



Flow controls feature reverse flow check, an aluminum knob option, positive shut-off and linear adjustment. Models are available for flows to 129 lpm (34 gpm).

Needle valve models feature an aluminum knob option, positive shut-off and linear adjustment. Models are available for flows up to 113 lpm (30 gpm).

Pressure compensated flow regulators offer accurate flow maintenance up to 80 lpm (21 gpm). Adjustable-orifice pressure-compensated flow controls allow adjustment from zero to full flow.

Compensating elements work with remote orifices to maintain accurate flow rates to 208 lpm (55 gpm).

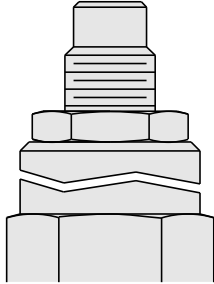
Flow divider/combiner valves maintain flow circuit ratios regardless of system operating pressure conditions. Models are available for flows up to 150 lpm (40 gpm).

- Pressure compensated regulators.
- Variable or fixed orifice restrictor valves.
- Operating pressures to 345 bar (5000 psi).
- Quiet, modulated response.
- Hardened parts for long life.
- Industry common cavities—compact sizes.
- Adjustments cannot be backed out of the valve.
- Optional spring ranges.

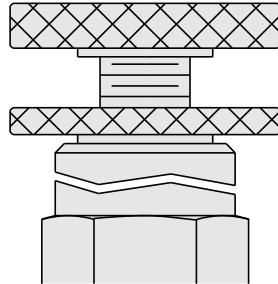
Adjustment Options – FC, FR & NV Series

“A”
1/4-in. Hex Allen Head
P/N 7004400

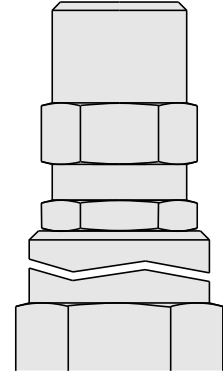
For FR valves:
3/16-in. Hex Allen Head
P/N 7046100



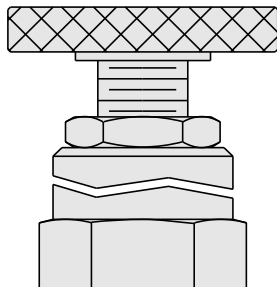
“B”
1 1/2-in. Dia. Aluminum Knob
Kit P/N 6260010



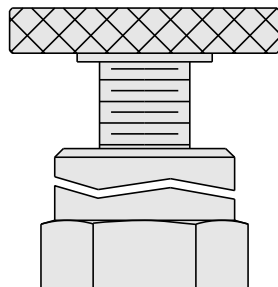
“C”
Option “A” with Cover Cap
P/N 7006700 (Steel)



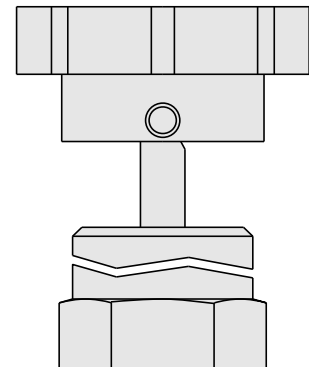
“D”
Top Knob with Lock Nut



“E”
Top Knob Only
P/N 7010250

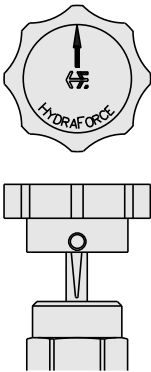


“E”
Plastic Knob
for NVxx-21, FR12-23,
FR12-32, FR10-33, FR12-33
Kit P/N 6113160

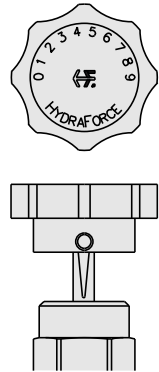


Adjustment Options – MR Series, 180° Rotation

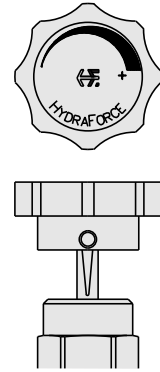
**Plastic Knob
Pointer In-Lay
Kit P/N 5341010**



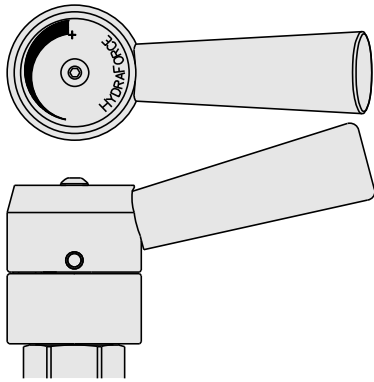
**Plastic Knob
Numbers 1-10 In-Lay
Kit P/N 5341020**



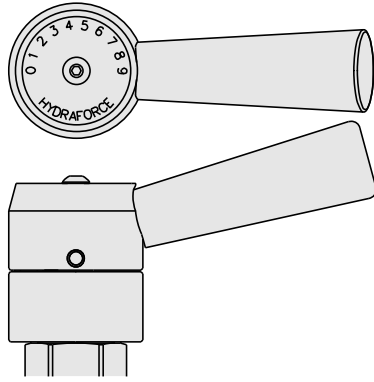
**Plastic Knob
Flow Arrow In-Lay
Kit P/N 5341030**



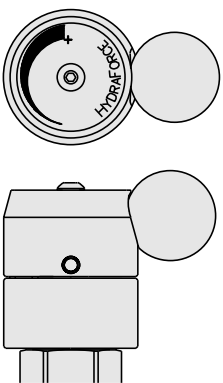
**Lever Handle
Friction Lock
Kit P/N 5341040**



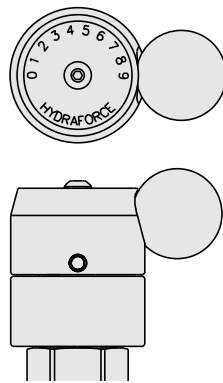
**Lever Handle
10-Position Detent
Kit P/N 5341050**



**Ball Handle
Friction Lock
Kit P/N 5341060**

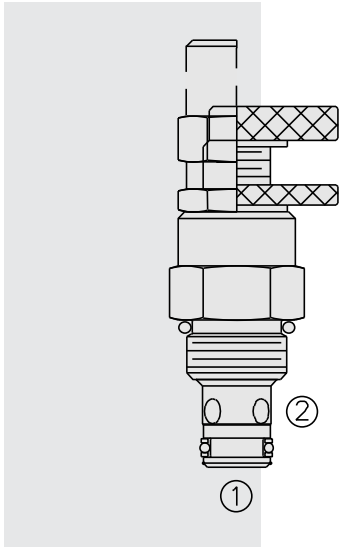


**Ball Handle
10-Position Detent
Kit P/N 5341070**



*See page 4.990.1
for MR Series Knob/Handle
Installation Instructions.*

NV08-20 Needle Valve



DESCRIPTION

A screw-in, cartridge-style, variable orifice, hydraulic flow restrictor valve.

OPERATION

The NV08-20 increases its orifice value from fully closed to fully open with counterclockwise adjustment rotation.

FEATURES

- Adjustments cannot be backed out of the valve.
- Desired settings may be locked down.
- Hardened parts for long life.
- Aluminum knob option.
- Positive shut-off.
- Linear adjustment.
- Compact size.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: 42 lpm (11 gpm) nominal at 7 bar (100 psi) differential at full open 3.5 turns

Internal Leakage: 0.25 cc/minute (5 drop/minute) max. at shut-off

Adjustment Torque Required: 0.56 Nm (5 inch-pounds) at 7 bar (100 psi);
5.41 Nm (48 inch-pounds) at 207 bar (3000 psi)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of
7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

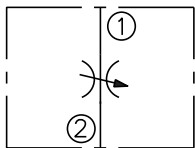
Cavity: VC08-2; See page 9.108.1

Cavity Tool: CT08-2XX; See page 8.600.1

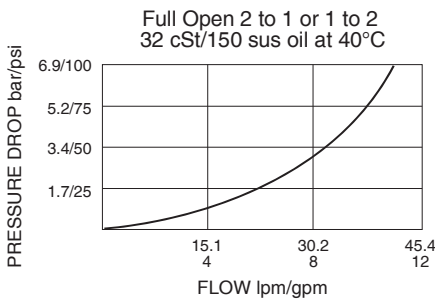
Seal Kit: SK08-2X-M; See page 8.650.1

SYMBOLS

USASI/ISO:

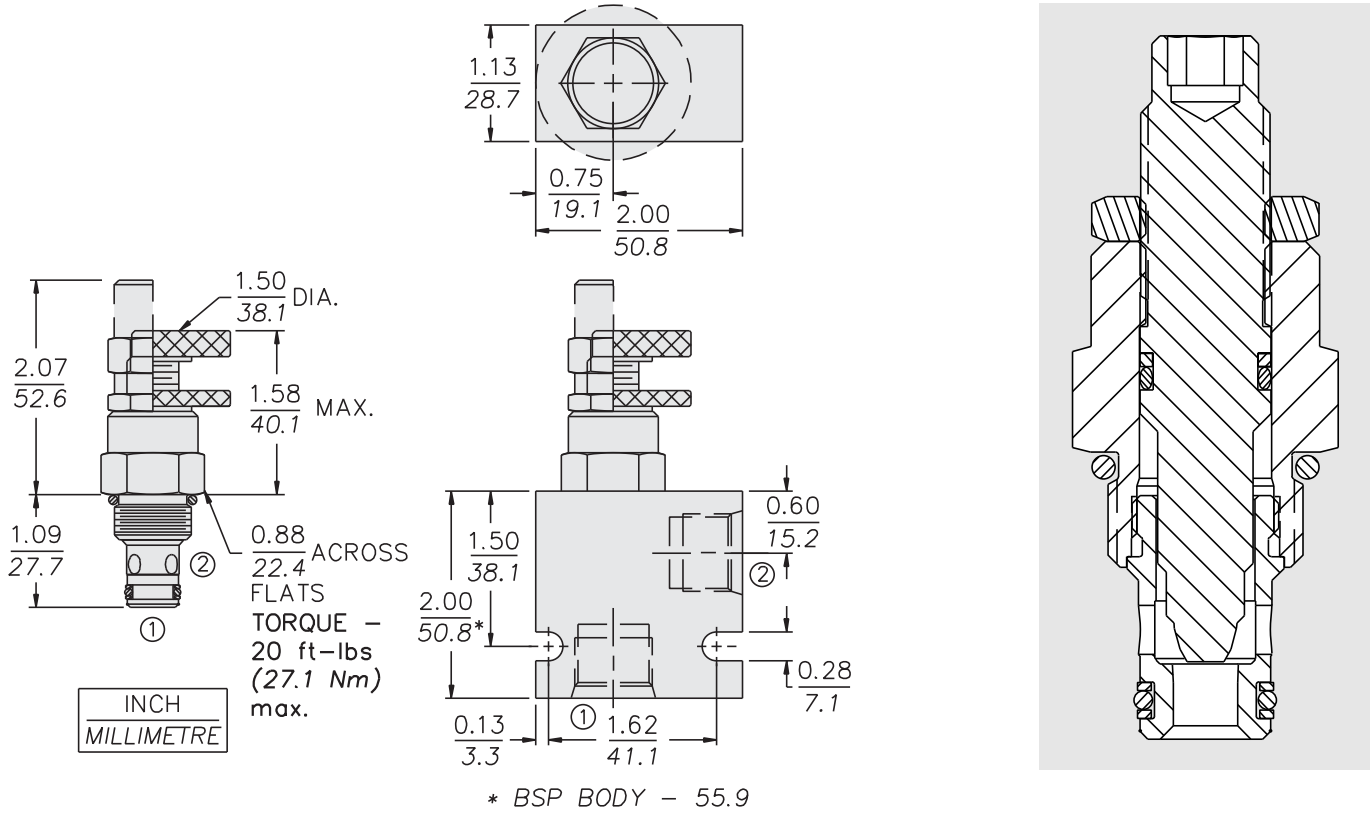


PERFORMANCE (Cartridge Only)



NV08-20

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.10 kg. (0.23 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.
 Anodized aluminum knobs.

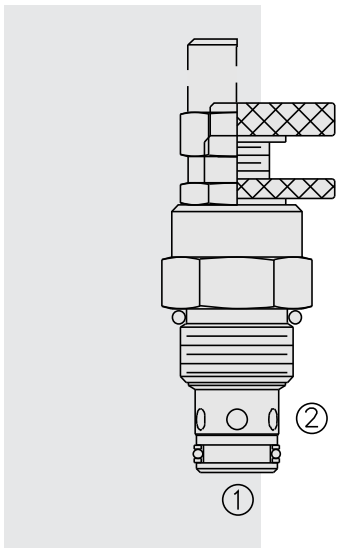
Standard Ported Body: Weight: 0.16 kg. (0.35 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.008.1

TO ORDER

NV08-20		-	-	-
Adjustment Option				Seals
1/4 in. Hex Allen Head	A			N Buna N (Std.)
1-1/2 in. Dia. Alum. Knobs	B			V Fluorocarbon
Option A with Cover Cap	C			P Polyurethane
Top Knob with Lock Nut	D			
Top Knob Only	E			
Lockwire Holes (with Option C)	L			
Screen	S			
				Porting
				0 Cartridge Only
				4T SAE 4
				6T SAE 6
				2B 1/4 in. BSP*
				3B 3/8 in. BSP*
				4B 1/2 in. BSP*

*BSP Body; U.K. Mfr. Only

NV10-20 Needle Valve



DESCRIPTION

A screw-in, cartridge-style, variable orifice, hydraulic flow restrictor valve.

OPERATION

The NV10-20 increases its orifice value from fully closed to fully open with counterclockwise adjustment rotation.

FEATURES

- Adjustments cannot be backed out of the valve.
- Desired settings may be locked down.
- Hardened parts for long life.
- Industry common cavity.
- Aluminum knob option.
- Positive shut-off.
- Linear adjustment.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: 45 lpm (12 gpm) nominal at 7 bar (100 psi) at full open 3.5 turns

Internal Leakage: 0.25 cc/minute (5 drop/minute) max. at shut-off

Adjustment Torque Required: 0.56 Nm (5 inch-pounds) at 7 bar (100 psi);
5.41Nm (48 inch-pounds) at 207 bar (3000 psi)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of
7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

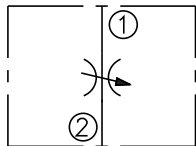
Cavity: VC10-2; See page 9.110.1

Cavity Tool: CT10-2XX; See page 8.600.1

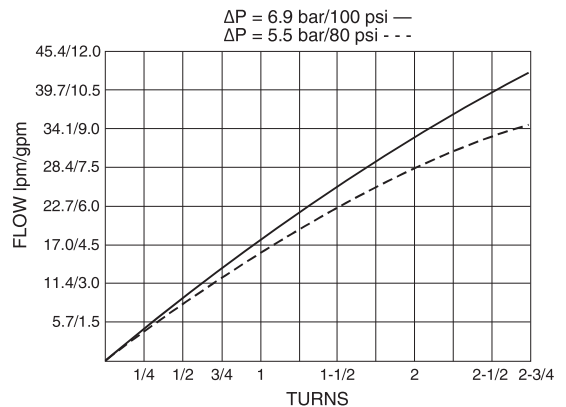
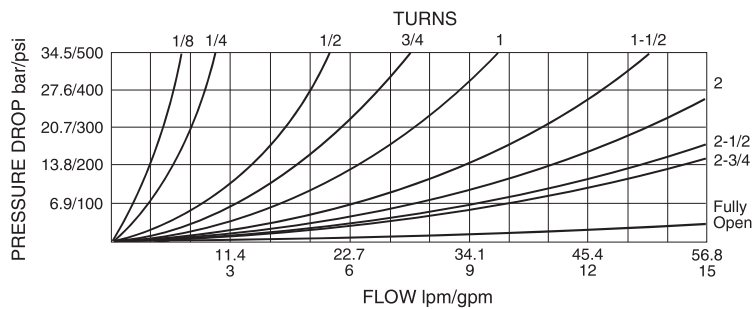
Seal Kit: SK10-2X-M; See page 8.650.1

SYMBOLS

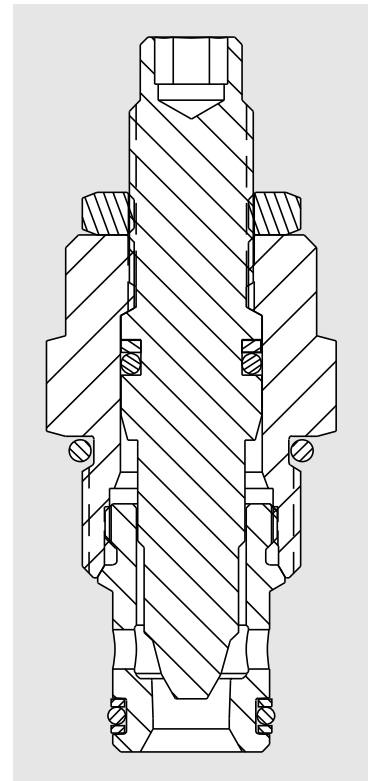
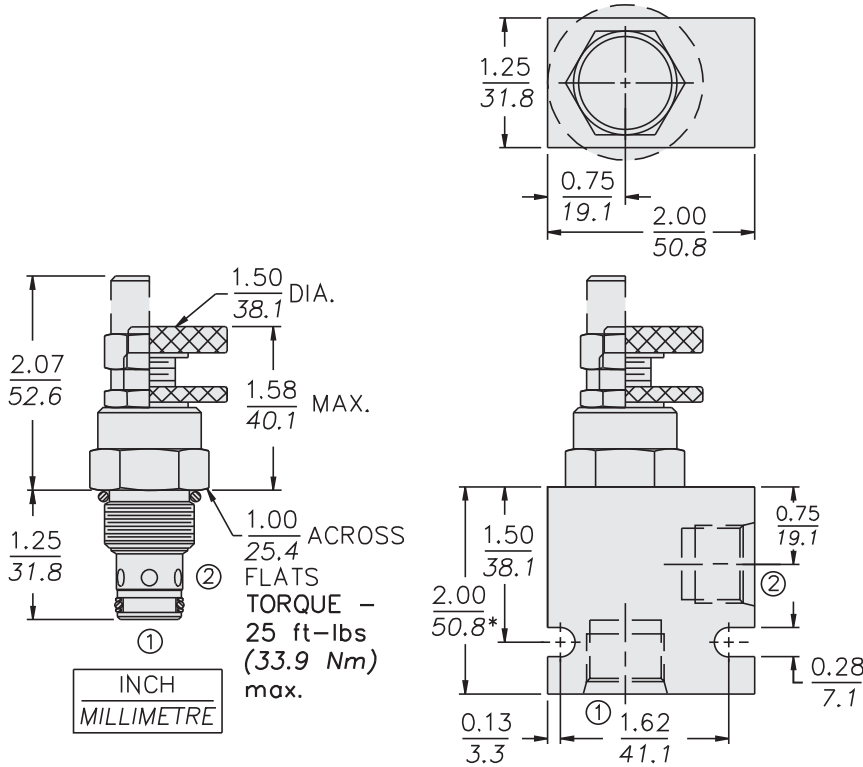
USASI/ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



* BSP BODY - 55.9

MATERIALS

Cartridge: Weight: 0.15 kg. (0.33 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.
 Anodized aluminum knobs.

Standard Ported Body: Weight: 0.16 kg. (0.35 lbs.)
 Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

TO ORDER

NV10-20

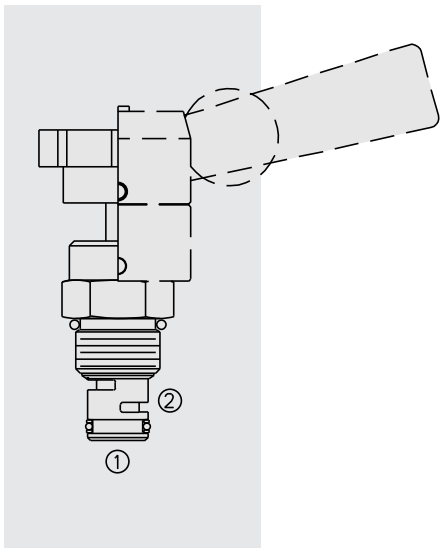
- Adjustment Option**
- A 1/4 in. Hex Allen Head
 - B 1-1/2 in. Dia. Alum. Knob
 - C Option A with Cover Cap
 - D Top Knob with Lock Nut
 - E Top Knob Only
 - L Option C with Lockwire Holes

- Seals**
- N Buna N (Std.)
 - V Fluorocarbon

- Porting**
- 0 Cartridge Only
 - 6T SAE 6
 - 8T SAE 8
 - 2B 1/4 in. BSP*
 - 3B 3/8 in. BSP*
 - 4B 1/2 in. BSP*

*BSP Body;
 U.K. Mfr. Only

MR10-20 Manual Rotary Flow Control



DESCRIPTION

A manually-adjustable variable orifice, offering linear control with adaptability to a variety of adjustment operators (ordered separately).

OPERATION

In extreme clockwise position, valve is fully closed (normally closed). Counterclockwise rotation of 180° gradually increases flow. The first 10° (approx.) of rotation is deadband. The last 15° of rotation increases flow very little. For a normally-open version with counterclockwise rotation gradually decreasing flow, consult factory.

NOTE: Use of the valve in the 1 to 2 direction is **not** recommended if the plastic knob operator is used. Because of the low effort (internal bearing used) adjustment, flow forces may cause setting change. The valve will operate 1 to 2 well with handle-type operator kits.

FEATURES

- Ten-position detent or infinite friction lock options.
- Good linearity in three flow range options.
- Adaptable to a variety of operators.
- Optional lock-down bracket.
- Heavy-duty construction.
- Low effort adjustment.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Max. Flow: See Performance Chart

Flow Rate Delivered at 5.5 bar (80 psi) Differential:

Model Code	Flow
A	49 lpm (13 gpm)
B	34 lpm (9 gpm)
C	22 lpm (6 gpm)

Leakage in "Off" Position at 207 bar (3000 psi): 164 cc/min. (10 cu. in.)

Temperature: -40 to 120°C with standard Buna N seals

Torque Required to Change Position Under Load:

@ 7 bar (100 psi): 3.9 Nm (35 lb.-in.)

@ 240 bar (3500 psi): 5.1 Nm (45 lb.-in.)

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No position restrictions; See page 9.020.1

See page 4.780.2 for operator handles/knobs installation;

See page 4.780.1 for lock-down bracket installation.

Cavity: VC10-2; See page 9.110.1

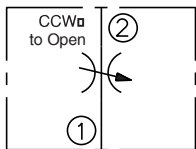
Cavity Tool: CT10-2XX; See page 8.600.1

Seal Kit: SK10-2X-M; See page 8.650.1

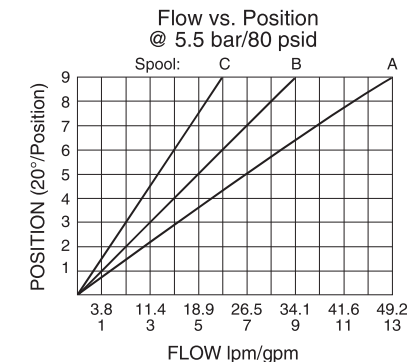
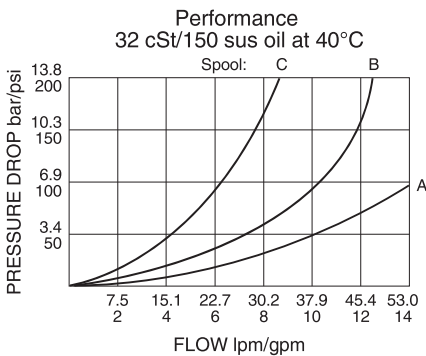
Lock-Down Bracket Kit: Part Number 5399000

SYMBOLS

USASI/ISO:

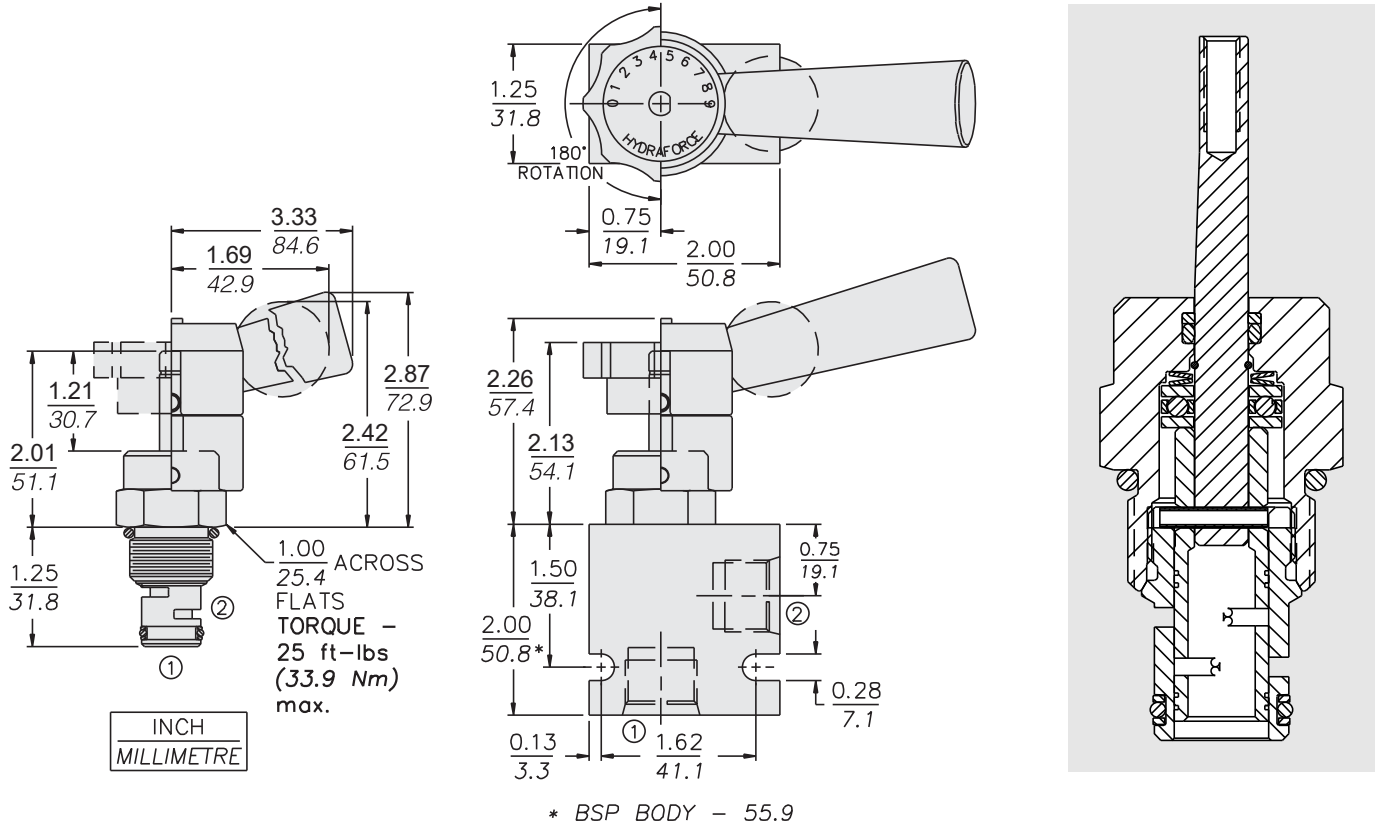


PERFORMANCE (Cartridge Only)



MR10-20

DIMENSIONS



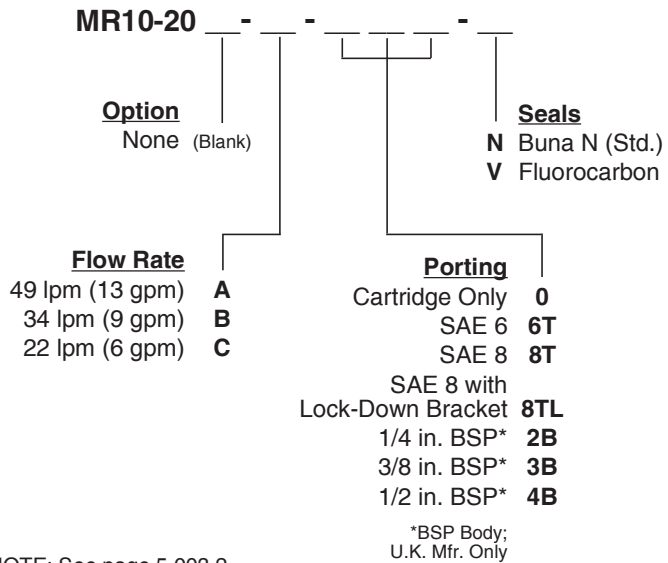
MATERIALS

Cartridge: Weight: 0.12 kg. (0.26 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and Fluorocarbon back-ups standard.

Standard Ported Body: Weight:
0.16 kg. (0.35 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

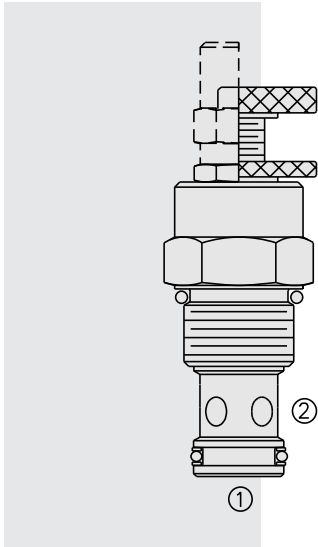
Lever-Type Handle: (Sold Separately)
Weight: 0.18 kg. (0.38 lb.) Steel with hardened work surfaces. Zinc-plated exposed surfaces. Plastic lever arm.

TO ORDER



NOTE: See page 5.003.2 for Flow Control Adjustment Options (ordered separately).

NV12-20 Needle Valve



DESCRIPTION

A screw-in, cartridge-style, variable orifice, hydraulic flow restrictor valve.

OPERATION

The NV12-20 increases its orifice value from fully closed to fully open with counter-clockwise adjustment rotation.

FEATURES

- Adjustments cannot be backed out of the valve.
- Desired settings may be locked down.
- Hardened parts for long life.
- Cost effective cavity.
- Aluminum knob option.
- Positive shut-off.
- Linear adjustment.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: 113.6 lpm (30 gpm) nominal at 7 bar (100 psi) at full open 5-6 turns

Internal Leakage: 0.15 cc/minute (3 drops/minute) max. at shut-off

Adjustment Torque Required: 0.17 Nm (1.5 lb.-in.) at 7 bar (100 psi);
16.9 Nm (150 lb.-in.) at 207 bar (3000 psi)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

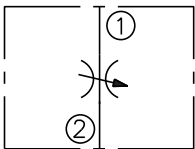
Cavity: VC12-2; See page 9.112.1

Cavity Tool: CT12-2XX; See page 8.600.1

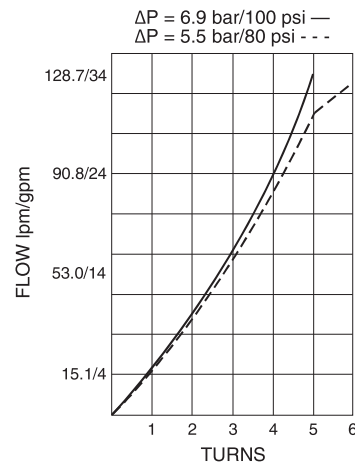
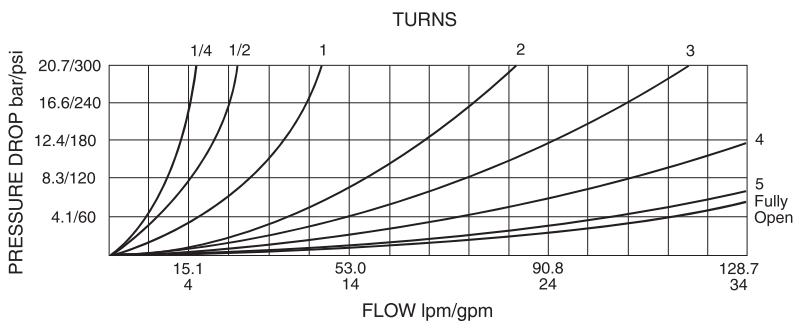
Seal Kit: SK12-2X-M; See page 8.650.1

SYMBOLS

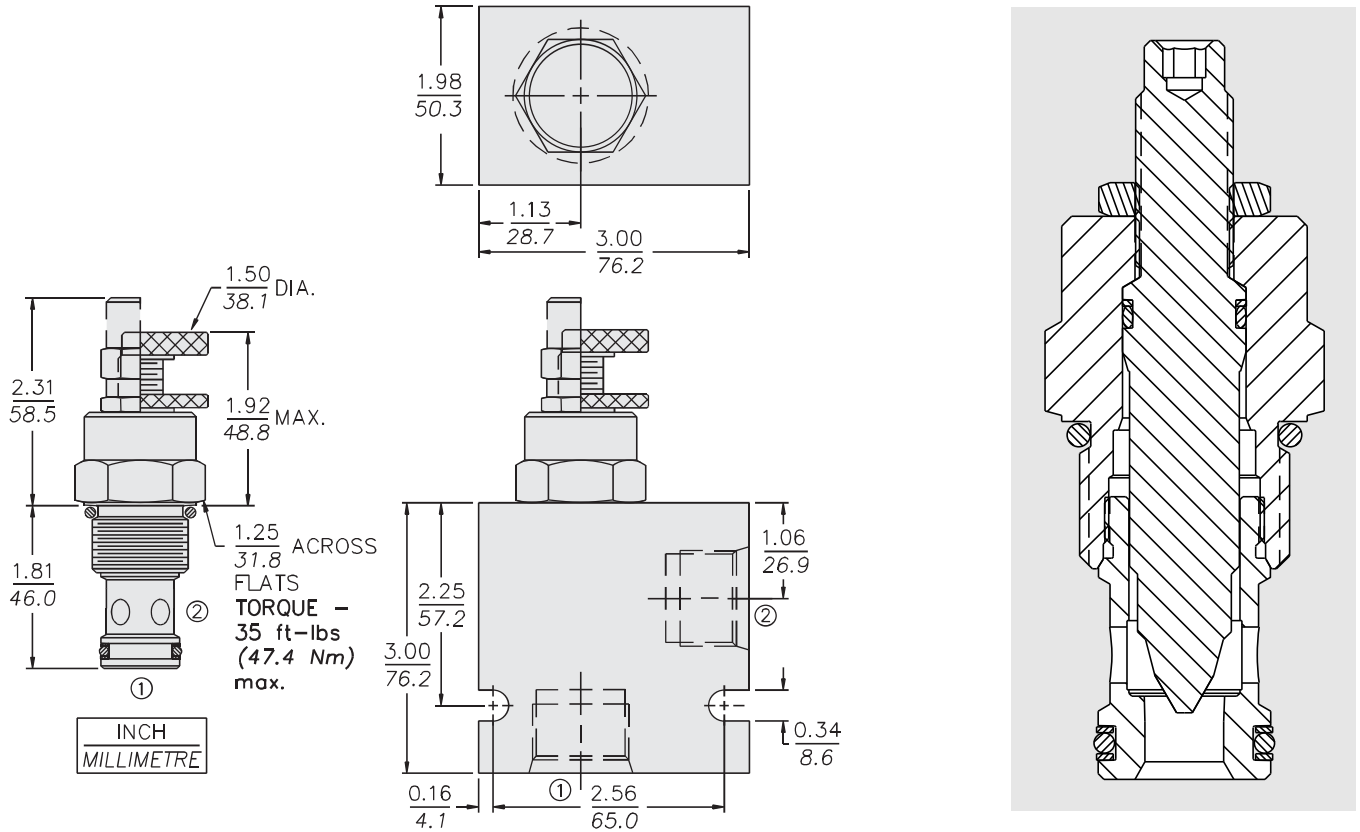
USASI/ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.32 kg. (0.70 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.
 Anodized aluminum knobs.

Standard Ported Body: Weight: 0.57 kg. (1.25 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.012.1

TO ORDER

NV12-20 - -

Adjustment Option

- A 1/4 in. Hex Allen Head
- B 1-1/2 in. Dia. Alum. Knob
- C Option A with Cover Cap
- D Top Knob with Lock Nut
- E Top Knob Only
- L Lockwire Holes

Seals

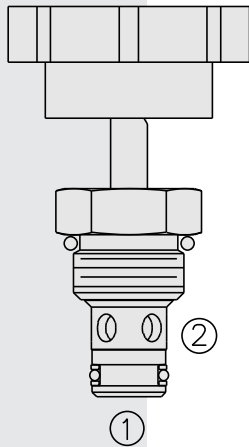
- N Buna N (Std.)
- V Fluorocarbon
- P Polyurethane

Porting

- 0 Cartridge Only
- 10T SAE 10
- 12T SAE 12
- 16T SAE 16
- 4B 1/2 in. BSP*
- 6B 3/4 in. BSP*
- 8B 1 in. BSP*

*BSP Body;
 U.K. Mfr. Only

NV08-21 Needle Valve with Positive Shut-Off



DESCRIPTION

A screw-in, cartridge-style, variable orifice, hydraulic flow restrictor valve. It is intended for applications requiring fine adjustment over multiple turns.

OPERATION

The NV08-21 increases its orifice value from fully closed to fully open with adjustment rotation in the counterclockwise direction. Effective adjustment is linear to eight turns.

Note: This is intended as a low-effort adjustment suitable for operation through linkage. It may be unsuitable in environments where vibration is present.

FEATURES

- Adjustment cannot be backed out of the valve.
- Hardened parts for long life.
- Industry common cavity.
- Fine/low effort adjustment.
- Positive shut-off.
- Linear adjustment.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: See Performance Chart

Internal Leakage: 0.25 cc/minute (5 drops/minute) max. at shut-off

Adjustment Torque Required: 0.34 Nm (3 inch-pounds) at 7 bar (100 psi); 0.68 Nm (6 inch-pounds) at 207 bar (3000 psi)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

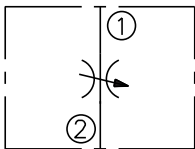
Cavity: VC08-2; See page 9.108.1

Cavity Tool: CT08-2XX; See page 8.600.1

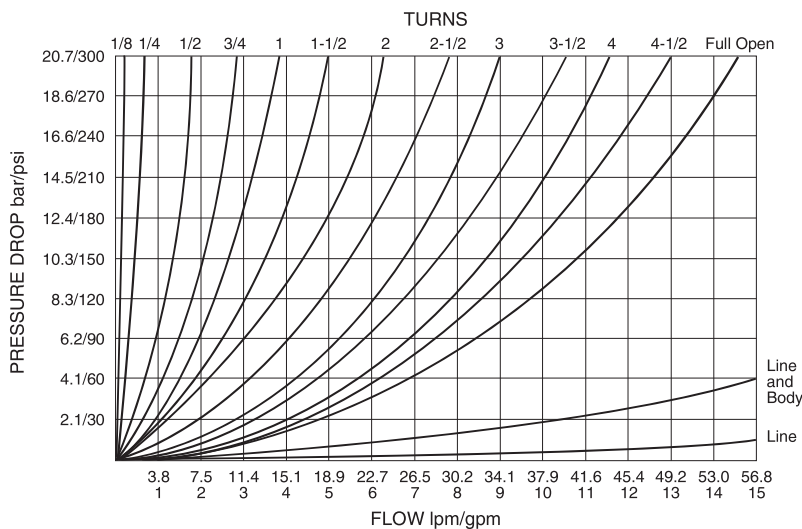
Seal Kit: SK08-2X-M; See page 8.650.1

SYMBOLS

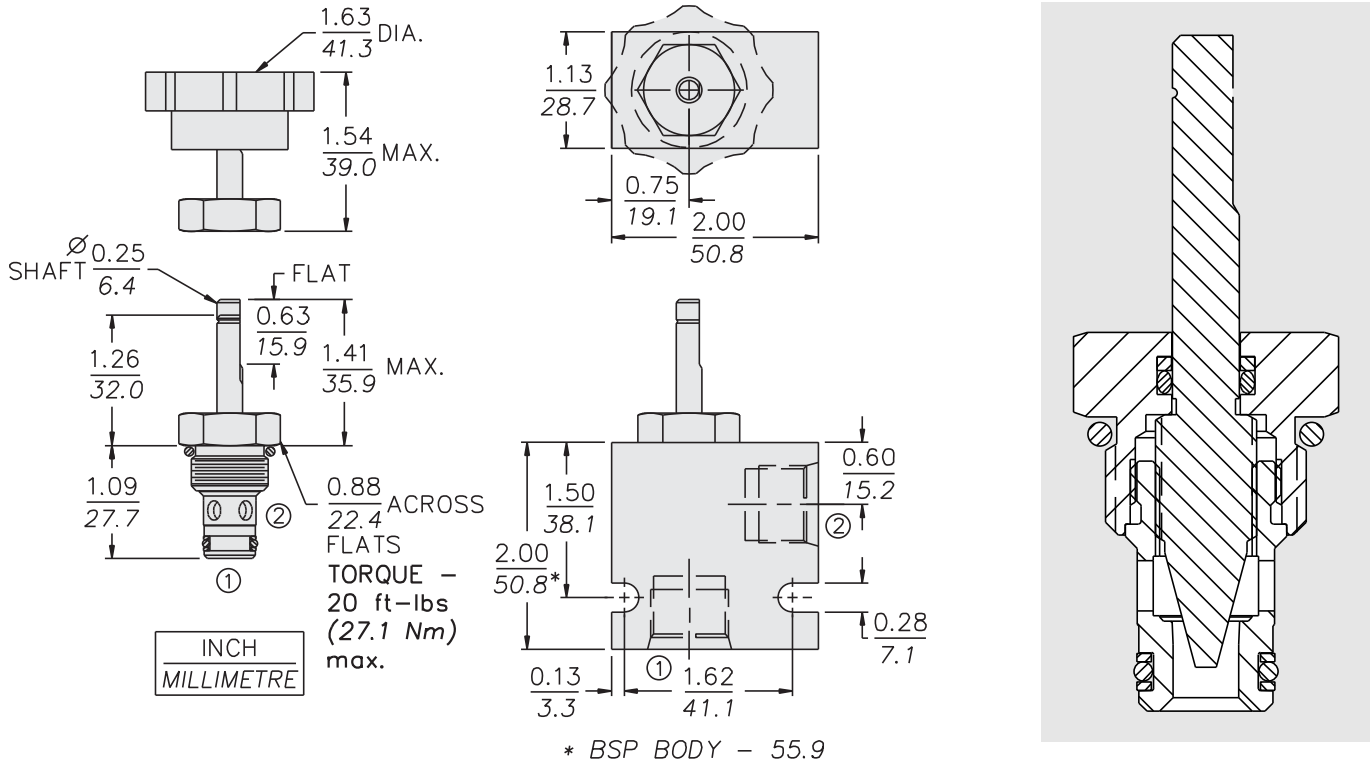
USASI/ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS

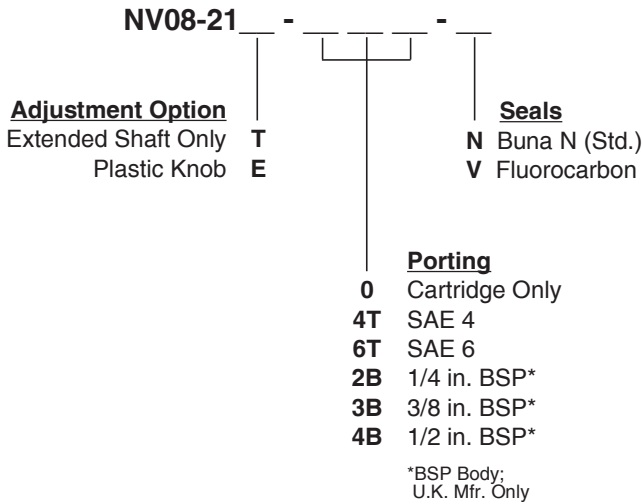


MATERIALS

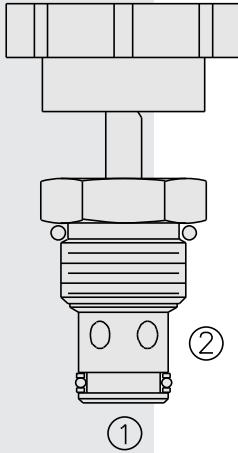
Cartridge: Weight: 0.14 kg. (0.30 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.
 Plastic knob with metal insert.

Standard Ported Body: Weight:
 0.16 kg. (0.35 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.008.1

TO ORDER



NV10-21 Needle Valve with Positive Shut-Off



DESCRIPTION

A screw-in, cartridge-style, variable orifice, hydraulic flow restrictor valve. It is intended for applications requiring fine adjustment over multiple turns.

OPERATION

The NV10-21 increases its orifice value from fully closed to fully open with adjustment rotation in the counterclockwise direction. Effective adjustment is linear to eight turns.

Note: This is intended as a low-effort adjustment suitable for operation through linkage. It may be unsuitable in environments where vibration is present.

FEATURES

- Adjustment cannot be backed out of the valve.
- Hardened parts for long life.
- Industry common cavity.
- Fine/low effort adjustment.
- Positive shut-off.
- Linear adjustment.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: 57 lpm (15 gpm) nominal at 11 bar (160 psi) at full open 9 turns

Internal Leakage: 0.05 cc/minute (1 drop/minute) max. at shut-off

Adjustment Torque Required: 0.34 Nm (3 inch-pounds) at 7 bar (100 psi); 0.68 Nm (6 inch-pounds) at 207 bar (3000 psi)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

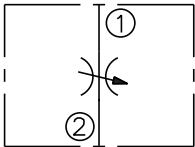
Cavity: VC10-2; See page 9.110.1

Cavity Tool: CT10-2XX; See page 8.600.1

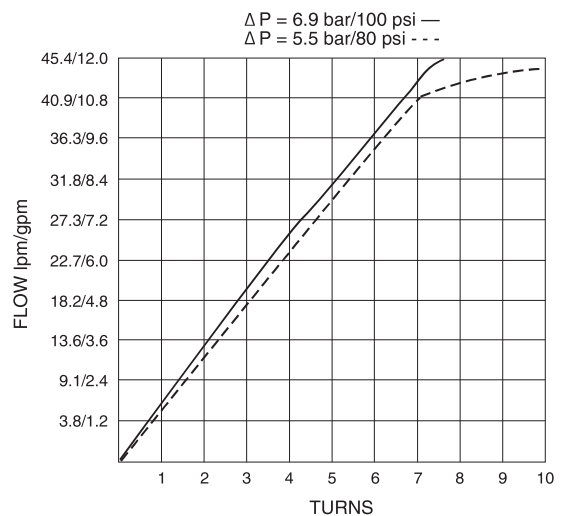
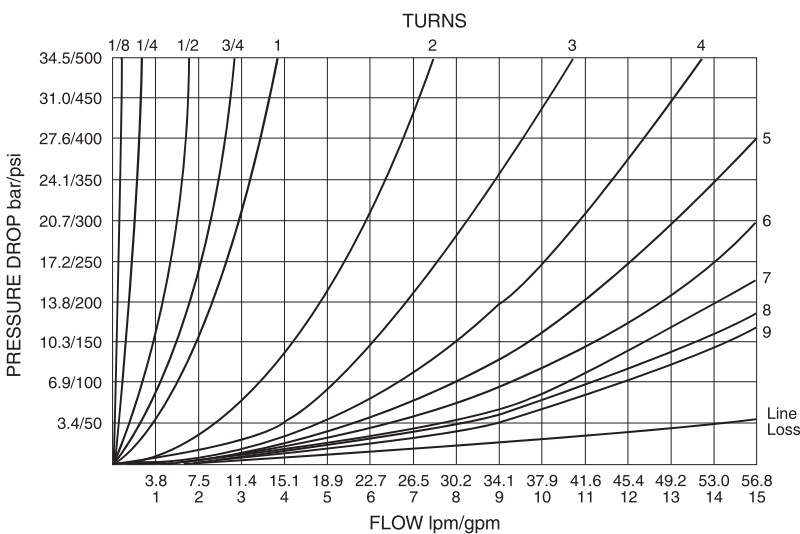
Seal Kit: SK10-2X-M; See page 8.650.1

SYMBOLS

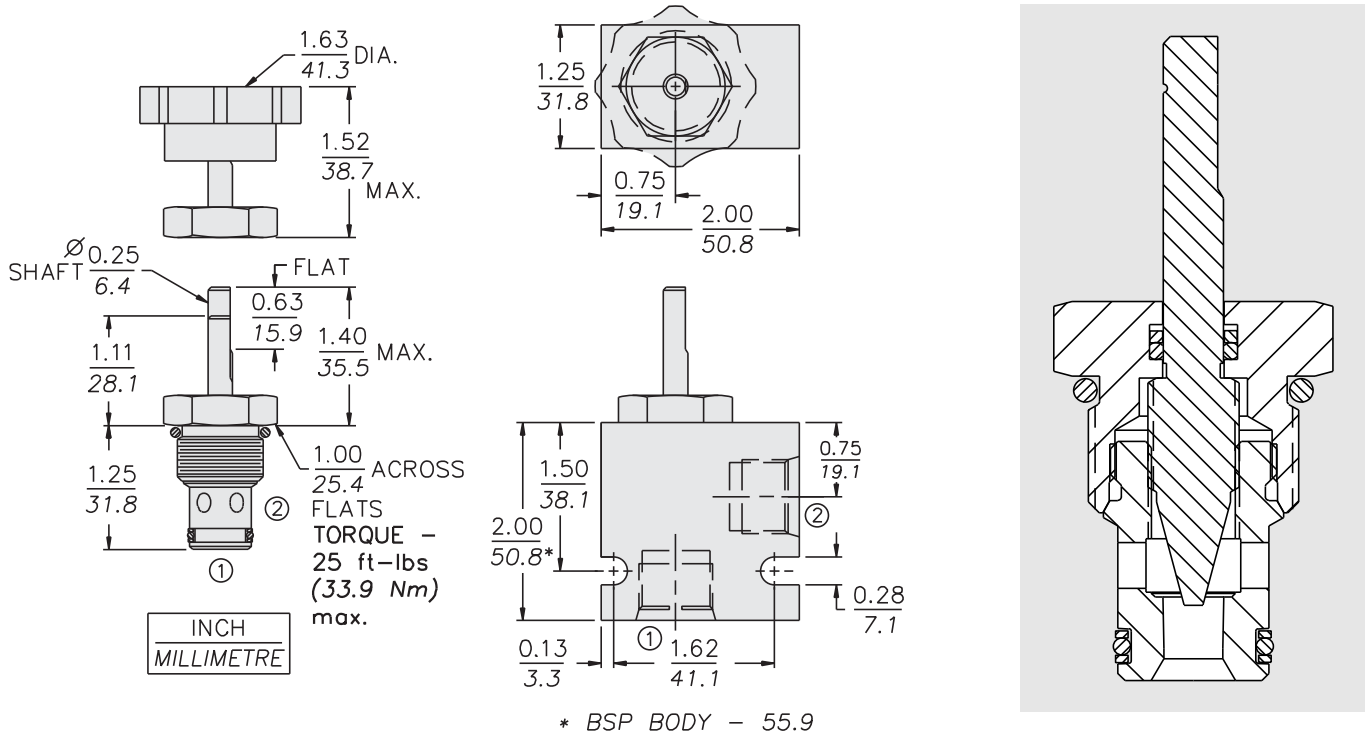
USASI/ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS

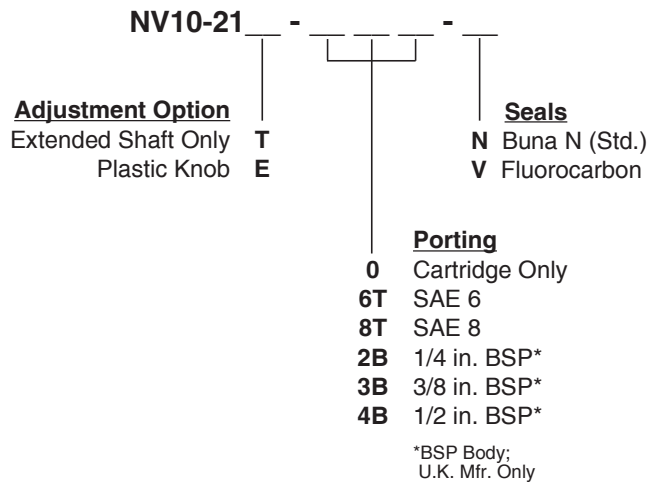


MATERIALS

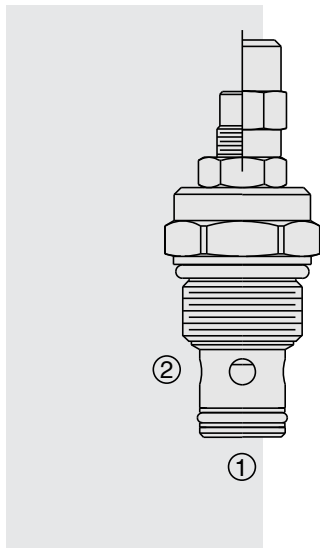
Cartridge: Weight: 0.15 kg. (0.33 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.
Plastic knob with metal insert.

Standard Ported Body: Weight:
0.16 kg. (0.35 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi) Ductile
iron bodies available; dimensions
may differ. See page 8.010.1

TO ORDER



NV10-22 Needle Valve, Lockable



DESCRIPTION

A screw-in, cartridge-style, variable orifice, hydraulic flow restrictor valve that requires only 5-1/2 turns for full adjustment.

OPERATION

The NV10-22 increases its orifice value from fully closed to fully open with counter-clockwise adjustment rotation. Effective adjustment is linear over the 5-1/2 turn adjustment range. Settings are lockable in any position.

FEATURES

- Adjustments cannot be backed out of the valve.
- Desired setting may be locked down.
- Hardened parts for long life.
- Industry common cavity.
- Positive shut-off.
- Linear adjustment.

RATINGS

Operating Pressure: Inlet: 240 bar (3500 psi)

Flow: 57 lpm (15 gpm) nominal at 11 bar (160 psi) at full open 5.5 turns

Internal Leakage: 0.05 cc/minute (1 drop/minute) max. at shut-off

Temperature: -40 to 120°C with Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

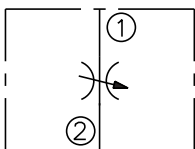
Cavity: VC10-2; See page 9.110.1

Cavity Tool: CT10-2X-X; See page 8.600.1

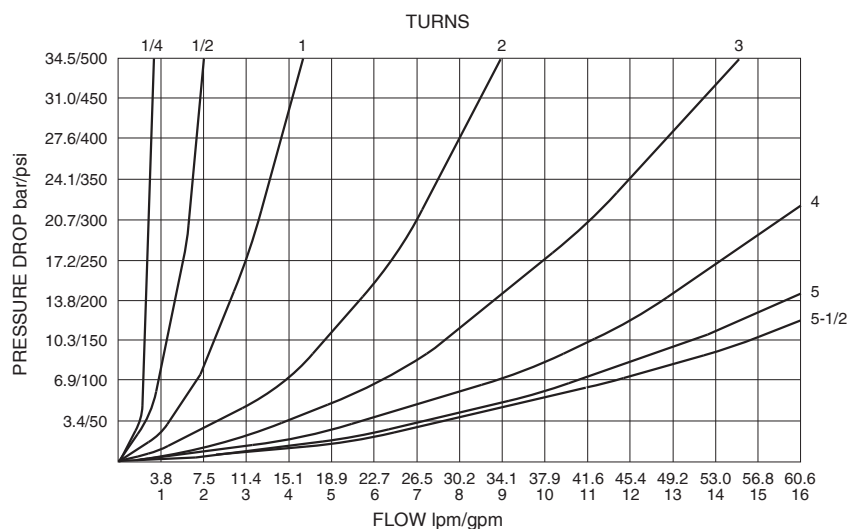
Seal Kit: SK10-2X-M; See page 8.650.1

SYMBOLS

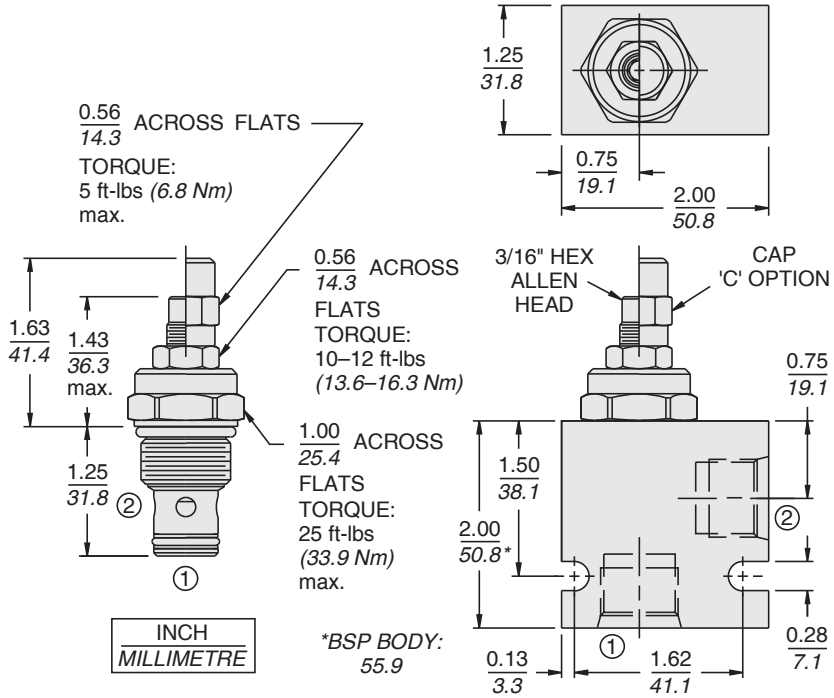
USASI/ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS

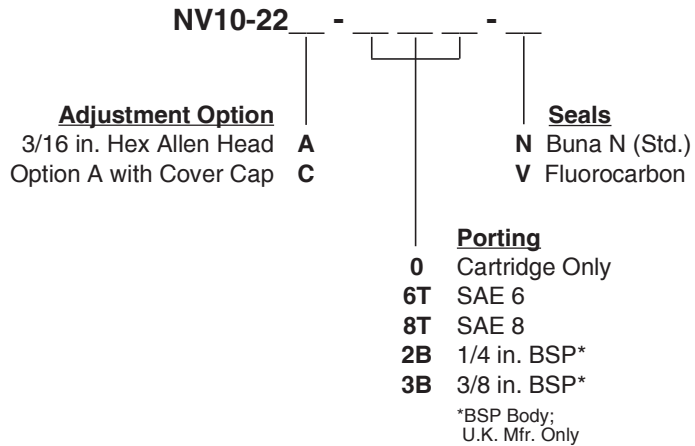


MATERIALS

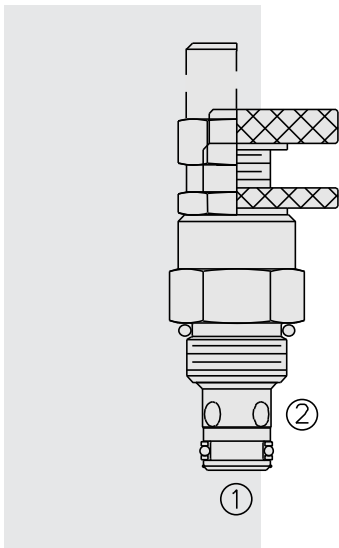
Cartridge: Weight: 0.15 kg. (0.33 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.
Anodized aluminum knobs.

Standard Ported Body: Weight:
0.16 kg. (0.35 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

TO ORDER

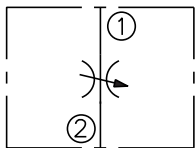


NV08-23 Needle Valve, Fine Adjustment

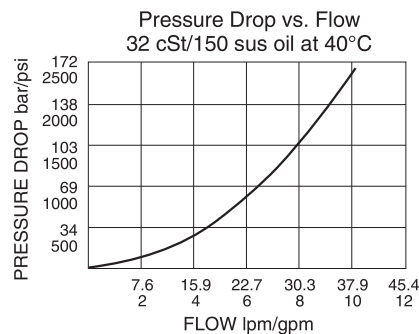


SYMBOLS

USASI/ISO:



PERFORMANCE (Cartridge Only)



DESCRIPTION

A screw-in, cartridge-style, variable orifice, fine adjustment, hydraulic flow restrictor valve.

OPERATION

The NV08-23 increases its orifice value from fully closed to fully open with counterclockwise adjustment rotation.

FEATURES

- Adjustments cannot be backed out of the valve.
- Desired settings may be locked down.
- Hardened parts for long life.
- Aluminum knob option.
- Positive shut-off.
- Linear adjustment.
- Compact size.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: 38 lpm (10 gpm) nominal at 165 bar (2400 psi) fully open

Internal Leakage: 0.25 cc/minute (5 drop/minute) max. at shut-off

Adjustment Torque Required: 0.56 Nm (5 inch-pounds) at 7 bar (100 psi);
5.41 Nm (48 inch-pounds) at 207 bar (3000 psi)

Operating Temperature: -40 to 100°C (-40° to 212°F) with standard Buna N seals
-26 to 204°C (-15°F to 400°F) with Fluorocarbon seals
-54 to 104°C (-65°F to 225°F) with Polyurethane seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

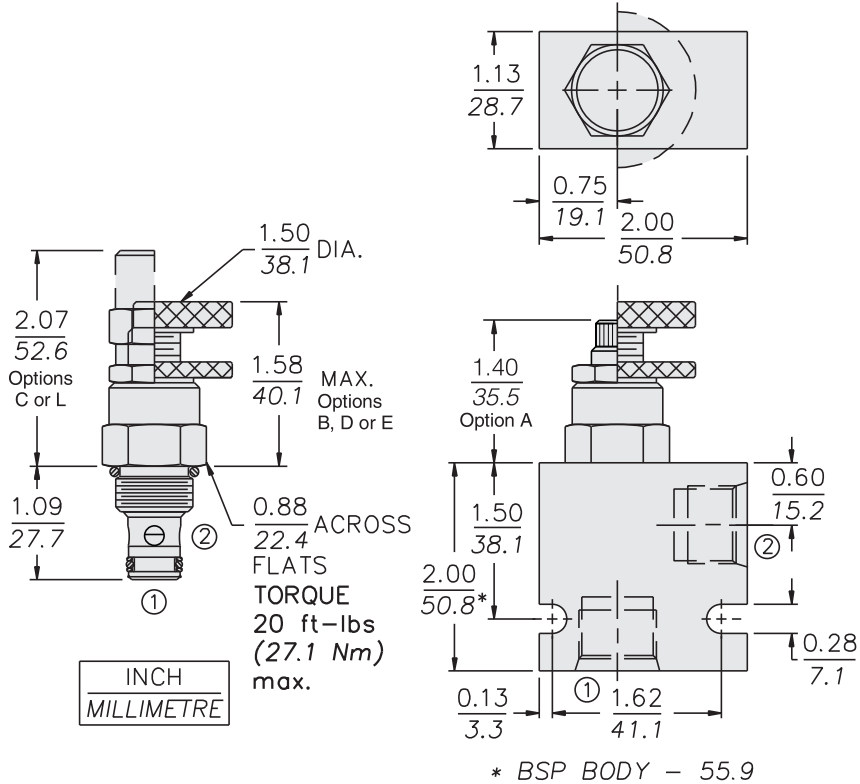
Installation: No restrictions; See page 9.020.1

Cavity: VC08-2; See page 9.108.1

Cavity Tool: CT08-2XX; See page 8.600.1

Seal Kit: SK08-2X-M; See page 8.650.1

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.11 kg. (0.25 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.
 Anodized aluminum knobs.

Standard Ported Body: Weight: 0.16 kg. (0.35 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.008.1

TO ORDER

NV08-23

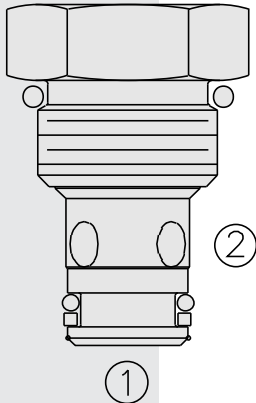
- Adjustment Option**
- A 1/4 in. Hex Allen Head
 - B 1-1/2 in. Dia. Alum. Knobs
 - C Option A with Cover Cap
 - D Top Knob with Lock Nut
 - E Top Knob Only
 - L Lockwire Holes (with Option C)

- Seals**
- N Buna N (Std.)
 - V Fluorocarbon
 - P Polyurethane

- Porting**
- 0 Cartridge Only
 - 4T SAE 4
 - 6T SAE 6
 - 2B 1/4 in. BSP*
 - 3B 3/8 in. BSP*
 - 4B 1/2 in. BSP*

*BSP Body; U.K. Mfr. Only

FC08-20F Flow Control, Orifice Check



DESCRIPTION

A screw-in, cartridge-style, restrictor check valve.

OPERATION

The FC08-20F acts as a restrictor in the 2 to 1 direction. As a check valve it provides free flow from 1 to 2.

FEATURES

- Hardened spool and cage for long life.
- Industry-common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: See Performance Chart

Temperature: -40 to 120°C with Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

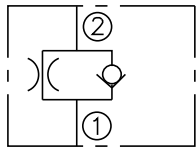
Cavity: VC08-2; See page 9.108.1

Cavity Tool: CT08-2XX; See page 8.600.1

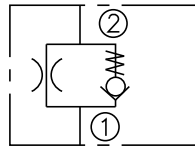
Seal Kit: SK08-2X-T; See page 8.650.1

SYMBOLS

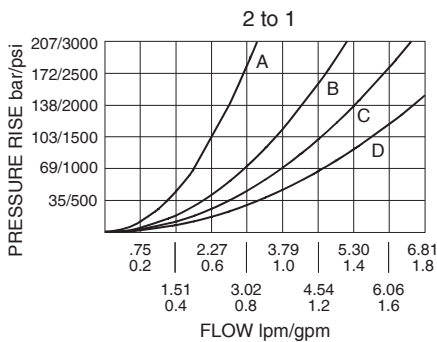
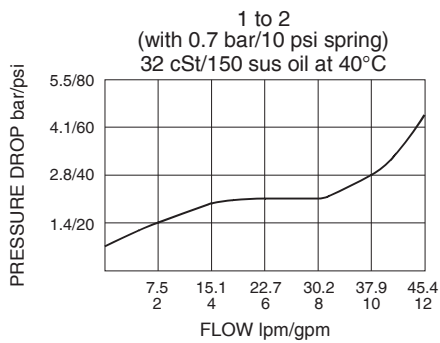
USASI:



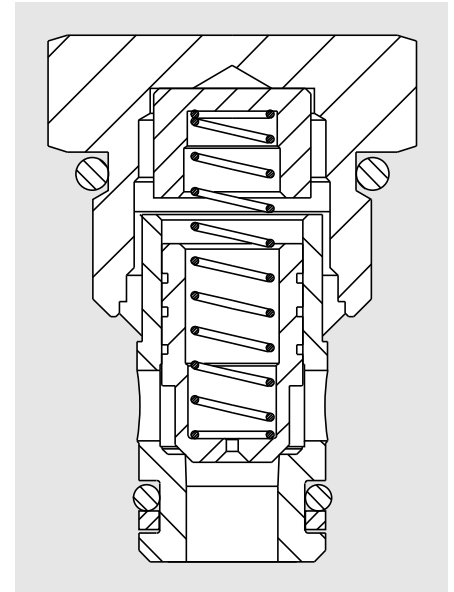
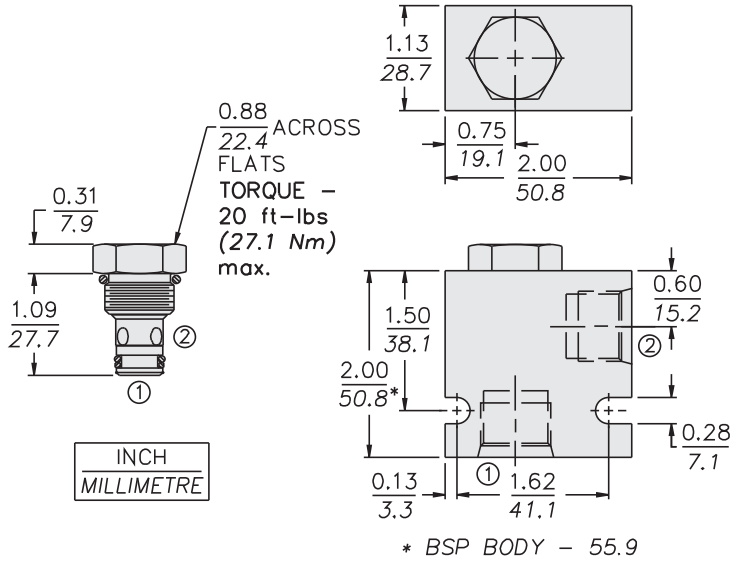
ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.10 kg. (0.23 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-up standard.

Standard Ported Body: Weight:
0.16 kg. (0.35 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.008.1

TO ORDER

FC08-20F -

Porting
Cartridge Only **0**
SAE 4 **4T**
SAE 6 **6T**
1/4 in. BSP* **2B**
3/8 in. BSP* **3B**
1/2 in. BSP* **4B**
*BSP Body; U.K. Mfr. Only

Bias Spring
10 0.7 bar (10 psi) Std.
Optional Bias Springs
considered on OEM request.

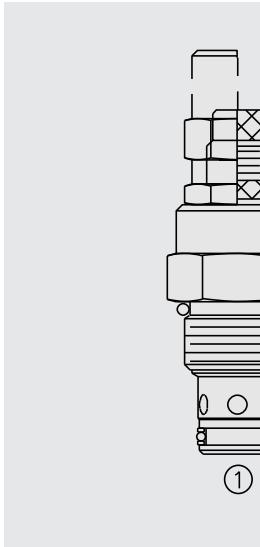
Equivalent Orifice Size

A .030 in.
B .033 in.
C .038 in.
D .042 in.
E .053 in.
F .056 in.
G .047 in.
H .028 in.

Seals

N Buna N (Std.)
V Fluorocarbon

FC10-20 Flow Control



DESCRIPTION

A screw-in, cartridge-style, variable orifice, hydraulic flow control valve with reverse flow check.

OPERATION

The FC10-20 increases its orifice value from fully closed to fully open with counterclockwise adjustment rotation.

FEATURES

- Adjustments cannot be backed out of the valve.
- Desired settings may be locked down.
- Hardened parts for long life.
- Industry common cavity.
- Aluminum knob option.
- Positive shut-off.
- Linear adjustment.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: 45 lpm (12 gpm) nominal at 7 bar (100 psi) at full open 3.0 turns

Internal Leakage: 0.50 cc/minute (10 drops/minute) max. at shut-off

Adjustment Torque Required: 0.34 Nm (3 inch-pounds) at 7 bar (100 psi);
4.50 Nm (40 inch-pounds) at 207 bar (3000 psi)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

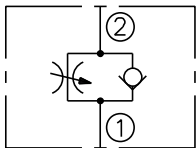
Cavity: VC10-2; See page 9.110.1

Cavity Tool: CT10-2XX; See page 8.600.1

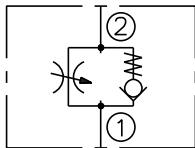
Seal Kit: SK10-2X-M; See page 8.650.1

SYMBOLS

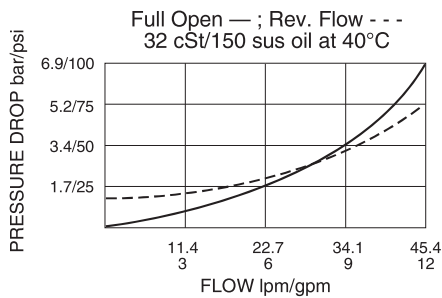
USASI:



ISO:

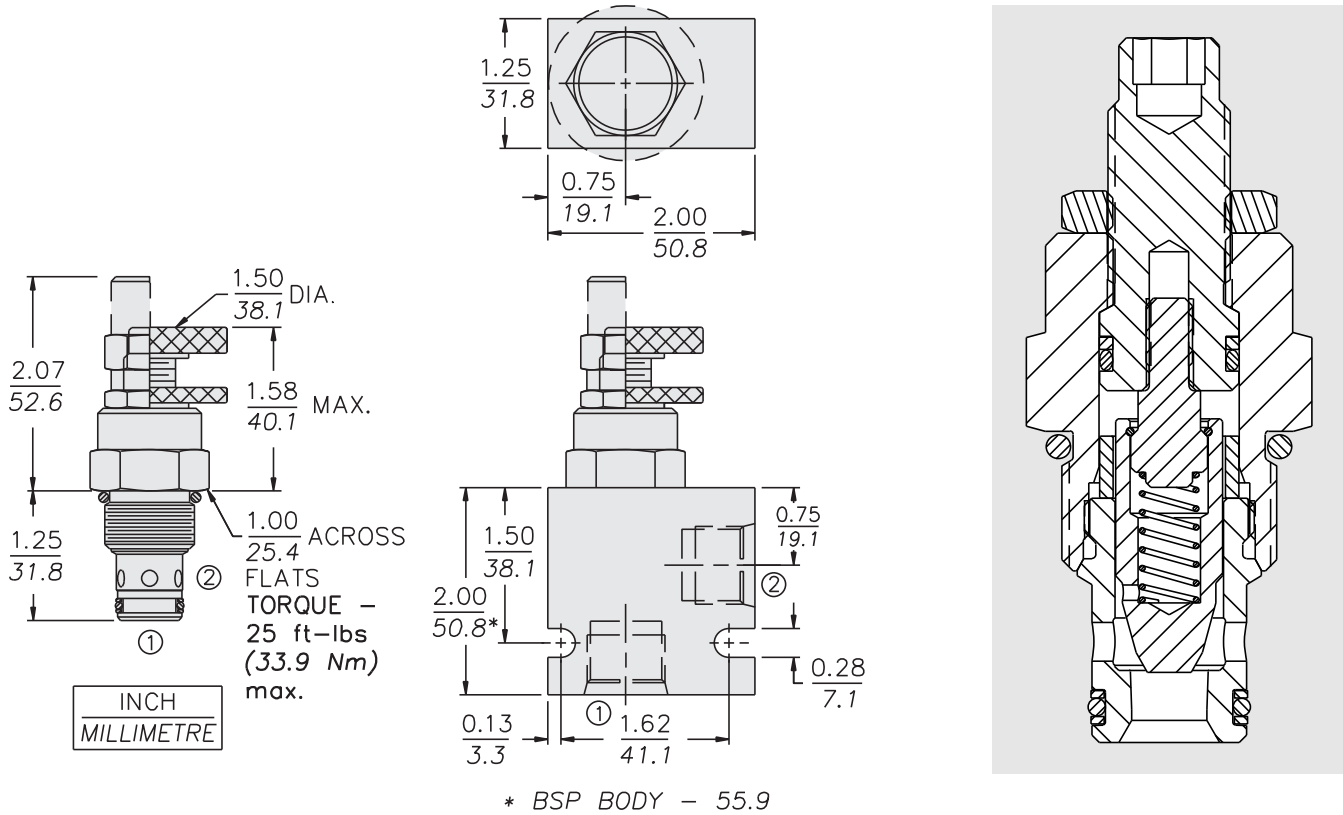


PERFORMANCE (Cartridge Only)



FC10-20

DIMENSIONS

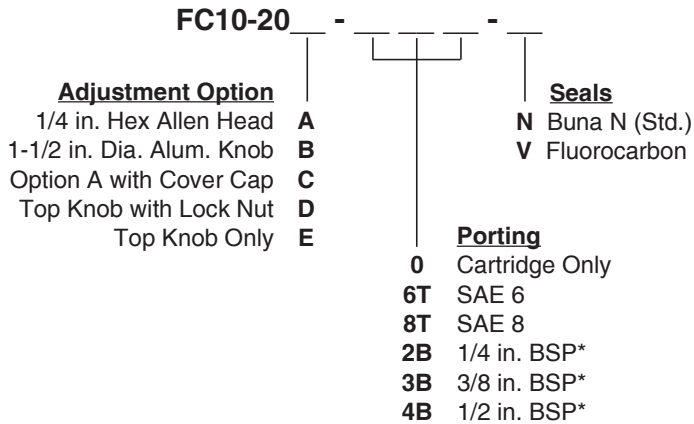


MATERIALS

Cartridge: Weight: 0.17 kg. (0.37 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.
 Anodized aluminum knobs.

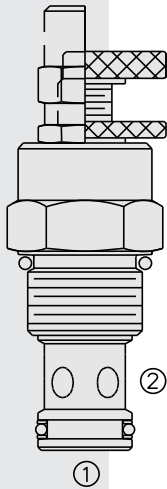
Standard Ported Body: Weight:
 0.16 kg. (0.35 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1.

TO ORDER



*BSP Body; U.K. Mfr. Only

FC12-20 Flow Control



DESCRIPTION

A screw-in, cartridge-style, variable orifice, hydraulic flow control valve with reverse flow check.

OPERATION

The FC12-20 adjusts flow passage from 2 to 1 to full open with counterclockwise rotation.

The cartridge has a fully guided check which is spring-biased closed until sufficient pressure is applied at 1 to open to 2.

FEATURES

- Adjustments cannot be backed out of the valve.
- Desired settings may be locked down.
- Hardened parts for long life.
- Aluminum knob option.
- Positive shut-off.
- Linear adjustment.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: See Performance Chart

Internal Leakage: 0.15 cc/minute (3 drops/minute) max. at 240 bar (3500 psi)

Adjustment Torque:

@ 6.9 bar (100 psi): 0.17 Nm (1.5 lb.-in.)

@ 207 bar (3000 psi): 16.9 Nm (150 lb.-in.)

Standard Bias Spring at Crack: 1.4 bar (20 psi)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

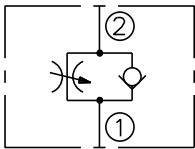
Cavity: VC12-2; See page 9.112.1

Cavity Tool: CT12-2XX; See page 8.600.1

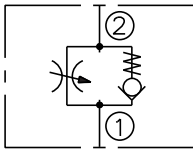
Seal Kit: SK12-2X-M; See page 8.650.1

SYMBOLS

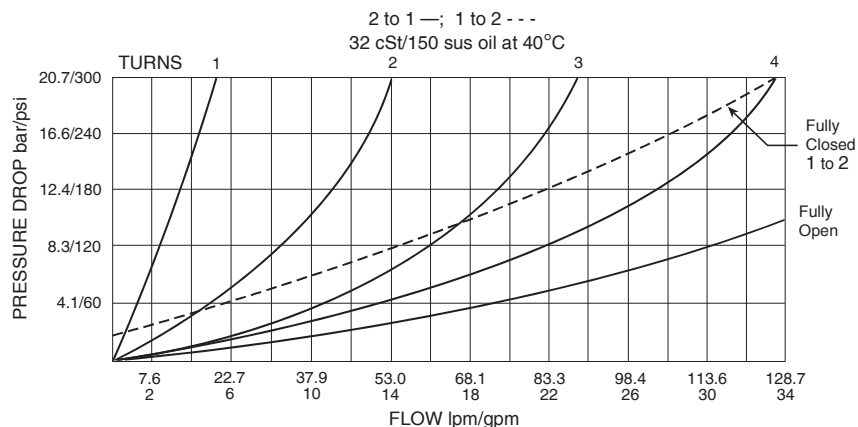
USASI:



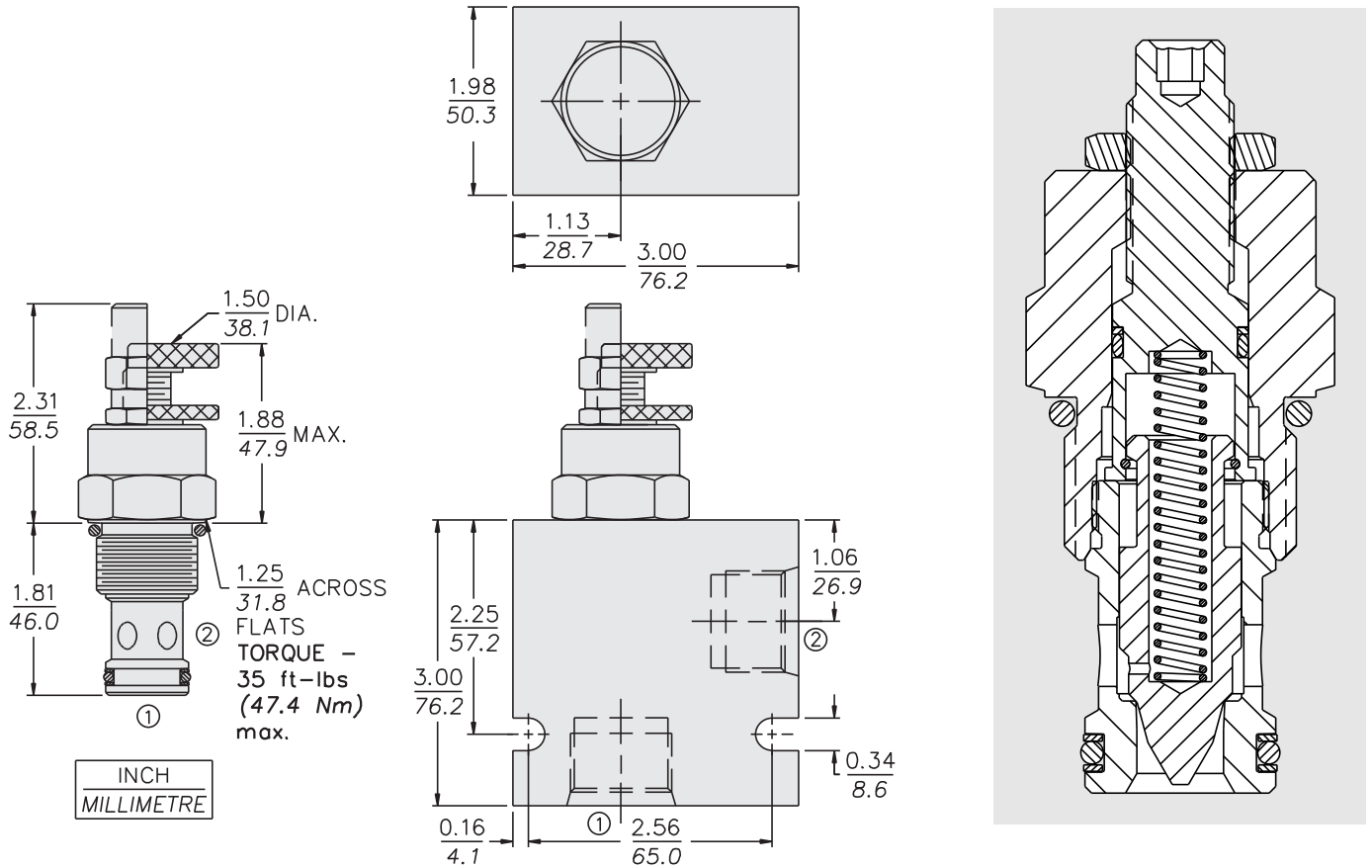
ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.20 kg. (0.45 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-up standard.

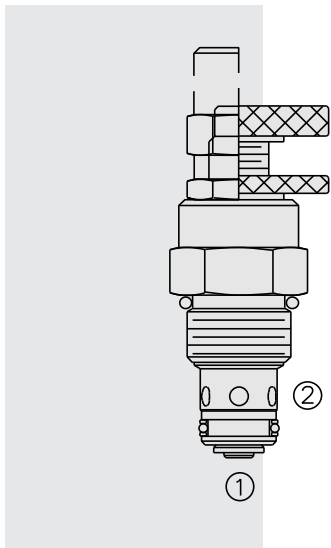
Standard Ported Body: Weight: 0.57 kg. (1.25 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.012.1

TO ORDER

FC12-20 - - -		
Adjustment Option		Seals
1/4 in. Hex Allen Head	A	N Buna N (Std.)
1-1/2 in. Dia. Alum. Knob	B	V Fluorocarbon
Option A with Cover Cap	C	
Top Knob with Lock Nut	D	
Top Knob Only	E	
		Porting
		0 Cartridge Only
		10T SAE 10
		12T SAE 12
		16T SAE 16
		4B 1/2 in. BSP*
		6B 3/4 in. BSP*
		8B 1 in. BSP*

*BSP Body; U.K. Mfr. Only

FC10-21 Flow Control



DESCRIPTION

A screw-in, cartridge-style, variable orifice, hydraulic flow control valve with reverse flow check.

OPERATION

The FC10-21 increases its orifice value from fully closed to fully open with clockwise adjustment rotation.

FEATURES

- Adjustments cannot be backed out of the valve.
- Desired settings may be locked down.
- Hardened parts for long life.
- Industry common cavity.
- Aluminum knob option.
- Positive shut-off.
- Linear adjustment.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: 57 lpm (15 gpm) nominal at 5.5 bar (80 psi) at full open 2.0 turns

Internal Leakage: 0.50 cc/minute (10 drops/minute) max. at shut-off

Adjustment Torque Required: 0.34 Nm (3 inch-pounds) at 7 bar (100 psi);
4.50 Nm (40 inch-pounds) at 207 bar (3000 psi)

Free Reverse Flow Check Bias Spring: See ordering information

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

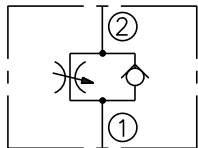
Cavity: VC10-2; See page 9.110.1 (Cavity Variation "A")

Cavity Tool: CT10-2XX; See page 8.600.1

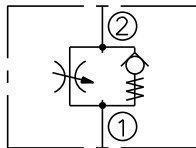
Seal Kit: SK10-2X-M; See page 8.650.1

SYMBOLS

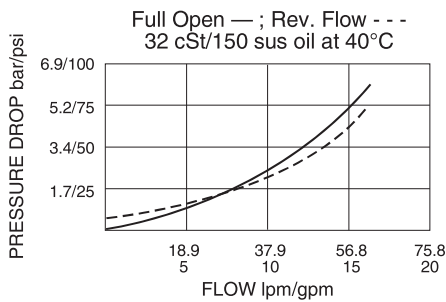
USASI:



ISO:

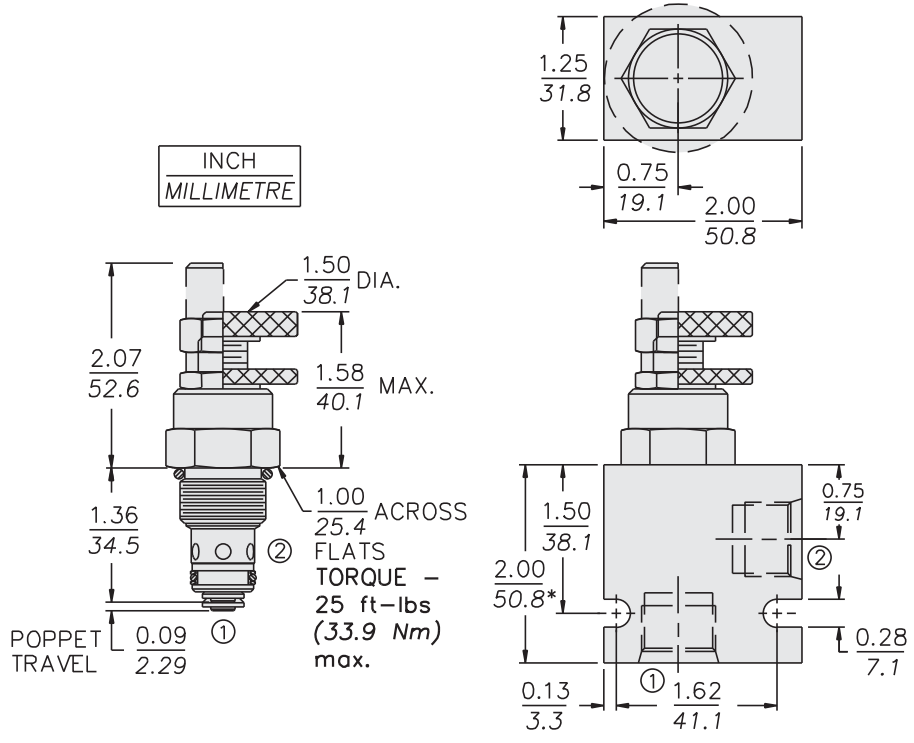


PERFORMANCE (Cartridge Only)



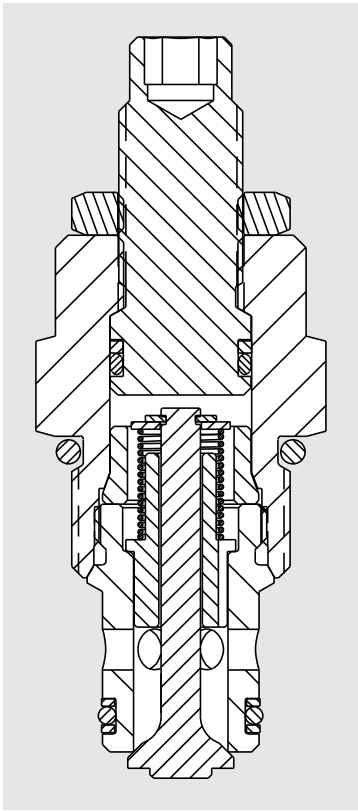
FC10-21

DIMENSIONS



ORIFICE DISCS SHOULD NOT BE USED WITH THIS PRODUCT.

* BSP BODY - 55.9



MATERIALS

Cartridge: Weight: 0.17 kg. (0.37 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.
Anodized aluminum knobs.

Standard Ported Body: Weight: 0.16 kg. (0.35 lbs.)
Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

TO ORDER

FC10-21

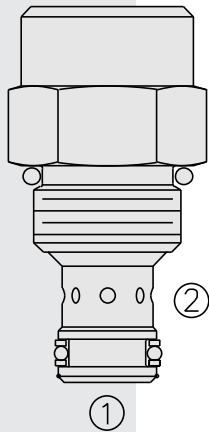
- Adjustment Option**
- A 1/4 in. Hex Allen Head
 - B 1-1/2 in. Dia. Alum. Knob
 - C Option A with Cover Cap
 - D Top Knob with Lock Nut
 - E Top Knob Only

- Spring Setting**
- 05 0.34 bar (5 psid)
 - 25 1.72 bar (25 psid)
 - 55 3.78 bar (55 psid)

- Seals**
- N Buna N (Std.)
 - V Fluorocarbon

- Porting**
- 0 Cartridge Only
 - 8T SAE 8

FR08-20F Regulator, Pressure-Compensated



DESCRIPTION

A screw-in, cartridge-style, fixed orifice, pressure-compensated, hydraulic flow regulating valve (restrictive type).

OPERATION

The **FR08-20F** maintains a constant flow rate out of 2 regardless of load pressure changes in the circuit downstream of 2.

The fixed control orifice is factory preset to customer flow specification. The valve begins to respond to load changes when the flow through the valve creates a pressure differential across the control orifice greater than 5.5 bar (80 psid), with accurate flow maintenance from 7.6 to 240 bar (110 to 3500 psid). Reverse flow (2 to 1) returns through the control orifice and is non-compensated.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Compact size.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow Settings: 0.4 lpm (0.1 gpm) min., 7.5 lpm (2.0 gpm) max.

Standard Compensator Bias Spring: 5.5 bar (80 psid) differential

Flow Maintenance Setting Range: 0.2 to 1.8 lpm (0.05 to 0.49 gpm) to accuracy of $\pm 15\%$; 1.9 to 7.5 lpm (0.5 to 2.0 gpm) to accuracy of $\pm 10\%$

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

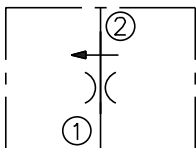
Cavity: VC08-2; See page 9.108.1

Cavity Tool: CT08-2XX; See page 8.600.1

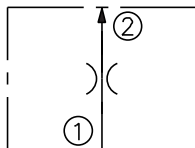
Seal Kit: SK08-2X-M; See page 8.650.1

SYMBOLS

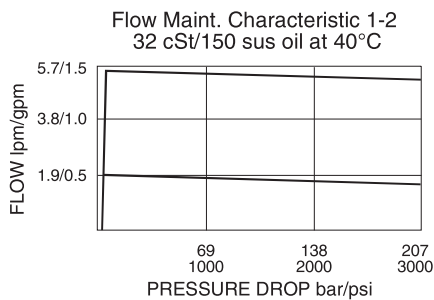
USASI:



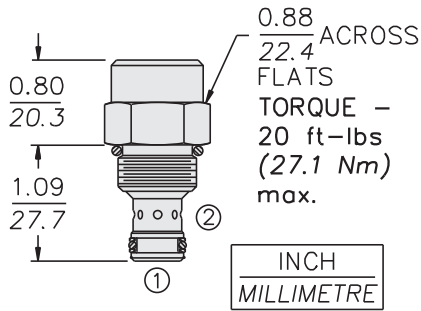
ISO:



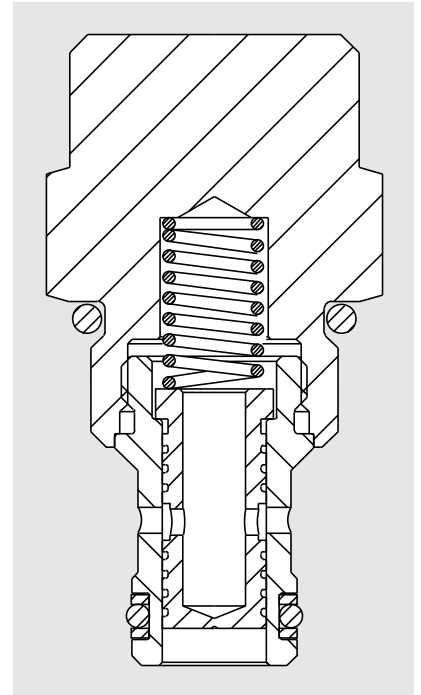
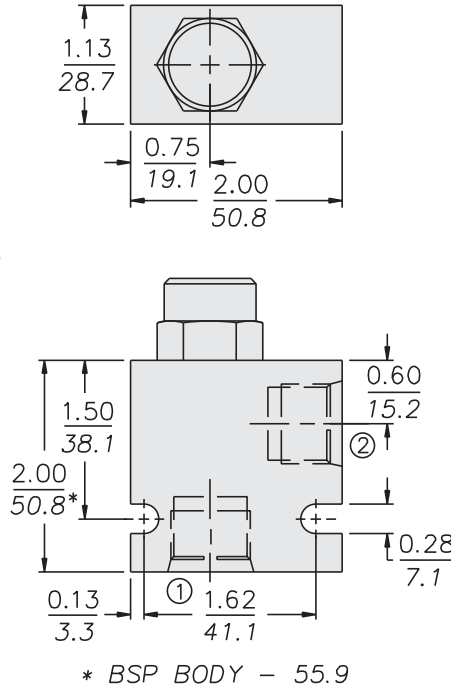
PERFORMANCE (Cartridge Only)



DIMENSIONS



ORIFICE DISCS SHOULD NOT BE USED WITH THIS PRODUCT.

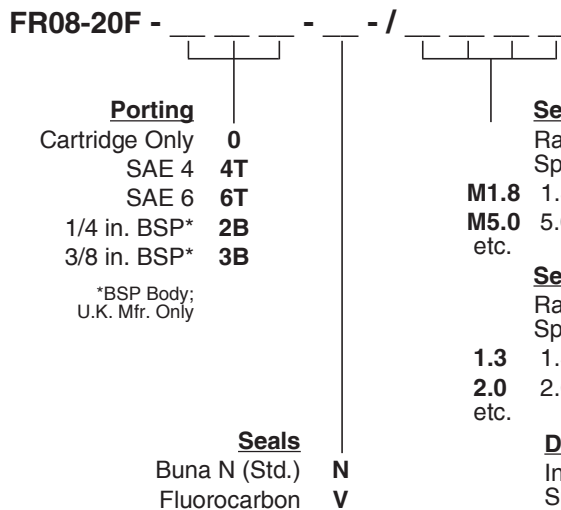


MATERIALS

Cartridge: Weight: 0.07 kg. (0.15 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and fluorocarbon back-ups standard.

Standard Ported Body: Weight: 0.16 kg. (0.35 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.008.1

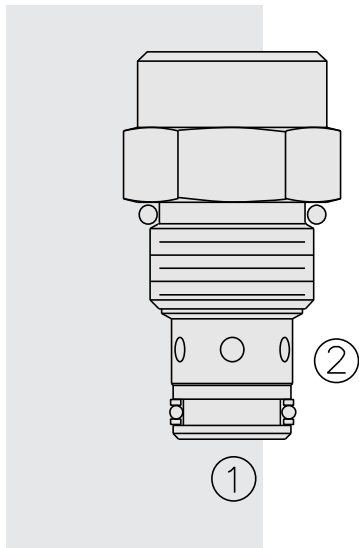
TO ORDER



Note: Compensator spring values may be varied for OEM application to provide changed differential pressure/output flow relationships. Consult factory.

Note: Minimum drill diameter is 0.020 in. For smaller orifice sizes consult factory.

FR10-20F Regulator, Pressure-Compensated



DESCRIPTION

A screw-in, cartridge-style, fixed orifice, pressure compensated, hydraulic flow regulating valve (restrictive type).

OPERATION

The **FR10-20F** maintains a constant flow rate out of 2 regardless of load pressure changes in the circuit downstream of 2.

The fixed control orifice is factory preset to customer flow specification. The valve begins to respond to load changes when the flow through the valve creates a pressure differential across the control orifice greater than 5.5 bar (80 psid), with accurate flow maintenance from 7.6 to 240 bar (110 to 3500 psid). Reverse flow (2 to 1) returns through the control orifice and is non-compensated.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow Settings: 2.1 lpm (0.05 gpm) min., 22.7 lpm (6.0 gpm) max.

Flow Maintenance: 0.37 to 1.85 lpm (0.1 to 0.49 gpm) settings $\pm 20\%$

1.89 to 5.63 lpm (0.5 to 1.49 gpm) settings $\pm 15\%$

5.68 to 22.71 lpm (1.5 to 6.00 gpm) settings $\pm 10\%$

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

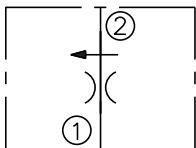
Cavity: VC10-2; See page 9.110.1

Cavity Tool: CT10-2XX; See page 8.600.1

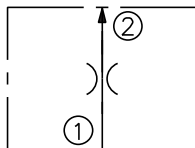
Seal Kit: SK10-2X-M; See page 8.650.1

SYMBOLS

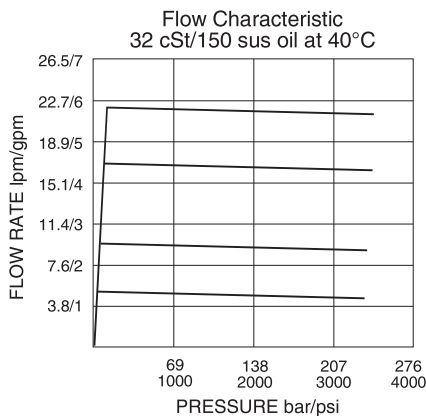
USASI:



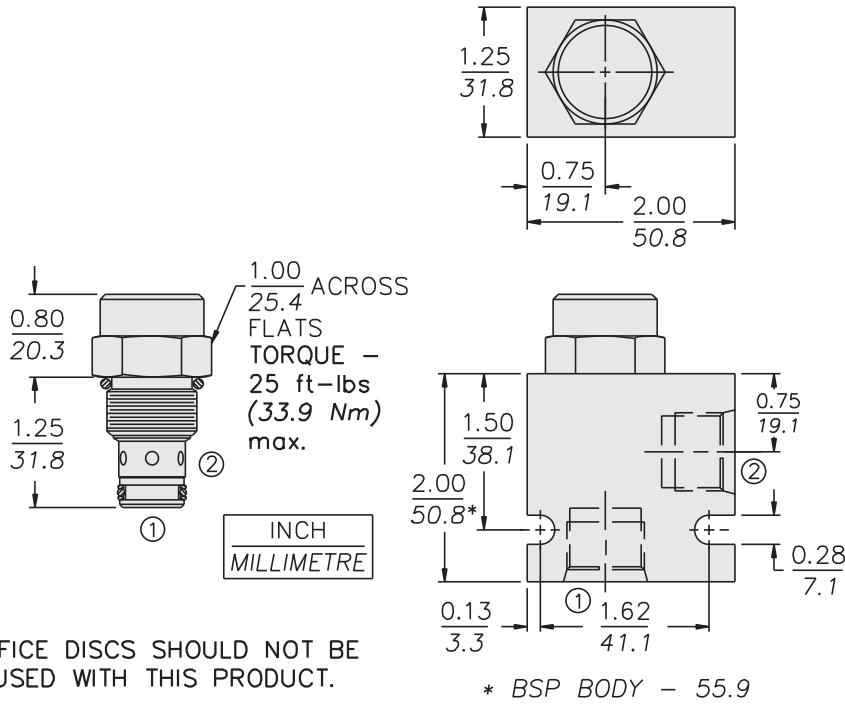
ISO:



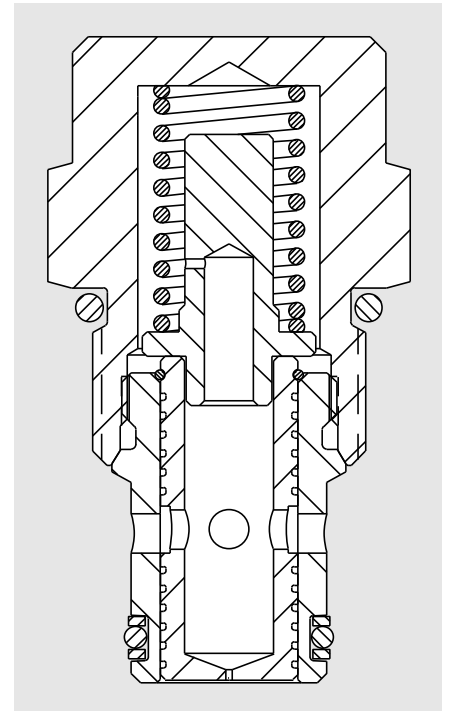
PERFORMANCE (Cartridge Only)



DIMENSIONS



ORIFICE DISCS SHOULD NOT BE USED WITH THIS PRODUCT.

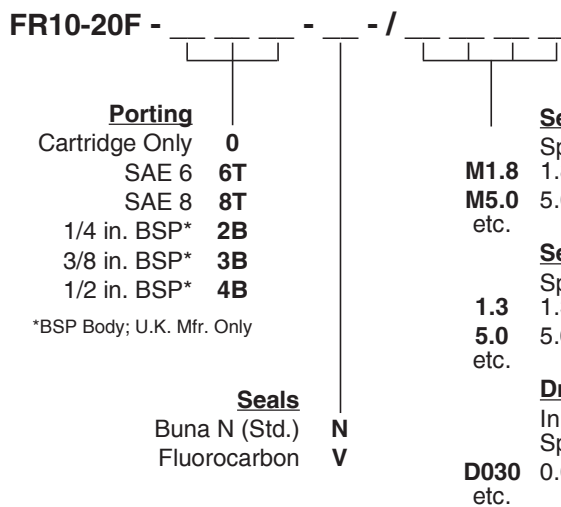


MATERIALS

Cartridge: Weight: 0.08 kg. (0.18 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 0.16 kg. (0.35 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi) Ductile iron bodies available; dimensions may differ. See page 8.010.1.

TO ORDER



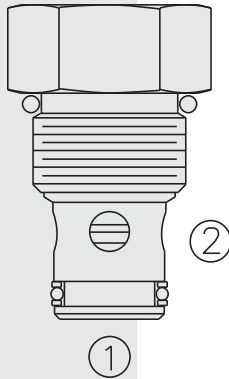
Setting in lpm
Specify, for example:
M1.8 1.8 lpm
M5.0 5.0 lpm
etc.

Setting in gpm
Specify, for example:
1.3 1.3 gpm
5.0 5.0 gpm
etc.

Drill Size Method
In thousandths of an inch.
Specify, for example:
D030 0.030 in. control orifice hole
etc.

Note: Minimum drill diameter is 0.020 in.
For smaller orifice sizes consult factory.

FR50-20F Regulator, Pressure-Compensated,



DESCRIPTION

A screw-in, cartridge-style, fixed orifice, pressure compensated, hydraulic flow regulating valve (restrictive type) for operation up to 345 bar (5000 psi).

OPERATION

The **FR50-20F** maintains a constant flow rate from 1 to 2 regardless of load pressure changes in the circuit downstream of 2.

The fixed control orifice is factory preset to customer flow specification. The valve begins to respond to load changes when the flow through the valve creates a pressure differential across the control orifice greater than 5.5 bar (80 psi), with accurate flow maintenance from 7.6 to 345 bar (110 to 5000 psi). Reverse flow (2 to 1) returns through the control orifice and is non-compensated.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: 345 bar (5000 psi)

Flow Settings: 0.4 lpm (0.1 gpm) minimum; 22.7 lpm (6.0 gpm) maximum

Flow Maintenance: 0.37 to 1.85 lpm (0.1 to 0.49 gpm) settings $\pm 20\%$

1.89 to 5.63 lpm (0.5 to 1.49 gpm) settings $\pm 15\%$

5.68 to 22.71 lpm (1.5 to 6.00 gpm) settings $\pm 10\%$

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

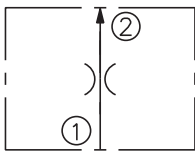
Installation: No restrictions; See page 9.020.1

Cavity: VC10-2; See page 9.110.1

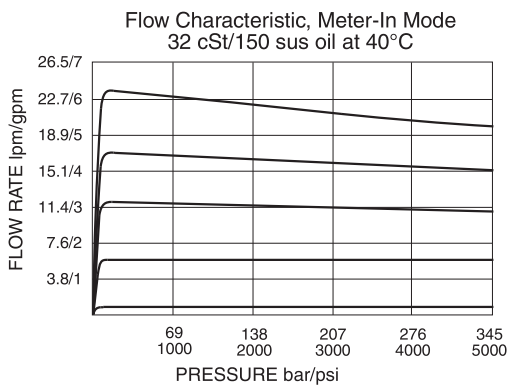
Cavity Tool: CT10-2XX; See page 8.600.1

Seal Kit: SK10-2X-M; See page 8.650.1

ISO SYMBOL



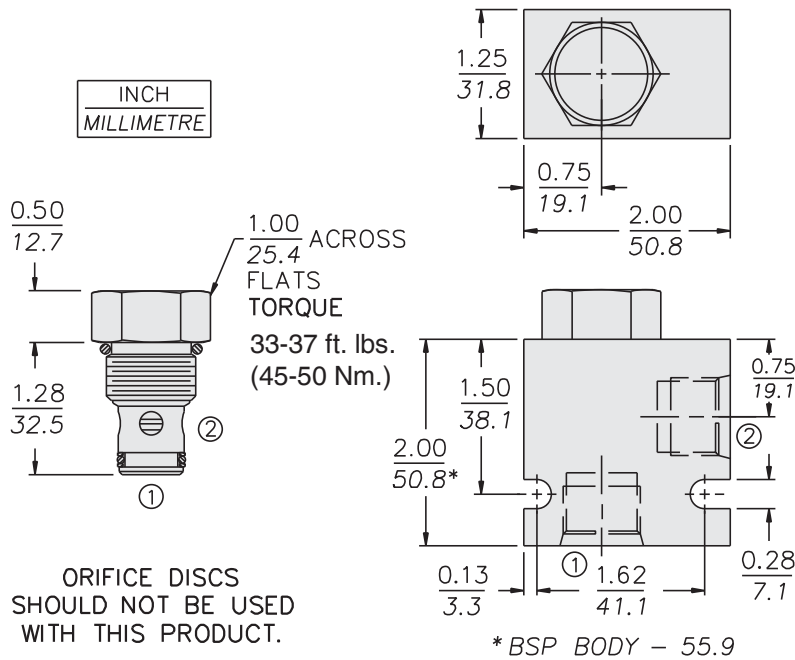
PERFORMANCE (Cartridge Only)



High Pressure

FR50-20F

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.1 kg. (0.21 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Standard Ported Body: Weight:
0.16 kg. (0.35 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi) Ductile
iron bodies available; dimensions
may differ. See page 8.010.1.

TO ORDER

FR50-20F - - - / - - -

Porting

Cartridge Only **0**
SAE 6 **6T**
SAE 8 **8T**
1/4 in. BSP* **2B**
3/8 in. BSP* **3B**
1/2 in. BSP* **4B**

*BSP Body; U.K. Mfr. Only

Seals

Buna N (Std.) **N**
Fluorocarbon **V**
Polyurethane **P**

Polyurethane seals are required for
operation over 241 bar (3500 psi)

Setting in lpm

Range: 0.8 to 22.7 lpm
Specify, for example:

M1.8
M5.0
etc.

Setting in gpm

Range: 0.2 to 6.0 gpm
Specify, for example:

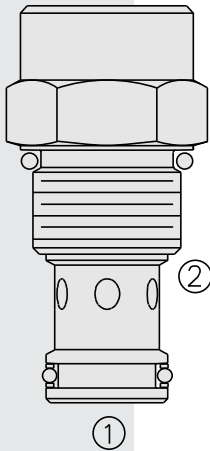
1.3
5.0
etc.

Drill Size Method

Dia. in thousandths of an inch.
Range is 0.021 to 0.154 in.
Specify, for example:

D030
etc.

FR12-20F Regulator, Pressure-Compensated



DESCRIPTION

A screw-in, cartridge-style, fixed orifice, pressure-compensated, hydraulic flow regulating valve (restrictive type).

OPERATION

The **FR12-20F** maintains a constant flow rate out of 2 regardless of load pressure changes in the circuit downstream of 2.

The fixed control orifice is factory preset to customer flow specification. The valve begins to respond to load changes when the flow through the valve creates a pressure differential across the control orifice greater than 5.5 bar (80 psid), with accurate flow maintenance from 7.6 to 240 bar (110 to 3500 psid). Reverse flow (2 to 1) returns through the control orifice and is non-compensated.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Cost-effective cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow Settings: 4 lpm (1 gpm) min; 55 lpm (14.5 gpm) max.

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

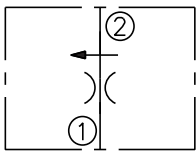
Cavity: VC12-2; See page 9.112.1

Cavity Tool: CT12-2XX; See page 8.600.1

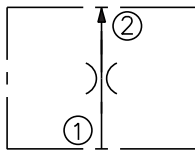
Seal Kit: SK12-2X-M; See page 8.650.1

SYMBOLS

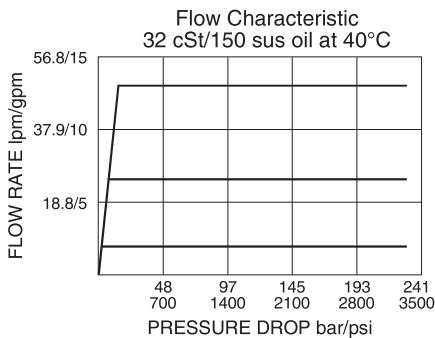
USASI:



ISO:

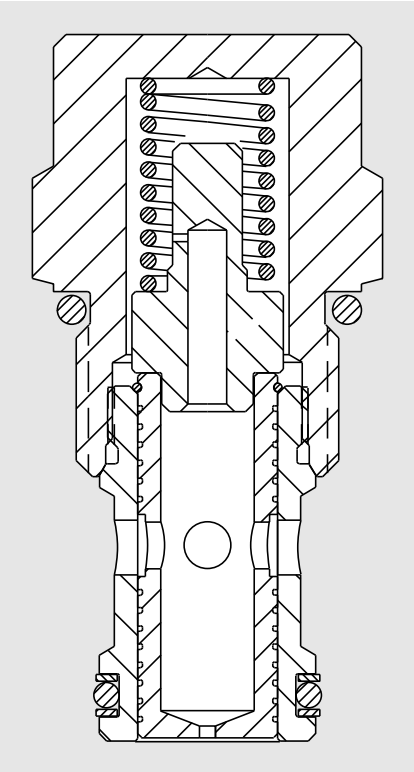
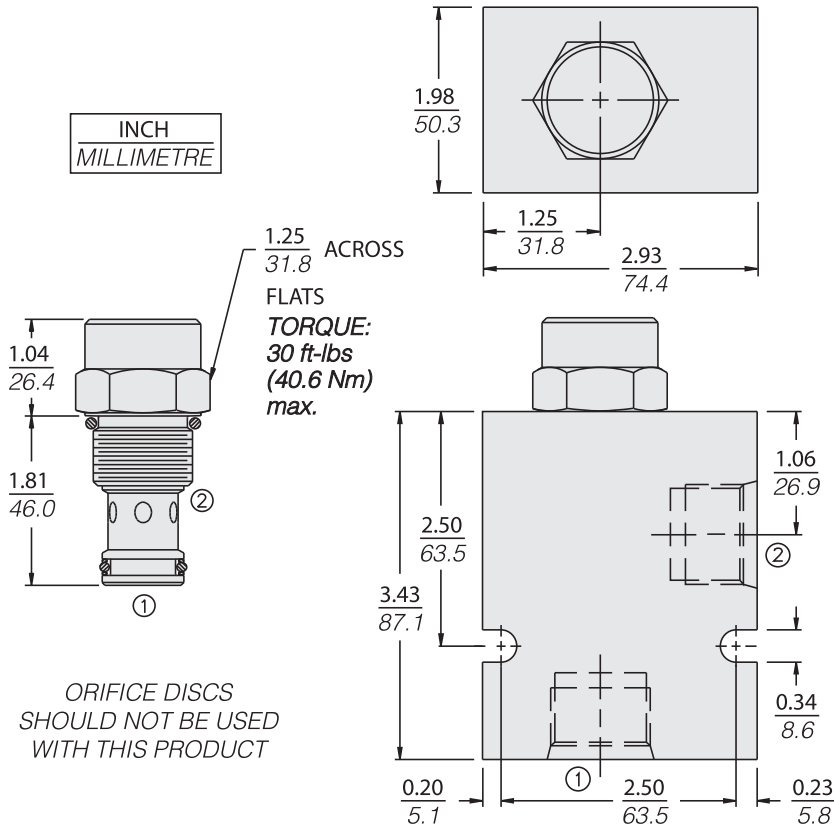


PERFORMANCE



FR12-20F

DIMENSIONS

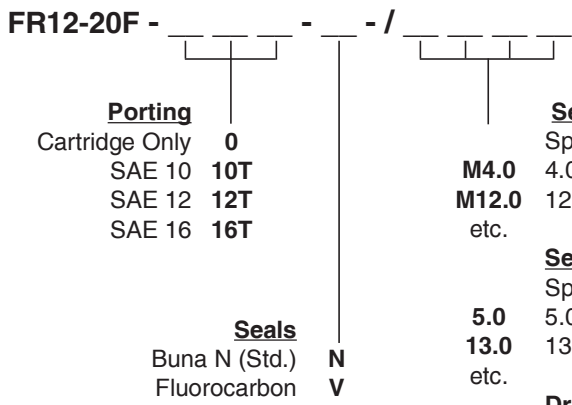


MATERIALS

Cartridge: Weight: 0.08 kg. (0.18 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 0.52 kg. (1.15 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.012.1

TO ORDER



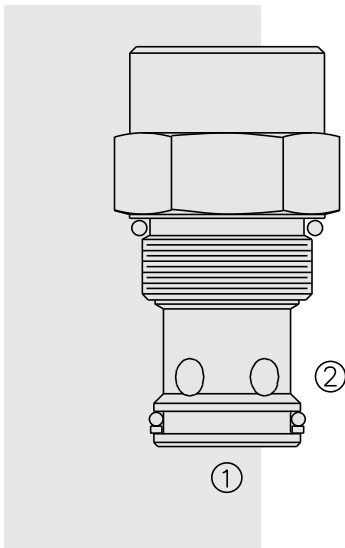
Setting in lpm
 Specify, for example:
M4.0 4.0 lpm
M12.0 12.0 lpm
 etc.

Setting in gpm
 Specify, for example:
5.0 5.0 gpm
13.0 13.0 gpm
 etc.

Drill Size Method
 In thousandths of an inch.
 Specify, for example:
D030 0.030 in. control orifice hole
 etc.

Note: Minimum drill diameter is 0.020 in.
 For smaller orifice sizes consult factory.

FR16-20F Regulator, Pressure-Compensated



DESCRIPTION

A screw-in, cartridge-style, fixed orifice, pressure-compensated, hydraulic flow regulating valve (restrictive type).

OPERATION

The **FR16-20F** maintains a constant flow rate from port 1 to 2 regardless of load pressure changes.

The fixed control orifice is factory preset to customer flow specification. The valve begins to respond to load changes when the flow through the valve creates a pressure differential across the control orifice greater than 5.5 bar (80 psid), with accurate flow maintenance from 7.6 to 240 bar (300 to 3500 psid). Reverse flow (2 to 1) returns through the control orifice and is non-compensated.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Cost-effective cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow Settings: 4 lpm (1 gpm) min; 113 lpm (30 gpm) max.

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

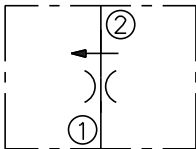
Cavity: VC16-2; See page 9.116.1

Cavity Tool: CT16-2XX; See page 8.600.1

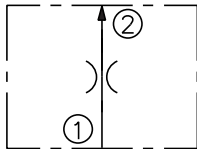
Seal Kit: SK16-2X; See page 8.650.1

SYMBOLS

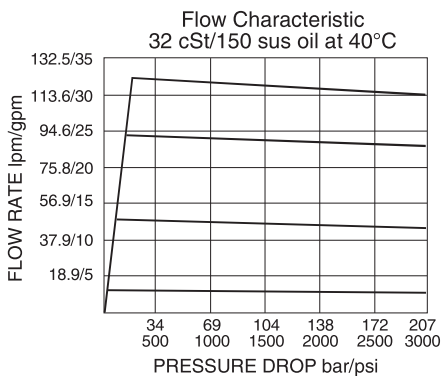
USASI:



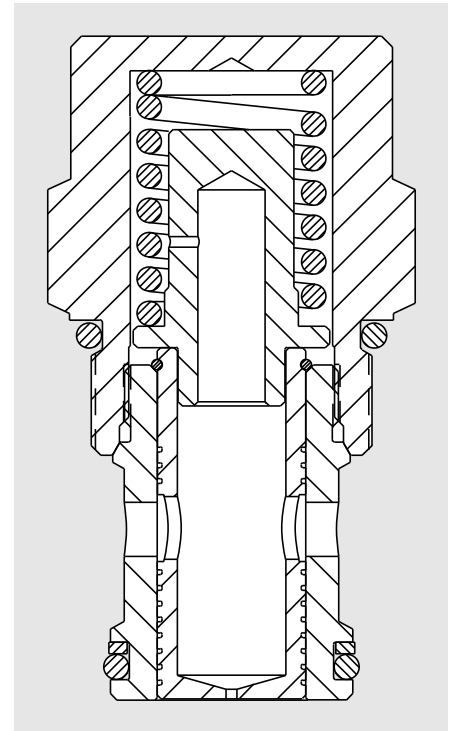
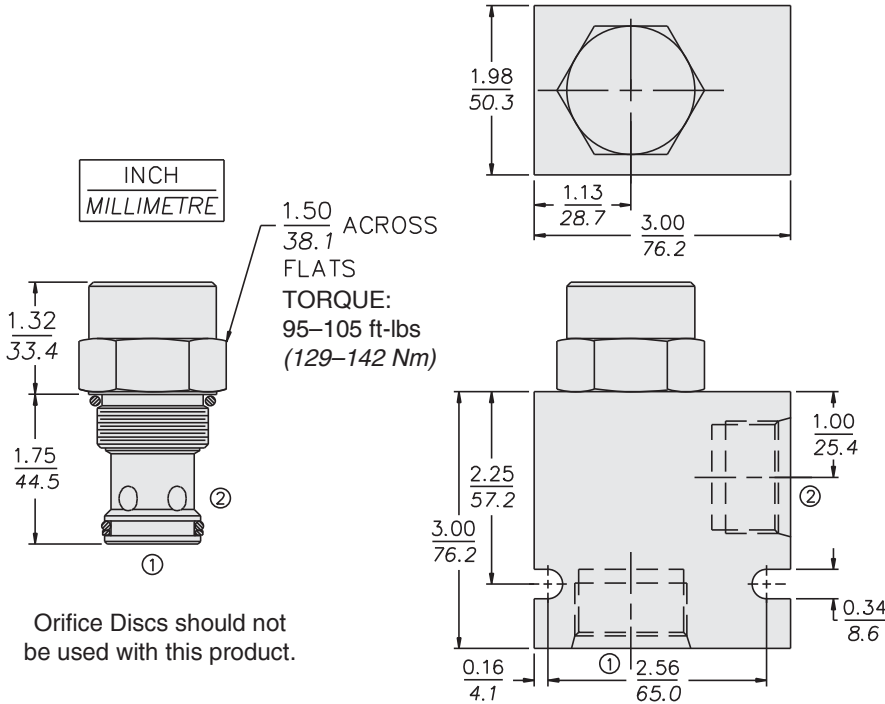
ISO:



PERFORMANCE



DIMENSIONS

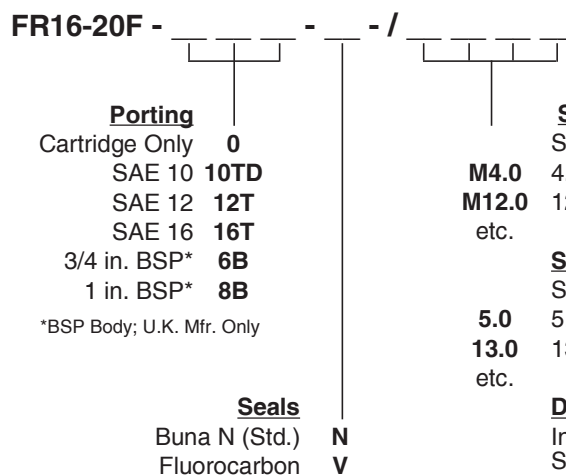


MATERIALS

Cartridge: Weight: 0.41 kg. (0.92 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 0.57 kg. (1.25 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.016.1

TO ORDER



Setting in lpm
Specify, for example:

M4.0 4.0 lpm
M12.0 12.0 lpm
etc.

Setting in gpm
Specify, for example:

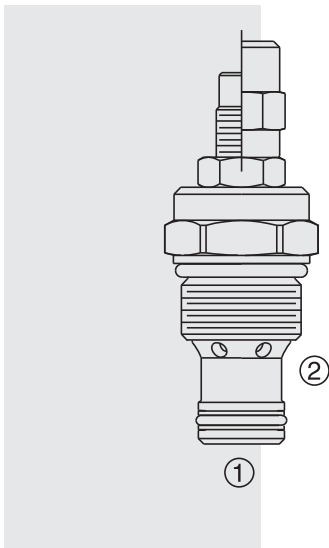
5.0 5.0 gpm
13.0 13.0 gpm
etc.

Drill Size Method
In thousandths of an inch.
Specify, for example:

D250 0.250 in. control orifice hole
etc.

Note: Minimum drill diameter is 0.020 in.
For smaller orifice sizes consult factory.

FR50-23 Regulator, Pressure-Compensated,



DESCRIPTION

A screw-in, cartridge-style, adjustable, pressure-compensated, restrictive-type hydraulic flow regulating valve.

OPERATION

The **FR50-23** maintains a constant flow rate out of 2 regardless of load pressure changes in the circuit downstream of 2 or upstream of 1.

The regulated flow increases from closed to fully open with counter-clockwise rotation of the adjustment screw. The valve will maintain the set flow regardless of pressure variations on the regulated or inlet port. Reverse flow from 2 to 1 bypasses the control orifice.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Cost-effective cavity.

RATINGS

Operating Pressure: 345 bar (5000 psi)

Flow Rating: 0.4–11.5 lpm (0.1–3.0 gpm)

Flow Maintenance: ±10% through full pressure range

Internal Leakage 1 to 2: 30 ml/minute (1.8 cu. in./minute) at 345 bar (5000 psi)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

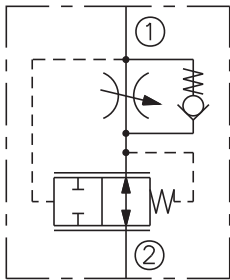
Cavity: VC10-2; See page 9.110.1

Cavity Tool: CT10-2XX; See page 8.600.1

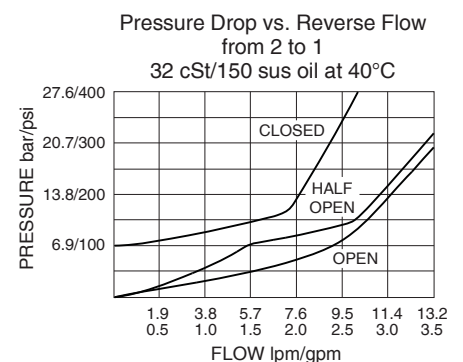
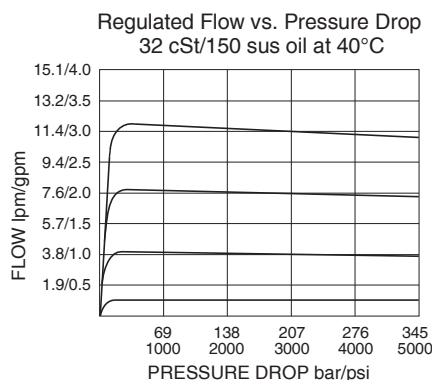
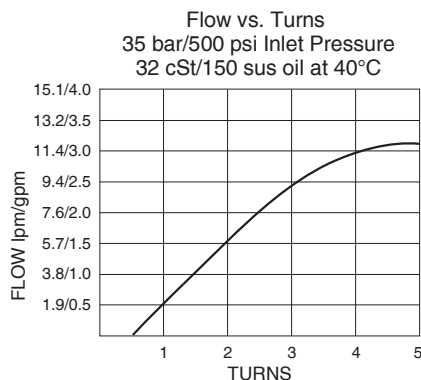
Seal Kit: SK10-2X-M; See page 8.650.1

SYMBOLS

USASI/ISO:



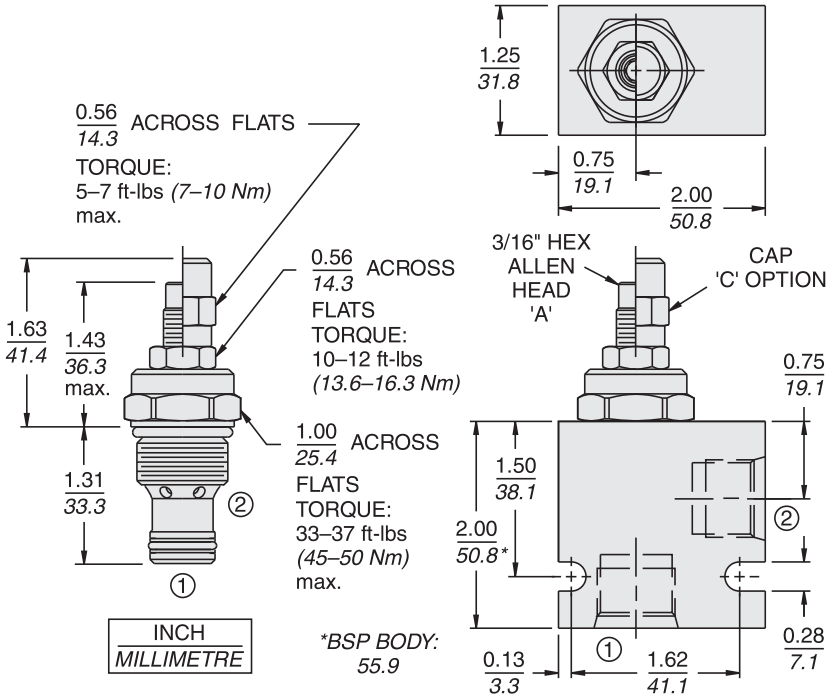
PERFORMANCE



High Pressure

FR50-23

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.14 kg. (0.31 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 0.16 kg. (0.35 lbs.)
Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

TO ORDER

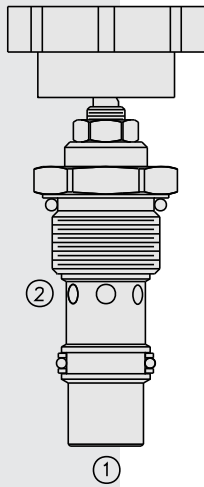
FR50-23 - - - /

<p>Adjustment Option 3/16" Hex Allen Head Option 'A' w/Cover Cap</p> <p>A C</p>	<p>Porting</p> <p>Cartridge Only 0 SAE 6 6T SAE 8 8T 1/4 in. BSP* 2B 3/8 in. BSP* 3B</p> <p><small>*BSP Body; U.K. Mfr. Only</small></p>	<p>Flow Setting (Blank) Factory Set at 1.5-2.0 gpm</p> <p>1.5 1.5 gpm etc.</p> <p>M10 Setting in lpm Specify; For example: 10 lpm etc.</p>
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Seals

- N** Buna N (Std.)
- V** Fluorocarbon
- P** Polyurethane (required for operation over 241 bar/3500 psi)

FR12-23 Regulator, Pressure-Compensated



DESCRIPTION

A screw-in, cartridge-style, adjustable orifice, pressure-compensated, manually-operated hydraulic flow regulating valve (restrictive type).

OPERATION

The **FR12-23** maintains a constant flow rate out of 2 regardless of load pressure changes in the circuit downstream of 2 or upstream of 1.

The regulated flow increases from closed to fully open with counter-clockwise rotation of the adjustment screw. The valve will maintain the set flow regardless of pressure variations on the regulated or inlet port. Reverse flow (2 to 1) bypasses the control orifice.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Cost-effective cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow Settings: 0–77 lpm (0–20 gpm)

Internal Leakage (1 to 2): 0.12 lpm (0.03 gpm) max., fully closed

Adjustment Torque Required: 1.7 Nm (15 in.-lbs.) at 207 bar (3000 psi)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: VC12-2, Variation "B"; See page 9.112.1

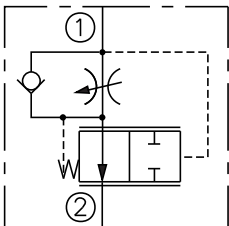
Cavity Tool: CT12-2XX; See page 8.600.1

Seal Kit: SK12-2X-M; See page 8.650.1

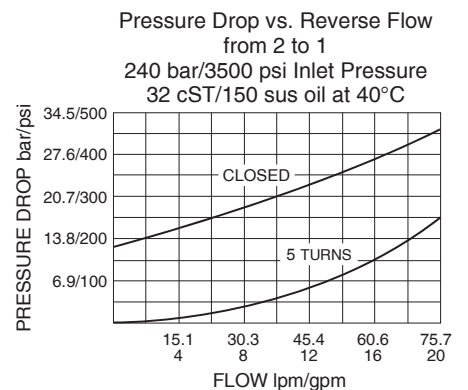
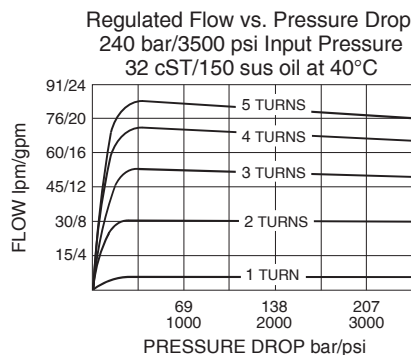
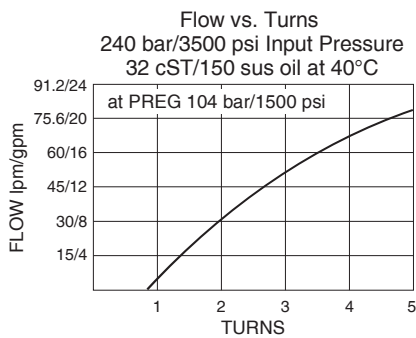
Knob Kit: Part Number 6113160; Converts from shaft-only version to "E" version

SYMBOLS

USASI/ISO:

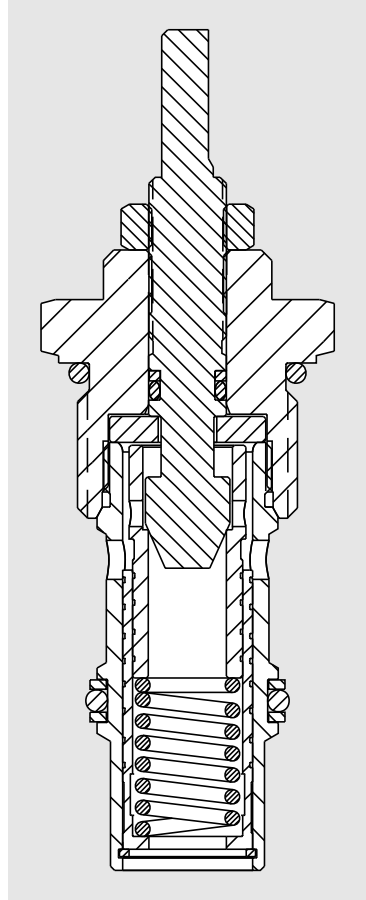
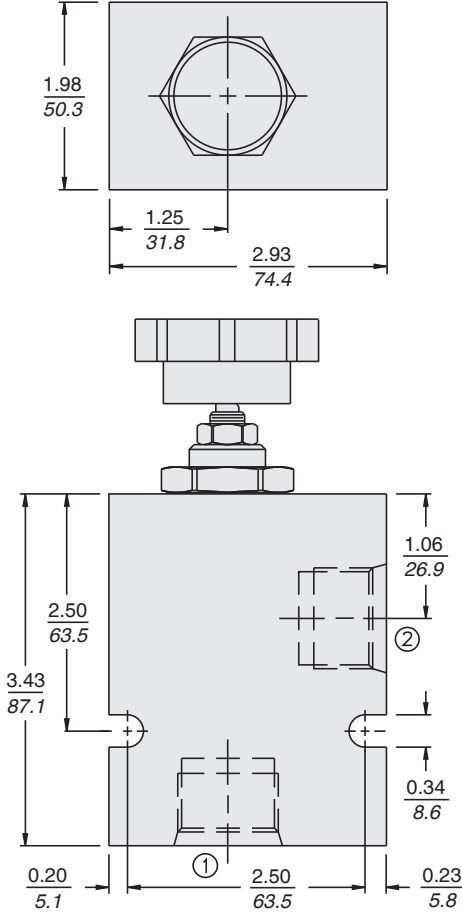
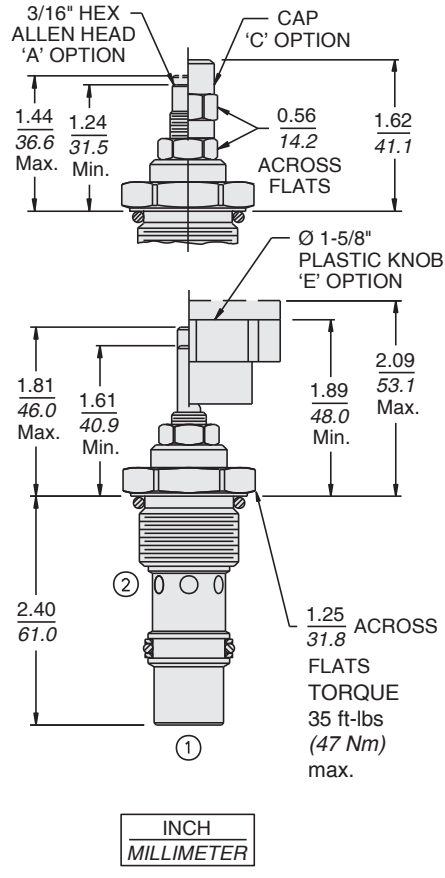


PERFORMANCE



FR12-23

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.08 kg. (0.18 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.

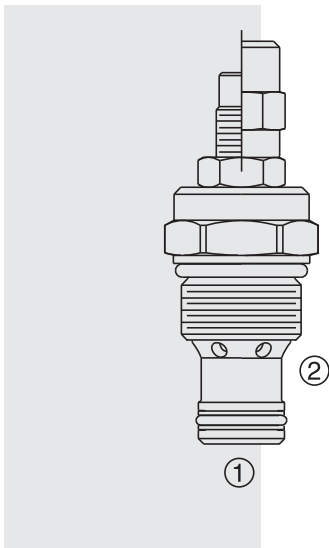
Special Ported Body: Weight:
 0.52 kg. (1.15 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.012.1

TO ORDER

FR12-23 - - - /

<p>Adjustment Option</p> <p>Extended Shaft Only Blank</p> <p>3/16" Hex Allen Head A</p> <p>Option 'A' w/Cover Cap C</p> <p>Plastic Knob E</p>	<p>Porting</p> <p>Cartridge Only 0</p> <p>SAE 10 10T</p> <p>SAE 12 12T</p> <p>SAE 16 16T</p> <p>Special ported body required. Consult factory.</p>	<p>Flow Setting</p> <p>(Blank) Factory Set at 4-6 gpm</p> <p>Setting in gpm</p> <p>Specify; For example:</p> <p>5.0 5.0 gpm</p> <p>10.0 10 gpm</p> <p>etc.</p> <p>Setting in lpm</p> <p>Specify; For example:</p> <p>M4.0 4.0 lpm</p> <p>M20.0 20.0 lpm</p> <p>etc.</p>	<p>Seals</p> <p>N Buna N (Std.)</p> <p>V Fluorocarbon</p> <p>P Polyurethane</p>
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FR50-28 Regulator, Pressure-Compensated,



DESCRIPTION

A screw-in, cartridge-style, adjustable, pressure-compensated, restrictive-type hydraulic flow regulating valve.

OPERATION

The **FR50-28** maintains a constant flow rate out of 2 regardless of load pressure changes in the circuit downstream of 2 or upstream of 1.

The regulated flow increases from closed to fully open with counter-clockwise rotation of the adjustment screw. The valve will maintain the set flow regardless of pressure variations on the regulated or inlet port. Reverse flow from 2 to 1 bypasses the control orifice.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Cost-effective cavity.

RATINGS

Operating Pressure: 345 bar (5000 psi)

Flow Rating: 0.8–34 lpm (0.2–9.0 gpm)

Flow Maintenance: ±10% through full pressure range

Internal Leakage 1 to 2: 35 ml/minute (2.5 cu. in./minute) at 345 bar (5000 psi)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

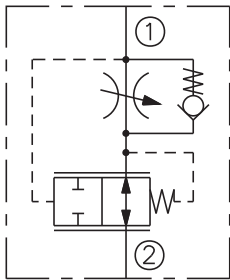
Cavity: VC10-2; See page 9.110.1

Cavity Tool: CT10-2XX; See page 8.600.1

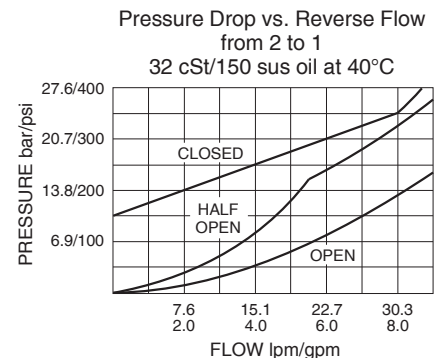
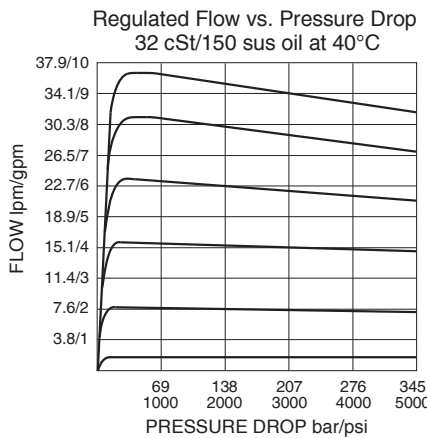
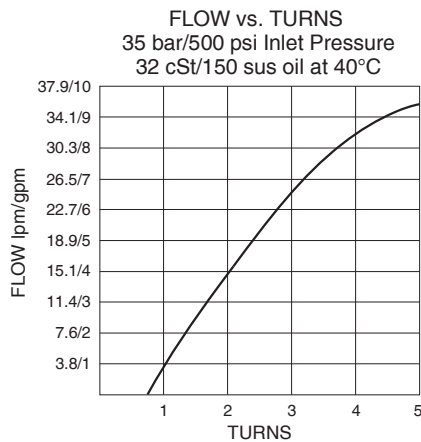
Seal Kit: SK10-2X-M; See page 8.650.1

SYMBOLS

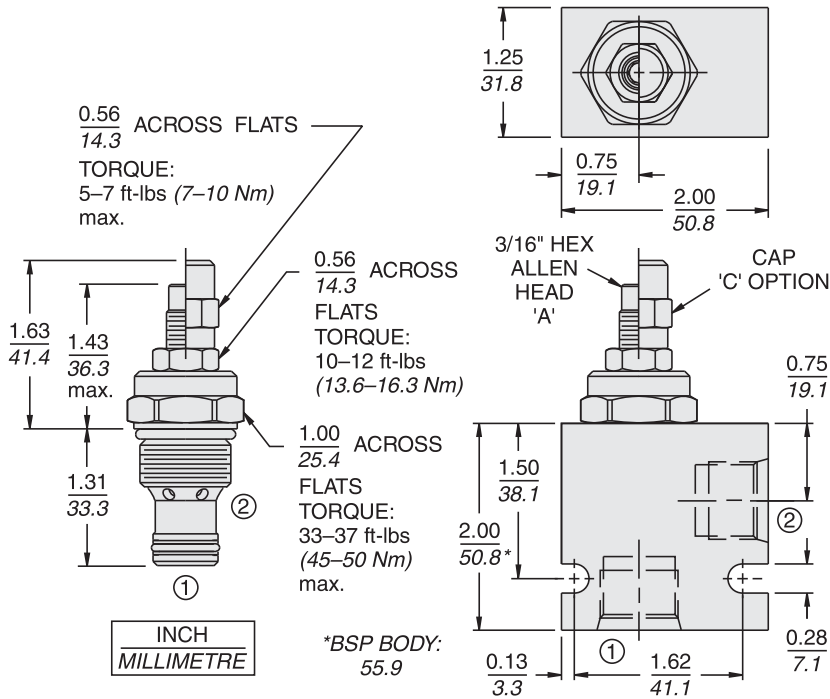
USASI/ISO:



PERFORMANCE



DIMENSIONS



MATERIALS

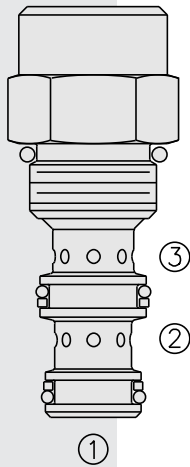
Cartridge: Weight: 0.14 kg. (0.31 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 0.16 kg. (0.35 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

TO ORDER

FR50-28		-	-	-	/	
	Adjustment Option	A				Flow Setting
	3/16" Hex Allen Head	C				(Blank) Factory Set at 1.5-2.0 gpm
	Option 'A' w/Cover Cap					Setting in gpm
						Specify; For example:
						5.5 5.5 gpm etc.
	Porting					Setting in lpm
	Cartridge Only	0				Specify; For example:
	SAE 6	6T				M20 20 lpm etc.
	SAE 8	8T				
	1/4 in. BSP*	2B				
	3/8 in. BSP*	3B				
	*BSP Body; U.K. Mfr. Only					
						Seals
						N Buna N (Std.)
						V Fluorocarbon
						P Polyurethane (required for operation over 241 bar/3500 psi)

FR08-30F Regulator, Pressure-Compensated



DESCRIPTION

A screw-in, cartridge-style, pressure-compensated, non-adjustable flow regulator, intended for use in fixed displacement hydraulic circuits requiring partial pump flow diversion on a priority basis.

OPERATION

The **FR08-30F** maintains a constant flow rate from 3 regardless of load pressure changes in the system downstream of 3, or in the bypass leg at 2.

The valve's spool maintains a constant differential pressure of 6.5 bar (95 psi) across a fixed internal orifice, thereby regulating the hydraulic flow rate from 1 to 3.

The FR08-30F is a priority type regulator, delivering the pump flow to 3 first, then bypassing excess to 2. All ports may be fully pressurized.

Flow out of priority port 3 may vary based on input flow amount, particularly with lower temperatures and increased fluid viscosities. Settings may need to be established through correlation study. Consult factory.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Compact size.

RATINGS

Operating Pressure: 207 bar (3000 psi)

Flow Rate: 7.6 lpm (2.0 gpm) max. regulated; 11.4 lpm (3.0 gpm) max. input.
Inlet pressure at 1 begins to rise over the compensating differential when bypass flow exceeds 7.5 lpm (2 gpm)

Standard Compensator Bias Spring: 6.5 bar (95 psid) differential

Flow Maintenance Setting Range: 0.4 to 1.8 lpm (0.10 to 0.49 gpm) to accuracy of $\pm 15\%$; 1.9 to 7.5 lpm (0.5 to 2.0 gpm) to accuracy of $\pm 10\%$

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

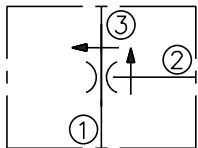
Cavity: VC08-3; See page 9.108.1

Cavity Tool: CT08-3XX; See page 8.600.1

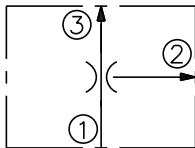
Seal Kit: SK08-3X-TB; See page 8.650.1

SYMBOLS

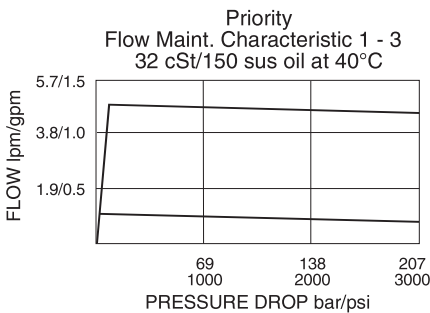
USASI:



ISO:

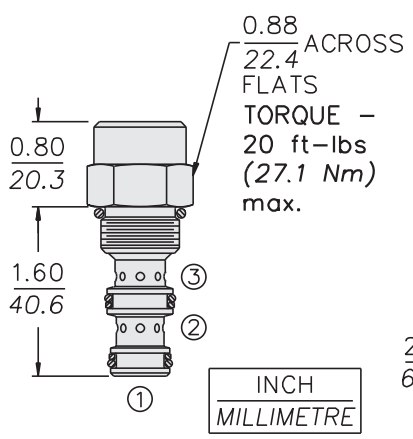


PERFORMANCE (Cartridge Only)

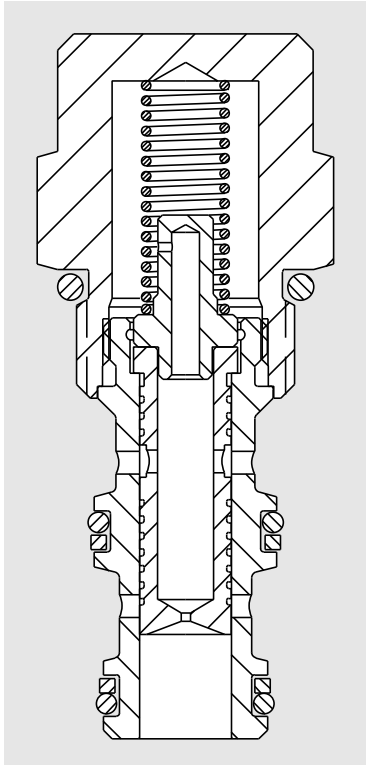
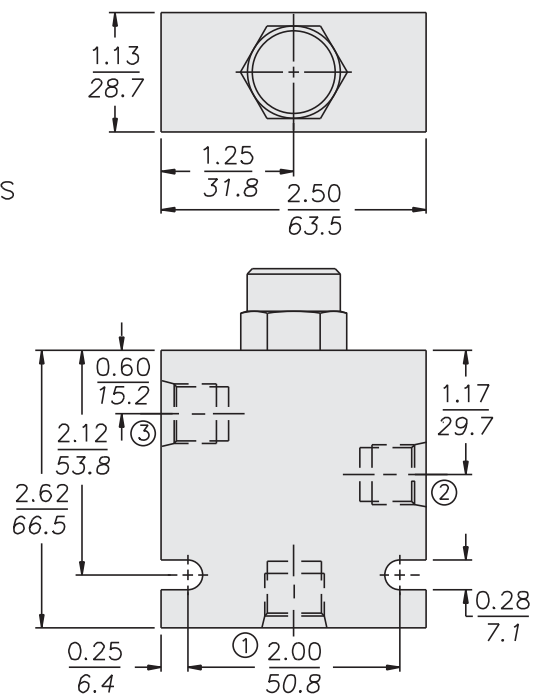


FR08-30F

DIMENSIONS



ORIFICE DISCS SHOULD NOT BE USED WITH THIS PRODUCT.

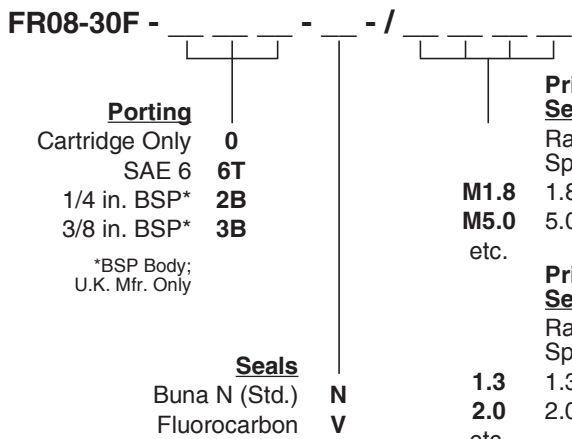


MATERIALS

Cartridge: Weight: 0.14 kg. (0.30 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and back-ups standard.

Standard Ported Body: Weight:
0.27 kg. (0.60 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.008.1.

TO ORDER



Priority Flow Setting in lpm
Range: 0.4 to 7.6 lpm
Specify, for example:

- M1.8** 1.8 lpm
- M5.0** 5.0 lpm
- etc.

Priority Flow Setting in gpm
Range: 0.1 to 2.0 gpm
Specify, for example:

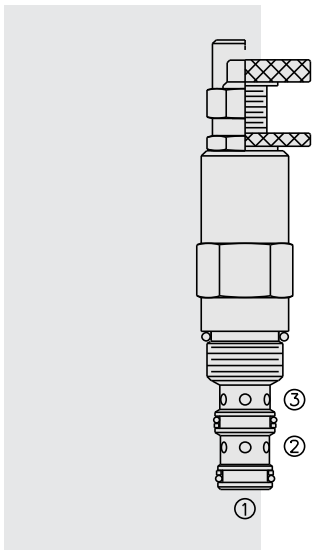
- 1.3** 1.3 gpm
- 2.0** 2.0 gpm
- etc.

Priority Flow Drill Size Method
In thousandths of an inch;
Specify, for example:
D030 0.030 in. control orifice hole
etc.

Note: Compensator spring values may be varied for OEM application to provide changed differential pressure/output flow relationships. Consult factory.

Note: Minimum drill diameter is 0.020 in. For smaller orifice sizes consult factory.

FR10-30A Regulator, Pressure-Compensated



DESCRIPTION

A screw-in, cartridge-style, fixed orifice, pressure-compensated, bypass-type hydraulic flow regulating valve, with limited range adjustment from a pre-determined nominal setting.

OPERATION

The **FR10-30A** maintains a constant flow rate from 3 regardless of load pressure changes in the system downstream of 3, or in the bypass leg at 2.

The valve will pressure-compensate once a minimum pressure drop (determined by spring adjustment setting) is achieved from 1 to 3. This value will range from approximately 4.8 to 13.8 bar (70 to 200 psid).

The cartridge may be adjusted to $\pm 25\%$ of nominal setting. At nominal setting, pressure drop is approximately 9 bar (130 psid).

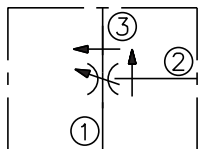
Flow out of priority port 3 may vary based on input flow amount, particularly with lower temperatures and increased fluid viscosities. Settings may need to be established through correlation study. Consult factory.

FEATURES

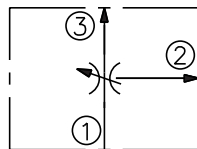
- Bypass port 2 may be fully pressurized.
- Hardened steel parts for long life.
- Quiet, modulated response.
- Industry common cavity.

SYMBOLS

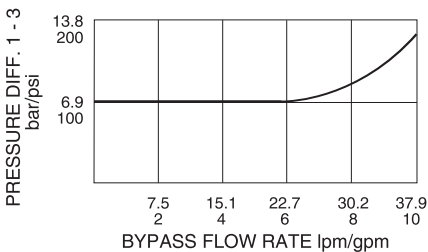
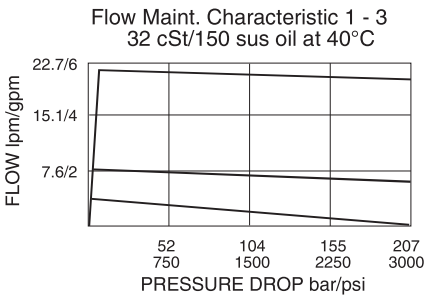
USASI:



ISO:



PERFORMANCE (Cartridge Only)



RATINGS

Operating Pressure: 207 bar (3000 psi)

Customer-Specified Standard Flow Setting:

Low Range: 1.9 to 9.5 lpm (0.5 to 2.5 gpm);
Specify in 1.9 lpm (0.5 gpm) increments.

High Range: 11.4 to 22.7 lpm (3.0 to 6.0 gpm);
Specify in 3.8 lpm (1 gpm) increments.

See ordering table on facing page.

Pressure at 1 begins to rise higher than compensating pressure differential when bypass flow exceeds 23 lpm (6 gpm).

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: VC10-3; See page 9.110.1

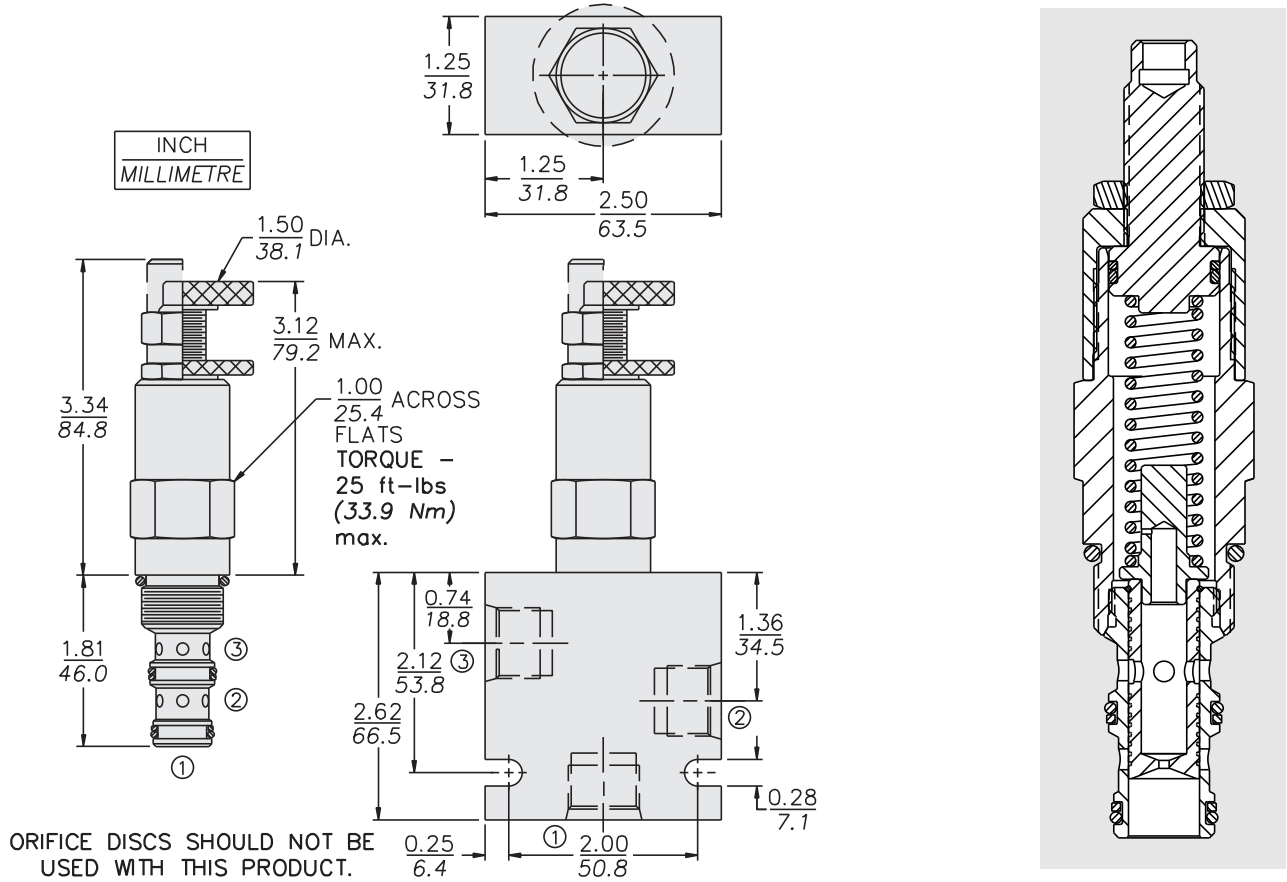
Cavity Tool: CT10-3XX; See page 8.600.1

Seal Kit: SK10-3X-TB; See page 8.650.1

NOTE: For certain applications with substantial dynamic load changes, particularly in cases where there is high differential pressure, we recommend the use of the FR10-33 (page 5.372.1) or the FR10-39 (page 5.382.1) in place of this valve.

FR10-30A

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.27 kg. (0.60 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.
Optional aluminum knob.

Standard Ported Body: Weight: 0.36 kg. (0.80 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

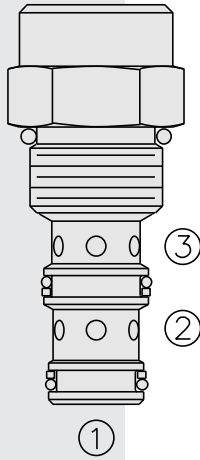
TO ORDER

FR10-30		-	-	- /	.
Adjustment Option		A	B	C	D
1/4 in. Hex Allen Head					
1-1/2 in. Dia. Alum. Knob					
Option A w/ Cover Cap					
Option B w/ Lock Nut					
Factory Preset					
Hidden Adjustment					
Porting		0	6T	8T	2B
Cartridge Only					
SAE 6					
SAE 8					
1/4 in. BSP*					
3/8 in. BSP*					
*BSP Body; U.K. Mfr. Only					
Seals		N	V		
Buna N (Std.)					
Fluorocarbon					
		0.5	1.0	2.0	2.5
		3.0	4.0	5.0	6.0
Standard Settings[†]		1.42 to 2.37 lpm (0.37 to 0.63 gpm)	2.84 to 4.73 lpm (0.75 to 1.25 gpm)	5.68 to 9.46 lpm (1.5 to 2.5 gpm)	7.08 to 11.81 lpm (1.87 to 3.12 gpm)
		8.52 to 14.19 lpm (2.25 to 3.75 gpm)	11.35 to 18.93 lpm (3.0 to 5.0 gpm)	14.19 to 23.66 lpm (3.75 to 6.25 gpm)	17.03 to 28.93 lpm (4.5 to 7.5 gpm)

Note: Compensator spring values may be varied for OEM application, to provide changed differential pressure/output flow relationships. Consult factory.

[†]At mean, adjustment is ±25%; Additional mean settings available on OEM request; consult factory.

FR10-30F Regulator, Pressure-Compensated



DESCRIPTION

A screw-in, cartridge-style, pressure-compensated, non-adjustable flow regulator, intended for use in fixed displacement hydraulic circuits requiring partial pump flow diversion on a priority basis.

OPERATION

The **FR10-30F** maintains a constant flow rate from 2 regardless of load pressure changes in the system downstream of 2, or in the bypass leg at 2.

The valve's spool maintains a constant differential pressure of 6.5 bar (95 psi) across a fixed internal orifice, thereby regulating the hydraulic flow rate from 2 to 2.

The FR10-30F is a priority type regulator, delivering the pump flow to 2 first, then bypassing excess to 2. All ports may be fully pressurized.

Flow out of priority port 2 may vary based on input flow amount, particularly with lower temperatures and increased fluid viscosities. Settings may need to be established through correlation study. Consult factory.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: 207 bar (3000 psi)

Flow Rate: 22.7 lpm (6.0 gpm) max. regulated; 37.8 lpm (10.0 gpm) max. input.
Pressure at 2 begins to rise higher than compensating pressure differential when bypass flow exceeds 23 lpm (6 gpm).

Standard Compensator Bias Spring: 6.5 bar (95 psid) differential

Flow Maintenance Setting Range: 0.4 to 5.9 lpm (0.10 to 1.5 gpm) to accuracy of $\pm 15\%$; 6 to 22.7 lpm (1.6 to 6.0 gpm) to accuracy of $\pm 10\%$

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

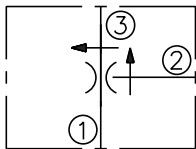
Cavity: VC10-3; See page 9.110.1

Cavity Tool: CT10-3XX; See page 8.600.1

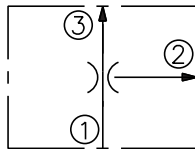
Seal Kit: SK10-3X-TB; See page 8.650.1

SYMBOLS

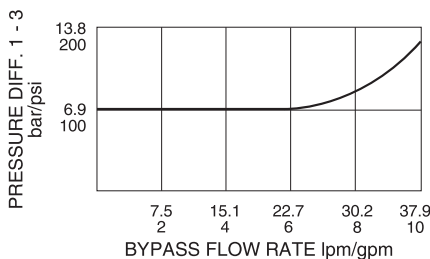
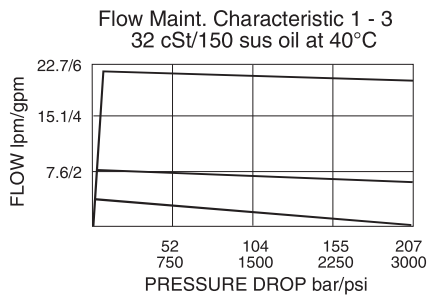
USASI:



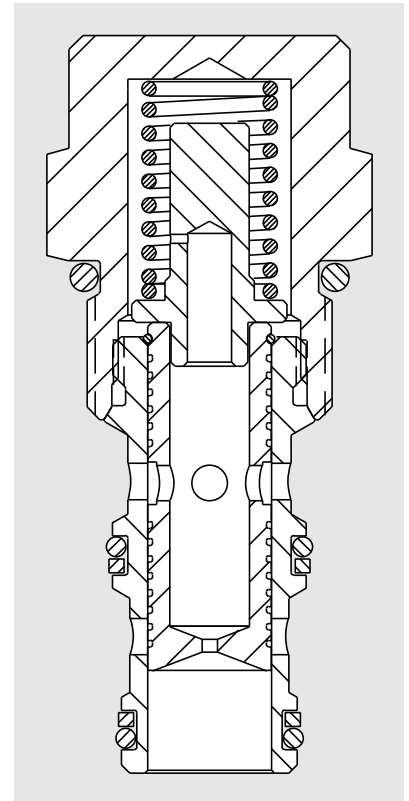
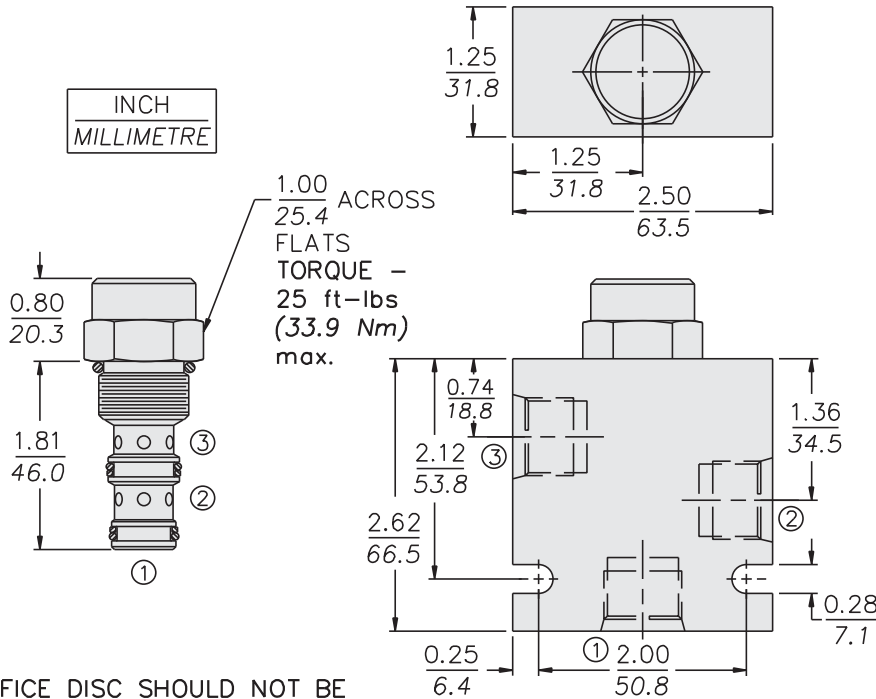
ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



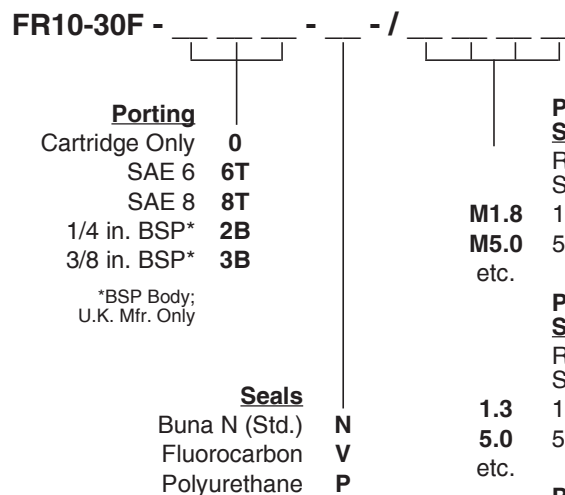
ORIFICE DISC SHOULD NOT BE USED WITH THIS PRODUCT.

MATERIALS

Cartridge: Weight: 0.16 kg. (0.35 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 0.36 kg. (0.80 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 240 bar (3500 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

TO ORDER



Priority Flow Setting in lpm
Range: 0.38 to 22.7 lpm;
Specify, for example:

- M1.8**
- M5.0**
- etc.

Priority Flow Setting in gpm
Range: 0.1 to 6.0 gpm
Specify, for example:

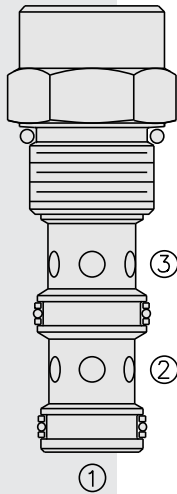
- 1.3**
- 5.0**
- etc.

Priority Flow Drill Size Method
In thousandths of an inch;
Specify, for example:
D030 0.030 in. control orifice hole etc.

Note: Compensator spring values may be varied for OEM application to provide changed differential pressure/output flow relationships. Consult factory.

Note: Minimum drill diameter is 0.020 in. For smaller orifice sizes consult factory.

FR12-30F Regulator, Pressure-Compensated



DESCRIPTION

A screw-in, cartridge-style, pressure-compensated, non-adjustable flow regulator, intended for use in fixed displacement hydraulic circuits requiring partial pump flow diversion on a priority basis.

OPERATION

The **FR12-30F** maintains a constant flow rate from 3 regardless of load pressure changes in the system downstream of 3, or in the bypass leg at 2.

The valve's spool maintains a constant differential pressure of 6.5 bar (95 psi) across a fixed internal orifice, thereby regulating the hydraulic flow rate from 2 to 3.

The FR12-30F is a priority type regulator, delivering the pump flow to 3 first, then bypassing excess to 2. All ports may be fully pressurized.

Flow out of priority port 3 may vary based on input flow amount, particularly with lower temperatures and increased fluid viscosities. Settings may need to be established through correlation study. Consult factory.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Cost effective cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow Rate: 49.2 lpm (13.0 gpm) max. regulated; 94.6 lpm (25.0 gpm) max. input

Standard Compensator Bias Spring: 6.5 bar (95 psid) differential

Flow Maintenance Setting Range: 3.8 to 11.4 lpm (1.0 to 3.0 gpm) to accuracy of $\pm 15\%$; 11.4 to 45.4 lpm (3.0 to 12.0 gpm) to accuracy of $\pm 10\%$

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

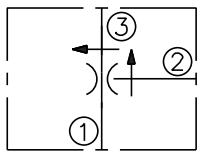
Cavity: VC12-3; See page 9.112.1

Cavity Tool: CT12-3XX; See page 8.600.1

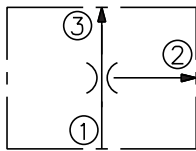
Seal Kit: SK12-3X-MM; See page 8.650.1

SYMBOLS

USASI:

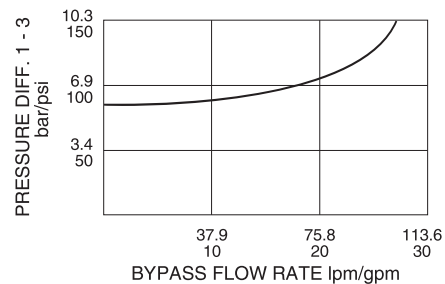
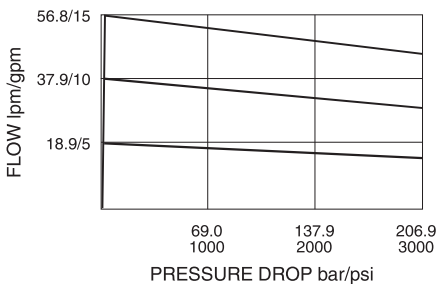


ISO:

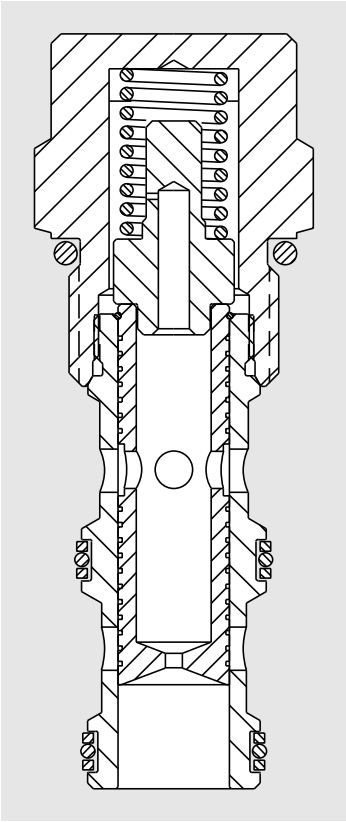
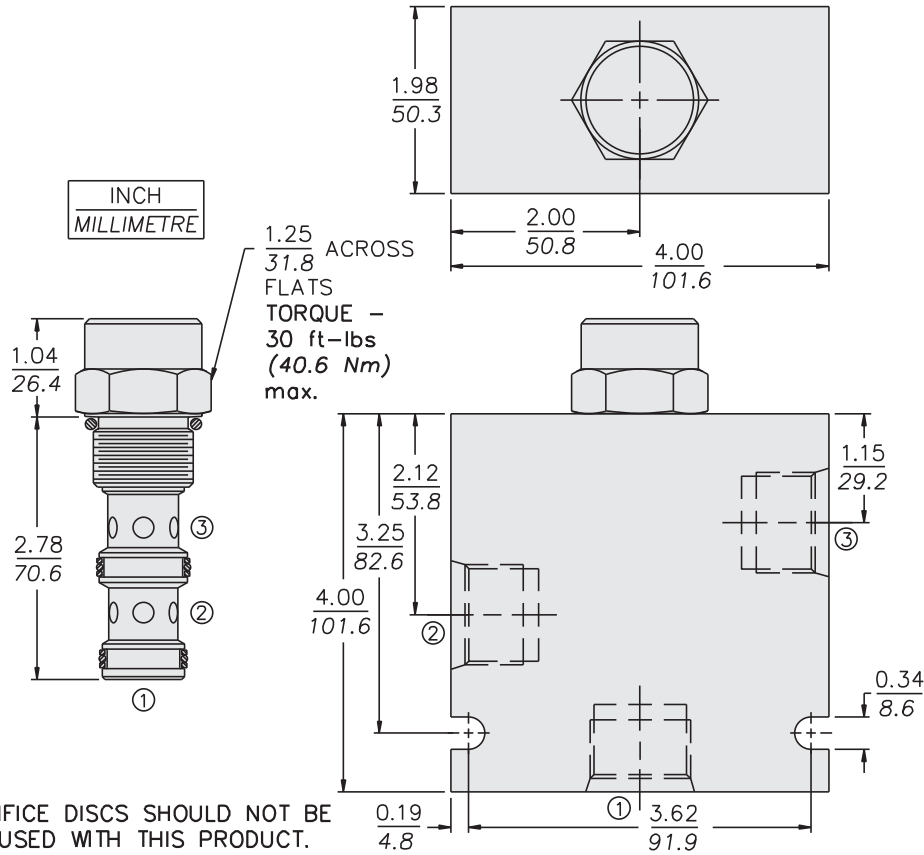


PERFORMANCE (Cartridge Only)

Flow Maint. Characteristic 1 to 3
32 cSt/150 sus oil at 40°C



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.30 kg. (0.68 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight:
0.98 kg. (2.15 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.012.1

TO ORDER

FR12-30F -	-	-	-	-	-	-	-	-
Porting								
Cartridge Only	0							
SAE 8	8T							
SAE 10	10T							
SAE 12	12T							
1/2 in. BSP*	4B							
3/4 in. BSP*	6B							
*BSP Body; U.K. Mfr. Only								
Seals								
Buna N (Std.)	N							
Fluorocarbon	V							

Note: Compensator spring values may be varied for OEM application to provide changed differential pressure/output flow relationships. Consult factory.

Priority Setting Setting in LPM

Range: 4 to 50 lpm
Specify, for example:

M4.0 4.0 lpm
M8.0 8.0 lpm
etc.

Setting in GPM

Range: 1 to 13 gpm
Specify, for example:

1.5 1.5 gpm
5.0 5.0 gpm
etc.

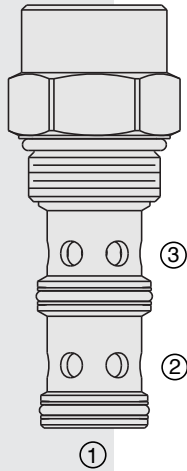
Drill Size Method

In thousandths of an inch.
Specify, for example:

D050 0.050 in. control orifice hole
etc.

Note: Minimum drill diameter is 0.020 in.
For smaller orifice sizes consult factory.

FR16-30F Regulator, Pressure-Compensated



DESCRIPTION

A screw-in, cartridge-style, pressure-compensated, non-adjustable flow regulator, intended for use in fixed displacement hydraulic circuits requiring partial pump flow diversion on a priority basis.

OPERATION

The **FR16-30F** maintains a constant flow rate from 3 regardless of load pressure changes in the system downstream of 3, or in the bypass leg at 2.

The valve's spool maintains a constant differential pressure of 5.5 bar (80 psi) across a fixed internal orifice, thereby regulating the hydraulic flow rate from 1 to 3.

The FR16-30F is a priority type regulator, delivering the pump flow to 3 first, then bypassing excess to 2. All ports may be fully pressurized.

Flow out of priority port 3 may vary based on input flow amount, particularly with lower temperatures and increased fluid viscosities. Settings may need to be established through correlation study. Consult factory.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.

RATINGS

Operating Pressure: 241 bar (3500 psi)

Flow Rate: 113 lpm (30.0 gpm) max. priority; 190 lpm (50.0 gpm) max. input

Standard Compensator Bias Spring: 5.5 bar (80 psid) differential

Flow Maintenance Setting Range: up to 76 lpm (20 gpm) to accuracy of $\pm 10\%$;
76 to 114 lpm (20 to 30 gpm) to accuracy of $\pm 15\%$

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

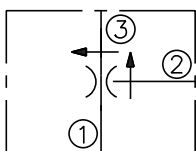
Cavity: VC16-3; See page 9.116.1

Cavity Tool: CT16-3XX; See page 8.600.1

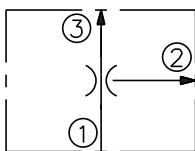
Seal Kit: SK16-3X-MM; See page 8.650.1

SYMBOLS

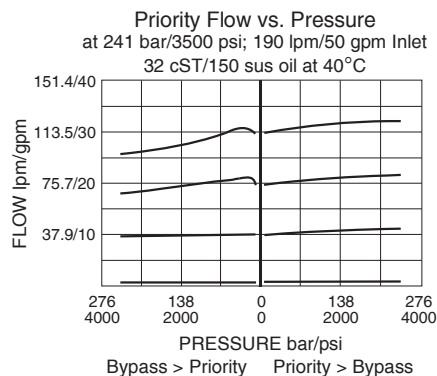
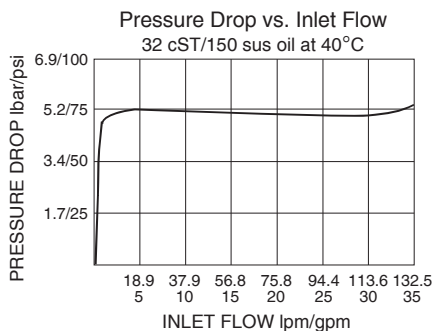
USASI:



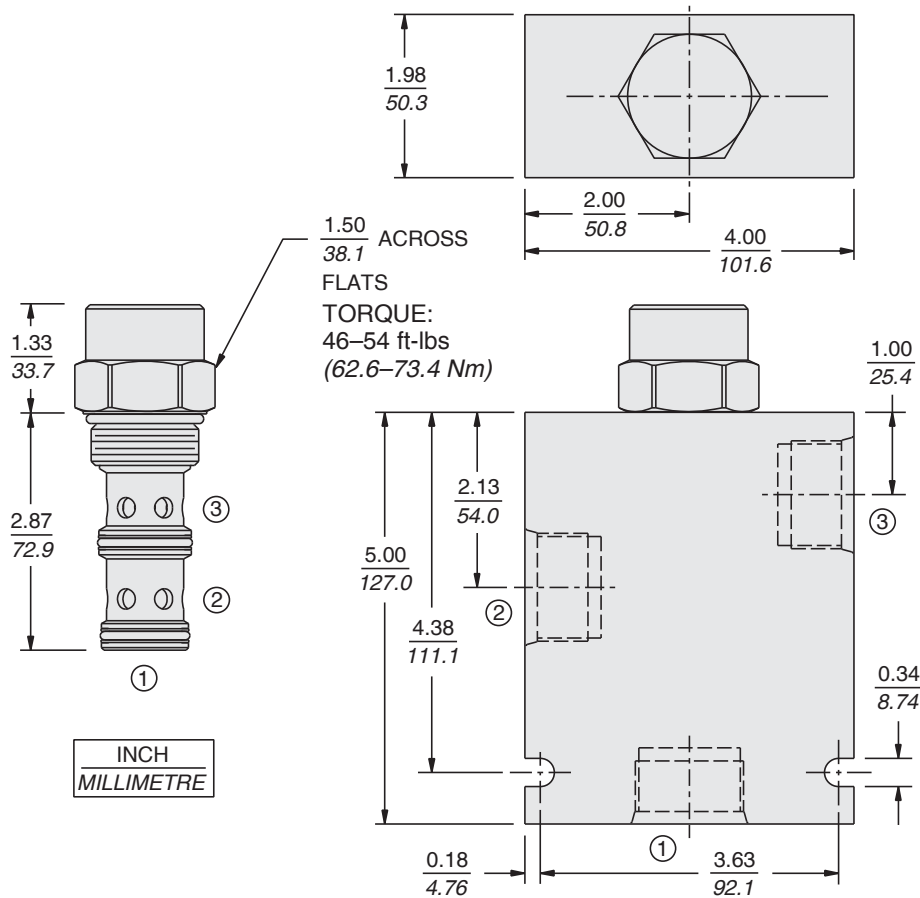
ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.49 kg. (1.07 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight:
1.5 kg. (3.35 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3-00 psi). Ductile iron bodies available; dimensions may differ. See page 8.012.1.

TO ORDER

FR16-30F -		-	- /
Porting			
Cartridge Only	0		
SAE 12	12T		
SAE 16	16		
Seals			
Buna N (Std.)	N		
Fluorocarbon	V		

Priority Setting Setting in LPM

Range: 4 to 113 lpm
Specify, for example:

M20.0 20.0 lpm

M100 100 lpm
etc.

Setting in GPM

Range: 1 to 30 gpm
Specify, for example:

15.0 15 gpm

22.0 22 gpm
etc.

Drill Size Method

In thousandths of an inch.

Range: 0.63 to 0.302

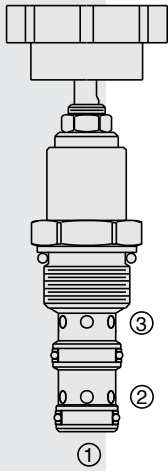
Specify, for example:

D150 0.150 in. control orifice hole
etc.

Note: Compensator spring values may be varied for OEM application to provide changed differential pressure/output flow relationships. Consult factory.

Note: Minimum drill diameter is 0.020 in. For smaller orifice sizes consult factory.

FR10-32 Flow Regulator, Orifice Adjustable,



DESCRIPTION

A screw-in, cartridge-style, pressure-compensated, manually-operated, bi-directional hydraulic flow regulating valve. An internal compensator spool provides compensated flow across the proportional orifice regardless of flow direction.

OPERATION

The FR10-32 provides regulated flow in both directions, from port 2 to port 3, or from port 3 to port 2. Port 1 should be blocked. Regulated flow increases from closed to fully open with clockwise rotation. The valve will maintain the set flow rate regardless of pressure variations at each of the ports.

FEATURES

- Hardened seat for long life and low leakage.
- Various adjustment options.
- Excellent linearity and hysteresis.
- Industry common cavity.

RATINGS

Operating Pressure: Inlet: 240 bar (3500 psi)

Rated Inlet Flow Rate: 19 lpm (5 gpm); see performance chart

Internal Leakage: 0.38 ml/minute (0.10 gpm/minute) maximum

Temperature: -40 to 120°C with Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: VC10-3; See page 9.110.1

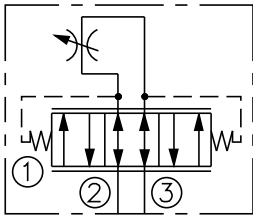
Cavity Tool: CT10-3XX; See page 8.600.1

Seal Kit: SK10-3X-MM; See page 8.650.1

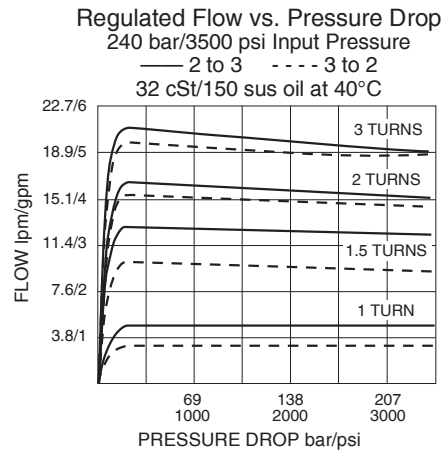
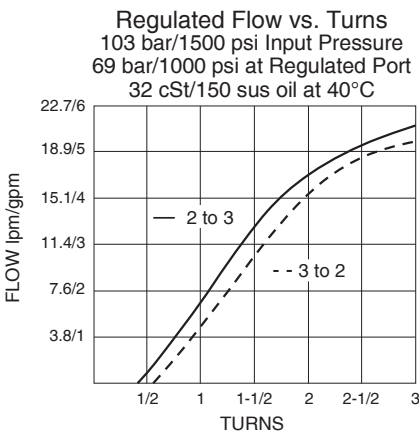
Knob Kit: Part Number 6113160

SYMBOLS

USASI/ISO:



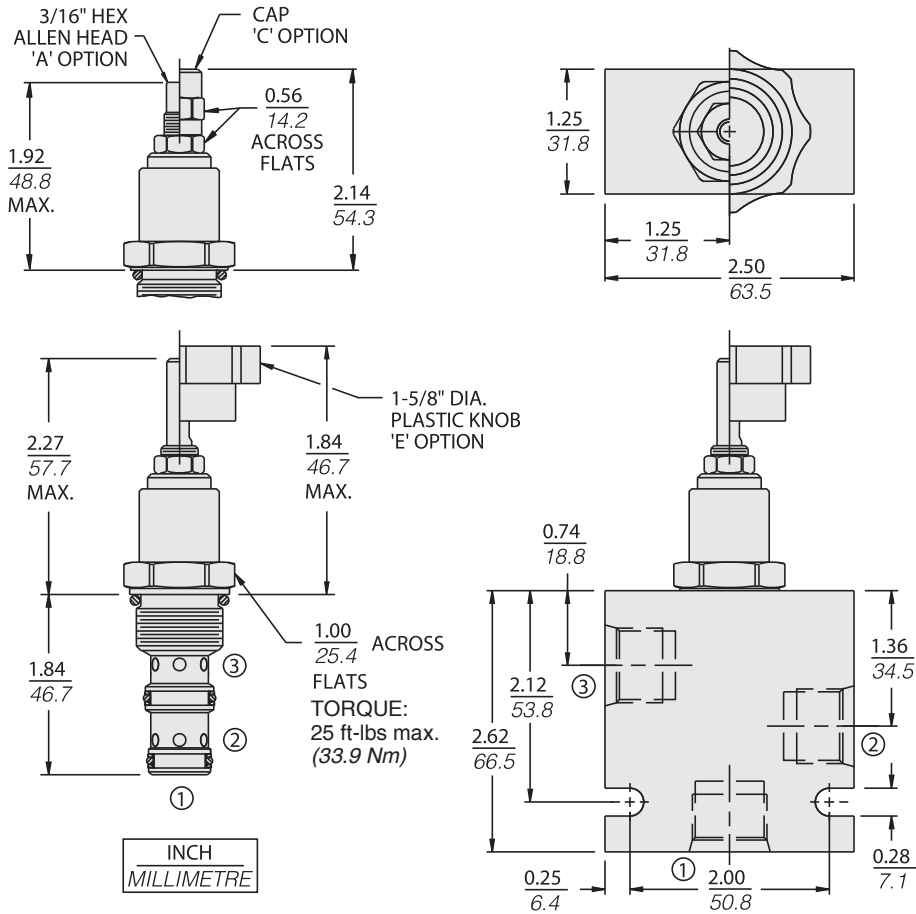
PERFORMANCE (Cartridge Only)



Bi-Directional

FR10-32

DIMENSIONS

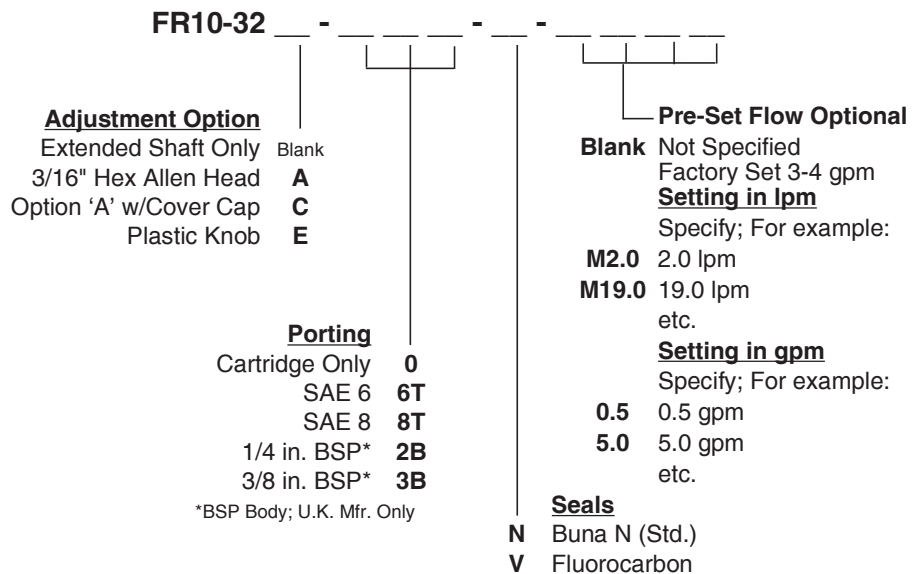


MATERIALS

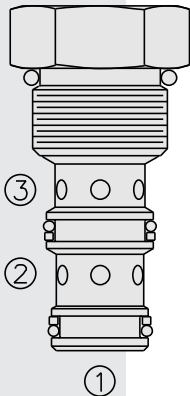
Cartridge: Weight: 0.30 kg. (0.68 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 0.36 kg. (0.80 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

TO ORDER



FR10-32F Flow Regulator, Fixed Orifice,



DESCRIPTION

A screw-in, cartridge-style, pressure-compensated, fixed orifice, bi-directional, restrictive-type flow control valve.

OPERATION

The FR10-32F maintains a constant flow rate regardless of pressure drop across the valve and regardless of flow direction: from port 2 to port 3 or from port 3 to port 2. Port 1 should be blocked.

FEATURES

- Hardened seat for long life and low leakage.
- Excellent linearity and hysteresis.
- Industry common cavity.

RATINGS

Operating Pressure: Inlet: 240 bar (3500 psi)

Flow Settings: 2.0 to 19.0 lpm (0.5 to 5 gpm); see performance chart

Internal Leakage: 0.38 ml/minute (0.10 gpm/minute) maximum

Temperature: -40 to 120°C with Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

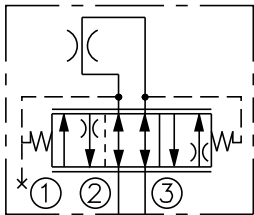
Cavity: VC10-3; See page 9.110.1

Cavity Tool: CT10-3XX; See page 8.600.1

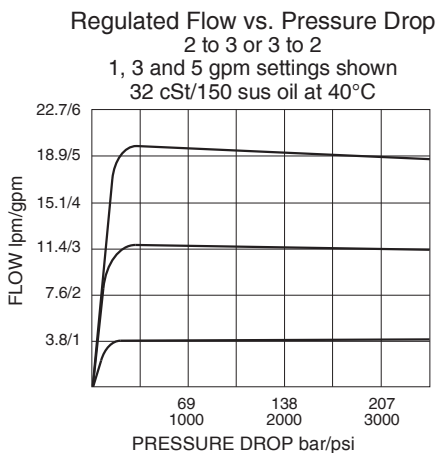
Seal Kit: SK10-3X-MM; See page 8.650.1

SYMBOLS

USASI/ISO:



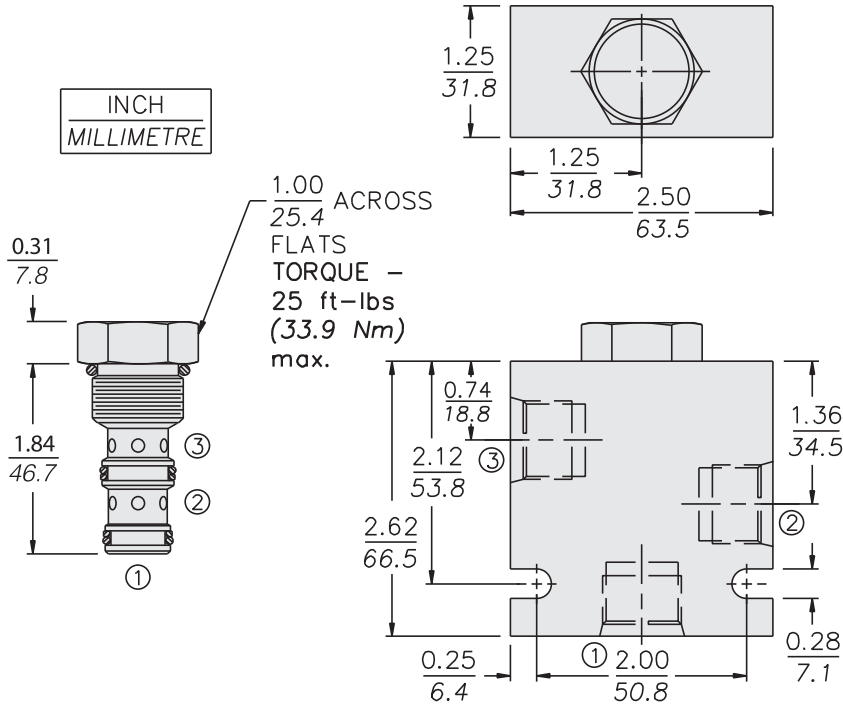
PERFORMANCE (Cartridge Only)



Bi-Directional

FR10-32F

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.30 kg. (0.68 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Standard Ported Body: Weight:
0.36 kg. (0.80 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.010.1

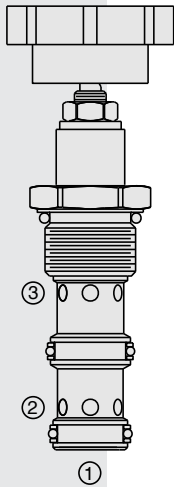
TO ORDER

FR10-32F -	-	- /	
Porting			
Cartridge Only	0		
SAE 6	6T		
SAE 8	8T		
1/4 in. BSP*	2B		
3/8 in. BSP*	3B		
*BSP Body; U.K. Mfr. Only			
Seals			
Buna N (Std.)	N		
Fluorocarbon	V		

Must Specify:
Setting in gpm
Specify; For example:
0.5 0.5 gpm
5.0 5.0 gpm
etc.
Setting in lpm
Specify; For example:
M2.0 2.0 lpm
M19.0 19.0 lpm
etc.

FR12-32 Flow Regulator, Orifice Adjustable,

U.S. Patent
6,167,906



DESCRIPTION

A manually adjustable, pressure-compensated, bi-directional flow control valve. An internal compensator spool provides compensated flow across the proportional orifice regardless of flow direction.

OPERATION

The FR12-32 provides regulated flow in both directions: from port 2 to port 3, or from port 3 to port 2. Port 1 should be blocked. Regulated flow increases from closed to fully open with clockwise rotation. The valve will maintain the set flow rate regardless of pressure variations at each of the ports.

FEATURES

- Excellent linearity and hysteresis characteristics.
- Hardened spool and cage for long life.
- Various adjustment options.

RATINGS

Maximum Operating Pressure: 240 bar (3500 psi)

Regulated Flow: 0-50 lpm (0-13 gpm)

Internal Leakage: 0.38 lpm (0.10 gpm) maximum

Temperature: -40 to 120°C with Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

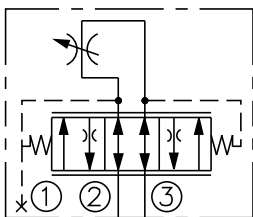
Installation: No restrictions; See page 9.020.1.

Cavity: VC12-3; See page 9.112.1

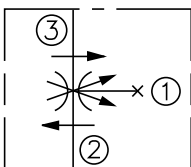
Cavity Tool: CT12-3X-XX; See page 8.600.1

Seal Kit: SK12-3X-MM; See page 8.650.1

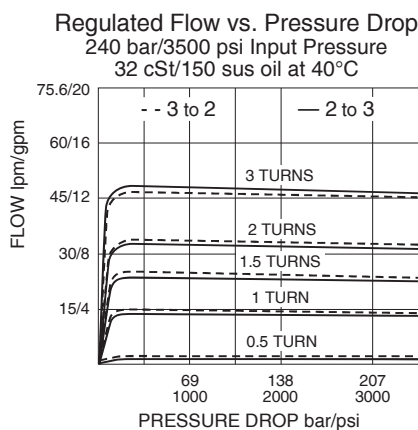
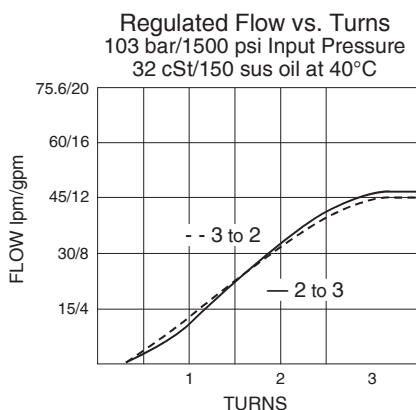
SYMBOLS



ABBREVIATED SYMBOL:



PERFORMANCE

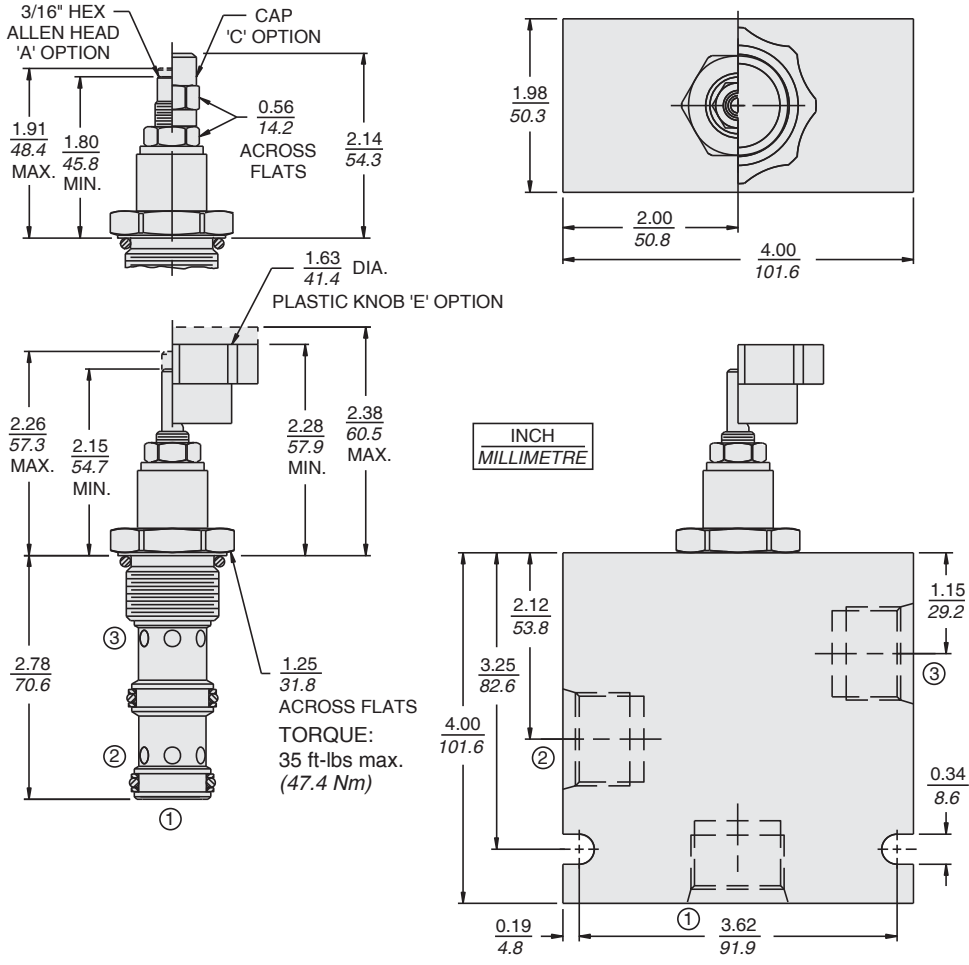


Bi-Directional

FR12-32

DIMENSIONS

U.S. Patent 6,167,906



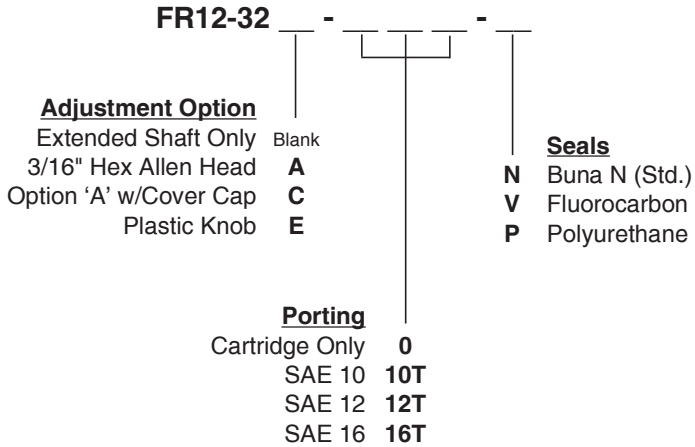
NOTE: Port 1 is plugged.

MATERIALS

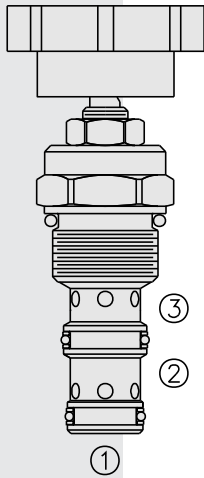
Cartridge: Weight: 0.38 kg. (0.8 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 1.09 kg. (2.4 lbs.)
 Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.012.2

TO ORDER



FR10-33 Flow Regulator, Pressure Compensated



DESCRIPTION

A screw-in, cartridge-style, adjustable orifice, pressure-compensated, manually-operated, bypass-type hydraulic flow regulating valve. It can be used as a priority-type flow regulator or a restrictive-type 2-way flow regulator when the bypass port (port 2) is blocked.

OPERATION

The **FR10-33** maintains a constant flow rate from 3 regardless of load pressure changes in the system downstream of 3, or in the bypass leg at 2. Reverse flow (3 to 1) bypasses the control orifice.

The regulated flow increases from closed to fully open, with counter-clockwise rotation of the knob.

Note: When used as a bypass flow control in applications where the priority flow port will be blocked by external valving, bypass pressure drop will increase unless a small amount of leakage is provided for the priority port. Consult factory.

FEATURES

- Bypass port 2 may be fully pressurized.
- Fine low-torque adjustment.
- Hardened steel parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow Rate: 3-ported regulated flow: 0–13 lpm (0–3.5 gpm)
2-ported regulated flow: 0–12 lpm (0–3.2 gpm)

Note: For higher flow rates, see the FR10-39 valve (page 5.382.1)

Input Flow: 3-ported: 0–19 lpm (0–5 gpm) nominal; 0–26 lpm (0–7 gpm) max.

Internal Leakage: 33 cc/minute (2 cu. in./minute) at 207 bar (3000 psi)

Adjustment Torque Required: 1.7 Nm (15 inch-pounds) at 207 bar (3000 psi)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: VC10-3; See page 9.110.1

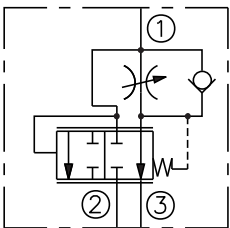
Cavity Tool: CT10-3XX; See page 8.600.1

Seal Kit: SK10-3X-MM; See page 8.650.1

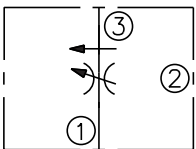
Knob Kit: Part Number 6113160

SYMBOLS

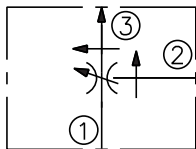
USASI/ISO:



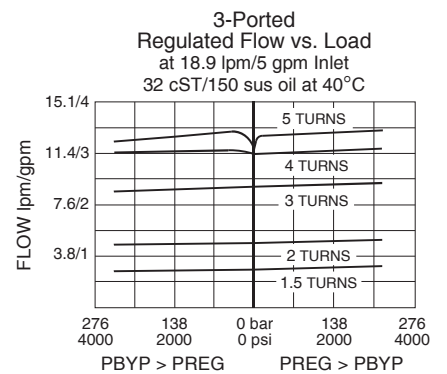
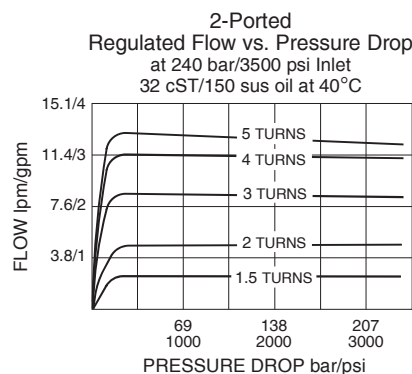
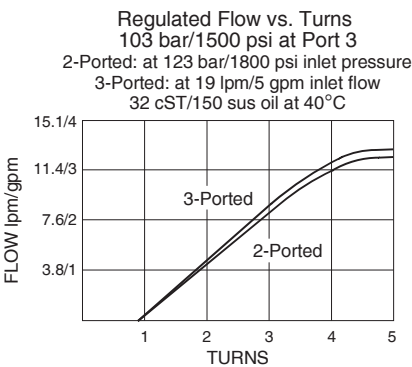
2-Ported:



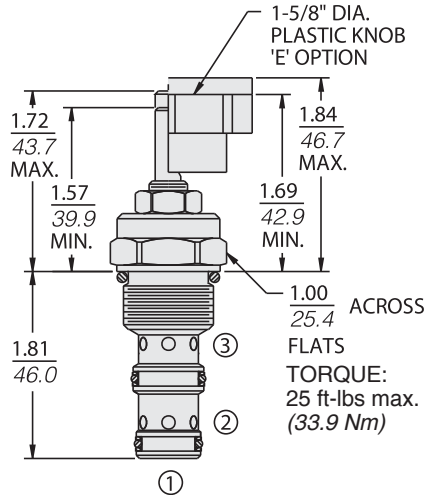
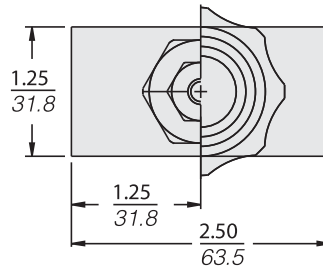
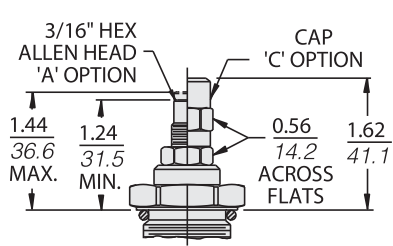
3-Ported:



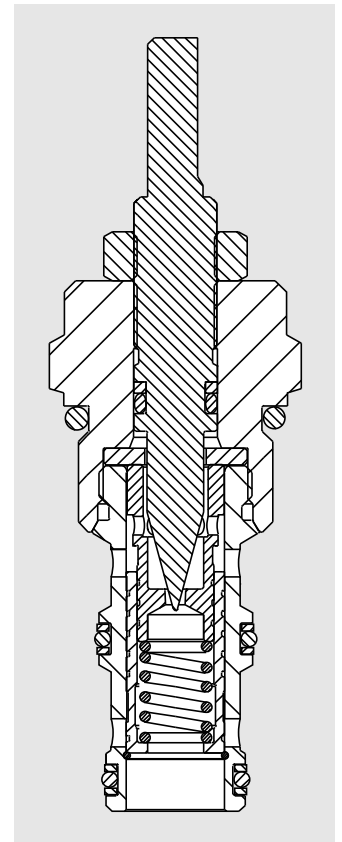
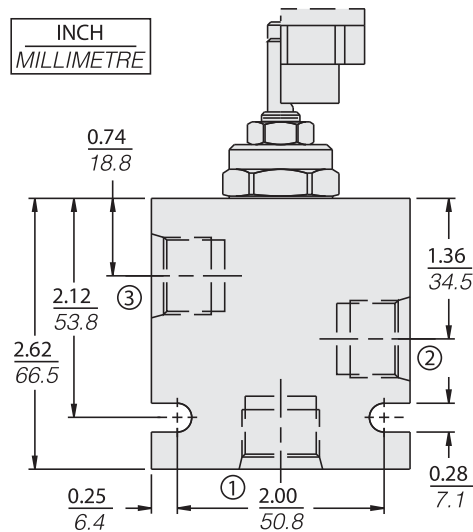
PERFORMANCE (Cartridge Only)



DIMENSIONS



INCH
MILLIMETRE



MATERIALS

Cartridge: Weight: 0.30 kg. (0.68 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 0.36 kg. (0.80 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

TO ORDER

FR10-33

Adjustment Option
Extended Shaft Only Blank
3/16" Hex Allen Head **A**
Option 'A' w/Cover Cap **C**
Plastic Knob **E**



Porting
Cartridge Only **0**
SAE 6 **6T**
SAE 8 **8T**
1/4 in. BSP* **2B**
3/8 in. BSP* **3B**

*BSP Body; U.K. Mfr. Only

Pre-Set Flow Optional
Blank Not Specified
Factory Set 1-2 gpm
Setting in lpm
Specify; For example:

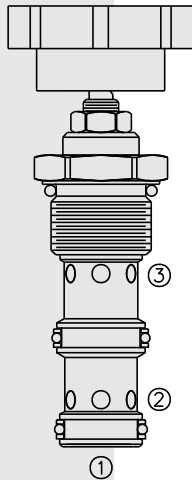
M1.0 1.0 lpm
M5.0 5.0 lpm
etc.

Setting in gpm
Specify; For example:

0.5 0.5 gpm
1.5 5.0 gpm
etc.

Seals
N Buna N (Std.)
V Fluorocarbon

FR12-33 Flow Regulator, Pressure Compensated



DESCRIPTION

A screw-in, cartridge-style, adjustable orifice, pressure-compensated, manually-operated, bypass-type hydraulic flow regulating valve. It can be used as a priority-type flow regulator or a restrictive-type 2-way flow regulator when the bypass port is blocked.

OPERATION

The **FR12-33** maintains a constant flow rate from 3 regardless of load pressure changes in the system downstream of 3, or in the bypass leg at 2. Reverse flow (3 to 1) bypasses the control orifice.

The regulated flow increases from closed to fully open, with counter-clockwise rotation of the knob.

Note: When used as a bypass flow control in applications where the priority flow port will be blocked by external valving, bypass pressure drop will increase unless a small amount of leakage is provided for the priority port. Consult factory.

FEATURES

- Bypass port 2 may be fully pressurized.
- Hardened steel parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow Rate: 3-ported regulated flow: 0 to 68 lpm (0 to 18 gpm)
2-ported regulated flow: 0 to 45 lpm (0 to 12 gpm)

Input Flow: 3-ported: 76 lpm (20 gpm) nominal; 114 lpm (30 gpm) max.

Internal Leakage: 0.12 lpm (7.3 cu. in./minute) at port 3, at 207 bar (3000 psi)

Adjustment Torque Required: 1.7 Nm (15 inch-pounds) at 207 bar (3000 psi)

Operating Temperature: -40 to 100°C with standard Buna N seals

-26 to 204°C with Fluorocarbon seals

-54 to 107°C with Polyurethane seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: VC12-3; See page 9.112.1

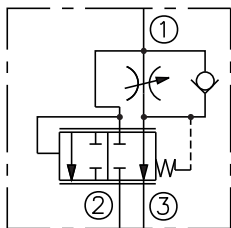
Cavity Tool: CT12-3XX; See page 8.600.1

Seal Kit: SK12-3X-MM; See page 8.650.1

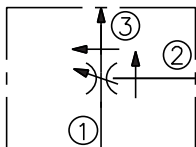
Knob Kit: Part Number 6113160

SYMBOLS

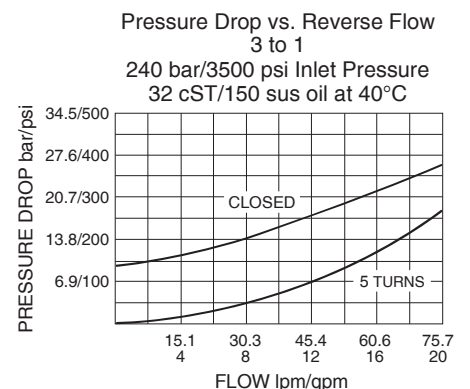
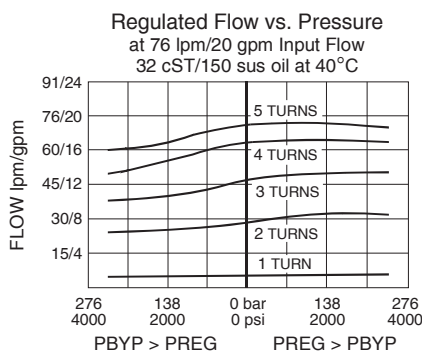
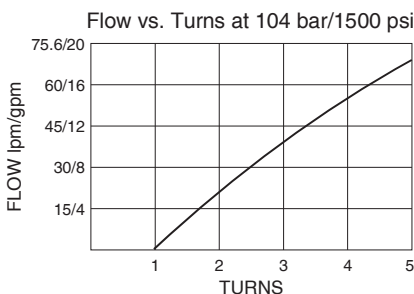
USASI/ISO:



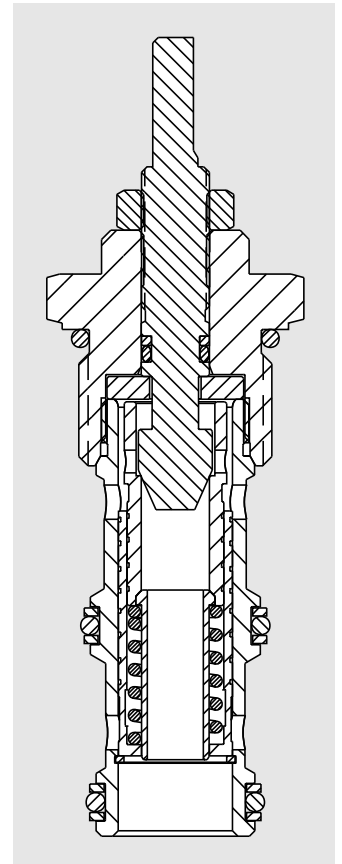
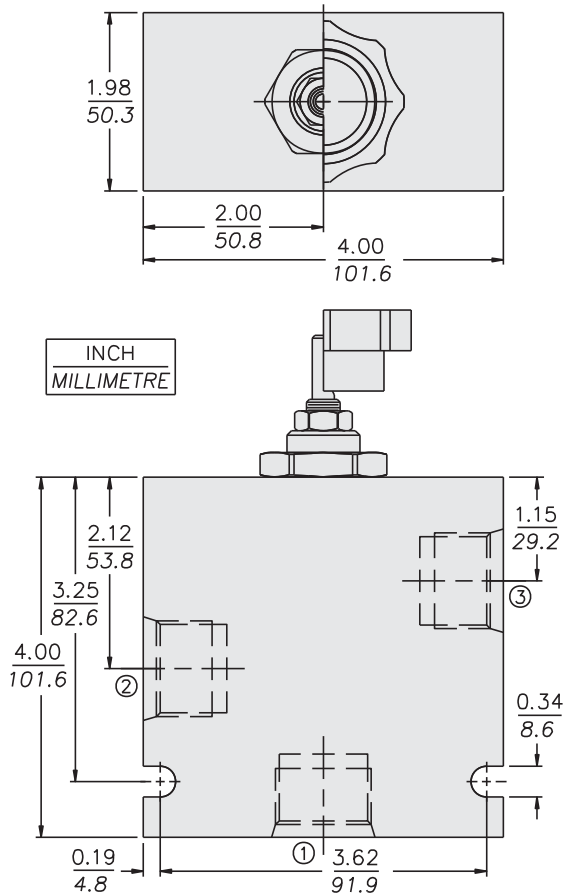
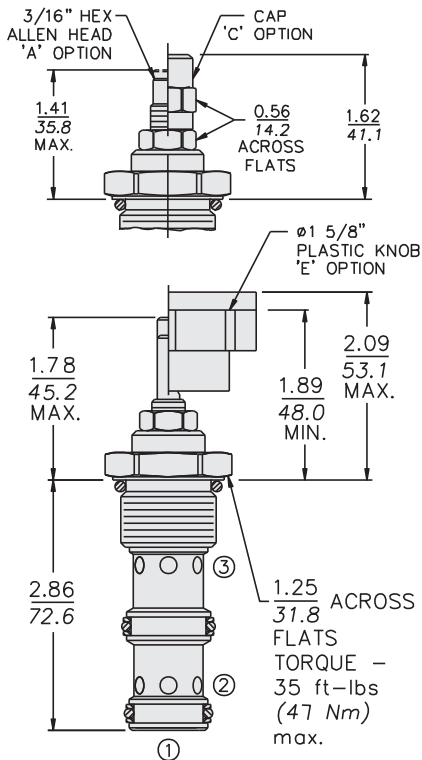
3-Ported:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.34 kg. (0.70 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 0.98 kg. (2.15 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.012.1.

TO ORDER

FR12-33 - -

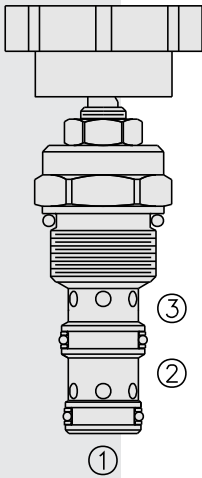
Adjustment Option
 Extended Shaft Only Blank
 3/16" Hex Allen Head **A**
 Option "A" with Cover Cap **C**
 Plastic Knob **E**

Seals
N Buna N (Std.)
V Fluorocarbon
P Polyurethane

Porting
 Cartridge Only **0**
 SAE 10 **10T**
 SAE 12 **12T**
 SAE 16 **16T**
 1/2 in. BSP* **4B**
 3/4 in. BSP* **6B**

*BSP Body; U.K. Mfr. Only

FR10-39 Flow Regulator, Pressure Compensated



DESCRIPTION

A screw-in, cartridge-style, adjustable orifice, pressure-compensated, manually-operated, bypass-type hydraulic flow regulating valve. It can be used as a priority-type flow regulator or a restrictive-type 2-way flow regulator when the bypass port (port 2) is blocked.

OPERATION

The **FR10-39** maintains a constant flow rate from 3 regardless of load pressure changes in the system downstream of 3, or in the bypass leg at 2. Reverse flow (3 to 1) bypasses the control orifice.

The regulated flow increases from closed to fully open, with counter-clockwise rotation of the knob.

Note: When used as a bypass flow control in applications where the priority flow port will be blocked by external valving, bypass pressure drop will increase unless a small amount of leakage is provided for the priority port. Consult factory.

FEATURES

- Bypass port 2 may be fully pressurized.
- Fine low-torque adjustment.
- Hardened steel parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow Rate: 3-ported regulated flow: 0–38 lpm (0–10 gpm)
2-ported regulated flow: 0–34 lpm (0–9 gpm)

Note: For lower flow rates, see the FR10-33 valve (page 5.372.1)

Input Flow: 3-ported: 0–38 lpm (0–10 gpm) nominal; 0–57 lpm (0–15 gpm) max.

Internal Leakage: 33 cc/minute (2 cu. in./minute) at 207 bar (3000 psi)

Adjustment Torque Required: 1.7 Nm (15 inch-pounds) at 207 bar (3000 psi)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: VC10-3; See page 9.110.1

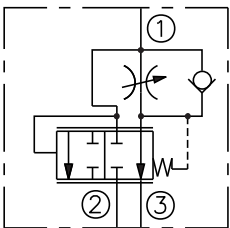
Cavity Tool: CT10-3XX; See page 8.600.1

Seal Kit: SK10-3X-MM; See page 8.650.1

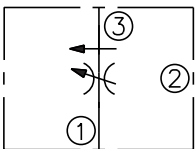
Knob Kit: Part Number 6113160

SYMBOLS

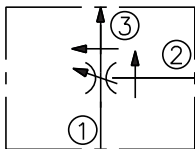
USASI/ISO:



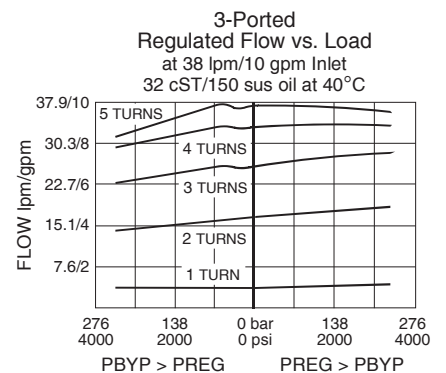
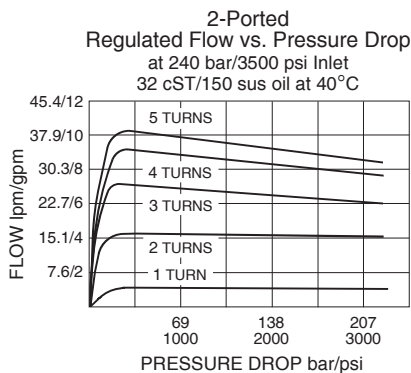
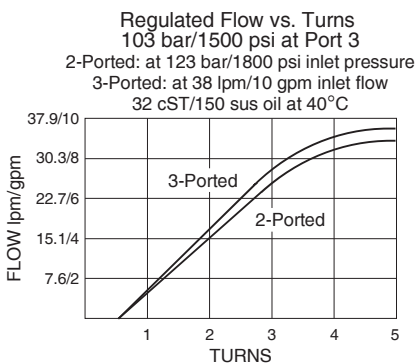
2-Ported:



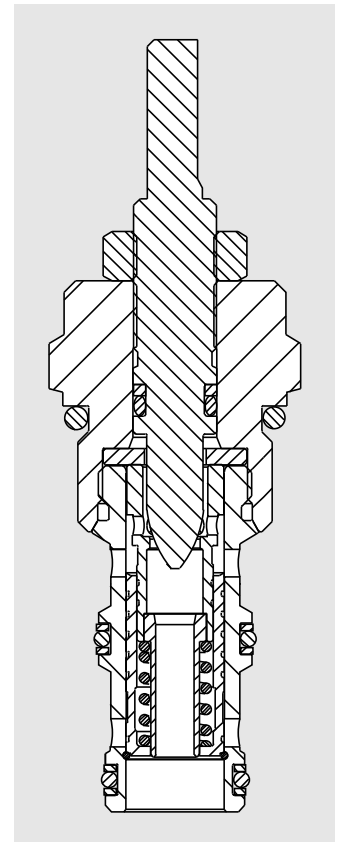
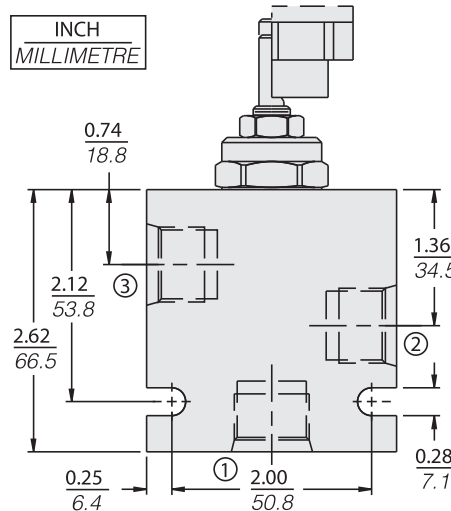
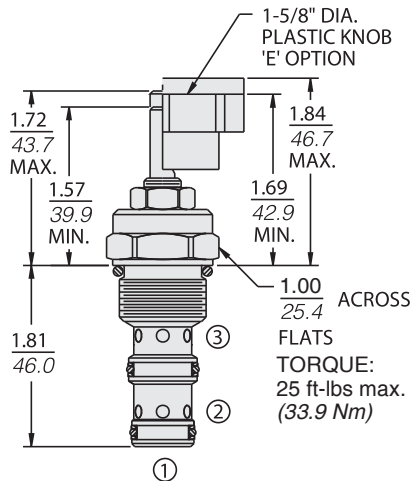
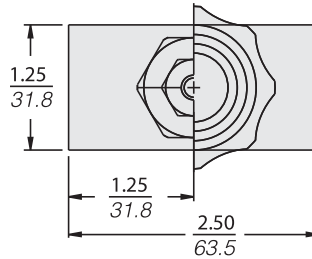
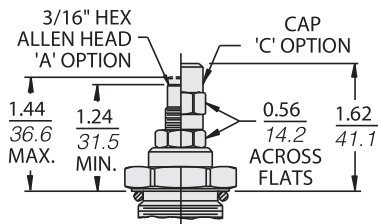
3-Ported:



PERFORMANCE (Cartridge Only)

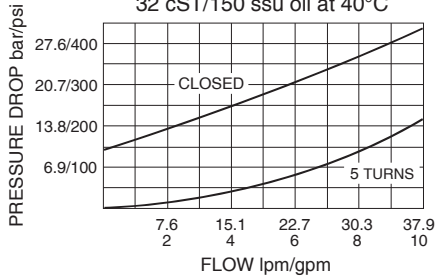


DIMENSIONS



PERFORMANCE (Cont'd.)

Pressure Drop vs. Reverse Flow from 3 to 1
34.5 bar/500 psi Inlet Pressure
32 cST/150 ssu oil at 40°C



MATERIALS

Cartridge: Weight: 0.30 kg. (0.68 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 0.36 kg. (0.80 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

TO ORDER

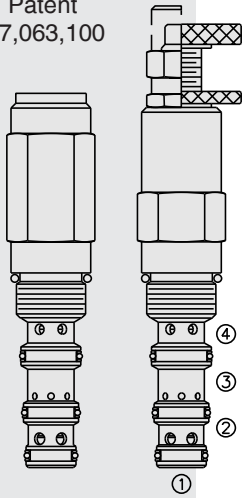
FR10-39 - -

Adjustment Option	Blank		Seals
Extended Shaft Only	A		N Buna N (Std.)
3/16" Hex Allen Head Option 'A' w/Cover Cap	C		V Fluorocarbon
Plastic Knob	E		
		Porting	
		0 Cartridge Only	
		6T SAE 6	
		8T SAE 8	
		2B 1/4 in. BSP*	
		3B 3/8 in. BSP*	

*BSP Body; U.K. Mfr. Only

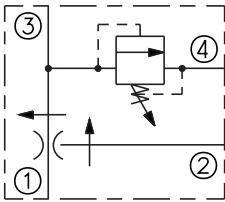
FRRV10-41F Priority Flow Regulator . . .

U.S. Patent
No. 7,063,100



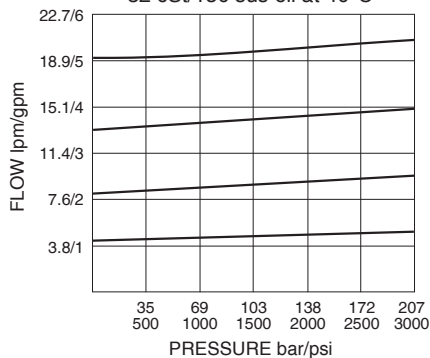
SYMBOLS

USASI/ISO:



PERFORMANCE (Cartridge Only)

Priority Flow vs. Priority Pressure
at 30.3 lpm/8 gpm Inlet Flow
32 cSt/150 sus oil at 40°C



DESCRIPTION

A screw-in, cartridge-style, multi-function valve which includes a fixed-compensated, priority-type flow regulator and an adjustable pressure relief valve in one cartridge.

OPERATION

The **FRRV10-41F** maintains a constant flow rate from port 3 regardless of load pressure changes at priority port 3 or bypass port 2. When load pressure at 3 reaches the setting of the relief valve, flow is dumped over the relief at 4.

The exit flow from the relief can be connected to tank or to the bypass flow.

Note: Back pressure at port 4 is directly additive to the relief setting.

FEATURES

- Two valve functions in one, industry-common cavity.
- Adjustments cannot be backed out of the valve.
- Relief valve adjustments prohibit relief valve spring from going solid.
- Quiet, modulated response.
- Hardened parts for long life.

RATINGS

Maximum Operating Pressure: 207 bar (3000 psi)

Maximum System Pressure: 276 bar (4000 psi)

Priority Flow: 19 lpm (5.0 gpm) maximum regulated

Inlet Flow: 38 lpm (10.0 gpm) maximum

Relief Valve Pressure Setting Ranges: 17 to 207 bar (250 to 3000 psi)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: VC10-4; See page 9.110.1

Cavity Tool: CT10-4XX; See page 8.600.1

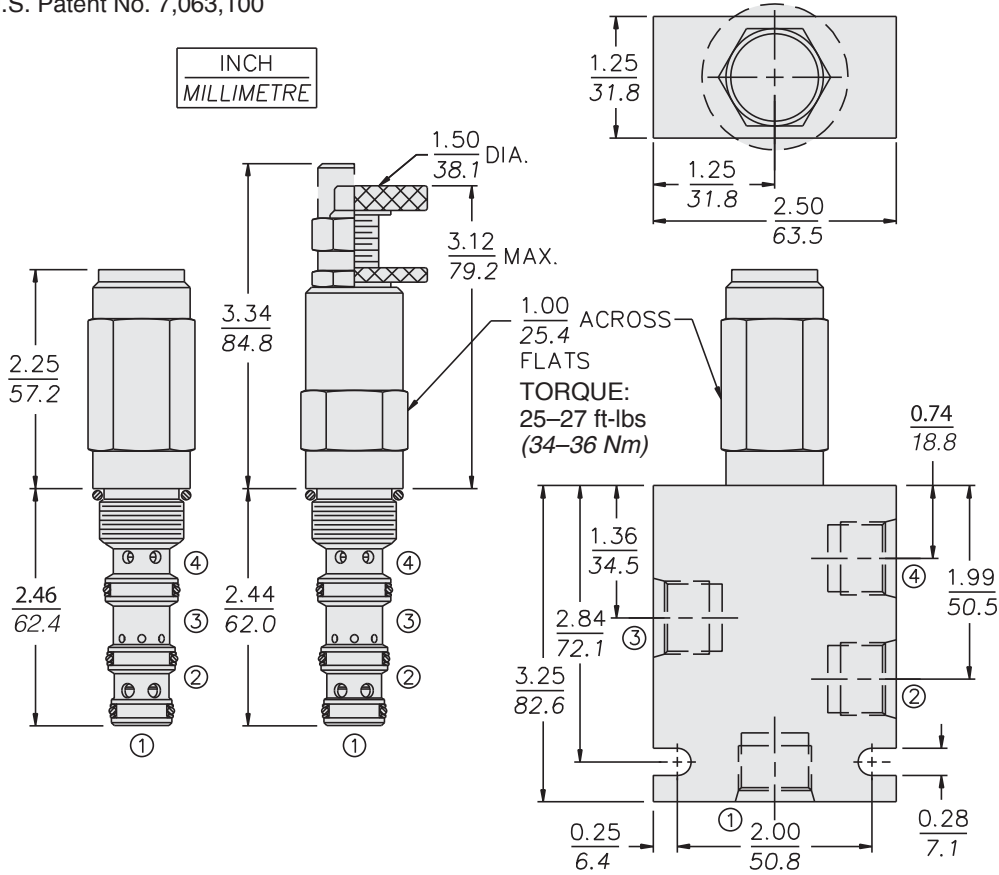
Seal Kit: SK10-4X-MMM; See page 8.650.1

with Built-In Relief Valve

FRRV10-41F

DIMENSIONS

U.S. Patent No. 7,063,100



MATERIALS

Cartridge: Weight: 0.34 kg. (0.70 lbs.) Steel with hardened work surfaces. Zinc-plated exposed surfaces. Buna N O-rings and polyester elastomer back-ups standard. Anodized aluminum knobs and caps.

Standard Ported Body: Weight: 0.34 kg. (0.70 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron body required for operation over 207 bar (3000 psi), dimensions may differ. See page 8.010.1

TO ORDER

FRRV10-41F

- Adjustment Option**
- 1/4 in. Hex Allen Head **A**
 - 1-1/2 in. Dia. Alum Knob **B**
 - Option A w/Cover Cap **C**
 - Factory Preset Non-Adj. **F**
 - Factory Preset Hidden Adj. **H**
 - Option C w/Lockwire Holes **L**

See page 6.003.1 for adjustment option details.

- Porting**
- Cartridge Only **0**
 - SAE 6 **6T**
 - SAE 8 **8T**
 - 1/4 in. BSP* **2B**
 - 3/8 in. BSP* **3B**
- *BSP Body; U.K. Mfr. Only

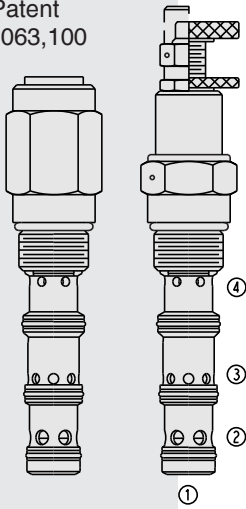
- Seals**
- Buna N(Std.) **N**
 - Fluorocarbon **V**

- Pressure Setting in bar**
- Range: 17 to 207 bar
 - M25** 25 bar (example)
 - M100** 100 bar (example)
- Pressure Setting in psi**
- Range: 250 to 3000 psi
 - 9.0** 900 psi (example)
 - 23.5** 2350 psi (example)

- Priority Flow Setting**
- Range: 1.0 to 19.0 lpm
 - M12.0** 12.0 lpm (example)
 - Range: 0.25 to 5.0 gpm
 - 3.0** 3.0 gpm (example)

FRRV12-41F Priority Flow Regulator . . .

U.S. Patent
No. 7,063,100



DESCRIPTION

A screw-in, cartridge-style, multi-function valve which includes a fixed-compensated, priority-type flow regulator and an adjustable pressure relief valve in one cartridge.

OPERATION

The **FRRV12-41F** maintains a constant flow rate from port 3 regardless of load pressure changes at priority port 3 or bypass port 2. When load pressure at 3 reaches the setting of the relief valve, flow is dumped over the relief at 4.

The exit flow from the relief can be connected to tank or to the bypass flow.

Note: Back pressure at port 4 is directly additive to the relief setting.

FEATURES

- Two valve functions in one, industry-common cavity.
- Adjustments cannot be backed out of the valve.
- Relief valve adjustments prohibit relief valve spring from going solid.
- Quiet, modulated response.
- Hardened parts for long life.

RATINGS

Maximum Operating Pressure: 207 bar (3000 psi)

Maximum System Pressure: 276 bar (4000 psi)

Priority Flow: 45.4 lpm (12.0 gpm) maximum regulated

Inlet Flow: 75.7 lpm (20.0 gpm) maximum

Relief Valve Pressure Setting Ranges: 17 to 207 bar (250 to 3000 psi)

Temperature: -40 to 120°C with standard Buna seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

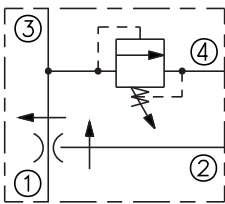
Cavity: VC12-4; See page 9.112.1

Cavity Tool: CT12-4XX; See page 8.600.1

Seal Kit: SK12-4X-MMM; See page 8.650.1

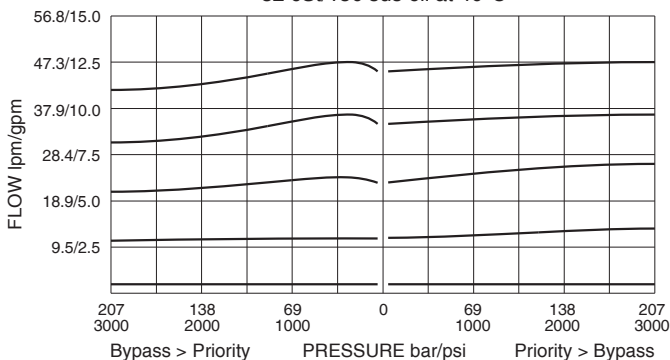
SYMBOLS

USASI/ISO:

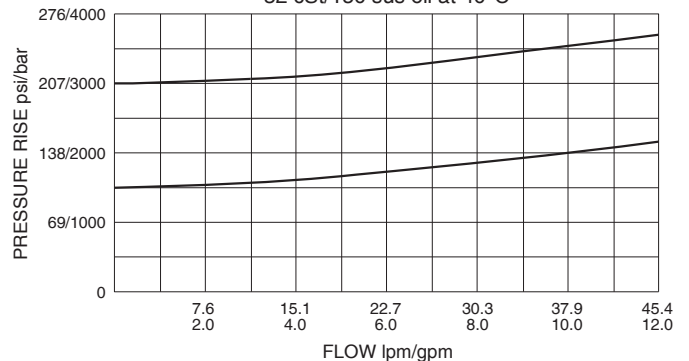


PERFORMANCE (Cartridge Only)

Priority Flow vs. Load Pressure
at 75.7 lpm/20.0 gpm Inlet Flow
32 cSt/150 sus oil at 40°C



Relief Pressure vs. Flow
32 cSt/150 sus oil at 40°C

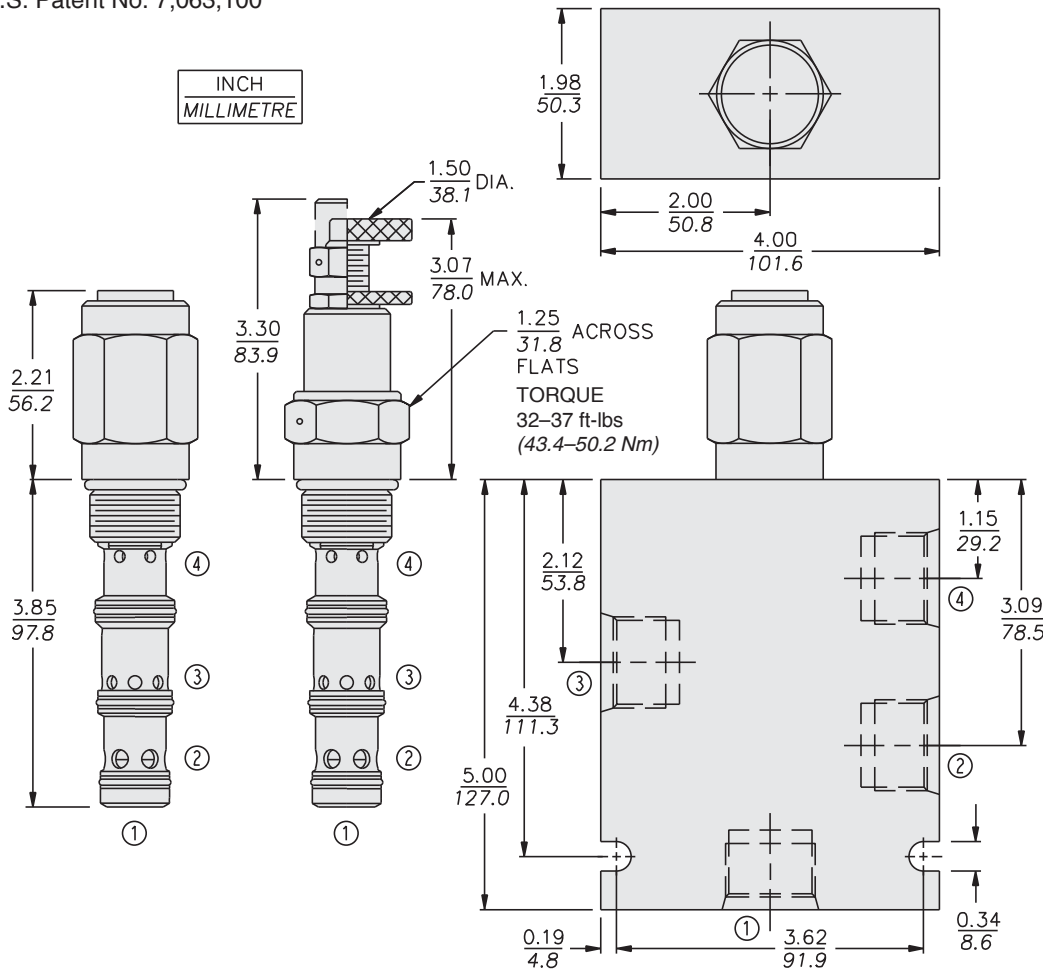


with Built-In Relief Valve

FRRV12-41F

DIMENSIONS

U.S. Patent No. 7,063,100



MATERIALS

Cartridge: Weight: 0.43 to 0.48 kg. (0.95 to 1.05 lbs.) depending on option selected. Steel with hardened work surfaces. Zinc-plated exposed surfaces. Buna N O-rings and polyester elastomer back-ups standard. Anodized aluminum knobs and caps.

Standard Ported Body: Weight: 1.50 kg. (3.30 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron body required for operation over 207 bar (3000 psi), dimensions may differ. See page 8.010.1

TO ORDER

FRRV12-41F

Adjustment Option
 1/4 in. Hex Allen Head **A**
 1-1/2 in. Dia. Alum Knob **B**
 Option A w/Cover Cap **C**
 Factory Preset Non-Adj. **F**
 Factory Preset Hidden Adj. **H**
 Option C w/Lockwire Holes **L**

See page 6.003.1 for adjustment option details.

Porting
 Cartridge Only **0**
 SAE 10 **10T**
 SAE 12 **12T**

Seals
 Buna N(Std.) **N**
 Fluorocarbon **V**

Pressure Setting in bar

Range: 17 to 207 bar

M25 25 bar (example)
M100 100 bar (example)

Pressure Setting in psi

Range: 250 to 3000 psi

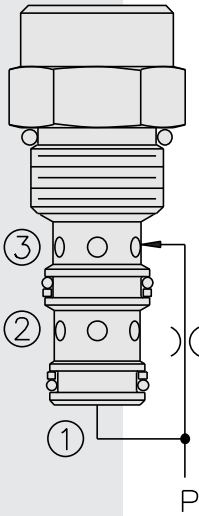
9.0 900 psi (example)
23.5 2350 psi (example)

Priority Flow Setting

Range: 1.0 to 45.4 lpm

M20.0 20.0 lpm (example)
 Range: 0.25 to 12.0 gpm
5.0 5.0 gpm (example)

EC10-30 Pressure Compensator



DESCRIPTION

A screw-in, cartridge-style pressure-compensating element, intended for use with a remote fixed or variable orifice to yield a two-port-type, pressure-compensated, flow regulating hydraulic valve.

OPERATION

The EC10-30 maintains a constant flow rate from 2 regardless of load pressure changes in the circuit downstream of 2.

The cartridge maintains a constant differential pressure from circuit point P to port 3 (see USASI Symbol), thereby regulating the hydraulic flow rate between the two points in the circuit.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: 207 bar (3000 psi)

Regulated Flow Rate: 30.3 lpm (8 gpm) max.

Standard Compensator Bias Spring: 5.5 bar (80 psid)

Flow Maintenance: ±10% from 0.38 to 38 lpm (0.1 to 10 gpm) at pressures from 5.5 to 207 bar (80 to 3000 psi)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

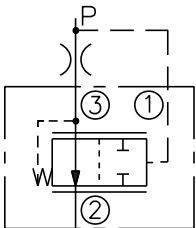
Cavity: VC10-3; See page 9.110.1

Cavity Tool: CT10-3XX; See page 8.600.1

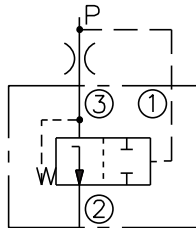
Seal Kit: SK10-3X-TB; See page 8.650.1

SYMBOLS

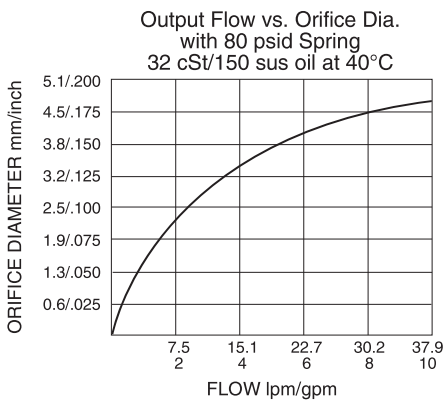
USASI:



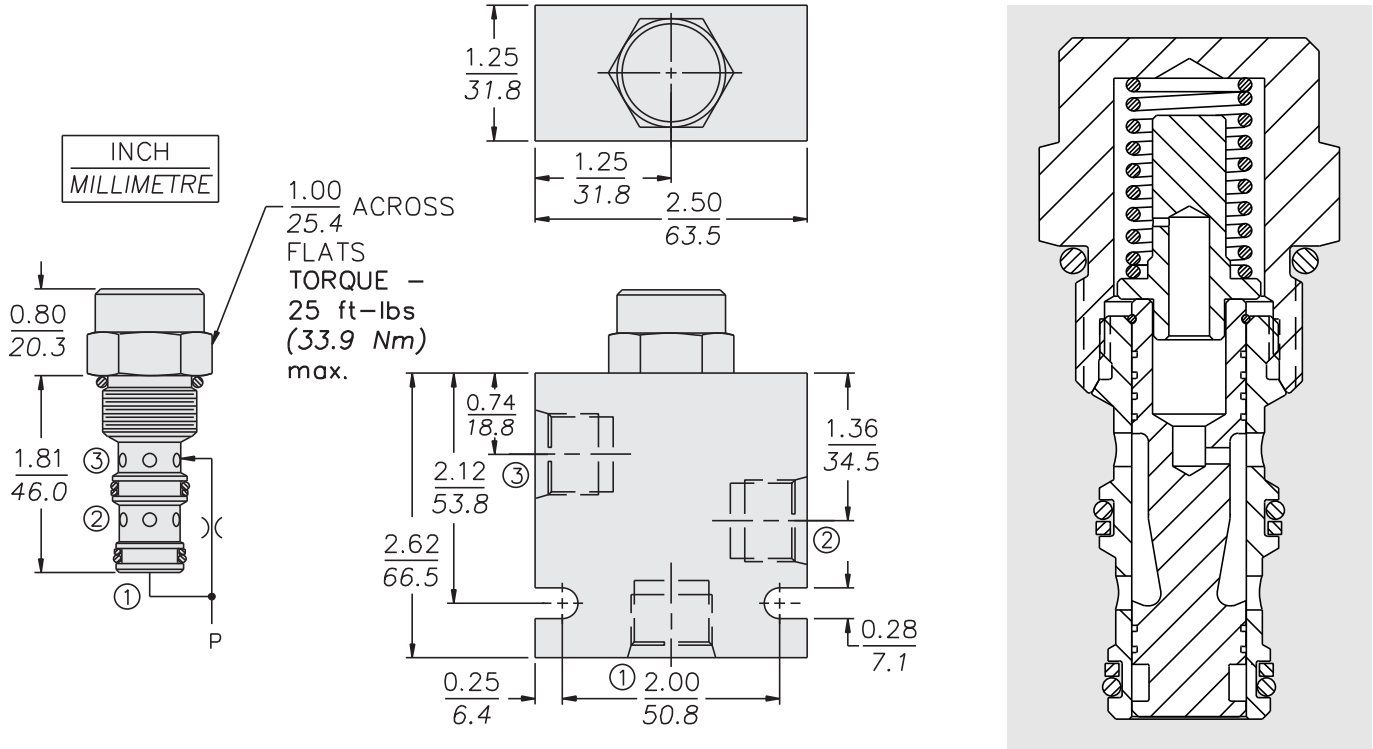
ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.11 kg. (0.25 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Standard Ported Body: Weight:
0.36 kg. (0.80 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.010.1.

TO ORDER

EC10-30 -

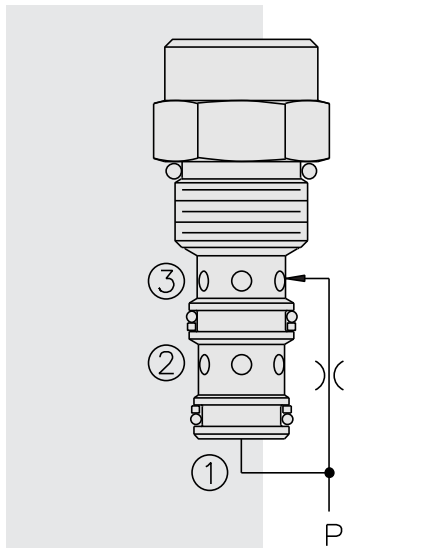
Porting
Cartridge Only **0**
SAE 6 **6T**
SAE 8 **8T**
1/4 in. BSP* **2B**
3/8 in. BSP* **3B**

*BSP Body; U.K. Mfr. Only

Compensator Spring
40 2.8 bar (40 psid)
80 5.5 bar (80 psid) standard
160 11.0 bar (160 psid)

Seals
N Buna N (Std.)
V Fluorocarbon

EC50-30 Pressure Compensator, High Pressure



DESCRIPTION

A screw-in, cartridge-style pressure-compensating element, intended for use with a remote fixed or variable orifice to yield a two-port-type, pressure-compensated, flow regulating hydraulic valve for use in high pressure circuits.

OPERATION

The EC50-30 maintains a constant flow rate from 2 regardless of load pressure changes in the circuit downstream of 2.

The cartridge maintains a constant differential pressure from circuit point P to port 3 (see USASI Symbol), thereby regulating the hydraulic flow rate between the two points in the circuit.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: 345 bar (5000 psi)

Regulated Flow Rate: 30.3 lpm (8 gpm) max.

Standard Compensator Bias Spring: 5.5 bar (80 psid)

Flow Maintenance: $\pm 10\%$ from 0.38 to 38 lpm (0.1 to 10 gpm) at pressures from 5.5 to 345 bar (80 to 5000 psi)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

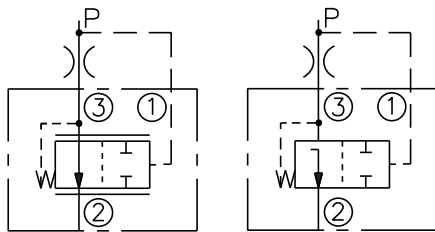
Cavity: VC10-3; See page 9.110.1 **vvCavity Tool:** CT10-3XX; See page 8.600.1

Seal Kit: SK10-3P-TB; See page 8.650.1

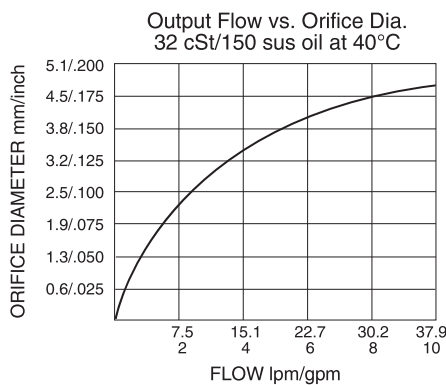
SYMBOLS

USASI:

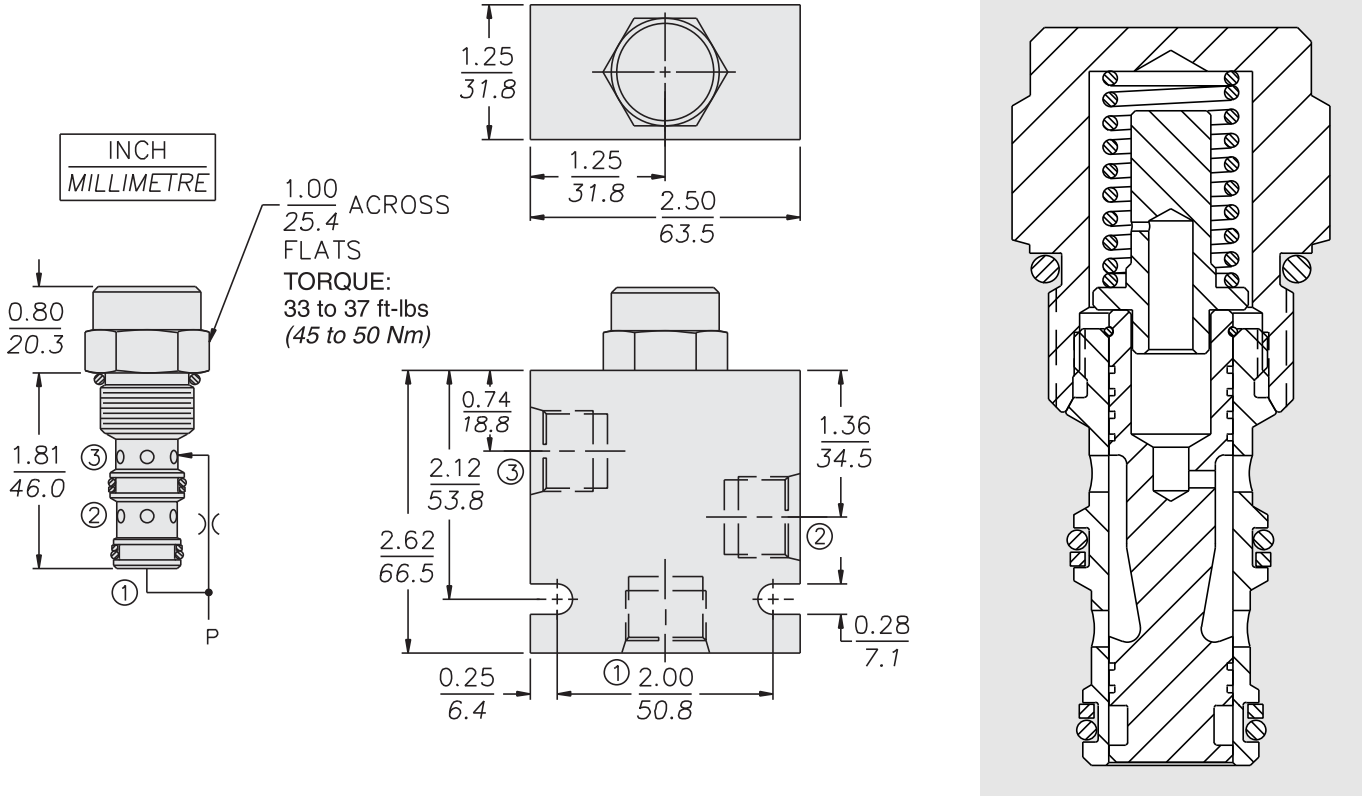
ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS

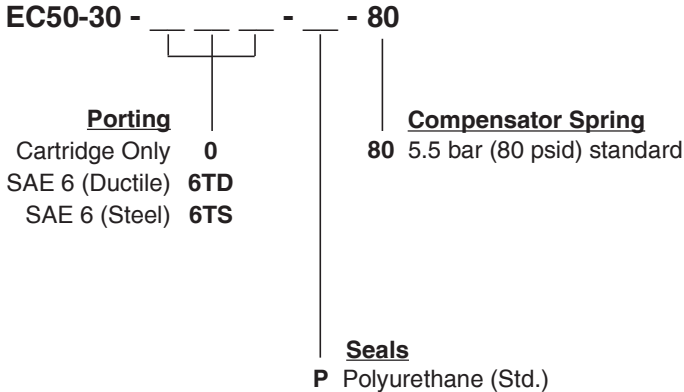


MATERIALS

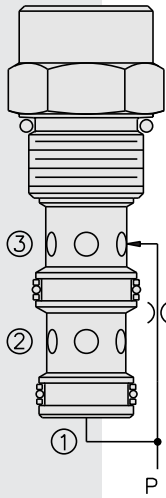
Cartridge: Weight: 0.11 kg. (0.25 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Polyurethane O-rings and
 Fluorocarbon back-ups standard.

Ported Body: Weight: 0.64 kg.
 (1.41 lbs.) Ductile Iron (code "D")
 standard, consult factory for weight,
 dimensions may differ. Rated to
 345 bar (5000 psi).
 See page 8.010.1

TO ORDER



EC12-30 Pressure Compensator



DESCRIPTION

A screw-in, cartridge-style pressure-compensating element, intended for use with a remote fixed or variable orifice to yield a two-port-type, pressure-compensated, flow-regulating hydraulic valve.

OPERATION

The EC12-30 maintains a constant flow rate from 2 regardless of load pressure changes in the circuit downstream of 2.

The cartridge maintains a constant differential pressure from circuit point P to port 1 (see USASI Symbol), thereby regulating the hydraulic flow rate between the two points in the circuit.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Regulated Flow Rate: 58 lpm (15 gpm) max.

Standard Compensator Bias Spring: 6.9 bar (100 psi) See note on Ordering Table.

Flow Maintenance: ±10% from 0.38 to 58 lpm (0.1 to 15 gpm) at pressures from 5.5 to 207 bar (80 to 3000 psi)

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: VC12-3; See page 9.112.1

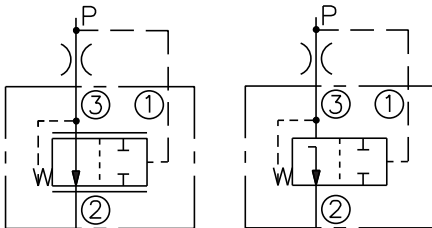
Cavity Tool: CT12-3XX; See page 8.600.1

Seal Kit: SK12-3X-MM; See page 8.650.1

SYMBOLS

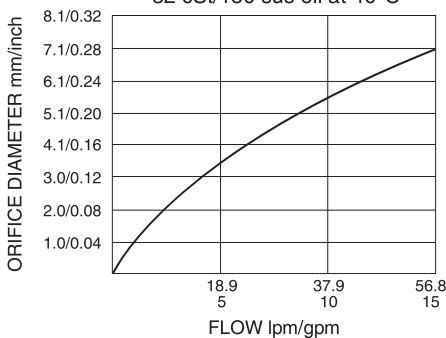
USASI:

ISO:

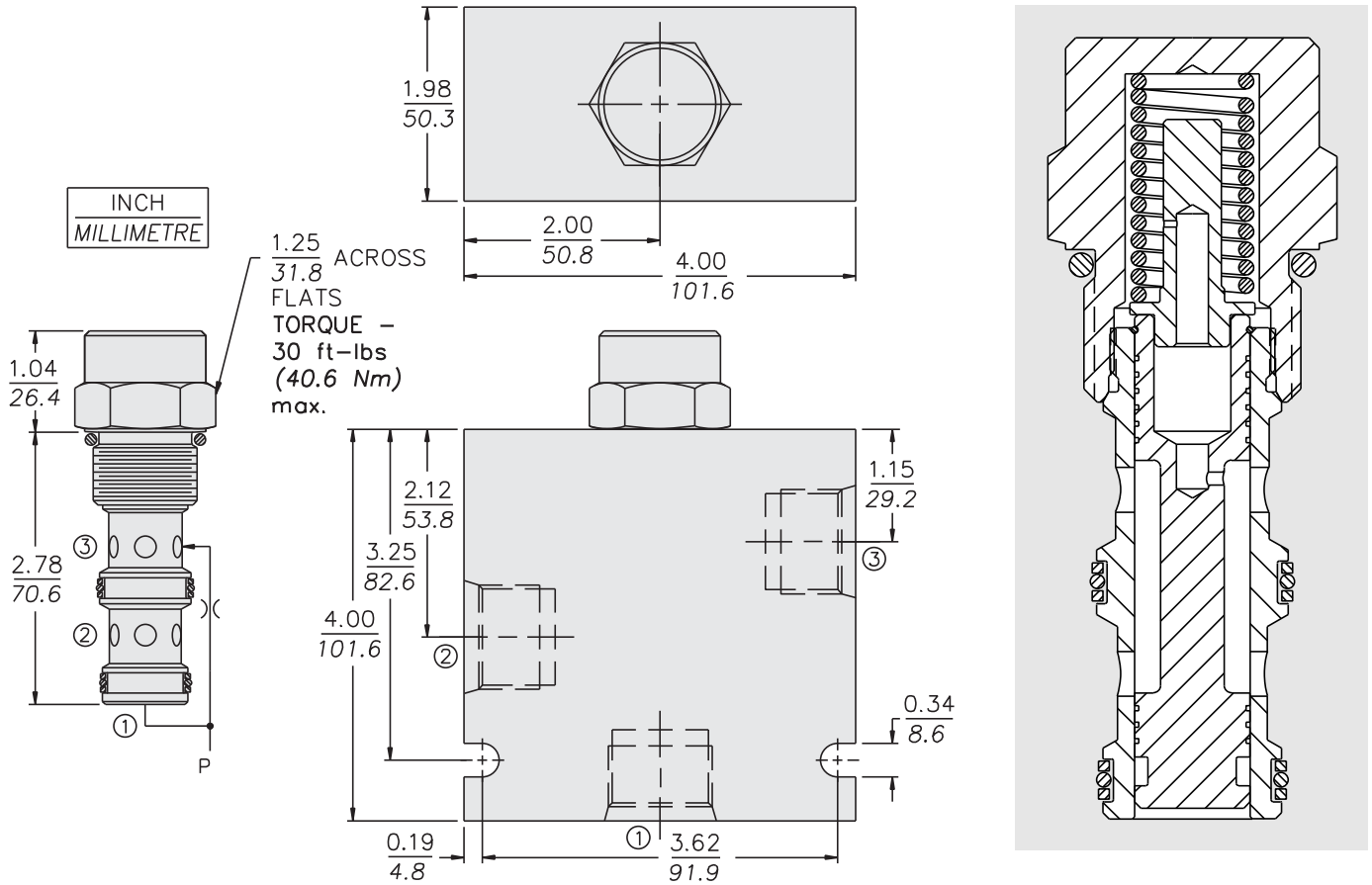


PERFORMANCE (Cartridge Only)

Output Flow vs. Orifice Dia.
with 100 psid Spring
32 cSt/150 sus oil at 40°C



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.23 kg. (0.50 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 1.13 kg. (2.5 lbs.)
Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.012.1

TO ORDER

EC12-30 -

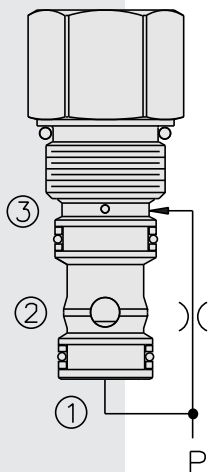
Porting
Cartridge Only **0**
SAE 8 **8T**
SAE 10 **10T**
SAE 12 **12T**
1/2 in. BSP* **4B**
3/4 in. BSP* **6B**

*BSP Body; U.K. Mfr. Only

Compensator Spring
100 6.9 bar (100 psid) standard
160 11.0 bar (160 psid)

Seals
N Buna N (Std.)
V Fluorocarbon

EC10-S31 Pressure Compensator



DESCRIPTION

A screw-in, cartridge-style pressure-compensator, intended for use upstream of a remote fixed or variable orifice to provide a constant flow rate regardless of load pressure changes.

OPERATION

The EC10-S31 delivers constant flow to port 2 regardless of load pressure changes.

FEATURES

- Hardened seat for long life and low leakage.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: Inlet: 240 bar (3500 psi)

Maximum Compensated Flow: 30.3 lpm (8 gpm) with 7.6 bar (110 psi) spring;
22.7 lpm (6 gpm) with 5.5 bar (80 psi) spring

Standard Compensator Bias Spring: 5.5 bar (80 psid)

Flow Maintenance: see performance chart

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

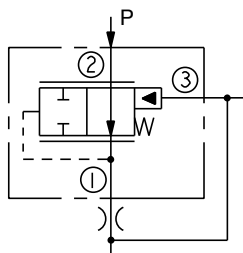
Cavity: VC10-S3; See page 9.110.1

Cavity Tool: CT10-S3-XX; See page 8.600.1

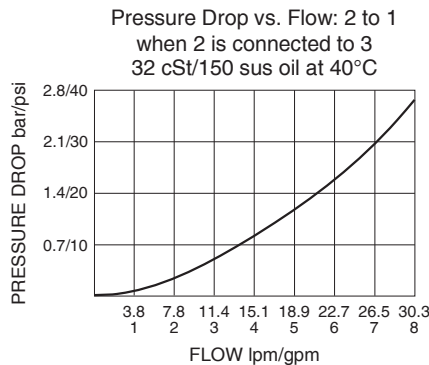
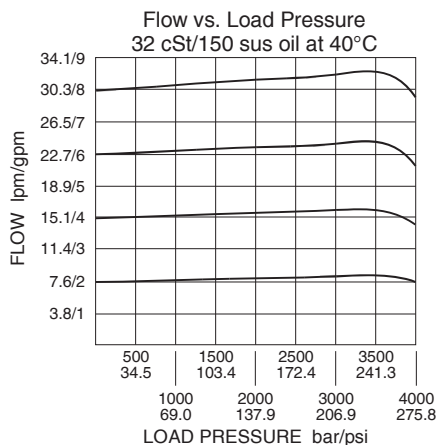
Seal Kit: SK10-S3X-MM; See page 8.650.1

SYMBOLS

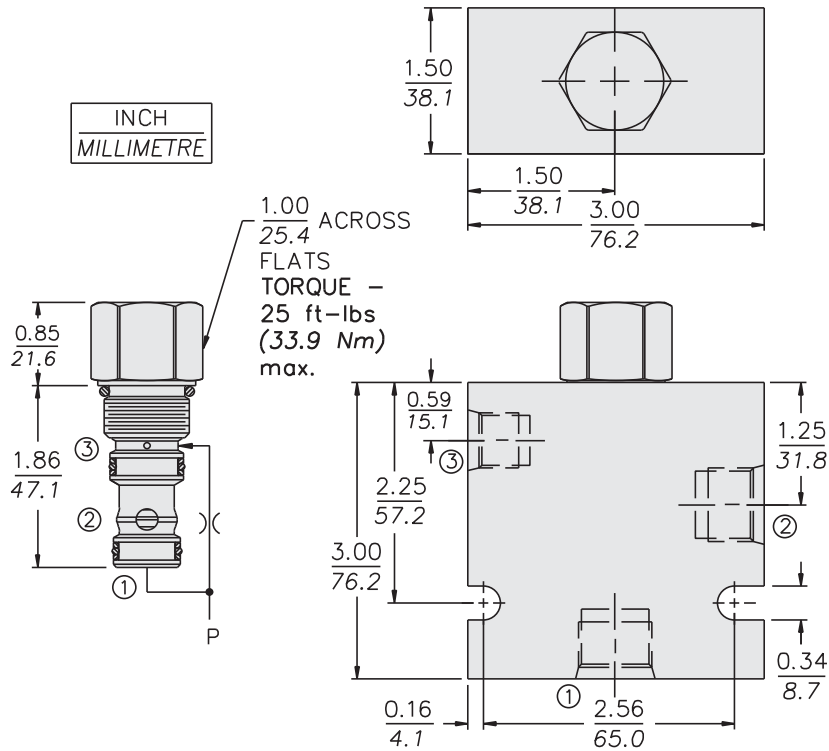
USASI/ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.11 kg. (0.25 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

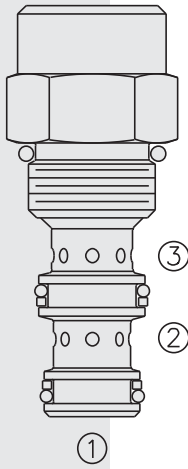
Standard Ported Body: Weight: 0.34 kg. (0.75 lbs.)
Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

TO ORDER

EC10-S31 - - -

Porting		Bias Spring	
Cartridge Only	0	80	5.5 bar (80 psi)
SAE 8	8T	110	7.6 bar (110 psi)
SAE 10	10T		
		Seals	
		N	Buna N (Std.)
		V	Fluorocarbon

EC08-32 Pressure-Compensator w/Load Sense



DESCRIPTION

A screw-in, cartridge-style, load sense, flow-on-demand pressure-compensator.

OPERATION

With inlet flow at 2, the EC08-32 will deliver required flow at 3 in response to load differential pressure sensed at 1.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: 241 bar (3500 psi)

Proof Pressure: 345 bar (5000 psi)

Burst Pressure: 1034 bar (15000 psi)

Flow Rate: 11.4 lpm (3.0 gpm) with 5.5 bar (80 psi) compensating spring;
 18.9 lpm (5.0 gpm) with 10.3 bar (150 psi) compensating spring
 30.3 lpm (8.0 gpm) with 17.2 bar (250 psi) compensating spring

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

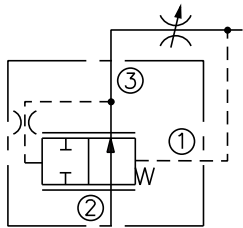
Cavity: VC08-3; See page 9.108.1

Cavity Tool: CT08-3XX; See page 8.600.1

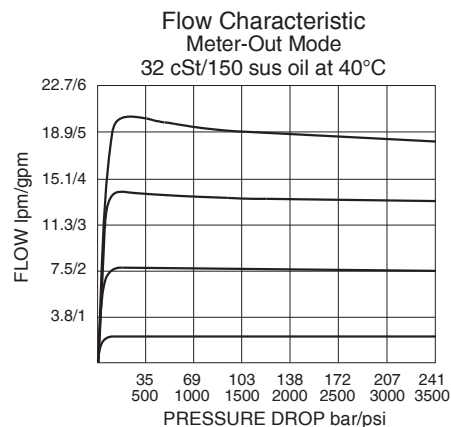
Seal Kit: SK08-3X-M; See page 8.650.1

SYMBOL

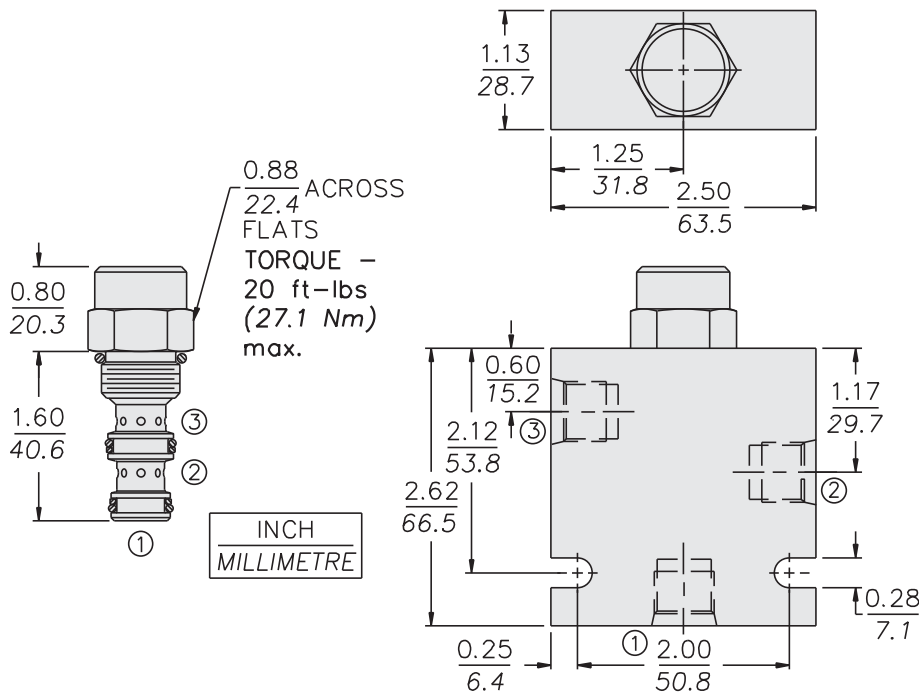
USASI/ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.10 kg. (0.22 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and back-ups standard.

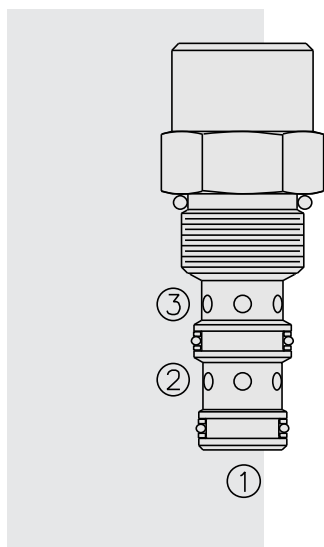
Standard Ported Body: Weight:
0.27 kg. (0.60 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.008.1.

TO ORDER

EC08-32 - - -

Porting			
Cartridge Only	0		
SAE 6	6T		
1/4 in. BSP*	2B		
3/8 in. BSP*	3B		
*BSP Body; U.K. Mfr. Only			
		Compensator Spring	
		80	5.5 bar (80 psid)
		150	10.3 bar (150 psid)
		250	17.2 bar (250 psid)
		Seals	
		N	Buna N (Std.)
		V	Fluorocarbon

EC10-32 Pressure Compensator



DESCRIPTION

A screw-in, cartridge-style, load sense, flow-on-demand pressure-compensator.

OPERATION

With inlet flow at 2, the **EC10-32** will deliver required flow at 3, in response to load differential pressure sensed at 1.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: Inlet: 207 bar (3000 psi)

Maximum Regulated Flow: 38.1 lpm (10.0 gpm) with 150 psi compensating spring;
28.0 lpm (7.5 gpm) with 80 psi compensating spring.

Flow Maintenance: See performance chart

Temperature: -40 to 120°C with Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

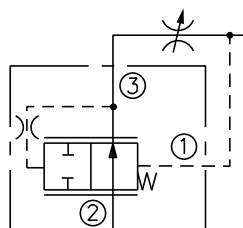
Cavity: VC10-3; See page 9.110.1

Cavity Tool: CT10-3XX; See page 8.600.1

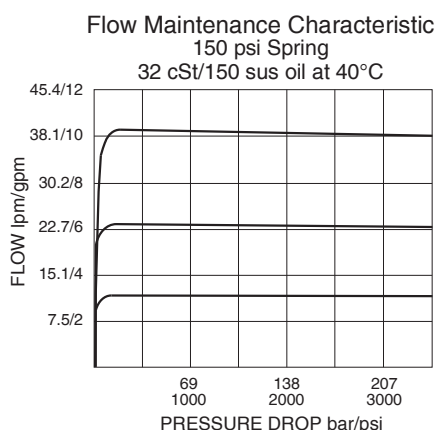
Seal Kit: SK10-3X-MM; See page 8.650.1

SYMBOLS

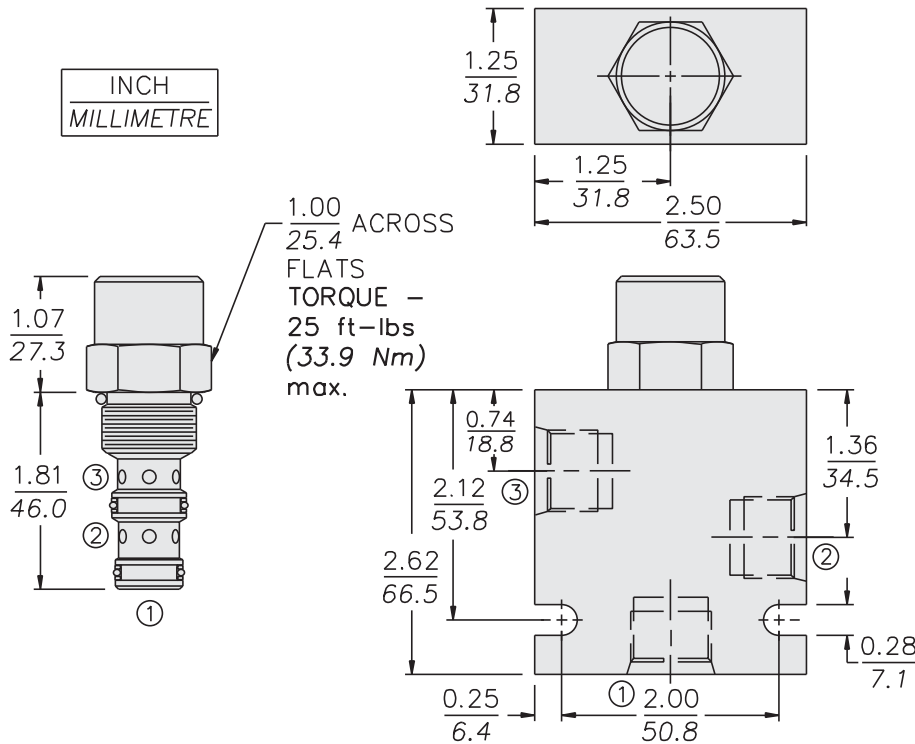
USASI/ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.11 kg. (0.25 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

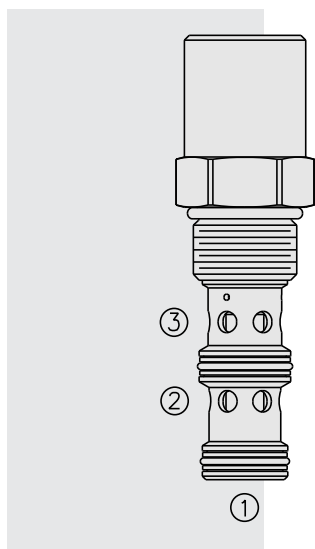
Standard Ported Body: Weight:
0.36 kg. (0.80 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.010.1

TO ORDER

EC10-32 -

Porting		Compensator Spring
Cartridge Only	0	80 5.5 bar (80 psid)
SAE 6	6T	150 10.3 bar (150 psid)
SAE 8	8T	
1/4 in. BSP*	2B	
3/8 in. BSP*	3B	
*BSP Body; U.K. Mfr. Only		
		Seals
		N Buna N (Std.)
		V Fluorocarbon

EC12-32 Pressure Compensator



DESCRIPTION

A screw-in, cartridge-style, load sense, flow-on-demand pressure-compensator.

OPERATION

With inlet flow at 2, the **EC12-32** will deliver required flow at 3, in response to load differential pressure sensed at 1.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: Inlet: 241 bar (3500 psi)

Maximum Regulated Flow: 57 lpm (15 gpm) with 80 psi compensating spring;
83 lpm (22 gpm) with 160 psi compensating spring.

Flow Maintenance: See performance chart

Temperature: -40 to 120°C with Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

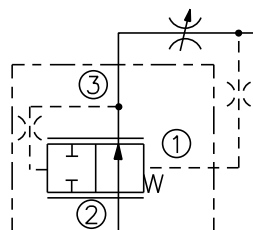
Cavity: VC12-3; See page 9.112.1

Cavity Tool: CT12-3XX; See page 8.600.1

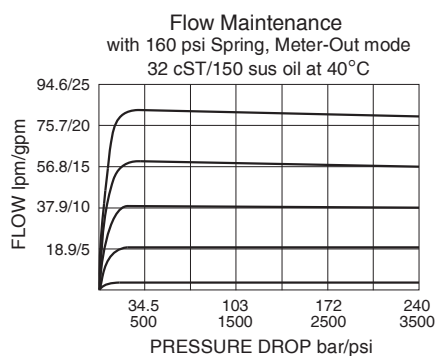
Seal Kit: SK12-3X-MM; See page 8.650.1

SYMBOLS

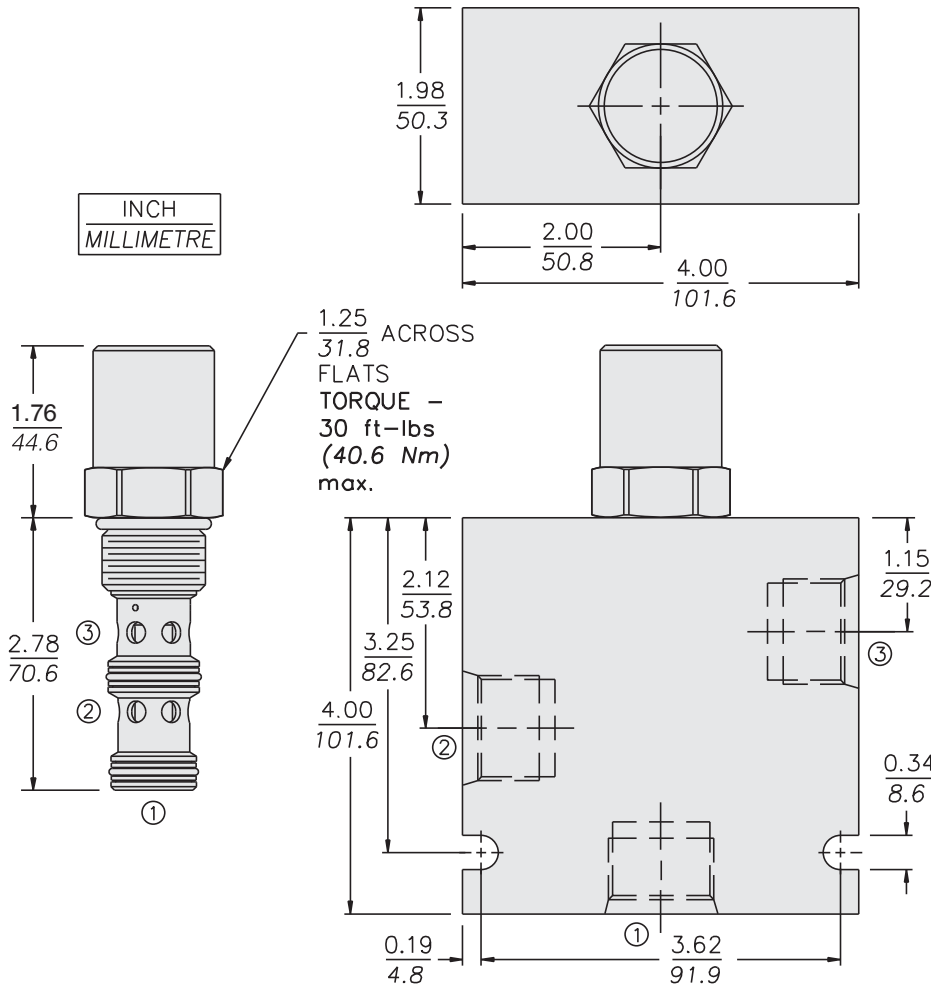
USASI/ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.39 kg. (0.87 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

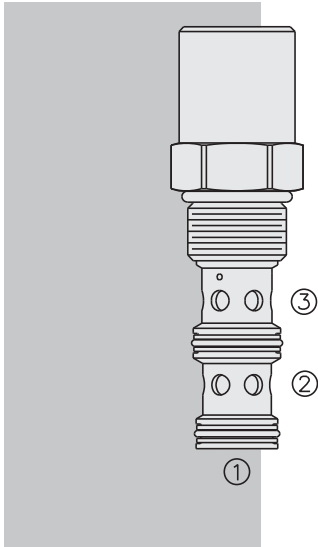
Standard Ported Body: Weight:
1.13 kg. (2.5 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available, dimensions
may differ. See page 8.012.1

TO ORDER

EC12-32 -

Porting				
Cartridge Only	0			
SAE 8	8T			
SAE 10	10T			
SAE 12	12T			
1/2 in. BSP*	4B			
3/4 in. BSP*	6B			
*BSP Body; U.K. Mfr. Only				
			Compensator Spring	
			80	5.5 bar (80 psid)
			160	11.0 bar (160 psid)
			Seals	
			N	Buna N (Std.)
			V	Fluorocarbon

HEC12-32 Pressure Compensator, Flow On Demand



DESCRIPTION

A screw-in, cartridge-style, load-sense, flow-on-demand, pressure compensator valve.

OPERATION

With inlet flow at port 2, the **HEC12-32** will deliver required flow at port 3, regardless of load pressure sensed at port 1. **NOTE:** For greater stability, it is recommended to install the 10.53 mm (0.21 inch) orifice in the load sense line at port 1.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.

RATINGS

Operating Pressure: 350 bar (5075 psi) 10% cycle life: 420 bar (6090 psi)

Proof Pressure: 690 bar (10000 psi)

Burst Pressure: 1380 bar (20000 psi)

Maximum Inlet Flow Rate:

- 83 lpm (22 gpm) with 11 bar (160 psi) compensating spring;
- 57 lpm (15 gpm) with 5.5 bar (80 psi) compensating spring

Maximum Internal Leakage: 52 ml/min (3.2 cu.in./min) at port 1 with 350 bar (5075 psi) pressure at port 2 and port 3 blocked.

Flow Maintenance: See performance chart

Temperature: -54° to 107°C (-65° to 225°F) with PPDI Urethane seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

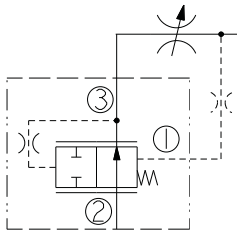
Installation: No restrictions; See page 9.020.1

Cavity: HVC12-3; See page 9.112.2

Cavity Tool: HCT-3X0-X-X; See page 8.600.1

Seal Kit: HSK12-3U-0; See page 8.650.1

ISO SYMBOL

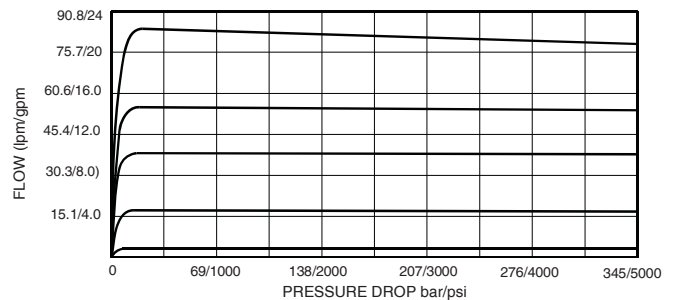


PERFORMANCE (Cartridge Only)

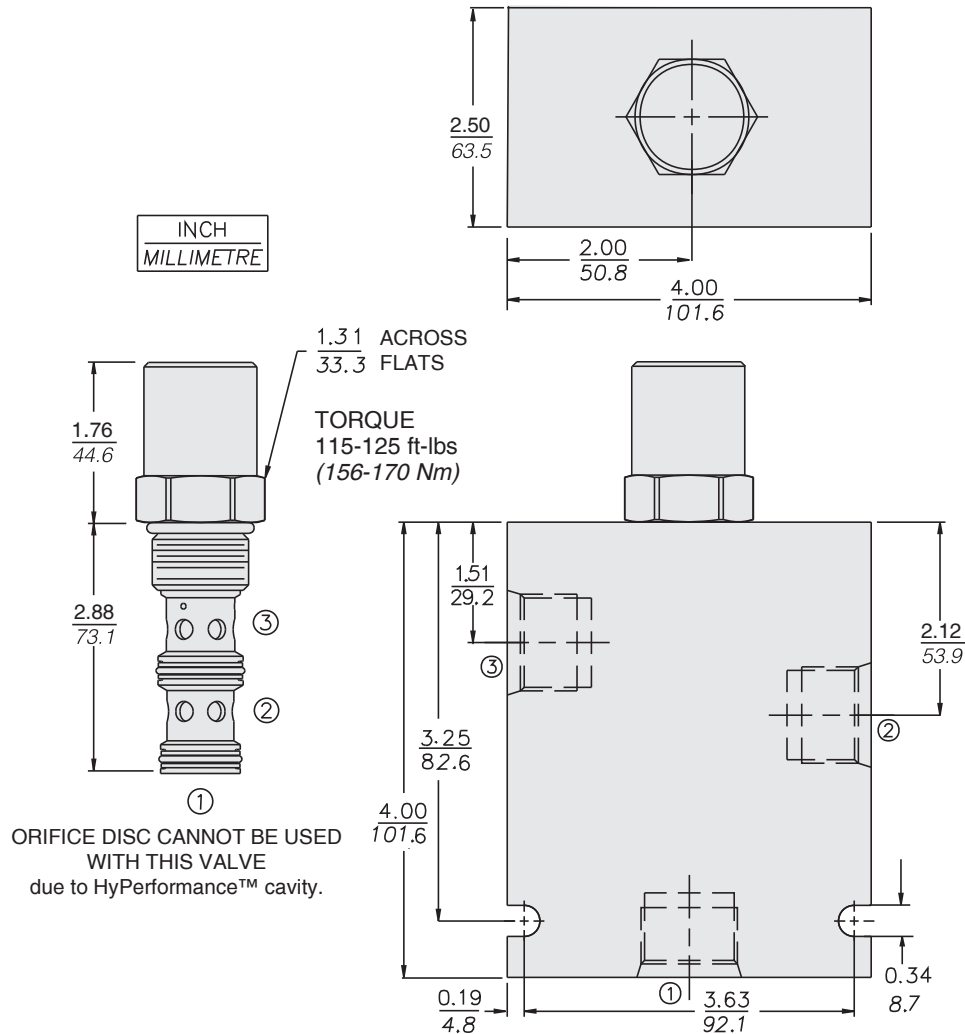
Flow Characteristics (Meter Out Mode)
HEC12-32 with 5.5 Bar (80 psi) Spring
32cSt Oil at 40°C (104°F)



Flow Characteristics (Meter Out Mode)
HEC12-32 with 11 Bar (160 psi) Spring
32cSt Oil at 40°C (104°F)



DIMENSIONS



MATERIALS

Cartridge: Weight: 5.2 kg. (11.5 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
PPDI urethane without back-up rings

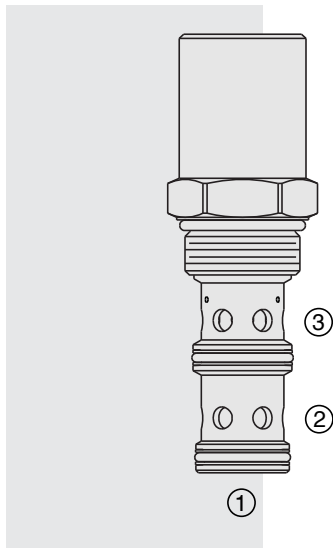
Ported Body: Weight: 4.05 kg (8.93 lb)
HyPerformance Ductile iron (code 'D'
standard. Rated to 345 bar (5000 psi)

TO ORDER

HEC12-32 - - -

Porting		Compensator Spring
Cartridge Only	0	80 5.5 bar (80 psi)
SAE 12	12TD	160 11 bar (160 psi)
*3/4 in. BSP	6BD	
*BSP body; U.K. Mrg. Only		
		Seals
		U PPDI Urethane

EC16-32 Pressure Compensator



DESCRIPTION

A screw-in, cartridge-style, load sense, flow-on-demand pressure-compensator.

OPERATION

With inlet flow at 2, the **EC16-32** will deliver required flow at 3, in response to load differential pressure sensed at 1.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: Inlet: 241 bar (3500 psi)

Maximum Regulated Flow: 134 lpm (30.0 gpm) with 80 psi compensating spring;
152 lpm (40 gpm) with 160 psi compensating spring.

Flow Maintenance: See performance chart

Temperature: -40 to 120°C with Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

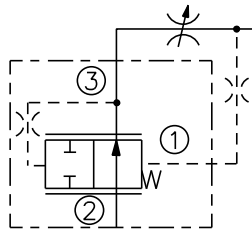
Cavity: VC16-3; See page 9.116.1

Cavity Tool: CT16-3XX; See page 8.600.1

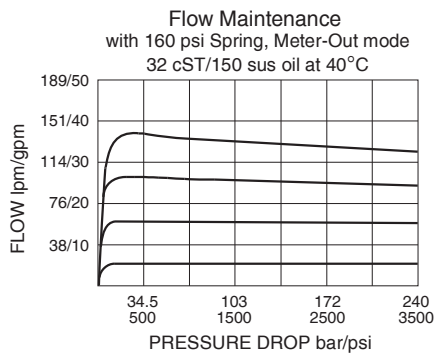
Seal Kit: SK16-3X-MM; See page 8.650.1

SYMBOLS

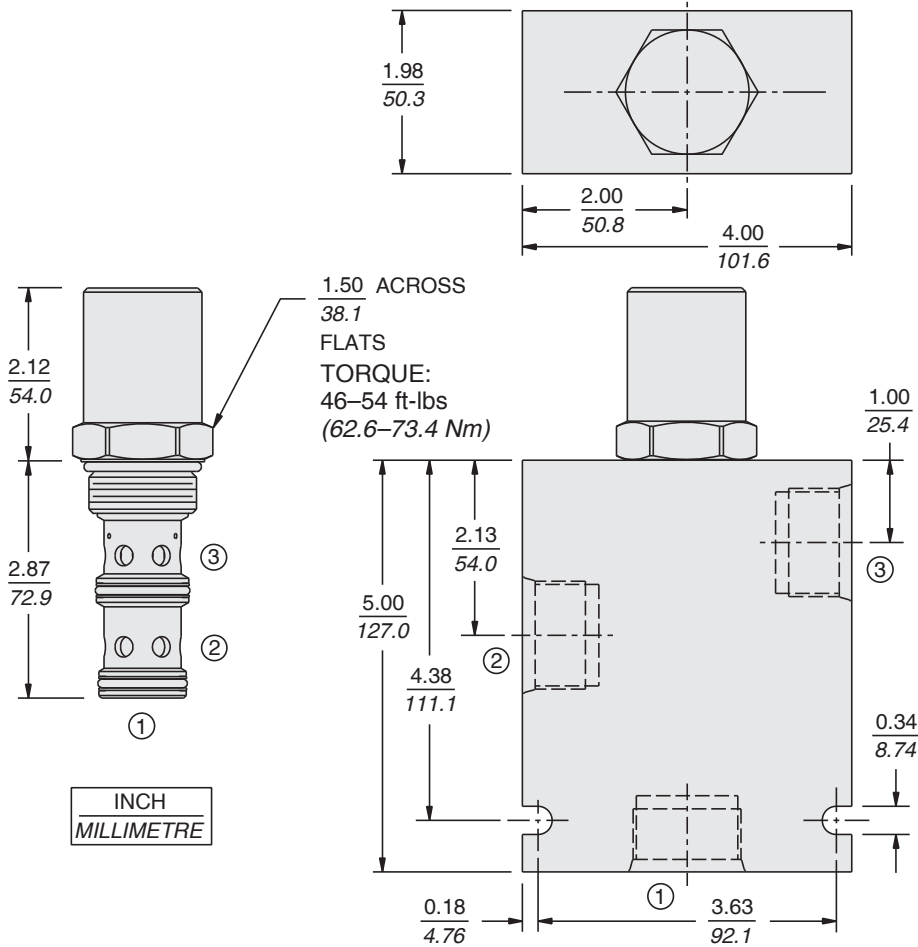
USASI/ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS

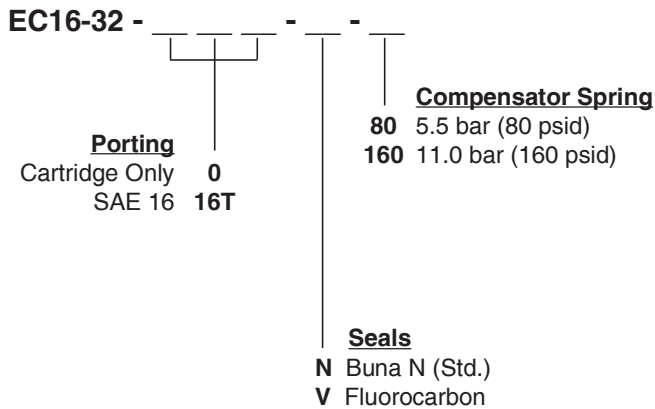


MATERIALS

Cartridge: Weight: 0.47 kg. (1.04 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight:
 1.50 kg. (3.3 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available, dimensions may differ. See page 8.016.1

TO ORDER

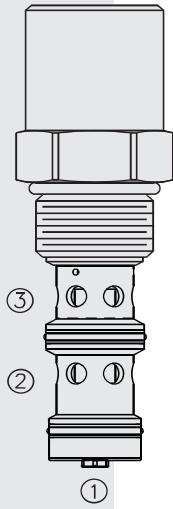


EC12-34

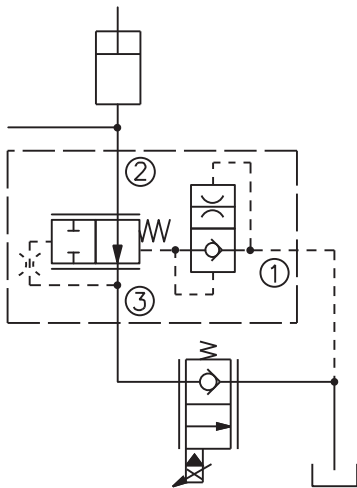
For more information on **EC12-34**,
please visit our website at
www.hydraforce.com

HEC12-34 Pressure Compensator, Load Holding

U.S. Patent
7,261,030

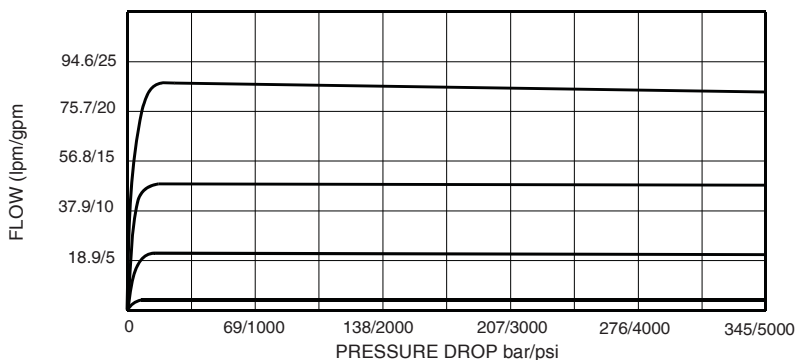


ISO SYMBOL



PERFORMANCE (Cartridge Only)

Flow Characteristics (Meter Out Mode)
HEC12-34 with 13 Bar (200 psi) Spring
32cSt Oil at 40°C (104°F)



DESCRIPTION

A screw-in, cartridge-style, load sense, flow-on-demand pressure-compensator with built-in damping and load-holding features for use in gravity-lowering circuits.

OPERATION

The HEC12-34 is designed to be used in combination with a flow control valve for lowering and holding a load. With inlet flow at port 2, port 3 will deliver required flow regardless of load pressure sensed at port 1.

FEATURES

- Hardened parts for long life.
- Hardened seat for low-leakage load-holding capability.
- Quiet, modulated response.

RATINGS

Operating Pressure: 350 bar (5075 psi) 10% cycle life 420 bar (6090 psi)

Proof Pressure: 690 bar (10,000 psi)

Burst Pressure: 1380 bar (20,000 psi)

Minimum Inlet Pressure Required in Load-Holding Mode: 31.0 bar (450 psi)

Flow Rating: 83 lpm (22 gpm) with 200 psi compensating spring

Flow Maintenance: See performance chart

Maximum Internal Leakage: 5 drops per minute at port 1 with 350 bar (5075 psi) pressure at port 2 and port 3 blocked.

Temperature: -54 to 107°C (-65 to 225°F) with PPDI urethane seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

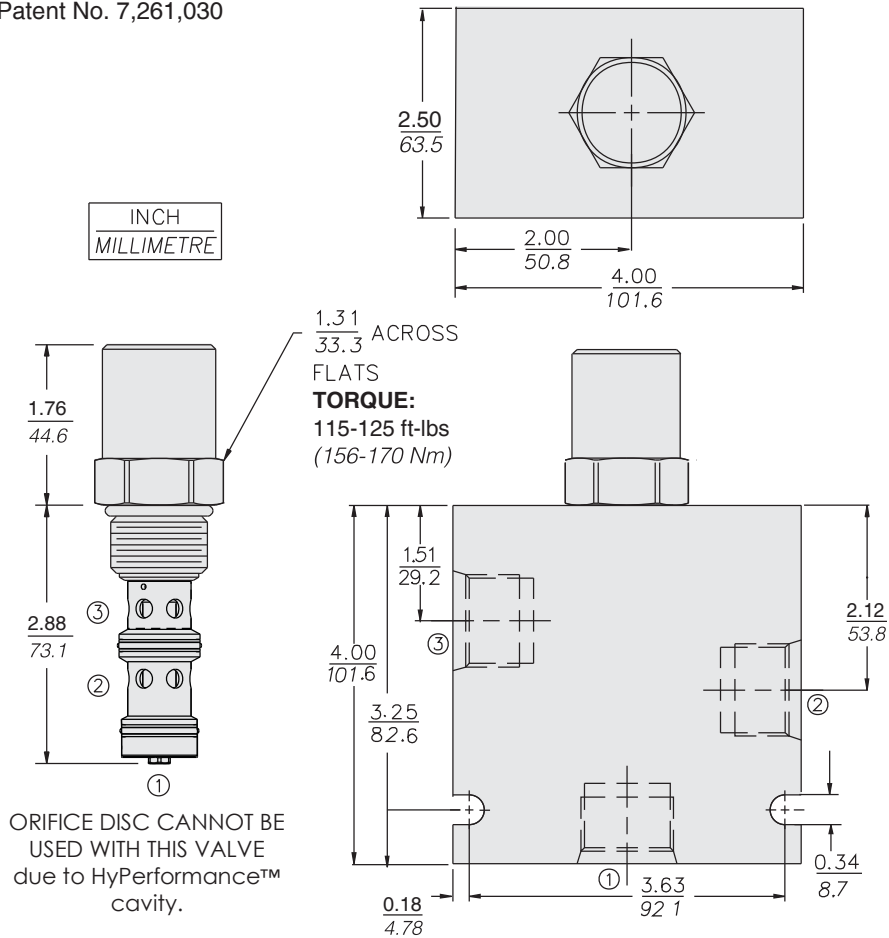
Cavity: HVC12-3; See page 9.112.1

Cavity Tool: HCT12-3X0-X-X; See page 8.600.1

Seal Kit: HSK12-3U-0; See page 8.650.1

DIMENSIONS

U.S. Patent No. 7,261,030



MATERIALS

Cartridge: Weight: 0.42 kg. (0.93 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
PPDI urethane seals without back-up rings standard.

Standard Ported Body: Weight:
4.05 kg. (8.93 lbs.) HyPerformance™
Ductile iron (code 'D') standard.
Rated to 354 bar (5000 psi).

TO ORDER

HEC12-34 - - 200

Porting
Cartridge Only **0**
SAE 12 **12TD**
3/4 in. BSP **6BD**
* BSP Body; U.K. Mfg. Only

Compensator Spring
200 13.8 bar (200 psid)

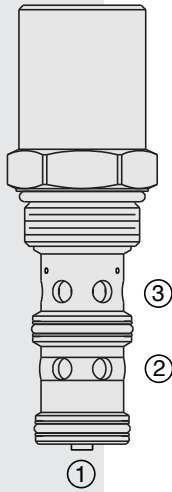
Seals
U PPDI Urethane

NOTE: Urethane seals recommended for operating pressures above 241 bar (3500 psi).

NOTE: Consult factory for additional seal options.

EC16-34 Pressure Compensator, Load Holding

U.S. Patent
7,261,030



DESCRIPTION

A screw-in, cartridge-style, load sense, pressure-compensator hydraulic valve with built-in damping and load-holding features for use in gravity-lowering circuits.

OPERATION

The EC16-34 is designed to be used in combination with a flow control valve for lowering and holding a load. With inlet flow at port 2, port 3 will deliver required flow regardless of load pressure at 2. Port 1 of the compensator must be connected to the outlet of a flow control valve that is connected to the tank.

FEATURES

- Hardened spool and cage for long life.
- Hardened seat for low-leakage load-holding capability.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: Inlet: 241 bar (3500 psi) with standard Buna N seals.

Maximum Regulated Flow: 170 lpm (45 gpm) See performance chart.

Compensation Value: 13.8 bar (200 psi).

Maximum Leakage at port 2: 5 drops/minute with 207 bar (3000 psi) at 2.

Temperature: -40 to 120°C with Buna N seals.

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

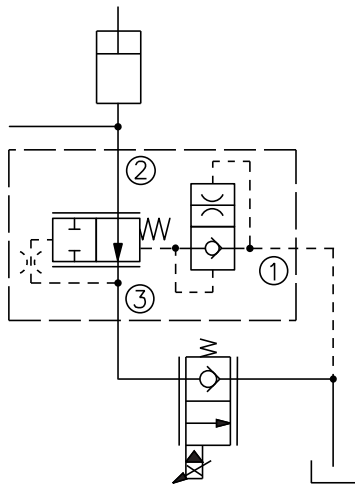
Cavity: VC16-3; See page 9.116.1

Cavity Tool: CT16-3XX; See page 8.600.1

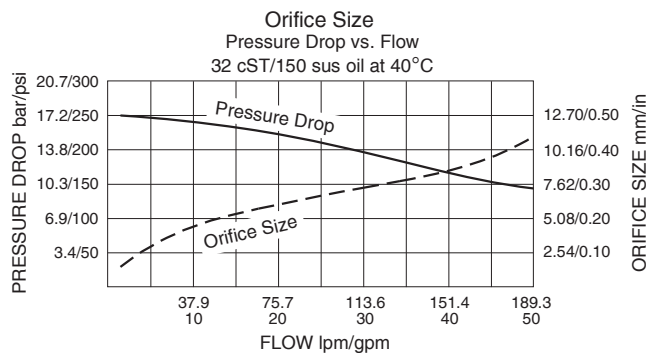
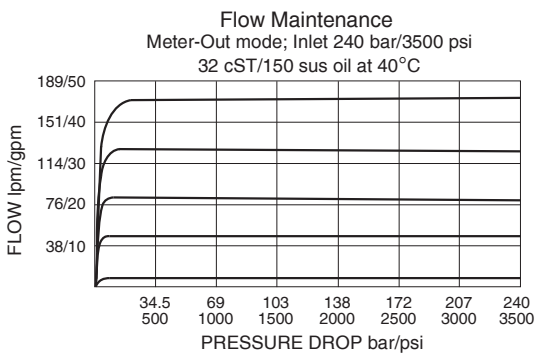
Seal Kit: SK16-3X-MM; See page 8.650.1

SYMBOL

USASI/ISO:

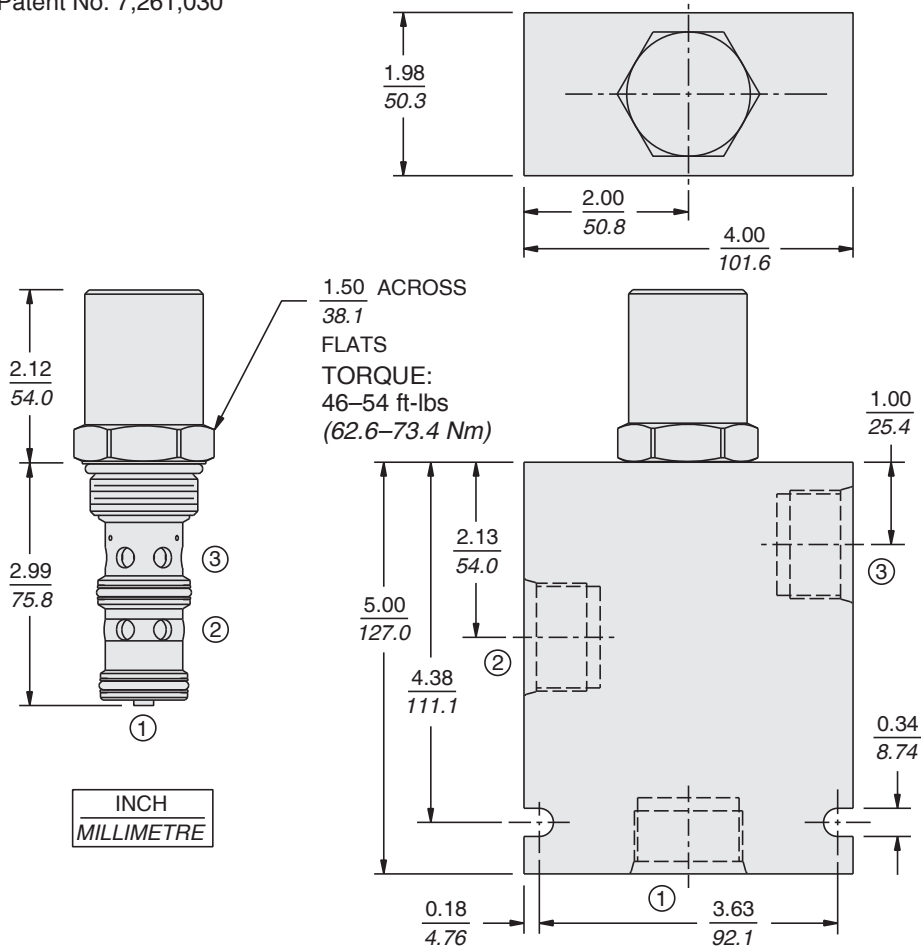


PERFORMANCE (Cartridge Only)



DIMENSIONS

U.S. Patent No. 7,261,030

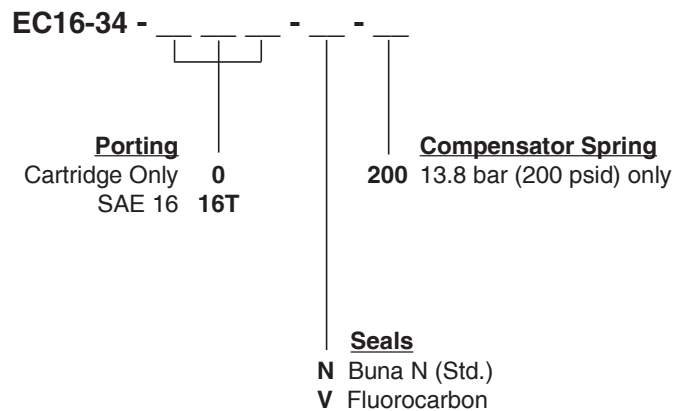


MATERIALS

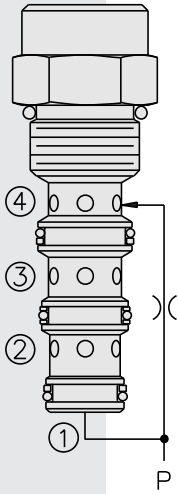
Cartridge: Weight: 0.52 kg. (1.15 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight:
1.50 kg. (3.3 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available, dimensions may differ. See page 8.016.1

TO ORDER



EC10-40 Pressure Compensator



DESCRIPTION

A screw-in, cartridge-style pressure-compensating element, intended for use with a remote fixed or variable orifice to yield a three-port (bypass-type), pressure-compensated, flow regulating hydraulic valve.

OPERATION

The **EC10-40** maintains a constant flow rate from 3 regardless of load pressure changes in the circuit downstream of 3.

The cartridge maintains a constant differential pressure from circuit point P to port 3 (see USASI Symbol), thereby regulating the hydraulic flow rate between the two points in the circuit. The EC10-40 is a priority type regulator, delivering pump flow first to 3, then bypassing excess to 2. All ports may be fully pressurized.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: 207 bar (3000 psi)

Flow Rate: 38 lpm (10 gpm) max. regulated; 57 lpm (15 gpm) max. input.

EC10-40 inlet pressure begins to rise over compensating pressure when bypass oil exceeds 26 lpm (7 gpm).

Standard Compensator Bias Spring: 5.5 bar (80 psid)

Flow Maintenance: 0.38 to 1.86 lpm (0.1 to 0.49 gpm) settings $\pm 20\%$;

1.89 to 5.64 lpm (0.5 to 1.49 gpm) settings $\pm 15\%$;

5.68 to 37.85 lpm (1.5 to 10 gpm) settings $\pm 10\%$

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

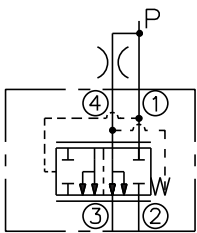
Cavity: VC10-4; See page 9.110.1

Cavity Tool: CT10-4XX; See page 8.600.1

Seal Kit: SK10-4X-TMB; See page 8.650.1

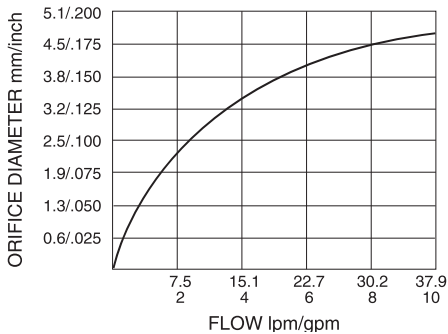
SYMBOLS

USASI/ISO:



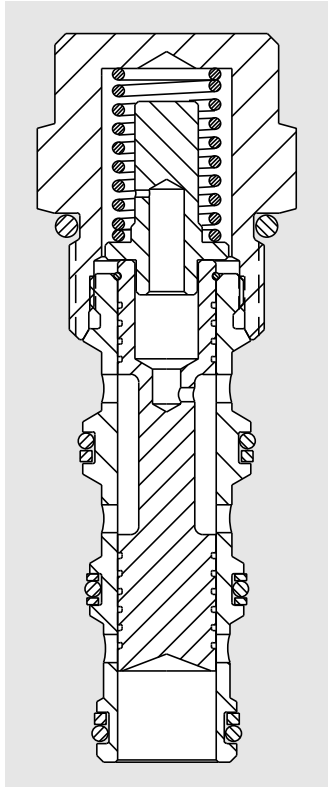
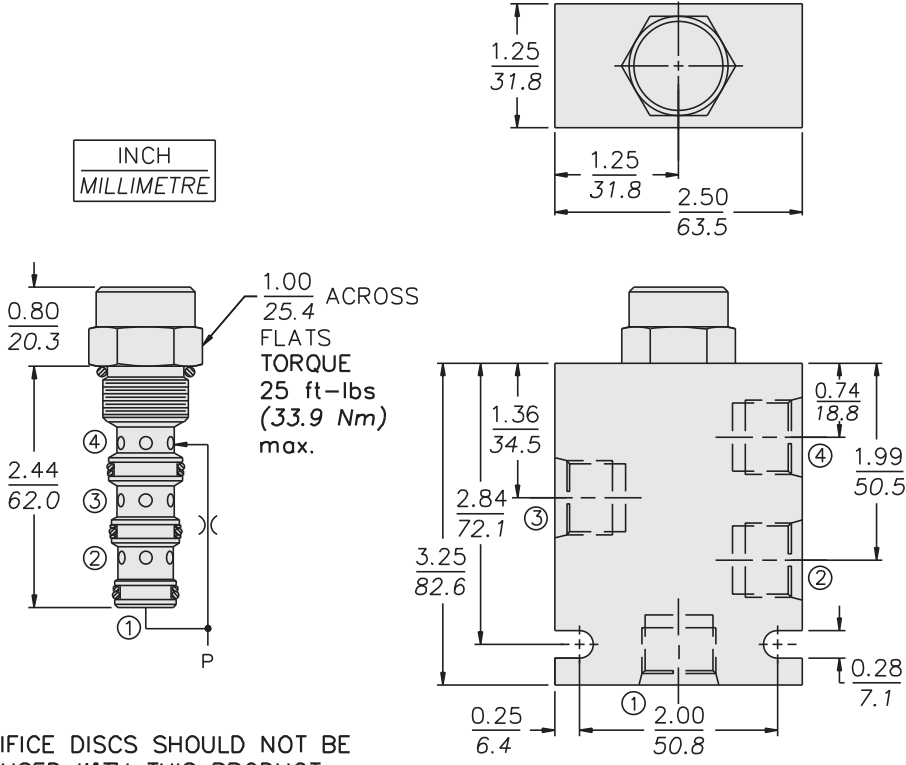
PERFORMANCE (Cartridge Only)

Output Flow vs. Orifice Dia.
with 80 psid Spring
32 cSt/150 sus oil at 40°C



EC10-40

DIMENSIONS



ORIFICE DISCS SHOULD NOT BE USED WITH THIS PRODUCT.

MATERIALS

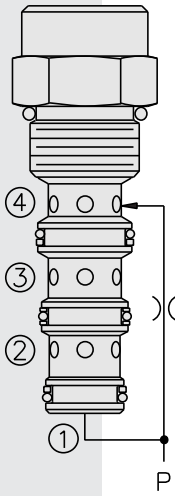
Cartridge: Weight: 0.16 kg. (0.35 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 0.34 kg. (0.75 lbs.)
Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

TO ORDER

EC10-40 -		
Porting		Compensator Spring
Cartridge Only	0	40 2.8 bar (40 psid)
SAE 6	6T	80 5.5 bar (80 psid) standard
SAE 8	8T	160 11.0 bar (160 psid)
1/4 in. BSP*	2B	
3/8 in. BSP*	3B	
		Seals
		N Buna N (Std.)
		V Fluorocarbon

EC50-40 Pressure Compensator, High Pressure



DESCRIPTION

A screw-in, cartridge-style pressure-compensating element, intended for use with a remote fixed or variable orifice to yield a three-port (bypass-type), pressure-compensated, flow regulating hydraulic valve for use in high pressure circuits.

OPERATION

The EC50-40 maintains a constant flow rate from 3 regardless of load pressure changes in the circuit downstream of 3.

The cartridge maintains a constant differential pressure from circuit point P to port 3 (see USASI Symbol), thereby regulating the hydraulic flow rate between the two points in the circuit. The EC50-40 is a priority type regulator, delivering pump flow first to 3, then bypassing excess to 2. All ports may be fully pressurized.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: 345 bar (5000 psi)

Flow Rate: 38 lpm (10 gpm) max. regulated; 57 lpm (15 gpm) max. input.

EC50-40 inlet pressure begins to rise over compensating pressure when bypass oil exceeds 26 lpm (7 gpm).

Standard Compensator Bias Spring: 5.5 bar (80 psid)

Flow Maintenance: 0.38 to 1.86 lpm (0.1 to 0.49 gpm) settings $\pm 20\%$;

1.89 to 5.64 lpm (0.5 to 1.49 gpm) settings $\pm 15\%$;

5.68 to 37.85 lpm (1.5 to 10 gpm) settings $\pm 10\%$

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

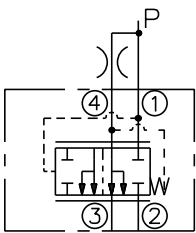
Cavity: VC10-4; See page 9.110.1

Cavity Tool: CT10-4XX; See page 8.600.1

Seal Kit: SK10-4P-TMB; See page 8.650.1

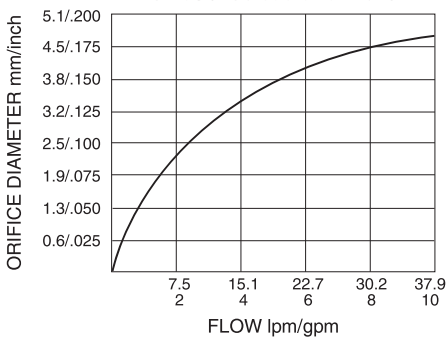
SYMBOLS

USASI/ISO:

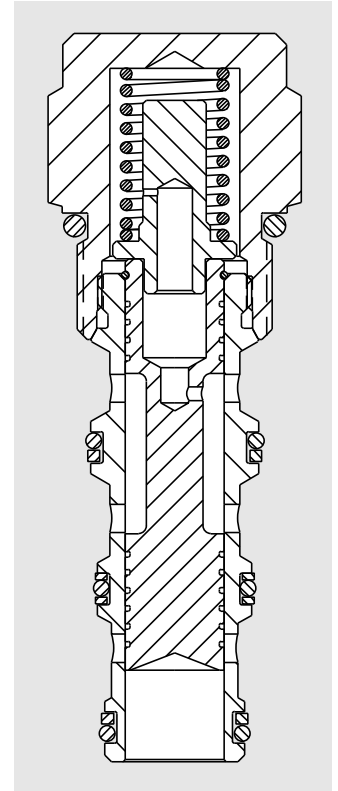
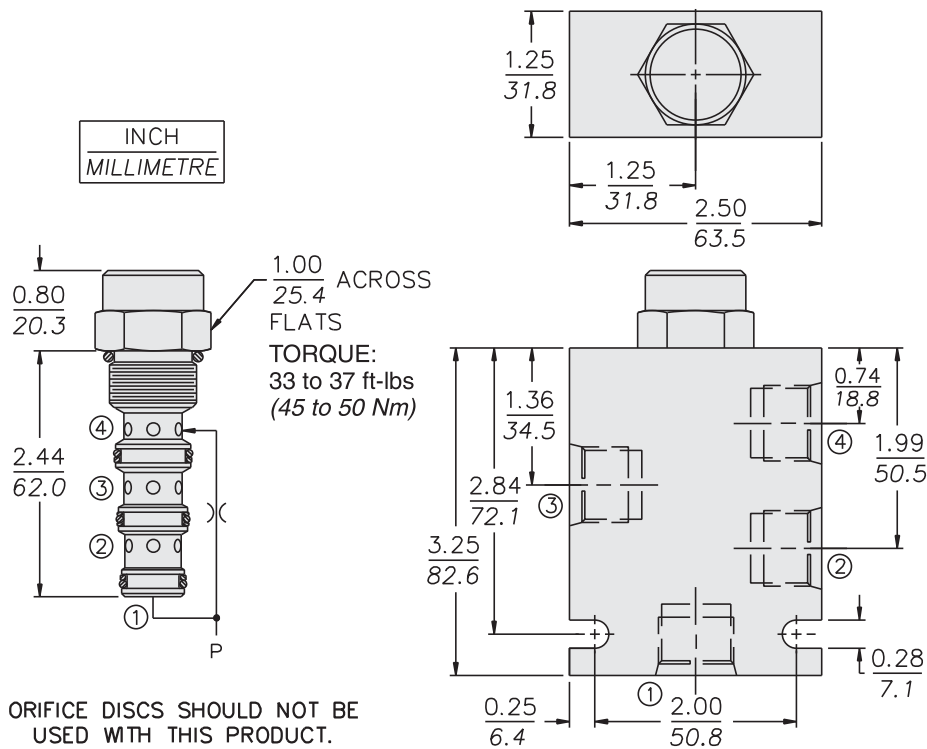


PERFORMANCE (Cartridge Only)

Output Flow vs. Orifice Dia.
with 80 psid Spring
32 cSt/150 sus oil at 40°C



DIMENSIONS



MATERIALS

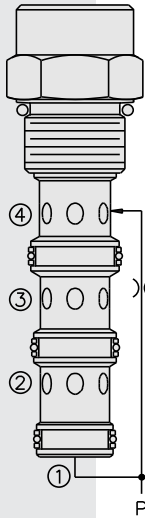
Cartridge: Weight: 0.18 kg. (0.39 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Polyurethane O-rings and
 Fluorocarbon back-ups standard.

Ported Body: Weight: 0.68 kg.
 (1.51 lbs.); Ductile Iron (code "D")
 standard, consult factory for weight,
 dimensions may differ. Rated to
 345 bar (5000 psi).
 See page 8.010.1.

TO ORDER

EC50-40 -		Compensator Spring	
Porting	0	80	5.5 bar (80 psid) standard
Cartridge Only	6TD	160	11.0 bar (160 psid)
SAE 6 (Ductile)			
		Seals	
		P	Polyurethane (Std.)

EC12-40 Pressure Compensator



DESCRIPTION

A screw-in, cartridge-style pressure-compensating element, intended for use with a remote fixed or variable orifice to yield a three-port (bypass-type), pressure-compensated, flow regulating hydraulic valve.

OPERATION

The EC12-40 maintains a constant flow rate from 3 regardless of load pressure changes in the circuit downstream of 3.

The cartridge maintains a constant differential pressure from circuit point P to port 3 (see USASI Symbol), thereby regulating the hydraulic flow rate between the two points in the circuit. The EC12-40 is a priority type regulator, delivering pump flow first to 3, then bypassing excess to 2. All ports may be fully pressurized.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Cost effective cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow Rate: 80 lpm (21 gpm) max. regulated; 120 lpm (32 gpm) max. input; 68 lpm (18 gpm) bypass.

Standard Compensator Bias Spring: 6.9 bar (100 psi)

Flow Maintenance: 7.57 to 75.7 lpm (2 to 20 gpm) settings $\pm 10\%$

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

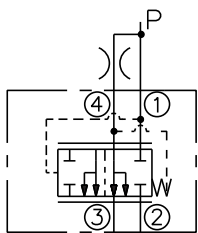
Cavity: VC12-4; See page 9.112.1

Cavity Tool: CT12-4XX; See page 8.600.1

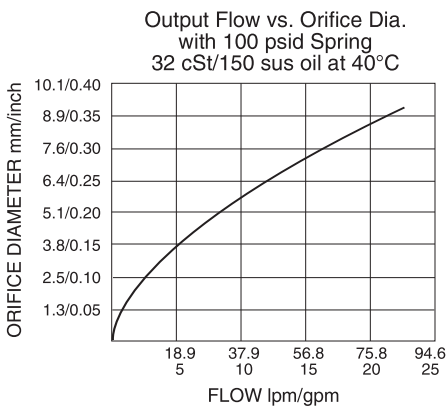
Seal Kit: SK12-4X-MMM; See page 8.650.1

SYMBOLS

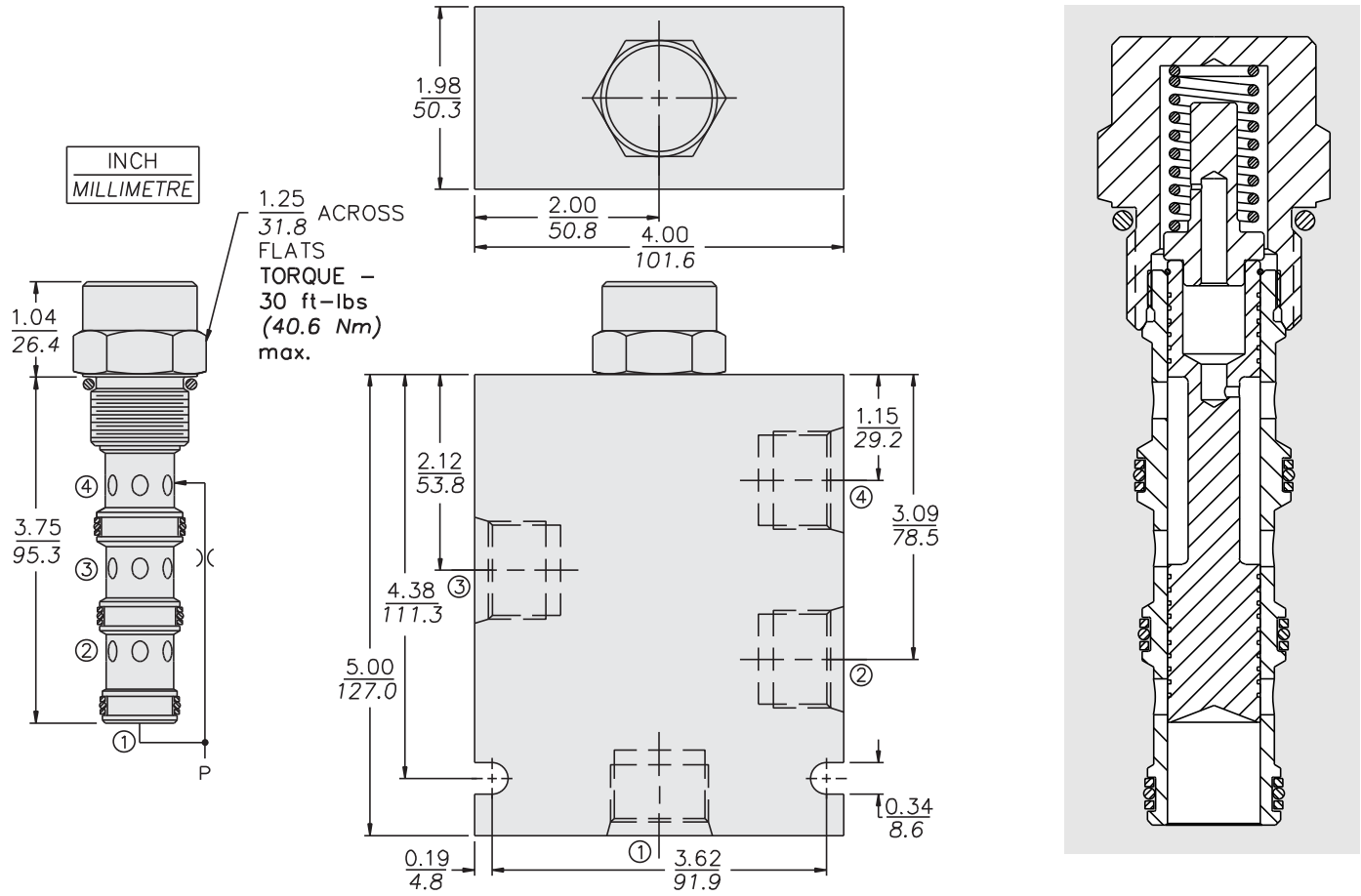
USASI/ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.28 kg. (0.61 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

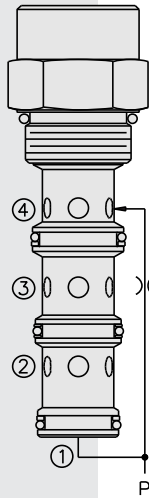
Standard Ported Body: Weight:
1.50 kg. (3.30 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.012.1

TO ORDER

EC12-40 -

Porting	Compensator Spring
Cartridge Only 0	100 6.9 bar (100 psid) standard
SAE 10 10T	160 11.0 bar (160 psid)
SAE 12 12T	
	Seals
	N Buna N (Std.)
	V Fluorocarbon

EC16-40 Pressure Compensator



DESCRIPTION

A screw-in, cartridge-style pressure-compensating element, intended for use with a remote fixed or variable orifice to yield a three-port (bypass-type), pressure-compensated, flow regulating hydraulic valve.

OPERATION

The EC16-40 maintains a constant flow rate from 3 regardless of load pressure changes in the circuit downstream of 3.

The cartridge maintains a constant differential pressure from circuit point P to port 3 (see USASI Symbol), thereby regulating the hydraulic flow rate between the two points in the circuit. The EC16-40 is a priority type regulator, delivering pump flow first to 3, then bypassing excess to 2. All ports may be fully pressurized.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow Rate: 100 lpm (26.5 gpm) max. regulated; 180 lpm (47.5 gpm) max. input.

Pressure at 1 begins to rise higher than compensating pressure differential when bypass flow exceeds 80 lpm (21 gpm).

Standard Compensator Bias Spring: 5.5 bar (80 psid)

Flow Maintenance: 7.57 to 98.4 lpm (2 to 26 gpm) settings $\pm 10\%$

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

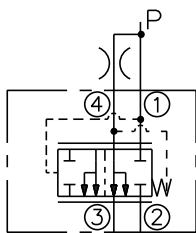
Cavity: VC16-4; See page 9.116.2

Cavity Tool: CT16-4XX; See page 8.600.1

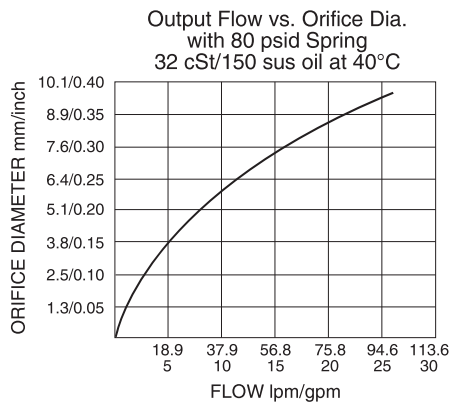
Seal Kit: SK16-4X-TMB; See page 8.650.1

SYMBOLS

USASI/ISO:

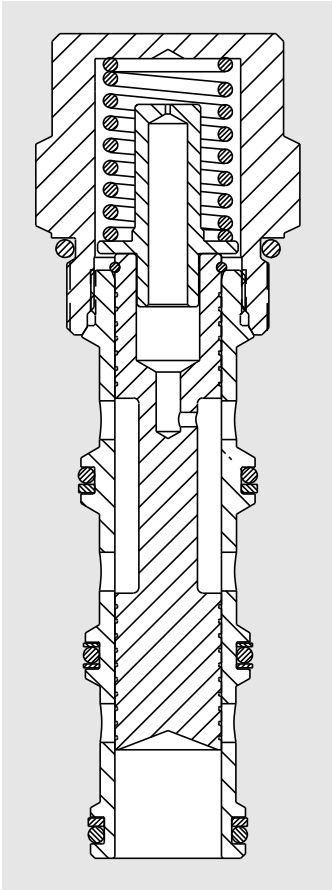
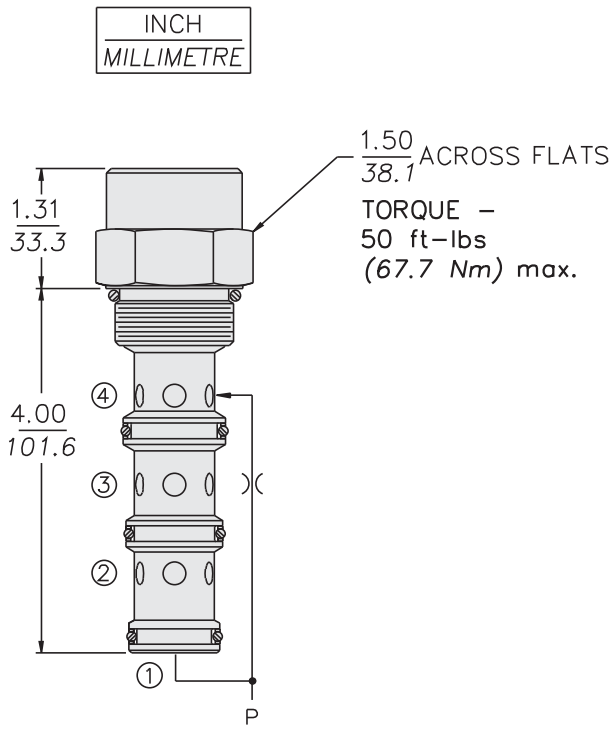


PERFORMANCE (Cartridge Only)



EC16-40

DIMENSIONS

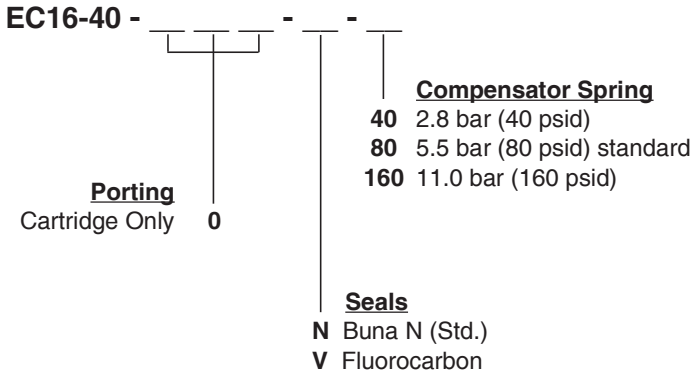


MATERIALS

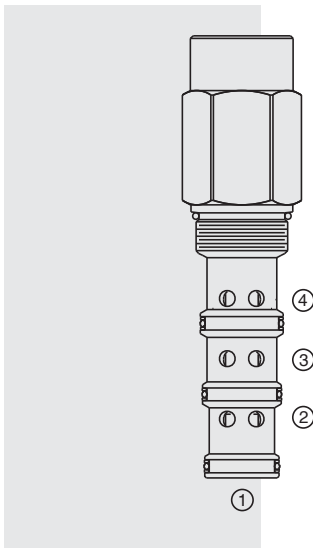
Cartridge: Weight: 0.36 kg. (0.80 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Ported Body: Not available; consult factory.

TO ORDER



EC42-M40 Pressure Compensator



DESCRIPTION

A screw-in, cartridge-style pressure-compensating element intended for use with a remote fixed or variable orifice to yield a three-port (bypass-type), pressure-compensated, flow regulating hydraulic valve.

OPERATION

The **EC42-M40** maintains a constant flow rate from 3 regardless of load pressure changes in the circuit downstream of 3.

The cartridge maintains a constant differential pressure from circuit point "P" to port 3 (see symbol), thereby regulating the hydraulic flow rate between the two points in the circuit. The EC42-M40 is a priority type regulator, delivering pump flow first to 3, then bypassing excess to 2. All ports may be fully pressurized.

NOTE: Pressure at port 1 begins to rise higher than compensating differential pressure when bypass flow exceeds values noted above.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: Inlet: 240 bar (3500 psi)

Maximum Inlet Flow: 302.8 lpm (80.0 gpm)

Maximum Regulated Flow: 151.1 lpm (40.0 gpm) with 5.5 bar (80 psi) compensating spring; 208.2 lpm (55.0 gpm) with 10.3 bar (150 psi) compensating spring

Maximum Bypass Flow: 170.3 lpm (45.0 gpm) with 5.5 bar (80 psi) compensating spring; 208.2 lpm (55.0 gpm) with 10.3 bar (150 psi) compensating spring

Flow Maintenance: see performance chart

Temperature: -40 to 120°C with Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

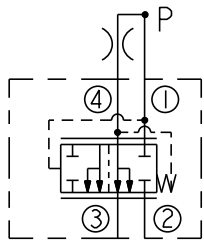
Installation: No restrictions; See page 9.020.1

Cavity: VC42-M4; See page 9.142.1

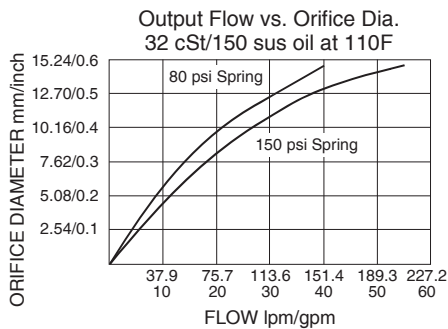
Cavity Tool: CT42-M4XX; See page 8.600.1

Seal Kit: SK42-4X-MMM; See page 8.650.1

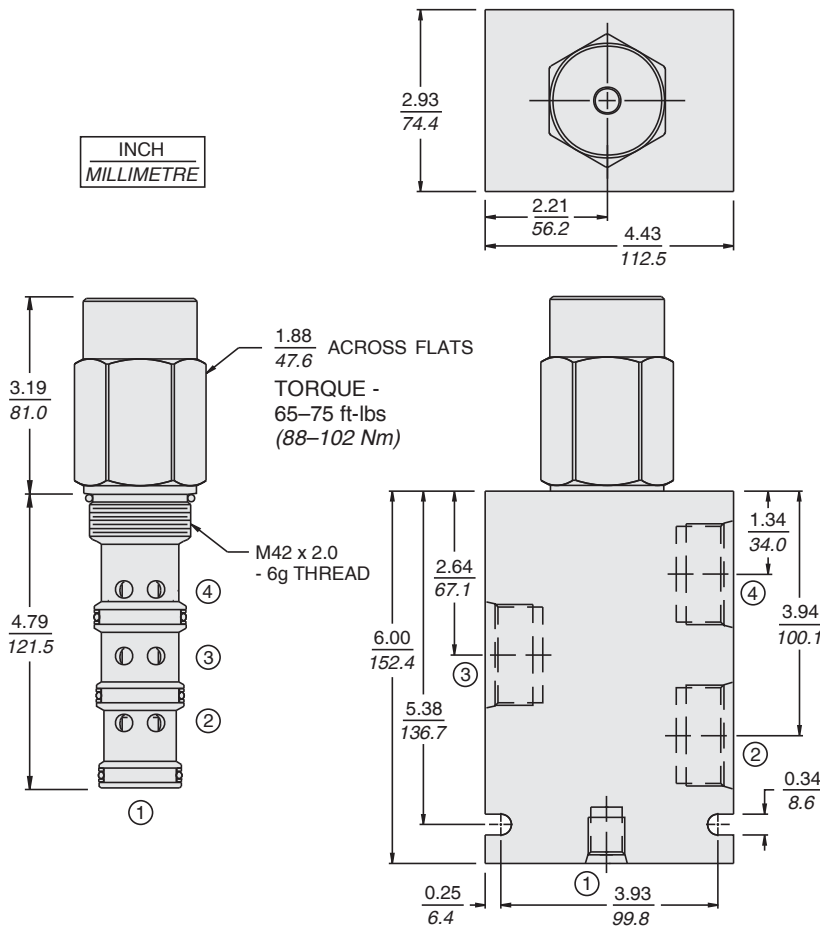
ISO SYMBOL



PERFORMANCE (Cartridge Only)



DIMENSIONS

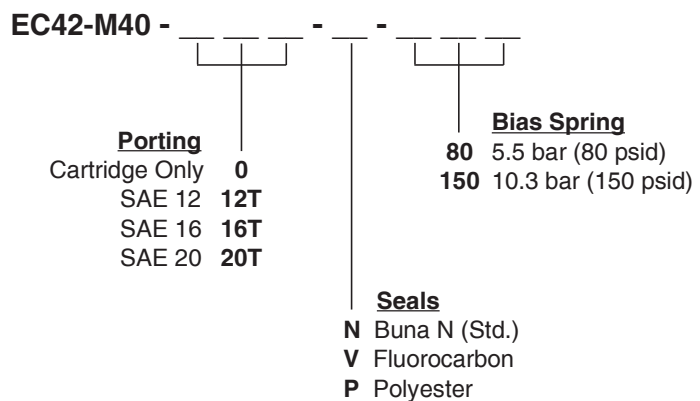


MATERIALS

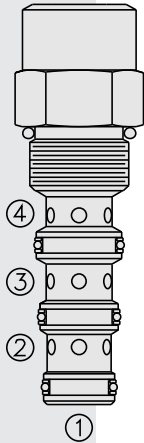
Cartridge: Weight: 1.56 kg. (3.44 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Standard Ported Body: Weight:
2.8 kg. (6.2 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.042.1

TO ORDER

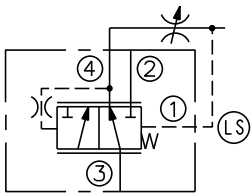


EC10-42 Pressure Compensator



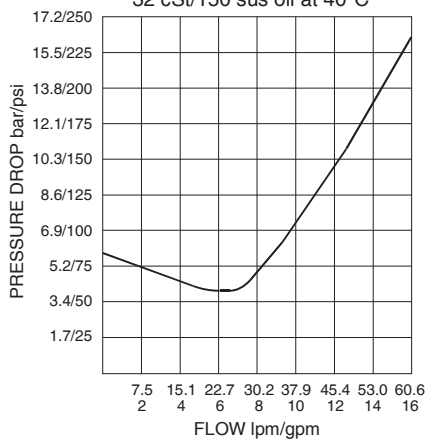
SYMBOLS

USASI/ISO:



PERFORMANCE (Cartridge Only)

Pressure Drop vs. Inlet Flow
 3 to 2; Port 4 closed; Port 2 no load;
 150 psi Compensator Spring
 32 cSt/150 sus oil at 40°C



DESCRIPTION

A screw-in, cartridge-style, priority-on-demand, pressure-compensator with a static load sense, intended to provide priority flow in the required amount, while allowing excess flow to be used for auxiliary functions.

OPERATION

With inlet flow at 3, the **EC10-42** will deliver required priority flow at 4, regardless of load pressure. Excess flow exits at 2. Port 1 is the load sense port. All ports may be fully pressurized.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: Inlet: 240 bar (3500 psi)

Maximum Regulated Flow: 37.9 lpm (10 gpm) with 10.3 bar (150 psi) compensator spring; 30.2 lpm (8.0 gpm) with 5.5 bar (80 psi) compensator spring

Flow Maintenance: see performance chart

Temperature: -40 to 120°C with Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: VC10-4; See page 9.110.1

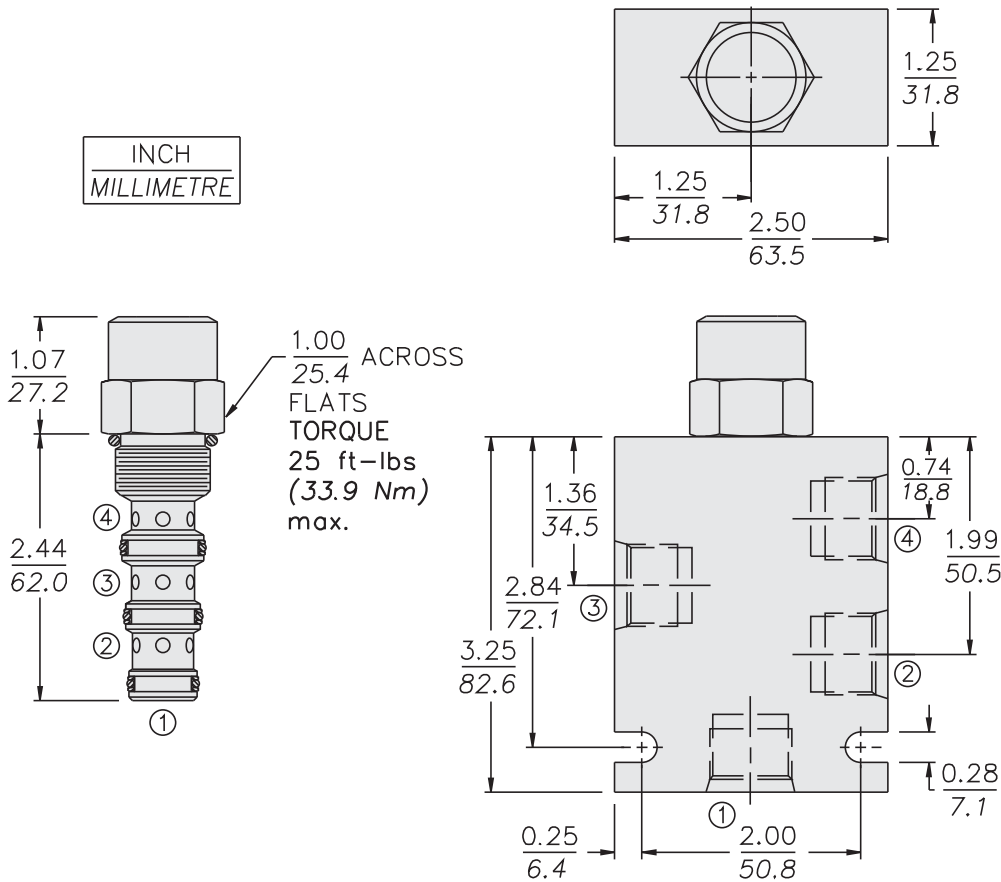
Cavity Tool: CT10-4-XXX; See page 8.600.1

Seal Kit: SK10-4X-MMM; See page 8.650.1

with Static Load Sense

EC10-42

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.16 kg. (0.35 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

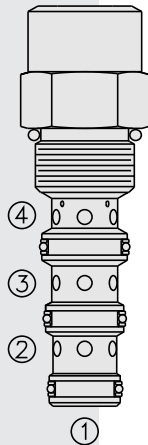
Standard Ported Body: Weight:
0.34 kg. (0.75 lbs.); Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.010.1

TO ORDER

EC10-42 -		Compensator Spring	
Porting		80	5.5 bar (80 psid)
Cartridge Only	0	150	10.3 bar (150 psid)
SAE 6	6T		
SAE 8	8T		
1/4 in. BSP*	2B		
3/8 in. BSP*	3B		
		Seals	
		N	Buna N (Std.)
		V	Fluorocarbon

*BSP Body;
U.K. Mfr. Only

EC50-42 Pressure Compensator, High Pressure



DESCRIPTION

A screw-in, cartridge-style, priority-on-demand, pressure-compensator with a static load sense, intended to provide priority flow in the required amount, while allowing excess flow to be used for auxiliary functions.

OPERATION

With inlet flow at 3, the **EC50-42** will deliver required priority flow at 4, regardless of load pressure. Excess flow exits at 2. Port 1 is the load sense port. All ports may be fully pressurized.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: Inlet: 345 bar (5000 psi)

Input Flow Rate: 45.4 lpm (12 gpm) maximum

Maximum Regulated Flow: 37.9 lpm (10 gpm) with 10.3 bar (150 psi) compensator spring; 30.2 lpm (8.0 gpm) with 5.5 bar (80 psi) compensator spring

Flow Maintenance: see performance chart

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

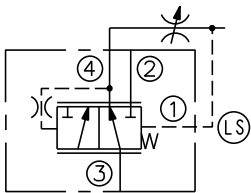
Cavity: VC10-4; See page 9.110.1

Cavity Tool: CT10-4-XXX; See page 8.600.1

Seal Kit: SK10-4P-TMB; See page 8.650.1

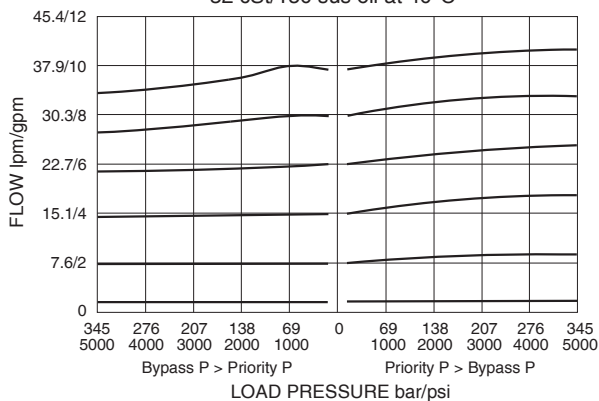
SYMBOLS

USASI/ISO:



PERFORMANCE (Cartridge Only)

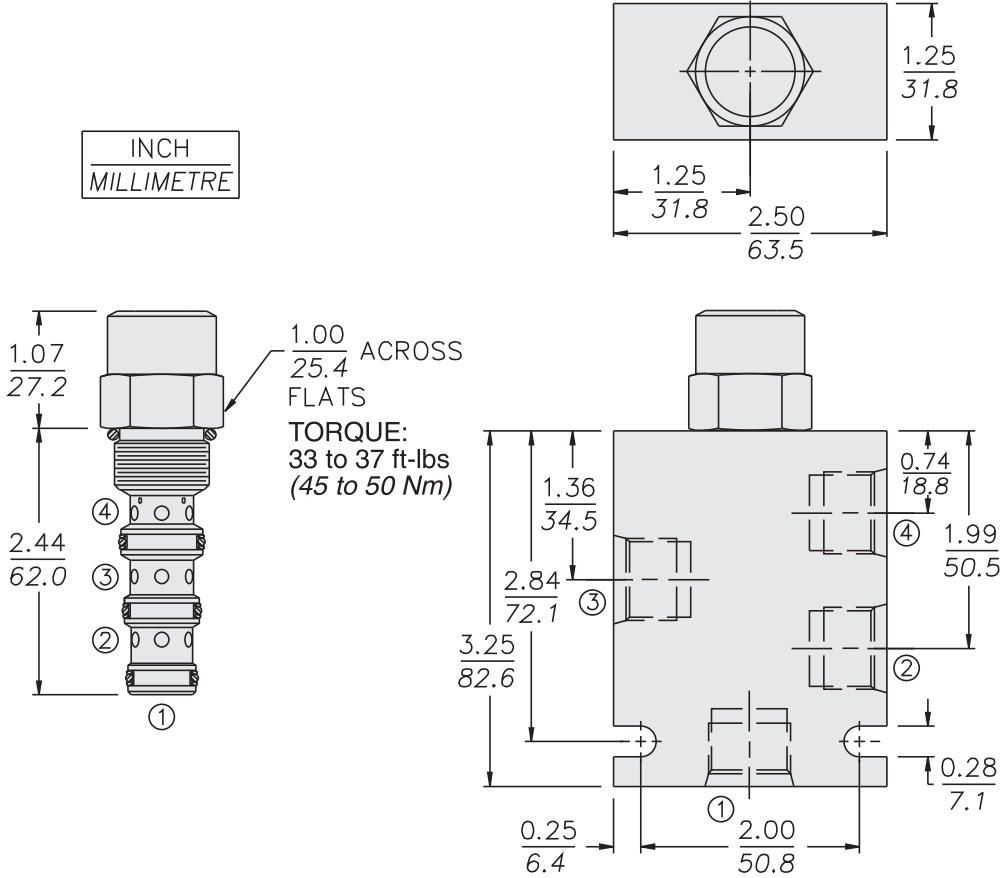
Priority Flow vs. Load
12 gpm Inlet Flow; 150 psi Compensator Spring
32 cSt/150 sus oil at 40°C



with Static Load Sense

EC50-42

DIMENSIONS

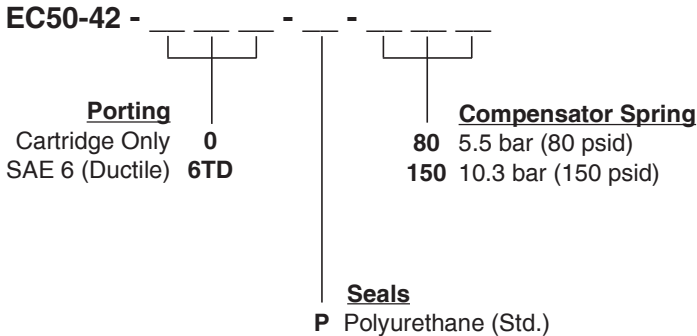


MATERIALS

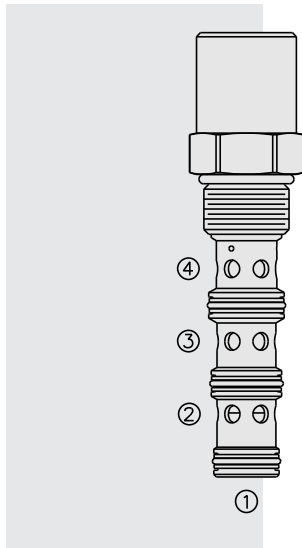
Cartridge: Weight: 0.17 kg. (0.37 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Ported Body: Weight: 0.68 kg.
(1.51 lbs.) Ductile Iron (code "D")
standard, consult factory for
weight, dimensions may differ.
Rated to 345 bar (5000 psi).
See page 8.010.1.

TO ORDER



EC12-42 Pressure Compensator



DESCRIPTION

A screw-in, cartridge-style, priority-on-demand, pressure compensator with static load sense intended to provide priority flow in the required amount, while allowing excess flow to be used for auxiliary functions.

OPERATION

With inlet flow at port 3, the **EC12-42** will deliver required priority flow at port 4, based on the size of the external orifice, regardless of load pressure. Excess flow exits, or is bypassed, at port 2. Port 1 is the load sense port. All ports may be fully pressurized.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: Inlet: 345 bar (5000 psi);

Note: Steel body required when used at or near 5000 psi.

Maximum Regulated Flow: 76 lpm (20 gpm) with 160 psi compensating spring;
54.5 lpm (14.4 gpm) with 80 psi compensating spring

Flow Maintenance: See performance chart

Temperature: -40 to 120°C with Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

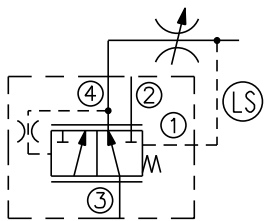
Cavity: VC12-4; See page 9.112.1

Cavity Tool: CT12-4-XXX; See page 8.600.1

Seal Kit: SK12-4X-MMM; See page 8.650.1

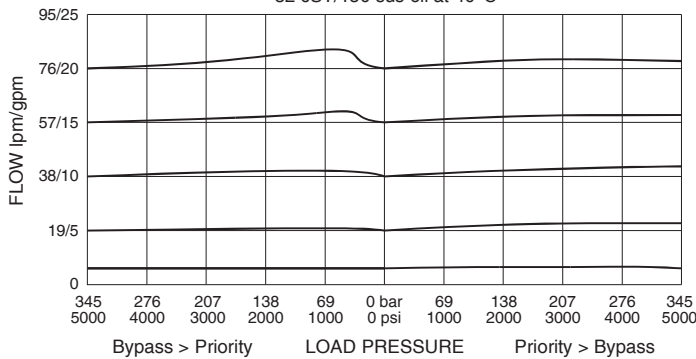
SYMBOLS

USASI/ISO:

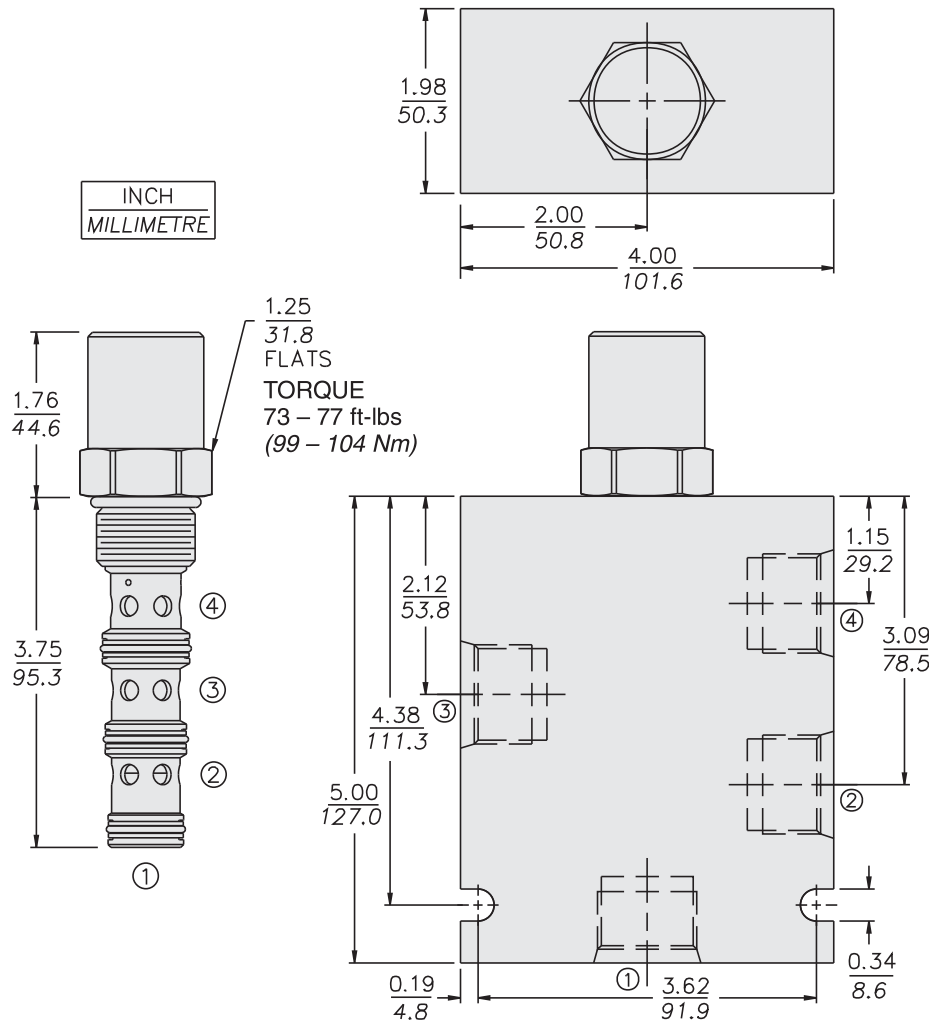


PERFORMANCE (Cartridge Only)

Priority Flow vs. Load
EC12-42-160 at 95 lpm/25 gpm Inlet Flow
32 cSt/150 sus oil at 40°C



DIMENSIONS

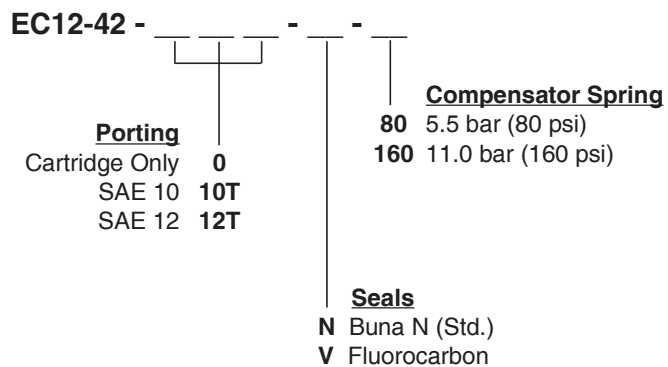


MATERIALS

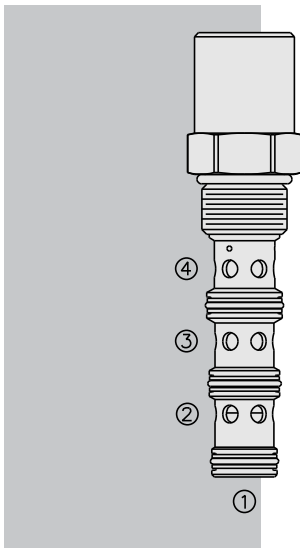
Cartridge: Weight: 0.43 kg. (0.94 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight:
1.50 kg. (3.30 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.012.1

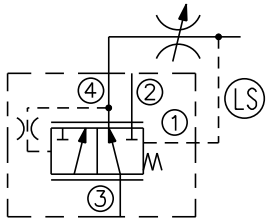
TO ORDER



HEC12-42 Pressure Compensator, Static Load Sense



ISO SYMBOL



DESCRIPTION

A screw-in, cartridge-style, priority-on-demand, pressure compensator with static load sense intended to provide priority flow in the required amount, while allowing excess flow to be used for auxiliary functions.

OPERATION

With inlet flow at port 3, the **HEC12-42** will deliver required priority flow at port 4, based on the size of the external orifice, regardless of load pressure. Excess flow exits, or is bypassed, at port 2. Port 1 is the load sense port. All ports may be fully pressurized.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: Inlet: 350 bar (5075 psi) 10% lift cycle; 420 bar (6090 psi)

Proof Pressure: 690 bar (10000 psi)

Burst Pressure: 1380 bar (20000 psi)

Maximum Inlet Flow Rate:

- 95 lpm (25 gpm) with 11 bar (160 psi) compensating spring;
- 68 lpm (18 gpm) with 5.5 bar (80 psi) compensating spring

Priority Flow Rate: Up to 80% of maximum input flow

Flow Maintenance: See performance chart.

Temperature: -54° to 107°C (-65° to 225°F) with PPDI Urethane seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

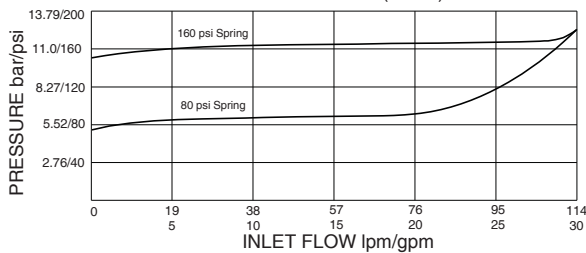
Cavity: HVC12-4; See page 9.112.1

Cavity Tool: HCT12-4-xxx; See page 8.600.1

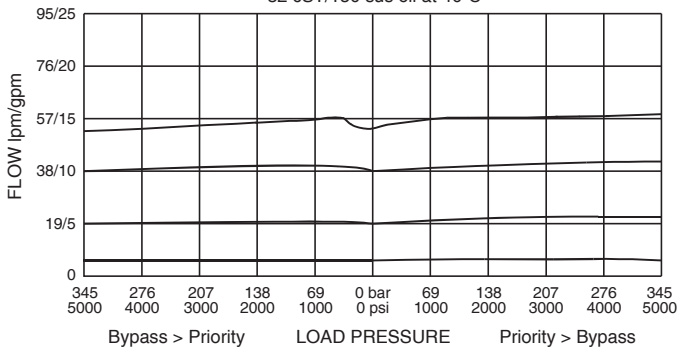
Seal Kit: HSK12-4U-MMM; See page 8.650.1

PERFORMANCE (Cartridge Only)

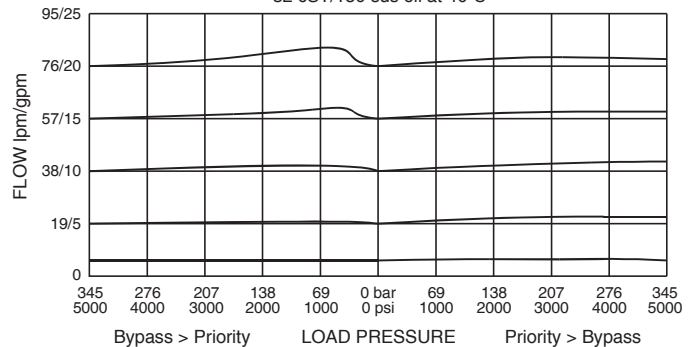
Pressure Drop vs. Inlet Flow
Port 3 to Port 2, Port 4 Blocked
32 cST Oil at 40°C (104°F)



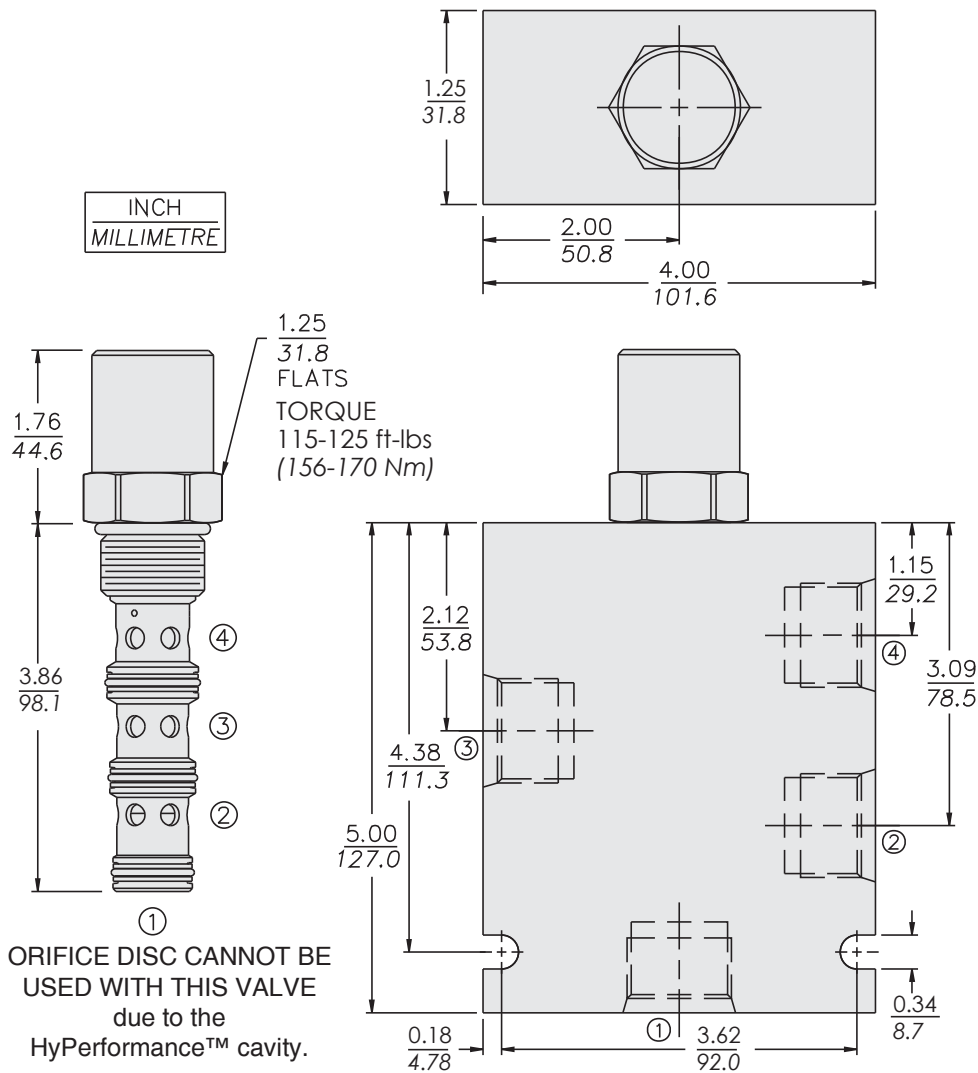
Priority Flow vs. Load
HEC12-42-80 at 68 lpm/18 gpm Inlet Flow
32 cST/150 sus oil at 40°C



Priority Flow vs. Load
HEC12-42-160 at 95 lpm/25 gpm Inlet Flow
32 cST/150 sus oil at 40°C



DIMENSIONS



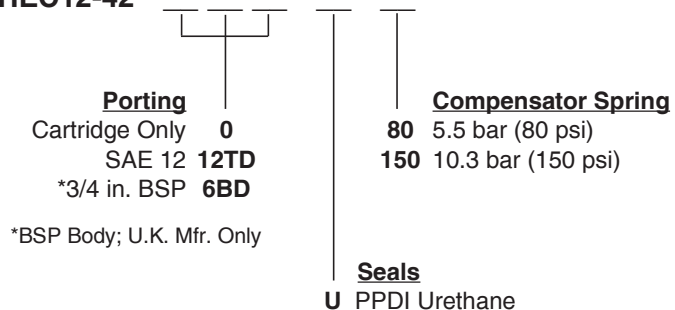
MATERIALS

Cartridge: Weight: 0.46 kg. (1.02 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Urethane seals without back-up rings standard.

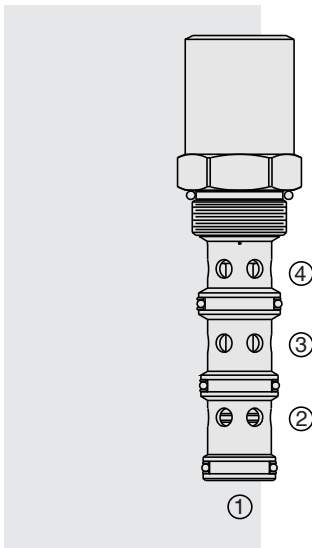
Standard Ported Body: Weight: 5.04 kg. (11.13 lbs.) Ductile iron (code 'D') body standard. Rated to 345 bar (5000 psi). See page 8.012.1.

TO ORDER

HEC12-42 -



EC16-42 Pressure Compensator,



DESCRIPTION

A screw-in, cartridge-style, priority on-demand, pressure-compensating element intended to provide priority flow in required amount while allowing excess flow to be used for auxiliary functions.

OPERATION

The EC16-42 is a priority-type valve delivering pump flow at port 3. Port 4 will deliver required priority flow regardless of load pressure. Excess flow exits at port 2. Port 1 is the load sense port. All ports may be fully pressurized.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Maximum Operating Pressure: 240 bar (3500 psi)

Input Flow: 190 lpm (50 gpm)

Priority Flow Rate: 95 lpm (25 gpm)

Temperature: -40 to 120°C with Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

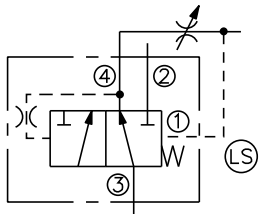
Cavity: VC16-4; See page 9.116.4

Cavity Tool: CT16-4XX; See page 8.600.1

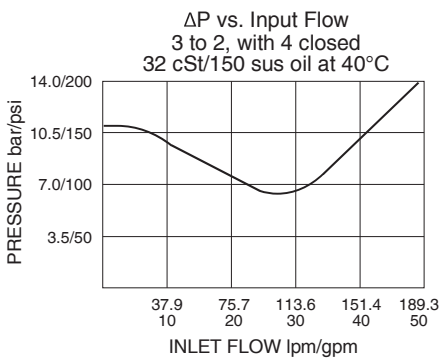
Seal Kit: SK16-4X-MMM; See page 8.650.1

SYMBOLS

USASI/ISO:



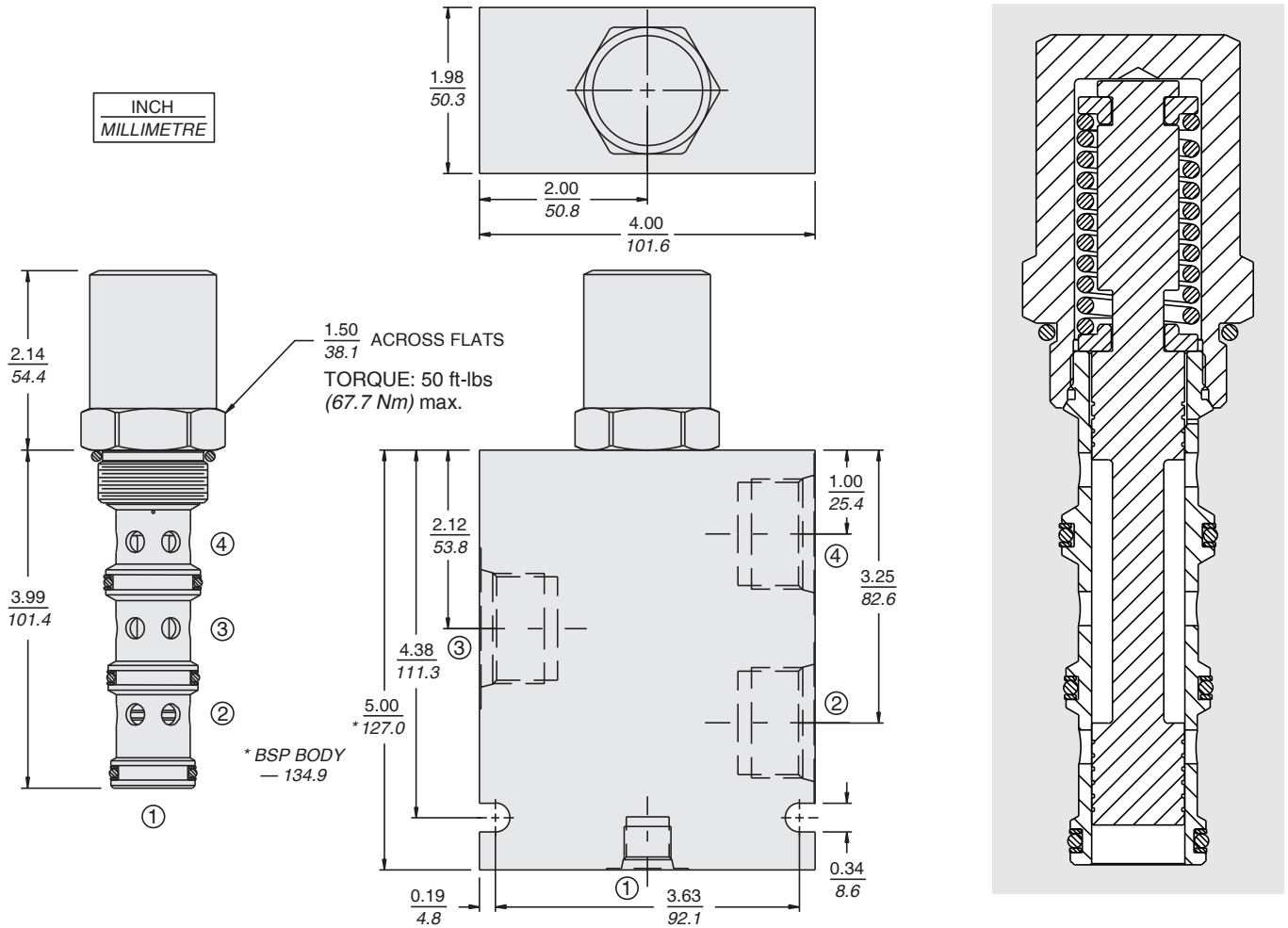
PERFORMANCE (Cartridge Only)



with Static Load Sense

EC16-42

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.56 kg. (1.23 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and TFE back-ups standard.

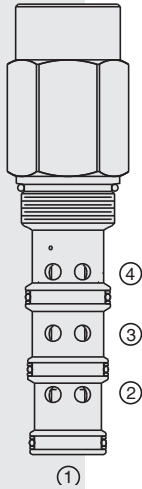
Standard Ported Body: Weight: 1.50 kg. (3.30 lbs.); Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.016.1.

TO ORDER

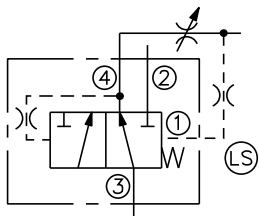
EC16-42 - - -

Porting	0	Compensator Spring
Cartridge Only	12T	80 5.51 bar (80 psid)
SAE 12; Port 1: SAE 6	16T	150 10.34 bar (150 psid)
SAE 16; Port 1: SAE 6		
	Seals	
	N Buna N (Std.)	
	V Fluorocarbon	

EC42-M42 Pressure Compensator with Static



ISO SYMBOL



DESCRIPTION

A screw-in, cartridge-style priority-on-demand pressure-compensator with static load sense.

OPERATION

The **EC42-M42** provides priority flow in the required amount, while allowing excess flow to be used for auxiliary functions. With port 3 providing inlet flow, port 4 will deliver the required priority flow regardless of load pressure. Excess flow exits at 2. Port 1 is the load sense port. All ports may be fully pressurized.

NOTE: 0.031 in. (0.79 mm) orifice is recommended to be installed in the load sense line at port 1 for better stability.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: 241 bar (3500 psi)

Maximum Input Flow: 303 lpm (80.0 gpm)

Maximum Priority Flow: 208 lpm (55.0 gpm) with 10.3 bar (150 psi) spring;
151 lpm (40.0 gpm) with 5.5 bar (80 psi) spring

Maximum Bypass Flow: 208 lpm (55.0 gpm) with 10.3 bar (150 psi) spring;
151 lpm (40.0 gpm) with 5.5 bar (80 psi) spring

Flow Maintenance: see performance chart

Temperature: -40 to 120°C with Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

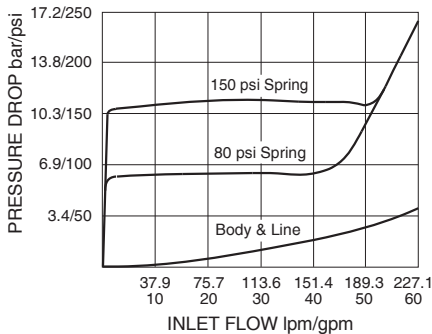
Cavity: VC42-M4; See page 9.142.1

Cavity Tool: CT42-M4XX; See page 8.600.1

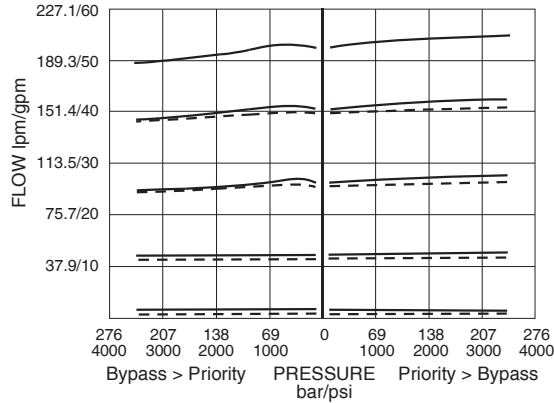
Seal Kit: SK42-4X-MMM; See page 8.650.1

PERFORMANCE (Cartridge Only)

Pressure Drop thru Bypass vs. Inlet Flow with 4 closed; no load at 2 0.031 in. (0.79 mm) Orifice in Load Sense Line 32 cSt/150 sus oil at 40°C



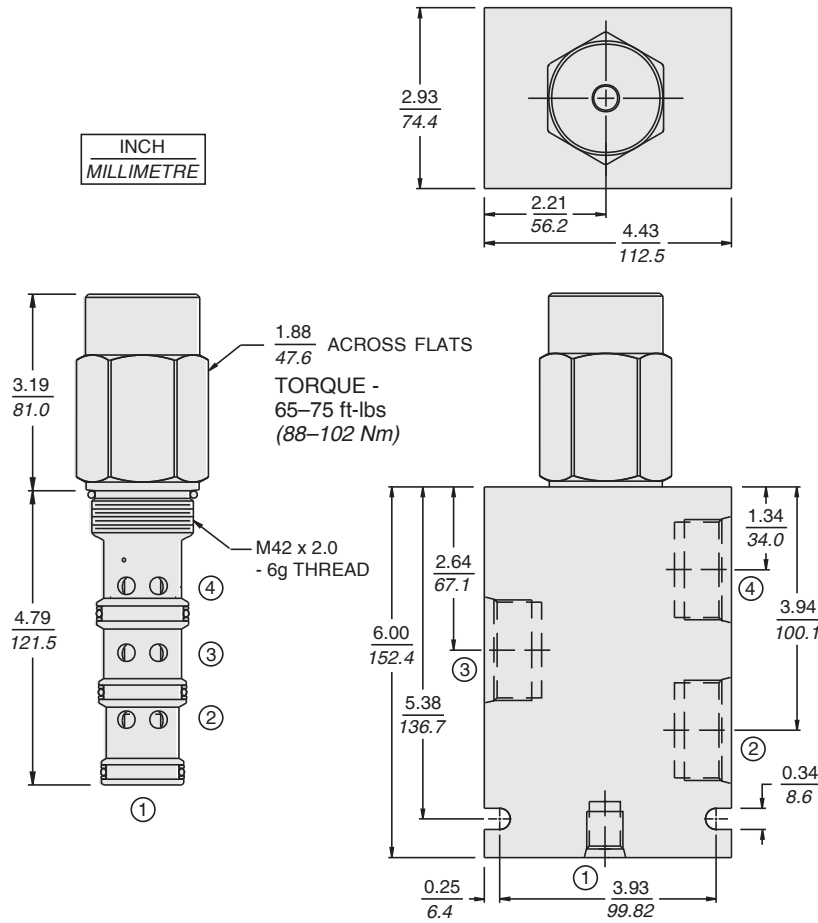
Priority Flow vs. Pressure at 3500 psi (241 bar), 60 gpm (227 lpm) Inlet 0.031 in. (0.79 mm) Orifice in Load Sense Line 150 psi Spring: —; 80 psi Spring: - - - - 32 cSt/150 sus oil at 40°C



Load Sense

EC42-M42

DIMENSIONS



MATERIALS

Cartridge: Weight: 1.56 kg. (3.44 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 2.8 kg. (6.2 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.042.1.

TO ORDER

EC42-M42 -

Porting

Cartridge Only	0
SAE 12	12T
SAE 16	16T
SAE 20	20T

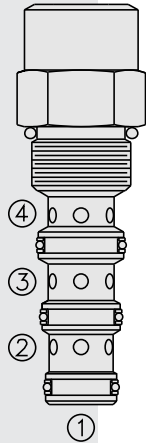
Bias Spring

80	5.5 bar (80 psid)
150	10.3 bar (150 psid)

Seals

N	Buna N (Std.)
V	Fluorocarbon
P	Polyurethane

EC10-43 Pressure Compensator



DESCRIPTION

A screw-in, cartridge-style, **priority-on-demand**, pressure-compensator with a dynamic load sense, intended to provide priority flow in the required amount, while allowing excess flow to be used for auxiliary functions.

OPERATION

With inlet flow at 3, the **EC10-43** will deliver required priority flow at 4, regardless of load pressure. Excess flow exits at 2. Port 1 is the load sense port. All ports may be fully pressurized.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: Inlet: 240 bar (3500 psi)

Maximum Regulated Flow: 34.1 lpm (9 gpm) with 10.3 bar (150 psi) compensator spring; 26.0 lpm (7.0 gpm) with 5.5 bar (80 psi) compensator spring

Flow Maintenance: see performance chart

Temperature: -40 to 120°C with Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

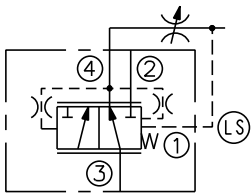
Cavity: VC10-4; See page 9.110.1

Cavity Tool: CT10-4-XXX; See page 8.600.1

Seal Kit: SK10-4X-MMM; See page 8.650.1

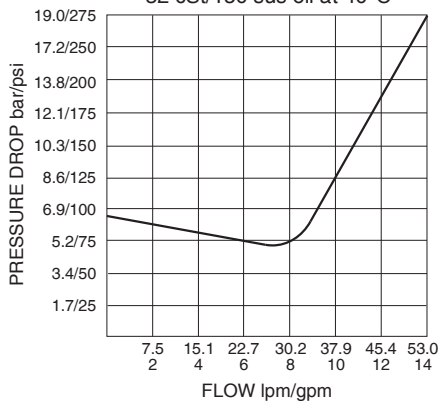
SYMBOLS

USASI/ISO:



PERFORMANCE (Cartridge Only)

Pressure Drop vs. Inlet Flow
3 to 2, with 4 closed;
No load at 2; 150 psi Spring
32 cSt/150 sus oil at 40°C

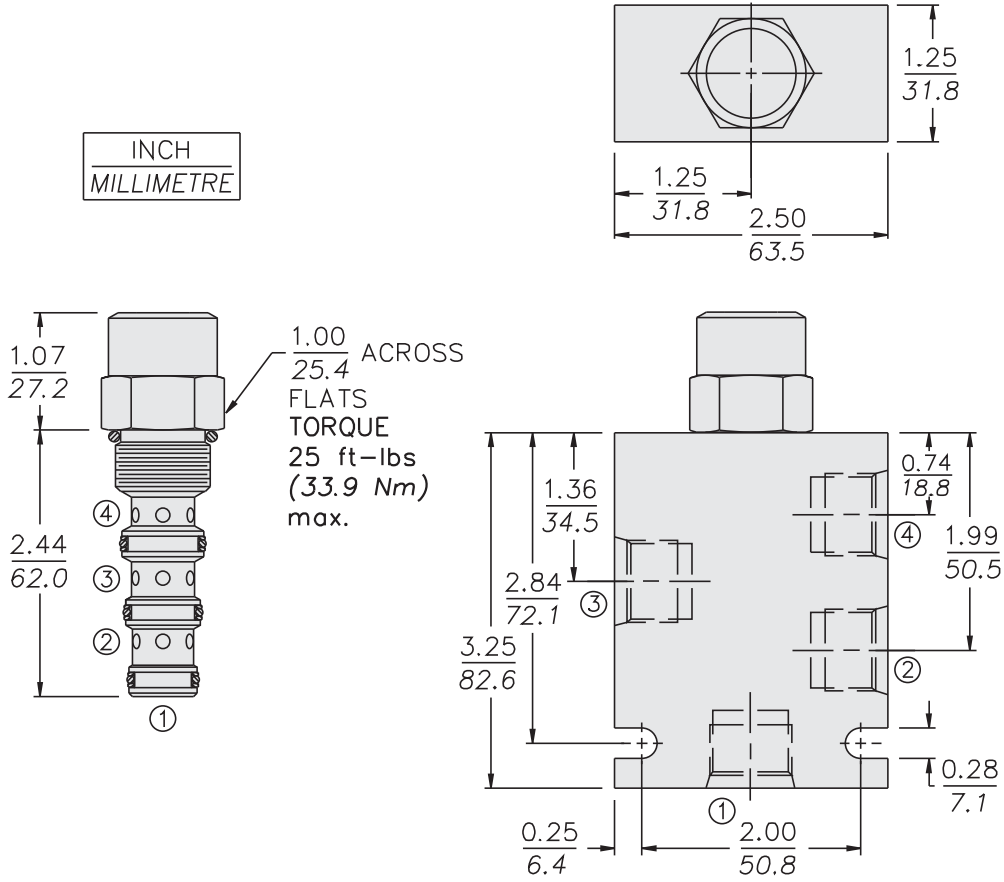


Note: This valve, the EC10-43, replaces the older EC10-41 functionally, although the two valves have different port logic. We will continue to provide the EC10-41 for existing customers, but recommend conversion to the new EC10-43 for new designs. For more information consult factory.

with Dynamic Load Sense

EC10-43

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.16 kg. (0.35 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

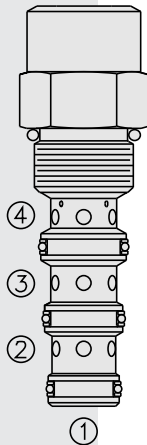
Standard Ported Body: Weight:
0.34 kg. (0.75 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.010.1.

TO ORDER

EC10-43 -		Compensator Spring	
Porting		80	5.5 bar (80 psid)
Cartridge Only	0	150	10.3 bar (150 psid)
SAE 6	6T		
SAE 8	8T		
1/4 in. BSP*	2B		
3/8 in. BSP*	3B		
		Seals	
		N	Buna N (Std.)
		V	Fluorocarbon

*BSP Body;
U.K. Mfr. Only

EC50-43 Pressure Compensator, High Pressure



DESCRIPTION

A screw-in, cartridge-style, priority-on-demand, pressure-compensator with a dynamic load sense, intended to provide priority flow in the required amount, while allowing excess flow to be used for auxiliary functions.

OPERATION

With inlet flow at 3, the **EC50-43** will deliver required priority flow at 4, regardless of load pressure. Excess flow exits at 2. Port 1 is the load sense port. All ports may be fully pressurized.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: Inlet: 345 bar (5000 psi)

Input Flow Rate: 45.4 lpm (12 gpm) maximum

Maximum Regulated Flow: 37.9 lpm (10 gpm) with 10.3 bar (150 psi) compensator spring; 30.2 lpm (8.0 gpm) with 5.5 bar (80 psi) compensator spring

Flow Maintenance: see performance chart

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

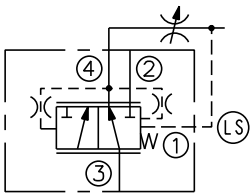
Cavity: VC10-4; See page 9.110.1

Cavity Tool: CT10-4-XXX; See page 8.600.1

Seal Kit: SK10-4P-TMB; See page 8.650.1

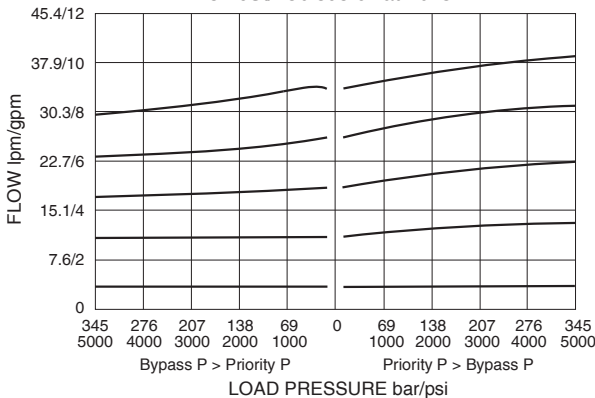
SYMBOLS

USASI/ISO:



PERFORMANCE (Cartridge Only)

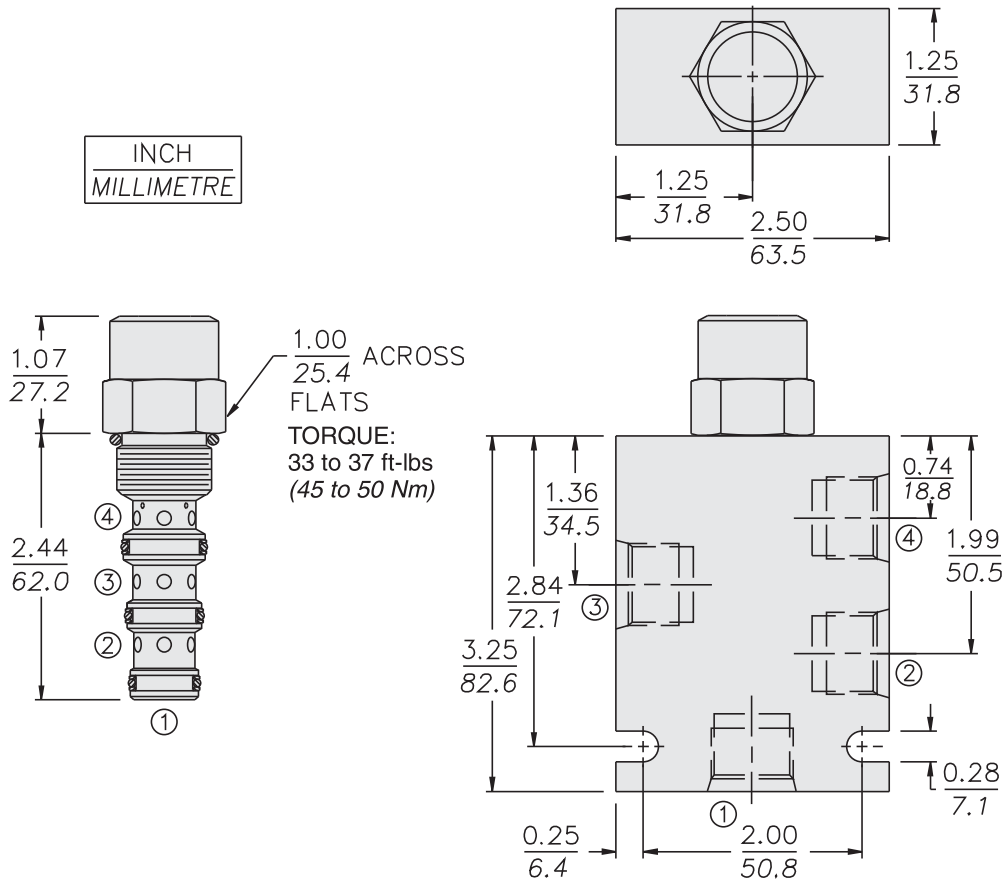
Priority Flow vs. Load
12 gpm Inlet Flow; 150 psi Compensator Spring
32 cSt/150 sus oil at 40°C



with Dynamic Load Sense

EC50-43

DIMENSIONS

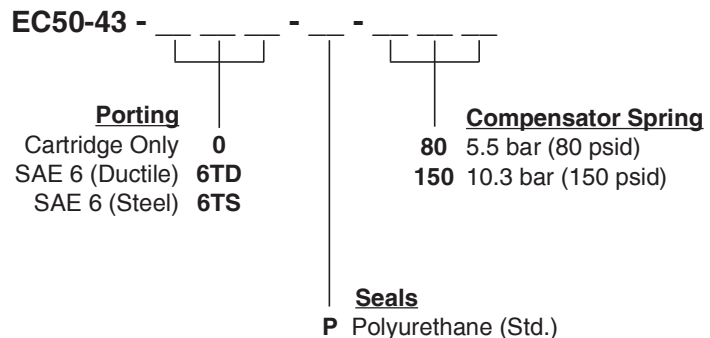


MATERIALS

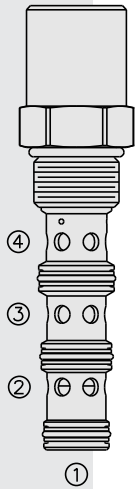
Cartridge: Weight: 0.17 kg. (0.37 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Ported Body: Weight: 0.68 kg.
(1.51 lbs.) Ductile Iron (code "D")
standard, consult factory for
weight, dimensions may differ.
Rated to 345 bar (5000 psi).
See page 8.010.1.

TO ORDER



EC12-43 Pressure Compensator



DESCRIPTION

A screw-in, cartridge-style, priority-on-demand, pressure compensator with dynamic load sense intended to provide priority flow in the required amount, while allowing excess flow to be used for auxiliary functions.

OPERATION

With inlet flow at port 3, the **EC12-43** will deliver required priority flow at port 4, based on the size of the external orifice, regardless of load pressure. Excess flow exits, or is bypassed, at port 2. Port 1 is the load sense port. All ports may be fully pressurized.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: Inlet: 345 bar (5000 psi);

Note: Steel body required when used at or near 5000 psi.

Maximum Input Flow Rate: 95 lpm (25 gpm) with 160 psi compensating spring; 68 lpm (18 gpm) with 80 psi compensating spring

Priority Flow Rate: Up to 80% of input flow

Flow Maintenance: See performance chart

Temperature: -40 to 120°C with Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

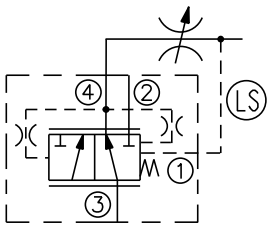
Cavity: VC12-4; See page 9.112.1

Cavity Tool: CT12-4-XXX; See page 8.600.1

Seal Kit: SK12-4X-MMM; See page 8.650.1

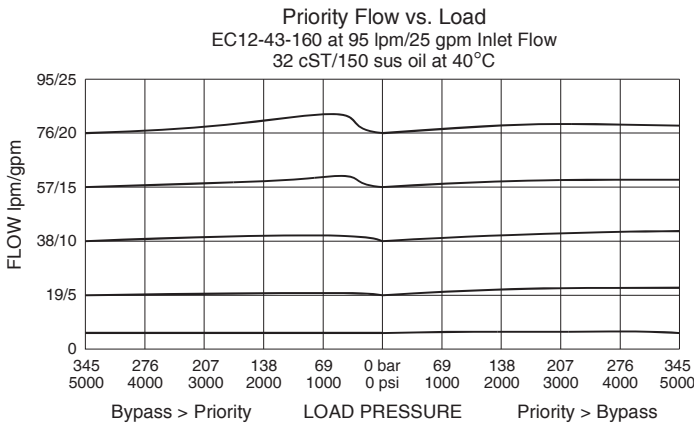
SYMBOLS

USASI/ISO:

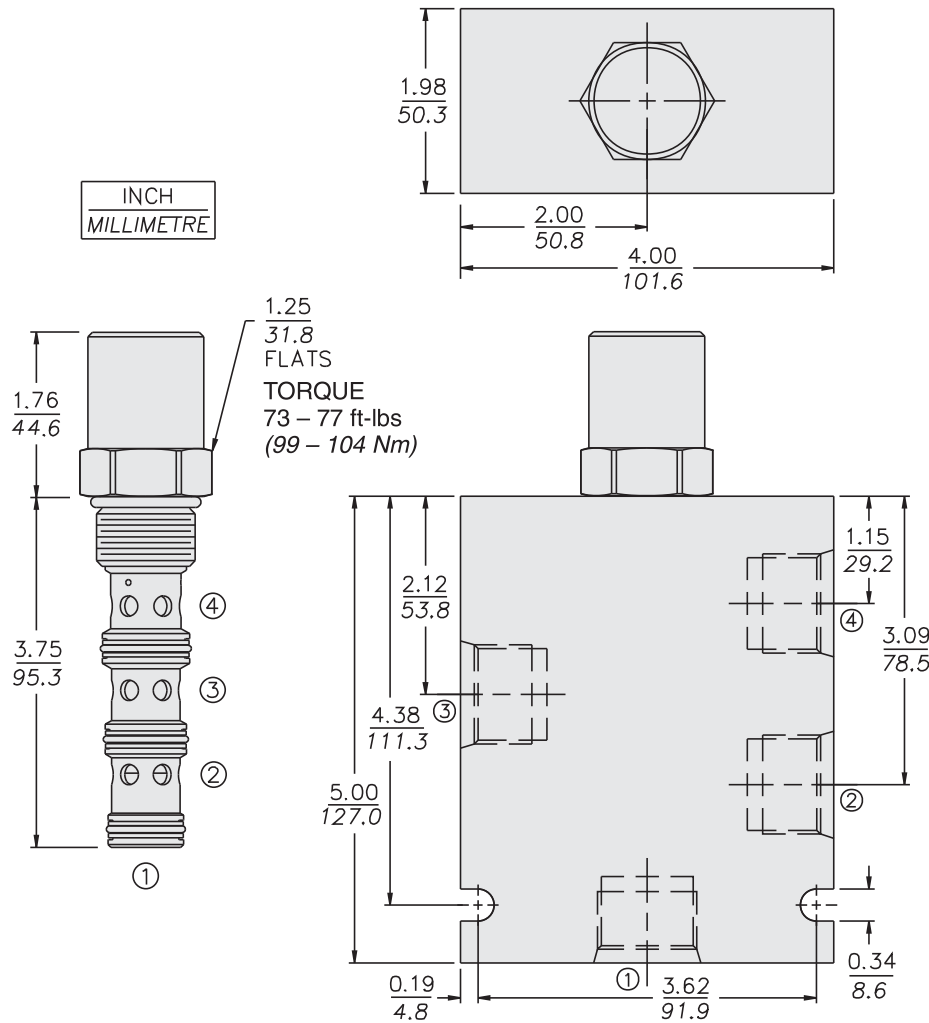


Note: This valve, the EC12-43, replaces the older EC12-41 functionally, although the two valves have different port logic. We will continue to provide the EC12-41 for existing customers, but recommend conversion to the new EC12-43 for new designs. For more information consult factory.

PERFORMANCE (Cartridge Only)



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.46 kg. (1.02 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

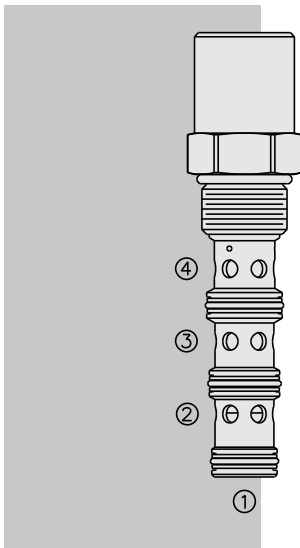
Standard Ported Body: Weight:
1.50 kg. (3.30 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.012.1

TO ORDER

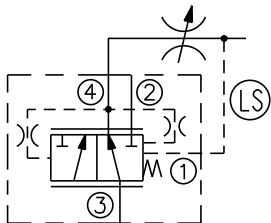
EC12-43 - - -

Porting			Compensator Spring	
Cartridge Only	0		80	5.5 bar (80 psi)
SAE 10	10T		160	11.0 bar (160 psi)
SAE 12	12T			
			Seals	
			N	Buna N (Std.)
			V	Fluorocarbon

HEC12-43 Pressure Compensator, Dynamic Load-Sense



ISO SYMBOL



DESCRIPTION

A screw-in, cartridge-style, priority-on-demand, pressure compensator with dynamic load sense intended to provide priority flow in the required amount, while allowing excess flow to be used for auxiliary functions.

OPERATION

With inlet flow at port 3, the **HEC12-43** will deliver required priority flow at port 4, regardless of load pressure. Excess flow exits, or is bypassed, at port 2. Port 1 is the load sense port. All ports may be fully pressurized.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.

RATINGS

Operating Pressure: 350 bar (5075 psi) 10% cycle life 420 bar (6090 psi)

Proof Pressure: 690 bar (10000 psi)

Burst Pressure: 1380 bar (20000 psi)

Maximum Inlet Flow Rate:

68 lpm (18 gpm) with 5.5 bar (80 psi) compensating spring;

95 lpm (25 gpm) with 11 bar (160 psi) compensating spring

Priority Flow Rate: Up to 80% of maximum input flow

Load Sense Line Flow Rate: 1.1 lpm (0.3 gmp) maximum with 350 bar (5075 psi) pressure adn Port 3 and Ports 2 and 4 blocked

Flow Maintenance: See performance chart

Temperature: -54° to 107°C (-65° to 225°F) with PPDI Urethane seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

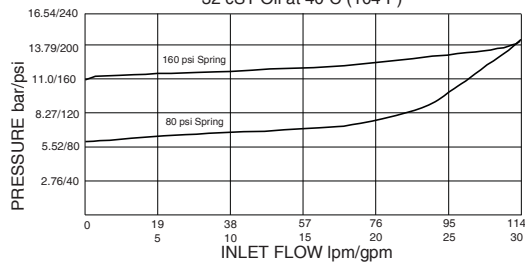
Cavity: HVC12-4; See page 9.132.1

Cavity Tool: HCT12-4-xxx; See page 8.600.1

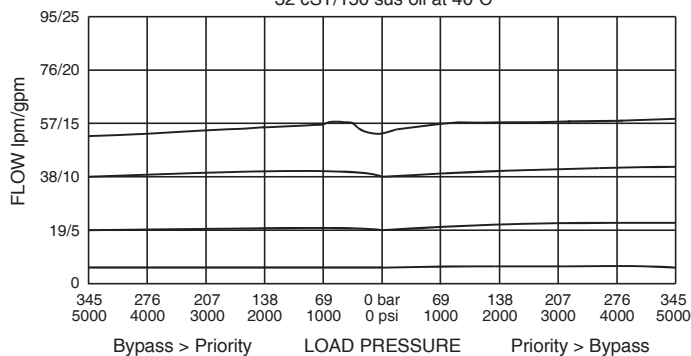
Seal Kit: HSK12-4U-0; See page 8.650.1

PERFORMANCE (Cartridge Only)

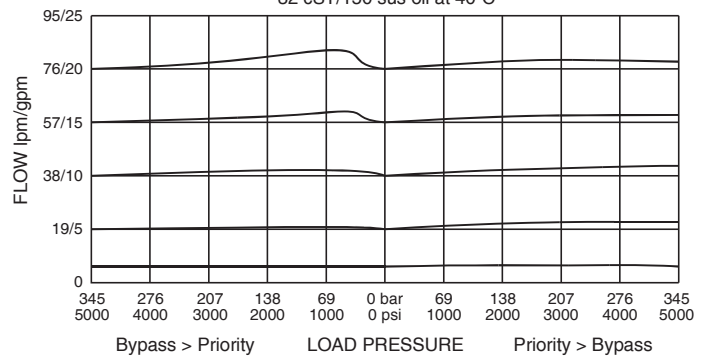
Pressure Drop vs. Inlet Flow
Port 3 to Port 2, Port 4 Blocked
32 cST Oil at 40°C (104°F)



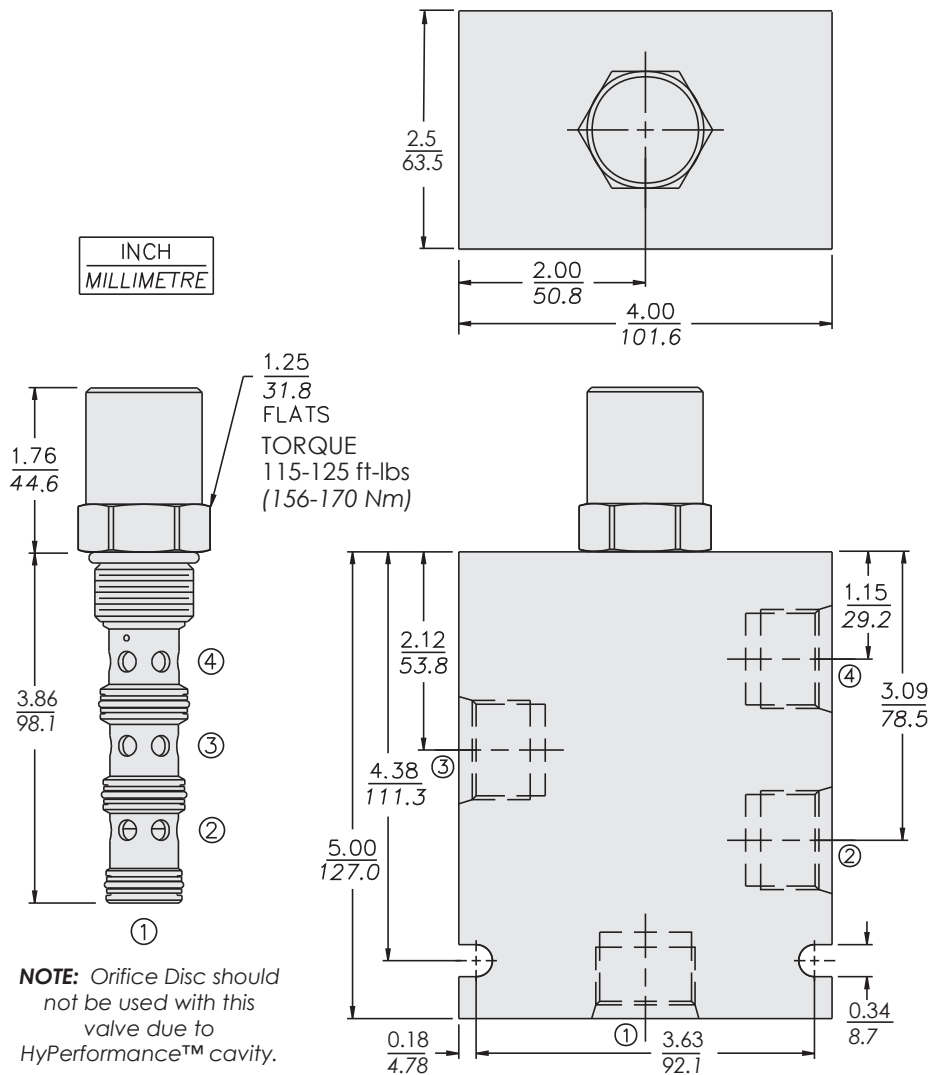
Priority Flow vs. Load
HEC12-43-80 at 68 lpm/18 gpm Inlet Flow
32 cST/150 sus oil at 40°C



Priority Flow vs. Load
HEC12-43-160 at 95 lpm/25 gpm Inlet Flow
32 cST/150 sus oil at 40°C



DIMENSIONS



MATERIALS

Cartridge: Weight: 0.44 kg. (0.98 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Urethane seals without back-up rings standard.

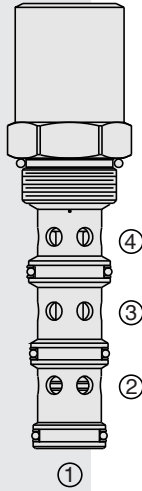
Ported Body: Weight: 4.05 kg. (8.93 lbs.)
HyPerformance Ductile iron (code 'D') standard. Rated to 354 bar (5000 psi)

TO ORDER

HEC12-43 -

Porting	-	-	-
Cartridge Only	0		
SAE 12	12TD		
*3/4 in. BSP	6BD		
* BSP body; U.K. Mfg. Only			
		Compensator Spring	
		80	5.5 bar (80 psi)
		150	10.3 bar (150 psi)
		Seals	
		U	PPDI Urethane

EC16-43 Pressure Compensator



DESCRIPTION

A screw-in, cartridge-style, **priority on-demand**, pressure-compensator with dynamic load sense. It is intended to provide priority flow in the required amount while allowing excess flow to be used for auxiliary functions.

OPERATION

With inlet flow at 3, the **EC16-43** will deliver required priority flow at 4, regardless of load pressure. Excess flow exits at 2. Port 1 is the load sense port. All ports may be fully pressurized.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Maximum Operating Pressure: Inlet: 240 bar (3500 psi)

Maximum Input Flow: 190 lpm (50 gpm)

Maximum Priority Flow Rate: 95 lpm (25 gpm)

Flow Maintenance: see performance chart

Temperature: -40 to 120°C with Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

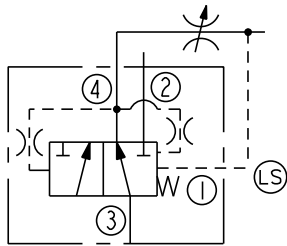
Cavity: VC16-4; See page 9.116.1

Cavity Tool: CT16-4-XXX; See page 8.600.1

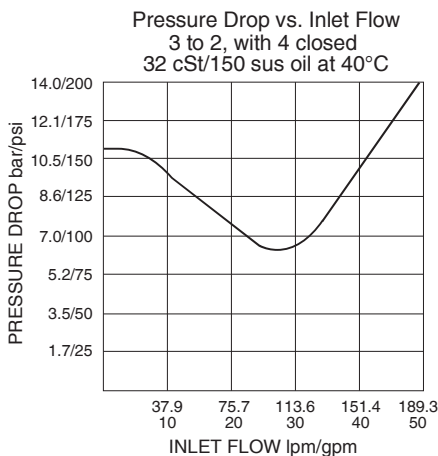
Seal Kit: SK16-4X-MMM; See page 8.650.1

SYMBOLS

USASI/ISO:



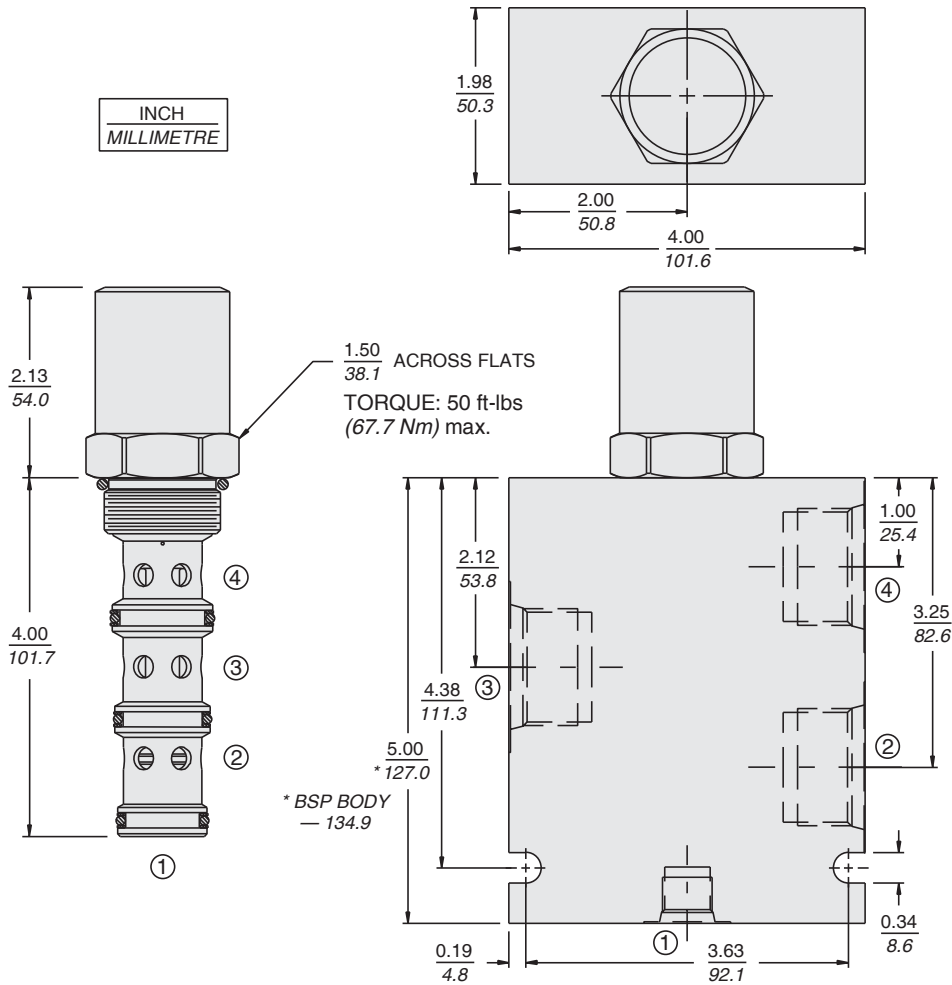
PERFORMANCE (Cartridge Only)



with Dynamic Load Sense

EC16-43

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.56 kg. (1.23 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

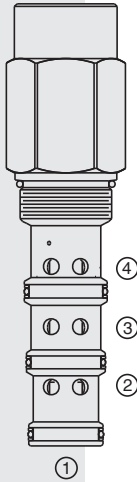
Standard Ported Body: Weight:
1.50 kg. (3.30 lbs.) Anodized high-
strength 6061 T6 aluminum alloy,
rated to 207 bar (3000 psi). Ductile
iron bodies available; dimensions
may differ. See page 8.016.1.

TO ORDER

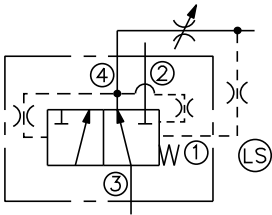
EC16-43 - - -

Porting			
Cartridge Only	0		Compensator Spring
SAE 12; Port 1: SAE 6	12T	80	5.51 bar (80 psid)
SAE 16; Port 1: SAE 6	16T	150	10.34 bar (150 psid)
			Seals
			N Buna N (Std.)
			V Fluorocarbon

EC42-M43 Pressure Compensator with Dynamic



ISO SYMBOL



DESCRIPTION

A screw-in, cartridge-style priority-on-demand pressure-compensator with dynamic load sense.

OPERATION

The **EC42-M43** provides priority flow in the required amount, while allowing excess flow to be used for auxiliary functions. With port 3 providing inlet flow, port 4 will deliver the required priority flow regardless of load pressure. Excess flow exits at 2. Port 1 is the load sense port. All ports may be fully pressurized.

NOTE: 0.031 in. (0.79 mm) orifice is recommended to be installed in the load sense line at port 1 for better stability.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: 241 bar (3500 psi)

Maximum Input Flow: 303 lpm (80.0 gpm)

Maximum Priority Flow: 208 lpm (55.0 gpm) with 10.3 bar (150 psi) spring;
151 lpm (40.0 gpm) with 5.5 bar (80 psi) spring

Maximum Bypass Flow: 208 lpm (55.0 gpm) with 10.3 bar (150 psi) spring;
151 lpm (40.0 gpm) with 5.5 bar (80 psi) spring

Flow Maintenance: see performance chart

Temperature: -40 to 120°C with Buna N seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: VC42-M4; See page 9.142.1

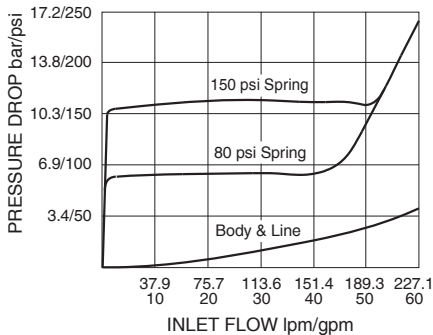
Cavity Tool: CT42-M4XX; See page 8.600.1

Seal Kit: SK42-4X-MMM; See page 8.650.1

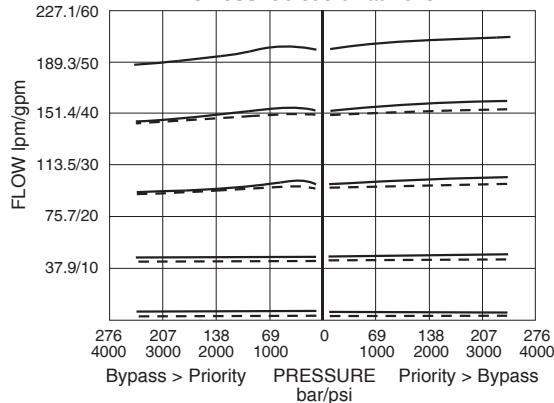
Note: This valve, the EC42-M43, replaces the older EC42-M41 functionally, although the two valves have different port logic. We will continue to provide the EC42-M41 for existing customers, but recommend conversion to the new EC42-M43 for new designs. For more information consult factory.

PERFORMANCE (Cartridge Only)

Pressure Drop thru Bypass vs. Inlet Flow with 4 closed; no load at 2 0.031 in. (0.79 mm) Orifice in Load Sense Line
32 cSt/150 sus oil at 40°C



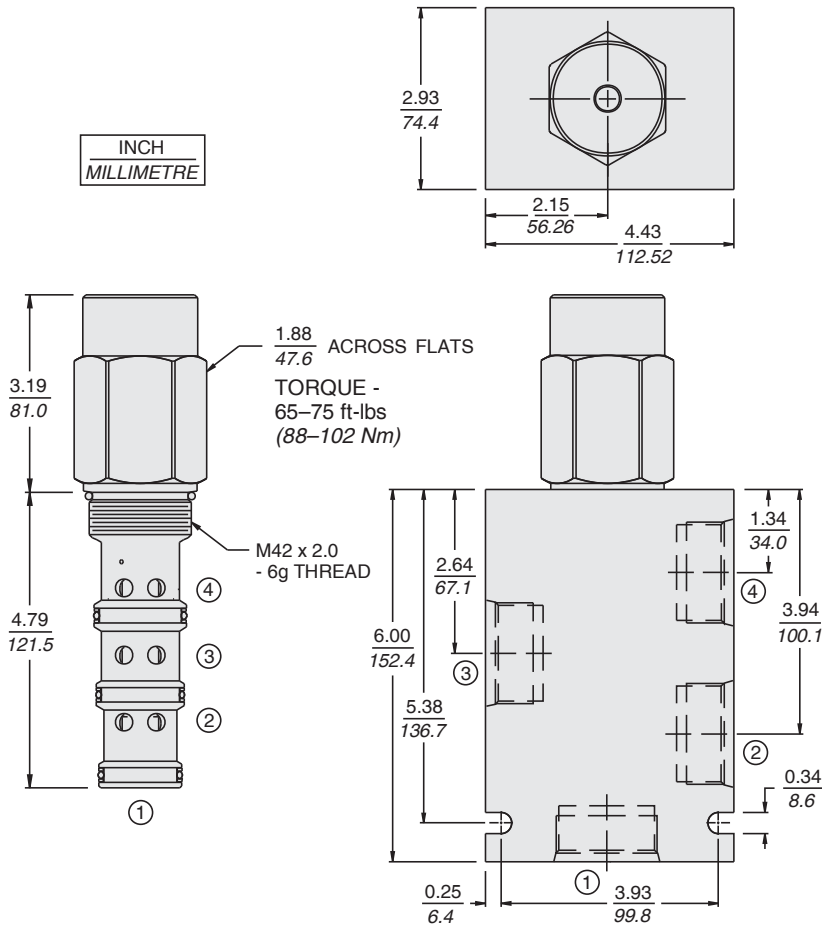
Priority Flow vs. Pressure at 3500 psi (241 bar), 60 gpm (227 lpm) Inlet 0.031 in. (0.79 mm) Orifice in Load Sense Line
150 psi Spring: —; 80 psi Spring: - - - -
32 cSt/150 sus oil at 40°C



Load Sense

EC42-M43

DIMENSIONS



MATERIALS

Cartridge: Weight: 1.58 kg. (3.48 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight: 2.8 kg. (6.2 lbs.)
 Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.042.1

TO ORDER

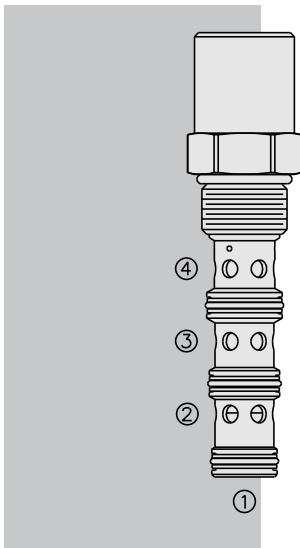
EC42-M43 -

Porting
 Cartridge Only **0**
 SAE 12 **12T**
 SAE 16 **16T**
 SAE 20 **20T**

Bias Spring
80 5.5 bar (80 psid)
150 10.3 bar (150 psid)

Seals
N Buna N (Std.)
V Fluorocarbon
P Polyurethane

HEC32-43 Pressure Compensator



DESCRIPTION

A screw-in, cartridge-style, priority-on-demand, pressure compensator with dynamic load sense intended to provide priority flow in the required amount, while allowing excess flow to be used for auxiliary functions.

OPERATION

With inlet flow at port 3, the **HEC32-43** will deliver required priority flow at port 4, based on the size of the external orifice, regardless of load pressure. Excess flow exits, or is bypassed, at port 2. Port 1 is the load sense port. All ports may be fully pressurized.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.

RATINGS

Operating Pressure: 350 bar (5075 psi)

Proof Pressure: 690 bar (10000 psi)

Burst Pressure: 1380 bar (20000 psi)

Maximum Inlet Flow Rate:

530 lpm (140 gpm) with 10.3 bar (150 psi) compensating spring;

379 lpm (100 gpm) with 5.5 bar (80 psi) compensating spring

Priority Flow Rate: 60% of maximum input flow

Flow Maintenance: See performance chart

Temperature: -54° to 107°C (-65° to 225°F) with PPDI Urethane seals

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

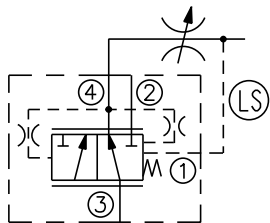
Cavity: HVC32-4; See page 9.132.1

Cavity Tool: HCT32-4-xxx; See page 8.600.1

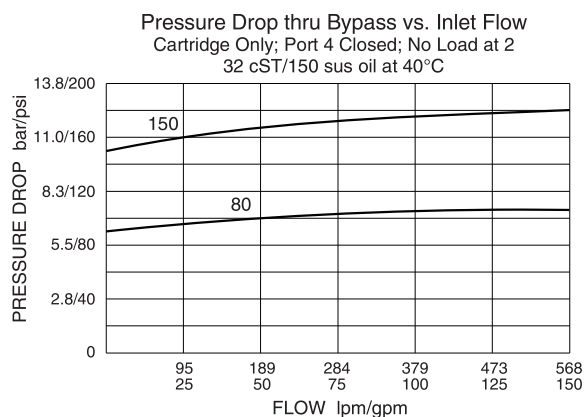
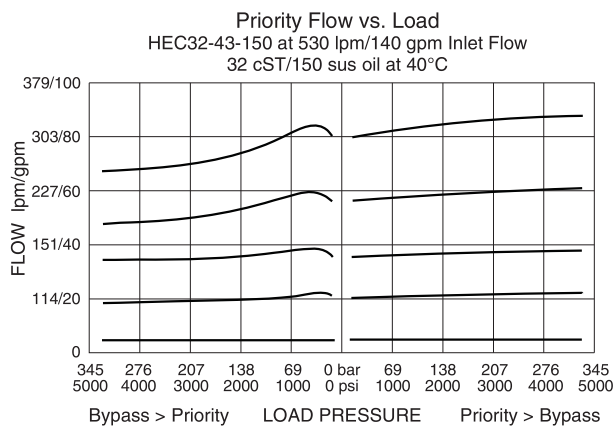
Seal Kit: SK32-4x-xxx; See page 8.650.1

SYMBOLS

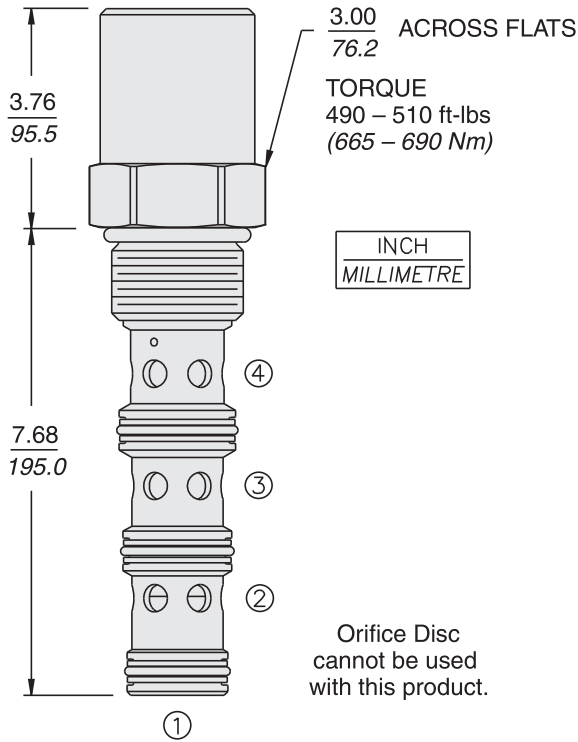
USASI/ISO:



PERFORMANCE (Cartridge Only)



DIMENSIONS

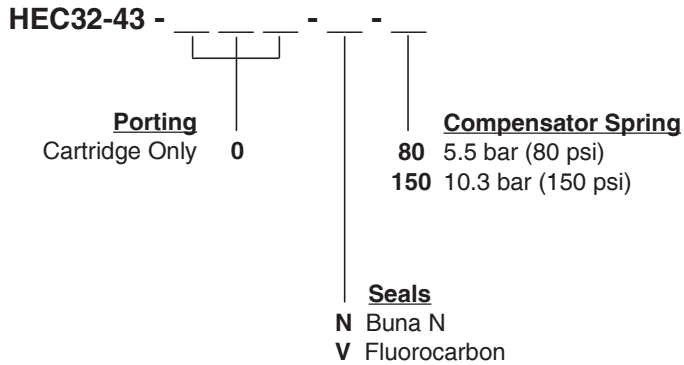


MATERIALS

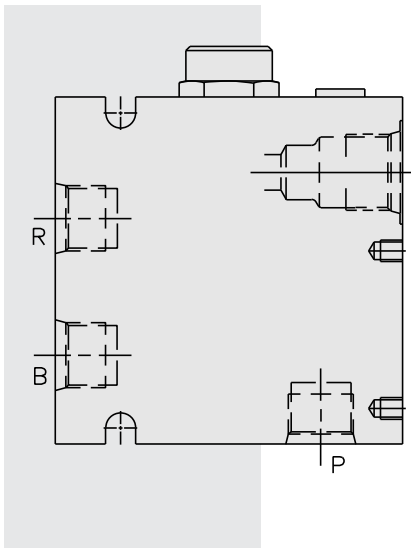
Cartridge: Weight: 5.2 kg. (11.5 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Urethane O-rings and back-ups standard.

Ported Body: Consult Factory.

TO ORDER



ECV10-44 In-Line Pressure Compensator w/Control Cavity



DESCRIPTION

The ECV10-44 is a standard model EC10-40 in a convenient in-line plumbed body with an integral control cartridge cavity VC10-2. Addition of needle valves, rotary valves, electro-proportional valves, etc. allow for infinitely variable pressure-compensated priority flow output.

OPERATION

The **ECV10-44** maintains a constant flow rate from port R regardless of load pressure changes in the circuit downstream of port R.

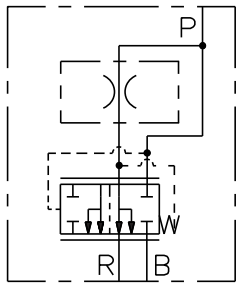
The cartridge maintains a constant differential pressure from port P to port R (see USASI Symbol), thereby regulating the hydraulic flow rate between the two ports. The ECV10-44 is a priority type regulator, delivering pump flow first to R, then bypassing excess to B. All ports may be fully pressurized. Flow output is a function of the flow required to maintain a pressure drop as determined by the compensating spring value. The control cavity is cartridge port 2 in, cartridge port 1 out, so all cartridge restrictions on 1 to 2 use apply.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Panel-mount capability.
- Lock-down bracket holes.

SYMBOL

USASI/ISO:



RATINGS

Operating Pressure: 207 bar (3000 psi)

Flow Rate: Determined by control used

Standard Compensator Bias Spring: 5.5 bar (80 psid)

Flow Maintenance:

0.38 to 1.86 lpm (0.1 to 0.49 gpm) settings $\pm 20\%$;

1.89 to 5.64 lpm (0.5 to 1.49 gpm) settings $\pm 15\%$;

5.68 to 37.85 lpm (1.5 to 10 gpm) settings $\pm 10\%$

Temperature: -40 to 120°C

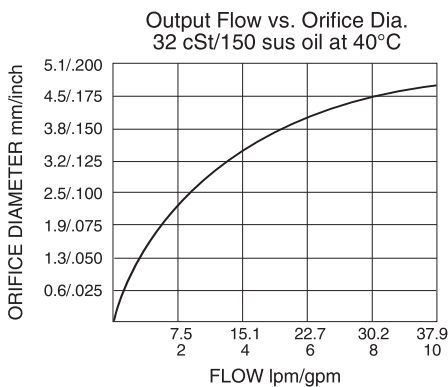
Filtration: See page 9.010.1.

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

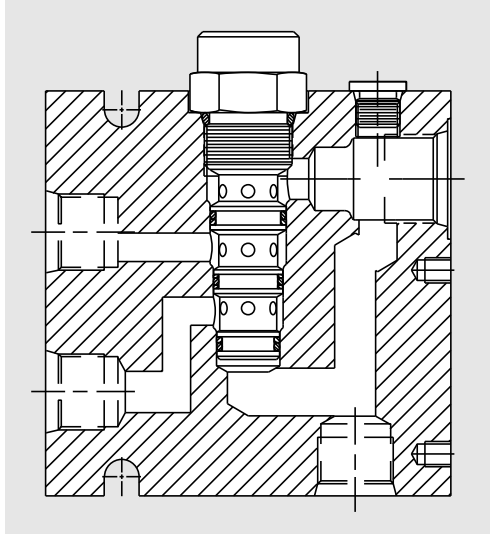
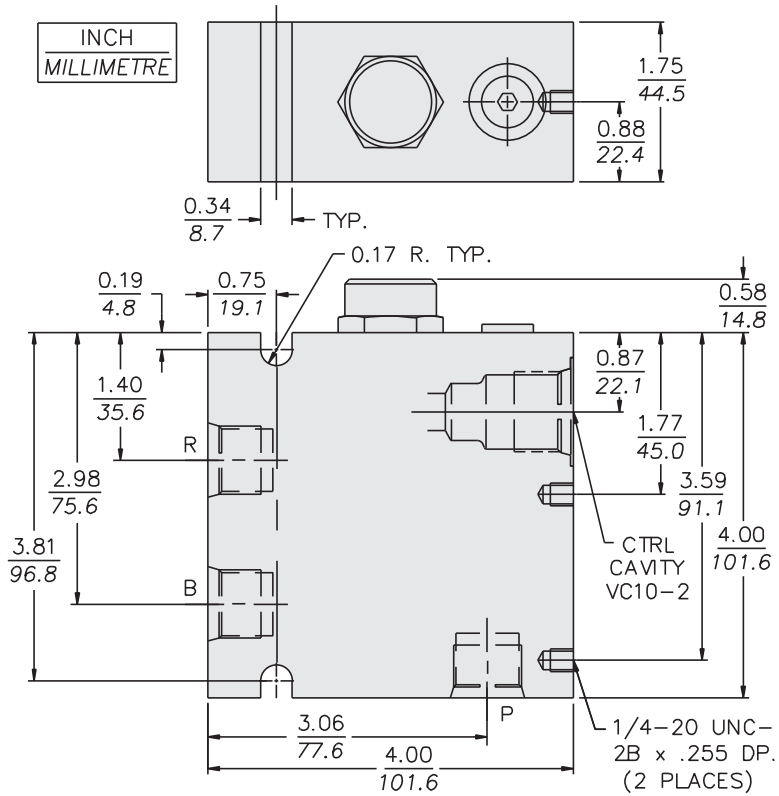
Seal Kit: Refer to EC10-40 data, page 5.482.1

PERFORMANCE (EC Cartridge Only)



ECV10-44

DIMENSIONS



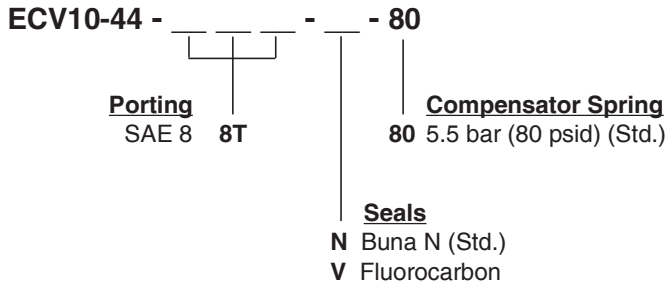
NOTE: EUROPEAN MANUFACTURED VERSION MAY DIFFER IN DESIGN/DIMENSIONS. CONSULT HYDRAFORCE HYDRAULICS LTD.

MATERIALS

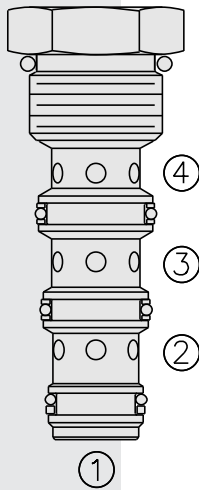
Cartridge: Weight: 0.11 kg. (0.25 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight:
 1.13 kg. (2.5 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi).

TO ORDER



FD10-40 Flow Divider/Combiner



DESCRIPTION

A screw-in, cartridge-style, spool-type flow divider/combiner. Optional flow dividing/combining ratios are maintained regardless of system operating pressure conditions.

OPERATION

In the dividing mode, the **FD10-40** will divert input flow from port 3 to ports 2 and 4, based on the ratio specified, regardless of operating pressure.

The cartridge will combine input flows from ports 2 and 4.

Should circuit operation result in a blockage of either 2 or 4, the opposite port may also close under certain conditions. Should this potential exist, consult the factory.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: 45.4 lpm (12 gpm) input max.

Flow Options:

Input Flow: 7.6 lpm (2 gpm); Ratio: 50:50; Model Code: 11

Input Flow: 15.1 lpm (4 gpm); Ratio: 50:50; Model Code: 22

Input Flow: 22.7 lpm (6 gpm); Ratio: 50:50; Model Code: 33

Input Flow: 30.3 lpm (8 gpm); Ratio: 50:50; Model Code: 44

Input Flow: 37.9 lpm (10 gpm); Ratio: 50:50; Model Code: 55

Input Flow: 45.4 lpm (12 gpm); Ratio: 50:50; Model Code: 66

Other ratio options available; consult factory.

Standard Compensator Bias Spring: 2.07 bar (30 psid)

Flow Accuracy: 10% from 30–100% of rated flow

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1.

Note: Standard 10 size 4-way bodies should not be used with this product. See page 8.010.1 for special flow divider bodies.

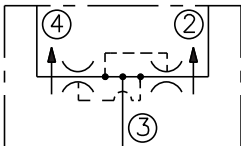
Cavity: VC10-4; See page 9.110.1 (Cavity Variation "A")

Cavity Tool: CT10-4XX; See page 8.600.1

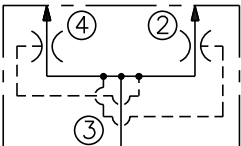
Seal Kit: SK10-4X-MMM; See page 8.650.1

SYMBOLS

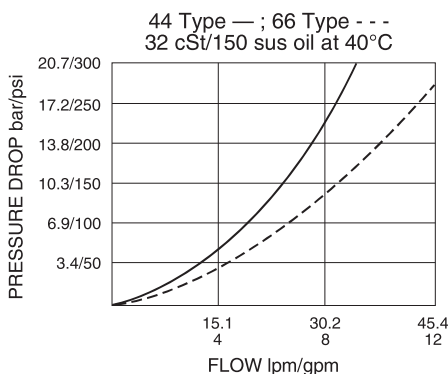
USASI:



ISO:



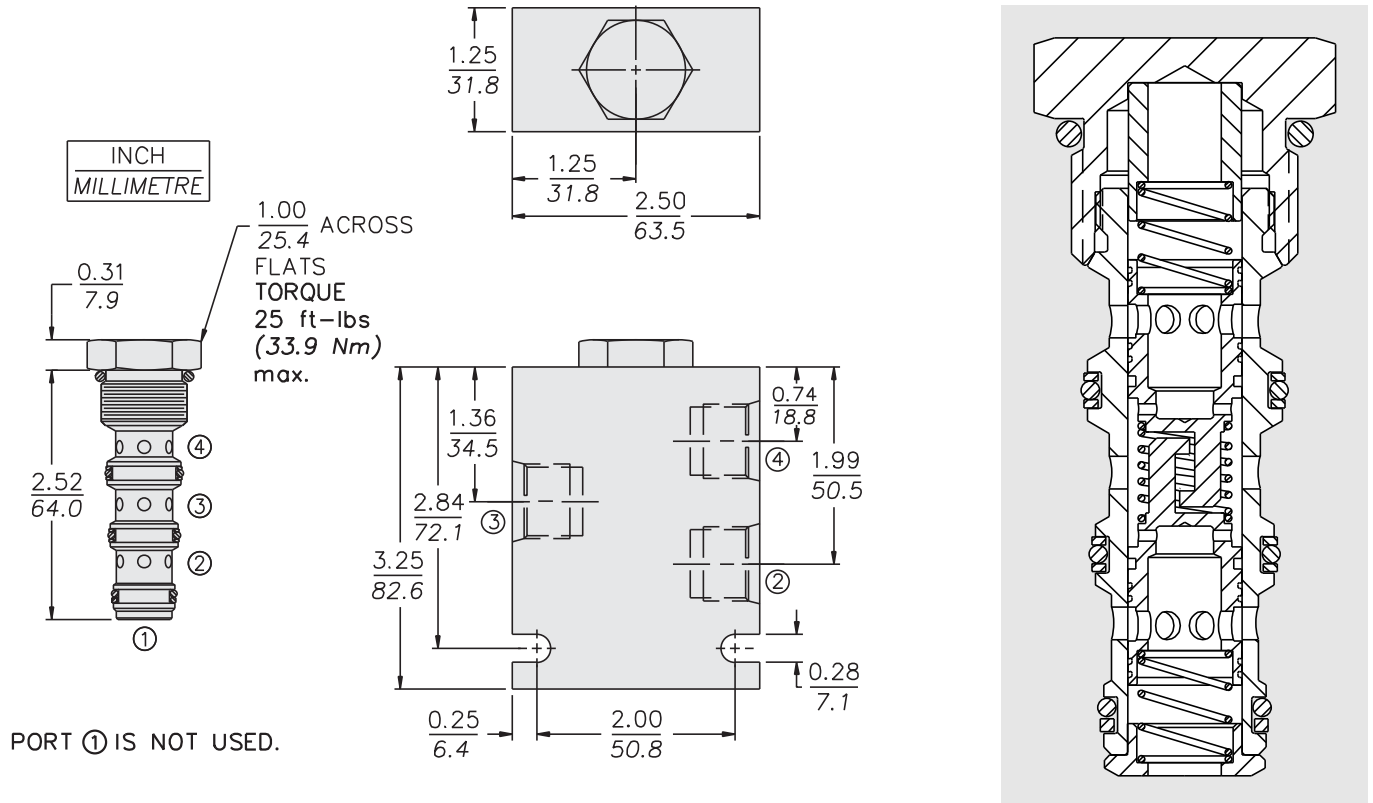
PERFORMANCE (Cartridge Only)



Note: This model will be superseded by the new FDxx-45 models, which incorporate the features of the FDxx-40, FDxx-41 and FDxx-42 series valves in one product. OEM's are encouraged to consider the newer, more robust and versatile FDxx-45 models for new applications:

- FD50-45; see page 5.632.1
- FD52-45; see page 5.634.1
- FD56-45; see page 5.636.1

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.10 kg. (0.23 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Special Ported Body: Weight: 0.34 kg. (0.75 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

TO ORDER

FD10-40 -

Special Ported Bodies

- Cartridge Only **0**
- SAE 6 (All Ports) **6T**
- SAE 8 (Port 3); SAE 6 (Ports 2 & 4) **8D**
- 1/4 in. BSP* (All Ports) **2B**
- 3/8 in. BSP* (All Ports) **3B**
- 1/2 in. BSP* (Port 3); 3/8 in. BSP* (Ports 2 & 4) **5B**

*BSP Body; U.K. Mfr. Only

Dividing/Combining Ratio

- 11** 50:50 rated @ 7.6 lpm (2 gpm) input
- 22** 50:50 rated @ 15.1 lpm (4 gpm) input
- 33** 50:50 rated @ 22.7 lpm (6 gpm) input
- 44** 50:50 rated @ 30.3 lpm (8 gpm) input
- 55** 50:50 rated @ 37.9 lpm (10 gpm) input
- 66** 50:50 rated @ 45.4 lpm (12 gpm) input

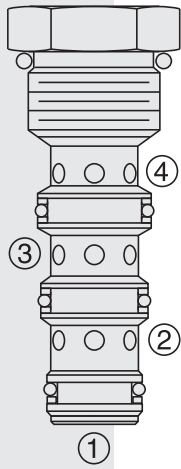
Seals

- N** Buna N (Std.)
- V** Fluorocarbon

Note: Standard 10-size 4-way bodies should not be used for flow dividers. See special flow divider bodies, page 8.010.1.

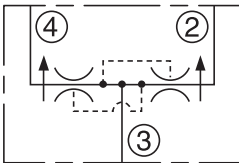
Note: Additional ratios and/or input flow sizings available for OEM applications. Consult factory.

FD12-40 Flow Divider/Combiner

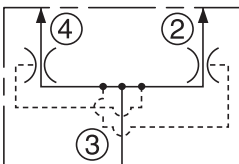


SYMBOLS

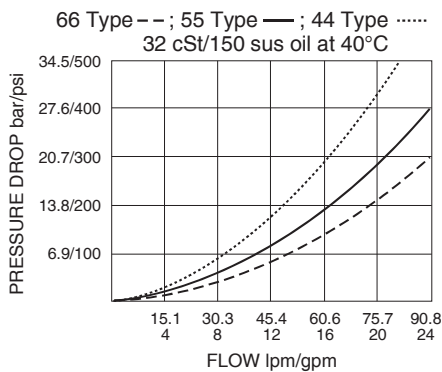
USASI:



ISO:



PERFORMANCE (Cartridge Only)



DESCRIPTION

A screw-in, cartridge-style, spool-type flow divider/combiner. Optional flow dividing/combining ratios are maintained regardless of system operating pressure conditions.

OPERATION

In the dividing mode, the **FD12-40** will divert input flow from port 3 to ports 2 and 4, based on the ratio specified, regardless of operating pressure.

The cartridge will combine input flows from ports 2 and 4.

Should circuit operation result in a blockage of either 2 or 4, the opposite port may also close under certain conditions. Should this potential exist, consult the factory.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: 90.8 lpm (24 gpm) input max.

Flow Options:

Input Flow: 60.6 lpm (16 gpm); Ratio: 50:50; Model Code: 44

Input Flow: 75.7 lpm (20 gpm); Ratio: 50:50; Model Code: 55

Input Flow: 90.8 lpm (24 gpm); Ratio: 50:50; Model Code: 66

Standard Compensator Bias Spring: 2.07 bar (30 psi)

Flow Accuracy: 10% from 30–100% of rated flow

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1.

Note: Standard 12 size 4-way bodies should not be used with this product.

See page 8.012.3 for special flow divider bodies.

Cavity: VC12-4; See page 9.112.1 (Cavity Variation "A")

Cavity Tool: CT12-4XX; See page 8.600.1

Seal Kit: SK12-4X-MMM; See page 8.650.1

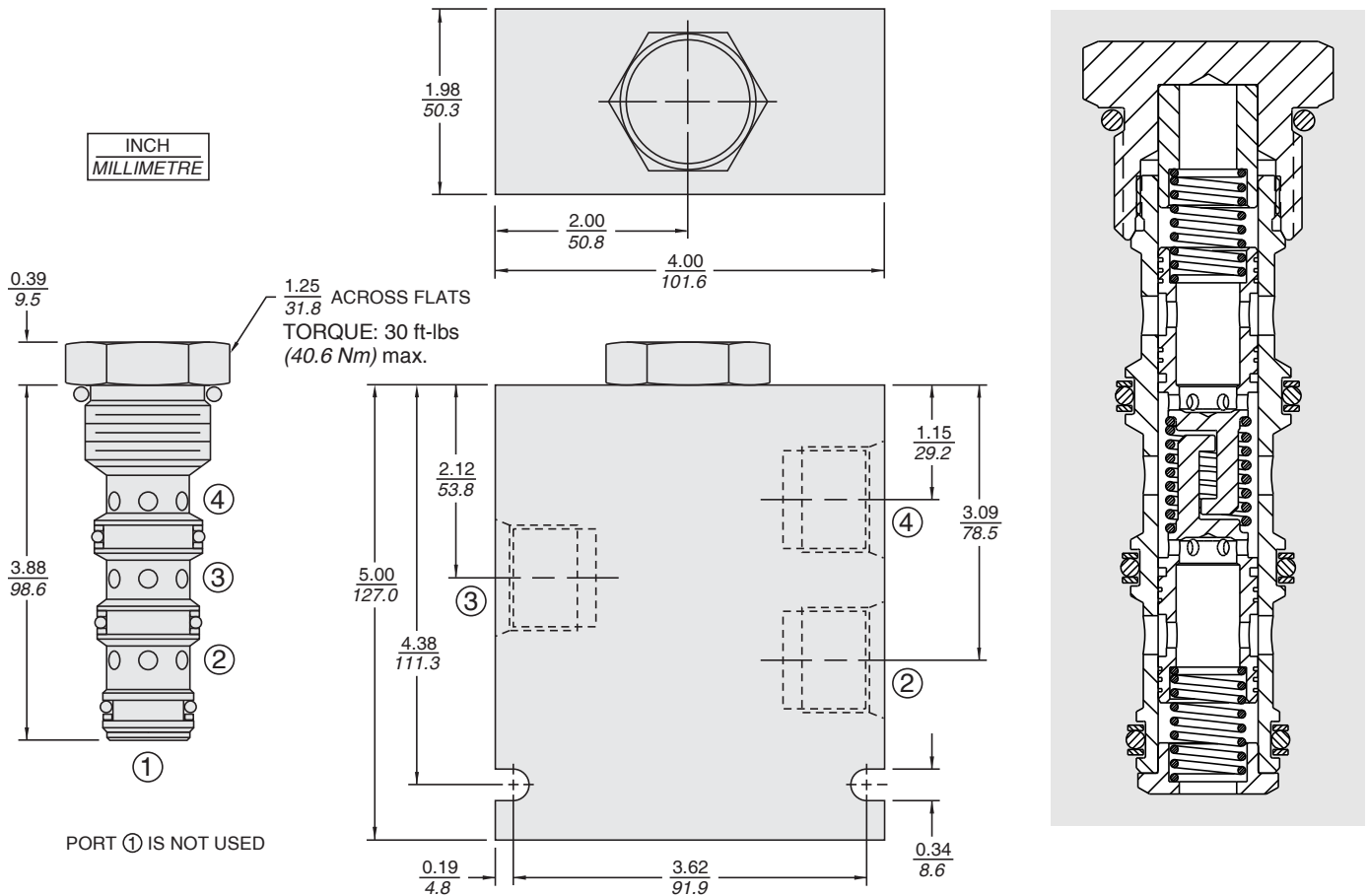
Note: This model will be superseded by the new FDxx-45 models, which incorporate the features of the FDxx-40, FDxx-41 and FDxx-42 series valves in one product. OEM's are encouraged to consider the newer, more robust and versatile FDxx-45 models for new applications:

FD50-45; see page 5.632.1

FD52-45; see page 5.634.1

FD56-45; see page 5.636.1

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.28 kg. (0.61 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight:
 1.50 kg. (3.30 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.012.1

TO ORDER

FD12-40 -

Porting
 Cartridge Only **0**
 SAE 10 **10T**
 SAE 12 **12T**
 See page 8.012.3 **8D**
 See page 8.012.3 **10D**

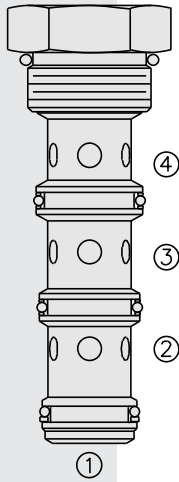
Flow Options (50/50 Ratio)
44 16 gpm (60 lpm)
55 20 gpm (74 lpm)
66 24 gpm (90 lpm)

Consult factory for other flow options.

Seals
N Buna N (Std.)
V Fluorocarbon

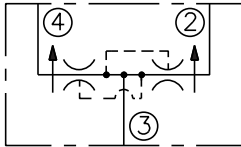
NOTE: Standard 12-size 4-way bodies should not be used for flow dividers. See special flow divider bodies, page 8.012.1

FD16-40 Flow Divider/Combiner

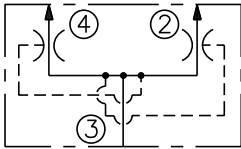


SYMBOLS

USASI:



ISO:



DESCRIPTION

A screw-in, cartridge-style, spool-type flow divider/combiner. Standard flow dividing/combining ratios are maintained regardless of system operating pressure conditions.

OPERATION

In the dividing mode, the **FD16-40** will divert input flow from 3 to 2 and 4, based on the ratio specified, regardless of operating pressure.

The cartridge will combine input flows from both 2 and 4 to 3.

Should circuit operation result in a blockage of either 2 or 4, the opposite port may also close under certain conditions. Should this potential exist, consider model FDC16, page 5.706.1.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: See Performance Chart

Flow Options:

Input Flow: 98.4 lpm (26 gpm); Ratio: 50:50; Model Code: 44

Input Flow: 151.4 lpm (40 gpm); Ratio: 50:50; Model Code: 66

Other ratio options available; consult factory.

Standard Compensator Bias Spring: 2.07 bar (30 psid)

Flow Accuracy: 10% from 33-100% of rated flow

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1.

Note that standard 16 size 4-way bodies should not be used with this product.

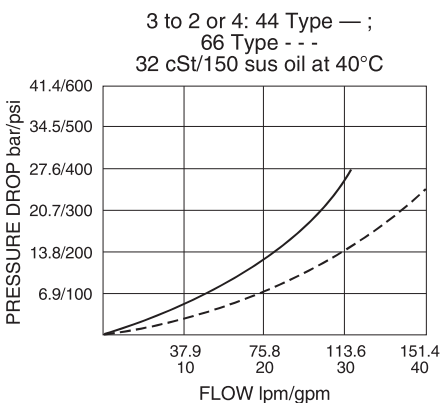
See page 8.016.1 for special flow divider bodies.

Cavity: VC16-4; See page 9.116.2

Cavity Tool: CT16-4XX; See page 8.600.1

Seal Kit: SK16-4X-MMM; See page 8.650.1

PERFORMANCE (Cartridge Only)



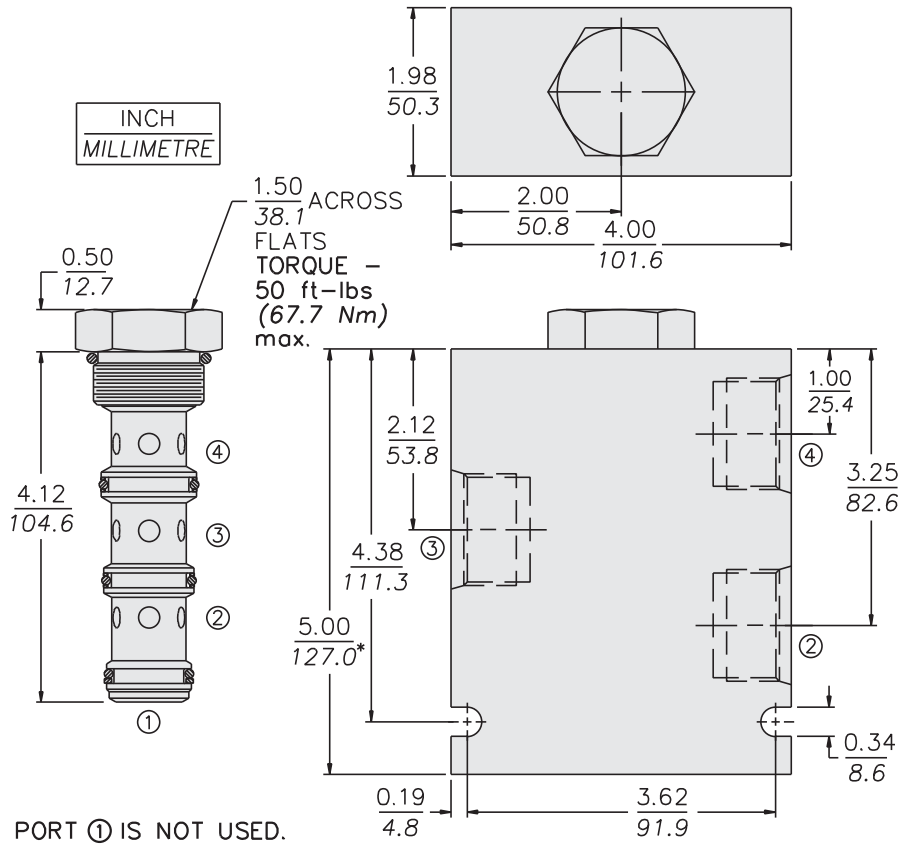
Note: This model will be superseded by the new FDxx-45 models, which incorporate the features of the FDxx-40, FDxx-41 and FDxx-42 series valves in one product. OEM's are encouraged to consider the newer, more robust and versatile FDxx-45 models for new applications:

FD50-45; see page 5.632.1

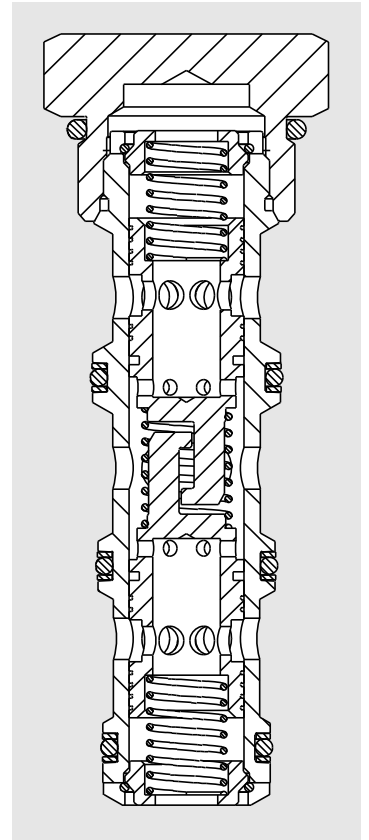
FD52-45; see page 5.634.1

FD56-45; see page 5.636.1

DIMENSIONS



* BSP BODY - 134.9



MATERIALS

Cartridge: Weight: 0.36 kg. (0.80 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Special Ported Body: Weight: 1.5 kg. (3.3 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.016.1.

TO ORDER

FD16-40 - - -

Special Ported Bodies

Cartridge Only	0
SAE 12 (All Ports)	12T
SAE 12 (Ports 2 & 4); SAE 16 (Port 3)	16D
SAE 16 (All Ports)	16T
3/4 in. BSP* (All Ports)	6B
3/4 in. BSP* (Ports 2 & 4); 1 in. BSP* (Port 3)	7B
1 in. BSP* (All Ports)	8B

*BSP Body; U.K. Mfr. Only

Dividing/Combining Ratio

44	50:50 rated @ 98.4 lpm (26 gpm) input
66	50:50 rated @ 151.4 lpm (40 gpm) input

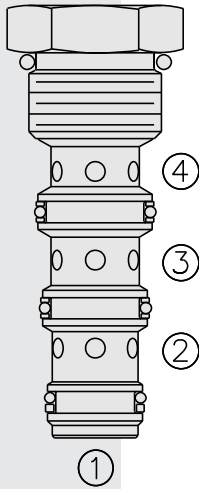
NOTE: Additional ratios and/or input flow sizings available for OEM applications. Consult factory.

Seals

N	Buna N (Std.)
V	Fluorocarbon

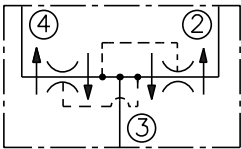
NOTE: Standard 16-size 4-way bodies should not be used for flow dividers. See special flow divider bodies, page 8.016.1.

FD10-41 Flow Divider/Combiner, Cylinder Synch.

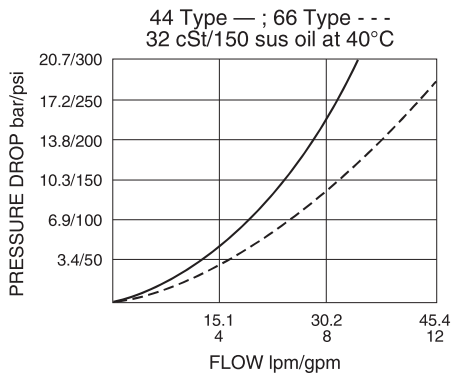


SYMBOLS

USASI/ISO:



PERFORMANCE (Cartridge Only)



DESCRIPTION

A screw-in, cartridge-style, spool-type flow divider/combiner. Optional flow dividing/combining ratios are maintained regardless of system operating pressure conditions.

OPERATION

In the dividing mode, the **FD10-41** will divert input flow from port 3 to ports 2 and 4, based on the ratio specified, regardless of operating pressure.

The cartridge will combine input flows from ports 2 and 4.

The FD10-41 is designed to allow synchronizing flow to the opposite cylinder once a cylinder has “bottomed” in the combining mode.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: 45.4 lpm (12 gpm) input max.

Flow Options:

Input Flow: 7.6 lpm (2 gpm); Ratio: 50:50; Model Code: 11

Input Flow: 15.1 lpm (4 gpm); Ratio: 50:50; Model Code: 22

Input Flow: 22.7 lpm (6 gpm); Ratio: 50:50; Model Code: 33

Input Flow: 30.3 lpm (8 gpm); Ratio: 50:50; Model Code: 44

Input Flow: 37.9 lpm (10 gpm); Ratio: 50:50; Model Code: 55

Input Flow: 45.4 lpm (12 gpm); Ratio: 50:50; Model Code: 66

Other ratio options available; consult factory.

Standard Compensator Bias Spring: 2.07 bar (30 psid)

Flow Accuracy: 10% from 30–100% of rated flow

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1.

Note: Standard 10 size 4-way bodies should not be used with this product. See page 8.010.1 for special flow divider bodies.

Cavity: VC10-4 (Variation “A”); See page 9.110.1

Cavity Tool: CT10-4XX; See page 8.600.1

Seal Kit: SK10-4X-MMM; See page 8.650.1

Note: This model will be superseded by the new FDxx-45 models, which incorporate the features of the FDxx-40, FDxx-41 and FDxx-42 series valves in one product. OEM’s are encouraged to consider the newer, more robust and versatile FDxx-45 models for new applications:

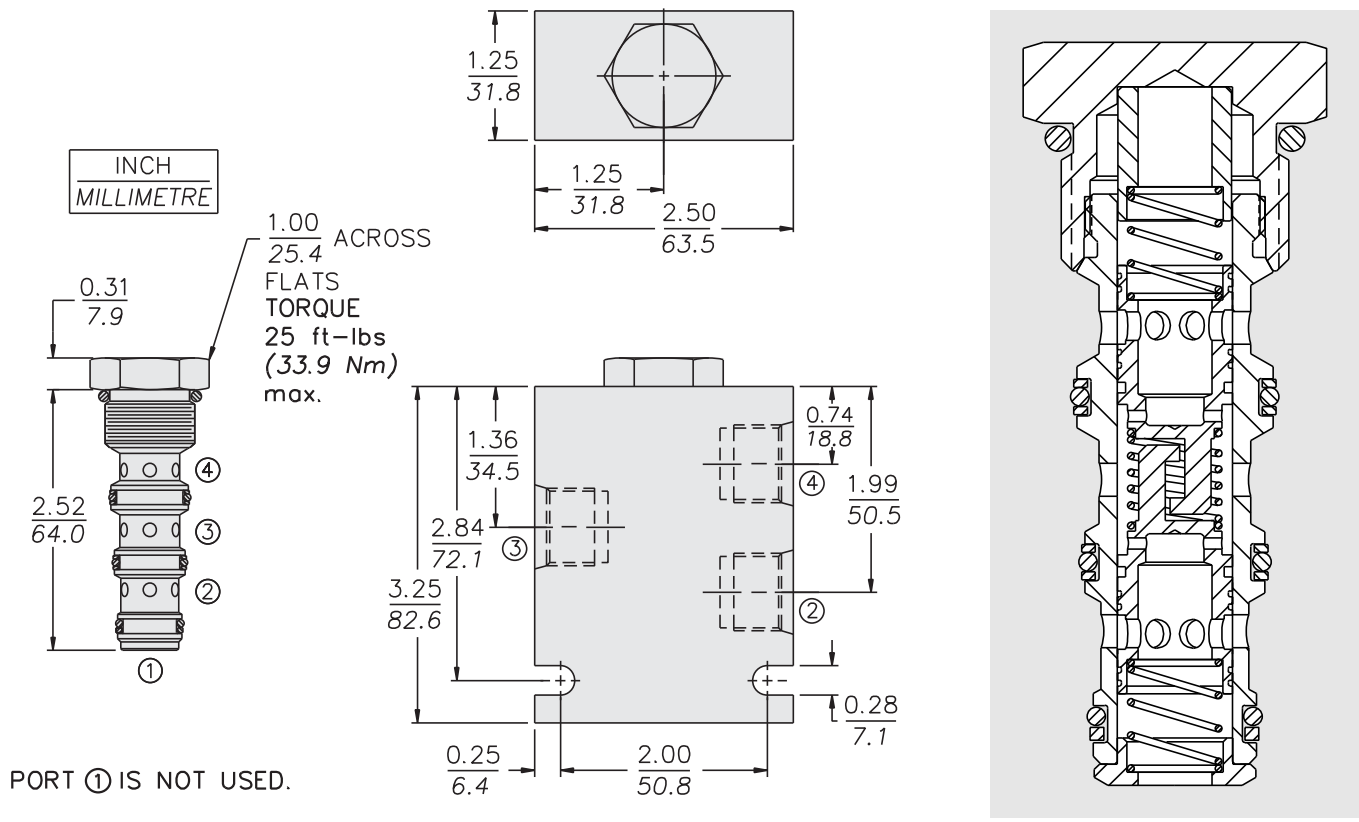
FD50-45; see page 5.632.1

FD52-45; see page 5.634.1

FD56-45; see page 5.636.1

FD10-41

DIMENSIONS



PORT ① IS NOT USED.

MATERIALS

Cartridge: Weight: 0.10 kg. (0.23 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.

Special Ported Body: Weight: 0.34 kg. (0.75 lbs.)
 Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ; See page 8.010.1.

TO ORDER

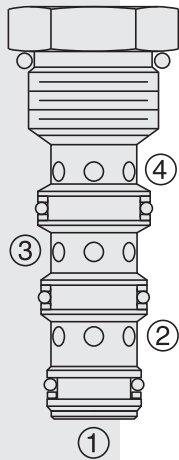
FD10-41 -			
Special Ported Bodies			Dividing/Combining Ratio
Cartridge Only	0		11 50:50 rated @ 7.6 lpm (2 gpm) input
SAE 6 (All Ports)	6T		22 50:50 rated @ 15.1 lpm (4 gpm) input
SAE 8 (Port 3); SAE 6 (Ports 2 & 4)	8D		33 50:50 rated @ 22.7 lpm (6 gpm) input
1/4 in. BSP* (All Ports)	2B		44 50:50 rated @ 30.3 lpm (8 gpm) input
3/8 in. BSP* (All Ports)	3B		55 50:50 rated @ 37.9 lpm (10 gpm) input
1/2 in. BSP* (Port 3); 3/8 in. BSP* (Ports 2 & 4)	5B		66 50:50 rated @ 45.4 lpm (12 gpm) input

NOTE: Standard 10-size 4-way bodies should not be used for flow dividers. See special flow divider bodies, page 8.010.1

Seals
N Buna N (Std.)
V Fluorocarbon

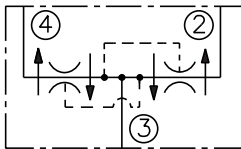
NOTE: Additional ratios and/or input flow sizings available for OEM applications. Consult factory.

FD12-41 Flow Divider/Combiner, Cylinder Synch.

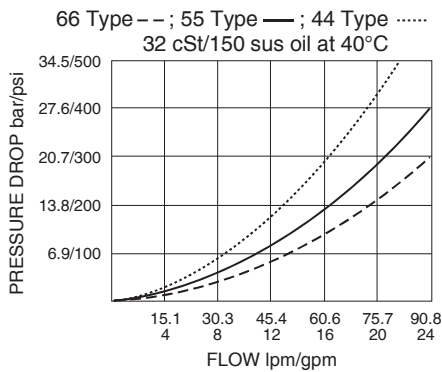


SYMBOLS

USASI/ISO:



PERFORMANCE (Cartridge Only)



DESCRIPTION

A screw-in, cartridge-style, spool-type flow divider/combiner. Optional flow dividing/combining ratios are maintained regardless of system operating pressure conditions.

OPERATION

In the dividing mode, the **FD12-41** will divert input flow from port 3 to ports 2 and 4, based on the ratio specified, regardless of operating pressure.

The cartridge will combine input flows from ports 2 and 4.

The **FD12-41** is designed to allow flow to the opposite cylinder once the first cylinder has "bottomed" in the combining mode.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: 90.8 lpm (24 gpm) input max.

Flow Options:

Input Flow: 60.6 lpm (16 gpm); Ratio: 50:50; Model Code: 44

Input Flow: 75.7 lpm (20 gpm); Ratio: 50:50; Model Code: 55

Input Flow: 90.8 lpm (24 gpm); Ratio: 50:50; Model Code: 66

Standard Compensator Bias Spring: 2.07 bar (30 psid)

Flow Accuracy: 10% from 30–100% of rated flow

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Note: Standard 12 size 4-way bodies should not be used with this product. See page 8.012.3 for special flow divider bodies.

Cavity: VC12-4; See page 9.112.1 (Cavity Variation "A")

Cavity Tool: CT12-4XX; See page 8.600.1

Seal Kit: SK12-4X-MMM; See page 8.650.1

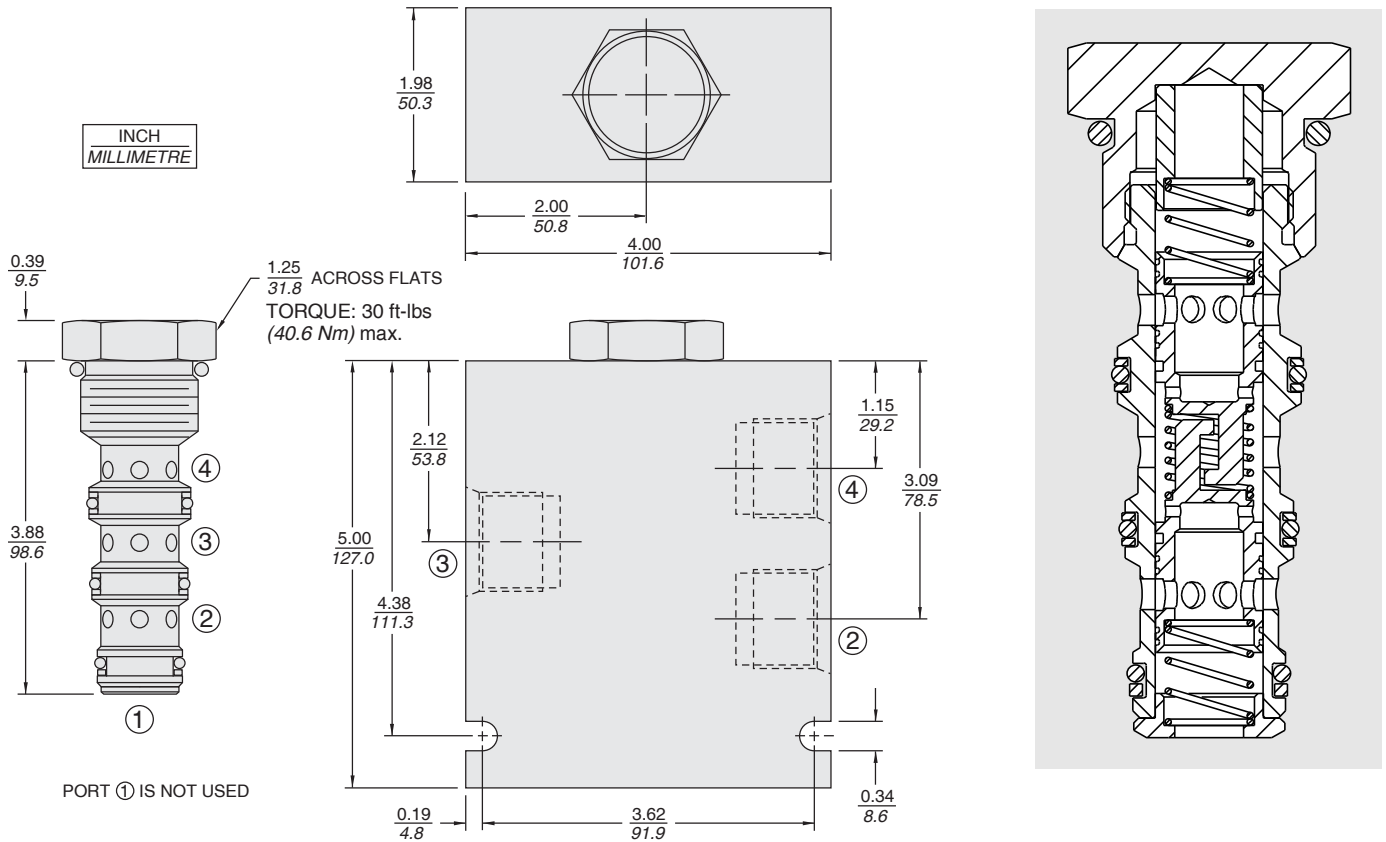
Note: This model will be superseded by the new FDxx-45 models, which incorporate the features of the FDxx-40, FDxx-41 and FDxx-42 series valves in one product. OEM's are encouraged to consider the newer, more robust and versatile FDxx-45 models for new applications:

FD50-45; see page 5.632.1

FD52-45; see page 5.634.1

FD56-45; see page 5.636.1

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.28 kg. (0.61 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.

Standard Ported Body: Weight:
 1.50 kg. (3.30 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.012.1

TO ORDER

FD12-41 -

Porting
 Cartridge Only 0
 SAE 10 10T
 SAE 12 12T
 See page 8.012.3 8D
 See page 8.012.3 10D

Flow Options (50/50 Ratio)

44 16 gpm (60 lpm)
 55 20 gpm (74 lpm)
 66 24 gpm (90 lpm)

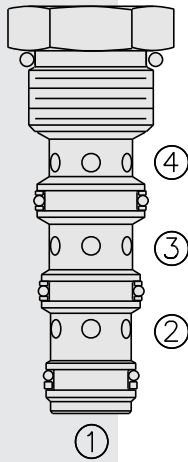
Consult factory for other flow options.

NOTE: Standard 12-size 4-way bodies should not be used for flow dividers. See special flow divider bodies, page 8.012.1

Seals

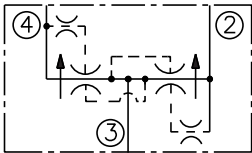
N Buna N (Std.)
 V Fluorocarbon

FD10-42 Flow Divider/Combiner w/ Anti-Stall Feature

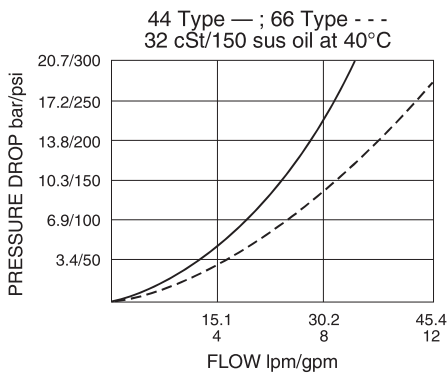


SYMBOLS

USASI/ISO:



PERFORMANCE (Cartridge Only)



DESCRIPTION

A screw-in, cartridge-style, spool-type flow divider/combiner. Optional flow dividing/combining ratios are maintained regardless of system operating pressure conditions.

OPERATION

In the dividing mode, the **FD10-42** will divert input flow from port 3 to ports 2 and 4, based on the ratio specified, regardless of operating pressure.

The cartridge will combine input flows from ports 2 and 4.

The FD10-42 is designed to maintain a flow path to both combining ports 2 and 4 when one port is “free-wheeling.” This feature keeps hydraulic (parallel) motor drive circuits from stalling in the combining mode only.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: 60.6 lpm (16 gpm) input max.

Flow Options:

- Input Flow: 7.6 lpm (2 gpm); Ratio: 50:50; Model Code: 11
 - Input Flow: 15.1 lpm (4 gpm); Ratio: 50:50; Model Code: 22
 - Input Flow: 22.7 lpm (6 gpm); Ratio: 50:50; Model Code: 33
 - Input Flow: 30.3 lpm (8 gpm); Ratio: 50:50; Model Code: 44
 - Input Flow: 37.9 lpm (10 gpm); Ratio: 50:50; Model Code: 55
 - Input Flow: 45.4 lpm (12 gpm); Ratio: 50:50; Model Code: 66
 - Input Flow: 60.6 lpm (16 gpm); Ratio: 50:50; Model Code: 88
- Other ratio options available; consult factory.

Standard Compensator Bias Spring: 2.07 bar (30 psid)

Flow Accuracy: 10% from 30–100% of rated flow

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1.

Note: Standard 10 size 4-way bodies should not be used with this product. See page 8.010.1 for special flow divider bodies.

Cavity: VC10-4 (Variation “A”); See page 9.110.1

Cavity Tool: CT10-4XX; See page 8.600.1

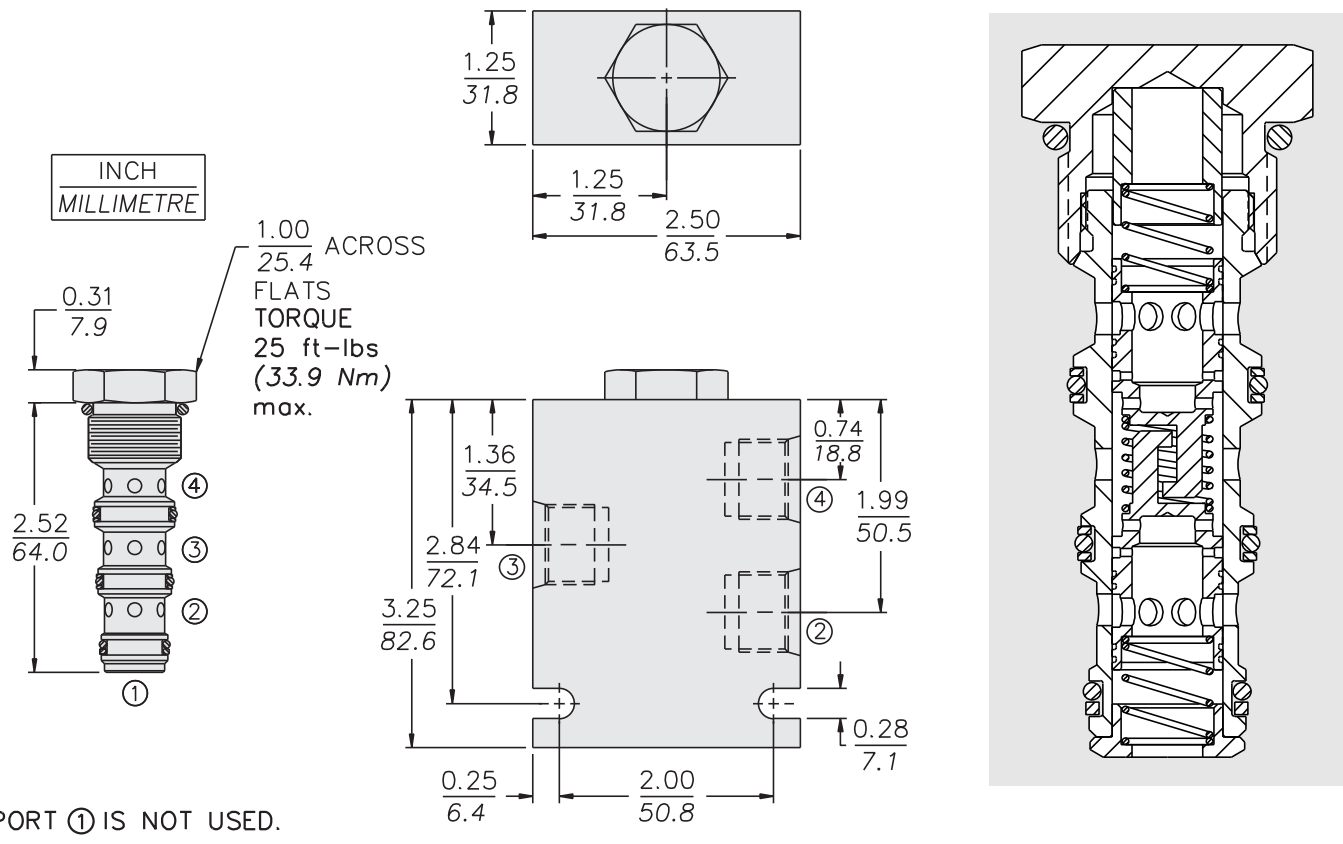
Seal Kit: SK10-4X-MMM; See page 8.650.1

Note: This model will be superseded by the new FDxx-45 models, which incorporate the features of the FDxx-40, FDxx-41 and FDxx-42 series valves in one product. OEM’s are encouraged to consider the newer, more robust and versatile FDxx-45 models for new applications:

- FD50-45; see page 5.632.1
- FD52-45; see page 5.634.1
- FD56-45; see page 5.636.1

FD10-42

DIMENSIONS



PORT ① IS NOT USED.

MATERIALS

Cartridge: Weight: 0.10 kg. (0.23 lbs.)
 Steel with hardened work surfaces.
 Zinc-plated exposed surfaces.
 Buna N O-rings and polyester elastomer back-ups standard.

Special Ported Body: Weight: 0.34 kg. (0.75 lbs.)
 Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ; See page 8.010.1

TO ORDER

FD10-42 - - -

- Special Ported Bodies**
- Cartridge Only **0**
 - SAE 6 (All Ports) **6T**
 - SAE 8 (Port 3); SAE 6 (Ports 2 & 4) **8D**
 - 1/4 in. BSP* (All Ports) **2B**
 - 3/8 in. BSP* (All Ports) **3B**
 - 1/2 in. BSP* (Port 3); 3/8 in. BSP* (Ports 2 & 4) **5B**
- *BSP Body; U.K. Mfr. Only

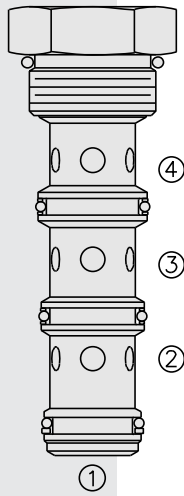
- Dividing/Combining Ratio**
- 11** 50:50 rated @ 7.6 lpm (2 gpm) input
 - 22** 50:50 rated @ 15.1 lpm (4 gpm) input
 - 33** 50:50 rated @ 22.7 lpm (6 gpm) input
 - 44** 50:50 rated @ 30.3 lpm (8 gpm) input
 - 55** 50:50 rated @ 37.9 lpm (10 gpm) input
 - 66** 50:50 rated @ 45.4 lpm (12 gpm) input
 - 88** 50:50 rated @ 60.6 lpm (16 gpm) input

NOTE: Standard 10-size 4-way bodies should not be used for flow dividers. See special flow divider bodies, page 8.010.1.

NOTE: Additional ratios and/or input flow sizings available for OEM applications. Consult factory.

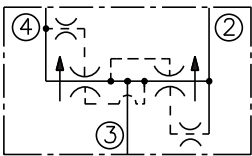
- Seals**
- N** Buna N (Std.)
 - V** Fluorocarbon

FD16-42 Flow Divider/Combiner, w/Anti-Stall Feature

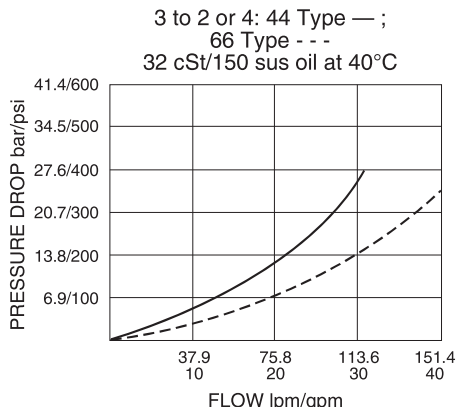


SYMBOLS

USASI/ISO:



PERFORMANCE (Cartridge Only)



DESCRIPTION

A screw-in, cartridge-style, spool-type flow divider/combiner. Standard flow dividing/combining ratios are maintained regardless of system operating pressure conditions.

OPERATION

In the dividing mode, the **FD16-42** will divert input flow from port 3 to ports 2 and 4, based on the ratio specified, regardless of operating pressure.

The cartridge will combine input flows from both 2 and 4.

The FD16-42 is designed to maintain a flow path to both combining ports 2 and 4 when one port is "free-wheeling." This feature keeps hydraulic (parallel) motor drive circuits from stalling in the combining mode only.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: See Performance Chart

Flow Options:

Input Flow: 98.4 lpm (26 gpm); Ratio: 50:50; Model Code: 44

Input Flow: 151.4 lpm (40 gpm); Ratio: 50:50; Model Code: 66

Other ratio options available; consult factory.

Standard Compensator Bias Spring: 2.07 bar (30 psid)

Flow Accuracy: 10% from 33-100% of rated flow

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Note that standard 16 size 4-way bodies should not be used with this product.

See page 8.016.1 for special flow divider bodies.

Cavity: VC16-4; See page 9.116.2

Cavity Tool: CT16-4XX; See page 8.600.1

Seal Kit: SK16-4X-MMM; See page 8.650.1

Note: This model will be superseded by the new FDxx-45 models, which incorporate the features of the FDxx-40, FDxx-41 and FDxx-42 series valves in one product. OEM's are encouraged to consider the newer, more robust and versatile FDxx-45 models for new applications:

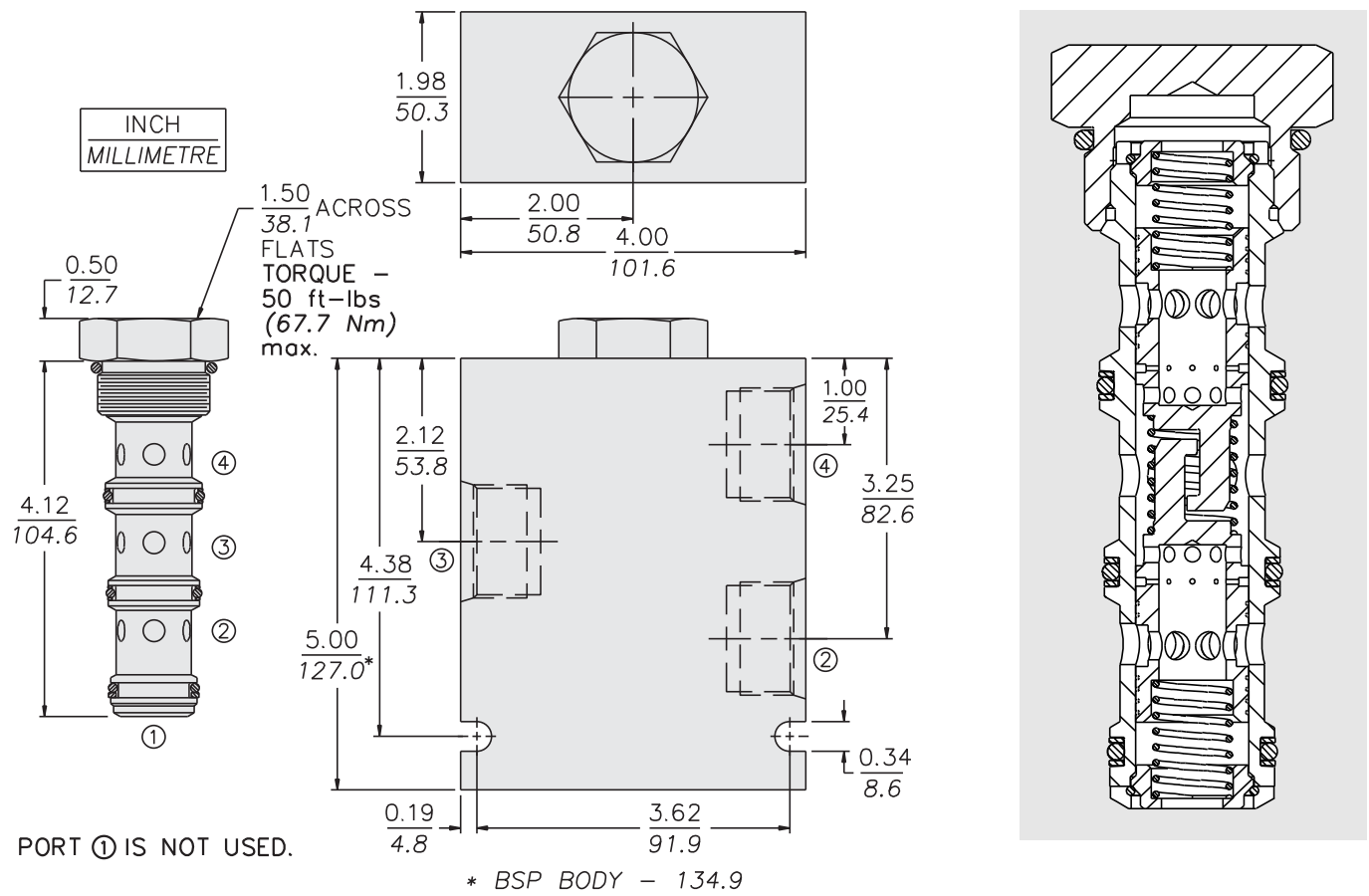
FD50-45; see page 5.632.1

FD52-45; see page 5.634.1

FD56-45; see page 5.636.1

FD16-42

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.36 kg. (0.80 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester
elastomer back-ups standard.

Special Ported Body: Weight: 1.5 kg.
(3.3 lbs.) Anodized high-strength
6061 T6 aluminum alloy, rated to
207 bar (3000 psi). Ductile iron
bodies available; dimensions
may differ. See page 8.016.1

TO ORDER

FD16-42 -

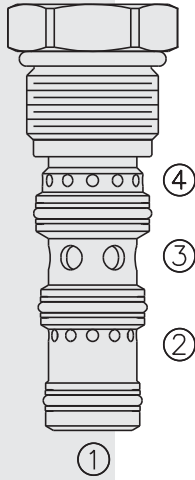
- Special Ported Bodies**
- Cartridge Only **0**
 - SAE 12 (All Ports) **12T**
 - SAE 12 (Ports 2 & 4);
SAE 16 (Port 3) **16D**
 - SAE 16 (All Ports) **16T**
 - 3/4 in. BSP* (All Ports) **6B**
 - 3/4 in. BSP* (Ports 2 & 4);
1 in. BSP* (Port 3) **7B**
 - 1 in. BSP* (All Ports) **8B**
- *BSP Body; U.K. Mfr. Only

- Dividing/Combining Ratio**
- 44** 50:50 rated @ 98.4 lpm
(26 gpm) input
 - 66** 50:50 rated @ 151.4 lpm
(40 gpm) input

- Seals**
- N** Buna N (Std.)
 - V** Fluorocarbon

NOTE: Standard 16-size 4-way bodies should not be used for flow dividers. See special flow divider bodies, page 8.016.1.

FD50-44 Flow Divider/Combiner . . . Heavy Duty,



DESCRIPTION

High performance, high pressure, multifunction, screw-in, cartridge-style, spool-type flow divider/combiner.

OPERATION

In the dividing mode, the **FD50-44** will divert input flow from port 3 to ports 2 and 4, based on the ratio specified. This valve provides a highly accurate, pressure compensated division of inlet flow or combination of return flow regardless of system operating pressure. When the flow direction is reversed, the valve will combine flows from ports 2 and 4 to port 3.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Wide operating flow range.
- Accurate division or combination of flow.
- Industry common cavity.

RATINGS

Operating Pressure: 345 bar (5000 psi)

Pressure Drop: 24 bar (350 psi) at maximum inlet flow

Flow Range Options:

Model Code **11**: 50:50 rated @ 2.5–9.5 lpm (0.7–2.5 gpm) input

Model Code **22**: 50:50 rated @ 4–19 lpm (1.0–5.0 gpm) input

Model Code **44**: 50:50 rated @ 7.5–38 lpm (2.0–10.0 gpm) input

Flow Accuracy: 5% of inlet flow at maximum flow rate;
10% of inlet flow at minimum flow rate

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Note: Standard 10 size 4-way bodies should not be used with this product. See page 8.010.1 for special flow divider bodies.

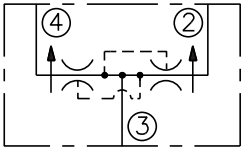
Cavity: VC10-4 (Variation "A"); See page 9.110.1

Cavity Tool: CT10-4X; See page 8.600.1

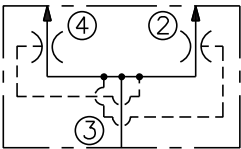
Seal Kit: SK10-4X-MMM; See page 8.650.1

SYMBOLS

USASI:

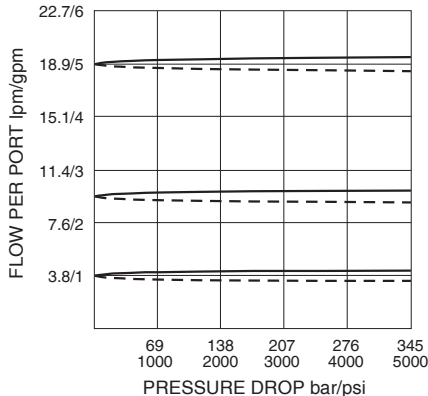


ISO:

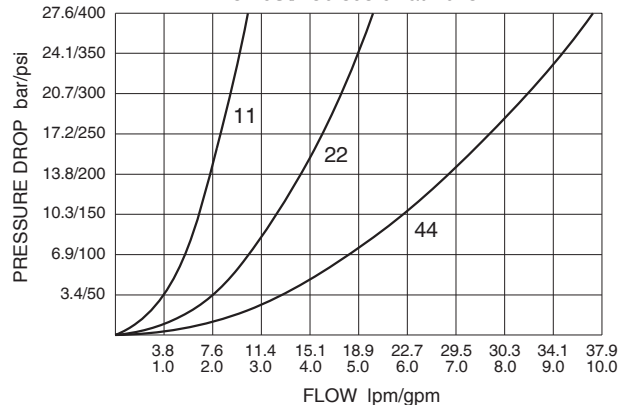


PERFORMANCE (Cartridge Only)

Pressure Drop vs. Inlet Flow
4 to 2, Model Code 44, Dividing Mode
— FL4; - - - FL2
32 cSt/150 sus oil at 40°C



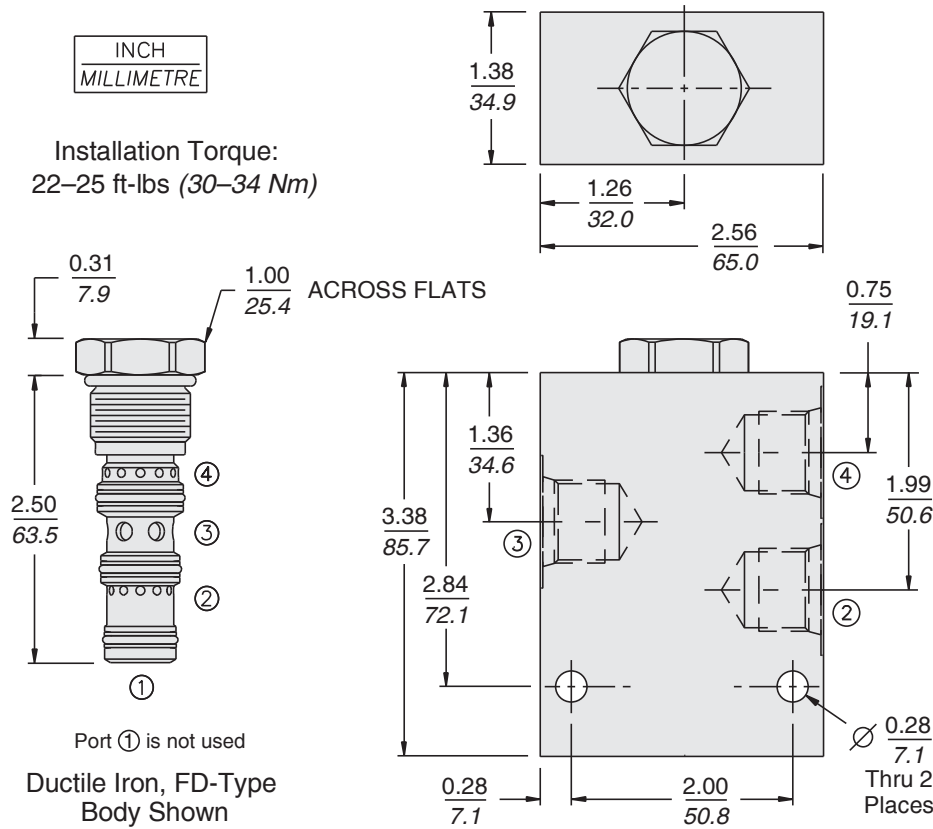
Inlet Flow vs Pressure Drop
Dividing Mode; Inlet at 3
32 cSt/150 sus oil at 40°C



Multifunction

FD50-44

DIMENSIONS



MATERIALS

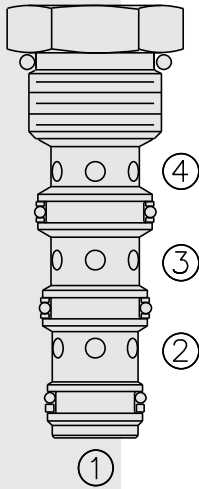
Cartridge: Weight: 0.11 kg. (0.25 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Special Ported Body: Ductile iron, required for operation over 207 bar (3000 psi). Aluminum bodies are available for lower pressure operation. See page 8.010.1

TO ORDER

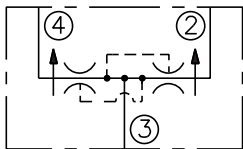
FD50-44 -		-	-	-
Special FD-Type Ductile Iron Ported Bodies				
Cartridge Only	0			
SAE 6 (all ports)	6TD			
SAE 8 (all ports)	8TD			
SAE 8 (port 3); SAE 6 (ports 2 & 3)	8DD			
1/4 in. BSP* (all ports)	2BD			
3/8 in. BSP* (all ports)	3BD			
*BSP Body; U.K. Mfr. Only				
NOTE: Standard 10-size 4-way bodies should not be used for flow dividers. See Special, FD-type, flow divider bodies, page 8.010.1.				
				Dividing/Combining Ratio
			11	50:50 rated @ 2.5–9.5 lpm (0.7–2.5 gpm) input
			22	50:50 rated @ 4–19 lpm (1.0–5.0 gpm) input
			44	50:50 rated @ 7.5–38 lpm (2.0–10.0 gpm) input
				Seals
			N	Buna N (Std.)
			V	Fluorocarbon
			P	Polyurethane (required for operation over 241 bar/3500 psi)

FD50-45 Flow Divider/Combiner . . . Heavy Duty,

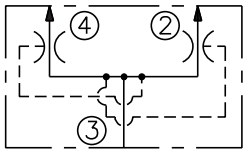


SYMBOLS

USASI:



ISO:



DESCRIPTION

A heavy duty, multifunction, screw-in, cartridge-style, spool-type flow divider/combiner.

OPERATION

In the dividing mode, the **FD50-45** will divert input flow from port 3 to ports 2 and 4, based on the ratio specified, regardless of operating pressure. When the flow direction is reversed the valve will combine flows from 2 and 4 to port 3. Synchronizing flow is provided in both the dividing and combining modes at “bottomed” conditions in cylinder applications and at “stalled” conditions in motor applications.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Wide operating flow range.
- Synchronizing in dividing and combining modes.
- Floating cage — High installation torque
- Industry common cavity.

RATINGS

Operating Pressure: 345 bar (5000 psi)

Flow Options:

- Input Flow: 15.1 lpm (4 gpm); Ratio: 50:50; Model Code: 22
- Input Flow: 22.7 lpm (6 gpm); Ratio: 50:50; Model Code: 33
- Input Flow: 34.1 lpm (9 gpm); Ratio: 50:50; Model Code: 44
- Input Flow: 45.4 lpm (12 gpm); Ratio: 50:50; Model Code: 66

Flow Accuracy: 10% from 25–100% of maximum rated flow

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

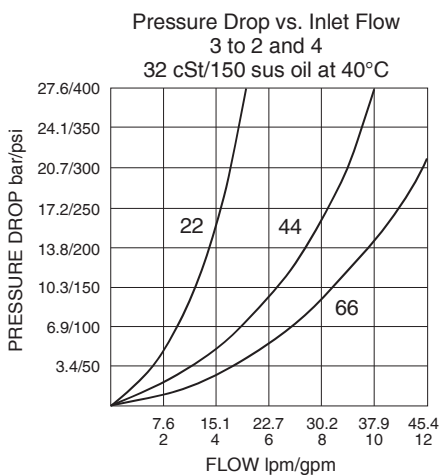
Note: Standard 10 size 4-way bodies should not be used with this product. See page 8.010.1 for special flow divider bodies.

Cavity: VC10-4; See page 9.110.1

Cavity Tool: CT10-4X; See page 8.600.1

Seal Kit: SK10-4X-MMM; See page 8.650.1

PERFORMANCE (Cartridge Only)

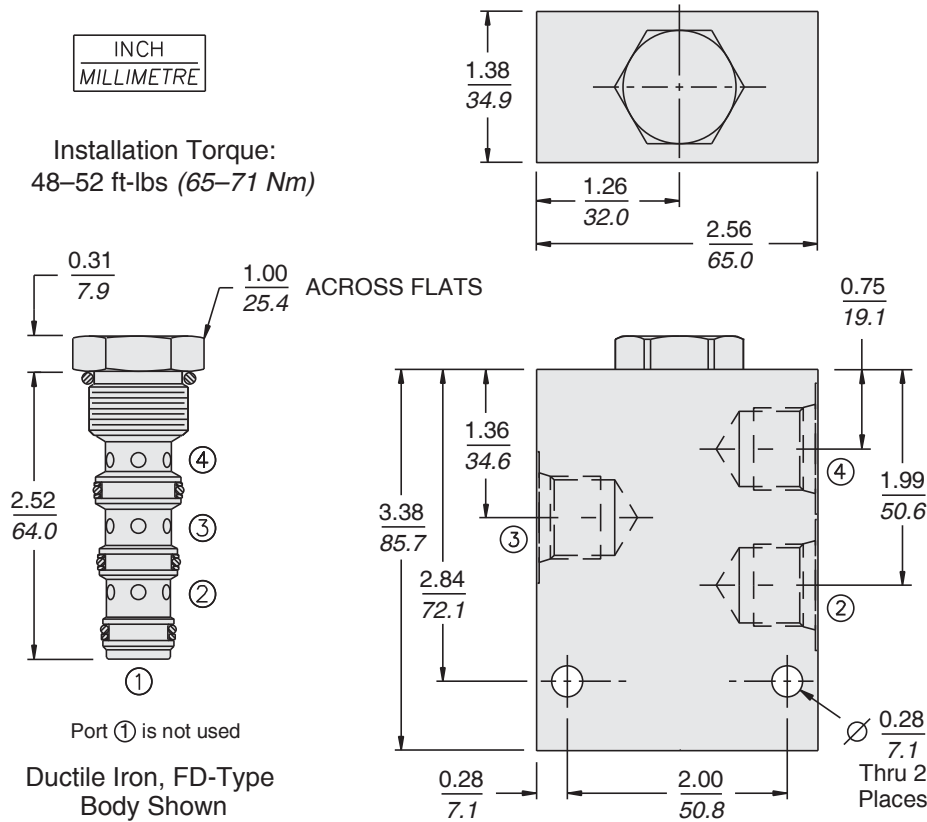


Note: This new FD50-45 flow divider incorporates the features of the older FDxx-40, FDxx-41 and FDxx-42 flow dividers in one product. It is designed to supersede the older models. OEM's are encouraged to consider this newer, more robust and versatile model for new applications.

Multifunction

FD50-45

DIMENSIONS



MATERIALS

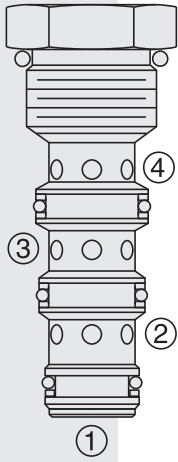
Cartridge: Weight: 0.10 kg. (0.23 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Special Ported Body: Ductile iron, required for operation over 207 bar (3000 psi). Aluminum bodies are available for lower pressure operation. See page 8.010.1

TO ORDER

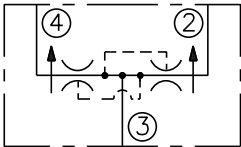
FD50-45 -		
Special FD-Type Ductile Iron Ported Bodies		Dividing/Combining Ratio
Cartridge Only	0	22 50:50 rated @ 15.1 lpm (4 gpm) input
SAE 6 (all ports)	6TD	33 50:50 rated @ 22.7 lpm (6 gpm) input
SAE 8 (all ports)	8TD	44 50:50 rated @ 34.1 lpm (9 gpm) input
SAE 8 (port 3); SAE 6 (ports 2 & 4)	8DD	66 50:50 rated @ 45.4 lpm (12 gpm) input
1/4 in. BSP* (all ports)	2BD	
3/8 in. BSP* (all ports)	3BD	
*BSP Body; U.K. Mfr. Only		
NOTE: Standard 10-size 4-way bodies should not be used for flow dividers. See Special, FD-type, flow divider bodies, page 8.010.1.		NOTE: Additional ratios and/or input flow sizings available for OEM applications. Consult factory.
		Seals
		N Buna N (Std.)
		V Fluorocarbon
		P Polyurethane*
		* Required for operation over 240 bar (3500 psi); FD50 option.

FD52-45 Flow Divider/Combiner . . . Heavy Duty,

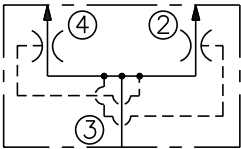


SYMBOLS

USASI:



ISO:



DESCRIPTION

A heavy duty, multifunction, screw-in, cartridge-style, spool-type flow divider/combiner.

OPERATION

In the dividing mode, the **FD52-45** will divert input flow from port 3 to ports 2 and 4, based on the ratio specified, regardless of operating pressure. When the flow direction is reversed, the valve will combine flows from 2 and 4 to port 3. Synchronizing flow is provided in both the dividing and combining modes at “bottomed” conditions in cylinder applications and at “stalled” conditions in motor applications.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Wide operating flow range.
- Synchronizing in dividing and combining modes.
- Floating cage — High installation torque.
- Industry-common cavity.

RATINGS

Operating Pressure: 345 bar (5000 psi)

Flow Options:

- Input Flow: 60.6 lpm (16 gpm); Ratio: 50:50; Model Code: 44
- Input Flow: 90.8 lpm (24 gpm); Ratio: 50:50; Model Code: 66

Flow Accuracy: 10% from 25–100% of rated flow

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

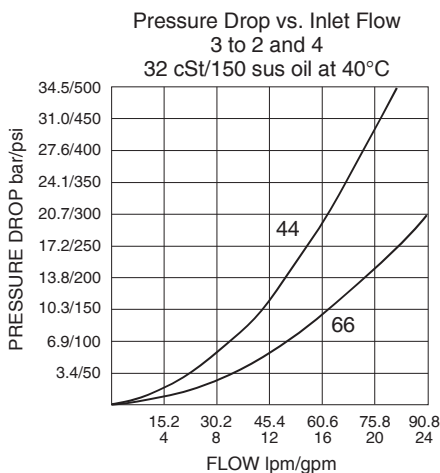
Note: Standard 12 size 4-way bodies should not be used with this product. See page 8.012.1 for special flow divider bodies.

Cavity: VC12-4; See page 9.112.1 (Cavity Variation "A")

Cavity Tool: CT12-4X; See page 8.600.1

Seal Kit: SK12-4X-MMM; See page 8.650.1

PERFORMANCE (Cartridge Only)

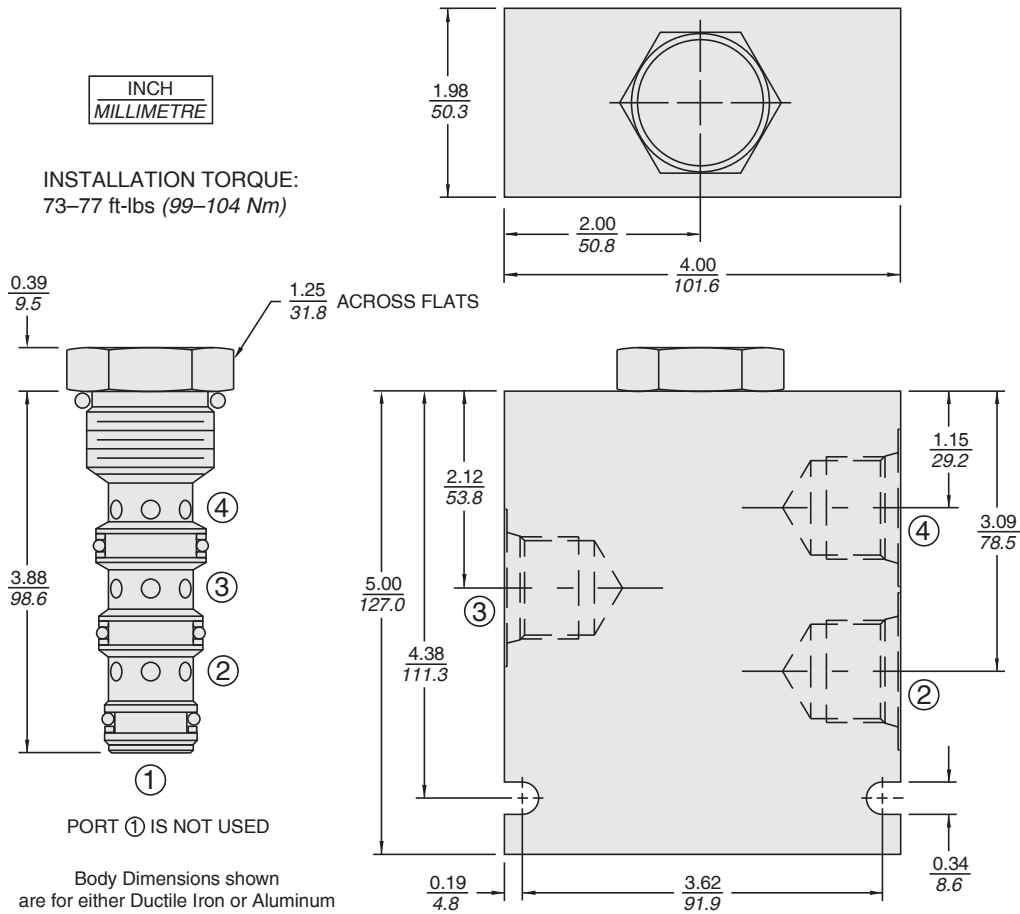


Note: This new FD52-45 flow divider incorporates the features of the older FDxx-40, FDxx-41 and FDxx-42 flow dividers in one product. It is designed to supersede the older models. OEM's are encouraged to consider this newer, more robust and versatile model for new applications.

Multifunction

FD52-45

DIMENSIONS



MATERIALS

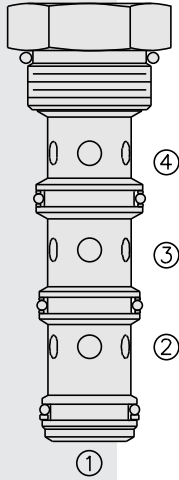
Cartridge: Weight: 0.28 kg. (0.61 lbs.)
Steel with hardened work surfaces;
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Special Ported Body: Ductile iron body required for operation over 207 bar (3000 psi). Aluminum bodies are available for lower pressure operation. See page 8.012.1

TO ORDER

FD52-45 -		
Special FD-Type		
Ductile Iron Ported Bodies		
Cartridge Only	0	
SAE 8	8TD	
SAE 10	10TD	
SAE 12	12TD	
1/2 in. BSP*	4BD	
3/4 in. BSP*	6BD	
*BSP Body; U.K. Mfr. Only		
NOTE: Standard 12-size 4-way bodies should not be used for flow dividers. See Special, FD-type, flow divider bodies, page 8.012.1.		
		Flow Options (50/50 Ratio)
		44 16 gpm (60 lpm)
		66 24 gpm (90 lpm)
		Consult factory for other flow options.
		Seals
		N Buna N (Std.)
		V Fluorocarbon
		P Polyurethane (Required for operation over 240 bar/3500 psi)

FD56-45 Flow Divider/Combiner . . . Heavy Duty,



DESCRIPTION

A heavy duty, multifunction, screw-in, cartridge-style, spool-type flow divider/combiner.

OPERATION

In the dividing mode, the **FD56-45** will divert input flow from 3 to 2 and 4, based on the ratio specified, regardless of operating pressure. When the flow direction is reversed the valve will combine flows from 2 and 4 to port 3. Synchronizing flow is provided in both the dividing and combining modes at bottomed conditions in cylinder applications and at stalled conditions in motor applications.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.
- Wide operating flow range.
- Synchronizing in dividing and combining modes.
- Floating cage — High installation torque.
- Industry common cavity.

RATINGS

Operating Pressure: 345 bar (5000 psi)

Flow Options:

- Input Flow: 98.4 lpm (26 gpm); Ratio: 50:50; Model Code: 44
- Input Flow: 128.7 lpm (34 gpm); Ratio: 50:50; Model Code: 66
- Input Flow: 167 lpm (44 gpm); Ratio: 50:50; Model Code: 88
- Input Flow: 197 lpm (52 gpm); Ratio: 50:50; Model Code: 99

Flow Accuracy: 10% from 25-100% of maximum rated flow

Temperature: -40 to 120°C

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Note that standard 16 size 4-way bodies should not be used with this product. See page 8.016.1 for special flow divider bodies.

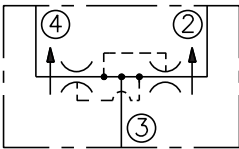
Cavity: VC16-4; See page 9.116.1

Cavity Tool: CT16-4X; See page 8.600.1

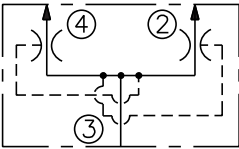
Seal Kit: SK16-4X-MMM; See page 8.650.1

SYMBOLS

USASI:

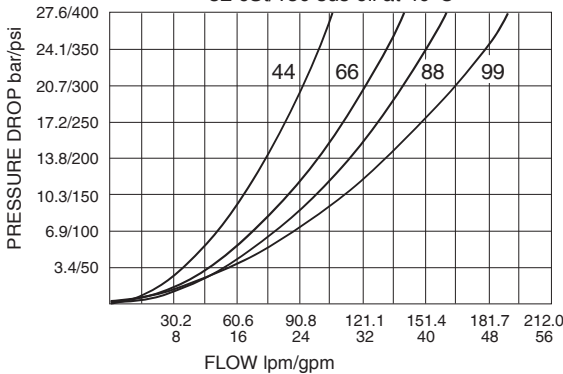


ISO:



PERFORMANCE (Cartridge Only)

Pressure Drop vs. Inlet Flow
3 to 2 and 4
32 cSt/150 sus oil at 40°C

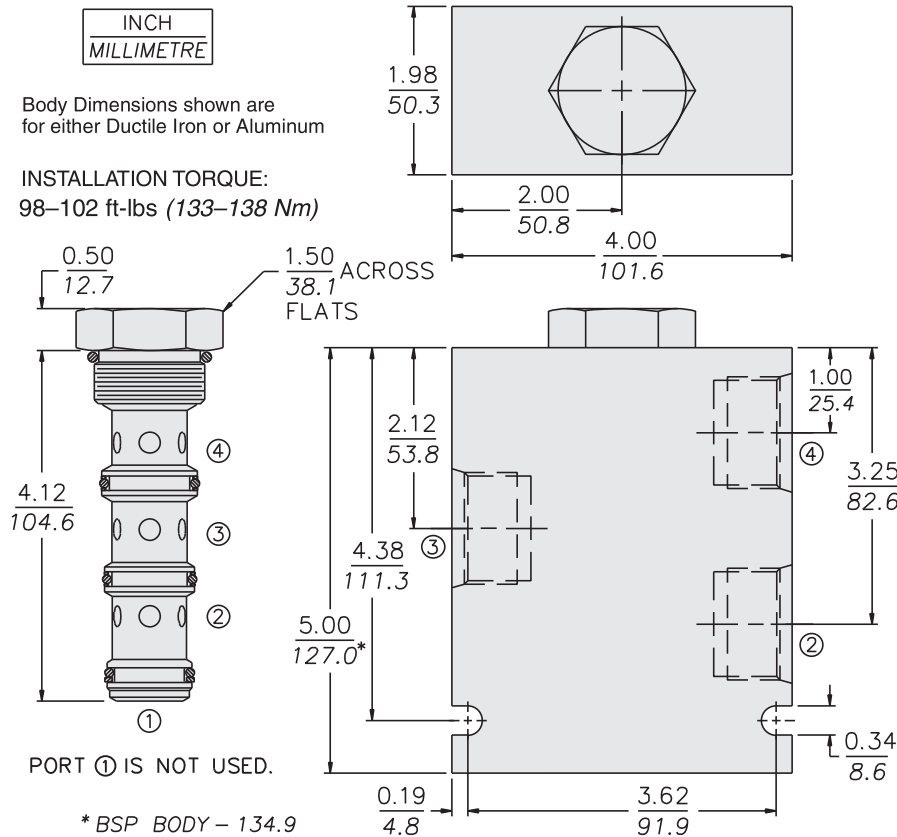


Note: This new FD56-45 flow divider incorporates the features of the older FDxx-40, FDxx-41 and FDxx-42 flow dividers in one product. It is designed to supersede the older models. OEM's are encouraged to consider this newer, more robust and versatile model for new applications.

Multifunction

FD56-45

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.36 kg. (0.80 lbs.)
Steel with hardened work surfaces.
Zinc-plated exposed surfaces.
Buna N O-rings and polyester elastomer back-ups standard.

Special Ported Body: Ductile iron body required for operation over 207 bar (3000 psi). Aluminum bodies are available for lower pressure operation. See page 8.016.1

TO ORDER

FD56-45 -

Special FD-Type Ductile Iron Ported Bodies

Cartridge Only	0
SAE 10 (all ports)	10TD
SAE 12 (all ports)	12TD
SAE 16 (all ports)	16TD
SAE 16 (port 3); SAE 12 (ports 2 & 4)	16DD
3/4 in. BSP* (all ports)	6BD
1 in. BSP* (all ports)	8BD
1 in. BSP* (port 3); 3/4 in. BSP* (ports 2 & 4)	8FD

*BSP Body; U.K. Mfr. Only

NOTE: Standard 16-size 4-way bodies should not be used for flow dividers. See Special, FD-type, flow divider bodies, page 8.016.1.

Dividing/Combining Ratio

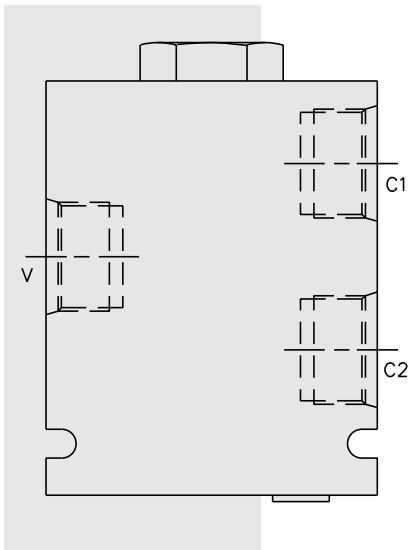
44	50:50 rated @ 98.4 lpm (26 gpm) input
66	50:50 rated @ 128.7 lpm (34 gpm) input
88	50:50 rated @ 167 lpm (44 gpm) input
99	50:50 rated @ 197 lpm (52 gpm) input

NOTE: Additional ratios and/or input flow sizings available for OEM applications. Consult factory.

Seals

N	Buna N (Std.)
V	Fluorocarbon
P	Polyurethane (Required for operation over 240 bar/3500 psi)

FDC16 Flow Divider/Combiner



DESCRIPTION

A specialized flow divider/combiner valve manifold, commonly applied in hydraulic motor drive applications with uneven pressure loads caused by steering or ground conditions. This valve/manifold assembly uses the FD16-40 cartridge valve; see page 5.604.1.

OPERATION

In the dividing mode, the **FDC16** will divert input flow from valve port 2 (V) to ports 2 (C2) and 2 (C1) based on the ratio specified, while pressure at 2 and 2 remains relatively equal. If a pressure differential develops, fluid will be transferred to the lower pressure port from the higher pressure port via an internal body orifice: 2 to 2 or 2 to 2.

In the combining mode, the internal orifice will serve to equalize load pressures, preventing combiner spool lock-up.

FEATURES

- Hardened parts for long life.
- Quiet, modulated response.

RATINGS

Operating Pressure: 207 bar (3000 psi) with aluminum body;
345 bar (5000 psi) with ductile iron body and polyurethane seals.

Flow: See Performance Chart

Flow Options:

- Code **44**: 50:50 rated @ 25 to 98.4 lpm (6.5 to 26 gpm) input
 - Code **66**: 50:50 rated @ 32 to 128 lpm (8.5 to 34 gpm) input
 - Code **88**: 50:50 rated @ 57 to 167 lpm (15 to 44 gpm) input
 - Code **99**: 50:50 rated @ 68 to 197 lpm (18 to 52 gpm) input
- Other ratio options available; consult factory.

Balancing Orifice: 1.52 mm (0.06 in.) standard.

Standard Compensator Bias Spring: 2.07 bar (30 psid)

Flow Accuracy: 10% from 33-100% of rated flow
with approx. equal 2 and 2 port loads.

Temperature: -40 to 120°C

Filtration: See page 9.010.1

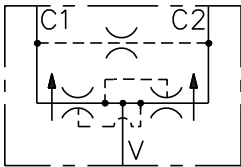
Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

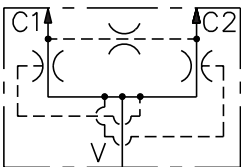
Seal Kit: for FD16-40 cartridge: SK16-4X-MMM; See page 8.650.1

SYMBOLS

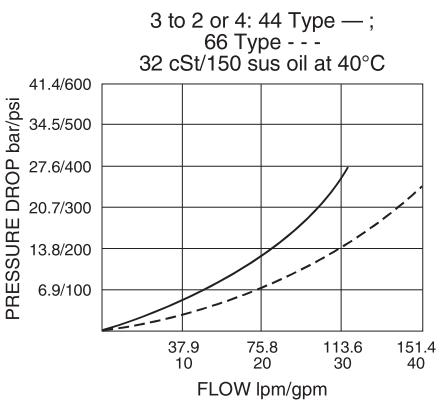
USASI:



ISO:

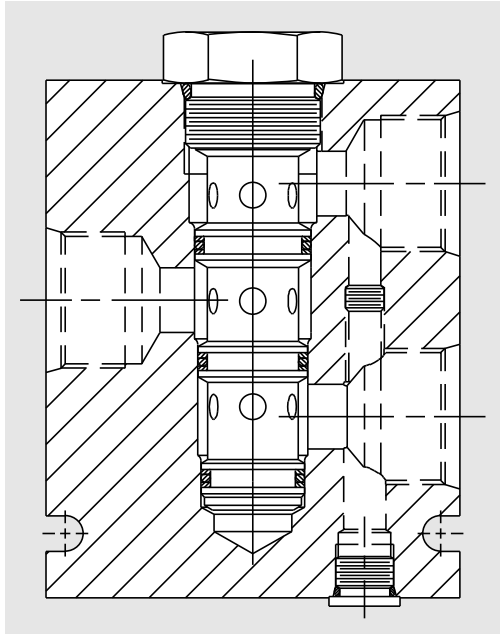
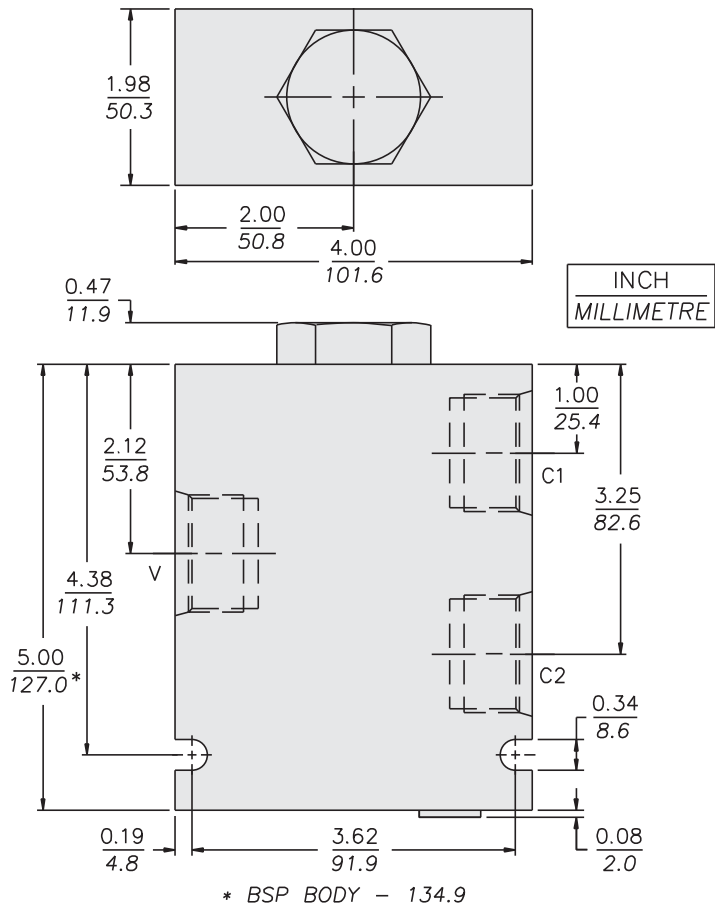


PERFORMANCE (Cartridge Only)



FDC16

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.38 kg. (0.83 lbs.) Steel with hardened work surfaces. Zinc-plated exposed surfaces. Buna N O-rings and polyester elastomer back-ups standard.

Special FDC Ported Bodies:

Aluminum: Weight: 1.32 kg. (2.93 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated up to 207 bar (3000 psi).

Ductile Iron: Weight: 3.77 kg. (8.32 lbs.) Rated up to 345 bar (5000 psi).

TO ORDER

FDC16 -		- 60	
Special Aluminum Ported Bodies		Balancing Orifice	
All Ports: SAE 12	12T	60	1.52 mm (0.06 in.) (Std.) non-removable
All Ports: SAE 16	16T	Dividing/Combining Ratio	
Port V: SAE 16; C1 & C2: SAE 12	16D	44	50:50 rated @ 25 to 98.4 lpm (6.5 to 26 gpm) input
Seals		66	50:50 rated @ 32 to 128 lpm (8.5 to 34 gpm) input
Buna N (Std.)	N	88	50:50 rated @ 57 to 167 lpm (15 to 44 gpm) input
Fluorocarbon	V	99	50:50 rated @ 68 to 197 lpm (18 to 52 gpm) input
Polyurethane	P	NOTE: Additional ratios, input flow ranges, and balance orifices available for OEM applications. Consult factory.	

Note: Polyurethane seals are required for operation over 241 bar (3500 psi).