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

SAE THREAD

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

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

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

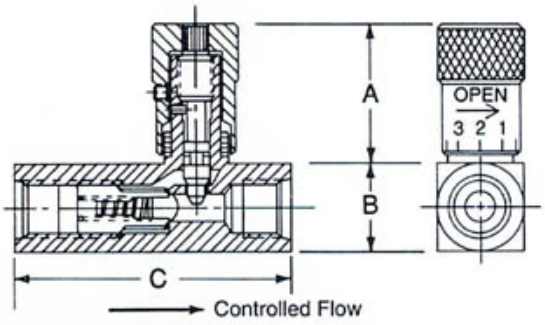
10 = 1/8"
20 = 1/4"
25 = 3/8"
30 = 1/2"
35 = 3/4"
40 = 1"

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

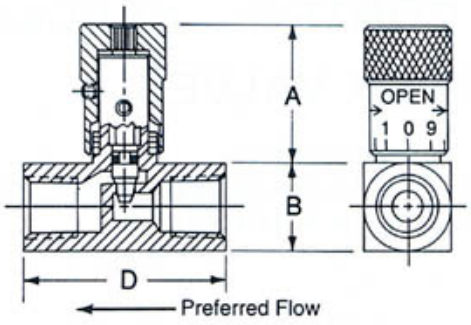
Examples:
To order 3/8" Brass Easy Read Flow Control Valves with standard threads, specify EF25B.

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

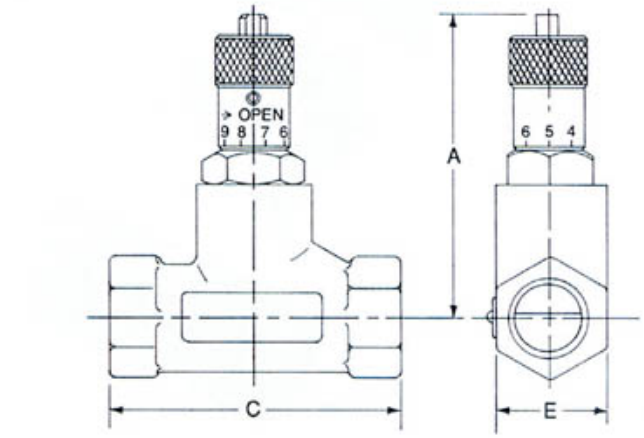
DIMENSIONS



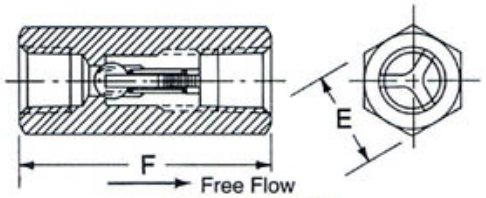
FLOW CONTROL VALVE



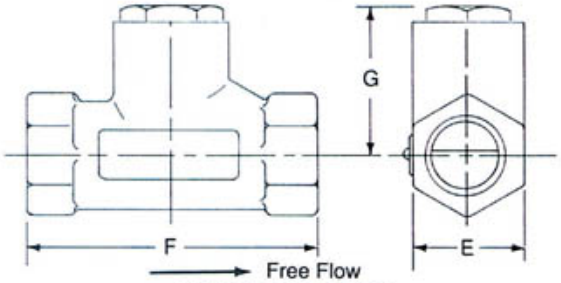
NEEDLE VALVE



1" FLOW CONTROL **1" NEEDLE VALVE**



CHECK VALVE



1" CHECK VALVE

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)

( ) Parentheses = Millimeters

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

FLOW RATING

PRESSURE DROP VS. NUMBER TURNS OPEN
(Controlled Flow)

TEST MEDIUM
150 SSU Oil @ 140° F.

FOR LIQUID

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

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 CURVES