

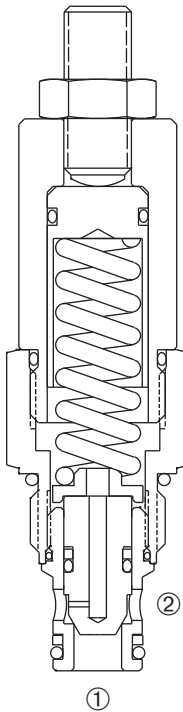
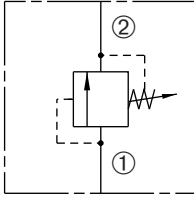
DRV2-080

Adjustable,
Direct-Acting Relief Valve



SERIES 8

USASI / ISO



DESCRIPTION

An adjustable, direct-acting poppet cartridge valve designed to limit pressure in hydraulic circuits.

OPERATION

The DRV2-080 prevents flow from ① to ② until the set crack pressure at ① is achieved. The poppet then unseats allowing flow from ① to ② protecting the circuit from over pressurization.

FEATURES and BENEFITS

- Quiet operation.
- Rapid response to pressure surges.
- Hardened poppet and seat for long life.
- Aluminum knob and disc nut option.
- Adjustment may be locked in place.
- Adjustment prevents spring from going solid.
- Industry common cavity.
- Compact size.

SPECIFICATIONS

Operating Pressure: 3000 PSI (207 Bar)

Flow: See PRESSURE DROP VS. FLOW graph.

Internal Leakage: 20 drops/min. max. at reseal.

Crack Pressure Defined: Determined at .25 gpm (0.9 L/min.)

Reseat Pressure: Nominal 80% of crack pressure.

Spring Ranges: 100 to 400 PSI (7 to 28 Bar)

Preset: 300 PSI (21 Bar)

300 to 2000 PSI (21 to 138 Bar)

Preset: 1500 PSI (103 Bar)

1500 to 3000 PSI (103 to 207 Bar)

Preset: 2500 PSI (172 Bar)

Temperature: -30°F to +250°F (-35°C to +120°C).

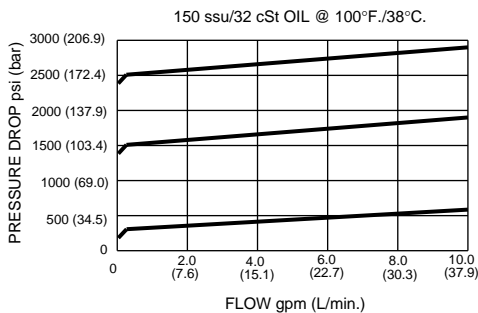
Recommended Filtration: ISO 20/18/14

Fluids: Mineral-based fluids. For other fluid compatibility, consult factory.

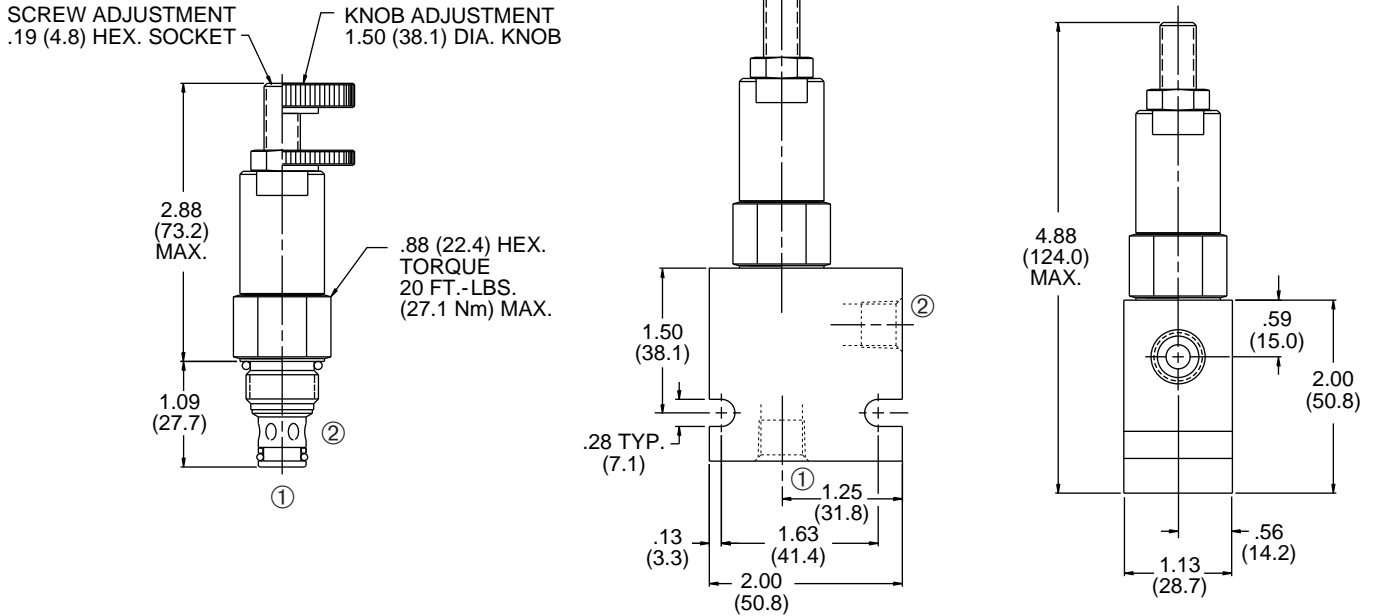
Cavity/Cavity Tool: 080-2, see page 11.08.2

Body Material: Anodized 6061T6 aluminum alloy rated at 3000 PSI (207 Bar).

PRESSURE DROP VS. FLOW

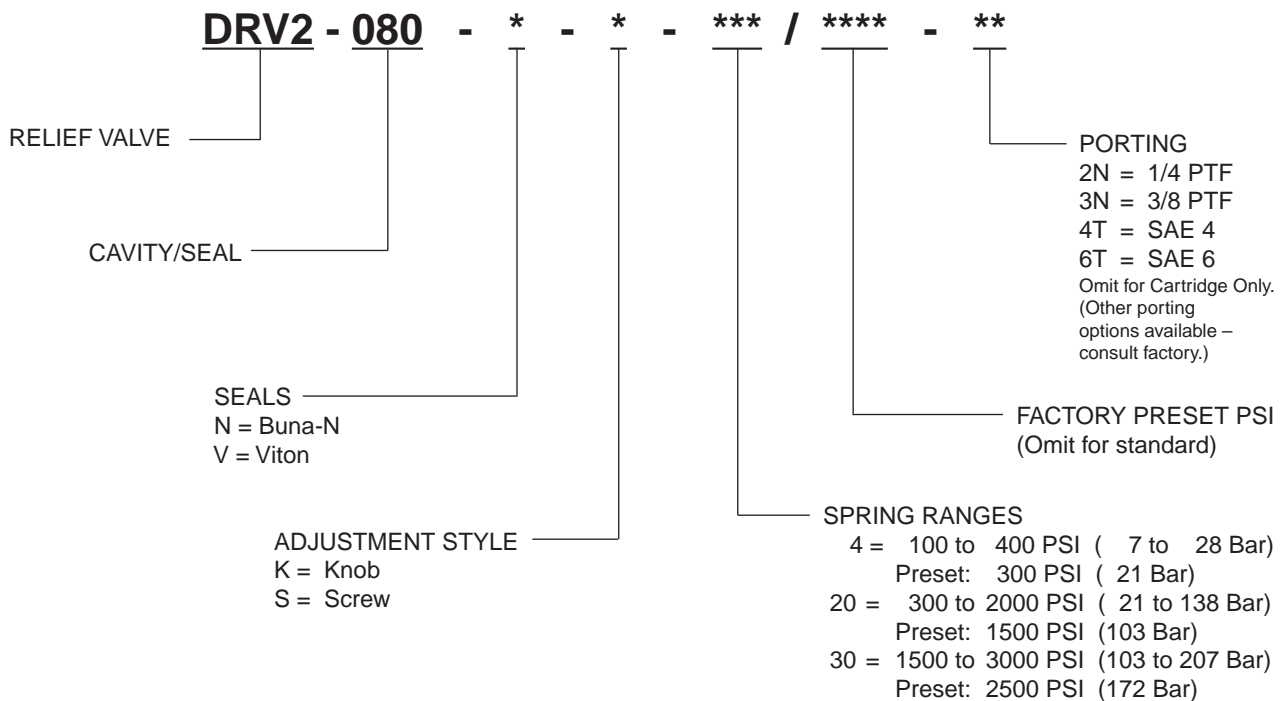


INSTALLATION DIMENSIONS



() Parentheses = Millimeters

HOW TO ORDER

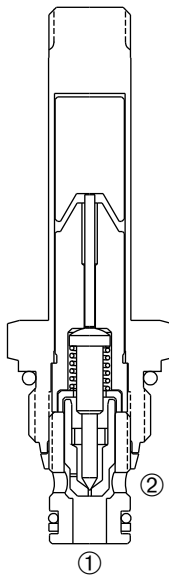
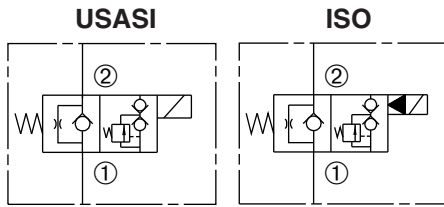


DSV2-080-2NOP

Normally-Open, Two-Way, Two-Position,
Poppet-Type Solenoid Valve



SERIES 8



DESCRIPTION

A cartridge valve designed with positive shut off to be used in load holding applications.

OPERATION

When de-energized, the DSV2-080-2NOP poppet is open to allow flow from ② to ①.

When energized, the poppet closes to block flow from ② to ①. In this condition, the cartridge allows reverse flow from ① to ② after overcoming the solenoid force of 75 PSI (5 Bar).

FEATURES and BENEFITS

- Continuous-duty solenoid.
- Hardened poppet and plunger for long life and low leakage.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Optional coil voltages and terminations.
- Filter screen standard.
- Industry common cavity.
- Compact size.

SPECIFICATIONS

Operating Pressure: 3000 PSI (207 Bar)

Flow: See PRESSURE DROP VS. FLOW graph.

Internal Leakage: 5 drops/min. max. at 3000 PSI (207 Bar)

Temperature: -30° F to +250° F (-35°C to +120° C)

Coil Rating: Continuous from 85% to 110% of rated voltage.

Current Draw: 12 VDC is 1.3 amps.

Minimum Pull-In Voltage: 85% of rated voltage at 3000 PSI (207 Bar)

Response Time: 80% of final change of state with 100% voltage supplied at 100% of nominal flow rating.

Pull-In: 12 VDC 25 m. sec. **Drop-Out:** 12 VDC 30 m. sec.

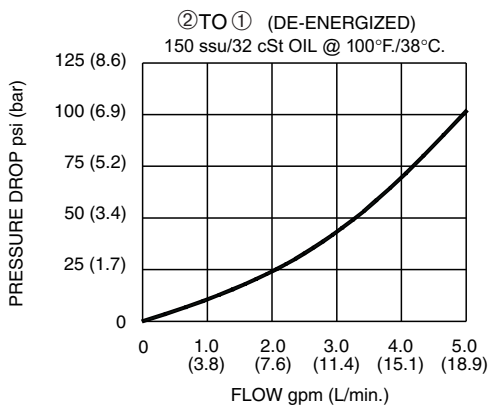
Recommended Filtration: Critical Application-ISO 17/15/13
Non-Critical Application-ISO 20/18/14

Fluids: Mineral-based fluids. For other fluid compatibility consult factory.

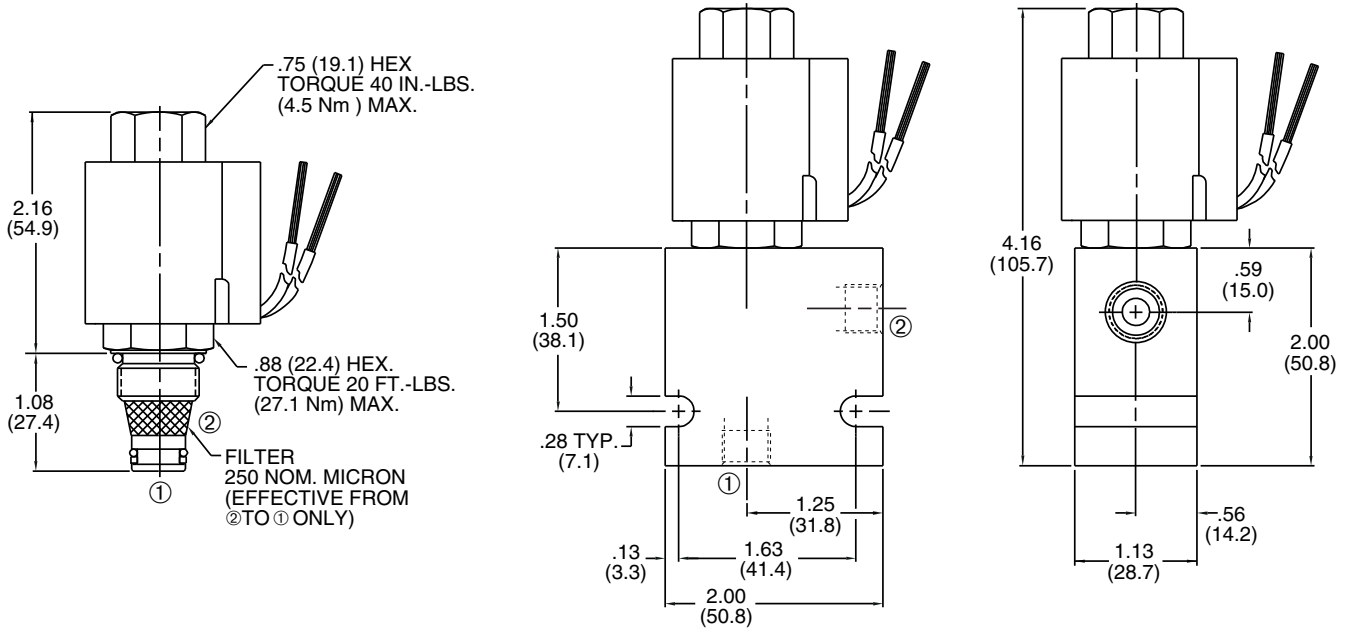
Cavity/Cavity Tool: 080-2, see page 11.08.2

Body Material: Anodized 6061T6 aluminum alloy rated at 3000 PSI (207 Bar).

PRESSURE DROP VS. FLOW



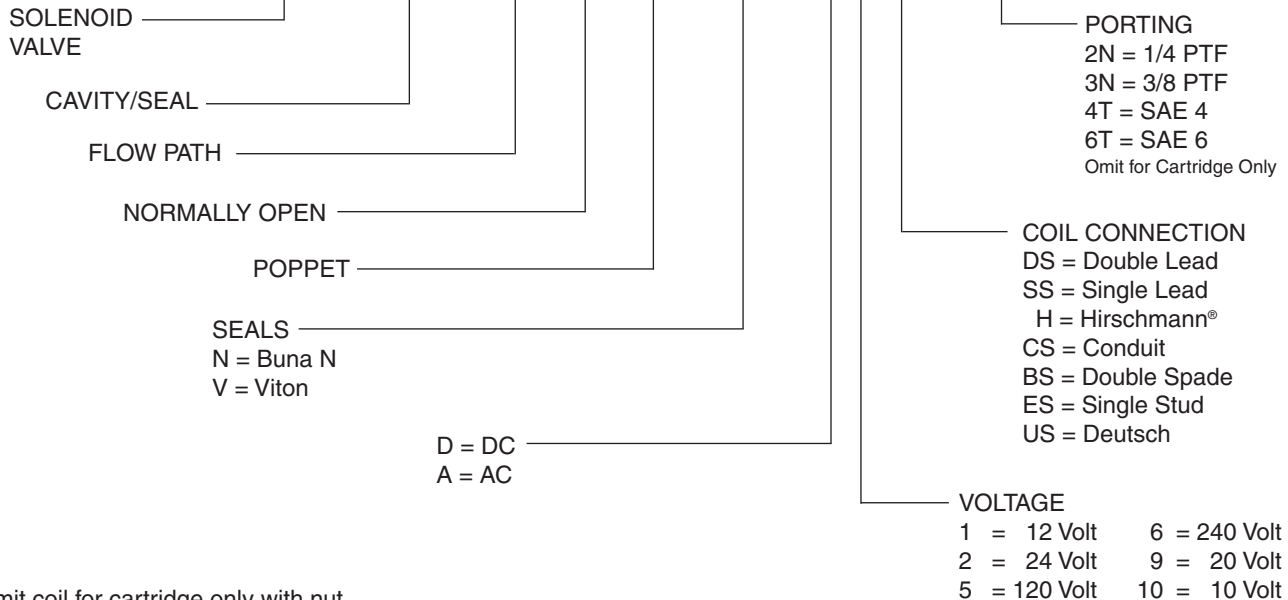
INSTALLATION DIMENSIONS



() Parentheses = Millimeters

HOW TO ORDER

DSV2 - 080 - 2 NO P - * - * * * - **



Omit coil for cartridge only with nut.
 Other porting and coil options available – consult factory.

Easy Read

FLOW CONTROL, NEEDLE and CHECK VALVES

- Metal Setting Knob and Stem
- Color Coding and Numerical Readout Allow Positive Setting for Precise Flow Control and Repeatability
- Can Be Accurately Adjusted Within a Small Fraction of a Turn (One Full Turn per Color)
- Available in Six Sizes: 1/8", 1/4", 3/8", 1/2", 3/4" and 1"
- Manufactured in Three Materials: Brass, Carbon Steel and Stainless Steel (Except 1" Which Is Naval Bronze, Ductile Iron)

Deltrol's unique line of Easy Read Flow and Needle Valves incorporate a metal setting knob and stem for added durability and positive operation. Color coding on stem allows you to precisely set flow requirements by simply turning knob to the appropriate marking.

Flow Control Valves provide controlled flow in one direction, free flow in opposite direction. Flow adjustment can be made under pressure. Setting knob can be locked in any desired position with convenient set screw. Easy Read Check Valves operate on slight differential pressure; full flow is permitted in the direction of the arrow, positive check in the opposite direction.

Recommended flow rates range for Flow and Check Valves from 3.0 GPM (11.4 L/min) to 55 GPM (208.2 L/min); 4.5 GPM (17 L/min) to 100 GPM (378.5 L/min) for Needle versions. These tough valves are ideal for general industrial and mobile applications including plastic injection molding machines, packaging equipment, machine tools, car washes, hospital beds, and many types of automotive equipment.

ORDERING INFORMATION

NPTF THREAD

SIZE	FLOW CONTROL VALVES			NEEDLE VALVES			CHECK VALVES			
	Brass	Carbon Steel	Stainless Steel	Brass	Carbon Steel	Stainless Steel	Brass	Carbon Steel	Stainless Steel	Crack Press. PSI
1/8"	EF10B	EF10S	EF10SS	EN10B	EN10S	—	EC10B	—	—	1 to 2.5
1/4"	EF20B	EF20S	EF20SS	EN20B	EN20S	EN20SS	EC20B	EC20S	EC20SS	1 to 2.5
3/8"	EF25B	EF25S	EF25SS	EN25B	EN25S	—	EDC25B	EDC25S	EDC25SS	1 to 2.5
1/2"	EF30B	EF30S	EF30SS	EN30B	EN30S	—	EDC30B	EDC30S	EDC30SS	1 to 2.5
3/4"	EF35B	EF35S	—	EN35B	EN35S	—	EDC35B	EDC35S	EDC35SS	1 to 2.5
1"	EF40B	EF40S	—	EN40B	EN40S	—	EC40B	EC40S	—	3 to 5 poppet type

ISO 7/1 - RS* — BSP TAPER THREAD

Size	Flow Control Valves		Needle Valves		Check Valves
	Brass	Steel	Brass	Steel	Steel
1/8"	EFB10B	EFB10S	ENB10B	ENB10S	—
1/4"	EFB20B	EFB20S	ENB20B	ENB20S	ECB20S
3/8"	EFB25B	EFB25S	ENB25B	ENB25S	ECB25S
1/2"	EFB30B	EFB30S	ENB30B	ENB30S	ECB30S
3/4"	EFB35B	EFB35S	ENB35B	ENB35S	ECB35S

ISO 7/1 - RP* — BSP PARALLEL THREAD

Size	Flow Control Valves		Needle Valves		Check Valves
	Brass	Steel	Brass	Steel	Steel
1/8"	EFBP10B	EFBP10S	—	ENBP10S	—
1/4"	EFBP20B	EFBP20S	ENBP20B	ENBP20S	ECBP20S
3/8"	EFBP25B	EFBP25S	ENBP25B	ENBP25S	ECBP25S
1/2"	EFBP30B	EFBP30S	—	ENBP30S	ECBP30S
3/4"	—	EFBP35S	—	ENBP35S	—

* Agrees with BS21:1995 and JIS B0203

SAE THREAD

SAE- 6	EFM620S
SAE- 8	EFM825S
SAE-10	EFM1030S
SAE-12	EFM1235S



ORDERING INFORMATION

MODEL THREAD SIZE MATERIAL
EF - M - 35 - S

EF = Easy Read Flow Control Valve
EN = Easy Read Needle Valve
EC, EDC = Easy Read Check Valve

— = NPTF
B = BSPT
M = SAE
BP = BSBP

10 = 1/8"
20 = 1/4"
25 = 3/8"
30 = 1/2"
35 = 3/4"
40 = 1"

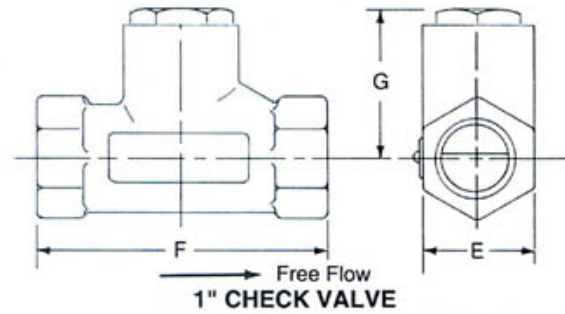
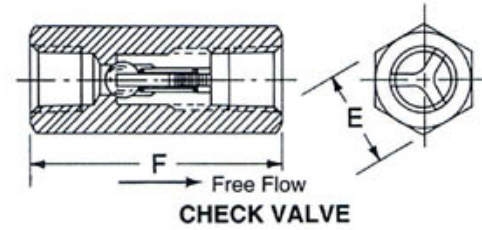
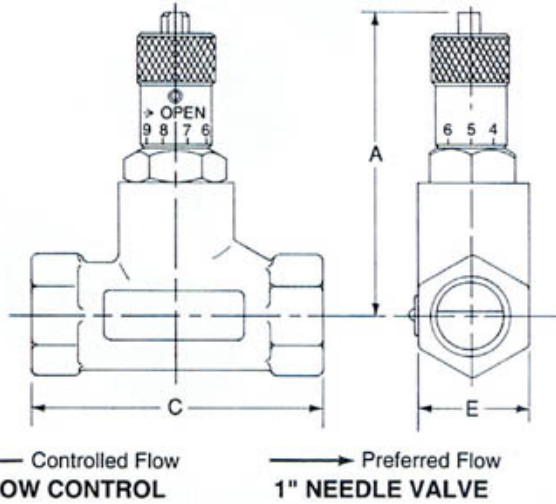
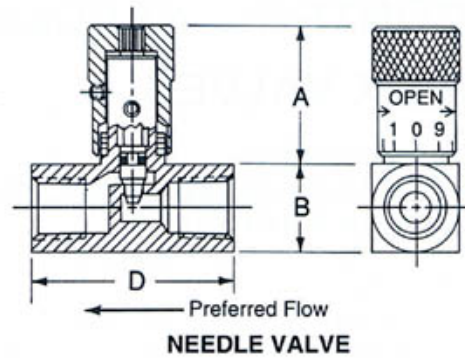
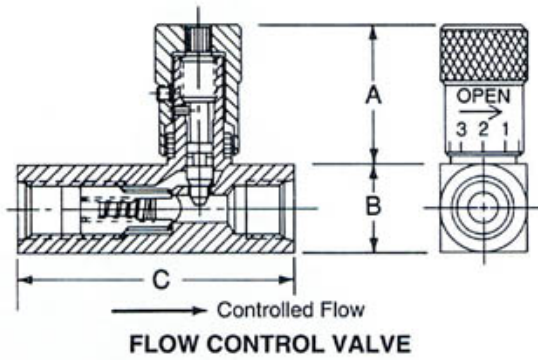
B = Brass
(1" - Naval Bronze)
S = Carbon Steel
(1" - Ductile Iron)
SS = Stainless Steel

Examples:

To order 3/8" Brass Easy Read Flow Control Valves with standard threads, specify EF25B.

To order 3/8" Brass Easy Read Flow Control Valves with SAE-8 threads, specify EFM 825S.

DIMENSIONS



SIZE	A Open	A Closed	B Square	B Square SAE	C	C SAE	D	E HEX	F	G
1/8"	1-9/32 (32.6)	1-1/16 (27.0)	5/8 (15.90)	—	1-15/16 (49.3)	—	1-7/16 (36.6)	5/8 (15.9)	1-11/16 (42.9)	—
1/4"	1-13/32 (35.8)	1-7/32 (31.0)	3/4 (19.1)	7/8 (22.3)	2-13/32 (61.2)	2-9/16 (65.1)	1-3/4 (44.5)	3/4 (19.1)	2 (50.8)	—
3/8"	1-5/8 (41.3)	1-3/8 (35.0)	1 (25.4)	1-1/8 (28.6)	2-7/8 (73.1)	3-1/4 (82.6)	2-1/16 (52.4)	1 (25.4)	2-1/2 (63.5)	—
1/2"	1-31/32 (50.0)	1-5/8 (41.3)	1-1/8 (28.6)	1-1/4 (31.8)	3-7/16 (87.4)	3-9/16 (90.5)	2-1/2 (63.5)	1-1/8 (28.6)	2-7/8 (73.1)	—
3/4"	2-3/16 (55.6)	1-13/16 (46.1)	1-3/8 (35.0)	1-1/2 (38.1)	3-3/4 (95.3)	4-1/8 (104.8)	2-3/4 (69.9)	1-3/8 (35.0)	3-1/4 (82.6)	—
1"	5-1/16 (128.6)	4-11/16 (119.1)	—	—	4-1/2 (114.3)	—	4-1/2 (114.3)	1-3/4 (44.5)	4-1/2 (114.3)	2-13/32 (61.2)

SPECIFICATIONS

Maximum Operating Pressure (Non-Shock Service)

Brass – 2,000 PSI (138 bar), Carbon Steel – 5,000 PSI (345 bar), Stainless Steel – 5,000 PSI (345 bar), Ductile Iron – 5,000 PSI (345 bar).

Minimum Burst Pressure

Brass – 8,000 PSI (551 bar), Carbon Steel – 20,000 PSI (1380 bar), Stainless Steel – 20,000 PSI (1380 bar), Ductile Iron – 20,000 PSI (1380 bar).

Operating Temperature Range ("O"-Ring)

Viton = -15° to +400°F (-26° to 204°C)
Max. Operating Temp for Flow and Check – +200°F (+93°C)

Threads

NPTF, BSPT, SAE, BSPP

Materials

Body – Brass, Carbon Steel, Stainless Steel
(Except 1" Body – Naval Bronze, Ductile Iron)

Needle – Stainless Steel on Steel and Stainless Steel
Flow and Needle Valves

Needle – Brass on Brass Flow and Needle Valves

O-Ring – Viton, Standard; Other Materials Available
(Contact Factory)

Washer Seal – Teflon

Retainer – Stainless Steel

Spring – Stainless Steel

Ball Follower – Delrin

Ball – Stainless Steel

Knob – Aluminum

() Parentheses = Millimeters

FLOW CURVES

FLOW RATING

PRESSURE DROP VS. NUMBER TURNS OPEN
(Controlled Flow)

TEST MEDIUM
150 SSU Oil @ 140° F.

FOR LIQUID

$$\text{FLOW IN GPM} = \frac{C_v \sqrt{(P_1 - P_2)}}{\sqrt{G_f}}$$

FOR GAS

$$Q(\text{scfh}) = \frac{42.2 C_v \sqrt{(P_1 - P_2) (P_1 + P_2)}}{\sqrt{G_f}}$$

When P_2 is less than $\frac{P_1}{2}$

the Expression $\sqrt{(P_1 - P_2) (P_1 + P_2)}$
becomes $0.87P_1$.

C_v = flow coefficient
 Q = std. cubic feet per hour at 14.7 PSIA and 60° F.
 P_1 = inlet pressure (PSIA)
 P_2 = outlet pressure (PSIA)
 G_f = specific gravity of media at operating temperature (air = 1.0)

Pressures are absolute pressures.

FLOW CONTROL CO-EFFICIENT (Cv FACTOR) (Fully Open- Controlled)	NEEDLE CO-EFFICIENT (Cv FACTOR) (Fully Open- Controlled)	CHECK FLOW CO-EFFICIENT (Cv FACTOR) (Return Flow)
1/8 — .275	1/8 — .254	1/8 — .750
1/4 — .525	1/4 — .506	1/4 — 1.470
3/8 — .756	3/8 — .917	3/8 — 3.300
1/2 — .927	1/2 — 1.200	1/2 — 3.600
3/4 — 1.430	3/4 — 1.840	3/4 — 5.410
1 — 8.000	1 — 9.600	1 — 9.600

MAX. RECOMMENDED FLOW GPM (L/min)

SIZE	Flow & Check	Needle Valves
1/8"	3.0 (11.4)	4.5 (17.1)
1/4"	6.0 (22.8)	10.0 (37.9)
3/8"	10.0 (37.9)	18.0 (68.2)
1/2"	12.0 (45.5)	28.0 (106)
3/4"	20.0 (75.7)	40.0 (151.4)
1"	55.0 (208.2)	100.0 (378.5)

() Parentheses = L/min

HOW TO ADJUST

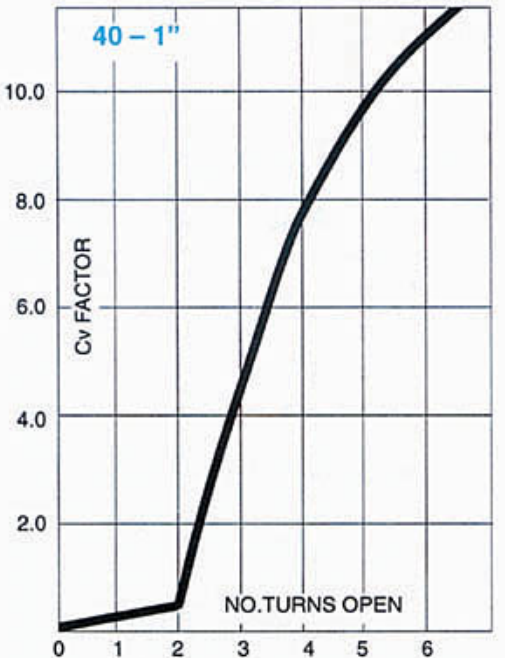
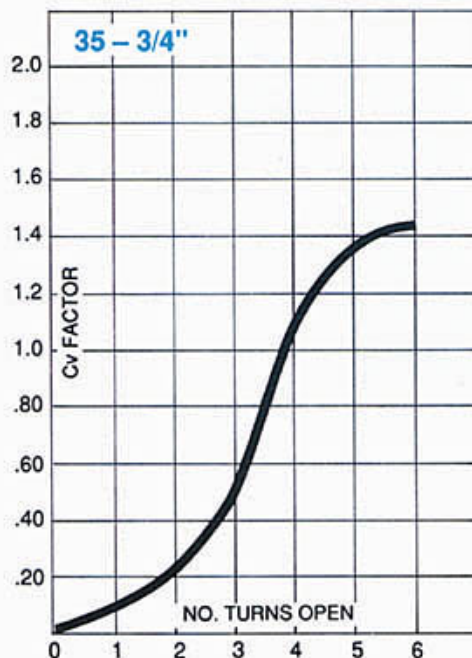
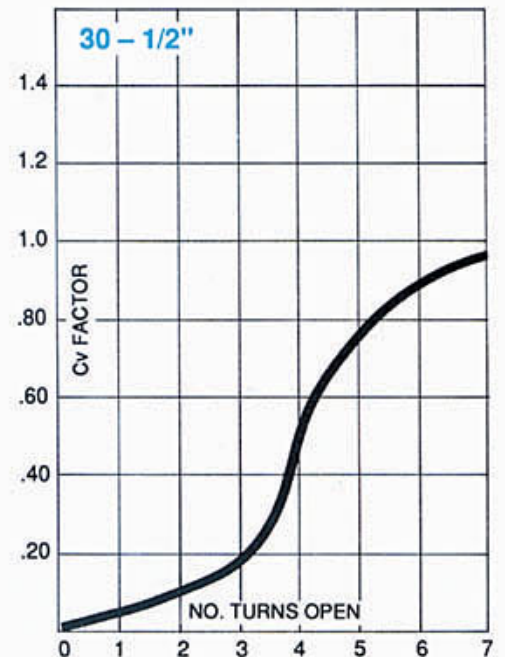
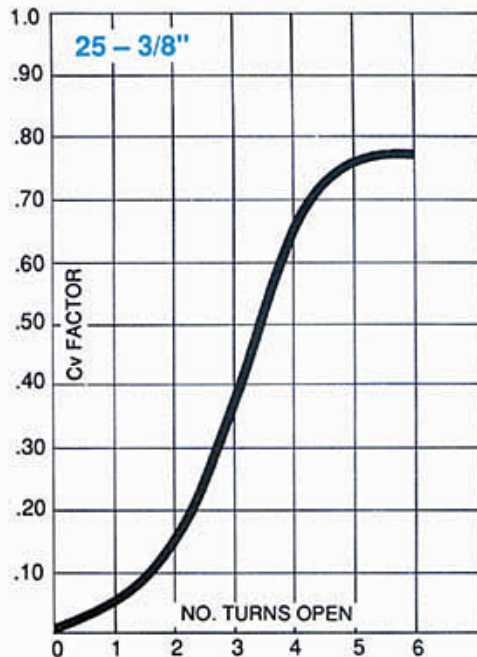
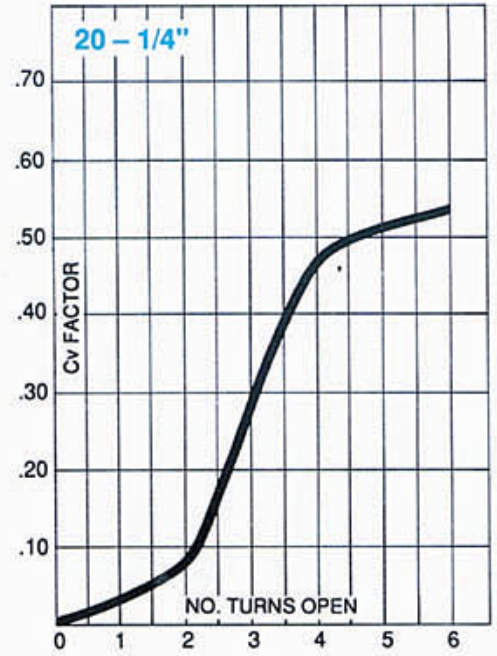
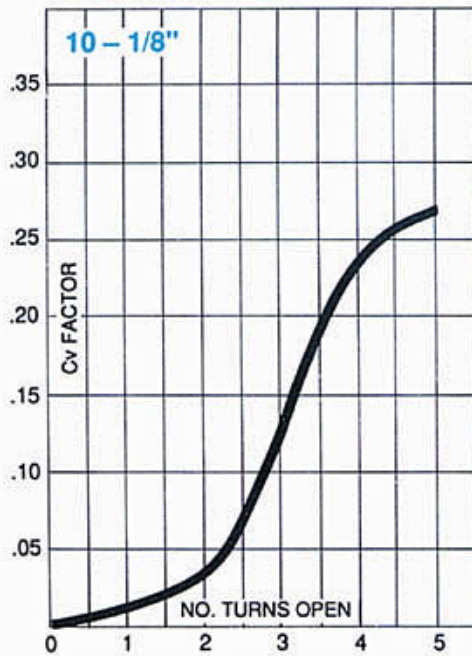
From the closed position, open the valve by turning metal knob counter-clockwise until the desired flow volume is obtained.

The colored band on the stem and the numerical readout indicate to what extent the valve is opened or closed. Each color on the color band represents one full turn.

Find the scribe mark on the upper surface of the valve body. The number on the knob in proximity to the scribe mark will indicate 10ths of a turn the valve is opened.

Record the information for future reference.

Note: Curves shown are graphical representations of Flow and Needle Valve meterability. Do not use as engineering data.





FLOW CONTROL VALVES



NEEDLE VALVES



CHECK VALVES

SPECIFICATIONS

Maximum Operating Pressure (Non-Shock Service)

Brass – 2,000 PSI (138 Bar)
Carbon Steel – 5,000 PSI (345 Bar)
Stainless Steel – 5,000 PSI (345 Bar)

Operating Temperature Range (O-Ring Packing)

Viton: -15° to +400° F (-26° to 203°C)

Threads

NPTF Standard, 1/8", 1/4", 3/8" 1/2", and 3/4". SAE Threads on special order.

Materials

Housing, Plug, Body – Hexagon Brass, Hexagon Carbon Steel, Hexagon 303 Stainless Steel
Needle – 416 Stainless Steel on Steel and Stainless Steel Valves
Needle – Brass on Brass Valves
Back-up Washer – Teflon
Knob – Aluminum
Tamperproof Key – Cadmium Plated Steel
Ball – Stainless Steel
Retainer – Stainless Steel
Poppet – Brass or Stainless Steel with Viton (Standard) O-Ring

Pneu-Trol®

FLOW CONTROL, NEEDLE AND CHECK VALVES

- Optional Bubble-Tight Check Valve Available

FLOW CONTROL

A spring biased ball or optional poppet check provides full flow in one direction; a stainless steel, tapered needle provides a wide range of adjustment of flow in the controlled direction. A locknut prevents unwanted changes in adjustment. A tamperproof adjustment key is standard; a knurled knob is optional at slight extra cost.

NEEDLE

A wide range of flow adjustment is possible because of the fine thread, tapered needle. Unwanted changes in adjustment are prevented by a locknut. A tamperproof adjustment key is standard; a knurled knob is available at slight extra cost.

CHECK

A slight pressure differential fully opens or closes the ball or poppet check valve. This valve is available with either ball check or bubble-tight poppet check.

FLOW RATE CHART

Cv FACTORS

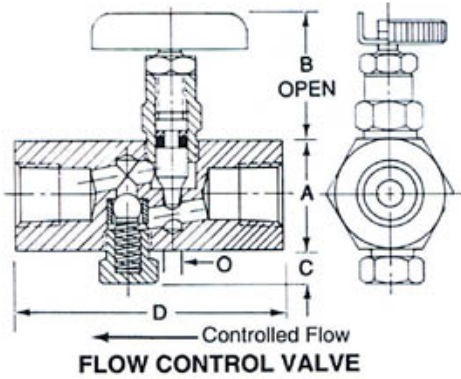
Size	Cv Max. Open Needle	Cv Flow Check
1/8"	.20	.23
1/4"	.43	.54
3/8"	.78	.83
1/2"	1.24	1.47
3/4"	1.93	1.90

MAX. RECOMMENDED FLOW GPM (L/min)

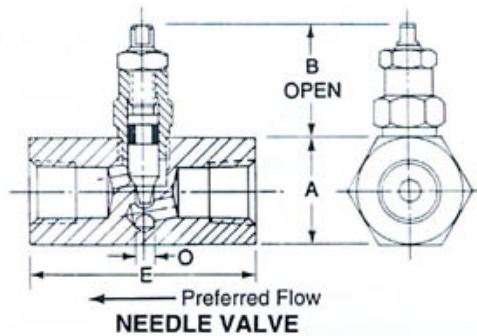
Size	Flow & Check Valves	Needle Valves
1/8"	1.5 (5.7)	3.2 (12.2)
1/4"	3.0 (11.4)	7.0 (26.5)
3/8"	5.0 (19)	13.5 (51.1)
1/2"	8.0 (30.3)	22.5 (85.2)
3/4"	12.0 (45.5)	34.0 (128.7)

() Parentheses = L/min

DIMENSIONS

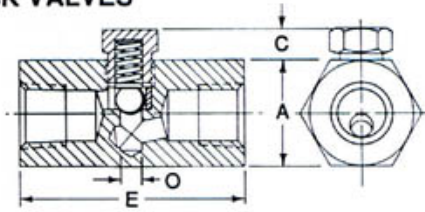


FLOW CONTROL VALVE



NEEDLE VALVE

CHECK VALVES



CHECK VALVE

PIPE SIZE	A HEX	B	C	D	E	O
1/8"	11/16 (17.5)	7/8 (22.3)	13/64 (5.2)	1-3/4 (44.5)	1-15/32 (37.4)	.107 (2.8)
1/4"	7/8 (22.3)	1 (25.4)	23/64 (9.2)	2-3/8 (60.4)	2 (50.8)	.156 (4.0)
3/8"	1-1/16 (27.0)	1-13/16 (46.1)	11/32 (8.8)	2-3/4 (69.9)	2-1/4 (57.2)	.219 (5.6)
1/2"	1-5/16 (33.4)	1-7/16 (36.6)	15/32 (12.0)	3-3/16 (81.0)	2-21/32 (67.5)	.281 (7.2)
3/4"	1-5/8 (41.3)	1-5/8 (41.3)	17/32 (13.5)	3-9/16 (90.5)	2-15/16 (74.7)	.343 (8.8)

() Parentheses = Millimeters.

ORDERING INFORMATION

Size	FLOW CONTROL VALVES			NEEDLE VALVES			CHECK VALVES			
	Brass	Carbon Steel	Stainless Steel	Brass	Carbon Steel	Stainless Steel	Brass	Carbon Steel	Stainless Steel	Crack Press PSI (Bar)++
1/8"	FP10BK F10B F10BK	F10S F10SK	— F10SSK	N10B N10BK	N10S N10SK	— N10SSK	C10B CP10B	C10S —	C10SS CP10SS	1 to 2.5++ (.07 to 17)
1/4"	FP20BK F20B F20BK	F20S F20SK	— F20SSK	N20B N20BK	N20S N20SK	— N20SSK	C20B CP20B	C20S —	C20SS CP20SS	1 to 2.5++ (.07 to 17)
3/8"	FP25BK F25B F25BK	F25S F25SK	— F25SSK	N25B N25BK	N25S N25SK	— N25SSK	C25B CP25B	C25S —	C25SS —	1 to 2.5++ (.07 to 17)
1/2"	F30B F30BK	F30S F30SK	— F30SSK	N30B N30BK	N30S N30SK	— N30SSK	C30B CP30B	C30S —	C30SS —	1 to 2.5++ (.07 to 17)
3/4"	F35B —	— F35SK	— —	N35B N35BK	— N35SK	— —	C35B —	C35S —	— —	1 to 2.5++ (.07 to 17)

ISO 7/1 - RS* — BSP TAPER THREAD

Size	Flow Control Valves		Needle Valves	
	Brass	Steel	Brass	Steel
1/8"	FB10BK	FB10SK	NB10BK	NB10SK
1/4"	FB20BK	FB20SK	NB20BK	NB20SK
3/8"	FB25BK	FB25SK	NB25BK	NB25SK
1/2"	—	FB30SK	—	NB30SK
3/4"	—	FB35SK	—	NB35SK

* Agrees with BS21:1995 and JIS B0203.

SAE THREAD

Size	FC Valves		Needle	Check
	Steel	Brass	Steel	Steel
SAE-4	—	—	NM425SK	—
SAE-6	FM620S	—	—	—
SAE-6	FM620SK	FM620BK	NM620SK	—
SAE-6	—	FM625BK	—	—
SAE-8	—	—	NM830SK	—
SAE-12	—	—	NM1235SK	—

ORDERING INFORMATION

SERIES THREAD SIZE MATERIAL KNOB

F B 10 B K

F = Flow Control
N = Needle
C = Ball Check
CP = Poppet Check
FP = Poppet Flow Control

— = NPTF
B = BSPT
M = SAE
BP = BSBP

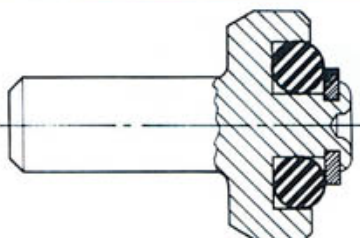
10 = 1/8"
20 = 1/4"
25 = 3/8"
30 = 1/2"
35 = 3/4"

B = Brass
S = Carbon
SS = Stainless Steel

Example:

For 1/4" brass flow control valves with knob, specify F20BK.

++Soft seat check valves if left seated for a period of time, will have the rubber adhere to the metal it is in contact with. This results in an initial high crack point due to sticking. The degree depends on many things (time seated, pressure, etc.).



Flow Control and Check Valve

Optional bubble-tight poppet check available in 1/8", 1/4", 3/8" and 1/2". (For application requiring 60 PSI (4 bar) or more, consult factory.)



FLOW CONTROL VALVES



NEEDLE VALVES



CHECK VALVES

SPECIFICATIONS

Maximum Operating Pressure (Non-Shock Service)

Brass – 2,000 PSI (138 Bar)
Carbon Steel – 5,000 PSI (345 Bar)
Stainless Steel – 5,000 PSI (345 Bar)

Operating Temperature Range (O-Ring Packing)

Viton: -15° to +400° F (-26° to 203°C)

Threads

NPTF Standard, 1/8", 1/4", 3/8" 1/2", and 3/4". SAE Threads on special order.

Materials

Housing, Plug, Body – Hexagon Brass, Hexagon Carbon Steel, Hexagon 303 Stainless Steel
Needle – 416 Stainless Steel on Steel and Stainless Steel Valves
Needle – Brass on Brass Valves
Back-up Washer – Teflon
Knob – Aluminum
Tamperproof Key – Cadmium Plated Steel
Ball – Stainless Steel
Retainer – Stainless Steel
Poppet – Brass or Stainless Steel with Viton (Standard) O-Ring

Pneu-Trol®

FLOW CONTROL, NEEDLE AND CHECK VALVES

- Optional Bubble-Tight Check Valve Available

FLOW CONTROL

A spring biased ball or optional poppet check provides full flow in one direction; a stainless steel, tapered needle provides a wide range of adjustment of flow in the controlled direction. A locknut prevents unwanted changes in adjustment. A tamperproof adjustment key is standard; a knurled knob is optional at slight extra cost.

NEEDLE

A wide range of flow adjustment is possible because of the fine thread, tapered needle. Unwanted changes in adjustment are prevented by a locknut. A tamperproof adjustment key is standard; a knurled knob is available at slight extra cost.

CHECK

A slight pressure differential fully opens or closes the ball or poppet check valve. This valve is available with either ball check or bubble-tight poppet check.

FLOW RATE CHART

Cv FACTORS

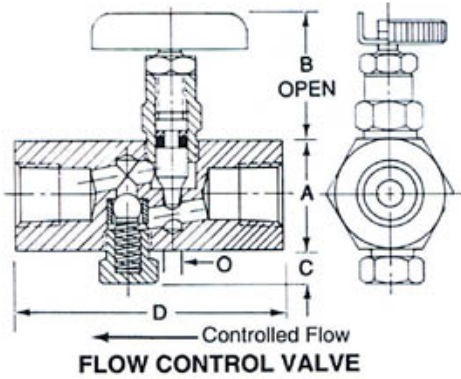
Size	Cv Max. Open Needle	Cv Flow Check
1/8"	.20	.23
1/4"	.43	.54
3/8"	.78	.83
1/2"	1.24	1.47
3/4"	1.93	1.90

MAX. RECOMMENDED FLOW GPM (L/min)

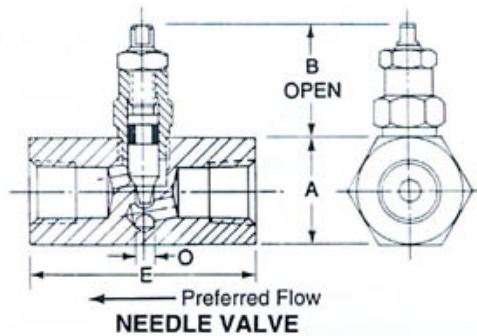
Size	Flow & Check Valves	Needle Valves
1/8"	1.5 (5.7)	3.2 (12.2)
1/4"	3.0 (11.4)	7.0 (26.5)
3/8"	5.0 (19)	13.5 (51.1)
1/2"	8.0 (30.3)	22.5 (85.2)
3/4"	12.0 (45.5)	34.0 (128.7)

() Parentheses = L/min

DIMENSIONS

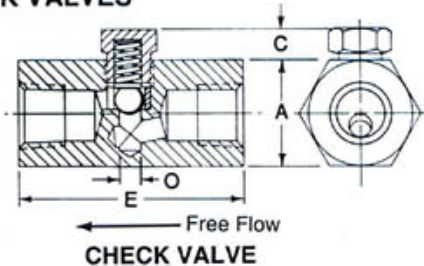


FLOW CONTROL VALVE



NEEDLE VALVE

CHECK VALVES



CHECK VALVE

PIPE SIZE	A HEX	B	C	D	E	O
1/8"	11/16 (17.5)	7/8 (22.3)	13/64 (5.2)	1-3/4 (44.5)	1-15/32 (37.4)	.107 (2.8)
1/4"	7/8 (22.3)	1 (25.4)	23/64 (9.2)	2-3/8 (60.4)	2 (50.8)	.156 (4.0)
3/8"	1-1/16 (27.0)	1-13/16 (46.1)	11/32 (8.8)	2-3/4 (69.9)	2-1/4 (57.2)	.219 (5.6)
1/2"	1-5/16 (33.4)	1-7/16 (36.6)	15/32 (12.0)	3-3/16 (81.0)	2-21/32 (67.5)	.281 (7.2)
3/4"	1-5/8 (41.3)	1-5/8 (41.3)	17/32 (13.5)	3-9/16 (90.5)	2-15/16 (74.7)	.343 (8.8)

() Parentheses = Millimeters.

ORDERING INFORMATION

Size	FLOW CONTROL VALVES			NEEDLE VALVES			CHECK VALVES			
	Brass	Carbon Steel	Stainless Steel	Brass	Carbon Steel	Stainless Steel	Brass	Carbon Steel	Stainless Steel	Crack Press PSI (Bar)++
1/8"	FP10BK F10B F10BK	F10S F10SK	— F10SSK	N10B N10BK	N10S N10SK	— N10SSK	C10B CP10B	C10S —	C10SS CP10SS	1 to 2.5++ (.07 to 17)
1/4"	FP20BK F20B F20BK	F20S F20SK	— F20SSK	N20B N20BK	N20S N20SK	— N20SSK	C20B CP20B	C20S —	C20SS CP20SS	1 to 2.5++ (.07 to 17)
3/8"	FP25BK F25B F25BK	F25S F25SK	— F25SSK	N25B N25BK	N25S N25SK	— N25SSK	C25B CP25B	C25S —	C25SS —	1 to 2.5++ (.07 to 17)
1/2"	F30B F30BK	F30S F30SK	— F30SSK	N30B N30BK	N30S N30SK	— N30SSK	C30B CP30B	C30S —	C30SS —	1 to 2.5++ (.07 to 17)
3/4"	F35B —	— F35SK	— —	N35B N35BK	— N35SK	— —	C35B —	C35S —	— —	1 to 2.5++ (.07 to 17)

ISO 7/1 - RS* — BSP TAPER THREAD

Size	Flow Control Valves		Needle Valves	
	Brass	Steel	Brass	Steel
1/8"	FB10BK	FB10SK	NB10BK	NB10SK
1/4"	FB20BK	FB20SK	NB20BK	NB20SK
3/8"	FB25BK	FB25SK	NB25BK	NB25SK
1/2"	—	FB30SK	—	NB30SK
3/4"	—	FB35SK	—	NB35SK

* Agrees with BS21:1995 and JIS B0203.

SAE THREAD

Size	FC Valves		Needle	Check
	Steel	Brass	Steel	Steel
SAE-4	—	—	NM425SK	—
SAE-6	FM620S	—	—	—
SAE-6	FM620SK	FM620BK	NM620SK	—
SAE-6	—	FM625BK	—	—
SAE-8	—	—	NM830SK	—
SAE-12	—	—	NM1235SK	—

ORDERING INFORMATION

SERIES **THREAD** **SIZE** **MATERIAL** **KNOB**
F **B** **10** **B** **K**

F = Flow Control
 N = Needle
 C = Ball Check
 CP = Poppet Check
 FP = Poppet Flow Control

— = NPTF
 B = BSPT
 M = SAE
 BP = BSBP

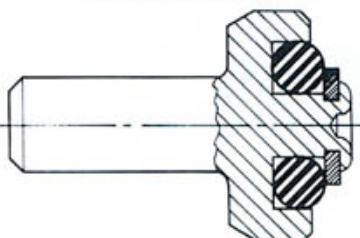
10 = 1/8"
 20 = 1/4"
 25 = 3/8"
 30 = 1/2"
 35 = 3/4"

B = Brass
 S = Carbon
 SS = Stainless Steel

Example:

For 1/4" brass flow control valves with knob, specify F20BK.

++Soft seat check valves if left seated for a period of time, will have the rubber adhere to the metal it is in contact with. This results in an initial high crack point due to sticking. The degree depends on many things (time seated, pressure, etc.).



Flow Control and Check Valve

Optional bubble-tight poppet check available in 1/8", 1/4", 3/8" and 1/2". (For application requiring 60 PSI (4 bar) or more, consult factory.)



Pneu-Trol

HIGH PRESSURE ANGLE and GLOBE NEEDLE VALVES



- For Faster, Less Critical Needle Adjustments
- Easily Adjustable Under Pressure
- Available with Fine Metering (SM) Needle

Pneu-Trol Angle and Globe Needle Valves are ideal for use in special and general purpose applications requiring excellent flow characteristics as well as positive shut-off service, such as chemical processing, machine tool service lines.

Valves are available in globe, and angle mounted types for pressures up to 10,000 PSI (690 bar) (carbon steel). The stem has 16 threads per inch for fast shut-off. Globe and angle type valves can be furnished for panel mounting by the use of a panel-mounting kit. These valves open and close easily under pressure.

The (SM) needle affords excellent metering characteristics for industrial applications.

SPECIFICATIONS

Maximum Operating Pressure (Non-Shock Service)

Carbon Steel – 10,000 PS (690 bar)

Minimum Burst Pressure

Carbon Steel – 20,000 PSI (1380 bar)

Operating Temperature Range (Packing)

Buna N (Standard):
-40° to +212°F (-40° to +100°C)

Needle

Standard 20° Included Angle
SM – Slotted Needle

Materials

Body – Carbon Steel
Stem – 416 Stainless Steel (Steel Valves)
Packing – See Operating Temperature Range
Packing Gland – Brass (Steel Valves)
Handle – Die Casting
Panel Mounting Nut – Brass Nickel Plated
Threads – NPTF

FLOW CHARACTERISTICS

Flow Co-efficient (Cv Factor) – Fully Open Models 01 and 02 Angle Type

1/4" – 0.85 3/8" – 1.67
1/2" – 1.89 3/4" – 3.70

Model 50 Globe Type

1/4" – 0.47 3/8" – 1.00
1/2" – 1.10 3/4" – 2.65
1" – 4.65

PANEL MOUNTING HOLE DIMENSIONS

NOTE: Panel Mounting Kits Available.
See Price List for Part Number.

1/4" 25/32" (20.0)
3/8" 31/32" (24.5)
1/2" 31/32" (24.5)
3/4" 1-5/32" (29.5)

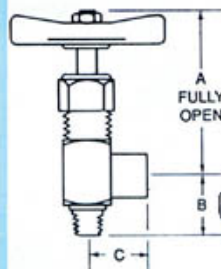
NOTE: Valves are of brazed construction. Steel – Copper Brazing.

PANEL MOUNTING KITS (Sold Separately)

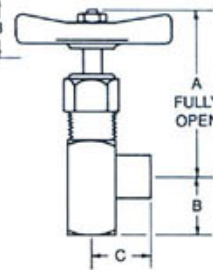
Available in Deluxe and Economy Kits in all sizes except 1" and 3/4".

DIMENSIONS

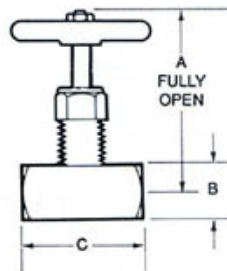
ANGLE (01)



ANGLE (02)



GLOBE (50)



Angle Pattern Model 01 Male-to-Female

Size	A	B	C	Orifice
1/4"	3-3/16 (81.0)	1-3/16 (30.2)	7/8 (22.3)	3/16 (4.8)
3/8"	3-13/16 (96.9)	1-7/16 (36.6)	1 (25.4)	9/32 (7.2)
1/2"	3-13/16 (96.9)	1-13/16 (46.1)	1-1/8 (28.6)	9/32 (7.2)

Angle Pattern Model 02 Female-to-Female

Size	A	B	C	Orifice
1/4"	3-3/16 (81.0)	1-3/16 (30.2)	7/8 (22.3)	3/16 (4.8)
3/8"	3-13/16 (96.9)	1-1/4 (31.8)	1 (25.4)	9/32 (7.2)
1/2"	3-13/16 (96.9)	1-7/16 (36.6)	1-1/8 (28.6)	9/32 (7.2)
3/4"	5" (127.0)	1-5/8" (41.3)	1-3/4" (44.5)	7/16" (11.2)

Globe Pattern Model 50 Female-to-Female

Size	A	B	C	Orifice
1/4"	3-1/16 (77.8)	7/8 (22.3)	2 (50.8)	3/16 (4.8)
3/8"	4-1/32 (102.4)	1 (25.4)	2-3/8 (60.4)	9/32 (7.2)
1/2"	3-15/16 (100.0)	1-1/4 (31.8)	2-7/8 (73.0)	9/32 (7.2)
3/4"	4-15/16 (125.5)	1-1/2 (38.1)	3-5/8 (92.1)	7/16 (11.2)
1"	6-1/8 (155.9)	2 (50.8)	4 (101.6)	9/16 (14.3)

() Parentheses = Millimeters

ORDERING INFORMATION

MODEL 01

Size	Standard
1/8"	S101S1
1/4"	S201S1
3/8"	S301S1
1/2"	S401S1

MODEL 50

Size	Standard	Fine Metering	ISO 7/1 - RS**	ISO 7/1 - RP**
1/4"	S250S1	SM250S1	SB250S1	SBP250S1
3/8"	S350S1	—	SB350S1	SBP350S1
1/2"	S450S1	—	SB450S1	SBP450S1
3/4"	S650S1	—	SB650S1	SBP650S1
1"	S850S1	—	—	—

MODEL 02

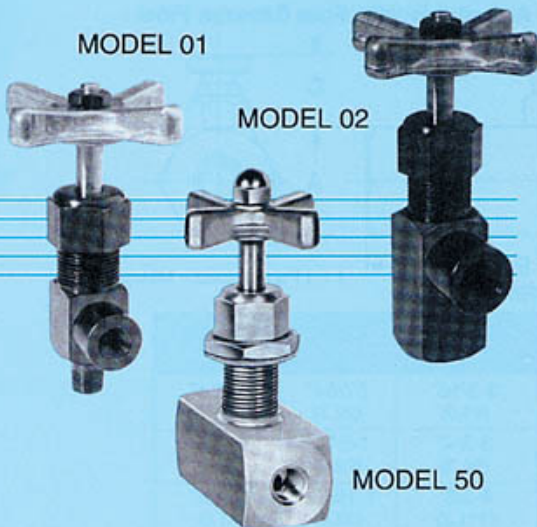
Size	Standard	Fine Metering	ISO 7/1 - RS**
1/4"	S202S1	SM202S1	SB202S1
3/8"	S302S1	—	SB302S1
1/2"	S402S1	—	SB402S1
3/4"	S602S1	—	SB602S1

** Agrees with BS21:1995 and JIS B0203.



Pneu-Trol

HIGH PRESSURE ANGLE and GLOBE NEEDLE VALVES



SPECIFICATIONS

Maximum Operating Pressure (Non-Shock Service)

Carbon Steel – 10,000 PS (690 bar)

Minimum Burst Pressure

Carbon Steel – 20,000 PSI (1380 bar)

Operating Temperature Range (Packing)

Buna N (Standard):
-40° to +212°F (-40° to +100°C)

Needle

Standard 20° Included Angle
SM – Slotted Needle

Materials

Body – Carbon Steel
Stem – 416 Stainless Steel (Steel Valves)
Packing – See Operating Temperature Range
Packing Gland – Brass (Steel Valves)
Handle – Die Casting
Panel Mounting Nut – Brass Nickel Plated
Threads – NPTF

FLOW CHARACTERISTICS

Flow Co-efficient (Cv Factor) – Fully Open Models 01 and 02 Angle Type

1/4" – 0.85 3/8" – 1.67
1/2" – 1.89 3/4" – 3.70

Model 50 Globe Type

1/4" – 0.47 3/8" – 1.00
1/2" – 1.10 3/4" – 2.65
1" – 4.65

PANEL MOUNTING HOLE DIMENSIONS

NOTE: Panel Mounting Kits Available.
See Price List for Part Number.

1/4" 25/32" (20.0)
3/8" 31/32" (24.5)
1/2" 31/32" (24.5)
3/4" 1-5/32" (29.5)

NOTE: Valves are of brazed construction. Steel – Copper Brazing.

PANEL MOUNTING KITS (Sold Separately)

Available in Deluxe and Economy Kits in all sizes except 1" and 3/4".

- For Faster, Less Critical Needle Adjustments
- Easily Adjustable Under Pressure
- Available with Fine Metering (SM) Needle

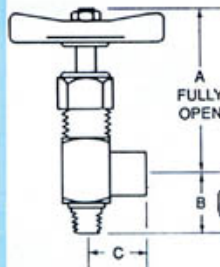
Pneu-Trol Angle and Globe Needle Valves are ideal for use in special and general purpose applications requiring excellent flow characteristics as well as positive shut-off service, such as chemical processing, machine tool service lines.

Valves are available in globe, and angle mounted types for pressures up to 10,000 PSI (690 bar) (carbon steel). The stem has 16 threads per inch for fast shut-off. Globe and angle type valves can be furnished for panel mounting by the use of a panel-mounting kit. These valves open and close easily under pressure.

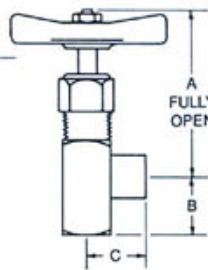
The (SM) needle affords excellent metering characteristics for industrial applications.

DIMENSIONS

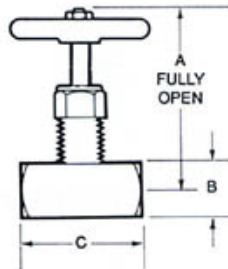
ANGLE (01)



ANGLE (02)



GLOBE (50)



Angle Pattern Model 01 Male-to-Female

Size	A	B	C	Orifice
1/4"	3-3/16 (81.0)	1-3/16 (30.2)	7/8 (22.3)	3/16 (4.8)
3/8"	3-13/16 (96.9)	1-7/16 (36.6)	1 (25.4)	9/32 (7.2)
1/2"	3-13/16 (96.9)	1-13/16 (46.1)	1-1/8 (28.6)	9/32 (7.2)

Angle Pattern Model 02 Female-to-Female

Size	A	B	C	Orifice
1/4"	3-3/16 (81.0)	1-3/16 (30.2)	7/8 (22.3)	3/16 (4.8)
3/8"	3-13/16 (96.9)	1-1/4 (31.8)	1 (25.4)	9/32 (7.2)
1/2"	3-13/16 (96.9)	1-7/16 (36.6)	1-1/8 (28.6)	9/32 (7.2)
3/4"	5" (127.0)	1-5/8" (41.3)	1-3/4" (44.5)	7/16" (11.2)

Globe Pattern Model 50 Female-to-Female

Size	A	B	C	Orifice
1/4"	3-1/16 (77.8)	7/8 (22.3)	2 (50.8)	3/16 (4.8)
3/8"	4-1/32 (102.4)	1 (25.4)	2-3/8 (60.4)	9/32 (7.2)
1/2"	3-15/16 (100.0)	1-1/4 (31.8)	2-7/8 (73.0)	9/32 (7.2)
3/4"	4-15/16 (125.5)	1-1/2 (38.1)	3-5/8 (92.1)	7/16 (11.2)
1"	6-1/8 (155.9)	2 (50.8)	4 (101.6)	9/16 (14.3)

() Parentheses = Millimeters

ORDERING INFORMATION

MODEL 01

Size	Standard
1/8"	S101S1
1/4"	S201S1
3/8"	S301S1
1/2"	S401S1

MODEL 50

Size	Standard	Fine Metering	ISO 7/1 - RS**	ISO 7/1 - RP**
1/4"	S250S1	SM250S1	SB250S1	SBP250S1
3/8"	S350S1	—	SB350S1	SBP350S1
1/2"	S450S1	—	SB450S1	SBP450S1
3/4"	S650S1	—	SB650S1	SBP650S1
1"	S850S1	—	—	—

MODEL 02

Size	Standard	Fine Metering	ISO 7/1 - RS**
1/4"	S202S1	SM202S1	SB202S1
3/8"	S302S1	—	SB302S1
1/2"	S402S1	—	SB402S1
3/4"	S602S1	—	SB602S1

** Agrees with BS21:1995 and JIS B0203.



FLOW CONTROL VALVES



NEEDLE VALVES



CHECK VALVES

SPECIFICATIONS

Maximum Operating Pressure (Non-Shock Service)

Brass – 2,000 PSI (138 Bar)
Carbon Steel – 5,000 PSI (345 Bar)
Stainless Steel – 5,000 PSI (345 Bar)

Operating Temperature Range (O-Ring Packing)

Viton: -15° to +400° F (-26° to 203°C)

Threads

NPTF Standard, 1/8", 1/4", 3/8" 1/2", and 3/4". SAE Threads on special order.

Materials

Housing, Plug, Body – Hexagon Brass, Hexagon Carbon Steel, Hexagon 303 Stainless Steel
Needle – 416 Stainless Steel on Steel and Stainless Steel Valves
Needle – Brass on Brass Valves
Back-up Washer – Teflon
Knob – Aluminum
Tamperproof Key – Cadmium Plated Steel
Ball – Stainless Steel
Retainer – Stainless Steel
Poppet – Brass or Stainless Steel with Viton (Standard) O-Ring

Pneu-Trol®

FLOW CONTROL, NEEDLE AND CHECK VALVES

- Optional Bubble-Tight Check Valve Available

FLOW CONTROL

A spring biased ball or optional poppet check provides full flow in one direction; a stainless steel, tapered needle provides a wide range of adjustment of flow in the controlled direction. A locknut prevents unwanted changes in adjustment. A tamperproof adjustment key is standard; a knurled knob is optional at slight extra cost.

NEEDLE

A wide range of flow adjustment is possible because of the fine thread, tapered needle. Unwanted changes in adjustment are prevented by a locknut. A tamperproof adjustment key is standard; a knurled knob is available at slight extra cost.

CHECK

A slight pressure differential fully opens or closes the ball or poppet check valve. This valve is available with either ball check or bubble-tight poppet check.

FLOW RATE CHART

Cv FACTORS

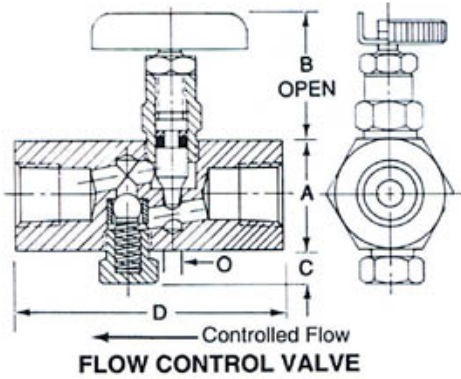
Size	Cv Max. Open Needle	Cv Flow Check
1/8"	.20	.23
1/4"	.43	.54
3/8"	.78	.83
1/2"	1.24	1.47
3/4"	1.93	1.90

MAX. RECOMMENDED FLOW GPM (L/min)

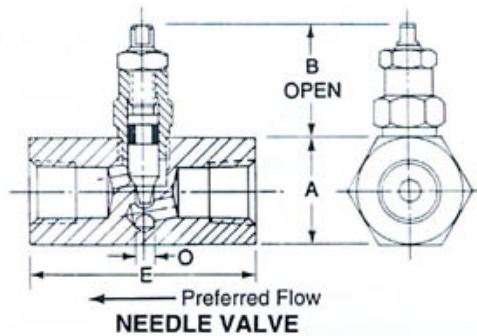
Size	Flow & Check Valves	Needle Valves
1/8"	1.5 (5.7)	3.2 (12.2)
1/4"	3.0 (11.4)	7.0 (26.5)
3/8"	5.0 (19)	13.5 (51.1)
1/2"	8.0 (30.3)	22.5 (85.2)
3/4"	12.0 (45.5)	34.0 (128.7)

() Parentheses = L/min

DIMENSIONS

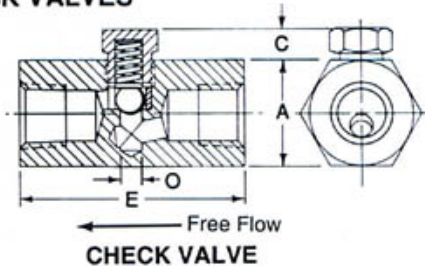


FLOW CONTROL VALVE



NEEDLE VALVE

CHECK VALVES



CHECK VALVE

PIPE SIZE	A HEX	B	C	D	E	O
1/8"	11/16 (17.5)	7/8 (22.3)	13/64 (5.2)	1-3/4 (44.5)	1-15/32 (37.4)	.107 (2.8)
1/4"	7/8 (22.3)	1 (25.4)	23/64 (9.2)	2-3/8 (60.4)	2 (50.8)	.156 (4.0)
3/8"	1-1/16 (27.0)	1-13/16 (46.1)	11/32 (8.8)	2-3/4 (69.9)	2-1/4 (57.2)	.219 (5.6)
1/2"	1-5/16 (33.4)	1-7/16 (36.6)	15/32 (12.0)	3-3/16 (81.0)	2-21/32 (67.5)	.281 (7.2)
3/4"	1-5/8 (41.3)	1-5/8 (41.3)	17/32 (13.5)	3-9/16 (90.5)	2-15/16 (74.7)	.343 (8.8)

() Parentheses = Millimeters.

ORDERING INFORMATION

Size	FLOW CONTROL VALVES			NEEDLE VALVES			CHECK VALVES			
	Brass	Carbon Steel	Stainless Steel	Brass	Carbon Steel	Stainless Steel	Brass	Carbon Steel	Stainless Steel	Crack Press PSI (Bar)++
1/8"	FP10BK F10B F10BK	F10S F10SK	— F10SSK	N10B N10BK	N10S N10SK	— N10SSK	C10B CP10B	C10S —	C10SS CP10SS	1 to 2.5++ (.07 to 17)
1/4"	FP20BK F20B F20BK	F20S F20SK	— F20SSK	N20B N20BK	N20S N20SK	— N20SSK	C20B CP20B	C20S —	C20SS CP20SS	1 to 2.5++ (.07 to 17)
3/8"	FP25BK F25B F25BK	F25S F25SK	— F25SSK	N25B N25BK	N25S N25SK	— N25SSK	C25B CP25B	C25S —	C25SS —	1 to 2.5++ (.07 to 17)
1/2"	F30B F30BK	F30S F30SK	— F30SSK	N30B N30BK	N30S N30SK	— N30SSK	C30B CP30B	C30S —	C30SS —	1 to 2.5++ (.07 to 17)
3/4"	F35B —	— F35SK	— —	N35B N35BK	— N35SK	— —	C35B —	C35S —	— —	1 to 2.5++ (.07 to 17)

ISO 7/1 - RS* — BSP TAPER THREAD

Size	Flow Control Valves		Needle Valves	
	Brass	Steel	Brass	Steel
1/8"	FB10BK	FB10SK	NB10BK	NB10SK
1/4"	FB20BK	FB20SK	NB20BK	NB20SK
3/8"	FB25BK	FB25SK	NB25BK	NB25SK
1/2"	—	FB30SK	—	NB30SK
3/4"	—	FB35SK	—	NB35SK

* Agrees with BS21:1995 and JIS B0203.

SAE THREAD

Size	FC Valves		Needle	Check
	Steel	Brass	Steel	Steel
SAE-4	—	—	NM425SK	—
SAE-6	FM620S	—	—	—
SAE-6	FM620SK	FM620BK	NM620SK	—
SAE-6	—	FM625BK	—	—
SAE-8	—	—	NM830SK	—
SAE-12	—	—	NM1235SK	—

ORDERING INFORMATION

SERIES THREAD SIZE MATERIAL KNOB
F B 10 B K

F = Flow Control
 N = Needle
 C = Ball Check
 CP = Poppet Check
 FP = Poppet Flow Control

— = NPTF
 B = BSPT
 M = SAE
 BP = BSBP

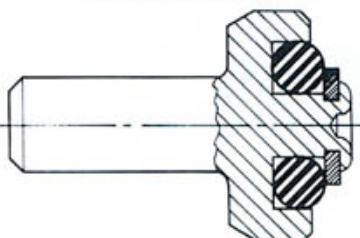
10 = 1/8"
 20 = 1/4"
 25 = 3/8"
 30 = 1/2"
 35 = 3/4"

B = Brass
 S = Carbon
 SS = Stainless Steel

Example:

For 1/4" brass flow control valves with knob, specify F20BK.

++Soft seat check valves if left seated for a period of time, will have the rubber adhere to the metal it is in contact with. This results in an initial high crack point due to sticking. The degree depends on many things (time seated, pressure, etc.).



Flow Control and Check Valve

Optional bubble-tight poppet check available in 1/8", 1/4", 3/8" and 1/2". (For application requiring 60 PSI (4 bar) or more, consult factory.)

SERIES 10

SPECIFICATIONS

Wattage: 10 volts: nominally 19 watts at 68°F/20°C.
12, 20, 24, 120 and 240 volts: nominally 22 watts at 68°F/20°C.

Duty Rating: Continuous at 100% voltage.

Ambient Operating Temperature: 212°F/100°C continuous at nominal voltage.

Encapsulating Material: Theroplastic Polyester (PET).

A.C. Coils: Internally rectified with a full wave bridge (no inrush current).

Termination Options: See below and on the next page.

VOLTS	19 WATT		22 WATT	
	OHMS	INITIAL CURRENT DRAW (AMPS)	OHMS	INITIAL CURRENT DRAW (AMPS)
10 DC	5.3	1.9		
12 DC			6.5	1.83
20 DC			18.2	1.10
24 DC			26.1	.92
120 AC			Δ496	.18
240 AC			Δ1830	.18

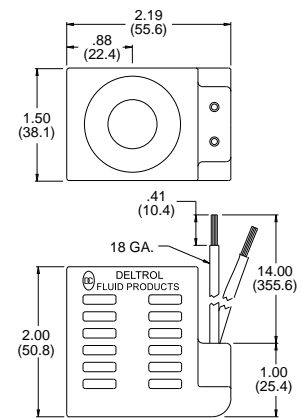
ΔRESISTANCE CANNOT BE MEASURED ON AC COIL ASSEMBLIES

DOUBLE LEADS

CODE - **D

VOLTS	PART NO.	LEAD COLOR
10 DC	10163-99	GREEN
12 DC	10162-76	RED
20 DC	10223-97	RED
24 DC	10162-77	BLUE
120 AC	10162-82	BLACK
240 AC	10162-83	YELLOW

LEAD WIRES: 18/20 GAUGE MEETS SAE J1128 XLPE, TYPE SXL.

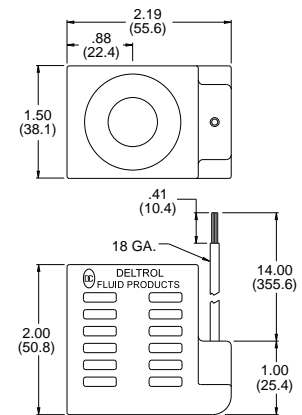


SINGLE LEAD

CODE - **S

VOLTS	PART NO.	LEAD COLOR
10 DC	10164-12	GREEN
12 DC	10164-10	RED
24 DC	10164-11	BLUE

LEAD WIRES: 18/20 GAUGE MEETS SAE J1128 XLPE, TYPE SXL.

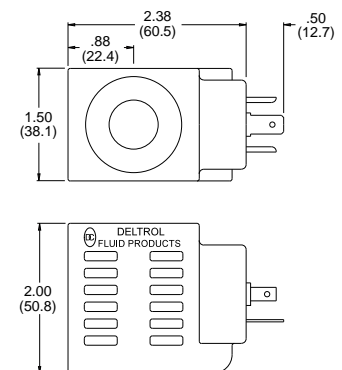


HIRSCHMANN®

CODE - **H

VOLTS	PART NO.
10 DC	10164-02
12 DC	10162-78
24 DC	10162-79
120 AC	10162-84
240 AC	10162-85

TERMINATION:
HIRSCHMANN GSR 200
(2 POLE + GROUND APPLIANCE PLUG)
MATING CONNECTOR 43650



Solenoid Coil

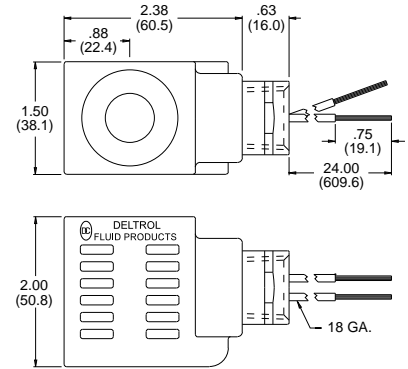
Data (continued)

SERIES 10

CONDUIT (FEMALE 1/2-14 NPT)

CODE - **C

VOLTS	PART NO.	LEAD COLOR
10 DC	10164-05	GREEN
12 DC	10162-80	RED
24 DC	10162-81	BLUE
120 AC	10162-86	BLACK
240 AC	10162-87	YELLOW



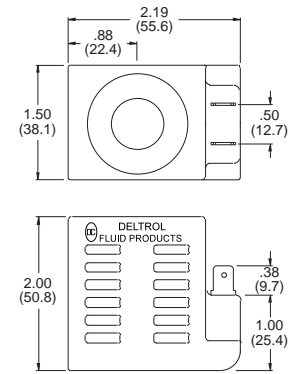
LEAD WIRES: 18/20 GAUGE MEETS SAE J1128 XLPE, TYPE SXL.

DOUBLE SPADE

CODE - **B

VOLTS	PART NO.
10 DC	10164-08
12 DC	10162-91
20 DC	10234-53
24 DC	10162-92
120 AC	10162-90
240 AC	10164-09

TERMINATION:
 1/4" MALE QUICK-CONNECT
 PER SAE J858A (TYPE 1B)

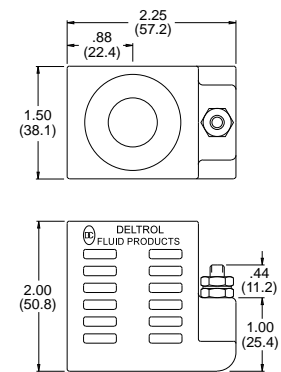


SINGLE STUD

CODE - **E

VOLTS	PART NO.
10 DC	10164-15
12 DC	10164-13
24 DC	10164-14

TERMINATION:
 10-32 MALE STUD WITH
 2 BRASS NUTS AND 1 STEEL
 EXTERNAL TOOTH LOCKWASHER



SERIES 8

SPECIFICATIONS

Wattage: Nominally 16 watt at 68°F/20°C.

Duty Rating: Continuous at 100% voltage.

Ambient Operating Temperature: 212°F/100°C continuous at nominal voltage.

Encapsulating Material: Theroplastic Polyester (PET).

A.C. Coils: Internally rectified with a full wave bridge (no inrush current).

Termination Options: See below and on the next page.

VOLTS	16 WATT	
	OHMS	INITIAL CURRENT DRAW (AMPS)
10 DC	6.2	1.60
12 DC	9.0	1.33
20 DC	25.0	.80
24 DC	35.8	.67
120 AC	Δ827	.15
240 AC	Δ3306	.07

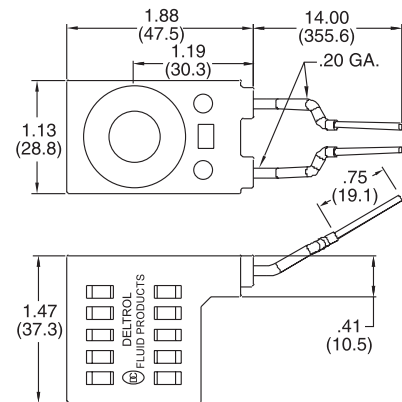
ΔRESISTANCE CANNOT BE MEASURED ON AC COIL ASSEMBLIES

DOUBLE LEADS

CODE - **DS

VOLTS	PART NO.	LEAD COLOR
10 DC	10205-94	GREEN
12 DC	10184-42	RED
24 DC	10184-37	BLUE
120 AC	10184-49	BLACK
240 AC	10184-53	YELLOW

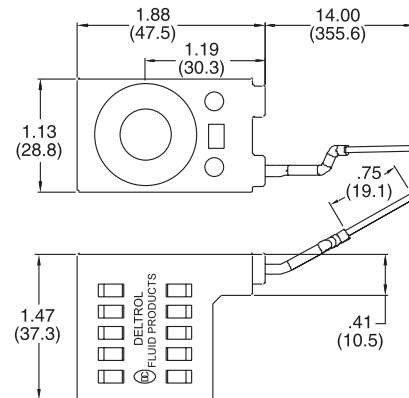
FOR INTERNAL DIODE – CONSULT FACTORY



SINGLE LEAD

CODE - **SS

VOLTS	PART NO.	LEAD COLOR
10 DC	10194-19	GREEN
12 DC	10184-32	RED
24 DC	10190-44	BLUE

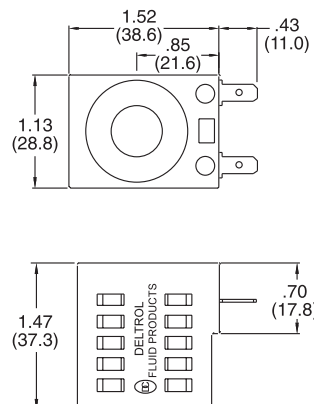


DOUBLE SPADE

CODE - **BS

VOLTS	PART NO.
10 DC	10221-46
12 DC	10216-12
20 DC	10222-51
24 DC	10216-11
120 AC	10222-49
240 AC	10222-50

TERMINATION:
 1/4" MALE QUICK-CONNECT
 PER SAE J858A (TYPE 1B)



FOR INTERNAL DIODE – CONSULT FACTORY

Solenoid Coil Data (continued)

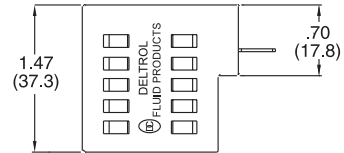
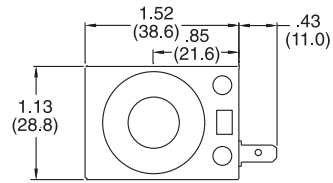
SERIES 8

SINGLE SPADE

CODE - **AS

VOLTS	PART NO.
10 DC	10222-46
12 DC	10221-30
24 DC	10221-47

TERMINATION:
1/4" MALE QUICK-CONNECT
PER SAE J858A (TYPE 1B)

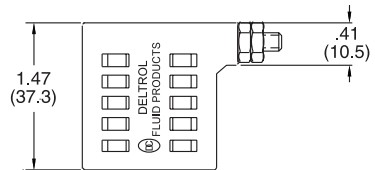
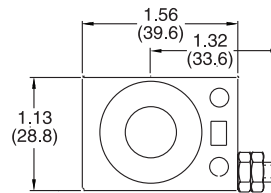


SINGLE STUD

CODE - **ES

VOLTS	PART NO.
10 DC	10196-60
12 DC	10196-61
24 DC	10196-62

TERMINATION:
8-32 MALE STUD
WITH BRASS NUTS

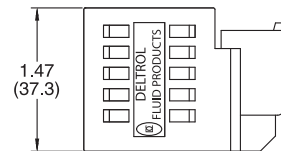
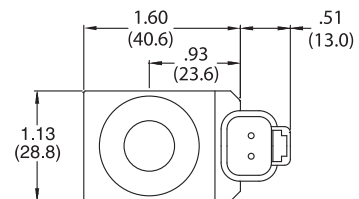


DEUTSCH

CODE - **US

VOLTS	PART NO.
10 DC	10210-13
12 DC	10222-99
20 DC	10228-95
24 DC	10228-52

TERMINATION:
INTEGRAL DEUTSCH CONNECTOR
DT04-2P
MATING CONNECTOR
DT06-2S



FOR INTERNAL DIODE – CONSULT FACTORY

SOLENOID

CHECK

MOTION CONTROL

FLOW CONTROL

RELIEF

PRESSURE CONTROL

SEQUENCE

SHUTTLE

DIRECTIONAL VALVES

ACCESSORIES

TECHNICAL DATA

Solenoid Coil

Features/Specifications

- **STANDARD VOLTAGE:** 10, 12, 20 AND 24 VOLTS D.C.
120 AND 240 VOLTS A.C.
- **WATTAGE:** SERIES 8: ALL COILS ARE NOMINALLY 16 WATTS AT 68°F./20°C.
SERIES 10: 10 VOLT COILS ARE NOMINALLY 19 WATTS AT 68°F./23°C.
12, 20, 24, 120 AND 240 VOLT COILS ARE NOMINALLY 22 WATTS AT 68°F./20°C.
- **DUTY RATING:** CONTINUOUS AT 100% VOLTAGE.
- **AMBIENT OPERATING TEMPERATURE:** 212°F./100°C. CONTINUOUS AT NOMINAL VOLTAGE.
- **MAGNET WIRE:** ALL 100 SERIES ARE THERMAL CLASS 200°C., NEMA PUB, NO. MW1000
- **ENCAPSULATING MATERIAL:** THEROPLASTIC POLYESTER (PET).
- **LEAD WIRES:** 18/20 GAUGE. MEETS SAE J1128 XLPE, TYPE SXL.
- **A.C. VOLTAGE COILS:** INTERNALLY FULL WAVE RECTIFIED TO SUPPLY THE COIL WINDING WITH D.C. CURRENT. THEREFORE THE COIL WINDING HAS NO "INRUSH" CURRENT MAKING IT SUITABLE FOR 50 OR 60 HERTZ (Hz) CYCLE APPLICATIONS. THE RECTIFIERS USED IN A.C. COILS MAY REQUIRE PROTECTION FROM TRANSIENT OVER VOLTAGES EXCEEDING 1000 VOLTS. PROTECT RECTIFIED A.C. COILS BY INSTALLING A COMMERCIALY AVAILABLE NONPOLARIZED SELENIUM DIODE SUPPRESSOR OR METAL-OXIDE VARISTOR ACROSS THE A.C. COIL AS SHOWN.

