turnaround issues may point to storing samples too long before shipping or shipping service problems.

Severity is represented on a sliding scale and is color-coded so that critical units are more apparent at first glance. Overall severity is based on report Comments—not individually flagged results.

- 0—Normal
- 1—At least one or more items have violated initial flagging points yet are still considered minor.
- 2—A trend is developing.
- 3— Simple maintenance and/or diagnostics are recommended.
- 4—Failure is eminent if maintenance not performed. Occasionally, a test result can violate the S4 excursion level. But, if there is no supporting data or a clear indicator of what is actually happening within the unit, maintenance action may not be recommended.

Manufacturer and Model can also identify metallurgies involved as well as the OEM's standard maintenance guidelines and possible wear patterns to expect.

Lube Manufacturer, Type and Grade identifies a lube's properties and its viscosity and is critical in determining if the right lube is being used.

Fluid Added is how much oil has been added since the last sample was taken.

Filter Types and their Micron Ratings are important in analyzing particle count—the higher the micron rating, the higher the particle count results.

Sump Capacity identifies the total volume of oil (in gallons) in which wear metals are suspended and is critical to trending wear metal concentrations.

The laboratory at which testing was completed is denoted by an **I** for Indianapolis and an **H** for Houston. The following Lab # is assigned to the sample upon entry for processing and should be the reference number used when notifying the lab with questions or concerns.

| | | | | | | | | | | | | | | | |
|--|----------|---|---|--|--|---|---|---|---|---|--------|----------|----------|--|--|
| 0904 UNIT ID: API-PHS4 SECOND ID: PROCESS HYDRAULIC STATION #4 UNIT TYPE: HYDRAULIC APPLICATION: STEEL MILL | | | | COMPANY INFORMATION ABC CONSTRUCTION COMPANY MAINTENANCE SUPERVISOR 317-808-3700 1234 ANYSTREET ANYTOWN, IN 46206-1177 | | | | | | | | | | | |
| ACCOUNT NUMBER: 0000000000000000 DATE SAMPLED: 02/19/06 DATE RECEIVED: 02/27/06 DATE COMPLETED: 02/28/06 | | OVERALL SEVERITY OF REPORT based on comments, not individual flags <table border="1" style="margin: auto;"> <tr> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">1</td> <td style="width: 20px; text-align: center;">2</td> <td style="width: 20px; text-align: center;">3</td> <td style="width: 20px; text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">NORMAL</td> <td style="text-align: center;">ABNORMAL</td> <td style="text-align: center;">CRITICAL</td> <td></td> <td></td> </tr> </table> | | | | 0 | 1 | 2 | 3 | 4 | NORMAL | ABNORMAL | CRITICAL | | |
| 0 | 1 | 2 | 3 | 4 | | | | | | | | | | | |
| NORMAL | ABNORMAL | CRITICAL | | | | | | | | | | | | | |
| TRACKING #: MANUFACTURER/MODEL: DEMAG DA STUART LUBE MFR: HYDRASHIELD ISO 68 LUBE TYPE - GRADE: 0 FILTER TYPE: SUMP CAPACITY: 00035 HYD SYSTEM PRESSURE: 500 FLUID ADDED: | | LAB # DD0964 | | LOCATION I | | | | | | | | | | | |
| | | ANALYST JDT | | Data Analyst Initials | | | | | | | | | | | |

Recommendations

A data analyst's job is to explain and, if necessary, recommend actions for rectifying significant changes in a unit's condition. Reviewing comments before looking at the actual test results will provide a roadmap to the report's most important information. Any actions that need to be taken are listed first in order of severity. Justifications for recommending those actions immediately follow.

| FLUID ANALYSIS REPORT - 877-458-3313 | |
|--------------------------------------|---|
| COMMENTS | Data flagged for observation only; Particle Count is at a MODERATE LEVEL (LEVEL 2); ACID NUMBER is MODERATELY HIGH; Aluminum is at a MINOR LEVEL; Is this system filtered? If so, please inform us of the filter micron rating. This will assist us in trending Particle Count; |

4

"Highlighted" numbers denote test results the analyst has flagged because they exceed pre-set warning parameters and warrant closer examination or require action. Individual results are flagged by severity color to better explain the overall severity assigned to the sample.

| S A M P L E # | WEAR METALS PPM | | | | | | | CONTAMINANT METALS - PPM | | | | | MULTI-SOURCE METALS - PPM | | | | ADDITIVE METALS PPM | | | | |
|---------------------------------|-----------------|----------|--------|----------|--------|------|-----|--------------------------|--------|-----------|------------|----------|---------------------------|---------|-------|-----------|---------------------|--------|------------|------|---|
| | IRON | CHROMIUM | NICKEL | ALUMINUM | COPPER | LEAD | TIN | SILICON | SODIUM | POTASSIUM | MOLYBDENUM | ANTIMONY | MANGANESE | LITHIUM | BORON | MAGNESIUM | CALCIUM | BARIUM | PHOSPHORUS | ZINC | |
| 30 | 1 | 0 | 0 | 0 | 0 | 0 | 157 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 135 | 4 | |
| 31 | 2 | 0 | 0 | 0 | 0 | 0 | 166 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 150 | 5 | |
| 32 | 1 | 0 | 0 | 2 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 10 | 1 | 126 | 5 | |
| 33 | 4 | 4 | 0 | 0 | 1 | 0 | 44 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 140 | 10 | |
| 34 | 3 | 0 | 0 | 2 | 1 | 0 | 32 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 5 | 1 | 1 | 0 | 1 | 109 | 0 |
| 35 | 3 | 0 | 0 | 3 | 0 | 0 | 31 | 0 | 0 | 0 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 112 | 2 | |

Elemental Analysis

Elemental Analysis, or Spectroscopy, identifies the type and amount of wear particles, contamination and additives. Determining metal content can alert you to the type and severity of wear occurring in the unit. Measurements are expressed in parts per million (ppm).

Combinations of these Wear Metals can identify components within the machine that are wearing. Knowing what metals a unit is made of can greatly influence an analyst's recommendations and determine the value of elemental analysis.

Knowledge of the environmental conditions under which a unit operates can explain varying levels of Contaminant Metals. Excessive levels of dust and dirt can be abrasive and accelerate wear.

Additive and Multi-Source Metals may turn up in test results for a variety of reasons. Molybdenum, antimony and boron are additives in some oils. Magnesium, calcium and barium are often used in detergent/dispersant additives. Phosphorous is used as an extreme pressure additive in gear oils. Phosphorous, along with zinc, are used in anti-wear additives (ZDP).

| S A M P L E # | WEAR METALS PPM | | | | | | | CONTAMINANT METALS - PPM | | | | | MULTI-SOURCE METALS - PPM | | | | ADDITIVE METALS PPM | | | | |
|---------------------------------|-----------------|----------|--------|----------|--------|------|-----|--------------------------|--------|-----------|------------|----------|---------------------------|---------|-------|-----------|---------------------|--------|------------|------|---|
| | IRON | CHROMIUM | NICKEL | ALUMINUM | COPPER | LEAD | TIN | SILICON | SODIUM | POTASSIUM | MOLYBDENUM | ANTIMONY | MANGANESE | LITHIUM | BORON | MAGNESIUM | CALCIUM | BARIUM | PHOSPHORUS | ZINC | |
| 30 | 1 | 0 | 0 | 0 | 0 | 0 | 157 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 135 | 4 | |
| 31 | 2 | 0 | 0 | 0 | 0 | 0 | 166 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 150 | 5 | |
| 32 | 1 | 0 | 0 | 2 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 10 | 1 | 126 | 5 | |
| 33 | 4 | 4 | 0 | 0 | 1 | 0 | 44 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 140 | 10 | |
| 34 | 3 | 0 | 0 | 2 | 1 | 0 | 32 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 5 | 1 | 1 | 0 | 1 | 109 | 0 |
| 35 | 3 | 0 | 0 | 3 | 0 | 0 | 31 | 0 | 0 | 0 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 112 | 2 | |

Iron (Fe)
Definites
Iron is a wear metal detected with Elemental Analysis by ICP (Inductively-coupled plasma), which detects up to 24 metals, measuring less than 5µm size, that can be present in used oil due to wear, contamination or additives. Wear Metals include iron, chromium, nickel, aluminum, cobalt, lead, tin, cadmium, silver, manganese and vanadium. Contaminant Metals include silicon, sodium, and potassium. Multi-Source Metals include molybdenum, antimony, manganosis, and lithium. Additive Metals include boron, magnesium, calcium, barium, phosphorous, and zinc. Elemental Analysis is instrumental in determining the type and severity of wear occurring in the unit.

Standard Test Method Used
ISO 15724
Reporting Measurement
ppm
Amount of Sample Needed
2 ml
Test Limitation

Possible Sources
Reciprocating Compressors
Shafts, Pistons, Crosshead, Packing Glands, Gears, Housing Casting, Valves
Rotary Compressors
Gears, Shafts, Bearings, Casting
Turbines / Centrifugal Compressors
Shafts, Gears, Bearings, Valves
Hydraulics
Rods, Cylinder, Gears, Shafts, Pistons
Reciprocating Engines
Cylinder Liners, Rings, Gears, Crankshaft, Camshaft, Rods, Valve Train, Oil Pump Gear,

When reviewing your report online, you can click on the metal to see its definition, the ASTM test method used, how the results are reported, the amount of sample needed to perform the test, possible sources as to where the metal is coming from, and an illustration of the test equipment.

Test Data

Test results are listed according to age of the sample—oldest to most recent, top to bottom—so that trends are apparent. Significant changes are flagged and printed in the gray areas of the report.

Samples* appear in an oldest to newest **numbered sequence** so that results are easily associated with them throughout the report and depth of analysis.

Viscosity measures a lubricant's resistance to flow at temperature and is considered its most important physical property. Depending on lube grade, it is tested at 40 and/or 100 degrees Centigrade and reported in centistokes.

Oxidation measures the breakdown of a lubricant due to age and operating conditions. Oxidation prevents additives from working and therefore promotes increased acid content, as well as increased viscosity. **Nitration** is an indication of excessive "blow-by" from cylinder walls and/or compression rings and indicates the presence of nitric acid, which speeds up oxidation. Too much disparity between oxidation and nitration can indicate air to fuel ratio problems. As Oxidation/Nitration increases, TAN will also increase and TBN will begin to decrease.

The **ISO Code** is an index number that represents a range of particles within a specific micron range, i.e. 4, 6, 14. Each class designates a range of measured particles per one ml of sample. The particle count is a cumulative range between 4 and 6 microns. This test is valuable in determining large particle wear in filtered systems.

| SAMP # | DATE SAMPLED DATE RECEIVED | UNIT TIME LUBE TIME | LUB E CHG | FIL T E R CHG | FUE L Vol. | SOOT Vol. | WAT E R Vol. | VIS | | TAN Total Acid | TBN Total Base | I-R OXI DA | I-R NIT RA | ISO CODE | 4 | 6 | 10 | 14 | 21 | 38 | 70 | 100 | |
|--------|-------------------------------|------------------------|-----------------|---------------------------|------------------|--------------|-----------------------|-----------|------------|-------------------|-------------------|------------------|------------------|-------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--|
| | | | | | | | | 40C CS | 100C CS | | | | | | MIC RO N | MIC RO N | MIC RO N | MIC RO N | MIC RO N | MIC RO N | MIC RO N | MIC RO N | |
| 30 | 09/05/05 09/14/05 | | N | N | | | 0.00 | 82.10 | | 6.78 | | | | 17/16/14 | 786 | 387 | 171 | 87 | 25 | 3 | 1 | 0 | |
| 31 | 10/15/05 10/19/05 | | N | N | | | 0.00 | 82.70 | | 7.79 | | | | 19/18/15 | 3805 | 1467 | 590 | 283 | 120 | 29 | 8 | 4 | |
| 32 | 11/07/05 11/10/05 | | N | N | | | 0.00 | 70.60 | | 3.34 | | | | 17/15/11 | 788 | 261 | 82 | 20 | 5 | 2 | 1 | 1 | |
| 33 | 12/21/05 12/27/05 | | N | N | | | 0.00 | 74.70 | | 6.05 | | | | 21/16/13 | 18836 | | | | | | | | |
| 34 | 01/08/06 01/11/06 | | N | N | | | 0.00 | 71.50 | | 2.53 | | | | 19/17/14 | 2670 | | | | | | | | |
| 35 | 02/19/06 02/27/06 | | U | U | | | 0.00 | 72.90 | | 3.62 | | | | 22/20/16 | 20844 | | | | | | | | |

| SAMP # | DATE SAMPLED | DATE RECEIVED | UNIT TIME | LUBE TIME | LUB CHG | FIL T ER CHG | FUE L Vol. | SOOT Vol. | WAT E R Vol. | 40C CS | 100C CS | TAN | TBN | I-R OXI DA | I-R NIT RA | ISO CODE | 4 | 6 | 10 | 14 | 21 | 38 | 70 | 100 |
|--------|--------------|---------------|-----------|-----------|---------|--------------|------------|-----------|--------------|--------|---------|-----|-----|------------|------------|----------|---|---|----|----|----|----|----|-----|
| 30 | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 | | | | | | | | | | | | | | | | | | | | | | | | |
| 34 | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | | | | | | | | | | | | |

TESTING SERVICES

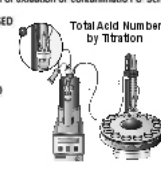
Acid Number
DEFINITION: Acid Number is the amount of acid present. Numbers higher than that of new lubricant is an indication of oxidation or contamination of some kind.

STANDARD TEST METHOD USED: ASTM D664

REPORTING MEASUREMENT: mg KOH/g

AMOUNT OF SAMPLE NEEDED: 4g

TEST LIMITATION:



Total Acid Number by Titration

Fuel and **Soot** results are all reported in % of volume. High fuel dilution decreases unit load capacity. Excessive soot is a sign of reduced combustion efficiency.

Water in oil decreases lubricity, prevents additives from working and furthers oxidation. Its presence can be determined by crackle or FTIR and is reported in % of volume. Water by Karl Fischer determines the amount of water present. These results appear in the Special Testing section of your report.

TAN: Total Acid Number is the amount of acid present in the lubricant. Numbers higher than that of new lube indicate oxidation or some type of contamination. **Total Base Number (TBN)** measures the lube's alkalinity, or ability to neutralize acid. When TAN and TBN approach the same number, the lube should be changed or "sweetened," meaning more lube could be added.

Online Tip: When reviewing your report online, you can click on the test name to see its definition, the ASTM test method used, how the results are reported, the amount of sample needed to perform the test and an illustration of the test equipment.

* Providing your lab with a new sample allows the analyst to verify product integrity and establishes a guideline for analyzing subsequent used oil samples. A new sample will appear first on all reports for the unit maintenance guidelines and possible wear patterns to expect.

Special Testing

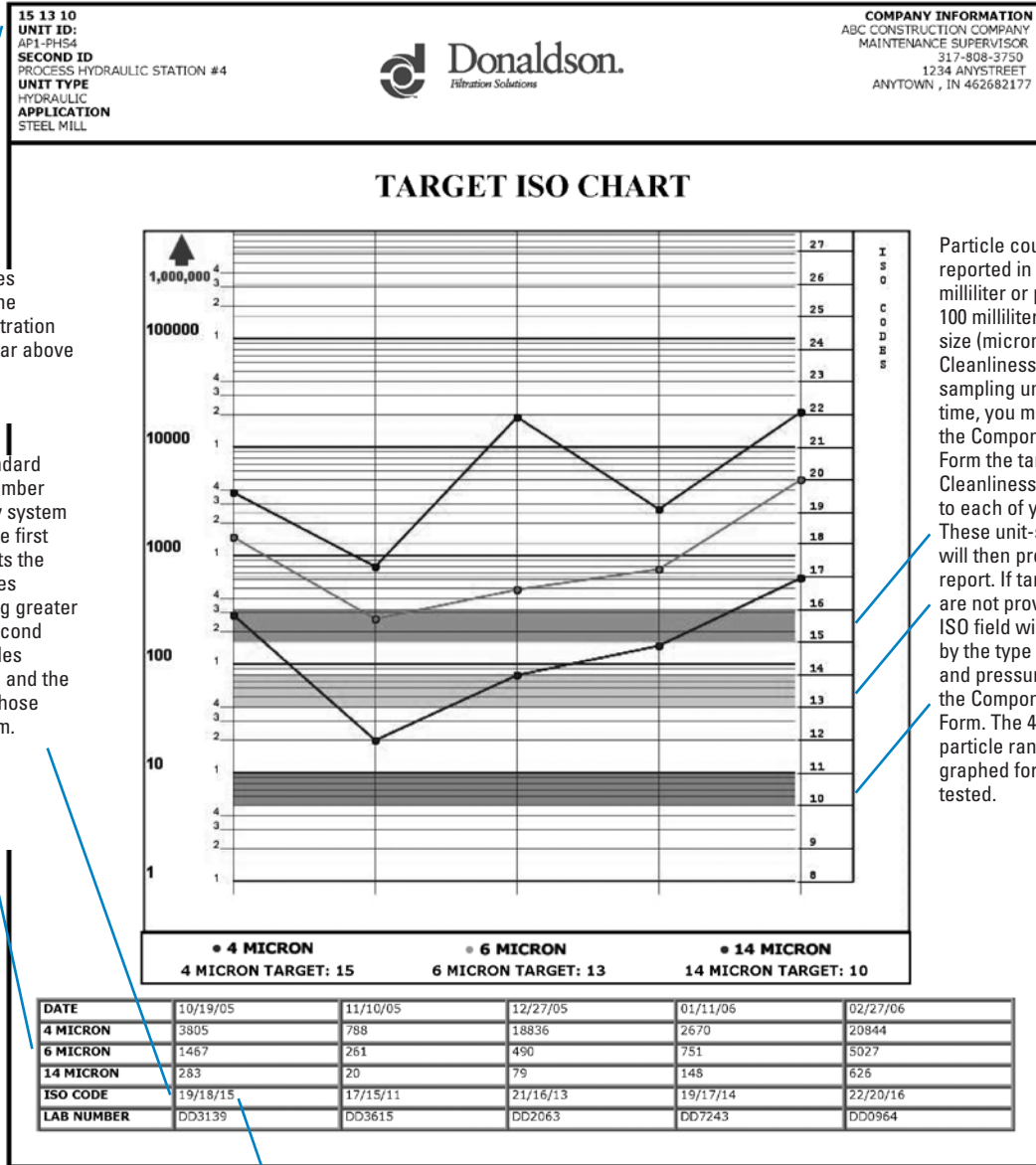
Special testing is often done when additional, or more specific, information is needed. For example, an Analytical Ferrograph might be requested when a ferrous metal larger than 5 microns has been detected by Direct Read Ferrography. The AF can determine actual size of the particle, its composition—iron, copper, etc.—and the type of wear it's creating—rubbing, sliding, cutting, etc. Additional special testing could include, Water by Karl Fischer and RPVOT (Rotating Pressure Vessel Oxidation Test).

Photo Micropatch

A photo Micropatch is included with each test report and provides digital imagery of the wear debris, contamination and/or filter media particles found in each fluid sample. It is taken at a 100x magnification and includes the sample's ISO code and a 10 micrometer scale for particle size comparison.



Target ISO Chart



Portable Fluid Analysis Kit

Fluid analysis is a snapshot of what is happening inside your equipment. It tells you the condition of the lubricant and identifies component wear and contamination in virtually any application. The Donaldson Portable Fluid Analysis Kit (**Part No. X009329**) allows you to conduct immediate on-site particulate analysis in as little as ten minutes.

Using the patch test method, you can quickly and reliably assign a three-digit cleanliness code per ISO 4406-1999 to a given fluid sample. Simply pull a 25 ml fluid sample through a patch membrane filter and compare oil sample particle distribution with the Fluid Cleanliness Comparison Guide (included) to assign an ISO Cleanliness Code.

- Use this kit to determine which systems need improved filtration.
- When improvements are made, use it to monitor the cleanliness status of the system.
- A great alternative to expensive, portable electronic devices.

Kit content details on the next page.



The **Donaldson Portable Fluid Analysis Kit** includes enough supplies for 100 fluid samples. All apparatus is securely packaged and well-protected with laser-etched foam in a sturdy carrying case.

Benefits

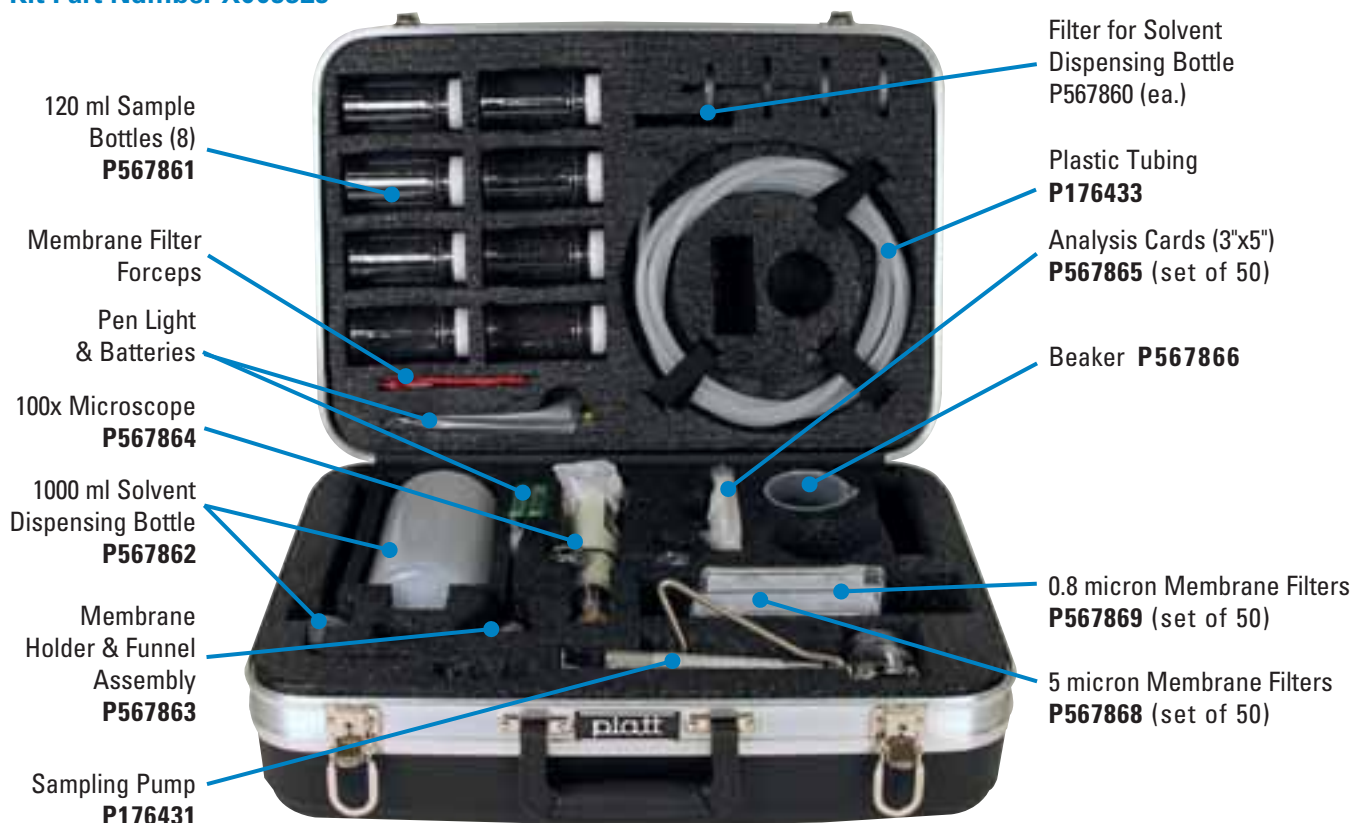
- Easy to use
- Results in as little as 10 minutes
- Measures particulate levels
- Provides reliable results

Kit Content and Physical Size:

Case Size: Height: 14.5"/368.3mm Width: 19.25"/489mm Depth: 7.75"/197mm

Case Weight: 9.95 lbs./4.51 kg

Kit Part Number X009329



Basic Steps for Use

Kit includes detailed operating instructions and visual comparison guide.

1. Assemble the pump and funnel assembly and screw on empty sample bottle.
2. Place solvent dispensing bottle filter on spout of solvent dispensing bottle.
3. Wash funnel with solvent* and pull solvent through assembly with hand-operated vacuum pump.
4. Place a patch membrane in the funnel assembly.
5. Pour the fluid sample into the funnel and fill to the 25 ml level.
6. Pull sample through patch membrane with hand-operated vacuum pump.
7. Wash funnel with solvent and pull through patch membrane with hand-operated vacuum pump.
8. When sample passes completely through patch membrane, remove membrane with forceps, place on clean index card and immediately cover with adhesive analysis lamination cover.
9. View patch membrane through microscope and compare sight screen from 100x microscope to various pictures shown in the Fluid Cleanliness Comparison Guide (included in kit) to assign the appropriate ISO cleanliness code.

* Odorless mineral spirits

Portable Oil Diagnostic System (PODS)

Donaldson Part Number: P567843

Intelligent and robust, the Portable Oil Diagnostic System measures, stores and reports oil condition parameters essential for reliable hydraulic systems operation. The unit analyzes fluids and lubricants in online or bottle sampling modes to determine the machine's operating condition immediately. This instant analysis is as accurate and precise as traditional laboratory analysis that normally takes weeks. Thus, providing a real-time assessment of the oil under operating conditions.

The PODS monitors the dirtiest of fluids due to its concentration limit of 30,000 particles/ml. Superior optics and design provide eight channels for particle counting, as well as measurement of viscosity and temperature to assess fluid conditions. Versatile in operation, the PODS offers compatibility with standard hydraulic fluids, oils and phosphate esters. A rugged carrying case ensures durability and the convenience of portability. The PODS contains a buffer for 500 records. The control analysis software provides real-time data download and visualization, as well as data analysis, formatting and reporting.

The PODS features a wide array of reporting formats, including ISO 4406, NAS 1638 and SAE AS 4059. The PODS can report to both the new MTD $\mu\text{m}(c)$ sizes (4/6/14) or to the previous ACFTD μm sizes (2/5/15). Unlike other portable particle counters on the market, the PODS unit fully supports the ISO 11171 standard. Whether calibrated to the new ISO 11171 standard or the optional ISO 4402 standard, the PODS meets industry demands.



This unit is available only in North America. Not available for export through Donaldson.

Features

- Efficient and intuitive to use
- Immediate laboratory-quality on site results
- Reports SAE and ISO cleanliness classifications, 4/6/14 $\mu\text{m}(c)$
- Harmonizes NAS 1638 to new MTD calibration
- Full ISO 11171 calibration options
- Standard bottle and online modes
- Multiple language support

Applications

- Allows for proactive maintenance
- Monitor system operations
- Extend system reliability
- Certify manufacturing "roll off"
- Identify maintenance cycles
- Schedule repair periods
- Track online system cleanliness

Technical Specifications

Donaldson Part Number: **P567843**

| | |
|----------------------------|---|
| Number of Channels | 8 |
| Size Channels | ISO-MTD (standard) : 4, 4.6, 6, 9.8, 14, 21.2, 38, 68 μm |
| | ACFTD (optional): ~1, 2, 5, 10, 15, 25, 50, 100 μm |
| Flow Rate | 50 ml/min standard (consult factory for optional offerings down to 15 mL/min) |
| Light Source | Laser diode |
| Calibration | ISO MTD (based on ISO 11171) |
| | Full ISO 11171 or ISO 4402 optional |
| Counting Efficiency | Meets JIS B9925:1997 |
| Concentration Limit | 20,000 particles/ml at 5% coincidence loss (per ISO 11171) |
| | 30,000 particles/ml at 10% coincidence |
| Sample Volume | 3 runs (averaged) of 5, 10 or 20 ml (programmable) |
| Fluid Temp Range | 0 to 90°C at 25°C ambient (32 to 194°F at 77°F ambient) |
| Measured Fluid Temperature | 0 to 100°C, $\pm 0.5^\circ\text{C}$ (32 to 212°F, $\pm 0.9^\circ\text{F}$) |
| Viscosity Range | 10 to 424 cSt |
| Measurement | 10 to 424 cSt $\pm 20\%$ at value |
| Wetted Materials | Aluminum, stainless steel, sapphire, PTFE and Aflas® |
| Cleanliness Classification | ISO 4406-1991, ISO 4406.2-1999, NAS 1638, |
| | MIL-STD-1246C, NAVAIR 01-1A-1, SAE AS 4059 |
| Data Storage | 500 Sample Records |
| Dimensions | 17.8 D x 33.0 W x 35.6 H cm (7 x 12.5 x 14 inches) |
| Weight | 9.5 kg (21 lbs) |
| Input/Output | Serial Communication RS-232 |
| Bottle Operation | Purge Volume 15 to 30 ml programmable |
| | Cartridge: CO ₂ , replaceable, rechargeable |
| | Operating Capacity: 60 samples per cartridge (120 ml sample bottle) |
| | Shop Air : 60 to 110 psi (4.1 to 7.6 bar) clean, dry |
| Online Operation | Fluid Pressure: 40 to 6000 psi (2.75 to 413.7 bar) |
| | Purge Volume: 15 to 999 ml programmable |
| Power | DC Input: +24 VDC, 2A |
| | AC/Battery Adapter: Universal 100 to 240 VAC, 50 to 60 Hz, 60 W |
| | Rechargeable Battery: Nickel-Metal Hydride |
| | Operating Time: 100 samples or 4 hours continuous |
| | Recharge Time: 2.5 Hours |
| Environment | Ambient Temperature: 0 to 50°C (32 to 122°F); 20 to 85% relative humidity, non-condensing |
| | Storage: -40 to 70°C (-40 to 158°F), up to 98% relative humidity, non-condensing |
| Accessories Included | Carrying Case, High Pressure Hose Adapter, CO ₂ Bottles, Sample Bottles, PODS Control Software |
| Optional Accessories | Ultrasonic Bath, Additional Sample Bottles and CO ₂ Bottles |

N. America Technical Support 1-800-866-7889



Off-Line Filtration:

Where and Why Used

The Donaldson Filter Cart, Filter Panel and Filter Buddy™ offer convenient off-line filtration, flushing and fluid transfer.* Use them with your in-plant machinery and mobile hydraulic equipment to achieve and maintain proper ISO cleanliness levels.

*Not for use with diesel fuel or gasoline.

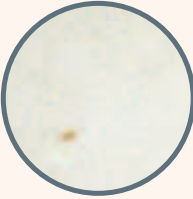
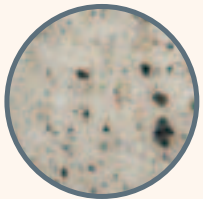
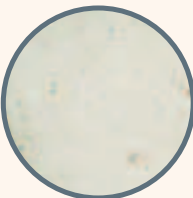
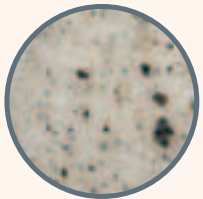


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New oil isn't clean oil.

To optimize system performance and lengthen component life, new oil should be filtered before being transferred into a reservoir or gearbox.

| Typical Fluid Applications | Viscosity | Target ISO Cleanliness & Photo Micropatch | |
|--|------------|--|--|
| Hydraulic Oil Transmission Oil Glycols (<150°F) Hydraulic Based Water Emulsions | 0-500 cSt | 16/14/11  | ISO 22/21/18 Typical Cleanliness of New, Delivered Fluids  |
| Gear Oils Glycols Phosphate Esters | 0-6000 cSt | 18/16/13  |  |

Filter Cart

The Donaldson filter cart provides a convenient portable mode of off-line filtration, flushing and fluid transfer.* Use it with your in-plant machinery and hydraulic equipment to achieve and maintain proper ISO cleanliness levels.

Two in-series pressure filters can provide coarse/fine particle removal or, install a water absorbing filter to obtain particulate and water removal. The powerful one horsepower motor won't bog down and when coupled with a 10 gpm/38 lpm pump it provides efficient fluid transfer and filtration. Convenience features include a rear mounted motor for better balance, a removable angled drip tray and clear braided hoses.

The Donaldson filter cart is designed with performance, convenience and safety in mind. Its value added features make it the best choice to protect your machinery and equipment from breakdowns caused by contamination.

*Not for use with diesel fuel or gasoline.



| Features | Benefits |
|----------------------------------|--|
| Rugged and durable frame | Enables long service life |
| High efficiency media | Cost effective filtration |
| Two pressure filters | Two-stage filtration – coarse/fine or particulate/water |
| Safety relief valve | Prevents over pressurizing and damage to pump, hoses and filters |
| Overload protected switch | Prevents motor/pump from overheating |

Applications

| | |
|---------------------------|--|
| Filter new fluid | New fluids are usually above the recommended ISO cleanliness levels |
| Offline filtration | Filter cart can be used to supplement existing filtration |
| Water removal | Using Donaldson water removal filters to remove free water from the system. |
| Transferring fluid | Fluid is transferred from a storage container (tote, drum, tank, etc.) to a machine's reservoir |
| Flushing | After repairs & builds machines need to be flushed thoroughly before returning to service. During equipment commissioning, new machines have original fabrication debris and dirt that has ingressed during transport and storage. |

Filter Cart Features

Stainless steel wands

- Will not break, corrosion resistant

Differential pressure indicators

- Lets you know when to change filters

Two pressure filters mounted in series

- Allows for particulate/water removal or coarse/fine particle removal

Removable angled drip tray

- Easy clean up, fluid will not leak out when tipped back

Clear braided hoses

- Visually shows fluid flowing

Suction filter

- Protects pump



Oil sampling valve

- Monitors filter performance and cleanliness of oil

Motor/Pump

- Industrial brand
10 gpm / 38 lpm flow

Motor mounted on back

- Better balance
- Fluid will not drip on motor when changing filters

Overload protected switch

- Protects motor and pump from overheating

Integrated safety relief valve

- Protects against over pressurizing

Foam filled tires

- Tires will not go flat

Available March 2012
Please contact your Donaldson sales representative for details.

Filter Cart Assembly Choices

Assembly Notes

Pressure and Suction Filters must be ordered separately.

| Fluid Viscosity Type & Part Number * | Low Viscosity X011297 Reference: DFC-10-P1-WM | High Viscosity X011298 Reference: DFC-HV-2-P1 |
|--------------------------------------|--|---|
| Maximum Recommended Fluid Viscosity: | 500 SUS or 108 cSt* | 8000 SUS or 1700 cSt* |
| Filter Bypass Valve Settings: | Suction – 5 psid/0.34 bar Pressure – 25 psid/1.7 bar | Suction – Y strainer Pressure – 25 psid/1.7 bar |
| Dry Weight: | approx. 140 lbs. (63.5 kg) | approx. 175 lbs. (79.38 kg) |
| Electrical Service: | 115 volts: 14 amp, single phase | |
| Cord Length: | 7 ft. /2.1 m cord with storage for 50 ft./15 m | |
| Gear Pump: | 60 Hz: 10.4 gpm/38 lpm* | |
| Motor: | 1 hp TEFC** | |
| Compatibility: | Mineral-based fluids, water glycols, polyol esters | |
| Operating Temperature: | -10° F to 150° F (-23° C to 65° C) | |
| Dimensions: | Height: 47" (1194 mm) Width: 24" (610 mm) Depth: 23" (585 mm) Hose/Wand assembly length: 10' (3.05 m) | |
| Notes: | Requires three filters | Requires six filters |

Pressure Filter Choices

| Media Number | Media Type | B ₁₀₀₀ = 1000 Rating | Length (in./mm) | Part No. |
|--------------|---------------|---------------------------------|-----------------|------------------------|
| No. ½ | Synteq™ | <4 µm | 14.2/361 | P564468 |
| No. 1 | Synteq | 5 µm | 11.6/294 | P170906 |
| | | | 11.6/294 | P171273; Viton®, Epoxy |
| No. 2 | Synteq | 9 µm | 11.6/294 | P165675 |
| | | | 11.6/294 | P171274; Viton, Epoxy |
| | | | 14.2/361 | P179763 |
| No. 2½ | Synteq | 10 µm | 11.6/294 | P176567 |
| No. 3 | Synteq | 10 µm | 14.2/361 | P170949 |
| No. 4 | Synteq | 10 µm | 7.6/193 | P176207 |
| | | | 11.6/294 | P165659 |
| | | | 11.6/294 | P171275; Viton, Epoxy |
| No. 9 | Synteq | 23 µm | 7.6/193 | P176208 |
| | | | 11.6/294 | P165569 |
| | | | 11.6/294 | P171276; Viton, Epoxy |
| | | | 14.2/361 | P173789 |
| No. 20 | Synteq | >50 µm | 11.6/294 | P165672 |
| | | | 14.2/361 | P170546 |
| N/A | Water Removal | N/A | 11.6/294 | P179075 |

Suction Filter Choices

| Media Type | Beta ₂₀₀ = 200 Rating | Length (in./mm) | Part No. |
|------------|----------------------------------|-----------------|----------|
| Wire | 150 µm | 6.7/170 | P550275 |
| Mesh | nominal | 10.7/271 | P550276 |

*Contact Donaldson for special order options

**Totally Enclosed Fan-Cooled

*** Same filters applied to HMK05/25 Models

Filter Notes

• Refer to table in the Technical Reference Guide for fluid compatibility with our filter media.

• Thread size is 1 3/4"-12 UNF-2B

¹ Filters with seals made of Buna-N® are appropriate for most applications involving petroleum oil. Filters with seals made of Viton® (a fluoroelastomer) are required when using diester, phosphate ester fluids, water glycol, water/oil emulsions, and HWCF (high water content fluids) over 150°F. Donaldson offers both types, as shown in the table above. Filters with seals made of Buna-N® are appropriate for most applications involving petroleum oil. Viton® and Buna-N® are registered trademarks of E. I. DuPont de Nemours and Company.

Calculating the Time Required for Single-Pass Filtration

When using the filter cart for offline filtration the fluid will need to pass through the filter cart approximately seven times to achieve single-pass filtration. Use the following formula to calculate the amount of time needed to achieve single-pass filtration:

$$\text{(Reservoir Size x 7) / Filter Cart Flow Rate} = \text{Time}^{***}$$

For example: if you have a 50 gallon reservoir it will take approximately 35* minutes to achieve single-pass filtration.
(50 gallons x 7) / 10 gpm = 35 minutes

***Times will vary depending on initial cleanliness of oil, system ingress, choice of media grades and other variables.



**Donaldson High Viscosity
Filter Cart
X011298**

Filter Buddy

Handheld Portable Filtration System

The Donaldson Filter Buddy™ is a 2 gpm (7.6 l/min) handheld portable system allowing you to kidney loop reservoirs that you normally cannot with larger filter carts.* Its small size and light weight (approx. 45 lbs.) allows carrying up and down stairs and into tight or confined spaces. It also fits on top of a drum for convenient transferring and filtering from a drum to a reservoir.

The Filter Buddy features dual HMK04 filtration utilizing Donaldson's exclusive high efficiency Synteq™ media. The filters are plumbed in series giving you the option of coarse/fine particle removal or install a water absorbing filter for water/ particle removal.

There are two models available: a standard (low viscosity) version for fluids up to 900 SUS and a high viscosity version for fluids up to 8000 SUS.

*Not for use with diesel fuel or gasoline.



| Features | Benefits |
|------------------------------|--|
| Rugged and durable frame | Enables long service life |
| Compact size | Allows filtration in hard to reach locations |
| High efficiency media grades | Cost effective filtration |
| Dual stage filtration | Coarse/fine or water/particulate removal |
| Overload protected switch | Prevents motor/pump from overheating |
| Sample ports | Enables system cleanliness measurements |

| Applications | |
|--------------------|--|
| Fluid transfer | Ensure that the fluid you are transferring from a drum or tote is clean. |
| Offline filtration | Supplement existing filtration to achieve target ISO cleanliness levels. |
| Water removal | Using Donaldson water removal filters to remove free water from the system. |
| Filter new fluid | Clean up new fluids because they are usually highly contaminated. Don't contaminate your equipment with new fluids. Protect your equipment with proper filtration. |

Available March 2012
Please contact your Donaldson sales representative for details.

Filter Buddy™ Assembly Choices

Assembly Notes

Filters must be ordered separately.

| Fluid Viscosity Type & Part Number* | Low Viscosity X011303 Reference: DFB-2-P1 | High Viscosity X011304 Reference: DFB-HV-2-P1 |
|--|---|---|
| Electrical Service: | 115 volts: 8.4 amp, single phase, | 230 volts: 4.2 amp, single phase |
| Pump: | 2 gpm (7.6 lpm) | 1.8 gpm (6.8 lpm) |
| Motor: | ½ hp TEFC** | ¾ hp TEFC |
| Maximum Recommended Viscosity: | 900 SUS (200 cSt) | 8000 SUS (1700 cSt) |
| Compatibility: | Mineral-based fluids, Water glycols, Polyol esters | |
| Hose: terminated with male NPT connections | Suction: 4' (1.2m) Length, ¾" (1.9 cm) OD | Suction: 4' (1.2m) Length, 1" (2.5cm) OD |
| | Discharge: 7' (2.1m) Length, ½" (1.3 cm) OD | Discharge: 7' (2.1m) Length, ¾" (1.9 cm) OD |
| P573154 Stainless Steel Wand Kit (optional): | Suction: 40" (1.0 m) Length | Discharge 20" (.5 m) Length |
| Dry Weight: | Approx. 55 lbs. (25 kg) | Approx. 65 lbs. (29 kg) |
| Dimensions: | Height: 21" (533 mm) | Height: 25" (635 mm) |
| | Width: 13" (330 mm) | Width: 13" (330 mm) |
| | Length: 26" (660 mm) | Length: 26" (660 mm) |
| Notes: | Requires two filters | Requires two filters |

Pressure Filter Choices

| Media | B ₁₀ = 1000 Rating | Media Technology | Length (in.) | | Part No. | |
|--------|-------------------------------|------------------|------------------|-----|----------------------|---------|
| No. ½ | <4 µm | Synteq™ | 9.4 | 240 | P165185; Viton® Seal | |
| No. 1 | 5 µm | Synteq | 9.4 | 240 | P167590 | |
| No. 2 | 9 µm | Synteq | 6 | 52 | P165354 | |
| | | | 9.4 | 240 | P165332 | |
| No. 2½ | 10 µm | Synteq | 6 | 152 | P176565 | |
| | | | 9.4 | 240 | P176566 | |
| | | | 9.4 | 240 | P173737 | |
| No. 2 | 10 µm | 300 psi collapse | 11.6 | 295 | P179343 | |
| | | | 9.4 | 240 | P170950 | |
| No. 3 | 10 µm | Synteq | 300 psi collapse | 9.4 | 240 | P163542 |
| | | | | 9.4 | 240 | P163555 |
| | | | | 6 | 152 | P164375 |
| | | | | 9.4 | 240 | P164378 |
| No. 6 | 13 µm | Synteq | 9.4 | 240 | P164056; Viton Seal | |
| No. 7 | 33 µm | Synteq | 6 | 152 | P164381 | |
| | | | 9.4 | 240 | P164384 | |
| No. 9 | 23 µm | Synteq | 6 | 152 | P163315 | |
| | | | 9.4 | 240 | P163567 | |
| No. 16 | 22 µm | Synteq | 9.4 | 240 | P164059; Viton Seal | |
| No. 20 | >50 µm | Synteq | 6 | 152 | P165335 | |
| | | | 9.4 | 240 | P165338 | |
| WA | na | Water Removal | 9.4 | 240 | P560584 | |

*Contact Donaldson for special order options

**Totally Enclosed Fan-Cooled

Notes

- Refer to table in the Technical Reference Guide for fluid compatibility with our filter media.
- Standard filter collapse rating is 150 psi, except as noted.
- Thread size is 1 3/8"-12 UNF-2B

¹ Filters with seals made of Buna-N® are appropriate for most applications involving petroleum oil. Filters with seals made of Viton® (a fluoroelastomer) are required when using diester, phosphate ester fluids, water glycol, water/oil emulsions and HWC (high water content fluids) over 150°F. Donaldson offers both types.

Buna-N® Viton® are a registered trademarks of E. I. DuPont de Nemours and Company.

Filter Panels

Fixed-Mounted Off-Line Filtration

The Donaldson filter panels provide fixed-mount offline filtration and a turnkey approach to supplemental filtration.* It isn't necessary for you to design and build a system, simply choose the desired flow rate and media grades, and let Donaldson build one for you.

Machinery and equipment are often designed with inadequate filtration, which will greatly decrease the life of your equipment and increase maintenance costs. Donaldson filter panels provide supplemental filtration for your in-plant machinery and hydraulic equipment helping to reduce costs and achieve and maintain proper ISO cleanliness levels.

Donaldson filter panels are offered in 3 gpm, 5 gpm and 10 gpm (11.4, 18.9 and 37.9 lpm) models. Reservoir size, fluid viscosity and fluid temperature will help determine the correct flow rate. Filter panels feature dual HMK05 filtration utilizing Donaldson's exclusive high efficiency Synteq™ media. The filters are plumbed in series giving you the option of coarse/fine particle removal or install a water absorbing filter for water/particle removal.



*Not for use with diesel fuel or gasoline.

| Features | Benefits |
|------------------------------------|--|
| High efficiency media grades | Cost effective filtration |
| Dual-stage filtration | Coarse/Fine or Water/Particulate removal |
| Differential pressure indicators | Alerts you when to change filters |
| Optional overload protected switch | Prevents motor/pump from overheating |
| Sample port | Enables system cleanliness measurements |

| Applications | |
|--------------------|--|
| Offline filtration | Supplement existing filtration to achieve target ISO cleanliness levels. |
| Water removal | Using Donaldson water removal filters to remove free water from the system. |
| Filter new fluid | Clean up new fluids because they are usually highly contaminated. Don't contaminate your equipment with new fluids. Protect your equipment with proper filtration. |

Available March 2012
Please contact your Donaldson sales representative for details.

Filter Panel Assembly Choices

Assembly Notes

Filters must be ordered separately.

| Fluid Viscosity Type & Part Number* | Low Viscosity Maximum 500 SUS (108 cSt) | | | High Viscosity Maximum 8000 SUS (1700 cSt) |
|--------------------------------------|---|--------------------------|----------------------------|---|
| | X011299 Ref: DFP-3-P1 | X011300 Ref: DFP-5-P1 | X011301 Ref: DFP-10-P1 | X011302 Ref: DFP-HV-2-P1 |
| Gear Pump Flow Rate: | 3 gpm (11.4 lpm) | 5 gpm (18.9 lpm) | 10 gpm (37.9 lpm) | 2 gpm (7.57 lpm) |
| TEFC** Motor: | ½ hp | ¾ hp | 1 hp | 1 hp |
| Compatibility: | Mineral-based fluids, water glycols, polyol esters | | | |
| Connections | Inlet (pump) : SAE 12 O-Ring Outlet: SAE 20 O-Ring | | | Inlet (pump) : SAE 12 O-Ring Outlet: SAE 20 O-Ring |
| Electrical Service: 115 volts | 8.4 amp | 14 amp | 14 amp | 14 amp |
| 230 volts | 4.2 amp | 7 amp | 7 amp | 7 amp |
| Dry Weight: | Approx. 95 lbs. (43 kg) | | | Approx. 120 lbs. (54 kg) |
| Dimensions: | Height: 20" (508 mm) | | Width: 36" (915 mm) | Depth: 8" (203 mm) |
| Notes: | Requires 2 Filters | | | Requires 4 Filters |

*Contact Donaldson for special order options

**Totally Enclosed Fan-Cooled

Filter Choices

| Media Number | Media Type | B _{et} = 1000 Rating | Length (in./mm) | Part No. |
|--------------|---------------|-------------------------------|-----------------|-----------------------------------|
| No. ½ | Synteq™ | <4 µm | 14.2/361 | P564468 |
| No. 1 | Synteq | 5 µm | 11.6/294 | P170906 |
| | | | 11.6/294 | P171273 ¹ Viton, Epoxy |
| No. 2 | Synteq | 9 µm | 11.6/294 | P165675 |
| | | | 11.6/294 | P171274 ¹ Viton, Epoxy |
| | | | 14.2/361 | P179763 |
| No. 2½ | Synteq | 10 µm | 11.6/294 | P176567 |
| No. 3 | Synteq | 10 µm | 14.2/361 | P170949 |
| No. 4 | Synteq | 10 µm | 7.6/193 | P176207 |
| | | | 11.6/294 | P165659 |
| | | | 11.6/294 | P171275 ¹ Viton, Epoxy |
| No. 9 | Synteq | 23 µm | 7.6/193 | P176208 |
| | | | 11.6/294 | P165659 |
| | | | 11.6/294 | P171276 ¹ Viton, Epoxy |
| No. 20 | Synteq | >50 µm | 14.2/361 | P173789 |
| | | | 11.6/294 | P165672 |
| | Water Removal | N/A | 11.6/294 | P170546 |
| | | | 11.6/294 | P179075 |

Filter Notes

- Refer to table in the Technical Reference Guide for fluid compatibility with our filter media.
- Thread size is 1 3/4"-12 UNF-2B

¹ Filters with seals made of Buna-N® are appropriate for most applications involving petroleum oil. Filters with seals made of Viton® (a fluoroelastomer) are required when using diester, phosphate ester fluids, water glycol, water/oil emulsions, and HWCF (high water content fluids) over 150°F. Donaldson offers both types, as shown in the table above. Filters with seals made of Buna-N® are appropriate for most applications involving petroleum oil. Viton® and Buna-N® are registered trademarks of E. I. DuPont de Nemours and Company.

VDOPS Vacuum Dehydration Oil Purification System

Features

- Variable frequency drive to improve inlet condition and performance
- Claw vacuum pump for superior performance and long life
- All controls and system function viewable from the front
- Alarm when filter is plugged and needs to be changed
- Upstream & downstream oil sample ports
- Custom options
- Space efficient
- High water extraction rates



Example Model Number: VDOPS-50VFD-840X-64kW-AWD-480-N4-V

| Classification | Code | Description |
|------------------------|-------|--|
| Product Type | VDOPS | Vacuum Dehydration Oil Purification System |
| Flow Rate | 50VFD | 50 GPM (189 lpm) Variable Frequency Drive (Variable Flow) |
| Housing Size and Style | 840X | 840X Carbon Steel Filter Housing |
| Heater Size | 64kW | 64 Kilowatt Heater |
| Optional Equipment | AWD | Auto Water Drain |
| Electrical Requirement | 480 | 480 Volts |
| NEMA Rating | N4 | NEMA 4 |
| Seal Material | V | Viton |

Installation Requirements

| | |
|-------------------------------|-------------------------|
| Input Voltage | 480 V / 3 Phase / 60 Hz |
| Designed FLA (Full Load Amps) | 98 AMPS |
| Inlet Connection Size | 2" Female Camlock |
| Outlet Connection Size | 2" Male Camlock |

Electrical Operating Specifications

| | |
|-------------------|--------------------|
| Oil Pump Motor | (Nameplate Rating) |
| Vacuum Pump Motor | (Nameplate Rating) |

Mechanical Operating Specifications

| | |
|---------------------------------|--------------------|
| Flow Rate | 50 GPM (189 lpm) |
| Maximum Discharge Pressure | 100 PSI (6.9 bar) |
| Normal Discharge Press | 30 PSI (2.1 bar) |
| Maximum Vacuum Setting | 27" Hg (686 mm Hg) |
| Minimum Vacuum Setting | 15" Hg (381 mm Hg) |
| Normal Heater Set Point Setting | 150° F (66° C) |
| Maximum Oil Viscosity | 1500 SSU (323 cSt) |
| Seal Material | Viton |

IMPORTANT Product Restriction

The **Vacuum Dehydration Oil Purification System** should never be used to remove particulates from volatile fluids such as gasoline since the pump cannot be used for solvents with low lubricity. In addition, the unit should not be used on liquids with a flash point below 200°F (93°C).

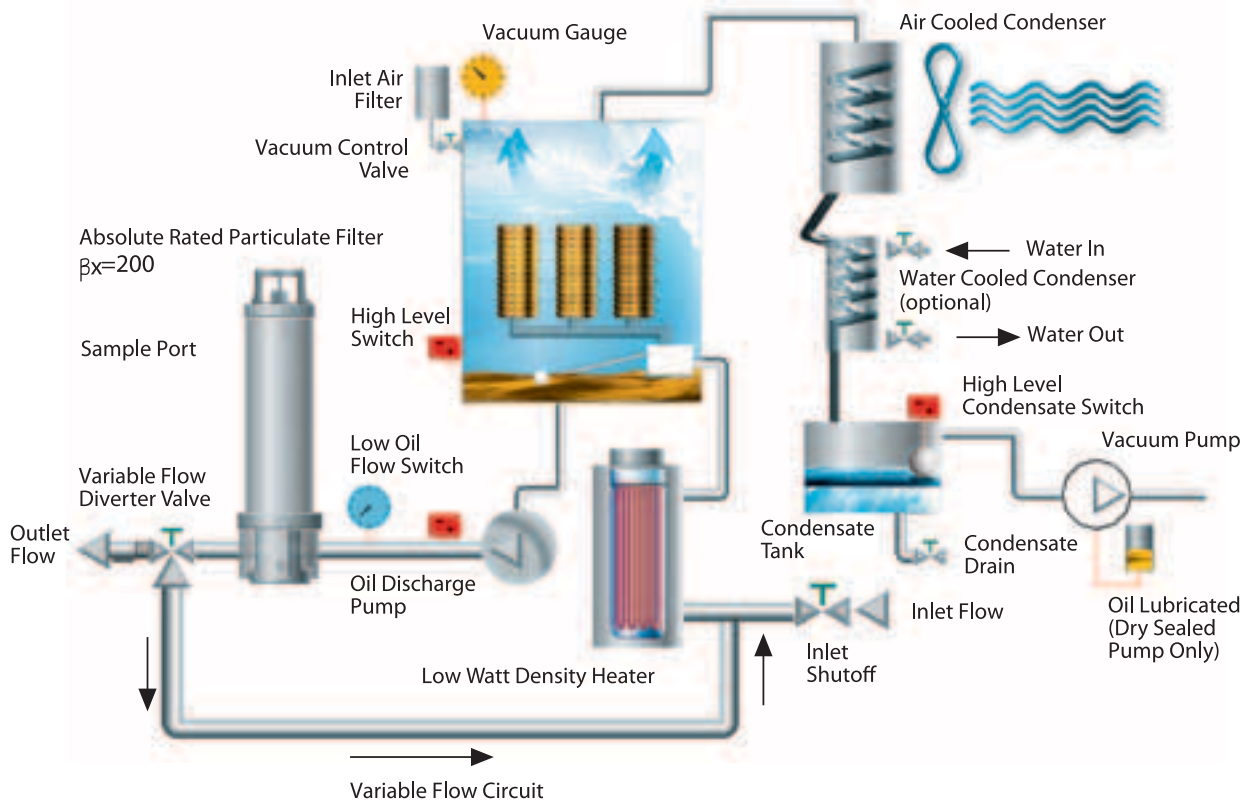
LEAD TIME NOTE:

This product is configured with the specifications and features of your choice. Please contact your Donaldson sales representative for lead time details.

Vacuum Dehydrators

The ultimate piece of equipment to effectively remove particulate, water and dissolved gases from petroleum and synthetically based fluids. This system removes 100% of free and emulsified water from oils, and 90% of dissolved water from oils to as low as 20 ppm. It also removes particulate to as low as ISO 12/10/9. In addition, this system removes 90% of dissolved gases. It is available in flow rates from 1-200 gpm (4-760 lpm), NEMA 4 and 7 Explosion Proof with custom options.

VDOPS Schematic



The water removal principle used in the Vacuum Dehydrators dependably removes water well below the oil saturation point, even when tightly bound in an emulsion. A vacuum pump draws fluid into the unit where it is heated and then flows through dispersal filters inside the vacuum tower. Contaminated oil flows through the pores of these filters, is exposed to the vacuum and dehydrated. Dried oil is removed, filtered and pumped back into the reservoir.

COPS Coalescer Oil Purification System

Features

- Variable frequency drive to improve inlet condition and performance
- Positive displacement pump for superior performance
- All controls and system function viewable from the front
- Auto mode for auto water drain
- Upstream and downstream oil sample ports
- Custom options
- Space efficient
- High free water extraction rates



Coalescers

Designed to rapidly remove free water and particulates from diesel fuel, fuel oil and most other hydraulic/lubricating oils. Coalescing technology outperforms centrifuges, are simpler to use, cost less to maintain and are lower in initial purchase price. Designed to run continuously in an outdoor environment, virtually no mechanical maintenance is needed. Flow rates available from 20-275 gpm (76-1041 lpm).

Example Model Number: COPS-20VFD-840X/2-24kW-480-TS-N4-B

| Classification | Code | Description |
|--|--------|--------------------------------------|
| Product Type | COPS | Coalescer Oil Purification System |
| Flow Rate | 20VFD | 20 GPM (76 lpm), Variable Flow Drive |
| Housing Size and Style | 840X/2 | Qty (2) 840X Housings in Series |
| Heater Size | 24kW | 24 kilowatts |
| Electrical Requirement | 480 | 480 / 3 Phase / 60 Hz |
| Optional Equipment | TS | Touch Screen |
| NEMA Rating | N4 | NEMA 4 |
| Seal Material | B | Buna-N |
| Installation Requirements | | |
| Input Voltage | | 480 / 3 Phase / 60 Hz |
| Designed FLA (Full Load Amps) | | 35 AMPS |
| Inlet Connection Size | | 2" Flanged |
| Outlet Connection Size | | 1-1/2" Flanged |
| Mechanical Operating Specifications | | |
| Flow Rate | | 20 GPM (76 lpm) |
| Maximum Discharge Pressure | | 100 PSI (6.9 bar) |
| Maximum Oil Viscosity | | 1500 SSU (323 cSt) |
| Seal Material | | Buna-N® |

IMPORTANT Product Restriction

The Coalescer Oil Purification System should never be used to remove particulates from volatile fluids such as gasoline since the pump cannot be used for solvents with low lubricity.

LEAD TIME NOTE:

This product is configured with the specifications and features of your choice. Please contact your Donaldson sales representative for lead time details.

Fluid Purification Systems

LTC Transformer Filtration

Bolt this system onto a transformer and continuously remove particulate (carbon) and water contamination, maintaining high dielectric values. Ideally suited for kidney loop filtration applications.



Bearing Lubrication

This system will remove particulate and heat from bearing lube oils to increase bearing life. It will achieve particulate removal from fluids to as low as ISO 12/10/9. It is available with optional flow and temperature monitoring devices.

High Flow Filter Skids

This system is ideal for rapidly removing particulate contamination from large reservoirs. Furthermore, this system creates turbulent flows in piping for oil flushing and efficiently removes particulate contamination to as low as ISO 12/10/9 levels. Flow rates are available from 50–2000 gpm (190–7600 lpm) with many quality features and additional options to increase its capabilities.



Common Fluid Purification Applications:

Turbine Lube Oil / Petro-Chemical Compressors / Diesel and Gas Fired Engines /
 Substation Maintenance Transformer Oil / EHC Speed Control Systems /
 Hydraulic Power Units for All Industries



The Donaldson Filter Buddy™ in use – cleaning up dirty oil in a small power unit.

Donaldson Delivers *any*
Performance Under Pressure





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 **Clean. Protect.
Polish.™**



Bulk Fuel and Lube Filtration Systems

Why Filter Bulk Fluids?

For filtration challenges downstream of the refinery, from delivery to the bulk tank right up to the final point of use.

Filters

Max. Working Pressure: 350 PSI/24.1 bar
 Rated Static Burst: 800 PSI/55.2 bar
 Operating Temperature: -40°F - 190°F/ -40°C - 88°C

| Part Number | Fluid Type | Max. Flow Range | Target Iso Cleanliness | Filter Efficiency |
|-------------|------------------------------------|-----------------|------------------------|-----------------------|
| P568664 | Engine Oil and Gear Oil | 65 gpm/246 lpm | 18/16/13 | 25 micron @ Beta 2000 |
| P568665 | Transmission Oil and Hydraulic Oil | 65 gpm/246 lpm | 16/14/11 | 7 micron @ Beta 2000 |
| P568666 | All Fuels | 65 gpm/246 lpm | 14/13/11 | 4 micron @ Beta 2000 |
| P570248 | Ethanol-Free Fluids* | 65 gpm/246 lpm | 18/16/13 | 20 micron @ Beta 2000 |

*Designed with expanding, water-absorbing media that prevents water from entering storage or equipment tanks.



Filter Heads

Max. Working Pressure: 350 PSI/24.1 bar
 Rated Static Burst: 800 PSI/55.2 bar

| Part Number | Filter Qty | Mounting Connection | Max. Flow Range |
|-------------|------------|---------------------|-----------------|
| P570329 | 1 | SAE-20 O-Ring | 65 gpm/246 lpm |
| P570330 | 1 | 1 1/4" NPT | 65 gpm/246 lpm |
| P568583 | 2 | 1 1/2" SAE 4-Bolt | 125 gpm/473 lpm |



Filter Manifolds

| Part Number | Filter Qty | Mounting Connection | Max. Flow Range |
|-------------|------------|---------------------|------------------|
| P561880 | 4 | 2" ANSI 150 Flange | 250 gpm/946 lpm |
| P568932 | 8 | 4" ANSI 150 Flange | 500 gpm/1893 lpm |
| P568933 | 10 | 4" ANSI 150 Flange | 600 gpm/2271 lpm |

T.R.A.P.™ Breathers

T.R.A.P. breathers prevent dirt and moisture from entering storage tanks from the vent.

| Assembly Part Number | Mounting Connection | Max. Flow Range | Filter Efficiency | Replacement Part Number |
|----------------------|---------------------|------------------|-------------------|-------------------------|
| X920006 | 1.5" NPT Female | 500 gpm/1893 lpm | >97% @ 3 micron | P923075 |



P570248 T.R.A.P.™ ARV™

Water absorbing filters (P570248), T.R.A.P.™ breathers, and Active Reservoir Vent™ products are used together to prevent moisture and contaminants from entering a bulk storage tank ensuring fluids are kept clean and dry.

Active Reservoir Vents (ARV)™

The ARV blows a blanket of dry, compressed air over fluids in storage to remove, free, and dissolve water.

Electrical Requirements: 110 V/50-60 Hz AC, Approx. 4W

| Part Number | Flow Rate (scfm) | Mounting Connection | Max. Tank Size |
|-------------|------------------|---------------------|---------------------------|
| P568790 | 3 | 1/2" NPTF | 10,000 Gal/37,900 Liters |
| P568791 | 10 | 1/2" NPTF | 30,000 Gal/113,700 Liters |

Point-of-Use Filters

High-Pressure Filtration for Point-of-Use Applications

Designed for high pressure delivery systems out of bulk storage tanks, typically on air pump fed hose reels in lube shops.

Element Collapse Rating: 300 PSI/20 Bar
 Max. Working Pressure: 800 PSI/55 Bar
 Rated Static Burst: 1700 PSI/117 Bar

| Part Number | Fluid Type | Max. Flow Range | Filter Efficiency |
|-------------|---|-----------------|----------------------|
| P565183 | For Hydraulic, Gear, Transmission and Engine Oils | 50 gpm/189 lpm | 15 micron@ Beta 2000 |
| P565185 | For Hydraulic, Gear, Transmission and Engine Oils | 50 gpm/189 lpm | 7 micron @Beta 2000 |
| P565184 | For Hydraulic, Gear, Transmission and Engine Oils | 50 gpm/189 lpm | 4 micron@Beta 2000 |

Point-of-Use Filter Heads

Max. Working Pressure: 800 PSI/55 Bar
 Rated Static Burst: 1700 PSI/117 Bar

| Part Number | Filter Qty | Mounting Connection | Max. Flow Range | Bypass Included? |
|-------------|------------|---------------------|-----------------|------------------|
| P566023 | 1 | SAE-16 O-Ring | 50 gpm/189 lpm | No |
| P566024 | 1 | SAE-16 O-Ring | 50 gpm/189 lpm | Yes |



Plastic point-of-use filter cartridges and metal housings are easily separated for recycling.

Bulk Fuel and Lube Filtration Systems

The sophistication of today's equipment, such as the increase in injection pressures on diesel engines, requires higher cleanliness levels than ever before.

Donaldson bulk filtration systems can save on costly component replacement and minimize equipment and vehicle downtime.

In short, Donaldson reduces your total cost of ownership.



Typical storage tank contaminated with dirt, water and microbial growth

Fuels and oils are transported from the refinery to the bulk tank storage site by truck, rail or pipeline.



From there it is loaded into another truck and delivered to your site.



Once in storage at your site, it can either be transferred to smaller tanks or dispensed directly into equipment.



Each time fluids are transferred, more contamination can be introduced.



Contaminants and water are the enemies of fuels and lubricants, robbing vehicles and equipment of performance and longevity.

Removing contaminants with bulk filtration prior to pumping fluids into equipment allows on-board filtration systems to do their job better, while supporting the advanced system technology required to meet new regulations.

Clean.

1 Donaldson single-pass filtration on the inlet reduces the risk of contamination in bulk storage tanks and helps maintain desired cleanliness levels.

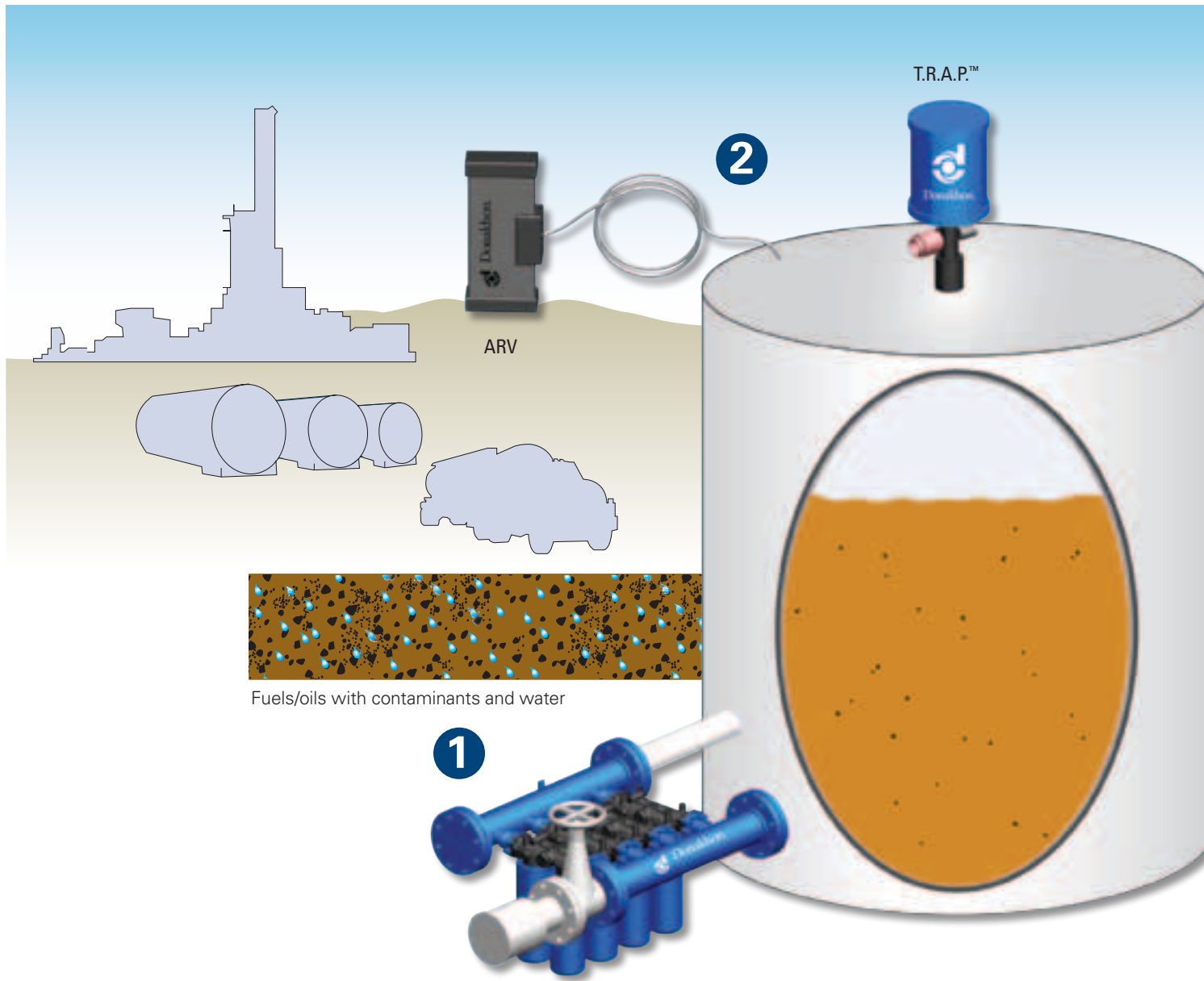
Compact and easy to replace, Donaldson filters are an important line of defense in maintaining fluid quality, and can be configured for high flow rates while minimizing pressure drop.

Protect.

2 Water absorbing filters, T.R.A.P.[™] breathers and Active Reservoir Vent[™] (ARV) products reduce the risk of moisture and contaminants entering a bulk storage tank so that fluids are kept clean and dry. Used together, they'll help guard fluids from free water, airborne contamination and microbial growth for as long as they stay in storage.

Polish.

3 Because unstable fluids and the tank itself can be a source of contamination, final filtration on the outlet with Donaldson filters ensures that targeted ISO cleanliness levels are achieved.





Donaldson Delivers Superior Bulk Fluid Filtration

Reduced downtime

Lower total cost of ownership

Modular solutions

Custom designs

Compact installation

Low installation costs

Easily serviced

Easily shipped

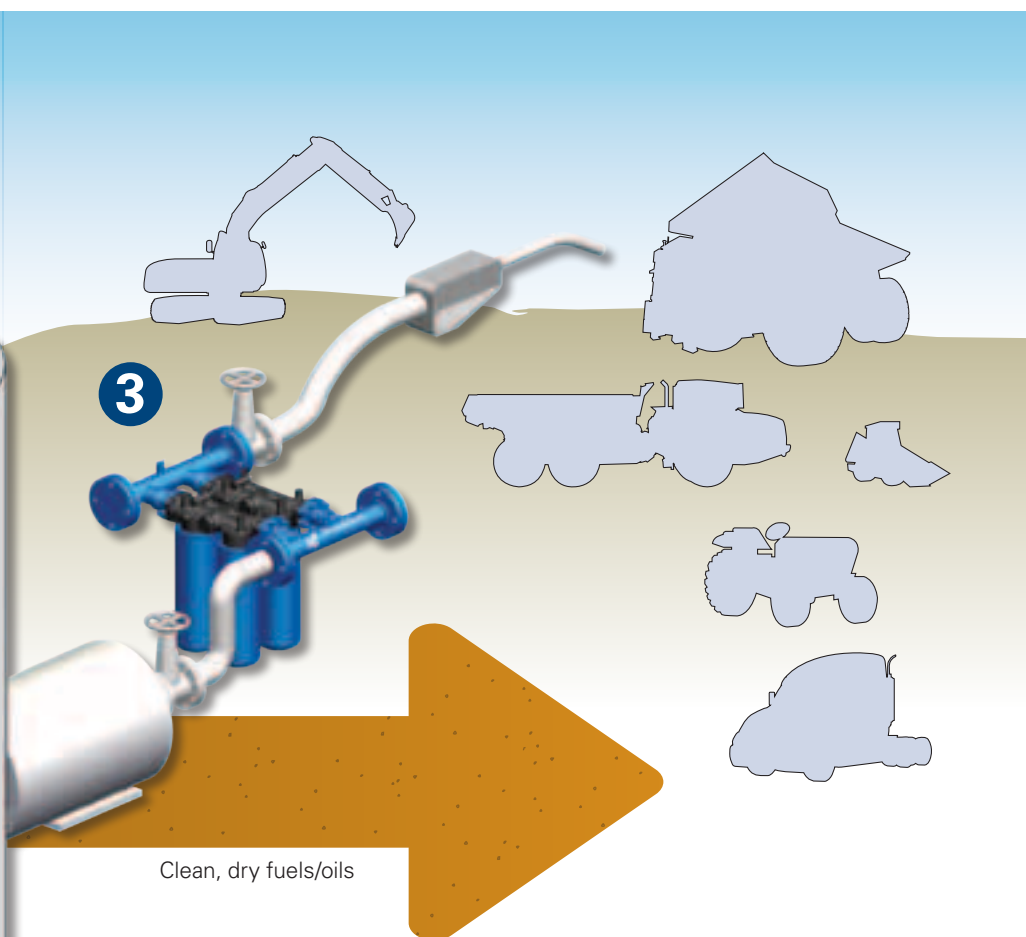
Variable flow rates

Minimal pressure drop

Material compatibility

Low inventory costs

Global presence



Clean, dry fuels/oils



Clean. Protect. Polish.™

Choosing the Right Filter

Choosing the Ideal Filters for Your System Doesn't Need to be Complicated

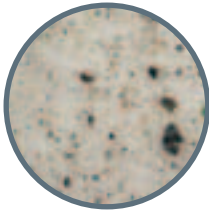
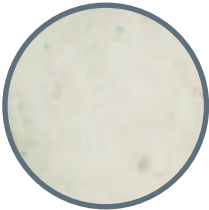
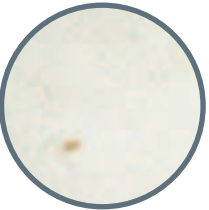

Just remember a few key principles:

Fluid viscosity plays an important role in restricting the flow through filters. It's crucial to select the proper filter to maintain adequate flow and avoid excessive pressure drops (see page 325 for viscosity data).

Selecting the right micron rating to achieve targeted ISO cleanliness without overbuilding the system will help avoid unnecessary cost.

Different types of oil have different properties. Choose a filter with the most compatible media-to-fluid properties.

Common Industry ISO Cleanliness Ratings

| | | | |
|--|---|---|---|
| ISO 22/21/18 | ISO 18/16/13 | ISO 16/14/11 | ISO 14/13/11 |
|  |  |  |  |
| Typical cleanliness of delivered fluids | Target rating for heavy gear/engine oils | Target rating for hydraulic/transmission oils | Target rating for diesel fuel |

| Typical Fluid Applications | Viscosity | Target ISO Cleanliness | FILTERS |
|--|------------|------------------------|----------------|
| Diesel Fuel | 0-100 cSt | 14/13/11 | P568666 |
| Transmission Oil Hydraulic Oil Glycols <150°F Hydraulic Based Water Emulsions | 0-500 cSt | 16/14/13 | P568665 |
| Engine Lube Oils Gear Oils Glycols Phosphate Esters | 0-6000 cSt | 18/16/13 | P568664 |



Donaldson Delivers Water Detection



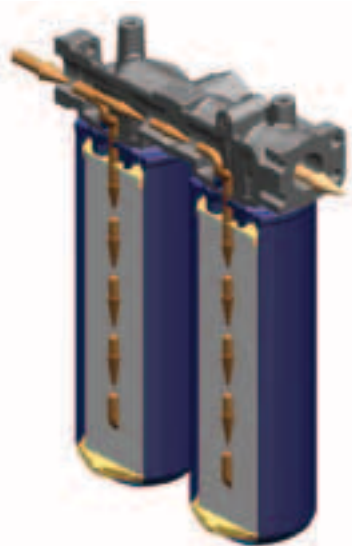
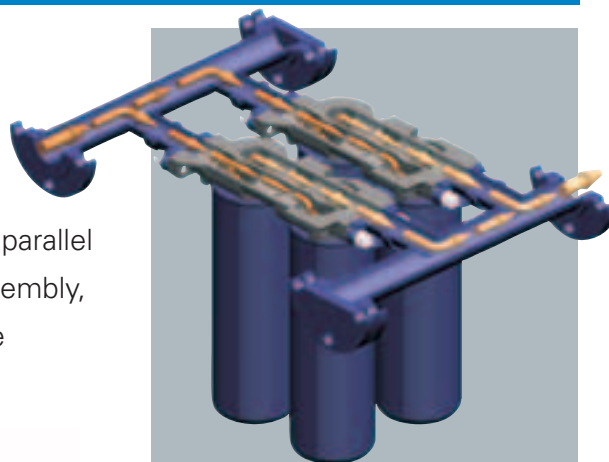
Are your bulk fluids passing large amounts of free water downstream – contaminating vehicles and equipment?

Water detection filters and systems, constructed with super absorbent media, will help you prevent downstream contamination. Installation of Donaldson's water absorbing filter (P570248) will stop flow if large amounts of free water are detected in your fluids. Designing systems with water detection filters requires careful sizing considerations. A Donaldson specialist will assist in configuring a system that meets your specific needs for flow and pressure drop.

Single Pass Filtration

Designed for Systems of any Size, with Minimal Pressure Drop

Donaldson bulk assemblies are manufactured and piped in parallel flow configurations to reduce pressure drop across the assembly, providing single-pass filtration performance, resulting in the targeted fluid cleanliness.



The flow is split between the two filters shown. Half of the flow travels through the first filter and the remaining flow travels through the second filter. Flow does not travel through both filters in sequence.



Fluids pass through the media and cleanliness targets are achieved in a single pass.



Clean fluid is pushed out of the filter, through the head and out into storage or for use.

Donaldson Delivers Material Compatibility

Donaldson bulk heads are constructed of aluminum with steel inserts to prevent excessive metal-to-metal bonding, or galling, between the head and the filter.

Viton® seals are used in all designs (unless otherwise specified) to maintain compatibility with most fluids.

Manifolds are constructed of painted carbon steel pipe with SAE 150 flanges. Manifolds are used to plumb together multiple dual heads (P568583) to handle high flow rates.

Viton is a registered trademark of E. I. du Pont de Nemours and Company.

Clean

Filters and Filter Heads

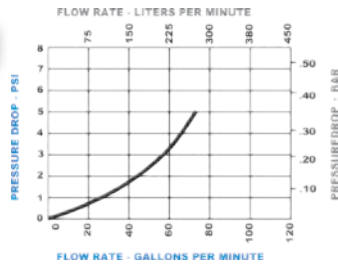
Clean fuels and oils on the inlet side to maintain cleanliness levels in bulk storage tanks. These products can also be used on the outlet side.

| FILTERS | Typical Fluid Applications | Max. Working Pressure | Rated Static Burst | Max. Flow Range | Operating Temperature | Target ISO Cleanliness | ISO Filter Efficiency |
|---------|--|-----------------------|--------------------|-----------------|-------------------------|------------------------|-----------------------|
| P568664 | Engine Oil and Gear Oil | 350 PSI/24.1 Bar | 800 PSI/55.2 Bar | 65 gpm/246 lpm | -40°F-190°F/-40°C -88°C | 18/16/13 | 25 micron@Beta 2000 |
| P568665 | Transmission Oil and Hydraulic Oil | | | | | 16/14/11 | 7 micron @Beta 2000 |
| P568666 | All Fuels | | | | | 14/13/11 | 4 micron@Beta 2000 |
| P570248 | Water-Absorbing for Ethanol-Free Fluids* | | | | | | 20 micron@Beta 2000 |

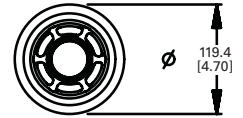
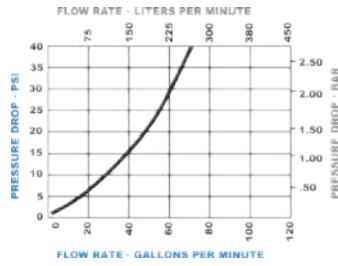
*Designed with expanding media that prevents water from entering storage or equipment tanks. Not recommended for contamination removal.



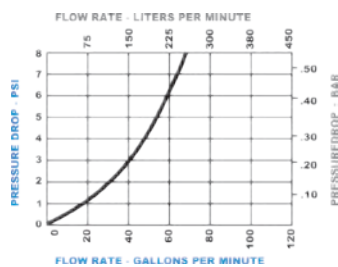
P568664



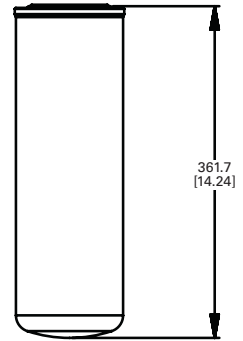
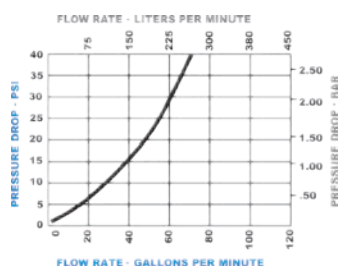
P568666



P568665



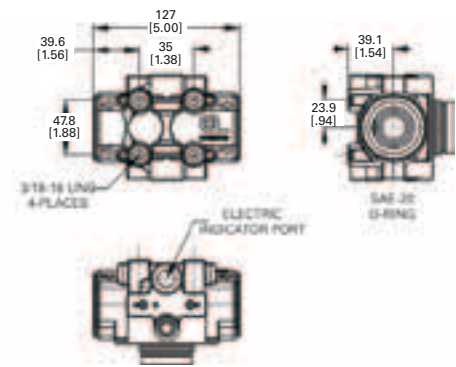
P570248



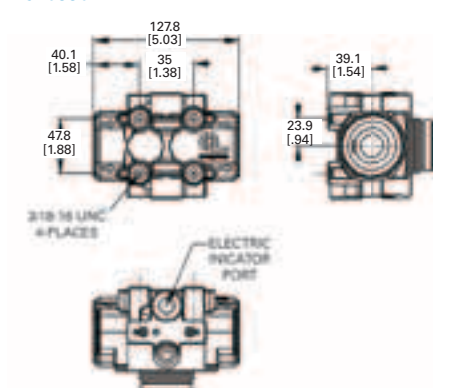
FILTER HEADS

| | Filter Quantity | Mounting Connection | Max. Working Pressure | Rated Static Burst | Max. Flow Range |
|---------|-----------------|---------------------|-----------------------|--------------------|-----------------|
| P570329 | 1 | SAE-20 O-Ring | 350 PSI/24 Bar | 800 PSI/55 Bar | 65 gpm/246 lpm |
| P570330 | 1 | 1 1/4" NPT | | | 65 gpm/246 lpm |
| P568583 | 2 | 1 1/2" SAE 4-Bolt | | | 125 gpm/473 lpm |

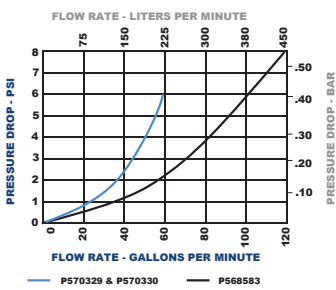
P570329



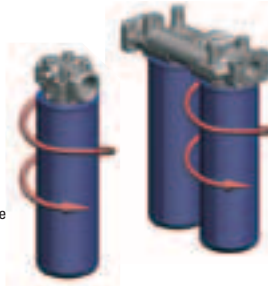
P570330



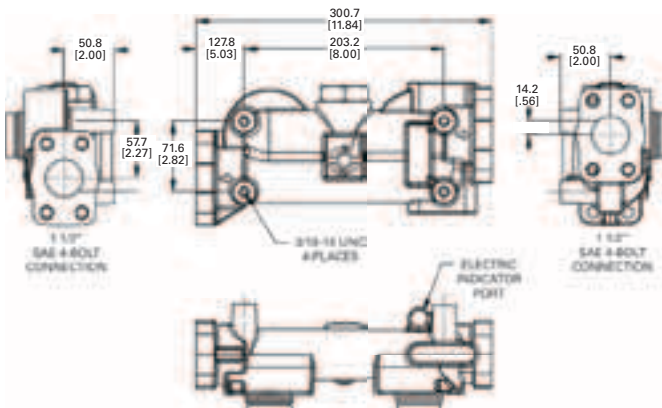
All Filter Heads



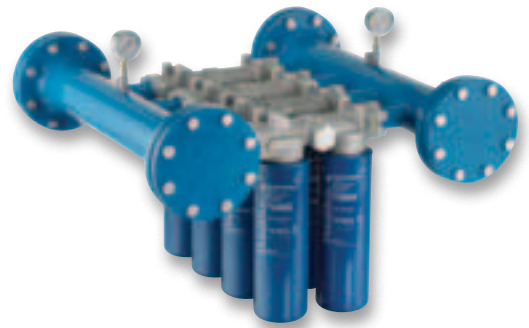
Rotate clockwise to install filter. 2" clearance necessary to change filter



P568583

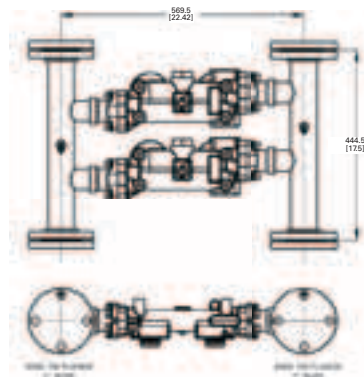
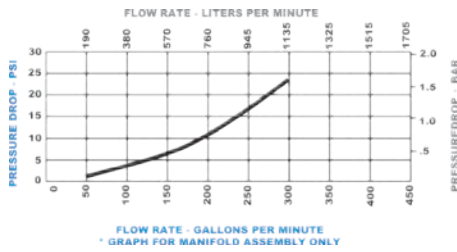


Manifold Assemblies

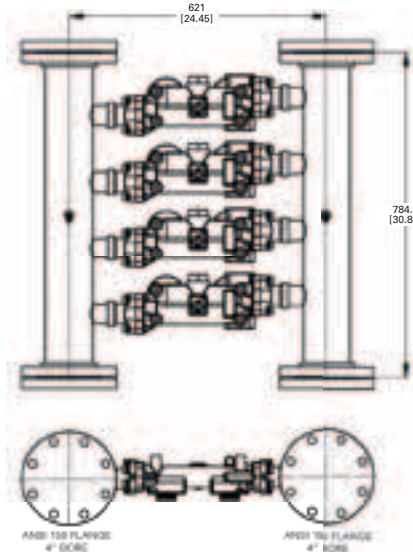
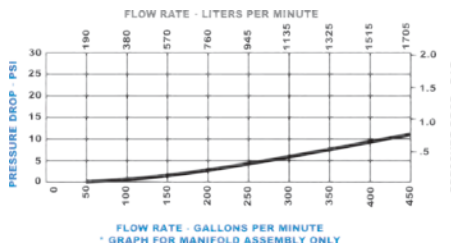


| MANIFOLDS | Filter Quantity | Mounting Connection | Max. Flow Range |
|----------------|-----------------|---------------------|------------------|
| P561880 | 4 | 2" 150 Flange | 250 gpm/946 lpm |
| P568932 | 8 | 4" ANSI 150 Flange | 500 gpm/1893 lpm |
| P568933 | 10 | 4" ANSI 150 Flange | 600 gpm/2271 lpm |

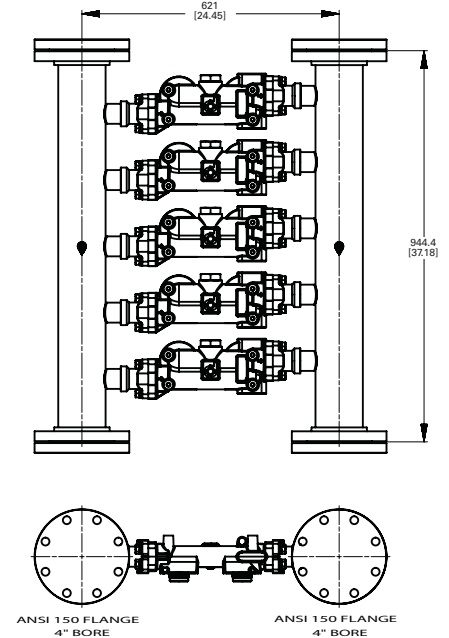
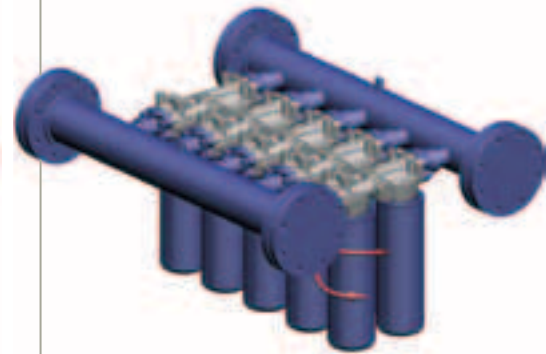
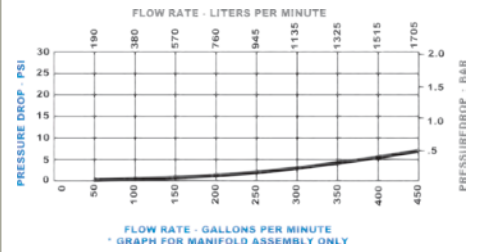
P561880



P568932



P568933



Protect

Protect Your Investment While It's in Storage

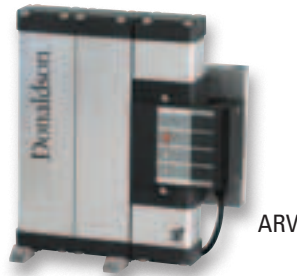
The Donaldson T.R.A.P.^{TM1} breather reduces the risk of dust and moisture entering storage tanks from the vent while allowing high flow rates of fluid into and out of the tank.

Protect fluids in storage from moisture with Active Reservoir VentTM (ARV). It draws moisture from fluids with dry compressed air².

¹Thermally Reactive Advanced Protection

²Compressed air and power not provided by Donaldson

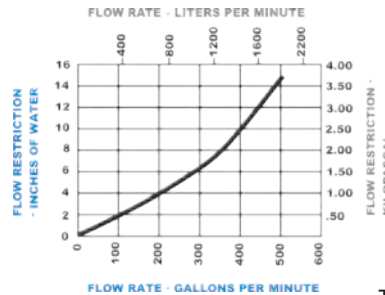
An **ARV** blows a blanket of dry air over fluids in storage to remove free and emulsified water.



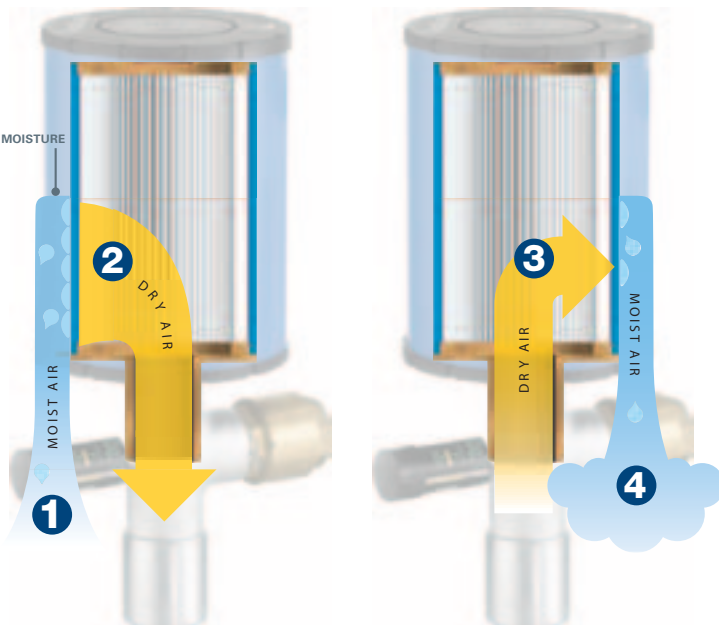
| ARV | Flow Rate (scfm) | Recommended Maximum Reservoir Size | Height | Width | Depth | Weight | Medium | Mounting Connection | Electrical Requirements |
|----------------|------------------|------------------------------------|------------|------------|-----------|--------------|-------------------------|---------------------|------------------------------|
| P568790 | 3 | 10,000 Gal/37,900 Liters | 14"/355 mm | 12"/300 mm | 5"/127 mm | 15 lbs/7 kg | Compressed Air/Nitrogen | 1/2" NPTF | 110 V/50-60 Hz AC, Approx.4W |
| P568791 | 10 | 30,000 Gal/113,700 Liters | 35"/889 mm | | | 33 lbs/15 kg | | | |

T.R.A.P.TM breathers prevent dirt and moisture from entering storage tanks from the vent, resulting in cleaner, drier air.

| T.R.A.P. BREATHER | Max. Flow Range | Filter Efficiency | Replacement filter | Connection |
|-------------------|------------------|-------------------|--------------------|-----------------|
| X920006 | 500 gpm/1893 lpm | >97% at 3 micron | P923075 | 1.5" NPT Female |



How a T.R.A.P.TM Breather Works



Intake Cycle (Inhalation)

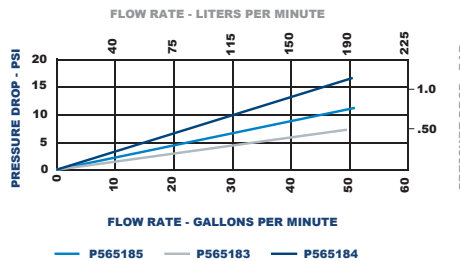
- 1 The circuit “breathes in” air containing moisture vapor.
- 2 The T.R.A.P. breather strips moisture and particulate from the incoming air, allowing only clean, dry air to enter the circuit.

Outflow Cycle (Exhalation)

- 3 During the “exhalation” cycle, the T.R.A.P. breather allows unrestricted airflow outward.
- 4 The outflow of dry air picks up the moisture collected by the T.R.A.P. breather during intake, and “blows it back out” – fully regenerating the T.R.A.P. breather’s water-holding capacity.

Designed for High Pressure Delivery Systems out of Bulk Storage Tanks

Point-of-use products “polish” or remove any contaminants that may have been picked up in storage or during final transfer. Heads, filters and manifolds highlighted in the “Clean” section (on pgs 320-321) are also used to polish fluids as they come out of storage. For higher-pressure delivery systems refer to the products below.



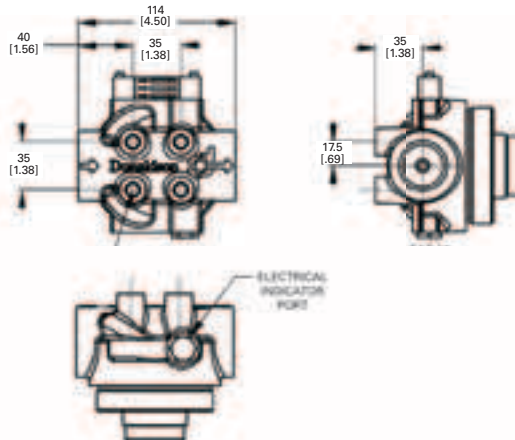
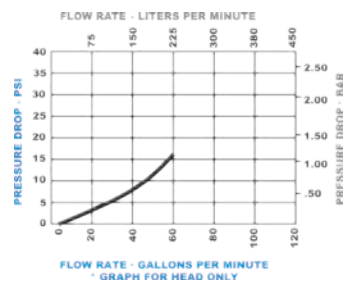
Rotate clockwise to install filter
2" clearance necessary to change filter

| POINT-OF-USE FILTERS | Typical Fluid Applications | Element Collapse Rating | Max. Working Pressure | Rated Static Burst | Max. Flow Range | Operating Temperature | Micron | Seals |
|----------------------|---|-------------------------|-----------------------|--------------------|-----------------|------------------------|--------|--------|
| P565184 | For Hydraulic, Gear, Transmission and Engine Oils | 300 PSI/20 Bar | 800 PSI/55 Bar | 1700 PSI/117 Bar | 50 gpm/189 lpm | -20°F-250°F/-29°C-121° | 4 | Viton® |
| P565185 | | | | | | | 7 | |
| P565183 | | | | | | | 15 | |
| P569826 | For Skydrol® | 300 PSI/20 Bar | 800 PSI/55 Bar | 1700 PSI/117 Bar | 50 gpm/189 lpm | -20°F-250°F/-29°C-121° | 2 | EPDM |
| P569824 | | | | | | | 5 | |
| P569823 | | | | | | | 8 | |
| P569825 | | | | | | | 14 | |

| POINT-OF-USE FILTER HEADS | Max. Working Pressure | Rated Static Burst | Max. Flow Range | Filter Quantity | Operating Temperature | Material | Compatible Filters | Mounting Connection |
|---------------------------|-----------------------|--------------------|-----------------|-----------------|--------------------------|--|-------------------------------|--|
| P566023 | 800 PSI/55 Bar | 1700 PSI/117 Bar | 50 gpm/189 lpm | 1 | -40DF-250DF/-40DC-121 DC | Aluminum head with Viton seals | P565183 | Single Head SAE-16 O-Ring |
| P566024 | | | | | | | P565184 P565185 | Single Head with 50 PSI //3.5 Bar Bypass SAE-16 O-Ring |
| P569830 | | | | | | Aluminum head with EPDM seals for Skydrol® | P569826 | Single Head SAE-16 O-Ring |
| P569831 | | | | | | | P569824 P569823 P569825 | Single Head with 50 PSI //3.5 Bar Bypass SAE-16 O-Ring |



Metal housings and plastic point-of-use filters are both single-use and are easily separated for recycling.



Skydrol is a registered trademark of Solutia Inc.

Understanding ISO Codes

Achieving the Target Cleanliness of a Fluid

ISO 4406 contamination codes consist of three numbers corresponding to the number of particles of 4 microns and larger, 6 microns and larger, and 14 microns and larger present in the fluid. This page illustrates what it means to start with a contamination of ISO 22/21/18 and target a cleanliness of ISO 14/13/11.

Data Necessary for Sizing Filtration Systems

Fluid usage

Fluid properties to determine viscosity at transfer temperature

Flow rate and pressure

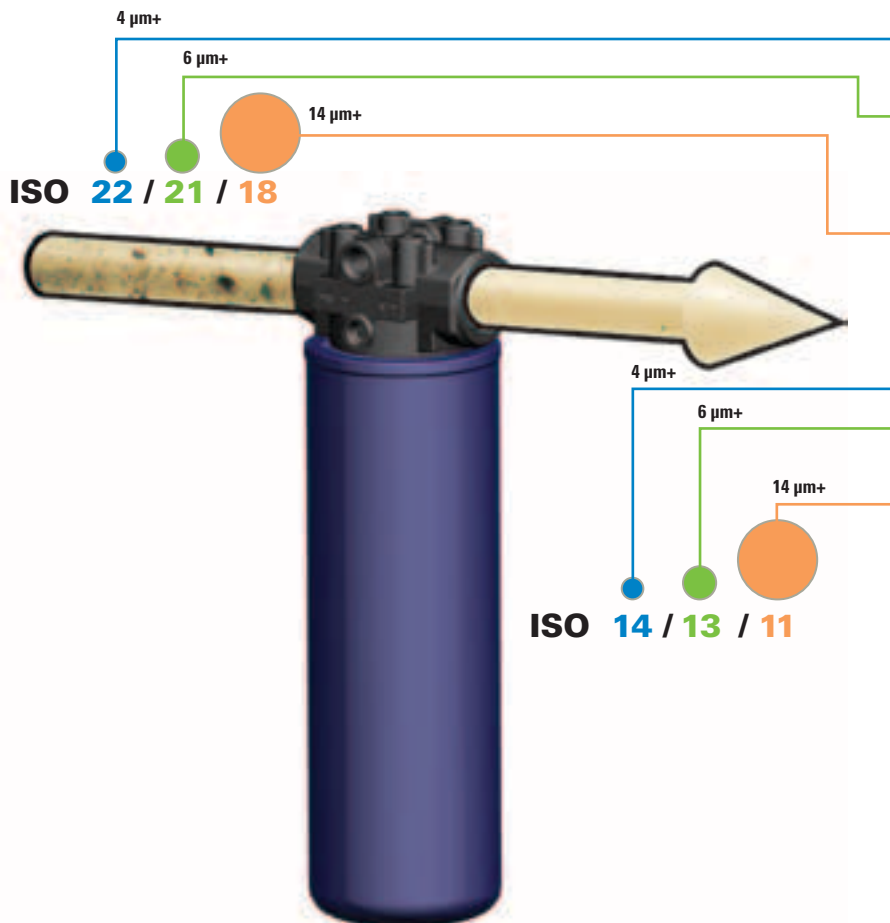
Sizes of Familiar Particles in Microns

| | | | |
|---------------------------|--------|----------------|-------|
| Grain of table salt | 100 µm | Talcum powder | 10 µm |
| Human hair | 80 µm | Red blood cell | 8 µm |
| Lower limit of visibility | 40 µm | Bacteria | 2 µm |
| White blood cell | 25 µm | Silt | <5 µm |

ISO 4406 Contamination Codes

Range of number of particles per 100 milliliters

| Code | More Than | Up to & Including |
|------|-----------|-------------------|
| 24 | 8,000,000 | 16,000,000 |
| 23 | 4,000,000 | 8,000,000 |
| 22 | 2,000,000 | 4,000,000 |
| 21 | 1,000,000 | 2,000,000 |
| 20 | 500,000 | 1,000,000 |
| 19 | 250,000 | 500,000 |
| 18 | 130,000 | 250,000 |
| 17 | 64,000 | 130,000 |
| 16 | 32,000 | 64,000 |
| 15 | 16,000 | 32,000 |
| 14 | 8,000 | 16,000 |
| 13 | 4,000 | 8,000 |
| 12 | 2,000 | 4,000 |
| 11 | 1,000 | 2,000 |
| 10 | 500 | 1,000 |
| 9 | 250 | 500 |
| 8 | 130 | 250 |
| 7 | 64 | 130 |
| 6 | 32 | 64 |
| 5 | 16 | 32 |
| 4 | 8 | 16 |
| 3 | 4 | 8 |
| 2 | 2 | 4 |
| 1 | 1 | 2 |



The Importance of Temperature in Sizing Your Filtration System

Fluid viscosity, measured in centiStokes (cSt) or Saybolt Seconds Universal (SSU or SUS), is the resistance of a fluid to flow (thickness of fluid). Low viscosity fluids pass through filters with less resistance than high viscosity fluids. Higher fluid viscosities have higher pressure drops due to higher resistance passing through the media.

The colder the fluid, the higher the viscosity, so the lowest potential temperature of the fluid is the best measure for sizing a bulk filtration system. Due to the high specific heat capacity of fluids, the lowest ambient temperature may not be an accurate reflection of the actual fluid temperature. Avoid over sizing your system by using the stored fluid temperature and not the lowest ambient temperature, which tends to be lower than the temperature of the fluid in storage or transport.

Data Necessary for Sizing Filtration Systems

Fluid usage

Fluid properties to determine viscosity at transfer temperature

Flow rate and pressure

Fuel/Oil Kinematic Viscosity Combined With Temperature in centiStokes (cSt)

| SAE Gear Oil | | | 75W | | | 80W | 85W | 90 | | | 140 | | |
|----------------|-----|--------|-----|-----|------|------|------|-------|-------|-------|-------|-------|-------|
| SAE Engine Oil | | | 5W | 10W | 20 | | 30 | 40 | 50 | | | | |
| ISO Grade | | | 15 | 22 | 32 | 46 | 68 | 100 | 150 | 220 | 320 | 460 | 680 |
| °F | °C | Diesel | | | | | | | | | | | |
| 248 | 120 | | | | 3.7 | 3.5 | 5.7 | 7.3 | 9.3 | 11.7 | 14.7 | 18.2 | 22.9 |
| 230 | 110 | | | | 4.4 | 5.5 | 7.0 | 9.0 | 11.7 | 14.9 | 18.9 | 23.7 | 30.2 |
| 212 | 100 | | 1 | 4.5 | 5.4 | 6.8 | 8.8 | 11.4 | 15.0 | 19.4 | 25.0 | 31.8 | 41.1 |
| 194 | 90 | | 3 | 5.3 | 6.7 | 8.5 | 11.2 | 14.8 | 19.8 | 26.0 | 34.1 | 44.0 | 57.9 |
| 176 | 80 | | 5 | 6.5 | 8.5 | 11.0 | 14.8 | 19.9 | 27.1 | 36.2 | 48.2 | 63.3 | 84.8 |
| 158 | 70 | | 6.2 | 8.5 | 11.1 | 14.8 | 20.2 | 27.7 | 38.5 | 52.4 | 71.1 | 95.2 | 130 |
| 140 | 60 | | 8 | 12 | 15.1 | 20.6 | 28.7 | 40.2 | 57.2 | 79.6 | 110 | 151 | 211 |
| 122 | 50 | | 11 | 15 | 21.5 | 29.9 | 42.9 | 61.5 | 98.7 | 128 | 181 | 254 | 365 |
| 104 | 40 | 1 | 15 | 22 | 32 | 46 | 68 | 100 | 150 | 220 | 320 | 460 | 680 |
| 86 | 30 | 2 | 21 | 32 | 50.7 | 75.6 | 116 | 175 | 271 | 409 | 613 | 907 | 1380 |
| 68 | 20 | 3 | 33 | 51 | 86.7 | 135 | 214 | 334 | 536 | 838 | 1290 | 1980 | 3130 |
| 50 | 10 | 4 | 52 | 87 | 162 | 264 | 438 | 711 | 1190 | 1920 | 3070 | 4870 | 8020 |
| 32 | 0 | 5 | 85 | 180 | 340 | 585 | 1020 | 1720 | 2990 | 5060 | 8400 | 13900 | 23900 |
| 14 | -10 | 9 | 185 | 375 | 820 | 1500 | 2770 | 4880 | 8890 | 15700 | 27200 | 47000 | 85000 |
| -4 | -20 | 15 | 400 | 800 | 2350 | 4650 | 9120 | 16800 | 32300 | 60000 | | | |

Flow Rate and Pressure

Bulk filtration systems need to be designed properly in order to meet a desired cleanliness rating. Choosing the correct filter and applying the right number of filters for a specific viscosity to maintain minimal pressure drop is critical to configure an efficient system for a given application.

Increased **flow rate** increases resistance as fluids pass through filters, making it harder to maintain ideal system pressure. Combined with viscosity, targeted flow rate is another critical factor in designing filtration systems.

These charts demonstrate the pressure drop experienced by fluids of various viscosities as the flow rate increases through a selected filter. The more vertical the line, the more filters need to be added to the system to distribute the volume of fluid, effectively reducing the flow rate through each filter and maintaining optimal pressure.

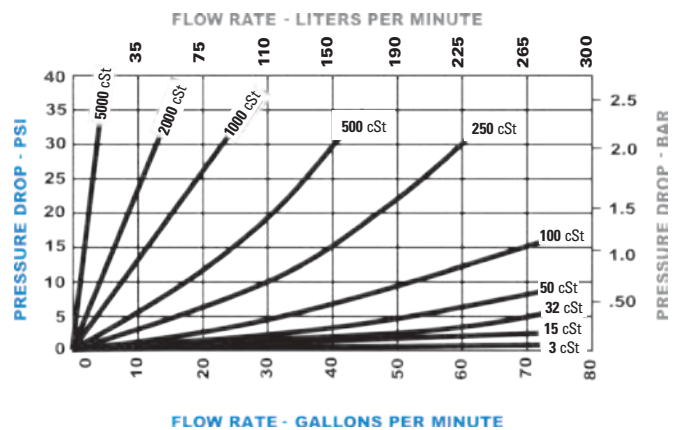
Data Necessary for Sizing Filtration Systems

Fluid usage

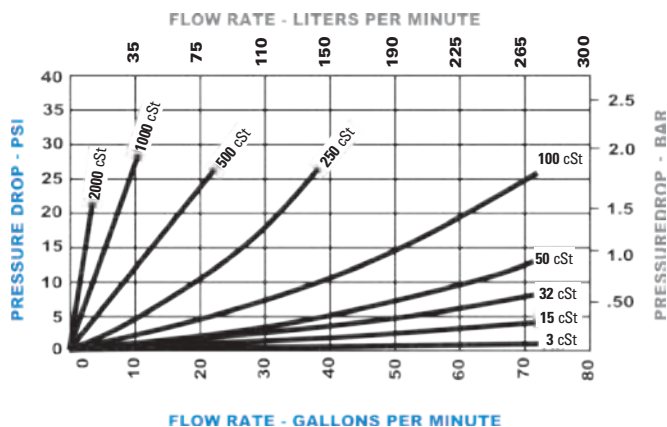
Fluid properties to determine viscosity at transfer temperature

Flow rate and pressure

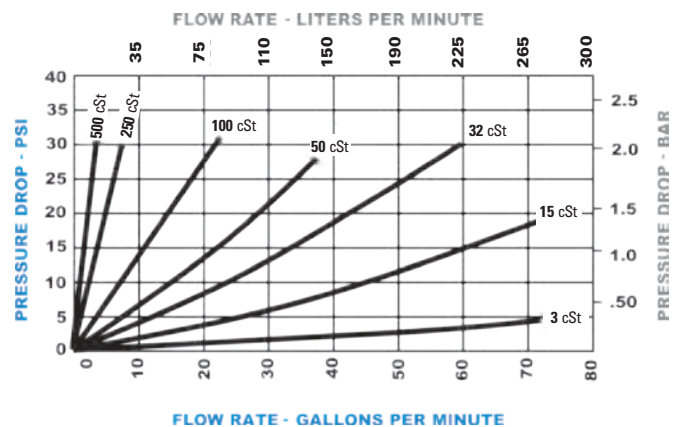
P568664 Engine Oil and Gear Oil



P568665 Transmission Oil and Hydraulic Oil



P568666 All Fuels



Customizing Your System

Steps to Sizing a Bulk Application

Example

| | | | |
|---|---|---|--|
| 1 | Define product flow rate, fluid type and pressure drop restriction. <i>New systems should ideally have less than 15 PSI/1 Bar pressure drop.</i> | Flow rate | 40 gpm/151 lpm |
| | | Fluid type | ISO 68 hydraulic/transmission fluid |
| | | System Pressure Drop | 10 PSI/.7 Bar |
| 2 | Use the table on the previous page to determine fluid viscosity using the fluid type and temperature. | Temperature at transfer | 68°F/20°C |
| | | Viscosity of ISO 68 at 68°F/20°C | 214 cSt |
| 3 | Select the appropriate filter (see pgs 320-323). | P568665 | |
| 4 | Determine the pressure drop using the flow rate and the fluid viscosity, according to the appropriate chart. <i>This number will be the pressure drop through one filter.</i> | 20 PSI/1.4 Bar is the approximated pressure drop for ISO 68 at 68°F/20°C through a P568665 filter. | |
| 5 | Divide the pressure drop resulting from step 4 by the desired system pressure drop. This number is the number of filters necessary to clean the fluid properly at the determined flow rate. | 20 (total PSI) / 10 (system pressure drop) 1.4 (total Bar) / 0.7 (system pressure drop) = 2 | |
| | | Result: This application requires two P568665 filters. | |

There's No Need to Do It Alone

Let a Donaldson specialist assist you by providing recommendations on sizing and positioning of Donaldson filters. You can help us design your system by providing:

Responses to steps 1-5 above.

A schematic of your fluid transfer process (hand sketches work great), and/or

Photographs of your site (tanks, inlets and outlets).

To get started, contact Donaldson:
bulk.filtration@donaldson.com
www.donaldsonbulkfiltration.com
 1-800-846-1846 or 1-952-703-4670



Donaldson Delivers
Performance
Under **Any**
Pressure.



www.donaldsonfilters.com

PRODUCT INFORMATION



www.donaldsonfilters.com

Donaldson provides this technical reference as a short course in “Hydraulic Filtration 101” — for those who want to gain a better understanding of hydraulic filtration.

In industrial and mobile applications at factories all over the world, we too often see hydraulic circuits that don’t include proper fluid filtration, or include it as an afterthought. Good filtration needs to be an integral part of the hydraulic circuit to ensure the long life and proper operation of the pumps, valves and motors. A \$100 filter protects your \$100,000 equipment.

This section is offered to aid in choosing the filter that will help you achieve the ideal cleanliness levels and longest life for your critical components.

Topics

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- Types of Contaminant330
- Factors in Component Life330
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- Filter Positioning 352

Symbols Used

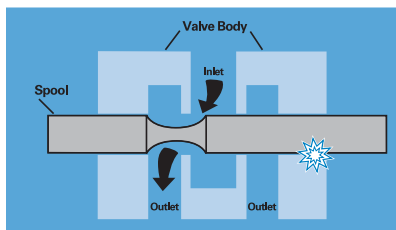
| | |
|------------|--|
| β | Beta Ratio |
| cSt | Centistokes |
| ΔP | Pressure Drop or Differential Pressure |
| ISO | International Standards Organization |
| μm | Micron or micrometer |
| ppm | Parts per million |
| SSU SUS | Saybolt Seconds Universal |

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Hydraulic Components Need Protection

Fluid power circuits are designed in all shapes and sizes, both simple and complex in design, and they all need protection from damaging contamination. Abrasive particles enter the system and, if unfiltered, damage sensitive components like pumps, valves and motors. It is the job of the hydraulic filter to remove these particles from the oil flow to help prevent premature component wear and system failure. As the sophistication of hydraulic systems increases, the need for reliable filtration protection becomes ever more critical.

How Contamination Damages Precision Parts



This illustration of a simple hydraulic valve illustrates how particles damage components. In normal operation, the spool slides back and forth in the valve

body, diverting oil to one side of the valve or the other. If a particle lodges between the spool and valve body, it will erode small wear particles from the metal surfaces. As these wear particles are moved back and forth by the action of the spool, they can roll into a burr that jams the spool and disables the valve.



Component Damage

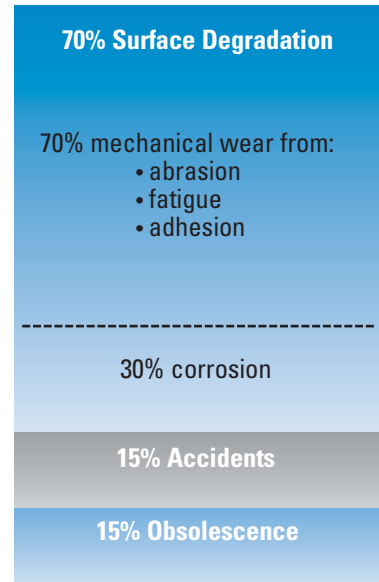
Looking down the barrel of an hydraulic cylinder, we can see the scratches along the inside surface. Don't cut costs by eliminating hydraulic filters. It could cost you more in the long run in major component repairs.

Types of Contaminant

- Many different types of contamination may be present in hydraulic fluid, causing various problems. Some are:
- Particulate (dust, dirt, sand, rust, fibers, elastomers, paint chips)
- Wear metals, silicon, and excessive additives (aluminum, chromium copper, iron, lead, tin, silicon, sodium, zinc, barium, phosphorous)
- Water
- Sealants (Teflon®* tape, pastes)
- Sludge, oxidation, and other corrosion products
- Acids and other chemicals
- Biological, microbes (in high water based fluids)

Typical Factors in Component Life

Studies show that most (typically 70%) of hydraulic component replacement is necessary because of surface degradation, and most of that is due to mechanical wear. Proper filtration of hydraulic fluids can lengthen component life.



Disaster Strikes

When filters are not a main component of the hydraulic circuit, disaster awaits. Here, piston rings were eaten away by contaminants.

* Teflon is a registered trademark of E.I. DuPont de Nemours & Co., Inc.

Where Contamination Comes From

There are a surprising number of contaminated sources in a hydraulic system or circuit.

New Hydraulic Fluid

Adding new fluid can be a source; even though it's fresh from the drum, new hydraulic fluid isn't clean. (It may look clean, but, remember, the human eye can only see a particle the size of about 40 μm .) Oil out of shipping containers is usually contaminated to a level above what is acceptable for most hydraulic systems: typically, new fluid has a cleanliness level about the same as ISO Code 23/21/19, and water content is typically 200 to 300 ppm. Never assume your oil is clean until it has been filtered. One very effective way of ensuring thorough fluid conditioning is with a dedicated off-line circulation loop, or "kidney" loop filtration. Learn more on page 299.

Built-In

Built-in contamination, also called primary contamination, is caused during the primary manufacture, assembly and testing of hydraulic components. Metal filings, small burrs, pieces of Teflon tape, sand and other contaminants are routinely found in initial clean up filtration of newly manufactured systems.

Ingressed

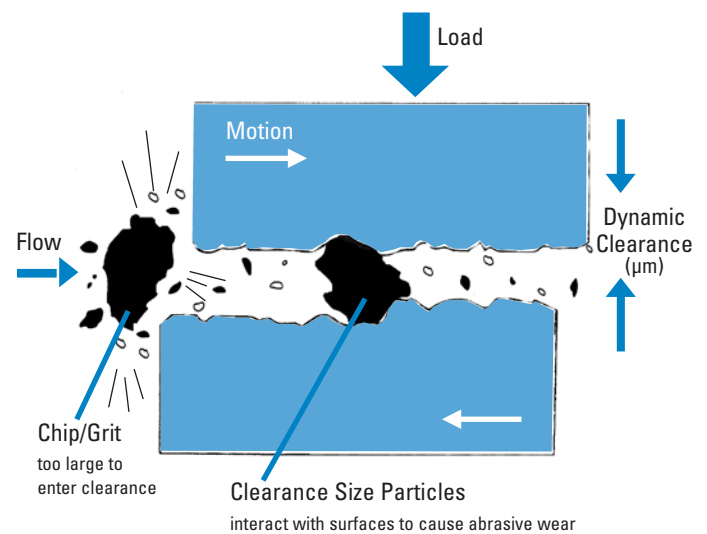
Ingressed or external contamination comes from the environment surrounding the system. Dirt can enter the hydraulic fluid supply through leaking seals, reservoir breather caps, and worn cylinder rod seals. Ingressed moisture, particularly, can cause long-term problems. As a hot system cools at night, cool moisture-laden air can be drawn into the reservoir; as the air condenses, water is released into the reservoir. Water in excess of 0.5% by volume in a hydrocarbon-based fluid accelerates the formation of acids, sludge and oxidation that can attack internal components, cause rust, and adversely affect lubrication properties. The severity of ingression and type of contaminant are dictated by the applications and environment.

Induced

Maintenance procedures can introduce contamination into the system. Opening the system allows airborne particles to enter. Leaving the system open during operation provides continuous ambient particle ingression. Keep your system closed as much as possible.

In-Operation

The major source of contamination are the pump and actuators, the hydraulic cylinder, or the hydraulic motor. Wear-generated contaminants are a hazard during normal hydraulic system operation. The circuit actually generates additional particles as the fluid comes into contact with the precision machined surfaces of valves, motors and pumps. Contaminant levels can keep doubling with every new particle generated. The result can be catastrophic if these contaminants are not properly filtered out of the system.



Rubber & Elastomers

Due to temperature, time, and high-velocity fluid streams, rubber compounds and elastomers degrade—thus releasing particulates into the fluid. This may be from hoses, accumulator bladders, seals, or other elastomer products.

High Water Based Fluids

The water in HWBF tends to support biological growth and generate organic contamination and microbes.

Replacement of Failed Components

Failure to thoroughly clean fluid conductor lines after replacing a failed hydraulic pump will cause premature catastrophic failure.

Donaldson recommends frequent oil sampling to ensure proper contamination control. Sample test points should be close to hydraulic pumps and at other key locations that provide safe, reliable access to the fluid while under full system pressure.

Fluid Conditioning

Fluid Conditioning is the term for the overall conditioning of the fluid in the hydraulic system, and encompasses particulate removal via filters along with other various methods for removing silt, air, water, heat, acid, sludge or chemicals.

Particulate Removal

Particulate removal is usually done with mechanical filters. A well designed reservoir that allows settling will also help in keeping particulates out of the mainstream fluid. For ferrous particulates and rust, reservoir magnets or strainer band magnets can also be used. Other methods such as centrifuging or electrostatic filtration units can also be used, particularly in continuous batch processing and fluid reclamation.

Removal of Silt

Silt, defined as very fine particulate under 5 µm in size, requires very fine filtration or “oil polishing.”

Air Removal

Getting air out of the system is best done by adding 100 mesh screen in the reservoir, approximately 30° from horizontal to coalesce entrained air and allow larger bubbles to rise to the surface when reservoir velocities are low.

Water Removal

A number of techniques exist to prevent water or moisture ingress or to remove water once it is present in a hydraulic or lube oil system. The best choice of technique for removal is dependent on the whether or not the water exists as a separate phase (dissolved or free), and also on the quantity of water present. For example, the presence of water or moisture can be reduced or prevented from entering a fluid reservoir through the use of absorptive breathers or active venting systems. However once free water is present in small quantities, water absorbing filters or active venting

systems usually provide adequate removal means. For large quantities of water, vacuum dehydration, coalescence, and centrifuges are appropriate techniques for its removal. However, as each of these techniques operates on different principles, they have various levels of water removal effectiveness. The chart below provides comparative information on these techniques and their relative effectiveness. Care should be taken to apply the best technique to a given situation and its demands for water removal.

Chemical Removal

Removal of acids, sludge, gums, varnishes, soaps, oxidation products and other chemicals generally requires an adsorbent (active) filter with Fuller Earth, active type clays, charcoal, or activated alumina.

Heat Removal

Removing heat is important to maintain viscosity and prevent fluid breakdown. Usually performed with heat exchangers, including air-to-oil and water-to-oil types, finned coolers, or refrigerated units.

Heat Addition

Added heat is used for cold temp start-up to get fluid viscosities within operational limits. Use heaters, immersion or in-line.

Kidney Loop Filtration

One very effective way of ensuring thorough fluid conditioning is with a dedicated off-line circulation loop, or “kidney” loop. This system uses a separate circulation pump that runs continuously, circulating and conditioning the fluid. Multiple stages and types of filters can be included in the circuit, as well as heat exchangers and in-line immersion heaters.

For further information on fluid conditioning, reference the off-line filtration section on page 299.

Water Prevention and Removal Techniques

| | Usage | Prevents Humidity Ingression | Removes Dissolved Water | Removes Free Water | Removes Large Quantities of Free Water | Limit of Water Removal |
|----------------------------------|------------------------|------------------------------|-------------------------|--------------------|--|-------------------------|
| Adsorptive Passive Breather | prevention | Y | | | | n/a |
| Active Venting System | prevention and removal | Y | Y | Y | | down to <10% saturation |
| Water Absorbing Cartridge Filter | removal | | | Y | | only to 100% saturation |
| Centrifuge | removal | | | Y | Y | only to 100% saturation |
| Coalescer | removal | | | Y | Y | only to 100% saturation |
| Vacuum Dehydrator | removal | | Y | Y | Y | down to ~20% saturation |

Proper Filter Application

When selecting a new filter assembly or replacement filter, it's important to first answer some basic questions about your application. Where will the filter be used? What is the required cleanliness level (ISO code) of your system? What type of oil are you filtering? Are there specific problems that need to be addressed?

It's also important to think about the viscosity of the fluid in your system. In some machinery lubrication applications, for example, the oil is very thick and has a tougher time passing through the layer of media fibers. Heating techniques and the addition of polymers can make the liquid less viscous and therefore easier to filter. Another option is to install a filter with larger media surface area, such as the Donaldson W041 or HRK10 low pressure filters, that can accommodate more viscous fluids.

Next, think about duty cycle and flow issues. Working components such as cylinders often create wide variations in flow—also called pulsating flow—that can be problematic for filters with higher efficiency ratings. On the other hand, dedicated off-line filtration (also called “kidney loop”) produces a very consistent flow, so it makes sense to use a more efficient filter. Learn more about off-line filtration on page 352.

Filters used in applications with steady, continuous operation at lower pressures will last longer than filters that must endure cycles of high pressure pulsating flow. Generally, the lower the micron rating of a filter, the more often it needs to be changed since it is trapping more particles.

Finally, it's wise to ask yourself, “How much is my equipment worth?” Calculate how much it would cost to replace the equipment in your system, in case of component failure, and make sure those areas are well protected with proper filtration. (For example, high performance servo valves are very sensitive, costly components that need to be protected with finer filtration media.)

Minimizing maintenance costs through good contamination control practices requires proper filter application based on the specific contamination problems. Good contamination control means cost-effective filtration. When looking for a filter, first assess the needs of your system and any problem areas.

Learn more about proper filter positioning on page 352.

Characteristics to Consider When Specifying a Filtration System

- 1) Oil Viscosity
- 2) Flow
- 3) Pressure
- 4) What Components will be protected by the filter
- 5) Cleanliness level required (expressed in ISO code)
- 6) Type of oil/fluid
- 7) Environment (the system, the surrounding conditions, etc.)
- 8) Duty cycle
- 9) Operating Temperature

A Hydraulic System Design Worksheet is available on page 335.

Fluid Properties

Lubricity The property of the fluid that keeps friction low and maintains an adequate film between moving parts.

Viscosity The thickness of the fluid as measured by resistance to flow. The fluid must be thin enough to flow freely, heavy enough to prevent wear and leakage. Hydraulic fluids thicken when they cool and thin out as they heat up. Because some hydraulic systems work under wide temperature extremes, viscosity can be an important factor.

Viscosity Index (VI) The rate of viscosity change with temperature: the higher the index, the more stable the viscosity as temperature varies. VI can sometimes be improved by additives, usually polymers.

Rust Resistance Rust inhibiting chemicals in hydraulic fluids help overcome the effects of moisture from condensation.

Oxidation Resistance Oxidation inhibitors delay the sludgy/acidic effects of air, heat, and contamination in the system.

Foaming Resistance Although control of foaming depends largely on reservoir design, anti-foaming additives in the fluid also help.

Types of Hydraulic Fluid

There are many kinds of fluids used for power, but they can basically be called petroleum-based fluids, biodegradable fluids, and fire-resistant fluids. A brief description of some of the types in each category are listed below; for details on these or others, consult your filter supplier or refer to a reputable manual on hydraulics, such as the Lightning Reference Handbook, published by Berendsen Fluid Power, Whittier, CA 90601.

Petroleum Based (Hydrocarbon)

These are the most commonly used fluids in hydraulic systems. Their major advantages are low cost, good lubricity, relatively low/non-toxicity, and common availability. This type of fluid is not just plain oil; rather, it is a special formulation with additives that make it suitable for hydraulic systems. Mostly, the additives inhibit or prevent rust, oxidation, foam and wear.

Variations:

- Straight oils: same as petroleum-based oil but without the additives.
- Automatic transmission fluids (ATF): excellent low temp viscosity and very high VI.
- Military hydraulic fluids (ie: MIL-H-5606 and MIL-H-83282): also called 'red oil' because of the color. Low viscosity, good for cold temp operations, but may have to be modified for pumps.

Fire Resistant Fluids

There are two types of fire-resistant fluids commonly used in hydraulic applications: Phosphate Esters and High Water Based Fluids (HWBF). Although generally not as viscous at cold temperatures as petroleum-based fluids, they are fire resistant due to their high content of noncombustible material. Very useful in overcoming the likelihood of fire caused by a broken hydraulic line spraying petroleum fluid into a pit of molten metal, onto a hot manifold, into a heat-treating furnace, or other ignition source.

Some types of HWBF:

- Oil-in-water emulsions (HFA): typically 95% water and 5% oil, with the oil droplets dispersed throughout the water. Provide some fire resistance, but due to oil content, other fluids are superior.
- Water-in-oil emulsions (invert emulsion HFB): typically 40% water and 60% oil, with the water dispersed in the oil. Provide some fire resistance, but due to oil content, other fluids are superior.
- Water-glycol (HFC): typically 40% water and 60% glycol. Excellent fire resistance. Since glycol is an antifreeze, water-glycol can be used at lower temps.

NOTE: HWBF may require reduced pressure rating of pumps and other components.

HFD Fluids

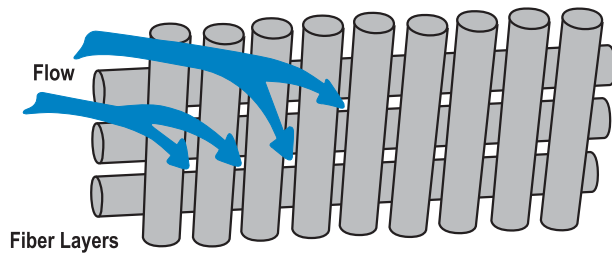
The HFD group is a classification given to several different types of synthetic products that do not contain petroleum oil or water. Phosphate ester fluids were the first HFD fluids and are the most fire resistant within the HFD family. Not as popular today, their use declined due to poor environmental performance, limited compatibility, and high cost. Certain phosphate esters have very high auto-ignition temperatures and are still used in specific applications, such as aircraft and power generation. A common brand is known as Sydol® (registered trademark of Solution, Inc.). Skydrol requires EPR seal for chemical compatibility. Today most phosphate esters have been replaced by polyol esters. Based on organic esters, polyol esters are the most common HFD fluids used today. They offer good inherent fire resistance, good compatibility with system materials, excellent hydraulic fluid performance, and easy conversion from petroleum oil. In addition, the organic nature of these fluids gives them good environmental performance in biodegradability and aquatic toxicity. Another type of synthetic, fire resistant fluids have been formulated for certain niche markets. Water free polyalkylene glycols (PAGs) feature extended fluid life and good environmental performance. Technically an HFD fluid, PAGs (also known as polyalphaolefins (PAOs) are more often used for their biodegradability and overall environmental friendliness. This group also contains the synthetic silicone (siloxane) oils, known for their anti-foaming properties.

Biodegradable

With increasing concern about the environmental impact of hydraulic system leaks and spills, biodegradable fluids are receiving expanded usage, particularly in Europe. There are two types of common biodegradable hydraulic fluids: 1) vegetable-based oils, such as sunflower or rapeseed oils, and 2) synthetic oils like diesters, etc. Generally, systems using biodegradable fluids are derated for maximum and minimum temperatures. Users who replace standard hydraulic oils with biodegradable oils must check with filtration component manufacturers to confirm that the fluid and components are compatible.

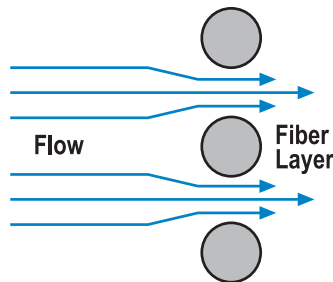
How Filter Media Functions In a Filtration System

The job of the media is to capture particles and allow the fluid to flow through. For fluid to pass through, the media must have holes or channels to direct the fluid flow and allow it to pass. That's why filter media is a porous mat of fibers that alters the fluid flow stream by causing fluid to twist, turn and accelerate during passage.



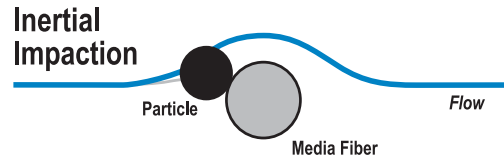
The fluid changes direction as it comes into contact with the media fibers, as illustrated above. As the fluid flows through the media, it changes direction continuously as it works its way through the maze of media fibers. As it works its way through the depths of the layers of fibers, the fluid becomes cleaner and cleaner. Generally, the thicker the media, the greater the dirt-holding capacity it has.

Looking at a cross-section view of the fibers, we can see how the flowstream is accelerated as it flows into the spaces between the fibers.

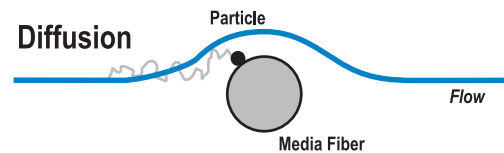


How Filter Media Collects Particles There are four basic ways media captures particles.

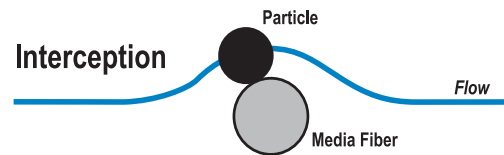
The first, called **inertia**, works on large, heavy particles suspended in the flow stream. These particles are heavier than the fluid surrounding them. As the fluid changes direction to enter the fiber space, the particle continues in a straight line and collides with the media fibers where it is trapped and held.



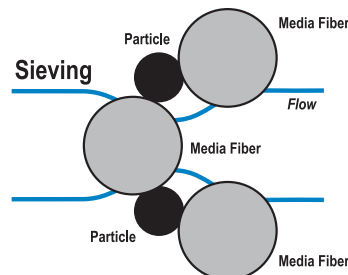
The second way media can capture particles is by **diffusion**. Diffusion works on the smallest particles. Small particles are not held in place by the viscous fluid and diffuse within the flow stream. As the particles traverse the flow stream, they collide with the fiber and are collected.



The third method of particle entrapment is called **interception**. Direct interception works on particles in the mid-range size that are not quite large enough to have inertia and not small enough to diffuse within the flow stream. These mid-sized particles follow the flow stream as it bends through the fiber spaces. Particles are intercepted or captured when they touch a fiber.



The fourth method of capture is called **sieving** and is the most common mechanism in hydraulic filtration. As shown at right, this is when the particle is too large to fit between the fiber spaces.



Basic Types of Hydraulic Filter Media

Filter Media

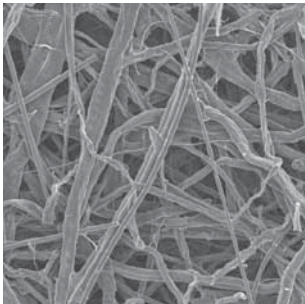
Media is a term used to describe any material used to filter particles out of a fluid flow stream. There are six basic types used to remove contamination in hydraulic applications:

Cellulose Media (Traditional)

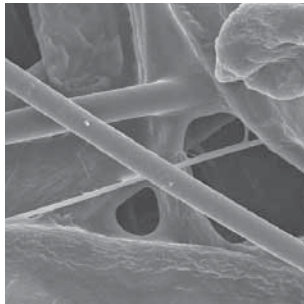
Cellulose fibers are actually wood fibers, microscopic in size and held together by resin. Fibers are irregular in both shape and size. Cellulose often has lower beta ratings, which means there are smaller pores in the media. Smaller media pores cause more flow resistance, resulting higher pressure drop.

While cellulose provides effective filtration for a wide variety of petroleum-base fluids, in certain applications it results in poor filtration performance as compared to synthetic media.

SEM 100X



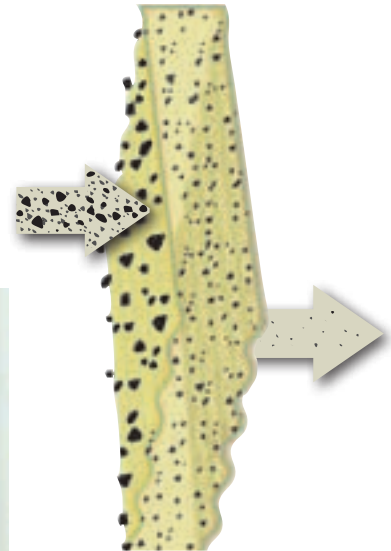
SEM 600X



MEDIA IMAGE



HOW IT WORKS



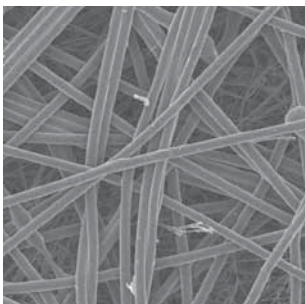
Synteq™ Media (Full Synthetic)

Synthetic fibers are man-made, smooth, rounded and provide the least resistance to flow. Their consistent shape allows for control of the fiber size and distribution pattern throughout the media mat to create the smoothest, least inhibited fluid flow. Consistency of fiber shape allows the maximum amount of contaminant-catching surface area and specific pore size control. The result is media with predictable filtration efficiencies removing specified contaminants and maximum dirt holding capacity.

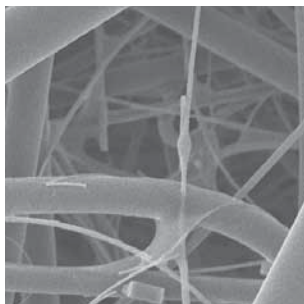
The low resistance of synthetic media to fluid flow makes it ideal for use with synthetic fluids, water glycols, water/oil emulsions, HWCF and petroleum-based fluids.



SEM 100X



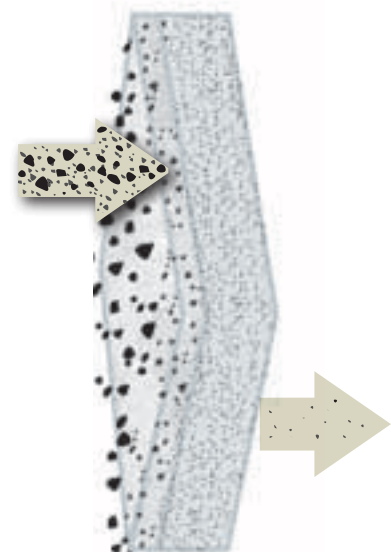
SEM 600X



MEDIA IMAGE



HOW IT WORKS

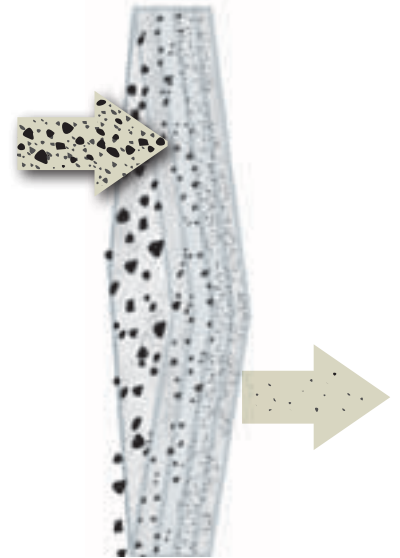


DT Synteq™ Media (High-Performance)

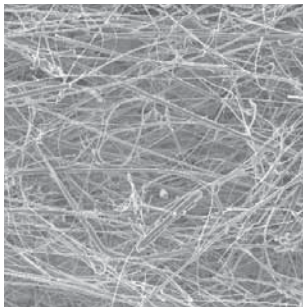
Donaldson high-performance DT grades of Synteq media utilize a blend of borosilicate glass fiber whose matrix is bonded together with an epoxy-based resin system. Donaldson filter media scientists found this to provides the best available chemical resistance for the broadest array of hydraulic applications.

DT Synteq is ideal for use with phosphate ester and water glycol fluids.

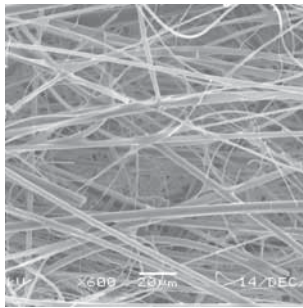
HOW IT WORKS



SEM 100X



SEM 600X



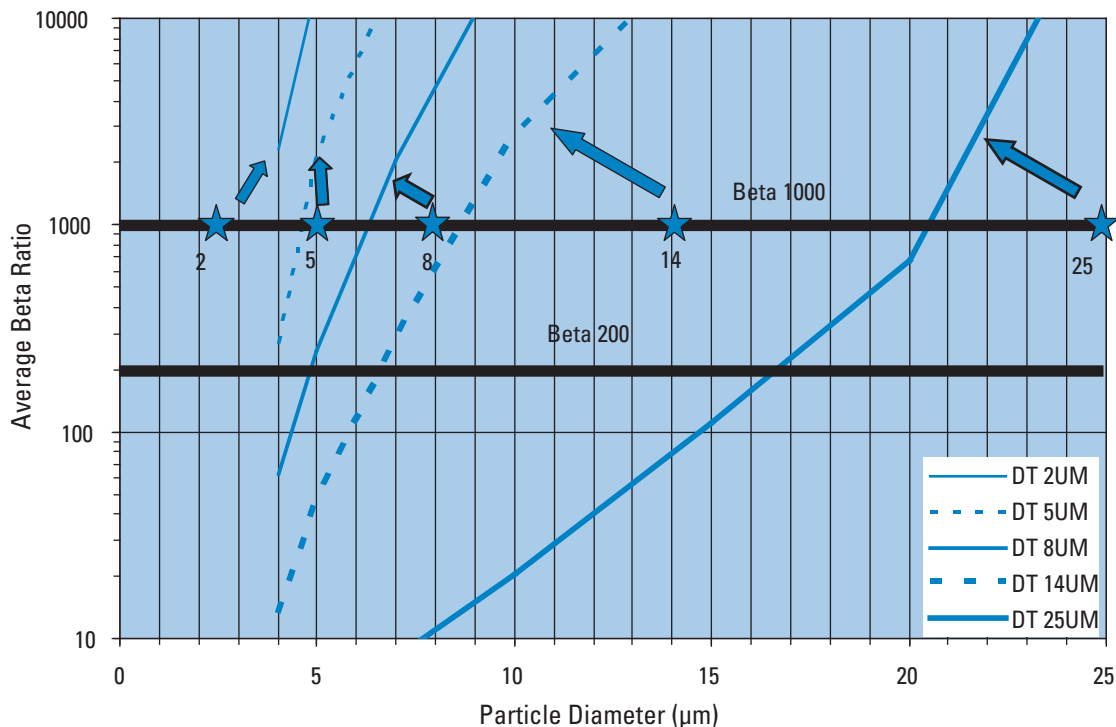
MEDIA IMAGE



The chemical and thermal compatibility of fluid filters is an increasingly difficult design challenge due to the complex variety of fluid systems. Today's fluid systems are often tailored towards the special needs fire resistance, biodegradability, and electrical insulating ability. Fortunately, there are chemical solutions available to meet these challenges.

Donaldson DT grades of Synteq media utilize a blend of borosilicate glass fiber whose matrix is bonded together with an epoxy-based resin system. Donaldson filter media scientists found this to provide the best available chemical resistance for the broadest array of hydraulic, fuel, and lube oil filtration applications.

Donaldson DT Synteq™ Media



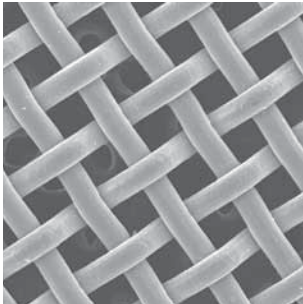
Wire-Mesh Media

Wire-mesh media consists of stainless steel, epoxy-coated wire mesh available in 3 mesh sizes:

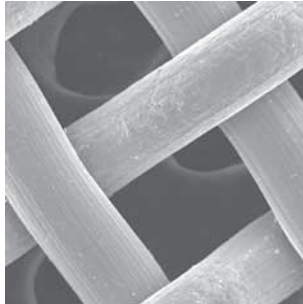
- 100 mesh yields 150 μm filtration
- 200 mesh yields 74 μm filtration
- 325 mesh yields 44 μm filtration

Typically wire-mesh filters will be applied to catch very large, harsh particulate that would rip up a normal filter. You may also find this media useful as a coarse filter in viscous fluid applications.

SEM 60X



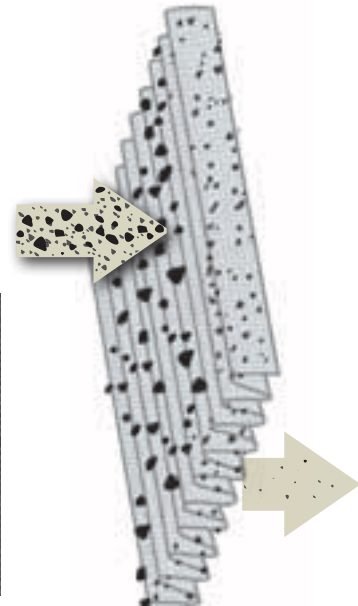
SEM 100X



MEDIA IMAGE



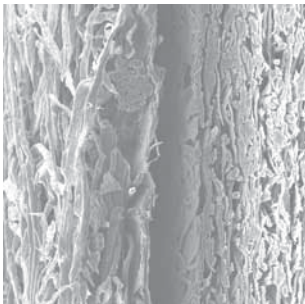
HOW IT WORKS



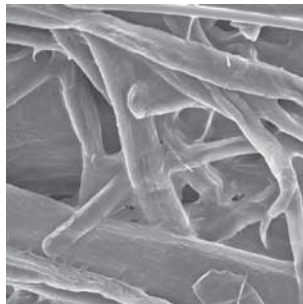
Water Absorbing Media

Water absorption media quickly and effectively removes free water from hydraulic systems. Using super-absorbent polymer technology with a high affinity for water absorption, this media alleviates many of the problems associated with water contamination found in petroleum-based fluids.

SEM 100X



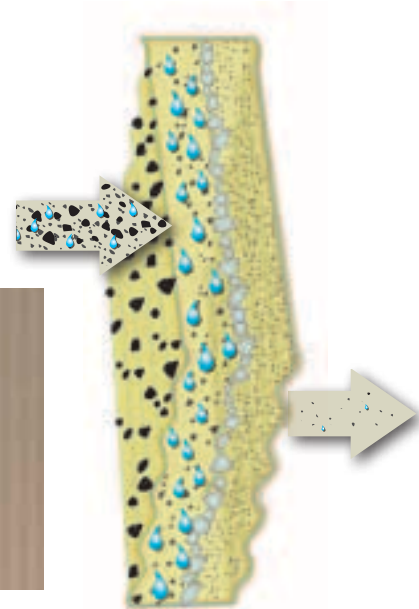
SEM 600X



MEDIA IMAGE



HOW IT WORKS



Donaldson Filter Media Efficiency Ratings per ISO 16889 Test Standards

ISO 16889 is the international standard for Multi-Pass Testing to determine the efficiency (beta rating or beta ratio) and the dirt-holding capacity of the filter. It replaced the ISO 4572 test standard.

Donaldson filter media has been re-tested per the new standard and the current beta ratios are shown at right. New beta ratios are shown at 200 and 1000, with a (c) to indicate test adherence to the ISO 16889 standard and traceability to NIST test dust.

| Fluid to be Filtered | Recommended Media |
|--|--------------------------|
| Petroleum-based..... | Synteq or Cellulose |
| Phosphate Ester | DT Synteq |
| Diester | Synteq |
| Water Glycol | DT Synteq |
| Water-Oil Emulsion | Synteq |
| Biodegradable Fluid | Synteq |
| HWCF (high water content fluids) | Synteq |
| Coarse Filtration..... | Wire Mesh |

Donaldson Filter Media Efficiency Ratings Per ISO 16889 Test Standards

| Media Number | FORMER Rating | NEW Rating | NEW Rating |
|--|------------------------------------|---|--|
| | Beta _x =75 per ISO 4572 | Beta _{x(c)} =200 per ISO 16889 | Beta _{x(c)} =1000 per ISO 16889 |
| Donaldson Synteq™ Synthetic Media | | | |
| No. ½ | 2 µm | <4 µm _(c) | <4 µm _(c) |
| No. 1 | 3 µm | 4 µm _(c) | 5 µm _(c) |
| No. 2 | 5 µm | 5 µm _(c) | 9 µm _(c) |
| No. 2½ | 10 µm | 8 µm _(c) | 10 µm _(c) |
| No. 3 | 10 µm | 8 µm _(c) | 10 µm _(c) |
| No. 4 | 10 µm | 8 µm _(c) | 10 µm _(c) |
| No. 6 | 13 µm | 10 µm _(c) | 13 µm _(c) |
| No. 7 | 22 µm | 18 µm _(c) | 33 µm _(c) |
| No. 9 | 22 µm | 18 µm _(c) | 23 µm _(c) |
| No. 16 | 37 µm | 16 µm _(c) | 22 µm _(c) |
| No. 20 | 40 µm | >50 µm _(c) | >50 µm _(c) |
| Donaldson DT Synteq Synthetic Media | | | |
| DT 2µm | N/A | <4 µm _(c) | <4 µm _(c) |
| DT 5µm | N/A | 4 µm _(c) | 5 µm _(c) |
| DT 8µm | N/A | 6 µm _(c) | 8 µm _(c) |
| DT 14µm | N/A | 10 µm _(c) | 14 µm _(c) |
| DT 25µm | N/A | 20 µm _(c) | 25 µm _(c) |
| Donaldson Cellulose Media | | | |
| No. 3 | 16 µm | 18 µm _(c) | 24 µm _(c) |
| No. 10 | 25 µm | 19 µm _(c) | 23 µm _(c) |
| No. 20 | 35 µm | >40 µm _(c) | >40 µm _(c) |
| No. 25 | N/A | 32 µm _(c) | >40 µm _(c) |
| Donaldson Wire Mesh Media | | | |
| No. 44 | 45 µm nominal | 325 mesh | N/A |
| No. 74 | 75 µm nominal | 200 mesh | N/A |
| No. 149 | 150 µm nominal | 100 mesh | N/A |
| Donaldson Water Absorbing Media | | | |
| WA | N/A | >30 µm(c) | >30 µm(c) |

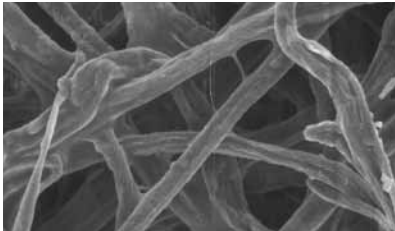
Hydraulic Filtration Pressure Drop

The difference between the inlet pressure and the outlet pressure is called pressure drop or differential pressure. It's symbolized by ΔP . ΔP is an irrecoverable loss of total pressure caused by the filter, and is mostly due to frictional drag on the fibers in the media.

Differential drop may increase as the particulate rating or efficiency of the filter (as expressed by its beta ratio) gets better. ΔP also increases as the filter is being loaded with contaminant.

Four Major Factors Contribute to Pressure Drop

1. Filter Media

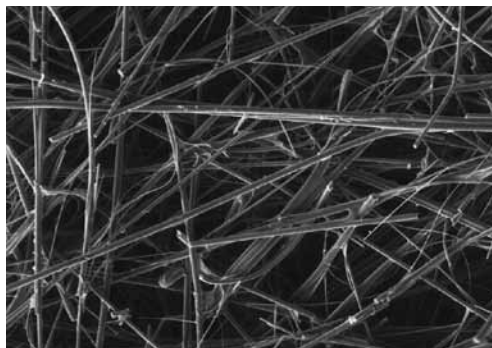


Natural Fiber Cellulose media, as seen under the scanning electron microscope.

Media is, of course, the main factor influencing pressure drop; indeed, it causes pressure drop. That's why having a low-friction, high-flowing media is so important. The natural cellulose or paper fibers (shown at left) typically used

in filtration are large, rough, and as irregular as nature made them.

Donaldson developed a synthetic media with smooth, rounded fibers, consistently shaped so that we can control the fiber size and distribution pattern throughout the media mat, and still allow the smoothest, least inhibited fluid flow. Our synthetic media is named Synteq™.



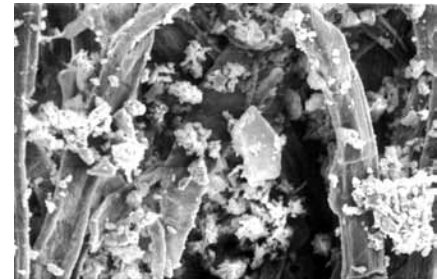
Donaldson's synthetic Synteq filter media — photo from scanning electron microscope — magnified hundreds of times.

Synteq fibers offer the least amount of resistance to fluid passing through the media. Consistency of fiber shape allows the maximum amount of contaminant-catching surface area and specific pore size control. The result is media with predictable filtration efficiencies at removing specified contaminants (i.g., 4 μm) and maximum dirt holding capacity. Natural cellulose fibers are larger than synthetic fibers and jagged in shape, so controlling size of the pores in the media mat is difficult and there is less open volume. In most applications this results in higher ΔP as compared to synthetic filters. Higher beta ratings mean there are smaller pores in the media; smaller media pores cause more flow resistance, in turn causing higher pressure drop.

2. Dirt, Contaminant

As dirt gets caught in the media, it eventually begins to build up and fill the pore openings. As the pore openings shrink, the differential pressure (pressure drop) increases. This is called restriction. This photo from our scanning electron microscope shows actual dirt particles building up in the media pores.

Excessive dirt in the media can cause dirt migration or even filter failure. Dirt migration occurs when the restriction is so great that the differential



pressure pushes dirt deeper into the media and, eventually, through the media and back into the system. Filter failure occurs when the restriction becomes so high that the filter cartridge collapses (outside-in flow) or bursts (inside-out flow) to relieve the upstream pressure.

To avoid such catastrophe, use of a filter service indicator is recommended. It measures the pressure drop across the filter, then signals when the filter is 'full' and needs to be changed.

3. Flow

Higher flows create higher pressure drop. With fast moving fluid, there will be more friction causing higher pressure drop across the media.

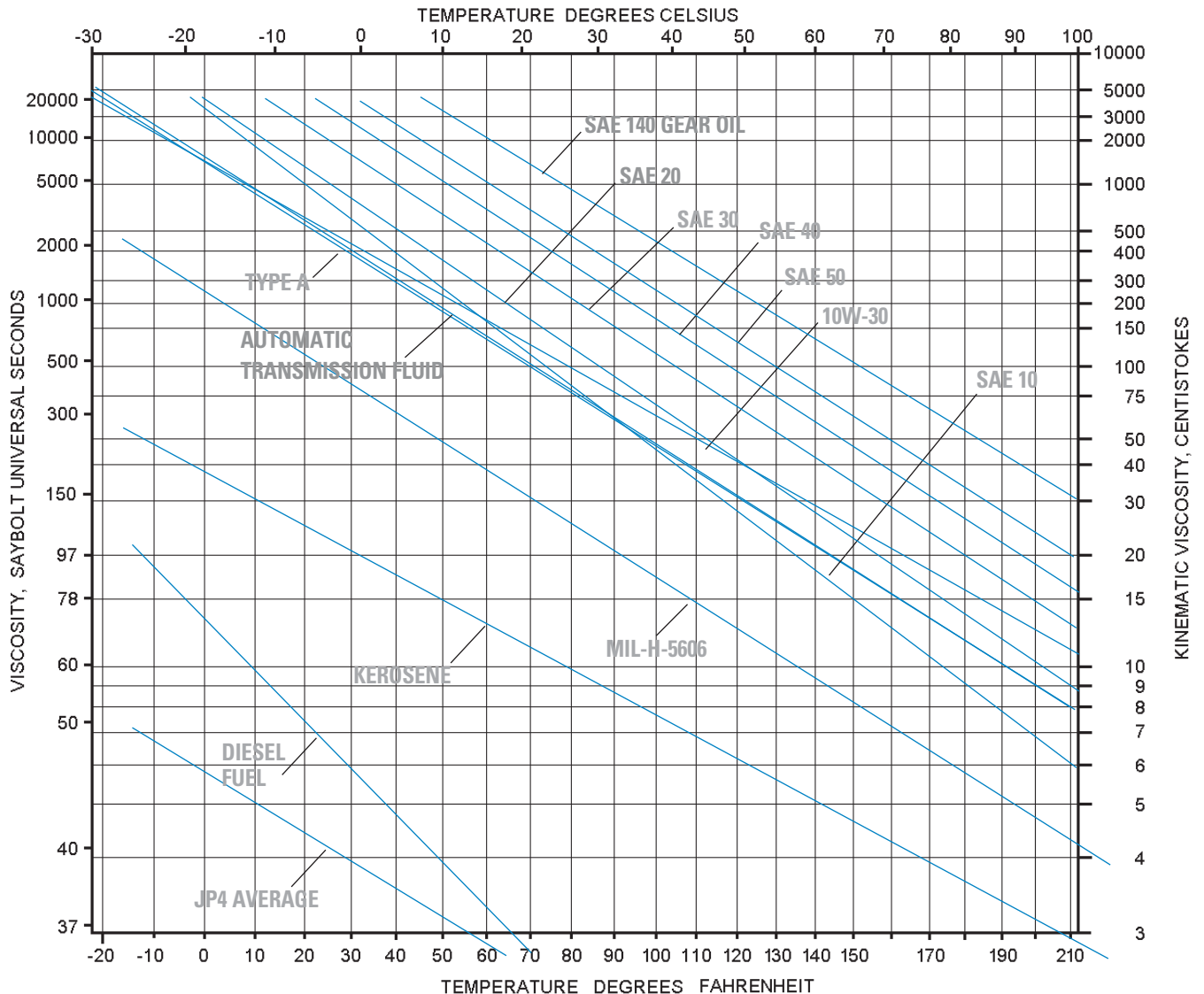
4. Fluid Viscosity

Measured in centistokes (cSt) or Saybolt Seconds Universal (SSU or SUS), fluid viscosity is the resistance of a fluid to flow. As fluid viscosity increases, the cSt rating increases. Higher fluid viscosities also mean higher pressure drop because the thicker oil has a tougher time passing through the layer of media fibers. Cold start fluid is a good example of highly viscous fluid. See chart below.

Filter media, amount of contamination, the flow rate, and fluid viscosity are all factors in the importance of sizing the filter for the system requirements. Filters that are too small won't be able to handle the system flow rate and will create excessive pressure drop from the start. The results could be filter operation in the bypass mode, filter failure, component malfunction, or catastrophic system failures. Filters that are too large for the system can be too costly. Oversized filters require more system oil and higher cost replacement filters. Optimal sizing is best.

Viscosity/Temperature Chart

A.S.T.M. Standard Viscosity-Temperature Chart for Liquid Petroleum Products (D 341-43) Saybolt Universal Viscosity



Filter Design and Construction

There are two main differences in a filter. The first is the design of the filter itself, and the second is the type of media that is used in the filter.

Filter

Filters have some attributes that are immediately obvious to the casual observer, such as height, inside diameter, outside diameter, media concentration, type of liner, seal design, and the way the media and components are glued or potted together.

Liners

Liners must be structurally sturdy to withstand pressure variance, yet open enough to allow good flow.

Seals

The top seal design must be leak-free, with a gasket or sealing device that ensures a good seal throughout the life of the filter. Standard seals are made of Buna-N® material, which is fine for most applications. However, if the filtered fluid is diester or phosphate ester fluid, you'll need a seal made of a fluoroelastomer such as Viton®.

Buna-N® and Viton® are registered trademarks of E. I. DuPont de Nemours and Company.

Media Potting

Media potting is key since it holds the media in place in between the end caps (not visible). Not only should the potting be fully around the ends of the media to prevent leaks, it should also be of a material that can withstand the application. For instance, epoxy potting should be used in filters that must perform in higher temperature environments, phosphate ester fluids and some high



water based fluids.

Inside the filter, the media can vary in thickness, pleat depth and pleat concentration.

For example, Donaldson hydraulic filters are generally equipped with either white ("Synteq™" our synthetic material) or natural brown (paper or cellulose material) media. ***It is important to note that media colors vary according to each manufacturer—it should not be assumed that any white-colored media is made of synthetic material.***

Some of the most important characteristics of filter media (structure, fiber diameter, volume solidity, basis weight, thickness, layering) can only be detected under a microscope.

Damaged Equipment

Damage happens when key filtration points are ignored! The pistons in this pump are severely damaged from contamination in the oil.



Combining the ISO Rating and Filter Performance Ratings

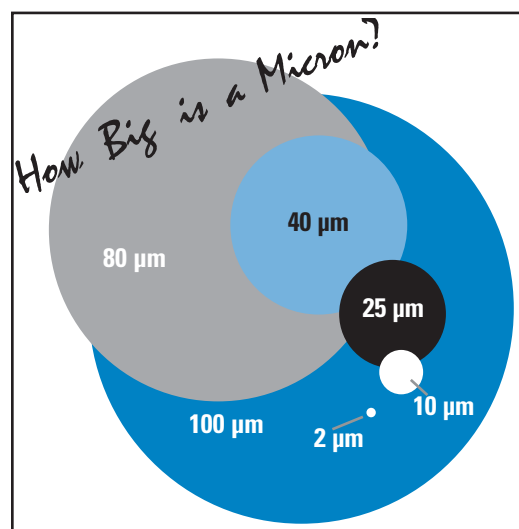
While filter manufacturers publish beta ratings for filter media to describe efficiency performance levels, a direct connection between the beta rating scale and the ISO rating scale cannot be made.

The solution is monitoring filter media performance at removing particles in the 4 µm, 6 µm, and 14 µm ranges. Fluid analysis and field monitoring are the only ways to get these measurements. Combine data from several tests to form a range of performance. Remember, actual filter performance will vary between applications.

Here's how to determine which filter media will best protect your hydraulic components: plot any media performance range on the Application Guide to Donaldson Filter Media (page 345), then connect the dots to make a line. On the same graph, plot your component requirement. (Reference chart below for some popular components, or ask your supplier for the recommended ISO rating.) If the line of the media falls below the ISO line, or if the bottom line of the filtration range does not intersect the ISO line, the component will be protected.

Micron Sizes of Familiar Particles

| | |
|---------------------------|--------|
| Grain of table salt | 100 µm |
| Human hair | 80 µm |
| Lower limit of visibility | 40 µm |
| White blood cell | 25 µm |
| Talcum powder | 10 µm |
| Red blood cell | 8 µm |
| Bacteria | 2 µm |
| Silt | <5 µm |



Typical ISO Cleanliness

Here are some typical ISO cleanliness recommendations from component manufacturers. (These are guidelines; always check the ratings specified by the manufacturer of your specific components.)

| Pressure | <3000 PSI ≤210 Bar | >3000 PSI >210 Bar |
|---------------------------------|-----------------------|-----------------------|
| Pumps | --- ISO RATINGS --- | |
| Fixed Gear Pump | 19/17/15 | 18/16/13 |
| Fixed Vane Pump | 19/17/14 | 18/16/13 |
| Fixed Piston Pump | 18/16/14 | 17/15/13 |
| Variable Vane Pump | 18/16/14 | 17/15/13 |
| Variable Piston Pump | 17/15/13 | 16/14/12 |
| Valves | | |
| Directional (solenoid) | 20/18/15 | 19/17/14 |
| Pressure (modulating) | 19/17/14 | 19/17/14 |
| Flow Controls (standard) | 19/17/14 | 19/17/14 |
| Check Valves | 20/18/15 | 20/18/15 |
| Cartridge Valves | 20/18/15 | 19/17/14 |
| Load-sensing Directional Valves | 18/16/14 | 17/15/13 |
| Proportional Pressure Controls | 18/16/13 | 17/15/12* |
| Proportional Cartridge Valves | 18/16/13 | 17/15/12* |
| Servo Valves | 16/14/11* | 15/13/10* |
| Actuators | | |
| Cylinders | 20/18/15 | 20/18/15 |
| Vane Motors | 19/17/14 | 18/16/13 |
| Axial Piston Motors | 18/16/13 | 17/15/12 |
| Gear Motors | 20/18/15 | 19/17/14 |
| Radial Piston Motors | 19/17/15 | 18/16/13 |

* Requires precise sampling practices to verify cleanliness levels.
Source: Vickers

Media Application Guide and ISO Rating System

The Application Guide for Donaldson Filter Media on page 345 provides a data format for rating fluid contamination level and plotting filter media performance.

The vertical numbers on the left side of the chart represent particle counts in a logarithmic progression of ten: .01, .1, 1, 10, 102, 103, 104, 105 and 106. (This represents the number of particle in the oil sample at the given size.) The numbers across the bottom of the chart represent particle size in microns.

Donaldson media efficiency performance levels are derived from the ISO 16889 test standard with NIST-certified on-line automatic particle counters and ISO medium test dust. The Donaldson media efficiency performance levels shown are based on test averages under steady flow conditions. Actual performance levels may vary by application, viscosity, flow variance and contamination differences. Contact Donaldson or your Donaldson distributor for specific application calculations. The international rating system for fluid contamination levels is called the ISO contamination code and it is detailed in the ISO 4406 document. Most component manufacturers publish filtration level recommendations using the ISO code. The ISO code, located on the right side of the media application guide on page 345, is easy to use if you remember the 4 µm, 6 µm and 14 µm numbers along the bottom of the chart.

Manufacturer’s ISO contamination levels are based on controlling the particle counts of 4 µm, 6 µm and 14 µm particles in hydraulic system oil. This level is identified by measuring the number of particles 4µm and greater, 6 µm and greater, and 14 µm and greater in one milliliter of the system hydraulic oil sample.

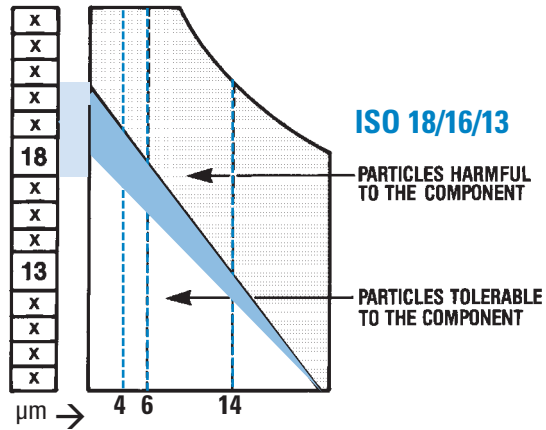
How to Use the ISO Rating

Example: A cartridge valve manufacturer recommends an ISO cleanliness level of 18/16/13.

- 1) On the Application Guide for Donaldson Filter Media on the next page, place a dot on the vertical 4 µm line, horizontally even with the 18 box of the ISO code.
- 2) Place a dot on the vertical 6 µm line horizontally even with the 16 box of the ISO code.
- 3) Place a dot on the vertical 14 µm line horizontally even with the 13 box of the ISO code.
- 4) Connect the dots to get the ISO cleanliness level 18/16/13.

As illustrated below, particle counts falling on and above the 18/16/13 line are damaging to the component and exceed the 18/16/13 specification set by the manufacturer.

Select a Donaldson media that falls below 18/16/13 to achieve cleanliness level tolerable to the component.



ISO 4406 Contamination Code

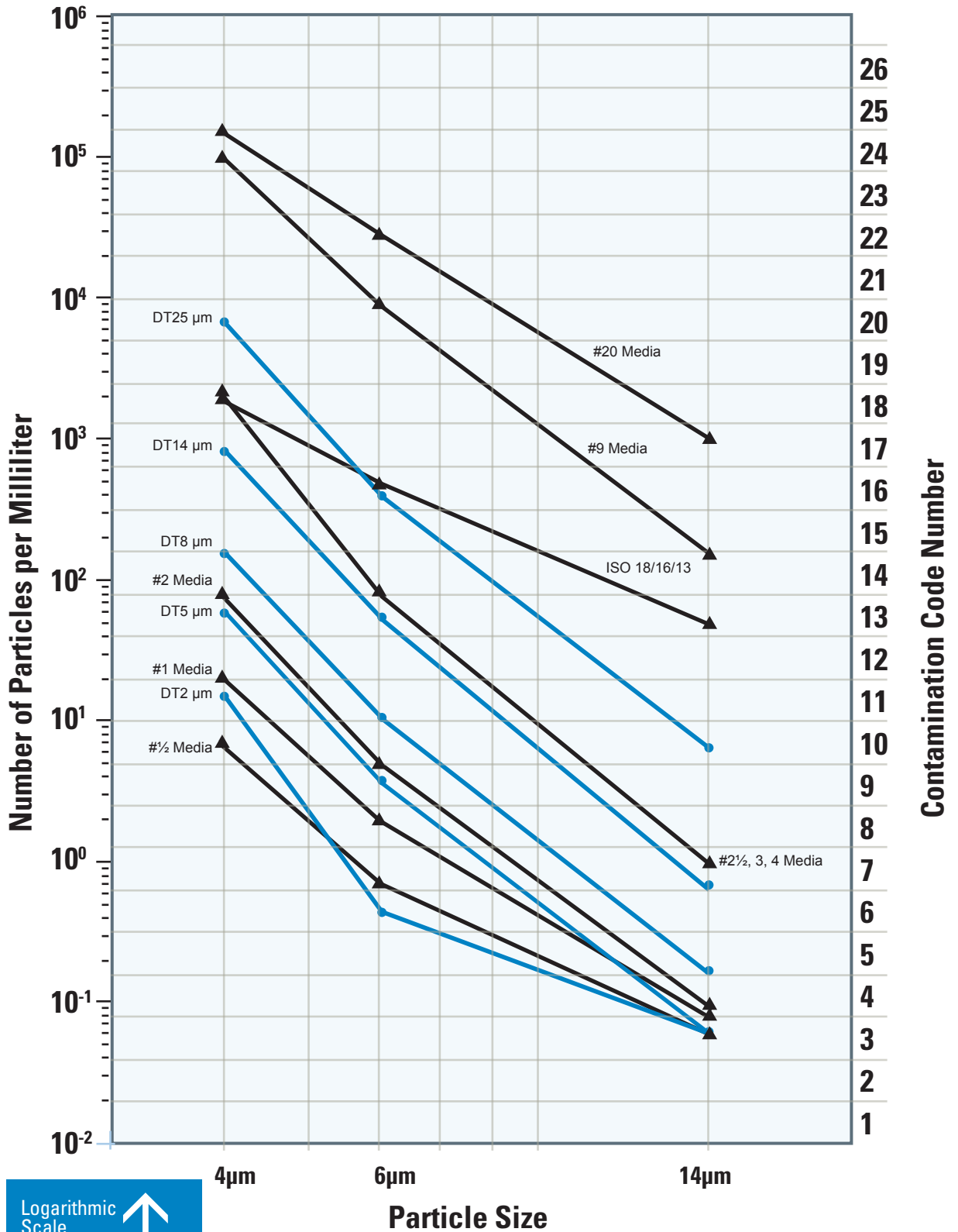
This correlates to the numbers in the boxes along the right side of the graph on the next page.


Range of number of particles per milliliter:

| Code | More Than | Up to & Including | Code | More Than | Up to & Including |
|------|-----------|-------------------|------|-----------|-------------------|
| 24 | 80,000 | 160,000 | 14 | 80 | 160 |
| 23 | 40,000 | 80,000 | 13 | 40 | 80 |
| 22 | 20,000 | 40,000 | 12 | 20 | 40 |
| 21 | 10,000 | 20,000 | 11 | 10 | 20 |
| 20 | 5,000 | 10,000 | 10 | 5 | 10 |
| 19 | 2,500 | 5,000 | 9 | 2.5 | 5 |
| 18 | 1,300 | 2,500 | 8 | 1.3 | 2.5 |
| 17 | 640 | 1,300 | 7 | .64 | 1.3 |
| 16 | 320 | 640 | 6 | .32 | .64 |
| 15 | 160 | 320 | | | |

HYDRAULIC FILTRATION TECHNICAL REFERENCE

Application Guide for Donaldson Filter Media



Logarithmic Scale 
This represents the number of particles at a given size in the oil sample

Filter Efficiency Standards

Understanding the Beta Rating System

This information is provided as an aid to understanding fluid filter efficiency terminology based on current ISO, ANSI and NFPA test standards. It is not proprietary and may be reproduced or distributed in any manner for educational purposes.

What is Beta Ratio?

Beta ratio (symbolized by β) is a formula used to calculate the filtration efficiency of a particular fluid filter using base data obtained from multi-pass testing.

In a multi-pass test, fluid is continuously injected with a uniform amount of contaminant (i.e., ISO medium test dust), then pumped through the filter unit being tested. Filter efficiency is determined by monitoring oil contamination levels upstream and downstream of the test filter at specific times. An automatic particle counter is used to determine the contamination level. Through this process an upstream to downstream particle count ratio is developed, known as the beta ratio. The formula used to calculate the beta ratio is:

$$\text{Beta ratio}_{(x)} = \frac{\text{particle count in upstream oil}}{\text{particle count in downstream oil}}$$

where (x) is a given particle size

Indicates that testing was done with APC's calibrated with NIST fluid

$$\beta_{10(c)} = 1000$$

1000 times more particles upstream than downstream that are 10 μm and larger

Why the Efficiency Rating Test Standard was Updated

The International Industry Standard (ISO) for multi-pass testing provides a common testing format for filter manufacturers to rate filter performance. This standardization gives you the ability to reliably compare published filter ratings among different brands of filters.

ISO test standards were updated in 1999 to reflect the improved technology available in particle counters and other test equipment. The newer particle counters provide more precise counting and greater detail— reflecting a truer indication of filter performance.

The National Fluid Power Association (NFPA), the National Institute of Standards & Technology (NIST), and industry volunteers, including several engineers from Donaldson, helped revise the ISO standard. ISO 16889 has been in force since late 1999 and ISO 4572 is officially discontinued.

Better Test Dust

The old test dust (AC fine test dust or ACFTD) was “ball milled,” which produced dust particles of varying size and shape. Particle distribution was often different from batch to batch. The accuracy of ACFTD distribution and previous APC calibration procedure was questioned by industry, due to lack of traceability and certification. ACFTD hasn't been produced since 1992.

Now, the new test dust (ISO medium test dust) is “jet milled” to produce consistent particle size, shape, and distribution from batch to batch. See dust size comparison chart below.

Liquid Automatic Particle Counters (APC's)

In the old test standard (ISO 4572), fluid samples obtained in bottles and off-line particle counting were allowed. Now, in the updated standard (ISO 16889), on-line, laser-based automatic particle counters, especially made for measuring liquids, are required and bottle counting methods are disallowed, as illustrated on next page.

Find further information on ISO 16889 at www.NFPA.com or your ISO document source. Ask for ISO/TR16386: 1999 “The Impact of Changes in ISO Fluid Power Particle Counting— Contamination Control and Filter Test Standards.”

The old particle counter calibration was based on only one dimension of an irregularly-shaped particle (the longest cord). Today, the particle counter calibration is based on equivalent spherical area of an irregularly-shaped particle.

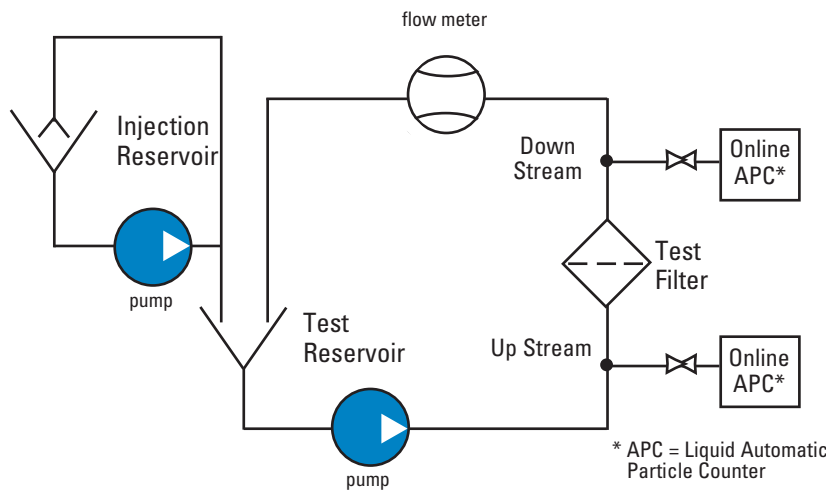
NIST provides calibration suspension, which is certified with X number of particles at a certain size. This is verified by NIST. The new way to list beta ratios includes a subscript (c) to indicate NIST certified test suspension and assures you of traceability and repeatability.

Overall, you can have strong confidence in filter ratings resulting from tests per ISO 16889, as they are highly accurate. As always, keep in mind that beta ratings are laboratory measurements under steady flow conditions with artificial contaminants – the real proof of the performance is how clean the filter keeps the fluids in the application. A good oil analysis program that checks the cleanliness of the oil periodically will verify that the proper filters are being used.

Test Dust Size Comparisons

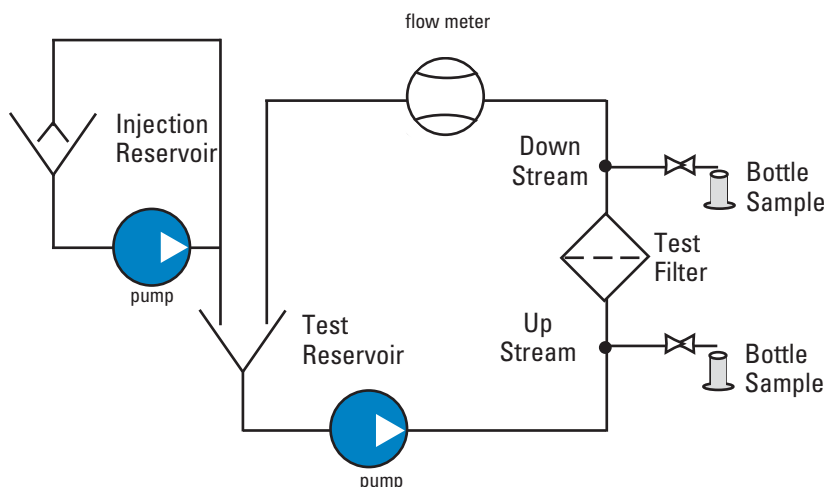
ACFTD calibrated size (µm) per ISO 4402 corresponds to a NIST-calibrated size [µm_(c)] per ISO 11171

| | | | | | | | | | | | | | | | | | |
|--------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| ACFTD | 0.8 | 1 | 2 | 2.7 | 3 | 4.3 | 5 | 7 | 10 | 12 | 15 | 15.5 | 20 | 25 | 30 | 40 | 50 |
| NIST | 4 | 4.2 | 4.6 | 5 | 5.1 | 6 | 6.4 | 7.7 | 9.8 | 11.3 | 13.6 | 14 | 17.5 | 21.2 | 24.9 | 31.7 | 38.2 |



ISO 16889

- In-Line Liquid Automatic Particle Counters (APC) are now required for proper testing.
- APC calibration follows ISO 11171 procedures
- ISO 11171 uses NIST (National Institute of Standards & Technology) certified calibration fluid



ISO 4572 (Discontinued)

- Either bottle samples or APC's were allowed.
- APC calibration followed ISO4402 ACFTD (Discontinued)

Highlights of ISO 16889

- ISO 4572 is now replaced by ISO 16889 as the international standard for Multi-Pass Tests to determine the efficiency (beta rating or beta ratio) and the dirt-holding capacity of the filter.
- The test bench for ISO 16889 must have On-Line Liquid Automatic Optical Particle Counters (APC) calibrated using NIST (National Institute of Standards & Technology)-certified calibration fluid. This includes added enhancements to APC's, to allow for better resolution, accuracy, repeatability and reproducibility.
- ISO 12103-1,A3 (ISO Medium, 5µm-80µm)
- Test Dust was selected as replacement dust for calibration and testing procedures.
- APC's are calibrated by passing a sample of calibration fluid with a known particle size distribution and producing a calibration curve to match the known count distribution.
- NIST used the Scanning Electron Microscope analysis and statistical analysis techniques to certify the particle size distribution.
- Particle counts, upstream and downstream, are taken every minute of the test.
- Beta ratios are reported with (c) to designate NIST traceability.

ISO 16889 recommends reporting beta ratings at:

| Rating | Efficiency |
|--------|------------|
| 2 | 50% |
| 10 | 90% |
| 75 | 98.7% |
| 100 | 99% |
| 200 | 99.5% |
| 1000 | 99.9% |

Example: $\beta_{4(c)}=200$ signifies that there are 200 times as many particles that are 4 µm and larger upstream as downstream. This is **99.5% efficiency**.

Example: $\beta_{5(c)}=1000$ indicates that there are 1000 times as many particles that are 5 µm and larger upstream as downstream. This is **99.9% efficiency**.

Donaldson Hydraulic Filter Media Beta Ratings

Donaldson hydraulic filter media beta ratings are average ratings obtained from multi-pass tests performed per the new ISO 16889 standard.

According to the ISO standard, each filter manufacturer can test a given filter at a variety of flow rates and terminal pressure drop ratings that fit the application, system configuration and filter size. Your actual performance may vary depending on the configuration of the filter tested and test conditions.

Donaldson Filter Media Efficiency Ratings Per ISO 16889 Test Standards

| Media Number | FORMER Rating Beta _x =75 per ISO 4572 | NEW Rating Beta _{x(c)} =200 per ISO 16889 | NEW Rating Beta _{x(c)} =1000 per ISO 16889 |
|--|--|--|---|
| Donaldson Synteq™ Synthetic Media | | | |
| No. ½ | 2 µm | <4 µm _(c) | <4 µm _(c) |
| No. 1 | 3 µm | 4 µm _(c) | 5 µm _(c) |
| No. 2 | 5 µm | 5 µm _(c) | 9 µm _(c) |
| No. 2½ | 10 µm | 8 µm _(c) | 10 µm _(c) |
| No. 3 | 10 µm | 8 µm _(c) | 10 µm _(c) |
| No. 4 | 10 µm | 8 µm _(c) | 10 µm _(c) |
| No. 6 | 13 µm | 10 µm _(c) | 13 µm _(c) |
| No. 7 | 22 µm | 18 µm _(c) | 33 µm _(c) |
| No. 9 | 22 µm | 18 µm _(c) | 23 µm _(c) |
| No. 16 | 37 µm | 16 µm _(c) | 22 µm _(c) |
| No. 20 | 40 µm | >50 µm _(c) | >50 µm _(c) |
| Donaldson DT Synteq Synthetic Media | | | |
| DT 2µm | N/A | <4 µm _(c) | <4 µm _(c) |
| DT 5µm | N/A | 4 µm _(c) | 5 µm _(c) |
| DT 8µm | N/A | 6 µm _(c) | 8 µm _(c) |
| DT 14µm | N/A | 10 µm _(c) | 14 µm _(c) |
| DT 25µm | N/A | 20 µm _(c) | 25 µm _(c) |
| Donaldson Cellulose Media | | | |
| No. 3 | 16 µm | 18 µm _(c) | 24 µm _(c) |
| No. 10 | 25 µm | 19 µm _(c) | 23 µm _(c) |
| No. 20 | 35 µm | >40 µm _(c) | >40 µm _(c) |
| No. 25 | N/A | 32 µm _(c) | >40 µm _(c) |
| Donaldson Wire Mesh Media | | | |
| No. 44 | 45 µm nominal | 325 mesh | |
| No. 74 | 75 µm nominal | 200 mesh | |
| No. 149 | 150 µm nominal | 100 mesh | |
| Donaldson Water Absorbing Media | | | |
| WA | N/A | >30 µm(c) | >30 µm(c) |

Cleanliness Level Correlation Table

Conversion of cleanliness specifications to filter performance is not an exact science because the contamination level in a hydraulic system is a function of the ingress and generation rate as well as the filter performance.

Factors That Affect Cleanliness Levels in a Hydraulic System

- Abrasive wear in space between adjacent moving surfaces of components.
- Erosive wear at component edges or direction changes where there is high fluid velocity.
- Fatigue wear by particles trapped between moving surfaces.

Identification of the Most Sensitive Component

- Required cleanliness level is dominated by the component with smallest clearances and/or highest loading on the lubricating film.
- Best source for determining this level is the specification published by the component manufacturer.
- Higher pressures reduce component life, unless contamination level is decreased accordingly.
- Operating at half the rated pressure of component will increase its life by more than four times.
- Percent of operating time at maximum pressure depends on individual machines and application.

| ISO Code | Particles Per Milliliter >10 microns | ISO FTD* Gravimetric Level (mg/l) | Mil Std 1236A (1967) | NAS 1638 (1964) | SAE Level (1963) |
|----------|--------------------------------------|-----------------------------------|----------------------|-----------------|------------------|
| 30/26/23 | 140,000 | 1000 | | | |
| 29/25/23 | 85,000 | | 1000 | | |
| 26/25/20 | 14,000 | 100 | 700 | | |
| 23/21/18 | 4,500 | | | 12 | |
| 2220/18 | 2,400 | | 500 | | |
| 22/20/17 | 2,300 | | | 11 | |
| 21/20/17 | 1,400 | 10 | | | |
| 21/19/16 | 1,200 | | 10 | | |
| 20/18/15 | 580 | | | 9 | 6 |
| 19/17/14 | 280 | | 300 | 8 | 5 |
| 18/16/13 | 140 | 1 | | 7 | 4 |
| 17/15/12 | 70 | | | 6 | 3 |
| 16/14/12 | 40 | | 200 | | |
| 16/14/10 | 35 | | | 5 | 2 |
| 15/13/10 | 14 | 0.1 | | 4 | 1 |
| 14/12/9 | 9 | | | 3 | 0 |
| 13/11/8 | 5 | | | 2 | |
| 12/10/8 | 3 | | 100 | | |
| 12/10/7 | 2.3 | | | 1 | |
| 11/10/6 | 1.4 | 0.01 | | | |
| 11/9/6 | 1.2 | | | 0 | |
| 10/8/5 | 0.6 | | | 0 | |
| 9/7/5 | 0.3 | | 50 | | |
| 8/6/3 | 0.14 | 0.001 | | | |
| 7/5/2 | 0.04 | | 25 | | |
| 6/2/8 | 0.01 | | 10 | | |

* SAE Fine Test Dust — ISO approved test and calibration contaminant.
Source: Milwaukee School of Engineering Seminar, Contamination & Filtration of Hydraulic Systems

Compatibility of Donaldson Filter Media with Hydraulic Fluids

While Donaldson has developed many formulations of media, they can be divided into two broad categories: natural fibers, usually cellulose, and synthetic or man-made fibers.

| Petroleum-Based (Hydrocarbon) Fluids | Recommended Filter Media | | |
|---|--------------------------|--------|-----------|
| | Cellulose | Synteq | DT Synteq |
| Straight oils | Yes | Yes | Yes |
| ATFs | Yes | Yes | Yes |
| Military hydraulic fluids | Yes | Yes | Yes |
| #2 Diesel fuel | Yes | Yes | Yes |
| Gasoline | Yes | Yes | Yes |
| E85 (85/15 Ethanol/Gasoline) | No | No | Yes |
| Fire Resistant Fluids | Cellulose | Synteq | DT Synteq |
| HFA - Oil-in-water emulsion | No | <150°F | Yes |
| HFB - Water-in-oil emulsion | No | <150°F | Yes |
| HFC - Water glycol | No | <150°F | Yes |
| HFD Synthetics - Polyol esters, Esters, Diesters, & blends | No | Yes | Yes |
| HFD Synthetics - Phosphate esters | No | No | Yes |
| HFD Synthetics - Polyalkylene glycols (PAG), Polyalphaolefins (PAO), & blends | No | Yes | Yes |
| HFD Synthetics - Silicone (siloxane) oil | No | Yes | Yes |
| Biodegradable Fluids | Cellulose | Synteq | DT Synteq |
| Vegetable-based oils - sunflower, rapeseed oils | No | Yes | Yes |
| Synthetic oils - PAG / PAO | No | Yes | Yes |
| Synthetic oils - Esters, Diesters | No | Yes | Yes |



Piston Pump Damage

The severe score marks on the piston slippers leave no question about why good hydraulic filtration is important.

A Note on Seals

- Filters with seals made of Buna-N[®] are appropriate for most applications involving petroleum oil and some high water content fluids. Filters with seals made of Viton[®] or Fluorel[®] (both fluoroelastomers) are required when using diesters, phosphate ester fluids. Donaldson offers both types. EPR (ethylene propylene rubber) seals are required for use with Skydrol[®] and Skydrol 500 fluids.

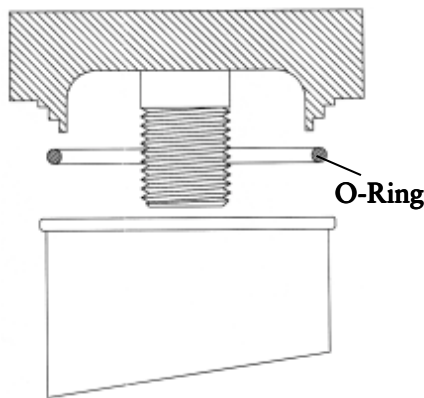
Buna-N[®] and Viton[®] are registered trademarks of E. I. DuPont de Nemours and Company. Skydrol is a registered trademarks of Solutin, Inc.

- In Donaldson filters with fluorocarbon elastomer seals, epoxy potting is used to accommodate higher temperature environments and for compatibility with fluids such as phosphate ester, diesters, and high water based fluids. The plastisol (heat cured) and urethane (self curing) potting materials used in other filters perform well with petroleum-based fluids.

Seal Installation Instructions

Remember...

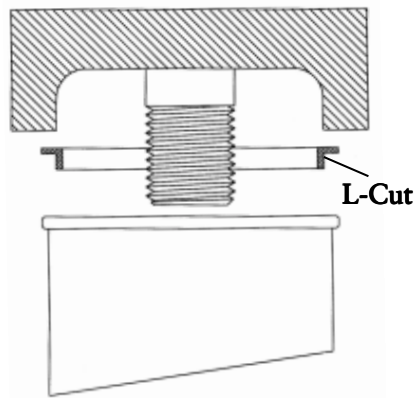
- Over-tightening filter may damage head.
- Dispose of used filter properly



O-Ring Seal

P166435

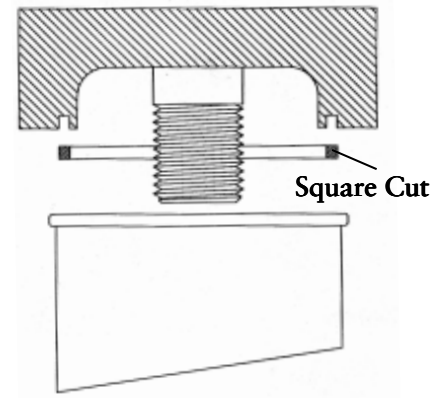
1. Remove used seal and clean gasket seat in head. Apply clean oil to new surfaces.
2. Install new seal on inside lip of filter.
3. Screw on new filter until gasket makes contact. Tighten filter until top edge makes metal to metal contact with filter head (approximately 1 ½ turns).



L-Cut Gasket

P170894 or P569908

1. Remove used seal and clean gasket seat in head. Apply clean oil to new surfaces.
2. Install new seal on inside lip of filter.
3. Screw on new filter until gasket makes contact. Tighten filter an additional ¾ turn.



Square-Cut Gasket

P165641

1. Remove old gasket and clean groove in head. Apply clean oil to new gasket surfaces.
2. Install new gasket into groove in filter head.
3. Screw on new filter until gasket makes contact. Tighten filter an additional ¼ turn.

How to Best Position Filters in Your Hydraulic Circuit

Within every hydraulic circuit there are many possible places for filters.

The best systems are strategically engineered to ensure that oil is filtered properly at each stage of its journey through the circuit. Ideally, filtration should occur in the following places:

- In the Reservoir
- Before/After the Pump
- In the Return-line System
- Off-line

In reality, many companies have to make tough decisions about which filters they can afford and which ones they'll have to live without.

Much depends on the cleanliness level requirements of the components, environment, duty cycle of the equipment and other variables that can vary from application to application.



Portable Kidney Loop Filter Cart

Kidney Loop Filters

Benefit: High

Sometimes referred to as “off-line” filters, kidney loop filters achieve very fine filtration by maintaining steady-state flow, independent of the hydraulic circuit.

With this type of filtration, the entire hydraulic system can keep operating while the kidney loop filter is being serviced.

A kidney loop filter utilizes low-pressure housings that are easily accessible and serviceable. These filters can either be integrated into the main hydraulic reservoir, or used in mobile filter carts like the one shown at left to service many hydraulic systems.

Note that kidney loop filters do not directly protect components — rather, their main function is to polish the oil to a very clean condition. It's also important to remember that an additional pump and motor will be required.

Filler / Breather

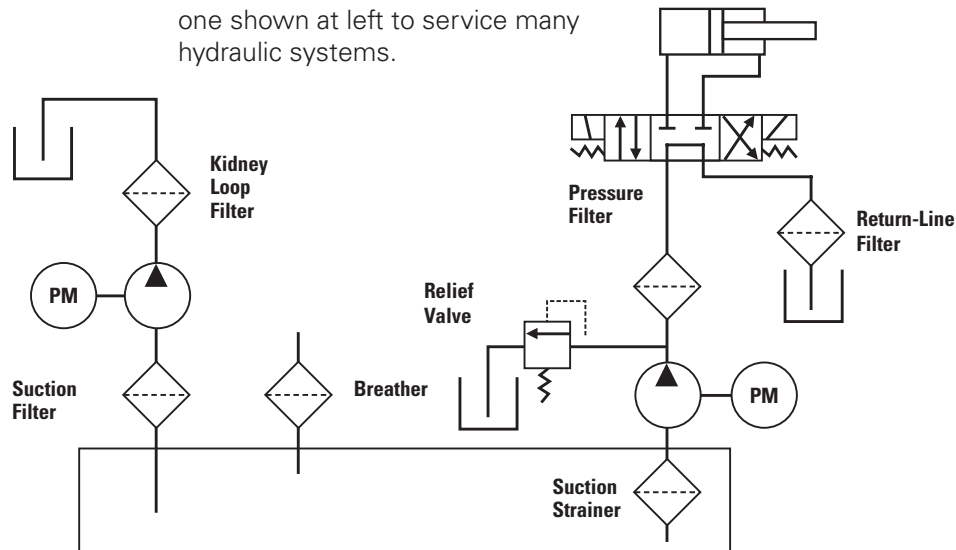
Benefit: High

Tank breathers are placed on hydraulic reservoirs to prevent atmospheric contamination from entering and to allow for sufficient air movement inside the reservoir.

Breathers should prevent particles larger than 3 microns from entering the system. This is a sensible, affordable solution for any hydraulic system, but by all means cannot be the only filter on a hydraulic system.



This diagram shows how various types of filters can be used in hydraulic circuits.



Suction Filter

Benefit: Medium

Normally placed between the reservoir and the pump, suction filters are designed to remove particles in the 5 to 150 micron range. They are easier to service and less expensive than many other types of filters—but because restriction in the suction line must be kept very low, filter housing size tends to be larger than similar flow return or pressure filter housings.

The most popular application for suction filters is with variable-speed hydrostatic pumps commonly found in off-road mobile applications and industrial variable-speed drives. They are also often used in harsh environments and charge pump applications.

Suction Strainer

Benefit: Low

Suction strainers, or sump-type filters, are often used in hydraulic fluid reservoirs. Their only real use is to keep cigarette butts, moths, nuts & bolts and the like out of the pump. Instead, such contaminants can easily be eliminated by keeping the reservoir sealed and by using a Filler/Breather and Return-Line Filter.

Return-Line Filter

Benefit: High

The advantages of return-line filters are many. They are usually low-pressure housings, which are less typically expensive. Their purpose is to collect the dirt from around the circuit as the oil returns to the reservoir. Much like the kidney loop, the return-line filter provides ultimate flexibility in positioning—it can perform almost anywhere within the return line circuit, either mounted inline or built into the reservoir.



Downsides are few, but worth noting: return-line filters can be subject to flow surges (which contribute to poor filter performance) and they do not filter the drain lines.

Note regarding return-line and kidney-loop filtration: If you're looking for a great value filter that's easy to maintain and with lots of media choices, this is a wise investment. Although these filters are very common, one downside is that there are very few standards of consistency from one manufacturer to the next, so replacement cartridges are not necessarily interchangeable.

Pressure Filter

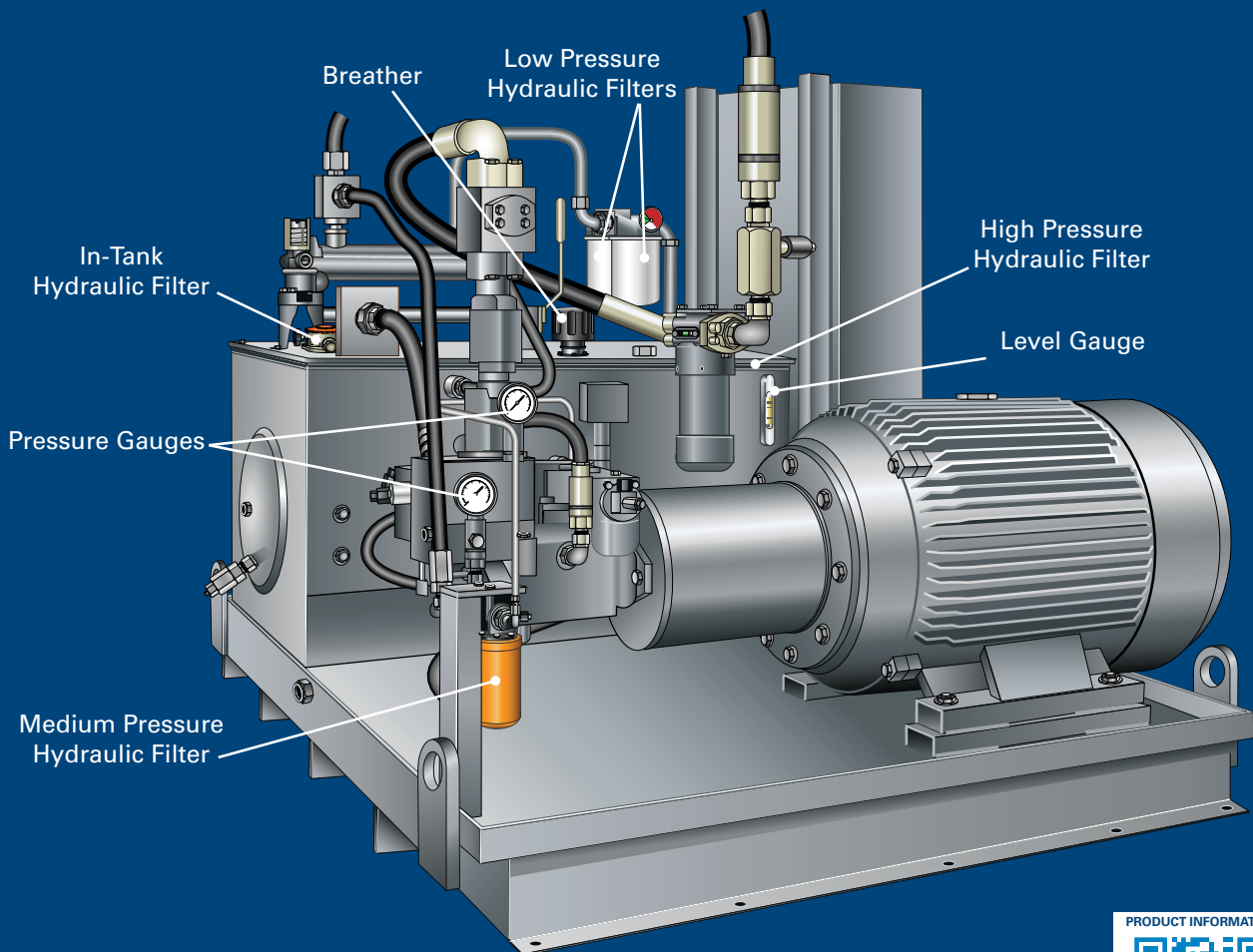
Benefit: High

This is also known as “last-chance” filtration. High pressure filters keep clean the oil that comes directly from the pump so that the more expensive downstream components (such as valves and actuators) are protected. Pressure line filters offer protection from catastrophic pump failure. They are a worthwhile investment for high-value systems — as are found in the aircraft industry, paper and steel mills, plastic injection molding, and in die-casting machines.



One downside to high pressure filters is, ironically, the high pressure. The entire system must be stopped in order to service a high-pressure filter—unless a duplex configuration is used. When oil is shooting out of a pump at 6000+ psi, it will take out anything in its way! By nature, a high-pressure pump is a prime mover of fluids, so it will experience significant wear over time. Service can also be more difficult because of its heavy-duty construction—as anyone who's ever tried to change a slippery, 200-pound cast-iron filter can attest.

Donaldson Delivers Performance Under **Any** Pressure.

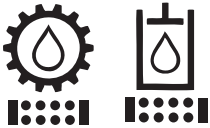


www.donaldsonfilters.com





HYDRAULIC FILTRATION FOR VEHICLES/EQUIPMENT APPLICATION DESIGN WORKSHEET



For proper development/design engineering solution, we ask you to provide details about your engine, project due dates, hydraulic or transmission system and performance (mechanical and filtration), system mounting, service, final packaging and product markings.

When completed, please forward to Donaldson.
Email: engine@donaldson.com
Fax: 952-887-3502

| | | | |
|--|-------------|--------------------------|--|
| Customer Name: | | Revision: | |
| Project Name: | | | |
| Contact Name: | | Title | |
| Phone: | Fax: | Email: | |
| Current Donaldson Model Used: (if applicable) | | Your Part Number: | |
| Target Cost: | | | |

Project Details

Type of Vehicle/Machine: _____
Units Per Year: _____
Key Project Dates:
 Design Proposal: _____
 Quote: _____
 Sample Delivery: _____
 Design Freeze: _____
 PPAP: _____
 Start of Production: _____

Application Information

Components That Need Protection

Pump (type?): _____
 Circuit: Hydraulic Pilot
 Transmission: Hydrostatic Powershift

Filter Location:

Suction Pressure Return
 Side Loop Charge Sump
 Other .. _____

Port Size & Type:

NPT: 1/2" 3/4" 1-1/4" 1-1/2" 2-1/2"
SAE O-ring: -8 -12 -16 -20 -24
4 Bolt Flange: 2" SAE 3" SAE 4" ANSI
 2" Code 61 2-1/2" Code 61
Other

Mounting Requirements:

Operating Conditions

Flow Rates: lpm or gpm
 Min _____ Normal _____ Max _____
Oil System Pressure (psi/kPa):
 Minimum _____ Normal _____ Maximum _____
Temperature: °C or °F
 Fluid: Min _____ Normal _____ Max _____
 Ambient: Min _____ Normal _____ Max _____

Fluid Type:

Petroleum Water-glycol
 Phosphate-ester HWBF
 Other _____

Viscosity: (2 required)

_____ cSt or Ssu @ _____ °C Temp
 _____ cSt or Ssu @ _____ °C Temp

Filtration Performance

ISO Contamination Level Required _____
 Beta 200/1000 = _____ / _____
 Filter Media: Synthetic Cellulose
 Wire

More on next page.

HYDRAULIC FILTRATION - TECHNICAL REFERENCE

Capacity:

_____ gms ISO Medium @ _____ flow to _____ psid

Pressure Drop Limits:

| Limits | psid | Flow | Viscosity |
|--------|------|------|-----------|
| 1 | @ | @ | |
| 2 | @ | @ | |
| 3 | @ | @ | |

Structural Performance

Hydrostatic Pressure Resistance (Burst):

Test Method : _____

Minimum Value: _____ psid / kPa

Collapse Pressure:

Test Method : _____

Minimum Value: _____ psid / kPa

Pressure Testing:

| | Min. Cycles | Range (psid) | Frequency (Hz) |
|--------------|-------------|--------------|----------------|
| Hydrodynamic | | to | |
| Flow Fatigue | | to | |
| Vibration | | to | |

Cracking Pressure:

Test Method : _____

Minimum Value: _____ psid / kPa

By-pass Valve: In Head In Filter

Setting: _____ psid / kPa

Leak Testing:

Test Method : _____

Minimum Value: _____ psid / kPa

Additional Information

Filter Service

Indicator Type: Electric

Type: _____

Filter Change Interval:

_____ km or miles or hours

Do you require installation, service or maintenance recommendations from Donaldson? Yes No

Packaging

Do you have any special packaging requirements?

Yes No If yes, please check all that apply:

Protective caps: on inlet on outlet on port

Final Assembly:

Bulk / Bagged Bulk/Individual Boxes

Other _____

Product Markings/Identity

Do you have any product marking requirements?

Head Assembly? Yes No

Filters? Yes No

If yes, artwork it is assumed customer will provide artwork for filter markings. Donaldson can provide marking area for artwork design. Standard installation icons are available from Donaldson.

Special Requirements or Application Notes

Use this area to provide additional information that will assist Donaldson engineering.

For Donaldson USE ONLY

Date Received: _____

Request From: Catalog Web Site

Other _____

Assigned to:

Business Unit: _____

Account Manager: _____

Product Manager: _____

Engineer: _____



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Hydraulic Applications Engineering

Donaldson Company, Inc., PO Box 1299, Minneapolis, MN 55440-1299

Use this section to help guide you to the proper page in this product guide to find more information and/or details about a individual part. The descriptions shown are, in most cases, abbreviated. A number of parts; i.e., indicators, are displayed in multiple product family pages.

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| K040799 | 77 | Head Assembly, FIK in-tank, SAE 16 O-Ring |
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| K041634 | 83 | FIK04 Assembly, SAE-20 & SAE-16 |
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| K041770 | 77 | Head Assembly, FIK in-tank, 1" NPT |
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| K060173 | 116 | In-Tank Assembly, HDK06 |
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| K070250 | 77 | Head Assembly, FIK in-tank, 2" SAE 4-Bolt |
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| K080087 | 128 | Assembly, HFK08, In-Line, SAE-20 |
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| P160128 | 117 | Bypass Spring, HDK06 |
| p160130 | 117 | Bypass Spring, HDK06 |
| P160135 | 117 | Top Handle, HDK06 |
| P160137 | 117 | Head O-ring, Buna N, HDK06 |
| P160365 | 117 | Nut Assembly, HDK06 |
| P160371 | 117 | Valve Assembly, Bypass, HDK06 |
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| P160476 | 117 | Cup Seal, Buna N, HDK06 |
| P160700 | 116 | Filter Cartridge, HDK06, WA |
| P160710 | 117 | Visual Indicator Repair Kit, Buna N Seal, HDK06, HDK08 |
| P160779 | 117 | Hex Nut Retainer Kit, HDK06, HDK08 |
| P160788 | 129 | Drain Plug, HDK08 |
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| P161016 | 116 | Filter Cartridge, HDK06, Synteq |
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| p161315 | 139 | O-Ring, Fluorocarbon, HPK02 |
| P161558 | 129 | Valve Assembly, Bypass 5 psi with magnets, HDK08 |
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| P161598 | 117, 129 | Bleed Valve, HDK06, HDK08 |

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| P161848 | 129 | Visual Indicator Repair Kit, Viton Seal, HDK08 |
| P161851 | 117 | O-Ring, Bypass Indicator Fluorocarbon, HDK06 |
| P161855 | 129 | Visual Indicator Kit, Viton Seal, HDK08 |
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| P162694 | 48 | Visual Indicator, 5 psi / 34.5 kPa |
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| P163457 | 129 | Valve Assembly, No Bypass, HDK08 |
| P163542 | 100, 101 | Spin-on filter, HMK04/24, Synteq |
| P163555 | 100, 101 | Spin-on filter, HMK04/24, Synteq |
| P163567 | 100, 101 | Spin-on filter, HMK04/24, Synteq |
| P163601 | 101 | Electric Indicator, SP, DC |
| P163642 | 48, 101 | Electric Indicator, SP, DC |
| P163681 | 101 | Head Assembly, HMK04, SAE-16 O-Ring |
| P163839 | 48, 101 | Electric Indicator, SP, DC, Normally closed |
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| P164056 | 100, 101 | Spin-on filter, HMK04/24, Synteq |
| P164059 | 100, 101 | Spin-on filter, HMK04/24, Synteq |
| P164071 | 129 | Valve Assembly, Bypass 25 psi, HDK08 |
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| P164176 | 176, 182 | Filter Cartridge, FPK04/HPK04 Synteq |
| P164178 | 182 | Filter Cartridge, HPK04, Synteq |
| P164227 | 209 | Filter Cartridge, HPK05, Synteq |
| P164229 | 209 | Filter Cartridge, HPK05, Synteq |
| P164315 | 139, 171, 184, 210, 236 | Visual Electric Indicator, All HPK Series |
| P164367 | 182 | Filter Cartridge, HPK04, Synteq |
| P164368 | 176 | Filter Cartridge, FPK04, Synteq |
| P164375 | 100, 101 | Spin-on filter, HMK04/24, Synteq |
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| P164381 | 100, 101 | Spin-on filter, HMK04/24, Synteq |
| P164384 | 100, 101 | Spin-on filter, HMK04/24, Synteq |
| P164405 | 128 | Filter Cartridge, HFK08, Synteq |
| P164407 | 128 | Filter Cartridge, HFK08, Synteq |
| P164435 | 209 | Filter Cartridge, HPK05, Synteq |
| P164585 | 209 | Filter Cartridge, HPK05, Synteq |
| P164592 | 176 | Filter Cartridge, FPK04, Synteq |
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| P164598 | 182 | Filter Cartridge, HPK04, Synteq |
| P164667 | 101 | Head Assembly, HMK04, SAE-16 O-Ring |
| P164699 | 116 | Filter Cartridge, HDK06, Synteq |
| P164703 | 128 | Filter Cartridge, HFK08, Synteq |
| P164896 | 117 | Cup Seal, Fluorocarbon, HDK06 |
| P165006 | 138, 152 | Filter Cartridge, HPK02/FPK02, Synteq |
| P165015 | 138, 152 | Filter Cartridge, HPK02/FPK02, Synteq |
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| P165043 | 138, 152 | Filter Cartridge, HPK02/FPK02, Synteq |
| P165136 | 138, 152 | Filter Cartridge, HPK02/FPK02, Synteq |
| P165138 | 138, 152 | Filter Cartridge, HPK02/FPK02, Synteq |
| P165185 | 100, 101 | Spin-on filter, HMK04/24, Synteq |
| P165194 | 48, 90, 96, 101, 108, 176 | Electrical Indicator, SP, DC, Normally open |
| P165319 | 170, 176, 182 | Filter Cartridge, HPK03, FPK04, HPK04, Synteq |
| P165332 | 100, 101 | Spin-on filter, HMK04/24, Synteq |
| P165335 | 100, 101 | Spin-on filter, HMK04/24, Synteq |
| P165338 | 100, 101 | Spin-on filter, HMK04/24, Synteq |
| P165354 | 100, 101 | Spin-on filter, HMK04/24, Synteq |
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| P165628 | 116 | Filter Cartridge, HDK06, Synteq |
| P165641 | 53 | Gasket, SP50/60, Square Cut, Nitrile |
| P165659 | 104 | Spin-on filter, HMK05/25, Synteq |
| P165672 | 104 | Spin-on filter, HMK05/25, Synteq |
| P165675 | 104 | Spin-on filter, HMK05/25, Synteq |
| P165762 | 40, 44, 48, 52, 56, 60, 65, 263 | Spin-on Filter, WO15/WO21/023/WO22/HBK05/SP50-60/SP80-90/SP100/120/Accy Synteq |
| P165875 | 40, 44, 48, 52, 56, 60, 65, 263 | Spin-on Filter, WO15/WO21/023/WO22/HBK05/SP50-60/SP80-90/SP100/120/Accy Synteq |
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| P165877 | 40, 44, 48, 52, 56, 60, 65 | Spin-on Filter, WO15/WO21/023/WO22/HBK05/SP50-60/SP80-90/SP100/120, Synteq |
| P165878 | 40, 44, 48, 52, 56, 60, 65 | Spin-on Filter, WO15/WO21/023/WO22/HBK05/SP50-60/SP80-90/SP100/120, Synteq |
| P165879 | 40, 44, 48, 52, 56, 60, 65 | Spin-on Filter, WO15/WO21/023/WO22/HBK05/SP50-60/SP80-90/SP100/120, Synteq |
| P165880 | 40, 44, 48, 52, 56, 60, 65 | Spin-on Filter, WO15/WO21/023/WO22/HBK05/SP50-60/SP80-90/SP100/120, Synteq |
| P165965 | 96 | Visual Indicator, 50 psi/345 kPa |
| P165973 | 105 | Head Assembly, HMK05, SAE-20 |
| P165984 | 48 | Visual Indicator, blank plate |
| P165984 | 101 | Visual indicators, blank plate |
| P166047 | 117 | Head O-ring, Fluorocarbon, HDK06 |
| P166048 | 117 | Baffle Assembly Kit, Fluorocarbon, HDK06 |
| P166049 | 117 | Visual Indicator Repair Kit, Fluorocarbon Seal, HDK06 |
| P166050 | 129 | Nut Retainer Kit, Viton o-ring, HDK08 |
| P166086 | 101 | Head Assembly, HMK04, 1" NPT |
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| P166254 | 176, 182 | Filter Cartridge, FPK04/HPK04 Synteq |
| P166255 | 176, 182 | Filter Cartridge, FPK04/HPK04 Synteq |
| P166353 | 170 | Head Assembly, HPK03, SAE-16 O-Ring |
| P166387 | 101 | Head Assembly, HMK04, SAE-12 O-Ring |
| P166416 | 101 | Head Assembly, HMK04, 1" NPT |
| P166417 | 101 | Head Assembly, HMK04, SAE-16 O-Ring |
| P166418 | 48 | Head Assembly, HBK05, 1¼" NPT |

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| P166439 | 48 | Head Assembly, HBK05, SAE-20 |
| P166462 | 128 | Filter Cartridge, HFK08, Synteq |
| P166597 | 116 | Filter Cartridge, HDK06, Synteq |
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| P166663 | 105 | Head Assembly, HMK05, O-Ring |
| P166664 | 101 | Head Assembly, HMK04, SAE-16 O-Ring |
| P166665 | 48 | Head Assembly, HBK05, 1¼" NPT |
| P166759 | 129 | Nut Assembly Kit, HDK08 |
| P166862 | 101 | Head Assembly, HMK04, SAE-16 O-Ring |
| P166902 | 101 | Head Assembly, HMK04, SAE-16 O-Ring |
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| P167184 | 176 | Filter Cartridge, FPK04, Synteq |
| P167185 | 170, 176, 182 | Filter Cartridge, HPK03, FPK04, HPK04, Synteq |
| P167186 | 170, 176, 182 | Filter Cartridge, HPK03, FPK04, HPK04, Synteq |
| P167187 | 182 | Filter Cartridge, HPK04, Synteq |
| P167188 | 182 | Filter Cartridge, HPK04, Synteq |
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| P167296 | 105 | Head Assembly, HMK25, 1½" SAE |
| P167297 | 105 | Head Assembly, HMK25, 1½" SAE O-Ring |
| P167411 | 176, 182 | Filter Cartridge, FPK04/HPK04 Synteq |
| P167412 | 176, 182 | Filter Cartridge, FPK04/HPK04 Synteq |
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| P167452 | 138 | HPK02 Housing for 8" /204 mm filter |
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| P167473 | 101 | Head Assembly, HMK04, SAE-12 O-Ring |
| P167529 | 101 | Head Assembly, HMK04, SAE-12 O-Ring |
| P167580 | 101 | Visual indicators, 50 psi/345 kPa |
| P167590 | 100, 101 | Spin-on filter, HMK04/24, Synteq |
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| P167621 | 105 | Head Assembly, HMK05, 1¼" NPT |

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| P167796 | 40, 44, 48, 52, 56, 60, 65 | Spin-on Filter, W015/W021/023/W022/HBK05/SP50-60/SP80-90/SP100/120, Synteq |
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| P167838 | 138, 152 | Filter Cartridge, HPK02/FPK02, Synteq |
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| P167843 | 176 | Filter Cartridge, FPK04, Synteq |
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| P167945 | 40, 44, 48, 52, 56, 60, 65 | Spin-on Filter, W015/W021/023/W022/HBK05/SP50-60/SP80-90/SP100/120, Synteq |
| P169012 | 260 | Reservoir Suction Strainer, Steel fitting |
| P169013 | 260 | Reservoir Suction Strainer, Steel fitting |
| P169014 | 260 | Reservoir Suction Strainer, Steel fitting |
| P169015 | 260 | Reservoir Suction Strainer, Steel fitting |
| P169016 | 260 | Reservoir Suction Strainer, Steel fitting |
| P169017 | 260 | Reservoir Suction Strainer, Steel fitting |
| P169018 | 260 | Reservoir Suction Strainer, Steel fitting |
| P169019 | 260 | Reservoir Suction Strainer, Steel fitting |
| P169020 | 260 | Reservoir Suction Strainer, Steel fitting |
| P169027 | 53 | Gasket, SP50/60, Fluorocarbon |
| P169309 | 101 | Head Assembly, HMK04, 1" NPT |
| P169310 | 101 | Head Assembly, HMK04, ¾" NPT |
| P169317 | 101 | Head Assembly, HMK04, ¾" NPT |
| P169320 | 101 | Head Assembly, HMK04, SAE-12 O-Ring |
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| P169429 | 155 | Filter Cartridge, FPK02 |
| P169430 | 40, 44, 48, 52, 56, 60, 65, 263 | Spin-on Filter, W015/W021/023/W022/HBK05/SP50-60/SP80-90/SP100/120, Synteq |
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| P169432 | 176, 182 | Filter Cartridge, FPK04/HPK04 Synteq |
| P169433 | 182 | Filter Cartridge, HPK04, Synteq |
| P169909 | 129 | Valve Assembly, Bypass, 25 psi Viton, HDK08 |

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| P169910 | 129 | Head O-ring, Viton , HDK08 |
| P169912 | 129 | O-Ring, Viton, HDK08 |
| P169913 | 129 | Cup Seal, Viton, HDK08 |
| P169984 | 105 | Head Assembly, HMK25, Flange Bypass |
| P169985 | 105 | Head Assembly, HMK25, 1½" NPT |
| P170306 | 96 | Spin-on filter, HMK03, Synteq |
| P170307 | 96 | Spin-on filter, HMK03, Synteq |
| P170308 | 96 | Spin-on filter, HMK03, Synteq |
| P170309 | 96 | Spin-on filter, HMK03, Synteq |
| P170310 | 96 | Spin-on filter, HMK03, Synteq |
| P170311 | 96 | Spin-on filter, HMK03, Synteq |
| P170312 | 96 | Spin-on filter, HMK03, Synteq |
| P170313 | 96 | Spin-on filter, HMK03, Synteq |
| P170327 | 96 | Head Assembly, HMK03, ¾" SAE 12 |
| P170489 | 170 | Head Assembly, HPK03, SAE-12 O-Ring |
| P170491 | 170 | Head Assembly, HPK03, SAE-12 O-Ring |
| P170546 | 104 | Spin-on filter, HMK05/25, Synteq |
| P170773 | 96 | Head Assembly, HMK03, ¾" SAE 12 |
| P170906 | 104 | Spin-on filter, HMK05/25, Synteq |
| P170926 | 101 | Electrical Indicator, 2 wire, DC |
| P170949 | 104 | Spin-on filter, HMK05/25, Synteq |
| P170950 | 100, 101 | Spin-on filter, HMK04/24, Synteq |
| P171087 | 96, 101 | Electrical Indicator, 2 wire, DC |
| P171143 | 101 | Electrical Indicator, 2 wire, DC |
| P171273 | 104 | Spin-on filter, HMK05/25, Synteq |
| P171274 | 104 | Spin-on filter, HMK05/25, Synteq |
| P171275 | 104 | Spin-on filter, HMK05/25, Synteq |
| P171276 | 104 | Spin-on filter, HMK05/25, Synteq |
| P171500 | 78, 79 | Filter Cartridge High Flow, FIK, Wire Mesh |
| P171501 | 78, 79 | Filter Cartridge High Flow, FIK, Synteq |
| P171502 | 78, 79 | Filter Cartridge High Flow, FIK, Synteq |
| P171503 | 78, 79 | Filter Cartridge High Flow, FIK, Cellulose |
| P171504 | 78, 79 | Filter Cartridge High Flow, FIK, Cellulose |
| P171505 | 78, 79 | Filter Cartridge High Flow, FIK, Wire Mesh |
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| P171527 | 78, 79 | Filter Cartridge Low & High Flow, FIK, Cellulose |
| P171528 | 78, 79 | Filter Cartridge Low & High Flow, FIK, Cellulose |
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| P171532 | 78, 79 | Filter Cartridge Low & High Flow, FIK, Synteq |
| P171533 | 78, 79 | Filter Cartridge Low & High Flow, FIK, Cellulose |
| P171534 | 78, 79 | Filter Cartridge Low & High Flow, FIK, Cellulose |
| P171535 | 78, 79 | Filter Cartridge Low & High Flow, FIK, Wire Mesh |
| P171536 | 78, 79 | Filter Cartridge High Flow, FIK, Wire Mesh |
| P171537 | 78, 79 | Filter Cartridge High Flow, FIK, Synteq |
| P171538 | 78, 79 | Filter Cartridge High Flow, FIK, Synteq |
| P171539 | 78, 79 | Filter Cartridge High Flow, FIK, Cellulose |
| P171540 | 78, 79 | Filter Cartridge High Flow, FIK, Cellulose |
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| P171554 | 78, 79 | Filter Cartridge High Flow, FIK, Wire Mesh |
| P171555 | 78, 79 | Filter Cartridge High Flow, FIK, Synteq |
| P171556 | 78, 79 | Filter Cartridge High Flow, FIK, Synteq |
| P171557 | 78, 79 | Filter Cartridge High Flow, FIK, Cellulose |
| P171558 | 78, 79 | Filter Cartridge High Flow, FIK, Cellulose |
| P171559 | 78, 79 | Filter Cartridge High Flow, FIK, Wire Mesh |
| P171572 | 78, 79 | Filter Cartridge High Flow, FIK, Wire Mesh |
| P171573 | 78, 79 | Filter Cartridge High Flow, FIK, Synteq |
| P171574 | 78, 79 | Filter Cartridge High Flow, FIK, Synteq |
| P171575 | 78, 79 | Filter Cartridge High Flow, FIK, Cellulose |
| P171576 | 78, 79 | Filter Cartridge High Flow, FIK, Cellulose |
| P171577 | 78, 79 | Filter Cartridge High Flow, FIK, Wire Mesh |
| P171578 | 78, 79 | Filter Cartridge High Flow, FIK, Wire Mesh |
| P171579 | 78, 79 | Filter Cartridge High Flow, FIK, Synteq |
| P171580 | 78, 79 | Filter Cartridge High Flow, FIK, Synteq |
| P171581 | 78, 79 | Filter Cartridge High Flow, FIK, Cellulose |
| P171582 | 78, 79 | Filter Cartridge High Flow, FIK, Cellulose |
| P171583 | 78, 79 | Filter Cartridge High Flow, FIK, Wire Mesh |

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| P171616 | 40, 44, 52, 56, 60, 65 | Spin-on Filter, WO15/WO21/023/WO22/SP50-60/SP80-90/SP100/120, Synteq |
| P171635 | 66 | Spin-on filter, TT30, Cellulose |
| P171640 | 66 | Spin-on filter, TT60, Cellulose |
| P171830 | 78, 79 | Filter Cartridge Low Flow, FIK, Wire Mesh |
| P171831 | 78, 79 | Filter Cartridge Low Flow, FIK, Wire Mesh |
| P171833 | 78, 79 | Filter Cartridge Low Flow, FIK, Wire Mesh |
| P171834 | 78, 79 | Filter Cartridge Low Flow, FIK, Wire Mesh |
| P171836 | 78, 79 | Filter Cartridge Low Flow, FIK, Cellulose |
| P171837 | 78, 79 | Filter Cartridge Low Flow, FIK, Cellulose |
| P171839 | 78, 79 | Filter Cartridge Low Flow, FIK, Cellulose |
| P171840 | 78, 79 | Filter Cartridge Low Flow, FIK, Cellulose |
| P171842 | 78, 79 | Filter Cartridge Low Flow, FIK, Synteq |
| P171843 | 78, 79 | Filter Cartridge Low Flow, FIK, Synteq |
| P171845 | 78, 79 | Filter Cartridge Low Flow, FIK, Synteq |
| P171846 | 78, 79 | Filter Cartridge Low Flow, FIK, Synteq |
| P171848 | 270 | Filler Breather Assemblies |
| P171855 | 270 | Filler Breather Assemblies |
| P171856 | 270 | Filler Breather Assemblies |
| P171859 | 270 | Filler Breather Assemblies |
| P171860 | 270 | Filler Breather Assemblies |
| P171861 | 260 | Reservior Suction Strainer, Steel fitting |
| P171869 | 260 | Reservior Suction Strainer, Steel fitting |
| P171877 | 260 | Reservior Suction Strainer, Steel fitting |
| P171885 | 260 | Reservior Suction Strainer, Steel fitting |
| P171889 | 260 | Reservior Suction Strainer, Steel fitting |
| P171913 | 284 | Fluid Level Gauge |
| P171918 | 284 | Fluid Level Gauge |
| P171920 | 284 | Fluid Level & Temp Gauge |
| P171922 | 284 | Fluid Level & Temp Gauge |
| P171953 | 238 | Pressure Gauge |
| P171956 | 238 | Pressure Gauge |
| P172434 | 79 | FIK In-tank Breather |
| P172953 | 48 | Head Assembly, HBK05, 1¼" NPT |
| P173292 | 270 | Filler Breather Replacement Cap |
| P173330 | 79 | FIK In-tank Breather |
| P173364 | 270 | Filler Breather Replacement Cap |
| P173544 | 263 | Breather, Threaded Adapter |
| P173545 | 263 | Breather, Threaded Adapter |
| P173573 | 128 | Filter Cartridge, HFK08, Wire Mesh |

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| P173702 | 96 | Spin-on filter, HMK03, Synteq |
| P173737 | 100, 101 | Spin-on filter, HMK04/24, Synteq |
| P173750 | 101 | Head Assembly, HMK04, SAE-12 O-Ring |
| P173893 | 101 | Electrical Indicator, 3 wire, DC |
| P173910 | 260 | Reservior Suction Strainer, Steel fitting |
| P173911 | 260 | Reservior Suction Strainer, Steel fitting |
| P173912 | 260 | Reservior Suction Strainer, Steel fitting |
| P173913 | 260 | Reservior Suction Strainer, Steel fitting |
| P173914 | 260 | Reservior Suction Strainer, Steel fitting |
| P173915 | 260 | Reservior Suction Strainer, Steel fitting |
| P173916 | 260 | Reservior Suction Strainer, Steel fitting |
| P173917 | 260 | Reservior Suction Strainer, Steel fitting |
| P173943 | 104 | Spin-on filter, HMK05/25, Wire Mesh |
| P173944 | 101 | Electrical Indicator, 3 wire, AC/DC |
| P174396 | 90, 96, 101 | Electrical Indicator, 3 wire, AC/DC |
| P176107 | 96 | Spin-on filter, HMK03, Synteq |
| P176207 | 104 | Spin-on filter, HMK05/25, Synteq |
| P176221 | 116 | Filter Cartridge, HDK06, Synteq |
| P176222 | 128 | Filter Cartridge, HFK08, Synteq |
| P176431 | 287, 310 | Sampling Pump |
| P176433 | 287, 310 | Plastic Tubing |
| P176565 | 100, 101 | Spin-on filter, HMK04/24, Synteq |
| P176566 | 100, 101 | Spin-on filter, HMK04/24, Synteq |
| P176567 | 104 | Spin-on filter, HMK05/25, Synteq |
| P176568 | 101 | Head Assembly, HMK04, SAE-16 O-Ring |
| P176569 | 101 | Head Assembly, HMK04, SAE-16 O-Ring |
| P176749 | 78, 79 | Filter Cartridge High Flow, FIK, Synteq |
| P179075 | 104 | Spin-on filter, HMK05/25, WA |
| P179089 | 32, 36, 263 | Spin-on Filter, SP15/25, WO12, Synteq |
| P179381 | 101 | Head Assembly, HMK04, SAE-16 O-Ring |
| P179460 | 96 | Head Assembly, HMK03, 3/4" SAE 12 |
| P179579 | 170 | Housing, HPK03, 8" / 204 mm filter |
| P179582 | 100 | Head Assembly, HMK24, 1¼" SAE 4-Bolt Code 61 |
| P179609 | 100 | Head Assembly, HMK24, SAE-20 O-Ring |
| P179763 | 104 | Spin-on filter, HMK05/25, Synteq |
| P468793 | 278 | ARV™ Kit Breather Assembly |
| P550250 | 40, 44, 52, 56, 60, 65, 263 | Spin-on Filter, WO15/WO21/023/WO22/SP50-60/SP80-90/SP100/120/Accy, Cellulose |

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| P550251 | 40, 44, 52, 56, 60, 65, 263 | Spin-on Filter, WO15/WO21/023/WO22/SP50-60/SP80-90/SP100/120/Accy, Cellulose |
| P550252 | 40, 44, 52, 56, 60, 65 | Spin-on Filter, WO15/WO21/023/WO22/SP50-60/SP80-90/SP100/120, Cellulose |
| P550274 | 32, 36 | Spin-on Filter, SP15-25/WO12, Wiremesh |
| P550275 | 44, 44, 52, 56, 60 | Spin-on Filter, WO15/WO21/WO23/WO22/SP50-60/SP80-90/SP100-120, Wiremesh |
| P550276 | 44, 44, 52, 56, 60 | Spin-on Filter, WO15/WO21/WO23/WO22/SP50-60/SP80-90/SP100-120, Wiremesh |
| P550386 | 40, 44, 52, 56, 60, 65, 263 | Spin-on Filter, WO15/WO21/023/WO22/SP50-60/SP80-90/SP100/120/Accy, Cellulose |
| P550387 | 40, 44, 52, 56, 60, 65 | Spin-on Filter, WO15/WO21/023/WO22/SP50-60/SP80-90/SP100/120, Cellulose |
| P550388 | 40, 44, 52, 56, 60, 65, 263 | Spin-on Filter, WO15/WO21/023/WO22/SP50-60/SP80-90/SP100/120/Accy, Cellulose |
| P551551 | 32, 36, 263 | Spin-on Filter, SP15-25/WO12, Breather, Cellulose |
| P551553 | 32, 36 | Spin-on Filter, SP15-25/WO12, Cellulose |
| P556005 | 263 | Breather, Spin-on Filter |
| P560584 | 100, 101 | Spin-on filter, HMK04/24, WA |
| P560693 | 32, 36, 263 | Spin-on Filter, SP15-25/WO12/Accy, Synteq |
| P560694 | 32, 36 | Spin-on Filter, SP15-25/WO12, Synteq |
| P560855 | 105 | Head Assembly, HMK25, 1½" SAE |
| P561131 | 32 | Head Assembly, SP15/25, ¾" NPT |
| P561132 | 32 | Head Assembly, SP15/25, ¾" NPT |
| P561133 | 32 | Head Assembly, SP15/25, SAE-12 |
| P561134 | 32 | Head Assembly, SP15/25, ¾" NPT |
| P561135 | 32 | Head Assembly, SP15/25, ¾" NPT |
| P561136 | 32 | Head Assembly, SP15/25, ¾" NPT |
| P561137 | 32 | Head Assembly, SP15/25, SAE-12 |
| P561138 | 32 | Head Assembly, SP15/25, SAE-8 |
| P561140 | 32 | Head Assembly, SP15/25, SAE-12 |
| P561141 | 32 | Head Assembly, SP15/25, SAE-12 |
| P561183 | 40, 44, 52, 56, 60 | Spin-on Filter, WO15/WO21/023/WO22/SP50-60/SP80-90/SP100-120, Cellulose WA |
| P561880 | 321 | Bulk Fluid, Manifold Assembly, 2" 150 Flange |
| P561885 | 105 | Head Assembly, HMK05, O-Ring |
| P561924 | 105 | Head Assembly, HMK25, 3 port s |
| P561952 | 52 | Head Assembly, SP50/60, 1¼" NPT |
| P562211 | 260 | Reservior Suction Strainer, Steel fitting |

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| P562212 | 260 | Reservoir Suction Strainer, Steel fitting |
| P562213 | 260 | Reservoir Suction Strainer, Steel fitting |
| P562214 | 260 | Reservoir Suction Strainer, Steel fitting |
| P562221 | 260 | Reservoir Suction Strainer, Steel fitting |
| P562222 | 260 | Reservoir Suction Strainer, Steel fitting |
| P562223 | 260 | Reservoir Suction Strainer,nylon fitting |
| P562224 | 260 | Reservoir Suction Strainer,nylon fitting |
| P562225 | 260 | Reservoir Suction Strainer,nylon fitting |
| P562226 | 260 | Reservoir Suction Strainer,nylon fitting |
| P562227 | 260 | Reservoir Suction Strainer,nylon fitting |
| P562228 | 260 | Reservoir Suction Strainer,nylon fitting |
| P562229 | 260 | Reservoir Suction Strainer,nylon fitting |
| P562231 | 260 | Reservoir Suction Strainer,nylon fitting |
| P562232 | 260 | Reservoir Suction Strainer,nylon fitting |
| P562233 | 260 | Reservoir Suction Strainer,nylon fitting |
| P562235 | 260 | Reservoir Suction Strainer,nylon fitting |
| P562236 | 260 | Reservoir Suction Strainer,nylon fitting |
| P562237 | 260 | Reservoir Suction Strainer,nylon fitting |
| P562238 | 260 | Reservoir Suction Strainer,nylon fitting |
| P562239 | 260 | Reservoir Suction Strainer,nylon fitting |
| P562240 | 260 | Reservoir Suction Strainer,nylon fitting |
| P562242 | 260 | Reservoir Suction Strainer,nylon fitting |
| P562243 | 260 | Reservoir Suction Strainer,nylon fitting |
| P562244 | 260 | Reservoir Suction Strainer,nylon fitting |
| P562245 | 260 | Reservoir Suction Strainer,nylon fitting |
| P562246 | 260 | Reservoir Suction Strainer,nylon fitting |
| P562247 | 261 | Tank Mounted Strainer |
| P562248 | 261 | Tank Mounted Strainer |
| P562249 | 261 | Tank Mounted Strainer |
| P562250 | 261 | Tank Mounted Strainer |
| P562251 | 261 | Tank Mounted Strainer |
| P562252 | 261 | Tank Mounted Strainer |
| P562253 | 261 | Tank Mounted Strainer |
| P562254 | 261 | Tank Mounted Strainer |
| P562255 | 261 | Tank Mounted Strainer |

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| P562256 | 261 | Tank Mounted Strainer |
| P562257 | 261 | Tank Mounted Strainer |
| P562259 | 261 | Tank Mounted Strainer |
| P562260 | 261 | Tank Mounted Strainer |
| P562264 | 261 | Tank Mounted Strainer |
| P562265 | 261 | Tank Mounted Strainer |
| P562266 | 261 | Tank Mounted Strainer |
| P562267 | 261 | Tank Mounted Strainer |
| P562269 | 261 | Tank Mounted Strainer |
| P562270 | 261 | Tank Mounted Strainer |
| P562271 | 261 | Tank Mounted Strainer |
| P562272 | 261 | Tank Mounted Strainer |
| P562273 | 261 | Tank Mounted Strainer |
| P562274 | 261 | Tank Mounted Strainer |
| P562275 | 261 | Tank Mounted Strainer |
| P562281 | 262 | Diffuser, TMD, Tank Mounted |
| P562282 | 262 | Diffuser, TMD, Tank Mounted |
| P562283 | 262 | Diffuser, TMD, Tank Mounted |
| P562284 | 262 | Diffuser, TMD, Tank Mounted |
| P562285 | 262 | Diffuser, TMD, Tank Mounted |
| P562287 | 262 | Diffuser, DFD, Line Mount |
| P562288 | 262 | Diffuser, DFD, Line Mount |
| P562289 | 262 | Diffuser, DFD, Line Mount |
| P562290 | 262 | Diffuser, DFD, Line Mount |
| P562291 | 262 | Diffuser, DFD, Line Mount |
| P562292 | 262 | Diffuser, DFD, Line Mount |
| P562293 | 262 | Diffuser, DFD, Line Mount |
| P562297 | 247 | In line Check Valves |
| P562298 | 247 | In line Check Valves |
| P562299 | 247 | In line Check Valves |
| P562301 | 247 | In line Check Valves |
| P562302 | 247 | In line Check Valves |
| P562303 | 247 | In line Check Valves |
| P562305 | 247 | In line Check Valves |
| P562306 | 247 | In line Check Valves |
| P562307 | 247 | In line Check Valves |
| P562308 | 247 | In line Check Valves |
| P562309 | 247 | In line Check Valves |
| P562311 | 247 | In line Check Valves |
| P562312 | 247 | In line Check Valves |
| P562313 | 247 | In line Check Valves |
| P562314 | 247 | In line Check Valves |
| P562316 | 247 | In line Check Valves |
| P562317 | 247 | In line Check Valves |
| P562319 | 247 | In line Check Valves |
| P562320 | 247 | In line Check Valves |
| P562321 | 247 | In line Check Valves |
| P562322 | 247 | In line Check Valves |
| P562323 | 247 | In line Check Valves |
| P562324 | 247 | In line Check Valves |
| P562325 | 247 | In line Check Valves |
| P562326 | 247 | In line Check Valves |
| P562327 | 247 | In line Check Valves |
| P562328 | 247 | In line Check Valves |

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| P562331 | 248 | Ball Valve, Low Pressure |
| P562332 | 250 | Ball Valve Lock Device |
| P562333 | 248 | Ball Valve, Low Pressure |
| P562335 | 250 | Ball Valve Lock Device |
| P562336 | 248 | Ball Valve, Low Pressure |
| P562338 | 248 | Ball Valve, Low Pressure |
| P562339 | 248 | Ball Valve, Low Pressure |
| P562340 | 250 | Ball Valve Lock Device |
| P562341 | 248 | Ball Valve, Low Pressure |
| P562342 | 251 | Ball Valve, 3 Way |
| P562343 | 248 | Ball Valve, Low Pressure |
| P562344 | 251 | Ball Valve, 3 Way |
| P562345 | 248 | Ball Valve, Low Pressure |
| P562346 | 248 | Ball Valve, Low Pressure |
| P562356 | 250 | Ball Valve, High Pressure |
| P562357 | 250 | Ball Valve, High Pressure |
| P562358 | 250 | Ball Valve, High Pressure |
| P562359 | 250 | Ball Valve, High Pressure |
| P562360 | 250 | Ball Valve, High Pressure |
| P562361 | 250 | Ball Valve, High Pressure |
| P562362 | 250 | Ball Valve, High Pressure |
| P562363 | 250 | Ball Valve, High Pressure |
| P562364 | 250 | Ball Valve, High Pressure |
| P562365 | 250 | Ball Valve, High Pressure |
| P562368 | 250 | Ball Valve, High Pressure |
| P562369 | 250 | Ball Valve, High Pressure |
| P562376 | 250 | Ball Valve Handle |
| P562377 | 250 | Ball Valve Handle |
| P562378 | 250 | Ball Valve Handle |
| P562379 | 250 | Ball Valve Seal Kit |
| P562380 | 250 | Ball Valve Seal Kit |
| P562381 | 250 | Ball Valve Seal Kit |
| P562382 | 250 | Ball Valve Seal Kit |
| P562383 | 250 | Ball Valve Seal Kit |
| P562387 | 249 | Ball Valve, Medium Pressure |
| P562388 | 249 | Ball Valve, Medium Pressure |
| P562389 | 249 | Ball Valve, Medium Pressure |
| P562390 | 249 | Ball Valve, Medium Pressure |
| P562391 | 249 | Ball Valve, Medium Pressure |
| P562392 | 249 | Ball Valve, Medium Pressure |
| P562394 | 249 | Ball Valve, Medium Pressure |
| P562395 | 249 | Ball Valve, Medium Pressure |
| P562396 | 249 | Ball Valve, Medium Pressure |
| P562397 | 249 | Ball Valve, Medium Pressure |
| P562398 | 249 | Ball Valve, Medium Pressure |
| P562399 | 249 | Ball Valve, Medium Pressure |
| P562404 | 251 | Ball Valve, 3 Way |
| P562405 | 251 | Ball Valve, 3 Way |
| P562406 | 251 | Ball Valve, 3 Way |
| P562407 | 251 | Ball Valve, 3 Way |
| P562408 | 282 | Sight Glass, Prism lens, nickel coated |
| P562409 | 282 | Sight Glass, Prism lens, nickel coated |

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| P562410 | 282 | Sight Glass, Prism lens, nickel coated |
| P562411 | 282 | Sight Glass, Prism lens, nickel coated |
| P562412 | 282 | Sight Glass, Prism lens, nickel coated |
| P562413 | 282 | Sight Glass, Prism lens, nickel coated |
| P562414 | 282 | Sight Glass, Prism lens, nickel coated |
| P562415 | 282 | Sight Glass, Prism lens, nickel coated |
| P562417 | 282 | Sight Glass, Prism lens |
| P562418 | 282 | Sight Glass, Prism lens |
| P562419 | 281 | Sight Glass, Transparent |
| P562420 | 281 | Sight Glass, Transparent |
| P562421 | 281 | Sight Glass, Transparent |
| P562423 | 281 | Sight Glass, Transparent |
| P562426 | 281 | Sight Glass, Transparent |
| P562427 | 281 | Sight Glass, Transparent |
| P562428 | 281 | Sight Glass, Transparent |
| P562430 | 281 | Sight Glass, Transparent |
| P562433 | 283 | Fluid Level & Temp Gauge, Bright Steel |
| P562434 | 286 | Fuel Level Gauge, LG-10 Series |
| P562435 | 286 | Fuel Level Gauge, LG-10 Series |
| P562436 | 286 | Fuel Level & Temp Gauge, LG-10 Series |
| P562437 | 286 | Fuel Level & Temp Gauge, LG-10 Series |
| P562438 | 286 | Fuel Level Gauge, LG-3 Series |
| P562440 | 286 | Fuel Level Gauge, LG-3 Series |
| P562441 | 286 | Fuel Level & Temp Gauge, LG-3 Series |
| P562442 | 286 | Fuel Level & Temp Gauge, LG-3 Series |
| P562444 | 286 | Fuel Level Gauge, LG-5 Series |
| P562445 | 286 | Fuel Level & Temp Gauge, LG-5 Series |
| P562447 | 286 | Fuel Level Gauge, LG-5 Series |
| P562448 | 286 | Fuel Level & Temp Gauge, LG-5 Series |
| P562449 | 286 | Fuel Level & Temp Gauge, LG-5 Series |
| P562450 | 286 | Fuel Level & Temp Gauge, LG-5 Series |
| P562451 | 286 | Fuel Level & Temp Gauge, LG-5 Series |
| P562452 | 286 | Fuel Level & Temp Gauge, LG-5 Series |
| P562453 | 285 | Fuel Level Gauge, LG-5 Series |
| P562454 | 286 | Fuel Level Gauge, LG-Z Series |
| P562456 | 286 | Fuel Level Gauge, LG-Z Series |
| P562458 | 286 | Fuel Level Gauge, LG-Z Series |
| P562476 | 269 | Filler Breather Cap, ABO |
| P562477 | 269 | Filler Breather Cap, ABO |
| P562480 | 269 | Filler Breather Cap, BPS |
| P562481 | 269 | Filler Breather Cap, BPS |
| P562482 | 269 | Filler Breather Cap, BPS |

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| P562483 | 269 | Filler Breather Cap, DPS |
| P562484 | 269 | Filler Breather Cap, DPS |
| P562492 | 269 | Filler Breather Cap, RPS |
| P562494 | 269 | Filler Breather Cap, DPS |
| P562495 | 269 | Filler Breather Cap, DPS |
| P562497 | 269 | Filler Breather Cap, DPS |
| P562502 | 269 | Filler Breather Cap, DPS |
| P562503 | 269 | Filler Breather Cap, DPS |
| P562510 | 267 | Breathers, MBS |
| P562511 | 267 | Breathers, MBS |
| P562512 | 267 | Breathers, MBS |
| P562514 | 267 | Breathers, MBS |
| P562516 | 267 | Breathers, MBS |
| P562517 | 267 | Breathers, ABS |
| P562518 | 267 | Breathers, ABS |
| P562519 | 267 | Breathers, ABS |
| P562520 | 267 | Breathers, ABS |
| P562521 | 267 | Breathers, ABS |
| P562522 | 267 | Breathers, ABS |
| P562523 | 267 | Breathers, ABS |
| P562524 | 267 | Breathers, ABS |
| P562525 | 267 | Breathers, ABS |
| P562526 | 267 | Breathers, ABS |
| P562527 | 267 | Breathers, ABS |
| P562528 | 267 | Breathers, ABS |
| P562529 | 267 | Breathers, ABS |
| P562530 | 267 | Breathers, ABS |
| P562531 | 267 | Breathers, ABS |
| P562532 | 267 | Breathers, ABS |
| P562533 | 267 | Breathers, ABS |
| P562534 | 274 | Filter Breather, Bayonet, High Impact |
| P562536 | 274 | Filter Breather, Bayonet, High Impact |
| P562537 | 274 | Filter Breather, Bayonet, High Impact |
| P562538 | 274 | Filter Breather, Bayonet, High Impact |
| P562539 | 274 | Filter Breather, Bayonet, High Impact |
| P562540 | 274 | Filter Breather, Bayonet, High Impact |
| P562541 | 274 | Filter Breather, Bayonet, High Impact |
| P562542 | 274 | Filter Breather, Bayonet, High Impact |
| P562544 | 274 | Filter Breather, Bayonet, High Impact |
| P562550 | 273 | Filler, Non-vent, Threaded |
| P562552 | 274 | Filter Breather, Bayonet, High Impact |
| P562553 | 274 | Filter Breather, Bayonet, High Impact |
| P562554 | 274 | Filter Breather, Bayonet, High Impact |
| P562555 | 274 | Filter Breather, Bayonet, High Impact |

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| P562556 | 274 | Filter Breather, Bayonet, High Impact |
| P562561 | 273 | Filter Breather, Mini |
| P562562 | 273 | Filter Breather, Mini |
| P562563 | 273 | Filler, Non-vent, Bayonet |
| P562564 | 273 | Filler, Non-vent, Bayonet |
| P562565 | 273 | Filler, Non-vent, Bayonet |
| P562573 | 272 | Filter Breather, Bayonet Style, ABB |
| P562574 | 272 | Filter Breather, Bayonet Style, ABB |
| P562575 | 272 | Filter Breather, Bayonet Style, ABB |
| P562576 | 272 | Filter Breather, Bayonet Style, ABB |
| P562577 | 272 | Filter Breather, Bayonet Style, ABB |
| P562578 | 272 | Filter Breather, Bayonet Style, ABB |
| P562579 | 272 | Filter Breather, Bayonet Style, ABB |
| P562580 | 272 | Filter Breather, Bayonet Style, ABB |
| P562581 | 272 | Filter Breather, Bayonet Style, ABB |
| P562582 | 272 | Filter Breather, Bayonet Style, ABB |
| P562583 | 272 | Filter Breather, Bayonet Style, ABB |
| P562584 | 272 | Filter Breather, Bayonet Style, ABB |
| P562585 | 272 | Filter Breather, Bayonet Style, ABB |
| P562587 | 272 | Filter Breather, Bayonet Style, ABB |
| P562589 | 272 | Filter Breather, Bayonet Style, ABB |
| P562590 | 272 | Filter Breather, Bayonet Style, ABB |
| P562592 | 272 | Filter Breather, Bayonet Style, ABB |
| P562593 | 272 | Filter Breather, Bayonet Style, ABB |
| P562594 | 272 | Filter Breather, Bayonet Style, ABB |
| P562595 | 272 | Filter Breather, Bayonet Style, ABB |
| P562596 | 272 | Filter Breather, Bayonet Style, ABB |
| P562598 | 272 | Filter Breather, Bayonet Style, ABB |
| P562599 | 272 | Filter Breather, Bayonet Style, ABB |
| P562600 | 272 | Filter Breather, Bayonet Style, ABB |
| P562601 | 272 | Filter Breather, Bayonet Style, ABB |
| P562602 | 272 | Filter Breather, Bayonet Style, ABB |
| P562603 | 272 | Filter Breather, Bayonet Style, ABB |
| P562605 | 272 | Filter Breather, Bayonet Style, ABB |
| P562608 | 272 | Filter Breather, Bayonet Style, ABB |
| P562609 | 272 | Filter Breather, Bayonet Style, ABB |
| P562610 | 271 | Filter Breather, Bayonet Style, ABB |
| P562611 | 271 | Filter Breather, Bayonet Style, ABB |
| P562612 | 271 | Filter Breather, Bayonet Style, ABB |
| P562614 | 271 | Filter Breather, Bayonet Style, ABB |
| P562616 | 271 | Filter Breather, Bayonet Style, ABB |
| P562618 | 271 | Filter Breather, Bayonet Style, ABB |
| P562619 | 271 | Filter Breather, Bayonet Style, ABB |
| P562620 | 271 | Filter Breather, Bayonet Style, ABB |
| P562623 | 271 | Filter Breather, Bayonet Style, ABB |
| P562624 | 271 | Filter Breather, Bayonet Style, ABB |
| P562625 | 271 | Filter Breather, Bayonet Style, ABB |
| P562626 | 271 | Filter Breather, Bayonet Style, ABB |
| P562627 | 263 | Breather, Threaded Adapter |
| P562628 | 263 | Breather, Threaded Adapter |
| P562629 | 250 | Ball Valve Seal Kit |
| P562630 | 250 | Ball Valve Seal Kit |
| P562668 | 276 | Filter Breather, Weld Riser |
| P562671 | 240 | Pressure Gauge, Front Flange |

| Part No. | Page No. | Product Description |
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| P562672 | 241 | Pressure Gauge, 4" dial, panel mount |
| P562673 | 241 | Pressure Gauge, 4" dial stem mount |
| P562674 | 241 | Pressure Gauge, 4" dial, panel mount |
| P562675 | 241 | Pressure Gauge, 4" dial stem mount |
| P562676 | 241 | Pressure Gauge, 4" dial, panel mount |
| P562677 | 241 | Pressure Gauge, 4" dial stem mount |
| P562678 | 241 | Pressure Gauge, 4" dial, panel mount |
| P562679 | 241 | Pressure Gauge, 4" dial stem mount |
| P562680 | 241 | Pressure Gauge, 4" dial, panel mount |
| P562681 | 241 | Pressure Gauge, 4" dial stem mount |
| P562682 | 241 | Pressure Gauge, 4" dial, panel mount |
| P562683 | 241 | Pressure Gauge, 4" dial stem mount |
| P562684 | 241 | Pressure Gauge, 4" dial, panel mount |
| P562685 | 241 | Pressure Gauge, 4" dial stem mount |
| P562686 | 241 | Pressure Gauge, 4" dial stem mount |
| P562687 | 241 | Pressure Gauge, 4" dial, panel mount |
| P562688 | 241 | Pressure Gauge, 4" dial stem mount |
| P562696 | 240 | Pressure Gauge, 2-1/2 dial, stem mount |
| P562697 | 240 | Pressure Gauge, 2-1/2 dial, Panel mount |
| P562698 | 240 | Pressure Gauge, 2-1/2 dial, Panel mount |
| P562699 | 240 | Pressure Gauge, Front Flange |
| P562700 | 240 | Pressure Gauge, 2-1/2 dial, Panel mount |
| P562701 | 240 | Pressure Gauge, 2-1/2 dial, stem mount |
| P562702 | 240 | Pressure Gauge, 2-1/2 dial, Panel mount |
| P562703 | 240 | Pressure Gauge, 2-1/2 dial, stem mount |
| P562704 | 240 | Pressure Gauge, 2-1/2 dial, Panel mount |
| P562705 | 240 | Pressure Gauge, 2-1/2 dial, stem mount |
| P562706 | 240 | Pressure Gauge, 2-1/2 dial, Panel mount |
| P562707 | 240 | Pressure Gauge, 2-1/2 dial, stem mount |
| P562708 | 240 | Pressure Gauge, 2-1/2 dial, Panel mount |
| P562709 | 240 | Pressure Gauge, 2-1/2 dial, stem mount |

| Part No. | Page No. | Product Description |
|----------|----------|---|
| P562710 | 240 | Pressure Gauge, 2-1/2 dial, Panel mount |
| P562711 | 240 | Pressure Gauge, 2-1/2 dial, stem mount |
| P562712 | 240 | Pressure Gauge, 2-1/2 dial, Panel mount |
| P562713 | 240 | Pressure Gauge, 2-1/2 dial, stem mount |
| P562716 | 240 | Pressure Gauge, 2-1/2 dial, Panel mount |
| P562717 | 240 | Pressure Gauge, 2-1/2 dial, stem mount |
| P562718 | 240 | Pressure Gauge, 2-1/2 dial, stem mount |
| P562719 | 240 | Pressure Gauge, 2-1/2 dial, stem mount |
| P562720 | 240 | Pressure Gauge, 2-1/2 dial, Panel mount |
| P562721 | 240 | Pressure Gauge, 2-1/2 dial, stem mount |
| P562722 | 240 | Pressure Gauge, 2-1/2 dial, Panel mount |
| P562723 | 240 | Pressure Gauge, 2-1/2 dial, stem mount |
| P562724 | 240 | Pressure Gauge, 2-1/2 dial, Panel mount |
| P562725 | 240 | Pressure Gauge, 2-1/2 dial, stem mount |
| P562726 | 240 | Pressure Gauge, 2-1/2 dial, Panel mount |
| P562727 | 240 | Pressure Gauge, 2-1/2 dial, stem mount |
| P562728 | 240 | Pressure Gauge, 2-1/2 dial, Panel mount |
| P562729 | 240 | Pressure Gauge, 2-1/2 dial, stem mount |
| P562730 | 240 | Pressure Gauge, 2-1/2 dial, Panel mount |
| P562731 | 240 | Pressure Gauge, 2-1/2 dial, stem mount |
| P562732 | 240 | Pressure Gauge, 2-1/2 dial, Panel mount |
| P562733 | 240 | Pressure Gauge, 2-1/2 dial, stem mount |
| P562734 | 240 | Pressure Gauge, 2-1/2 dial, stem mount |
| P562735 | 240 | Pressure Gauge, 2-1/2 dial, stem mount |
| P562736 | 240 | Pressure Gauge, 2-1/2 dial, stem mount |
| P562737 | 240 | Pressure Gauge, 2-1/2 dial, stem mount |
| P562738 | 240 | Pressure Gauge, 2-1/2 dial, stem mount |
| P562739 | 240 | Pressure Gauge, 2-1/2 dial, stem mount |
| P562740 | 240 | Pressure Gauge, 2-1/2 dial, stem mount |
| P563042 | 252 | Flange, Split Code 61 |
| P563044 | 252 | Flange, Split Code 61 |
| P563046 | 252 | Flange Split, Code 62 |

| Part No. | Page No. | Product Description |
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| P563047 | 252 | Flange, Split Code 61 |
| P563049 | 252 | Flange Split, Code 62 |
| P563050 | 252 | Flange, Split Code 61 |
| P563051 | 252 | Flange Split, Code 62 |
| P563053 | 252 | Flange, Split Code 61 |
| P563054 | 252 | Flange Split, Code 62 |
| P563056 | 252 | Flange, Split Code 61 |
| P563061 | 253 | Flange, Blank, Code 61 |
| P563063 | 253 | Flange, Blank, Code 61 |
| P563064 | 253 | Flange, Blank, Code 62 |
| P563065 | 253 | Flange, Blank, Code 61 |
| P563067 | 253 | Flange, Blank, Code 61 |
| P563088 | 254 | Flange, 4-bolt, NPTF, Code 61 |
| P563090 | 256 | Flange, 4-bolt, SAE Code 61, ST-O-ring |
| P563093 | 254 | Flange, 4-bolt, NPTF, Code 61 |
| P563094 | 255 | Flange, 4-bolt, NPTF, Code 62 |
| P563095 | 256 | Flange, 4-bolt, SAE Code 61, ST-O-ring |
| P563096 | 256 | Flange, 4-bolt, SAE Code 62, ST-O-ring |
| P563100 | 254 | Flange, 4-bolt, NPTF, Code 61 |
| P563101 | 255 | Flange, 4-bolt, NPTF, Code 62 |
| P563102 | 256 | Flange, 4-bolt, SAE Code 61, ST-O-ring |
| P563103 | 256 | Flange, 4-bolt, SAE Code 62, ST-O-ring |
| P563107 | 254 | Flange, 4-bolt, NPTF, Code 61 |
| P563108 | 255 | Flange, 4-bolt, NPTF, Code 62 |
| P563109 | 256 | Flange, 4-bolt, SAE Code 61, ST-O-ring |
| P563110 | 256 | Flange, 4-bolt, SAE Code 62, ST-O-ring |
| P563113 | 254 | Flange, 4-bolt, NPTF, Code 61 |
| P563115 | 256 | Flange, 4-bolt, SAE Code 61, ST-O-ring |
| P563117 | 254 | Flange, 4-bolt, NPTF, Code 61 |
| P563118 | 254 | Flange, 4-bolt, NPTF, Code 61 |
| P563119 | 257 | Flange, Flat Socket Weld, Code 61, O-ring |
| P563120 | 257 | Flange, Flat Socket Weld, Code 61, O-ring |
| P563121 | 257 | Flange, Flat Socket Weld, Code 61, O-ring |
| P563122 | 257 | Flange, Flat Socket Weld, Code 61, O-ring |
| P563123 | 257 | Flange, Flat Socket Weld, Code 61, O-ring |
| P563124 | 257 | Flange, Flat Socket Weld, Code 61, O-ring |
| P563127 | 257 | Flange, Flat Socket Weld, Code 61, O-ring |
| P563162 | 256 | Flange, 4-bolt, SAE Code 61, ST-flat face |
| P563163 | 255 | Flange, 4-bolt, NPTF, Code 61 |
| P563165 | 256 | Flange, 4-bolt, SAE Code 61, ST-flat face |
| P563166 | 255 | Flange, 4-bolt, NPTF, Code 61 |

| Part No. | Page No. | Product Description |
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| P563168 | 256 | Flange, 4-bolt, SAE Code 61, ST-flat face |
| P563171 | 255 | Flange, 4-bolt, NPTF, Code 61 |
| P563176 | 257 | Flange, Flat Socket Weld, Code 61, Flat Face |
| P563177 | 257 | Flange, Flat Socket Weld, Code 61, Flat Face |
| P563178 | 257 | Flange, Flat Socket Weld, Code 61, Flat Face |
| P563179 | 257 | Flange, Flat Socket Weld, Code 61, Flat Face |
| P563180 | 257 | Flange, Flat Socket Weld, Code 61, Flat Face |
| P563181 | 257 | Flange, Flat Socket Weld, Code 61, Flat Face |
| P563192 | 243 | Test Point, M12x1.5 thrd |
| P563193 | 243 | Test Point, M12x1.5 thrd |
| P563197 | 243 | Test Point, M12x1.5 thrd |
| P563199 | 243 | Test Point, M12x1.5 thrd |
| P563206 | 243 | Test Point, M12x1.5 thrd |
| P563207 | 243 | Test Point, M12x1.5 thrd |
| P563210 | 243 | Test Point, M16x2 Thread |
| P563212 | 243 | Test Point, M16x2 Thread |
| P563215 | 243 | Test Point, M16x2 Thread |
| P563219 | 243 | Test Point, M16x2 Thread |
| P563220 | 243 | Test Point, M16x2 Thread |
| P563224 | 243 | Test Point, M16x2 Thread |
| P563231 | 243 | Test Point, M16x2 Thread |
| P563232 | 243 | Test Point, M16x2 Thread |
| P563240 | 245 | Test Point+Hose, M12 x 1.5 Thread |
| P563243 | 245 | Test Point+Hose, M12 x 1.5 Thread |
| P563244 | 245 | Test Point+Hose, M12 x 1.5 Thread |
| P563245 | 245 | Test Point+Hose, M12 x 1.5 Thread |
| P563246 | 245 | Test Point+Hose, M12 x 1.5 Thread |
| P563247 | 245 | Test Point+Hose, M12 x 1.5 Thread |
| P563248 | 245 | Test Point+Hose, M12 x 1.5 Thread |
| P563249 | 245 | Test Point+Hose, M12 x 1.5 Thread |
| P563250 | 245 | Test Point+Hose, M16 x 2 Thread |
| P563251 | 245 | Test Point+Hose, M16 x 2 Thread |
| P563252 | 245 | Test Point+Hose, M16 x 2 Thread |
| P563254 | 245 | Test Point+Hose, M16 x 2 Thread |
| P563255 | 245 | Test Point+Hose, M16 x 2 Thread |
| P563256 | 245 | Test Point+Hose, M16 x 2 Thread |
| P563257 | 245 | Test Point+Hose, M16 x 2 Thread |
| P563259 | 245 | Test Point+Hose, M16 x 2 Thread |
| P563260 | 245 | Test Point+Hose, M16 x 2 Thread |
| P563261 | 245 | Test Point+Hose, M16 x 2 Thread |
| P563262 | 244 | Test Point Adapter, Pressure Gauge Connection |
| P563263 | 244 | Test Point Adapter, Hose Union Gauge |
| P563264 | 244 | Test Point Adapter, Hose Union Gauge |
| P563265 | 244 | Test Point Adapter, Series Converter |
| P563266 | 244 | Test Point Adapter, Series Converter |

| Part No. | Page No. | Product Description |
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| P563267 | 52 | Head Assembly, SP50/60, 1/4" NPT |
| P563268 | 52 | Head Assembly, SP50/60, 1/4" NPT |
| P563269 | 52 | Head Assembly, SP50/60, 1/4" NPT |
| P563270 | 52 | Head Assembly, SP50/60, 1/4" NPT |
| P563271 | 52 | Head Assembly, SP50/60, SAE-20 |
| P563272 | 52 | Head Assembly, SP50/60, SAE-20 |
| P563273 | 56 | Head Assembly, SP80/90, 1/2" NPT & 2" SAE 4 BOLT |
| P563274 | 56 | Head Assembly, SP80/90, 1/2" NPT & 2" SAE 4 BOLT |
| P563275 | 56 | Head Assembly, SP80/90, 1/2" NPT & 2" SAE 4 BOLT |
| P563276 | 56 | Head Assembly, SP80/90, 1/2" NPT & 2" SAE 4 BOLT |
| P563277 | 61 | Head Assembly, SP100/120, 1/2" NPT |
| P563278 | 32 | Head Assembly, SP15/25, 3/4" NPT |
| P563279 | 32 | Head Assembly, SP15/25, SAE-12 |
| P563280 | 32 | Head Assembly, SP15/25, SAE-12 |
| P563287 | 32 | Head Assembly, SP15/25, SAE-12 |
| P563288 | 32 | Head Assembly, SP15/25, 1/2" NPT |
| P563296 | 33, 53, 57, 61, 238 | Pressure Gauge, numeric, return or suction |
| P563297 | 33, 53, 57, 61, 238 | Pressure Gauge, color-coded, return |
| P563298 | 33, 53, 57, 61, 67, 238 | Pressure Gauge, color-coded, return or suction |
| P563299 | 33, 53, 57, 61, 238 | Pressure Gauge, numeric, suction |
| P563300 | 66, 238 | Pressure Gauge, color-coded, return |
| P563305 | 260 | Reservoir Suction Strainer, Steel fitting |
| P563306 | 261 | Tank Mounted Strainer |
| P563307 | 247 | In line Check Valves |
| P563308 | 249 | Ball Valve, Medium Pressure |
| P563309 | 249 | Ball Valve, Medium Pressure |
| P563310 | 249 | Ball Valve, Medium Pressure |
| P563311 | 248 | Ball Valve, Low Pressure |
| P563322 | 276 | Filler Breather, Bayonet, PBB |
| P563326 | 276 | Filler Breather, Bayonet, PBB |
| P563346 | 276 | Filler Breather, Bayonet, PBB |
| P563347 | 276 | Filler Breather, Bayonet, PBB |
| P563348 | 276 | Filler Breather, Bayonet, PBB |
| P563349 | 276 | Filler Breather, Bayonet, PBB |
| P563350 | 276 | Filler Breather, Bayonet, PBB |
| P563351 | 276 | Filler Breather, Bayonet, PBB |
| P563352 | 276 | Filler Breather, Bayonet, PBB |
| P563353 | 276 | Filler Breather, Bayonet, PBB |
| P563354 | 276 | Filler Breather, Bayonet, PBB |
| P563355 | 276 | Filler Breather, Bayonet, PBB |
| P563356 | 276 | Filler Breather, Bayonet, PBB |
| P563357 | 276 | Filler Breather, Bayonet, PBB |
| P563358 | 276 | Filler Breather, Bayonet, PBB |
| P563360 | 276 | Filler Breather, Bayonet, PBB |

| Part No. | Page No. | Product Description |
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| P563361 | 276 | Filler Breather, Bayonet, PBB |
| P563362 | 268 | Filler Breather Cap, PBS, threaded |
| P563363 | 268 | Filler Breather Cap, PBS, threaded |
| P563365 | 268 | Filler Breather Cap, PBS, threaded |
| P563366 | 268 | Filler Breather Cap, PBS, threaded |
| P563367 | 268 | Filler Breather Cap, PBS, threaded |
| P563368 | 268 | Filler Breather Cap, PBS, threaded |
| P563369 | 268 | Filler Breather Cap, PBS, threaded |
| P563370 | 268 | Filler Breather Cap, PBS, threaded |
| P563371 | 268 | Filler Breather Cap, PBS, threaded |
| P563372 | 268 | Filler Breather Cap, PBS, threaded |
| P563453 | 265 | T.R.A.P.™ Bayonet Filler Basket/ Flange |
| P563465 | 276 | Filler Breather, Bayonet, PBB |
| P563466 | 276 | Filler Breather, Bayonet, PBB |
| P563490 | 52 | Head Assembly, SP50/60, 1/4" NPT |
| P563491 | 52 | Head Assembly, SP50/60, 1/4" NPT |
| P563492 | 52 | Head Assembly, SP50/60, 1/4" NPT |
| P563513 | 286 | Fuel Level, Fast Mount Kit |
| P563514 | 286 | Fuel Level, Fast Mount Kit |
| P563614 | 269 | Filler Breather Cap, DPS |
| P563800 | 244 | Test Point Adapter, Bulkhead Gauge Adapter |
| P563807 | 244 | Test Point Adapter, Bulkhead Gauge Adapter |
| P563808 | 244 | Test Point Adapter, Direct Gauge Adapter |
| P563809 | 244 | Test Point Adapter, Direct Gauge Adapter |
| P563813 | 274 | Filter Breather, Bayonet, High Impact |
| P563874 | 265 | T.R.A.P.™ Bayonet Filler Basket/ Flange |
| P563901 | 267 | Breathers, ABS |
| P563909 | 286 | Fuel Level & Temp Gauge, LG-10 Series |
| P563913 | 286 | Fuel Level & Temp Gauge, LG-5 Series |
| P563973 | 67 | Head Assembly TT30/60, 1/2" NPT |
| P563975 | 67 | Head to Tank Seal, TT15 |
| P563976 | 67 | Head to Tank Seal, TT30/60 |
| P563978 | 33, 53, 57, 61, 67, 238 | Visual Indicator, electrical, return |
| P563979 | 33, 53, 57, 61, 67, 238 | Visual Indicator, electrical, suction or return |
| P563987 | 243 | Test Point, M16x2 Thread |
| P564038 | 67 | Head Assembly TT15, 3/4" NPT |
| P564147 | 52 | Head Assembly, SP50/60, SAE-20 |
| P564357 | 32, 36, 263 | Spin-on Filter, SP15/25, WO12, Accy Synteq |
| P564424 | 263 | Breather, Spin-on Filter |
| P564468 | 104 | Spin-on filter, HMK05/25, Synteq |
| P564484 | 101 | Head Assembly, HMK04, 1" NPT |
| P564485 | 101 | Head Assembly, HMK04, 1" NPT |
| P564486 | 105 | Head Assembly, HMK05, O-Ring |
| P564669 | 265 | Breather, T.R.A.P.™ |

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| P564850 | 101 | Head Assembly, HMK04, SAE-16 O-Ring |
| P564858 | 105 | Head Assembly, HMK05, O-Ring |
| P564892 | 56 | Head Assembly, SP80/90, SAE-24 O-Ring |
| P564936 | 112, 170, 176, 182, 190, 199, 204 | Filter Cartridge, WO61/HPK04/W621/W620/WS620/HPK03, FPK04 Synthetic |
| P564967 | 32, 36 | Spin-on Filter, SP15/25, WO12, Synteq |
| P565059 | 32, 36 | Spin-on Filter, SP15/25, WO12, Cellulose |
| P565060 | 32, 36 | Spin-on Filter, SP15/25, WO12, Cellulose |
| P565061 | 32, 36 | Spin-on Filter, SP15/25, WO12, Cellulose |
| P565062 | 32, 36 | Spin-on Filter, SP15/25, WO12 Water Absorbing |
| P565122 | 112, 170, 176, 182, 190, 199, 204 | Filter Cartridge, WO61/HPK04/W621/W620/WS620/HPK03, FPK04 Synthetic |
| P565123 | 112, 170, 176, 182, 190, 199, 204 | Filter Cartridge, WO61/HPK04/W621/W620/WS620/HPK03, FPK04 Synthetic |
| P565183 | 323 | Spin-on Filter, Bulk Fluid |
| P565184 | 323 | Spin-on Filter, Bulk Fluid |
| P565185 | 323 | Spin-on Filter, Bulk Fluid |
| P565187 | 112, 176, 182, 190, 199, 204, 209 | Filter Cartridge, WO61/W350/FPK04/HPK04/W621/W620/WS620/HPK05 Synthetic |
| P565188 | 112, 176, 182, 190, 199, 204 | Filter Cartridge, WO61/W350/FPK04/HPK04/W621/W620/WS620 Synthetic |
| P565189 | 112, 176, 182, 190, 199, 204 | Filter Cartridge, WO61/W350/FPK04/HPK04/W621/W620/WS620 Synthetic |
| P565195 | 183, 199, 204, 209 | Filter Cartridge, HPK04/W620/WS620/HPK05 Synthetic |
| P565196 | 183, 199, 204, 209 | Filter Cartridge, HPK04/W620/WS620/HPK05 Synthetic |
| P565197 | 183, 199, 204, 209 | Filter Cartridge, HPK04/W620/WS620/HPK05 Synthetic |
| P565242 | 66 | Spin-on filter, TT15, Cellulose |
| P565245 | 40, 44, 52, 56, 60, 65 | Spin-on Filter, SP15-25/WO12, Cellulose |
| P565616 | 265 | Breather, T.R.A.P.™ |
| P565857 | 265 | Breather, T.R.A.P.™ |
| P565858 | 265 | Breather, T.R.A.P.™ |
| P566023 | 323 | Bulk Fluid, Head Assembly, SAE-16 O-Ring |
| P566024 | 323 | Bulk Fluid, Head Assembly, SAE-16 O-Ring |

| Part No. | Page No. | Product Description |
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| P566037 | 265 | Breather, T.R.A.P.™ |
| P566151 | 265 | Breather, T.R.A.P.™ |
| P566156 | 265 | Breather, T.R.A.P.™ |
| P566168 | 265 | T.R.A.P.™ Mechanical Indicator Kit |
| P566174 | 265 | Breather, T.R.A.P.™ |
| P566187 | 90 | Filter Cartridge, HRK/HEK11, Synthetic |
| P566188 | 90 | Filter Cartridge, HRK, Synthetic |
| P566189 | 90 | Filter Cartridge, HRK/HEK11, Synthetic |
| P566190 | 90 | Filter Cartridge, HRK/HEK11, Synthetic |
| P566191 | 90 | Filter Cartridge, HRK/HEK11, Synthetic |
| P566192 | 90 | Filter Cartridge, HRK/HEK11, Synthetic |
| P566194 | 139, 148, 153 | Filter Cartridge, HPK02/W440/FPK02 Synthetic |
| P566195 | 139, 148, 153 | Filter Cartridge, HPK02/W440/FPK02 Synthetic |
| P566196 | 139, 148, 153 | Filter Cartridge, HPK02/W440/FPK02 Synthetic |
| P566197 | 139, 148, 153 | Filter Cartridge, HPK02/W440/FPK02 Synthetic |
| P566198 | 139, 148, 153 | Filter Cartridge, HPK02/W440/FPK02 Synthetic |
| P566199 | 139, 148, 153 | Filter Cartridge, HPK02/W440/FPK02 Synthetic |
| P566200 | 139, 148, 153 | Filter Cartridge, HPK02/W440/FPK02 Synthetic |
| P566201 | 139, 148, 153 | Filter Cartridge, HPK02/W440/FPK02 Synthetic |
| P566202 | 139, 148, 153 | Filter Cartridge, HPK02/W440/FPK02 Synthetic |
| P566203 | 139, 148, 153 | Filter Cartridge, HPK02/W440/FPK02 Synthetic |
| P566204 | 112, 166, 176, 190 | Filter Cartridge, WO61/W350/FPK04/W621 Synthetic |
| P566205 | 112, 166, 176, 190 | Filter Cartridge, WO61/W350/FPK04/W621 Synthetic |
| P566206 | 112, 166, 176, 190 | Filter Cartridge, WO61/W350/FPK04/W621 Synthetic |
| P566207 | 112, 166, 176, 190 | Filter Cartridge, WO61/W350/FPK04/W621 Synthetic |
| P566208 | 112, 166, 176, 190 | Filter Cartridge, WO61/W350/FPK04/W621 Synthetic |
| P566209 | 112, 166, 170, 176, 182, 190, 199, 204 | Filter Cartridge, W350/HPK03/FPK04/WO61/HPK04/W621/W620/WS620 Synthetic |
| P566210 | 112, 166, 170, 176, 182, 190, 199, 204 | Filter Cartridge, W350/HPK03/FPK04/WO61/HPK04/W621/W620/WS620 Synthetic |

| Part No. | Page No. | Product Description |
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| P566211 | 112, 166, 170, 176, 182, 190, 199, 204 | Filter Cartridge, W350/HPK03/FPK04/WO61/HPK04/W621/W620/WS620 Synthetic |
| P566212 | 112, 166, 170, 176, 182, 190, 199, 204 | Filter Cartridge, W350/HPK03/FPK04/WO61/HPK04/W621/W620/WS620 Synthetic |
| P566213 | 112, 166, 170, 176, 182, 190, 199, 204 | Filter Cartridge, W350/HPK03/FPK04/WO61/HPK04/W621/W620/WS620 Synthetic |
| P566214 | 112, 176, 182, 190, 199, 204 | Filter Cartridge, WO61/W350/FPK04/HPK04/W621/W620/WS620 Synthetic |
| P566215 | 112, 176, 182, 190, 199, 204 | Filter Cartridge, WO61/W350/FPK04/HPK04/W621/W620/WS620 Synthetic |
| P566216 | 112, 176, 182, 190, 199, 204 | Filter Cartridge, WO61/W350/FPK04/HPK04/W621/W620/WS620 Synthetic |
| P566217 | 112, 176, 182, 190, 199, 204 | Filter Cartridge, WO61/W350/FPK04/HPK04/W621/W620/WS620 Synthetic |
| P566218 | 112, 176, 182, 190, 199, 204 | Filter Cartridge, WO61/W350/FPK04/HPK04/W621/W620/WS620 Synthetic |
| P566219 | 183, 199, 204 | Filter Cartridge, FPK04/W620/WS620 Synthetic |
| P566220 | 183, 199, 204 | Filter Cartridge, FPK04/W620/WS620 Synthetic |
| P566221 | 183, 199, 204 | Filter Cartridge, FPK04/W620/WS620 Synthetic |
| P566222 | 183, 199, 204 | Filter Cartridge, FPK04/W620/WS620 Synthetic |
| P566223 | 183, 199, 204 | Filter Cartridge, FPK04/W620/WS620 Synthetic |
| P566239 | 120, 124 | Filter Cartridge, WO41/WO42, Synteq |
| P566240 | 120, 124 | Filter Cartridge, WO41/WO42, Synteq |
| P566241 | 120, 124 | Filter Cartridge, WO41/WO42, Synteq |
| P566242 | 120, 124 | Filter Cartridge, WO41/WO42, Synteq |
| P566243 | 120, 124 | Filter Cartridge, WO41/WO42, Synteq |
| P566244 | 120, 124 | Filter Cartridge, WO41/WO42, Synteq |
| P566245 | 120, 124 | Filter Cartridge, WO41/WO42, Synteq |
| P566246 | 120, 124 | Filter Cartridge, WO41/WO42, Synteq |
| P566247 | 120, 124 | Filter Cartridge, WO41/WO42, Synteq |
| P566248 | 120, 124 | Filter Cartridge, WO41/WO42, Synteq |
| P566249 | 120, 124 | Filter Cartridge, WO41/WO42, Synteq |

| Part No. | Page No. | Product Description |
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| P566250 | 120, 124 | Filter Cartridge, W041/W042, Synteq |
| P566251 | 120, 124 | Filter Cartridge, W041/W042, Synteq |
| P566252 | 120, 124 | Filter Cartridge, W041/W042, Synteq |
| P566253 | 120, 124 | Filter Cartridge, W041/W042, Synteq |
| P566254 | 120, 124 | Filter Cartridge, W041/W042, Synteq |
| P566255 | 120, 124 | Filter Cartridge, W041/W042, Synteq |
| P566256 | 120, 124 | Filter Cartridge, W041/W042, Synteq |
| P566257 | 120, 124 | Filter Cartridge, W041/W042, Synteq |
| P566258 | 120, 124, 171 | Filter Cartridge, W041/W042/HPK03 Synteq |
| P566270 | 70, 74, 86, 195 | Cartridge Filter, WL15/WL16/W033/W451, Synthetic |
| P566271 | 70, 74, 86, 195 | Cartridge Filter, WL15/WL16/W033/W451, Synthetic |
| P566272 | 70, 74, 86, 195 | Cartridge Filter, WL15/WL16/W033/W451, Synthetic |
| P566273 | 70, 74, 86, 195 | Cartridge Filter, WL15/WL16/W033/W451, Synthetic |
| P566274 | 70, 74, 86, 195 | Cartridge Filter, WL15/WL16/W033/W451, Synthetic |
| P566275 | 70, 74, 86, 195 | Cartridge Filter, WL15/WL16/W033/W451, Synthetic |
| P566276 | 70, 74, 86, 195 | Cartridge Filter, WL15/WL16/W033/W451, Synthetic |
| P566277 | 70, 74, 86, 195 | Cartridge Filter, WL15/WL16/W033/W451, Synthetic |
| P566278 | 70, 74, 86, 195 | Cartridge Filter, WL15/WL16/W033/W451, Synthetic |
| P566279 | 70, 74, 86, 195 | Cartridge Filter, WL15/WL16/W033/W451, Synthetic |
| P566280 | 70, 74, 86, 195 | Cartridge Filter, WL15/WL16/W033/W451, Synthetic |
| P566281 | 70, 74, 86, 195 | Cartridge Filter, WL15/WL16/W033/W451, Synthetic |
| P566321 | 265 | T.R.A.P. TM Bayonet Filler Basket/Flange |
| P566335 | 139, 148, 153 | Filter Cartridge, HPK02/W440/FPK02 Synthetic |
| P566336 | 139, 148, 153 | Filter Cartridge, HPK02/W440/FPK02 Synthetic |
| P566337 | 139, 148, 153 | Filter Cartridge, HPK02/W440/FPK02 Synthetic |
| P566338 | 139, 148, 153 | Filter Cartridge, HPK02/W440/FPK02 Synthetic |
| P566364 | 112, 166, 177, 190 | Filter Cartridge, W061/W350/FPK04/W621, Synthetic |
| P566365 | 112, 166, 177, 190 | Filter Cartridge, W061/W350/FPK04/W621, Synthetic |
| P566365 | 166, 171, 177 | Filter Cartridge, W350/FPK04/W621, Synthetic |

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| P566366 | 112, 166, 171, 177, 183, 190, 199, 204 | Filter Cartridge, W061/W350/HPK03/FPK04/HPK04/W621/W620/WS620, Synthetic |
| P566367 | 112, 166, 171, 177, 183, 190, 199, 204 | Filter Cartridge, W061/W350/HPK03/FPK04/HPK04/W621/W620/WS620, Synthetic |
| P566368 | 112, 177, 183, 190, 199, 204 | Filter Cartridge, W061/FPK04/HPK04/W621/W620/WS620, Synthetic |
| P566369 | 112, 177, 183, 190, 199, 204 | Filter Cartridge, W061/FPK04/HPK04/W621/W620/WS620, Synthetic |
| P566370 | 183, 199, 204 | Filter Cartridge, FPK04/W620/WS620 Synthetic |
| P566371 | 183, 199, 204 | Filter Cartridge, FPK04/W620/WS620 Synthetic |
| P566391 | 158, 162 | Filter Cartridge, W613, W322 Synthetic |
| P566392 | 158, 162 | Filter Cartridge, W613, W322, Synthetic |
| P566393 | 158, 162 | Filter Cartridge, W613, W322, Synthetic |
| P566394 | 158, 162 | Filter Cartridge, W613, W322, Synthetic |
| P566395 | 158, 162 | Filter Cartridge, W613, W322, Synthetic |
| P566396 | 158, 162 | Filter Cartridge, W613, W322, Synthetic |
| P566397 | 158, 162 | Filter Cartridge, W613, W322, Synthetic |
| P566398 | 158, 162 | Filter Cartridge, W613, W322, Synthetic |
| P566399 | 158, 162 | Filter Cartridge, W613, W322, Synthetic |
| P566400 | 158, 162 | Filter Cartridge, W613, W322, Synthetic |
| P566406 | 158, 162 | Filter Cartridge, W613, W322, Synthetic |
| P566407 | 158, 162 | Filter Cartridge, W613, W322, Synthetic |
| P566408 | 158, 162 | Filter Cartridge, W613, W322, Synthetic |
| P566409 | 158, 162 | Filter Cartridge, W613, W322, Synthetic |
| P566412 | 70, 74, 86, 195 | Cartridge Filter, WL15/WL16/W033/W451, Synthetic |
| P566413 | 70, 74, 86, 195 | Cartridge Filter, WL15/WL16/W033/W451, Synthetic |
| P566449 | 209 | Filter Cartridge, HPK05, Synthetic |
| P566450 | 209 | Filter Cartridge, HPK05, Synthetic |
| P566451 | 209 | Filter Cartridge, HPK05, Synthetic |
| P566452 | 209 | Filter Cartridge, HPK05, Synthetic |
| P566453 | 209 | Filter Cartridge, HPK05, Synthetic |
| P566454 | 209 | Filter Cartridge, HPK05, Synthetic |
| P566455 | 209 | Filter Cartridge, HPK05, Synthetic |
| P566462 | 209 | Filter Cartridge, HPK05, Synthetic |
| P566643 | 209 | Filter Cartridge, HPK05, Synthetic |
| P567065 | 144 | Filter Cartridge, W341, Synthetic |
| P567066 | 144 | Filter Cartridge, W341, Synthetic |

| Part No. | Page No. | Product Description |
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| P567067 | 144 | Filter Cartridge, W341, Synthetic |
| P567068 | 144 | Filter Cartridge, W341, Synthetic |
| P567069 | 144 | Filter Cartridge, W341, Synthetic |
| P567070 | 144 | Filter Cartridge, W341, Synthetic |
| P567071 | 144 | Filter Cartridge, W341, Synthetic |
| P567072 | 144 | Filter Cartridge, W341, Synthetic |
| P567390 | 265 | Breather, T.R.A.P. TM |
| P567392 | 265 | Breather, T.R.A.P. TM |
| P567456 | 139, 171, 184, 210, 236 | Visual Electric Indicator, All HPK Series |
| P567457 | 139, 171, 184, 210, 236 | Visual Electric Indicator, All HPK Series |
| P567458 | 139, 171, 184, 210, 236 | Visual Electric Indicator, All HPK Series |
| P567459 | 139, 171, 184, 210, 236 | Visual Electric Indicator, All HPK Series |
| P567639 | 182 | Head Assembly, HPK04, 1-1/2" SAE 4-Bolt / SAE-20 O-ring |
| P567640 | 182 | Head Assembly, HPK04, 1-1/2" SAE 4-Bolt / SAE-20 O-ring |
| P567641 | 182 | Head Assembly, HPK04, 1-1/2" SAE 4-Bolt / SAE-20 O-ring |
| P567642 | 182 | Head Assembly, HPK04, 1-1/2" SAE 4-Bolt |
| P567643 | 182 | Head Assembly, HPK04, 1-1/2" SAE 4-Bolt |
| P567644 | 182 | Head Assembly, HPK04, 1-1/2" SAE 4-Bolt |
| P567648 | 182 | Housing, HPK04, 16" / 406 mm Filters |
| P567649 | 182 | Housing, HPK04, 13" / 330 mm Filters |
| P567650 | 182 | Housing, HPK04, 8" / 204 mm filter |
| P567843 | 312 | Portable Oil Diagnostic System |
| P567851 | 310 | Re-agent A for Water Analysis (set of 50) |
| P567855 | 310 | Water Test Vessel |
| P567858 | 310 | Syringe |
| P567860 | 310 | Filter for Solvent Dispensing Bottle |
| P567861 | 310 | Sample Bottle, 120ml |
| P567862 | 310 | Solvent Dispensing Bottle, 1000 ml |
| P567863 | 310 | Membrane Holder & Funnel Assembly |
| P567864 | 310 | Microscope, 100x |
| P567865 | 310 | Analysis Cards (set of 50) |
| P567866 | 310 | Beaker |
| P567869 | 310 | Membrane Filters, 0.8 micron |
| P567875 | 112, 166, 170, 176, 182, 190, 199, 204 | Filter Cartridge, W061/W350/HPK03/FPK04/HPK04/W621/W620/WS620, Synthetic |
| P567931 | 265 | Breather, T.R.A.P. TM , Mini |
| P567932 | 265 | Breather, T.R.A.P. TM , Mini |
| P567933 | 265 | Breather, T.R.A.P. TM , Mini |

| Part No. | Page No. | Product Description |
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| P567986 | 139, 171, 184, 210, 236 | Visual Electrical Indicator, AC/DC Hirshman receptacle, All HPK Series |
| P567987 | 139, 171, 184, 210, 236 | Visual Electrical Indicator, AC/DC Hirshman receptacle, All HPK Series |
| P567988 | 139, 171, 184, 210, 236 | Visual Indicator, all HPK Series |
| P567989 | 139, 171, 184, 210, 236 | Visual Indicator, all HPK Series |
| P568583 | 320 | Bulk Fluid, Head Assemblies, 1-1/2" SAE 4-Bolt |
| P568664 | 320 | Spin-on Filter, Bulk Fluid |
| P568665 | 320 | Spin-on Filter, Bulk Fluid |
| P568666 | 320 | Spin-on Filter, Bulk Fluid |
| P568720 | 176 | Head Assembly, FPK04, SAE-20 |
| P568721 | 176 | Head Assembly, FPK04, SAE-20 |
| P568722 | 176 | Housing, FPK04, 4" / 102mm Filters |
| P568723 | 176 | Housing, FPK04, 8" / 204 mm Filter |
| P568724 | 176 | Housing, FPK04, 13" / 330 mm Filters |
| P568790 | 278,322 | Bulk Fluid, Active Reservoir Vent™ |
| P568791 | 278,322 | ARV™, Active Reservoir Vent |
| P568848 | 108 | Housing for HNK05, 10.54/267.8 |
| P568850 | 108 | Filter Cartridge, HNK05, Synteq |
| P568851 | 108 | Filter Cartridge, HNK05, Synteq |
| P568852 | 108 | Filter Cartridge, HNK05, Synteq |
| P568853 | 108 | Filter Cartridge, HNK05, Synteq |
| P568856 | 108 | Head Assembly, HNK04, SAE-12 |
| P568857 | 108 | Head Assembly, HNK04, SAE-12 |
| P568858 | 108 | Head Assembly, HNK04, SAE-16 |
| P568859 | 108 | Head Assembly, HNK04, SAE-16 |
| P568860 | 108 | Head Assembly, SAE-20 |
| P568861 | 108 | Head Assembly, SAE-20 |
| P568932 | 321 | Bulk Fluid, Manifold Assembly, 4" Ansi 150 Flange |
| P568933 | 321 | Bulk Fluid, Manifold Assembly, 4" Ansi 150 Flange |
| P569203 | 108 | Spin-on filter, HNK04, Synteq |
| P569204 | 108 | Spin-on filter, HNK04, Synteq |
| P569205 | 108 | Spin-on filter, HNK04, Synteq |
| P569206 | 108 | Spin-on filter, HNK04, Synteq |
| P569209 | 108 | Spin-on filter, HNK05, Synteq |
| P569210 | 108 | Spin-on filter, HNK05, Synteq |
| P569211 | 108 | Spin-on filter, HNK05, Synteq |
| P569212 | 108 | Spin-on filter, HNK05, Synteq |
| P569273 | 78, 79 | Filter Cartridge Low Flow, FIK, Synteq |
| P569274 | 78, 79 | Filter Cartridge Low/High Flow, FIK, Synteq |
| P569275 | 78, 79 | Filter Cartridge Low Flow, FIK, Synteq |
| P569275 | 78, 79 | Filter Cartridge High Flow, FIK, Synteq |
| P569276 | 78, 79 | Filter Cartridge Low Flow, FIK, Synteq |

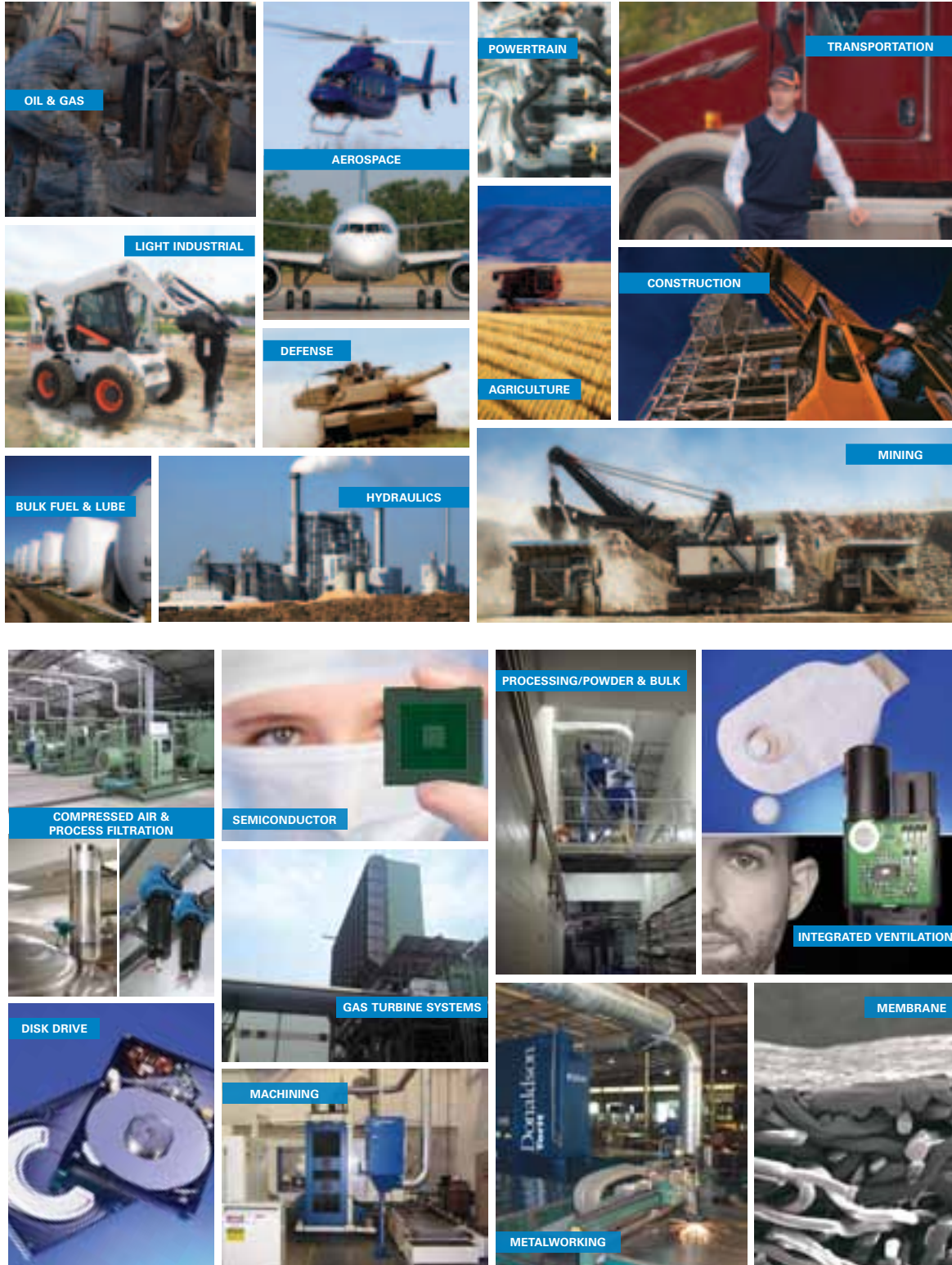
| Part No. | Page No. | Product Description |
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| P569277 | 78, 79 | Filter Cartridge High Flow, FIK, Synteq |
| P569278 | 78, 79 | Filter Cartridge High Flow, FIK, Synteq |
| P569279 | 78, 79 | Filter Cartridge High Flow, FIK, Synteq |
| P569280 | 78, 79 | Filter Cartridge High Flow, FIK, Synteq |
| P569527 | 70, 74, 86, 195 | Cartridge Filter, WL15/WL16/WO33/W451, Synthetic |
| P569528 | 112, 170, 177, 183 | Filter Cartridge, WO61/HPK03/FPK04/HPK04, WA |
| P569529 | 112, 177, 183 | Filter Cartridge, WO61/FPK04/HPK04 WA |
| P569531 | 90 | Filter Cartridge, HRK, Synthetic, WA |
| P569533 | 120, 124, 171 | Filter Cartridge, WO41/WO42/HPK03, WA |
| P569534 | 120, 124, 171 | Filter Cartridge, WO41/WO42/HPK03, WA |
| P569632 | 139, 171, 184, 210, 236 | Visual Indicator, all HPK Series |
| P569633 | 139, 171, 184, 210, 236 | Visual Indicator, all HPK Series |
| P569634 | 139, 171, 184, 210, 236 | Visual Electrical Indicator, AC/DC Hirshman receptacle, All HPK Series |
| P569635 | 139, 171, 184, 210, 236 | Visual Electrical Indicator, AC/DC Hirshman receptacle, All HPK Series |
| P569636 | 139, 171, 184, 210, 236 | Visual Electric Indicator, All HPK Series |
| P569637 | 139, 171, 184, 210, 236 | Visual Electric Indicator, All HPK Series |
| P569638 | 139, 171, 184, 210, 236 | Visual Electric Indicator, All HPK Series |
| P569639 | 139, 171, 184, 210, 236 | Visual Electric Indicator, All HPK Series |
| P569823 | 323 | Spin-on Filter, Bulk Fluid |
| P569824 | 323 | Spin-on Filter, Bulk Fluid |
| P569825 | 323 | Spin-on Filter, Bulk Fluid |
| P569826 | 323 | Spin-on Filter, Bulk Fluid |
| P569830 | 323 | Bulk Fluid, Head Assembly, SAE-16 O-Ring |
| P569831 | 323 | Bulk Fluid, Head Assembly, SAE-16 O-Ring |
| P569908 | 53 | Gasket, LPS05, L Shaped |
| P570248 | 320 | Spin-on Filter, Bulk Fluid |
| P570329 | 320 | Bulk Fluid, Head Assemblies, SAE-20 O-Ring |
| P570330 | 320 | Bulk Fluid, Head Assemblies, 1-1/14" NPT |
| P570353 | 263 | Breather, Threaded Adapter |
| P572298 | 134 | Filter Cartridge, W331, Synthetic |
| P572299 | 134 | Filter Cartridge, W331, Synthetic |

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| P572300 | 134 | Filter Cartridge, W331, Synthetic |
| P572301 | 134 | Filter Cartridge, W331, Synthetic |
| P572302 | 134 | Filter Cartridge, W331, Synthetic |
| P572303 | 144 | Filter Cartridge, W341, Synthetic |
| P572304 | 144 | Filter Cartridge, W341, Synthetic |
| P572305 | 144 | Filter Cartridge, W341, Synthetic |
| P572306 | 144 | Filter Cartridge, W341, Synthetic |
| P761056 | 155, 237 | Electrical Indicator, AC/DC |
| P762766 | 155 | Head Assembly, FPK02, SAE-12 O-Ring |
| P762767 | 155 | Head Assembly, FPK02, SAE-12 O-Ring |
| P762768 | 155 | Head Assembly, FPK02, SAE-12 O-Ring |
| P762769 | 155 | FPK02 Housing for 4" /102 mm filter |
| P762770 | 155 | FPK02 Housing for 8" /204 mm filter |
| P764183 | 83 | Filter Cartridge, FIK04, Suction, Wire Mesh 125µm |
| P764467 | 83 | Electrical Indicator, DC, NO, 36 psi/2.5 bar |
| P764612 | 83 | Visual Indicator, 36 psi/2.5 bar |
| P764613 | 83 | Electrical Indicator, DC, NC, 36 psi/2.5 bar |
| P765457 | 83 | Filter Cartridge, FIK04, Synteq 11µm |
| X009329 | 310 | Portable Fluid Analysis Kit |
| X009330 | 301 | Fluid Analysis Service |
| X011297 | 303 | Off-Line Filtration, Filter Cart, Low Viscosity Fluids |
| X011298 | 303 | Off-Line Filtration, Filter Cart, High Viscosity Fluids |
| X011299 | 307 | Off Line Filtration, Filter Panel, Low Viscosity Fluids |
| X011300 | 307 | Off Line Filtration, Filter Panel, Low Viscosity Fluids |
| X011301 | 307 | Off Line Filtration, Filter Panel, Low Viscosity Fluids |
| X011302 | 307 | Off Line Filtration, Filter Panel, High Viscosity Fluids |
| X011303 | 305 | Off-Line Filtration, Filter Buddy, Low Viscosity Fluids |
| X011304 | 305 | Off-Line Filtration, Filter Buddy, High Viscosity Fluids |
| X920006 | 322 | Bulk Fluid, T.R.A.P.™ Breather |

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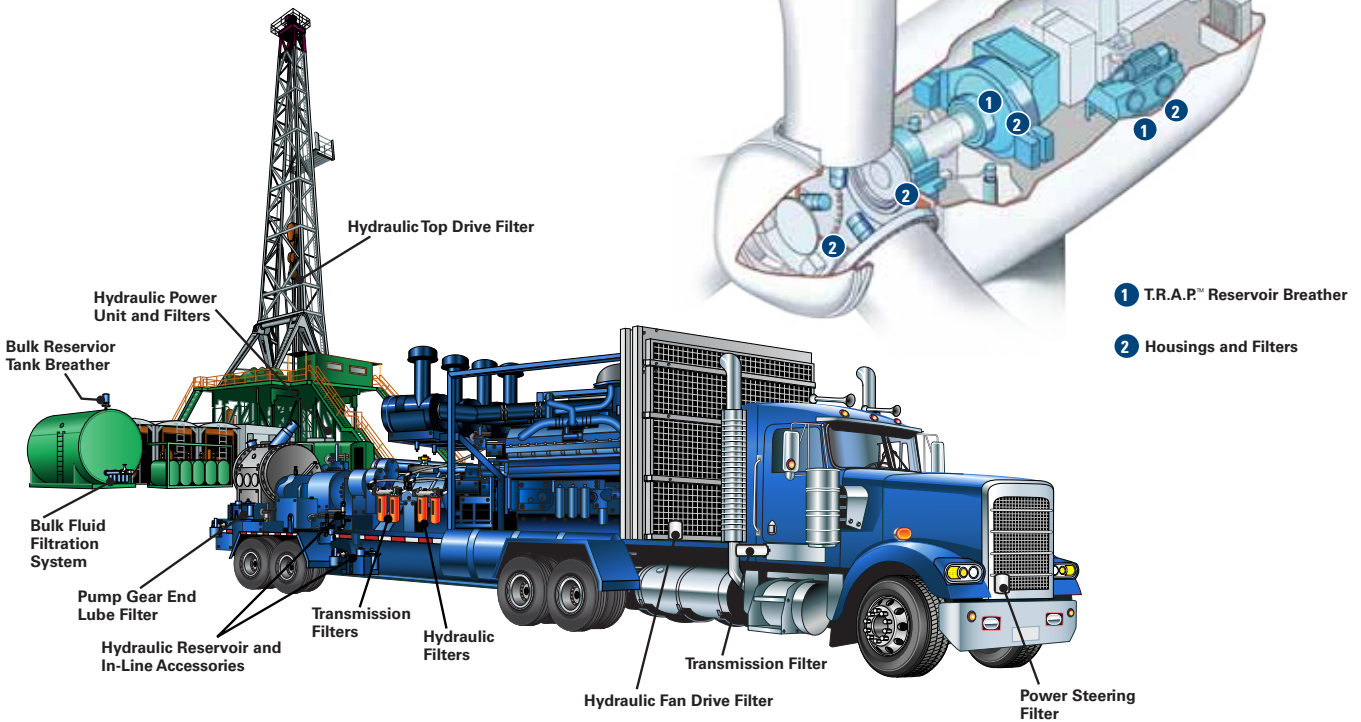
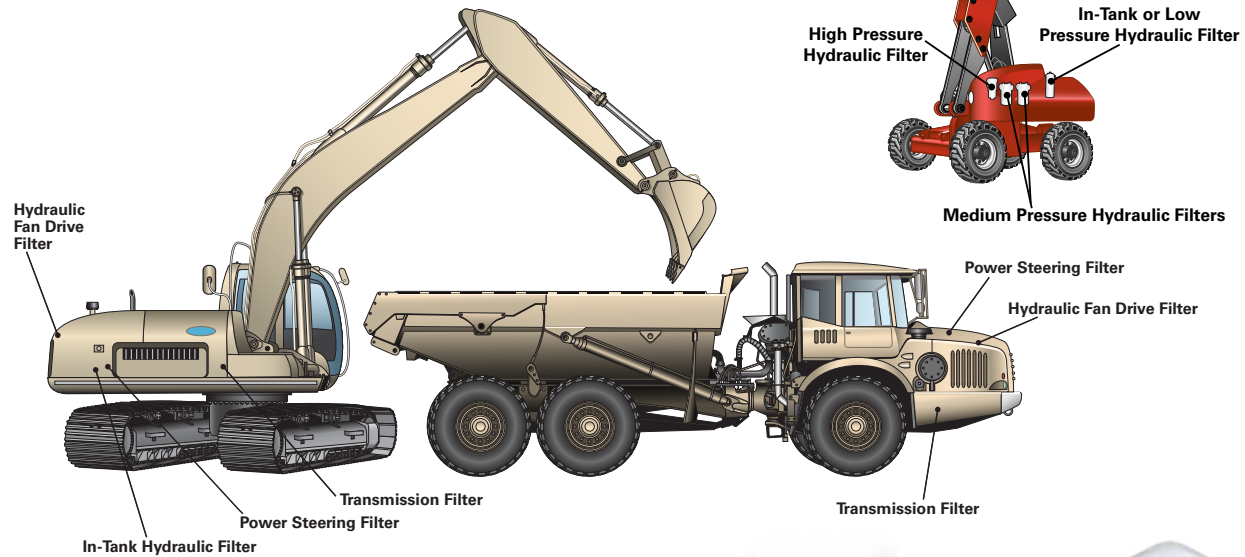
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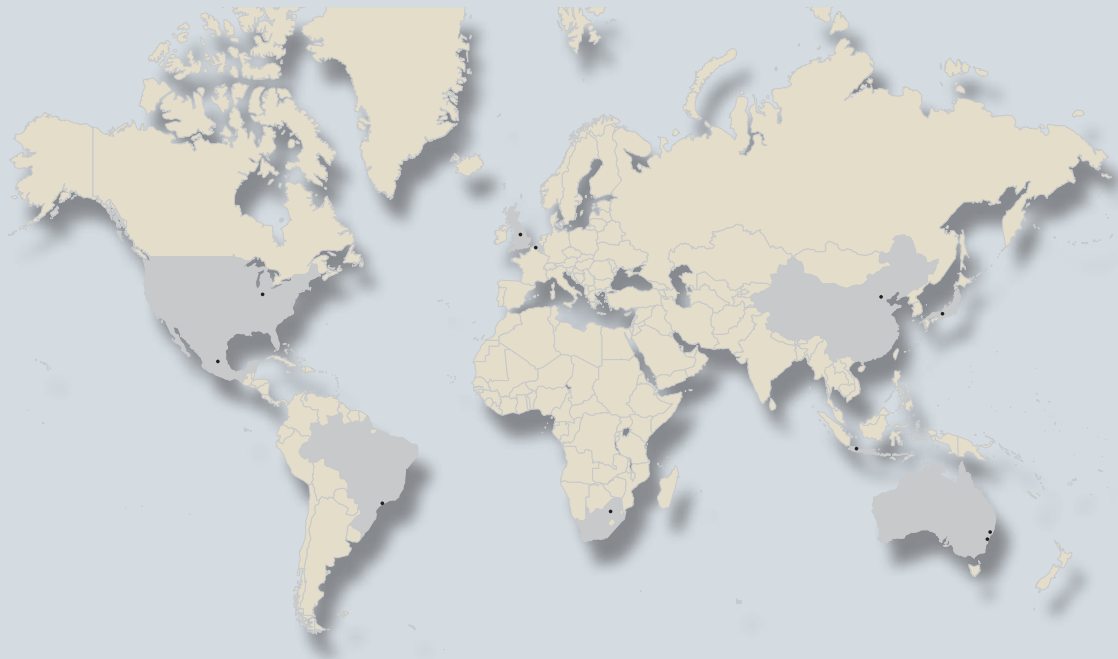
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