

MECHANICAL SPECIAL APPLICATION VALVES



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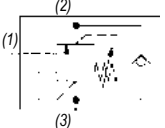


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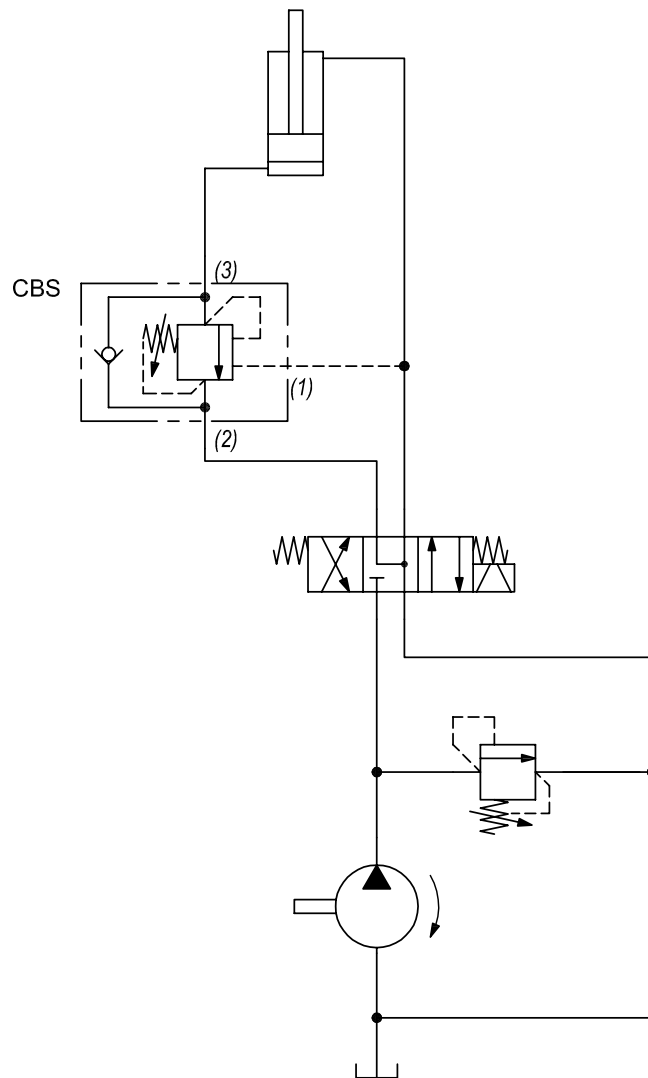
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COUNTERBALANCE VALVES

	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	15	4000	57	276	M20 X 1.5	QS-CBS	MS4

TYPICAL SCHEMATIC

Typical application for QS-CBS is to provide load holding and over-center motion control.



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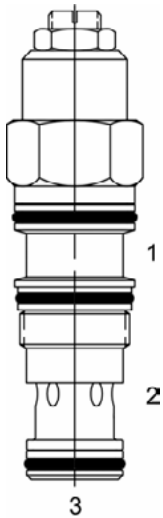


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QS-CBS COUNTERBALANCE VALVE, 3:1 RATIO



DESCRIPTION

M20 X 1.5 thread, counterbalance valve, 3:1 ratio.

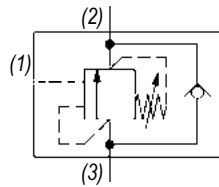
OPERATION

The QS-CBS check valve allows free flow from the directional valve (2) to the load (1) while a direct-acting, pilot-assisted relief valve controls flow from port (3) to port (2). Pilot assist at port 1 lowers the effective setting of the relief valve at a rate determined by the pilot ratio (3:1).

FEATURES

- Hardened parts for long life.
- Industry common metric cavity.

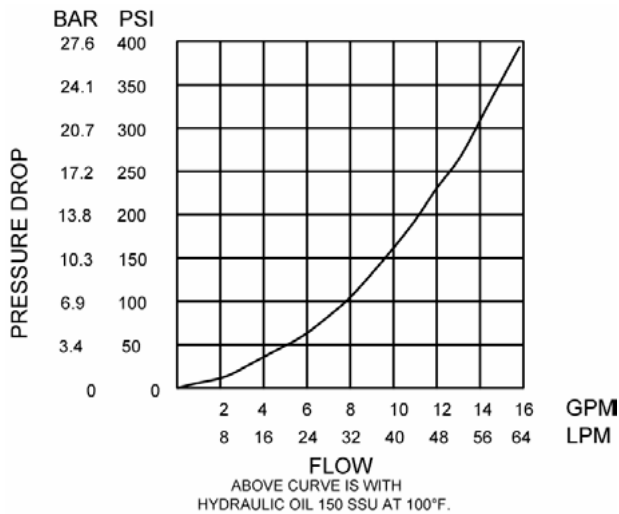
HYDRAULIC SYMBOL



Counterbalance valves with pilot assist are meant to control an overrunning load. Other names for this valve include motion control valve and over center valve.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Typical Internal Leakage (150 SSU)	0-10 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-40° to 250°F (-40° to 120°C)
Weight	.33 lbs (.15 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	QS SPECIAL 3W
Cavity Form Tool (Finishing)	40500012
Seal Kit	21170016

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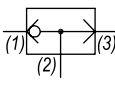


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IN-LINE VALVES

	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	8	3000	30	207	3/4-16	IM-CVA	MS8
	6	3500	23	241		IM-CVF-11	MS10
	6	3000	23	207		IM-CVF-13	MS12
	10	3500	38	241		IM-CSB	MS14

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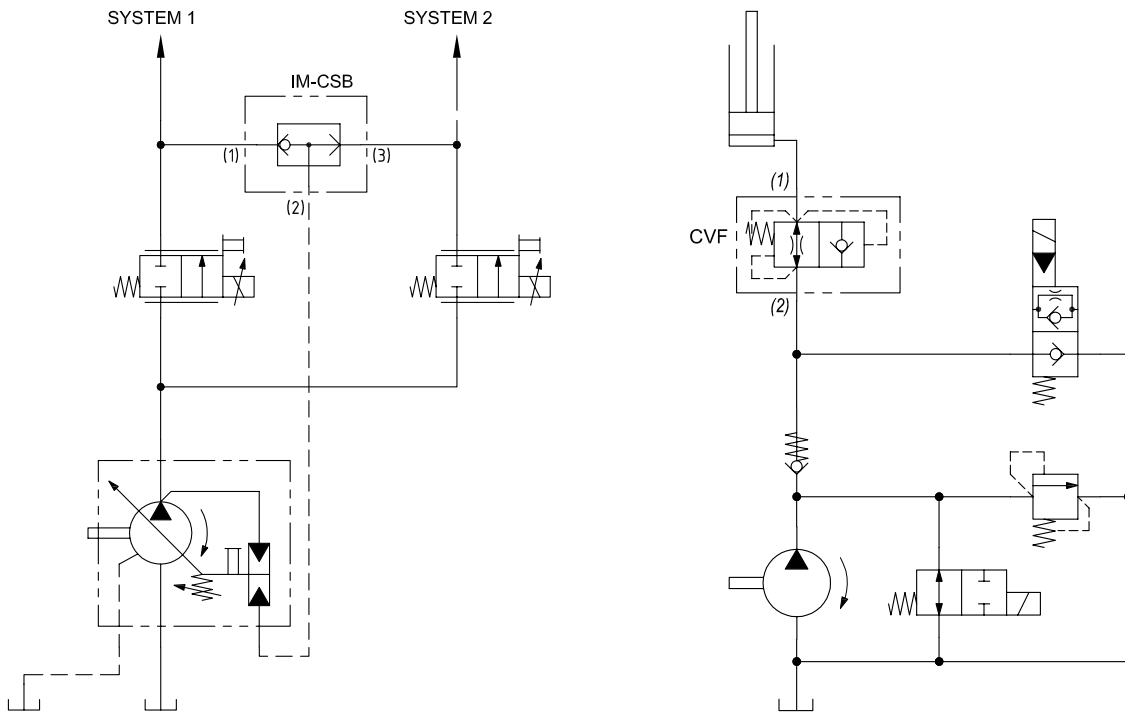
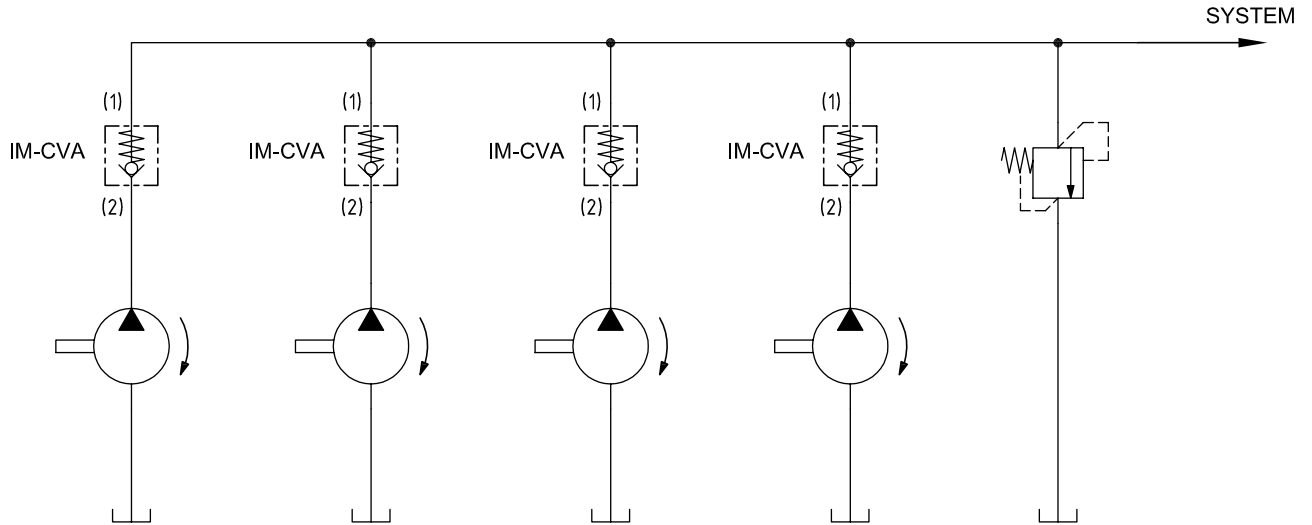
TYPICAL SCHEMATIC

In-line valves are useful in situations which require a valve to be mounted directly at an actuator or pump, or in cases in which it is not practical to combine the valves in to a single HIC manifold.

The IM-CVA can be used as shown to isolate pumps, by locating the valve directly at each pump outlet.

The IM-CVF is plumbed directly at the cylinder work port to prevent cylinder free fall, in the event of a hose failure.

The IM-CSB can be used to provide load sense to a pump compensator from two systems.



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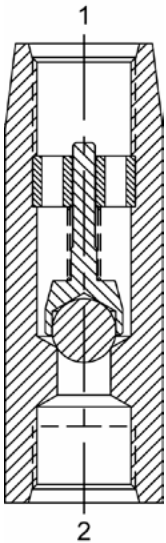


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IM-CVA INLINE CHECK VALVE



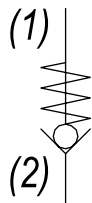
DESCRIPTION

#8 SAE, inline check valve.

OPERATION

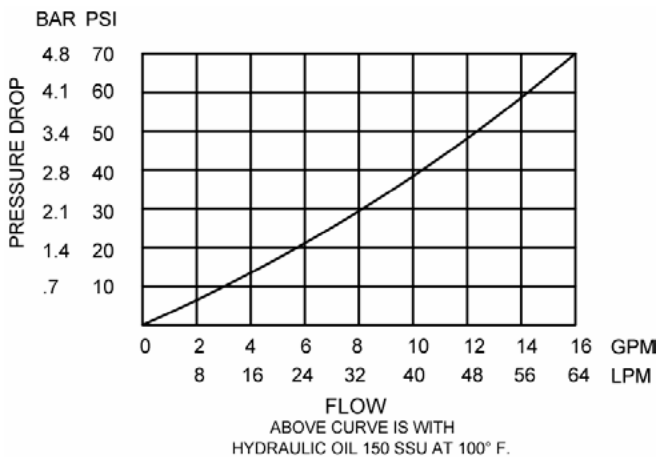
The IM-CVA allows flow from (2) to (1), while normally blocking oil flow from (1) to (2). The valve has a guided check ball, which is spring-biased closed until sufficient pressure is applied at (2) to open to (1).

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	8 GPM (30 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-40° to 250°F (-40° to 120°C)
Weight	.53 lbs (.24 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid

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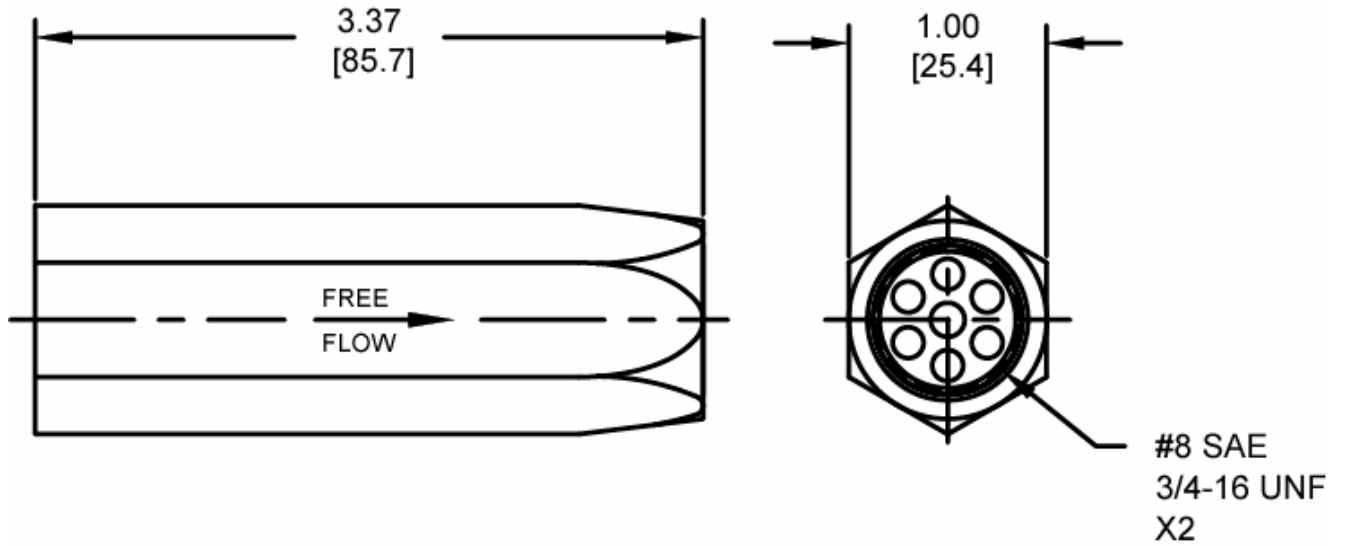


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DIMENSIONS



ORDERING INFORMATION

IM-CVA - -	
<p><u>OPTIONS</u></p> <p>Buna Standard 00</p>	<p><u>CRACK PRESSURE</u></p> <p>0005 5 PSI</p> <p>0025 25 PSI</p> <p>0050 50 PSI</p> <p>0075 75 PSI</p>

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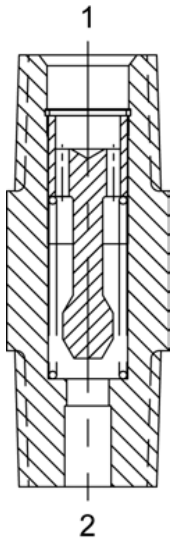


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IM-CVF-11 INLINE VELOCITY FUSE



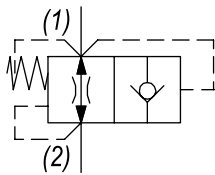
DESCRIPTION

3/8 NPTF thread, inline velocity fuse.

OPERATION

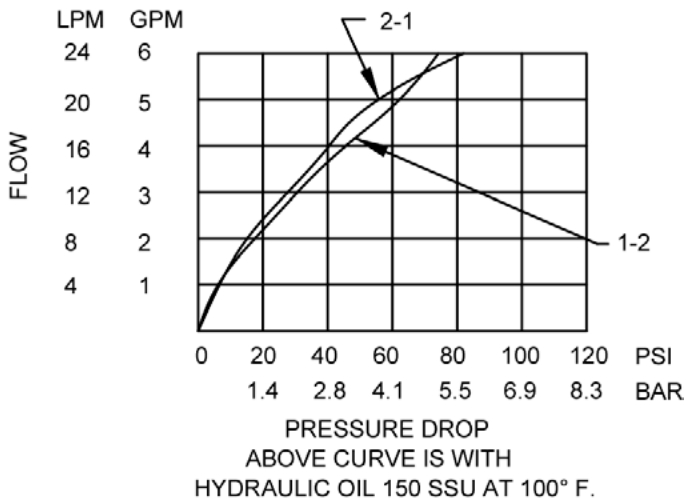
The IM-CVF-11 allows flow to pass between (1) and (2). When oil velocity from (1) to (2) exceeds the flow setting, the valve shifts and blocks flow from (1) to (2).

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow Max	6 GPM (23 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-40° to 250°F (-40° to 120°C)
Weight	.18 lbs (.08 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid

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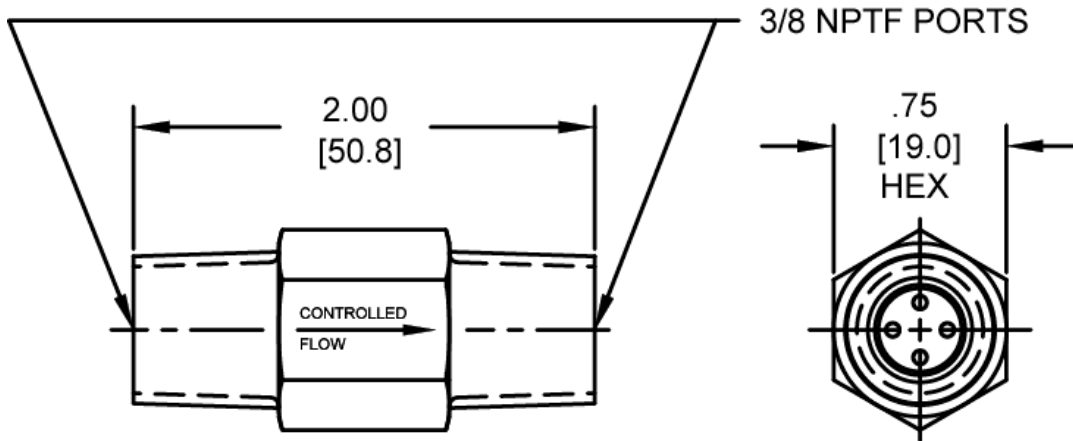


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DIMENSIONS



ORDERING INFORMATION

IM-CVF-11 -

<u>FLOW SETTINGS</u>	
01.0	1 PSI
02.0	2 PSI
03.0	3 PSI
04.0	4 PSI
05.0	5 PSI
06.0	6 PSI

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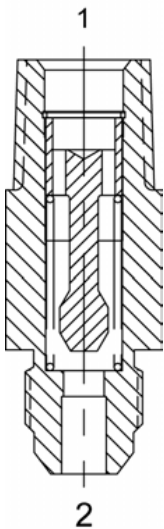


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IM-CVF-13 INLINE VELOCITY FUSE



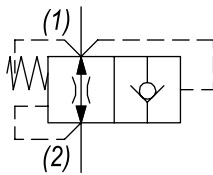
DESCRIPTION

3/8 NPTF (1) and #6 3/8 JIC (2) thread, inline velocity fuse.

OPERATION

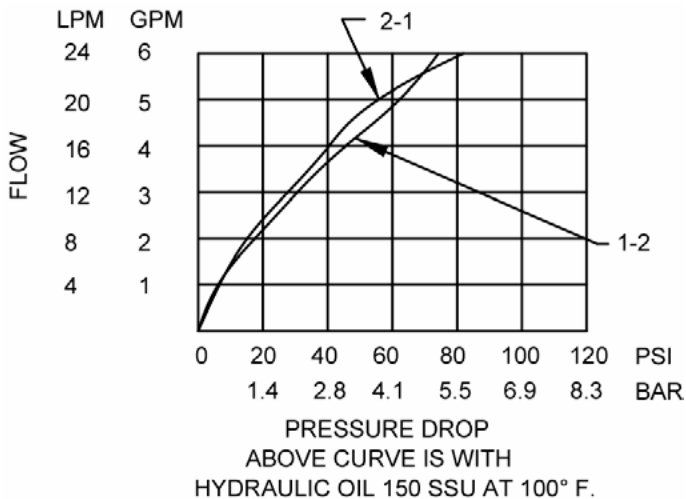
The IM-CVF-13 allows flow to pass between (1) and (2). When oil velocity from (1) to (2) exceeds the flow setting, the valve shifts and blocks flow from (1) to (2).

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow Max	6 GPM (23 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-40° to 250°F (-40° to 120°C)
Weight	.16 lbs (.07 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid

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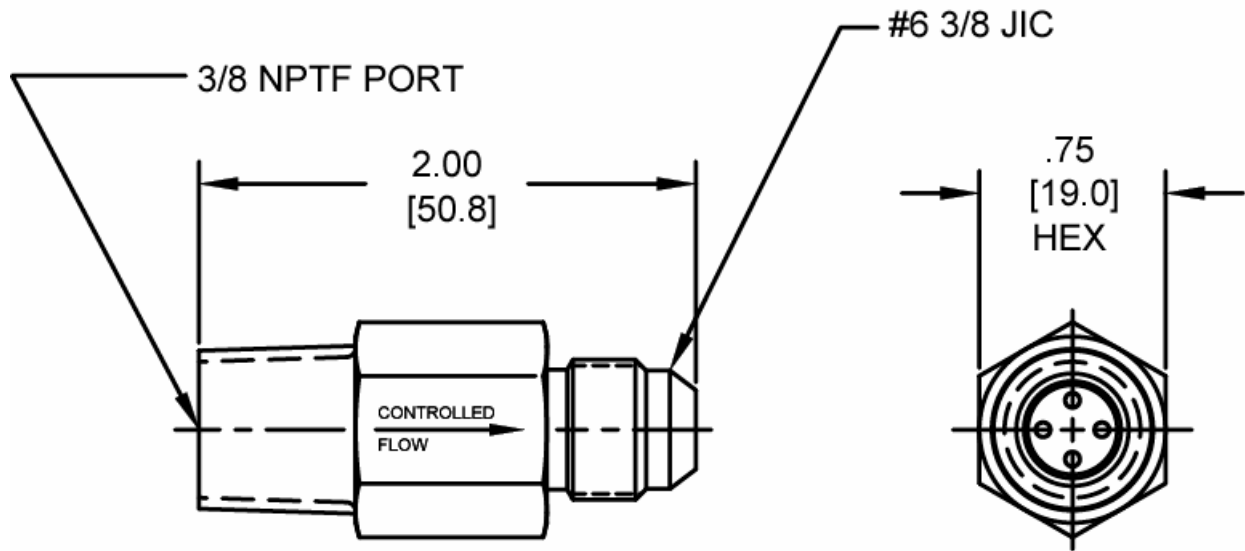


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DIMENSIONS



ORDERING INFORMATION

IM-CVF-13 -

FLOW SETTINGS

- 01.0 1 PSI
- 02.0 2 PSI
- 03.0 3 PSI
- 04.0 4 PSI
- 05.0 5 PSI
- 06.0 6 PSI

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IM-CSB INLINE SHUTTLE VALVE

DESCRIPTION

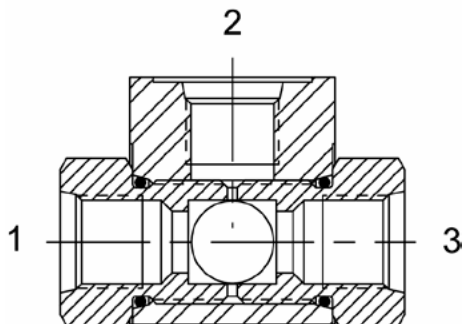
#6 SAE, inline shuttle valve.

OPERATION

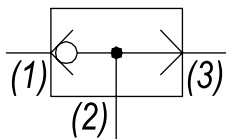
The IM-CSB allows flow from the higher pressure of (1) or (3) to (2). The valve is commonly used as a load sense to direct oil from the pressure side of a bidirectional hydraulic motor to a pressure released hydraulic brake.

FEATURES

- Hardened parts for long life.

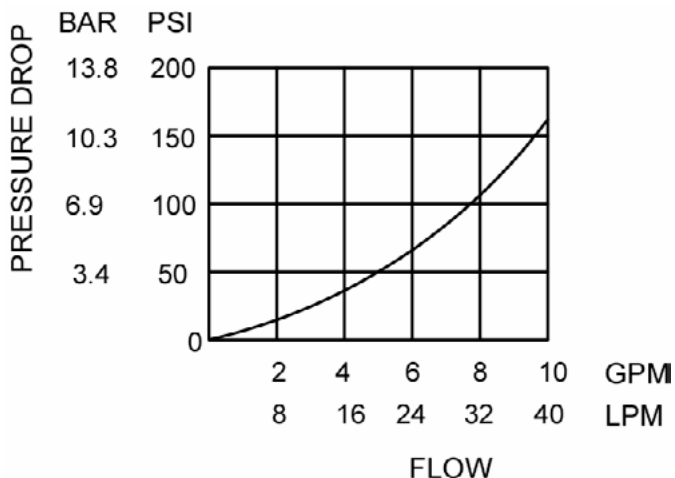


HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



ABOVE CURVE IS WITH HYDRAULIC OIL 150 SSU AT 100°F.

VALVE SPECIFICATIONS

Nominal Flow Max	10 GPM (38 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	1 cu in/min (16 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-40° to 250°F (-40° to 120°C)
Weight	.28 lbs (.13 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid

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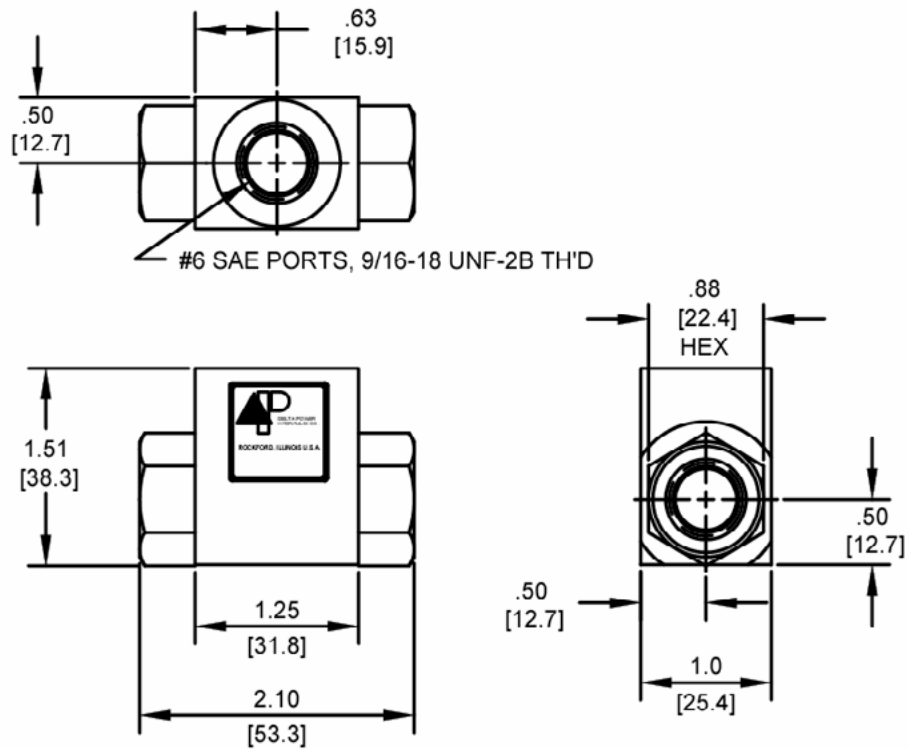


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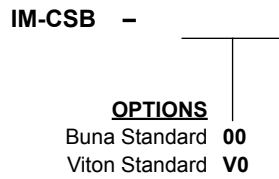


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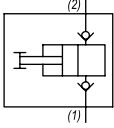
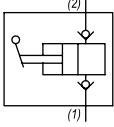
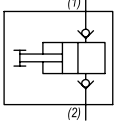
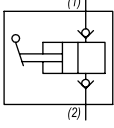


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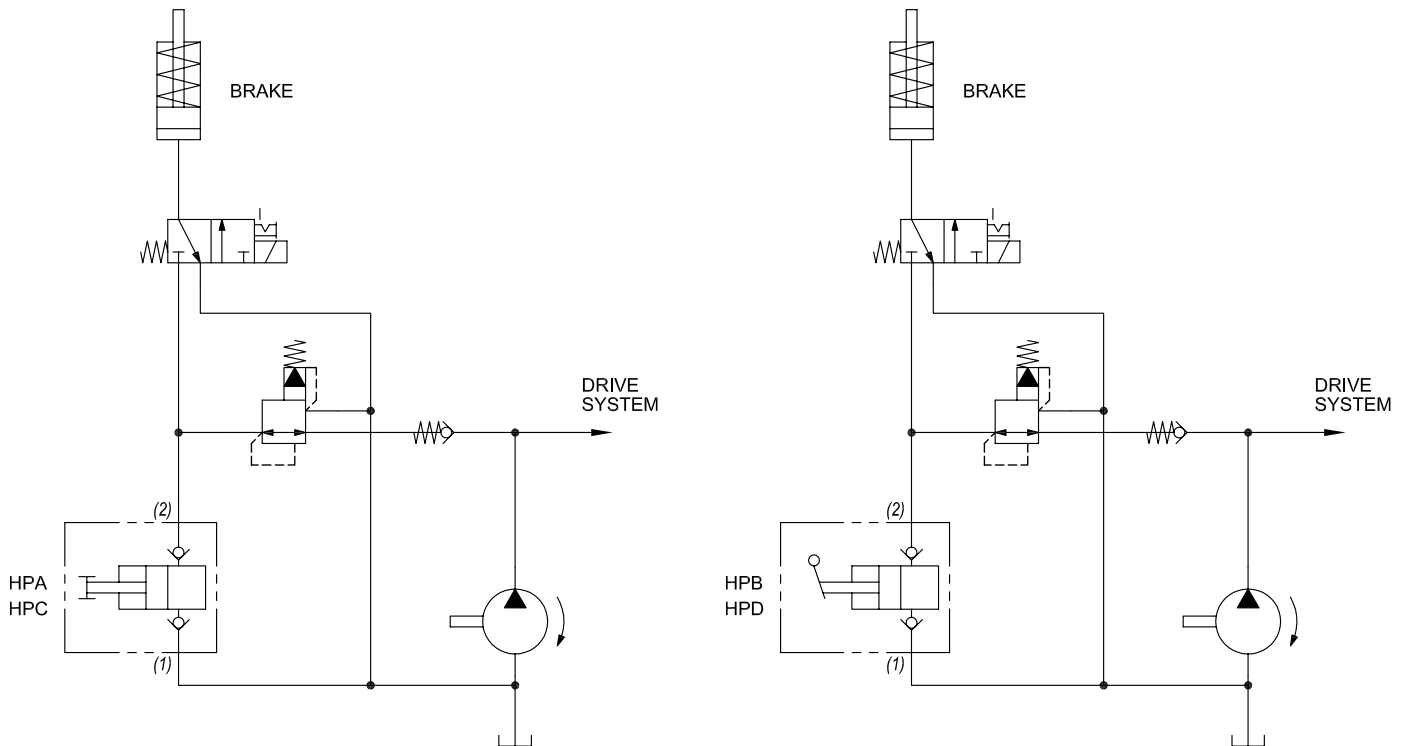
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HAND PUMPS

	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	—	500	—	34	7/8-14	DE-HPA	MS18
	—	3000	—	207	7/8-14	DE-HPB	MS20
	—	500	—	34	7/8-14	DE-HPC	MS22
	—	3000	—	207	7/8-14	DE-HPD	MS24

TYPICAL SCHEMATIC

Typical application for the HPA, HPB, HPC, and HPD is to supply pressure to release parking brake for towing.



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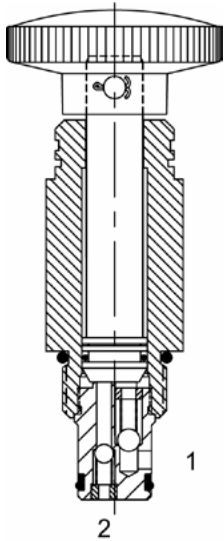


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DE-HPA HAND PUMP



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, cartridge type, plunger hand pump.

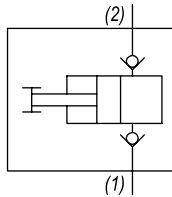
OPERATION

The DE-HPA hand pump when pulled primes thru Port (1) and when pushed pressurizes outlet port (2).

FEATURES

- Hardened parts for long life.
- Industry common cavity.

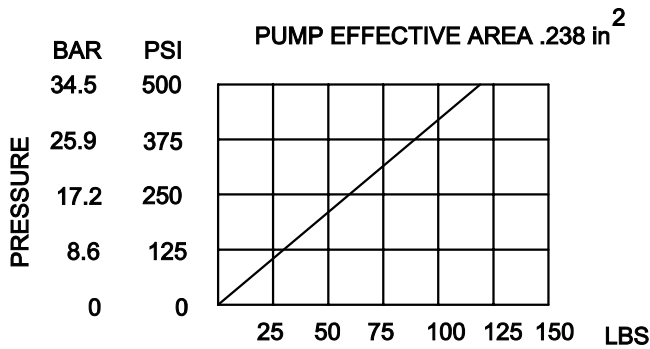
HYDRAULIC SYMBOL



This product is not intended as a load holding device.

PERFORMANCE

Actual Test Data (Cartridge Only)



FORCE
ABOVE CURVE IS WITH
HYDRAULIC OIL 150 SSU AT 100°F.

VALVE SPECIFICATIONS

Nominal Flow	.35 cu in/stroke
Rated Operating Pressure	500 PSI (34 bar)
Typical Internal Leakage (150 SSU)	0-10 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-40° to 250°F (-40° to 120°C)
Weight	.57 lbs (.26 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

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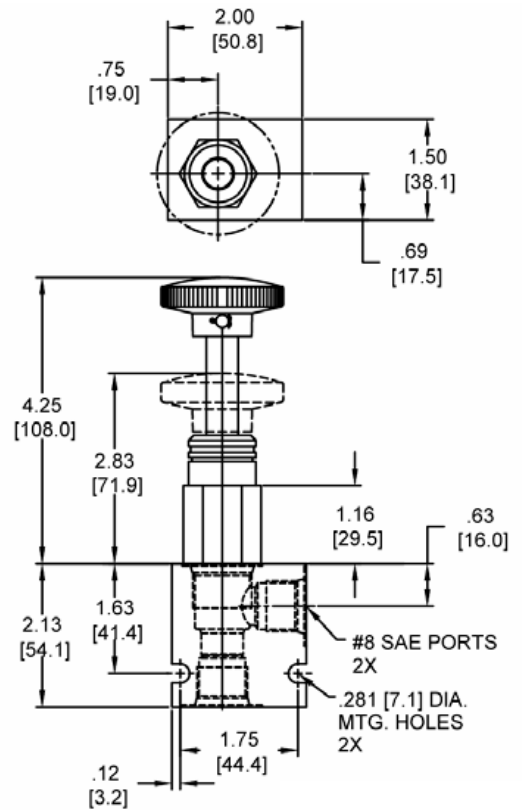
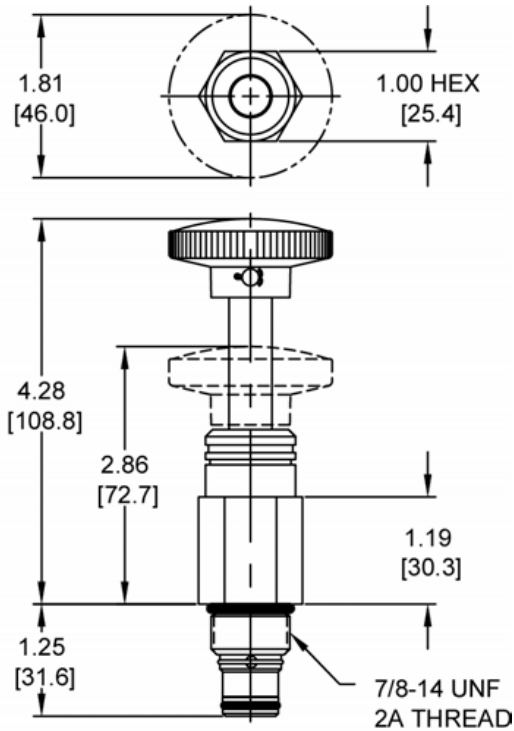


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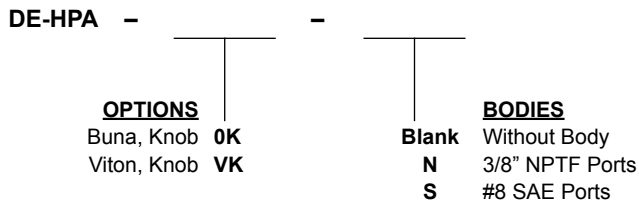
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DIMENSIONS



Body Weight: .47 lbs (21 kg)

ORDERING INFORMATION



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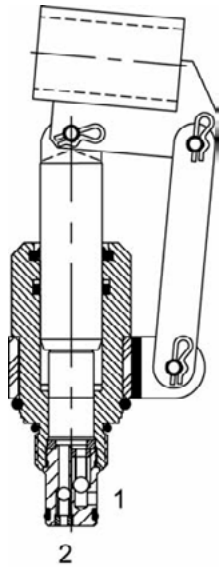


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DE-HPB HAND PUMP



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, screw in, cartridge type, hand pump.

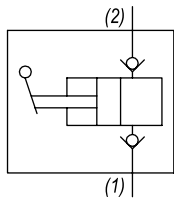
OPERATION

The DE-HPB hand pump when pipe handle is lifted, primes thru port (1) and when pushed provides flow pressure to outlet port (2).

FEATURES

- Large displacement per stroke.
- Industry common cavity.

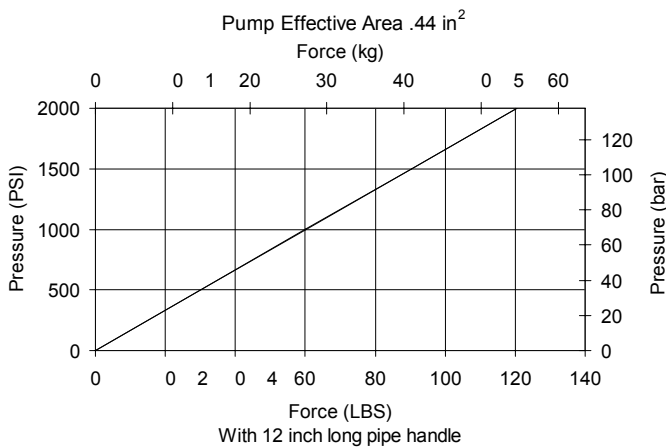
HYDRAULIC SYMBOL



This product is not intended as a load holding device. Linkage is not to be removed. 24" handle not supplied.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	.39 cu in/stroke
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	0-10 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-40° to 250°F (-40° to 120°C)
Weight	1.5 lbs (.69 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

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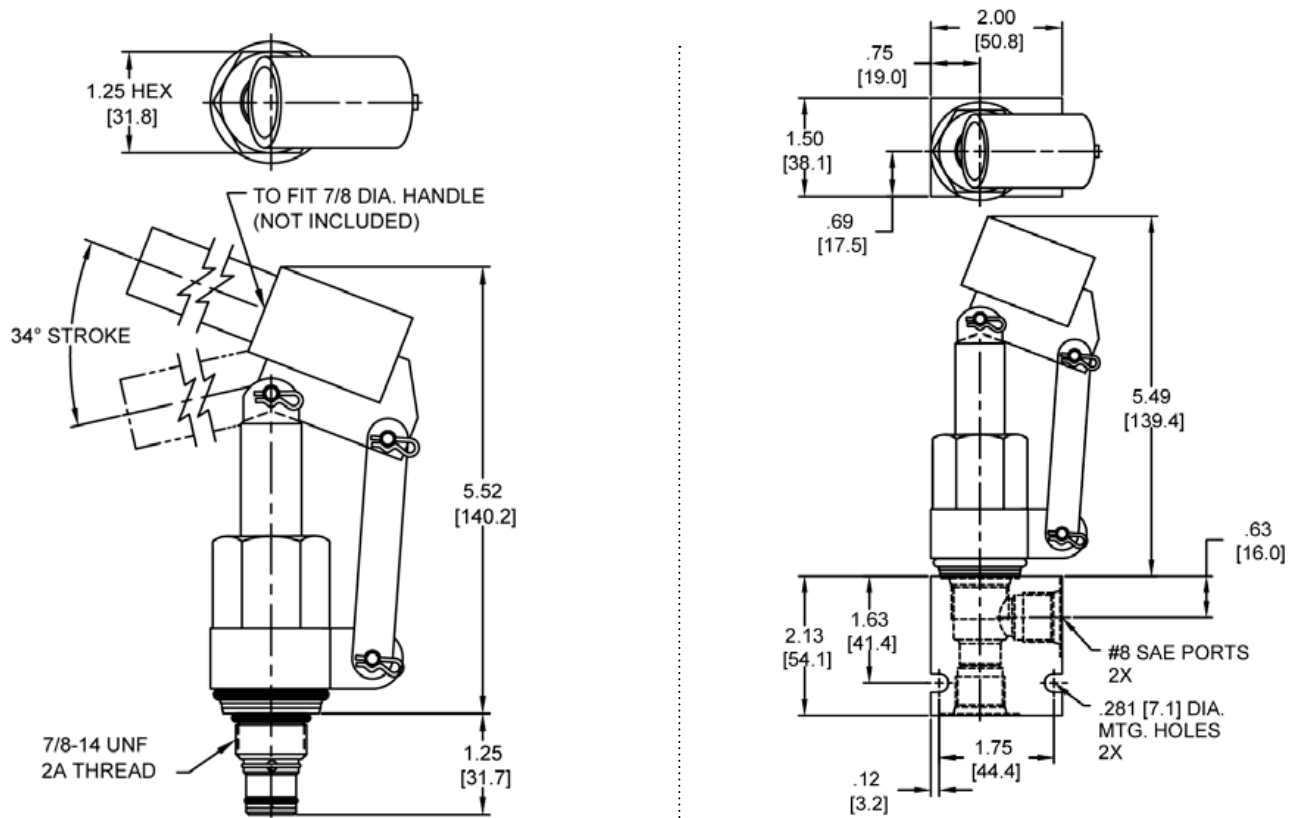


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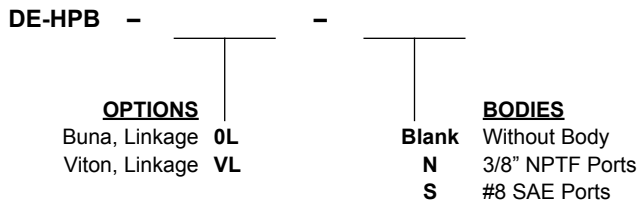
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DIMENSIONS



Body Weight: .47 lbs (21 kg)

ORDERING INFORMATION



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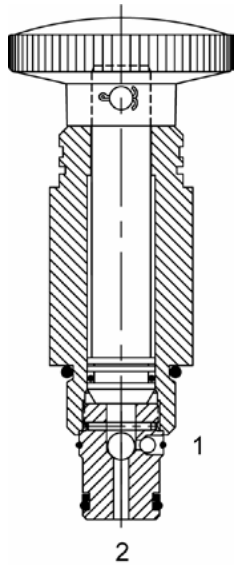


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DE-HPC HAND PUMP



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, cartridge type, plunger hand pump.

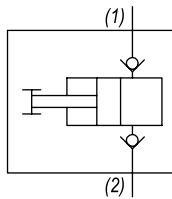
OPERATION

The DE-HPC hand pump when pulled primes thru port (2) and when pushed provide flow pressure to outlet port (1).

FEATURES

- Small profile.
- Industry common cavity.
- Large displacement per stroke.

HYDRAULIC SYMBOL

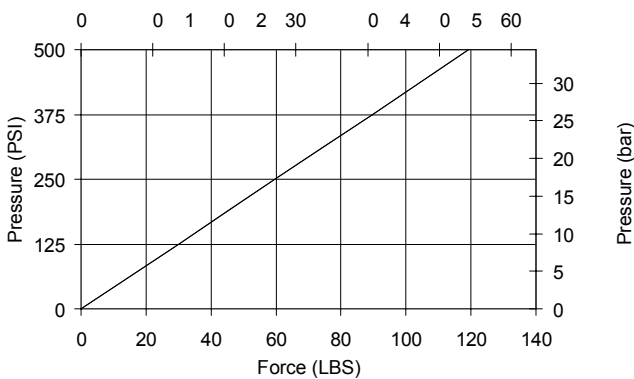


This product is not intended as a load holding device.

PERFORMANCE

Actual Test Data (Cartridge Only)

Pump Effective Area .24 in²
Force (kg)



VALVE SPECIFICATIONS

Nominal Flow	.35 cu in/stroke
Rated Operating Pressure	500 PSI (34 bar)
Typical Internal Leakage (150 SSU)	0-10 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-40° to 250°F (-40° to 120°C)
Weight	.57 lbs (.26 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

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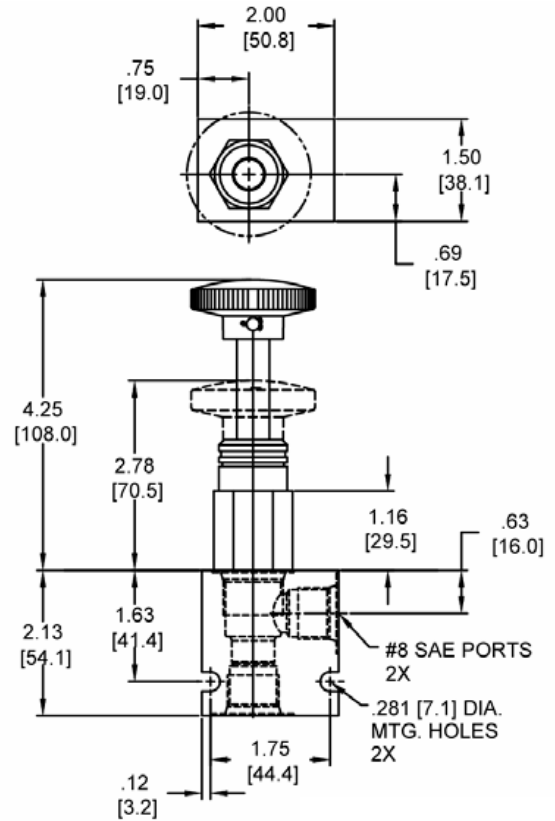
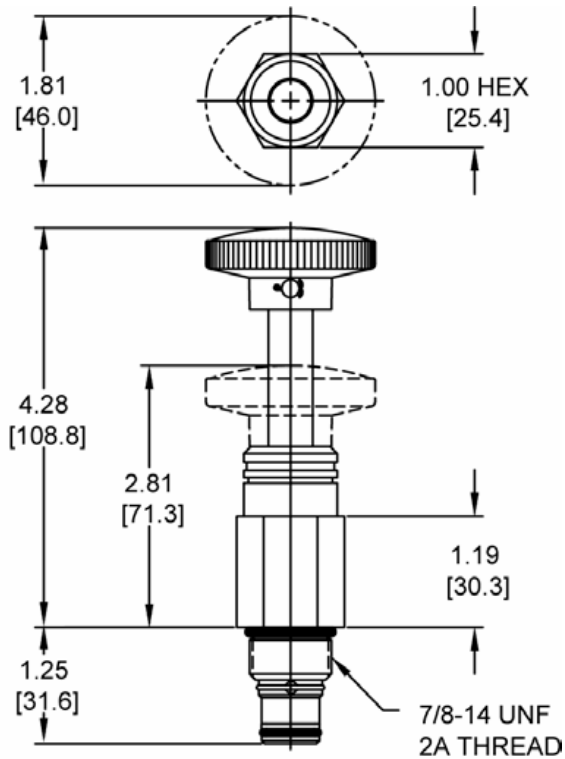


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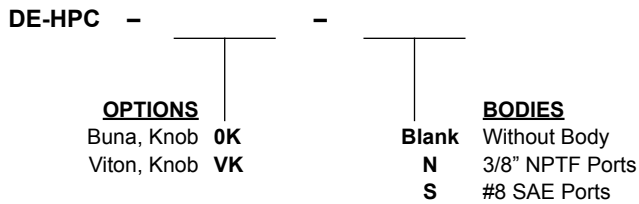
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DIMENSIONS



Body Weight: .47 lbs (21 kg)

ORDERING INFORMATION



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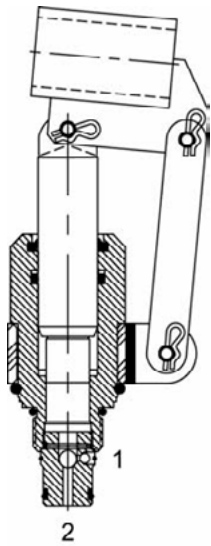


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DE-HPD HAND PUMP



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, cartridge type, hand pump.

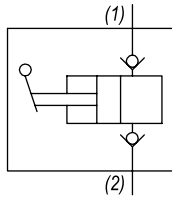
OPERATION

The DE-HPD hand pump when pipe handle is lifted, primes thru port (2) and when pushed provides flow pressure to outlet port (1).

FEATURES

- Large displacement per stroke.
- Industry common cavity.

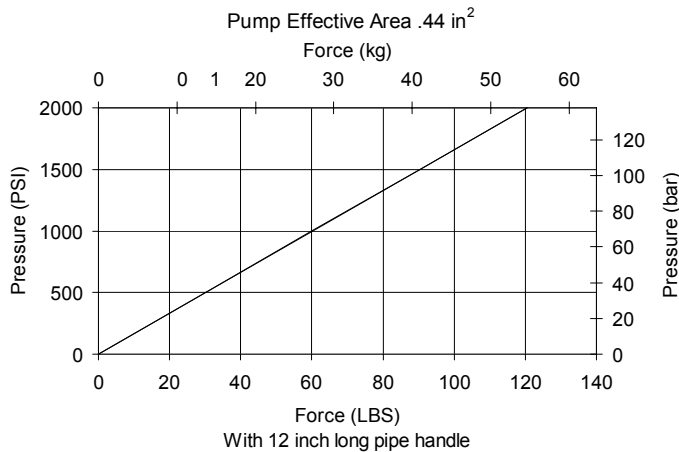
HYDRAULIC SYMBOL



This product is not intended as a load holding device. Linkage is not to be removed. 24" handle not supplied.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	.39 cu in/stroke
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	0-10 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-40° to 250°F (-40° to 120°C)
Weight	1.5 lbs (.69 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

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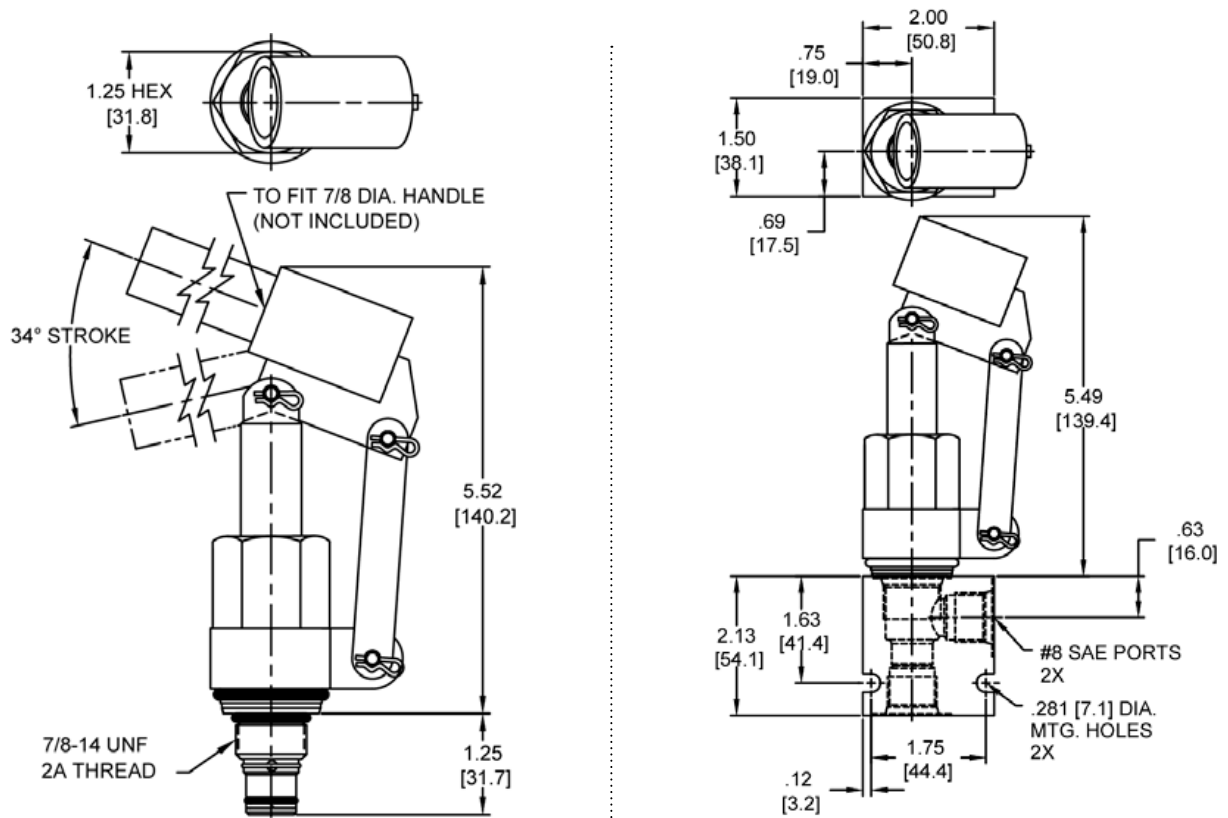


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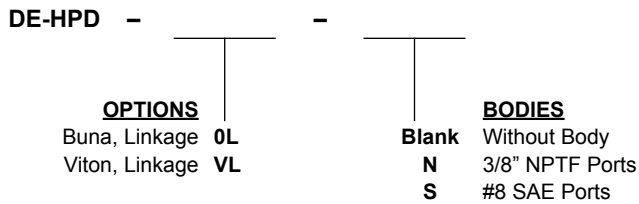
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DIMENSIONS



Body Weight: .47 lbs (21 kg)

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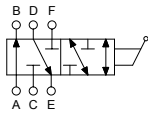


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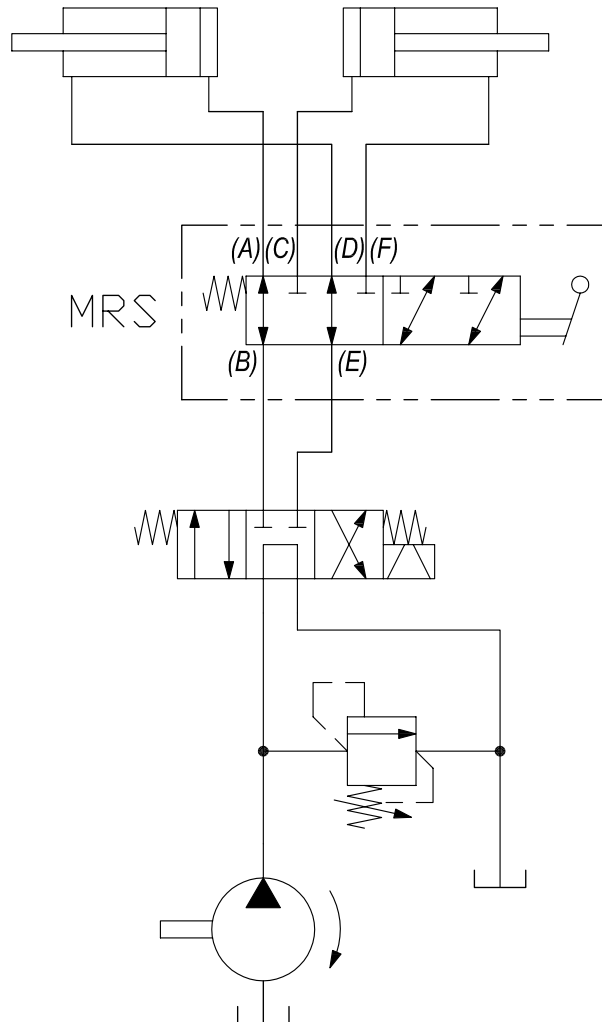
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SELECTOR VALVES

	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	25	3000	95	207		QS-MRS	MS28

TYPICAL SCHEMATIC

Typical application for the MRS is to manually select flow path between two functions, which use a common directional control valve. All ports are blocked during transition.



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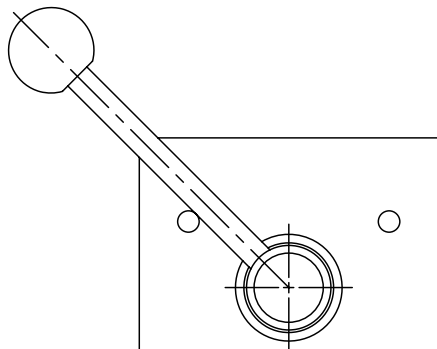
QS-MRS ROTARY SELECTOR VALVE

DESCRIPTION

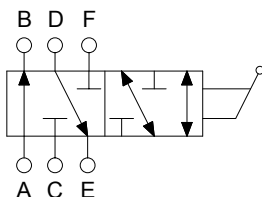
6 port rotary selector valve.

OPERATION

The QS-MRS when rotated counter-clockwise allows flow from (A) to (B) & (D) to (E) and blocks (C) & (F). When rotated clockwise, the valve directs flow from (C) to (B) & (F) to (E) and block flow at (A) & (D).



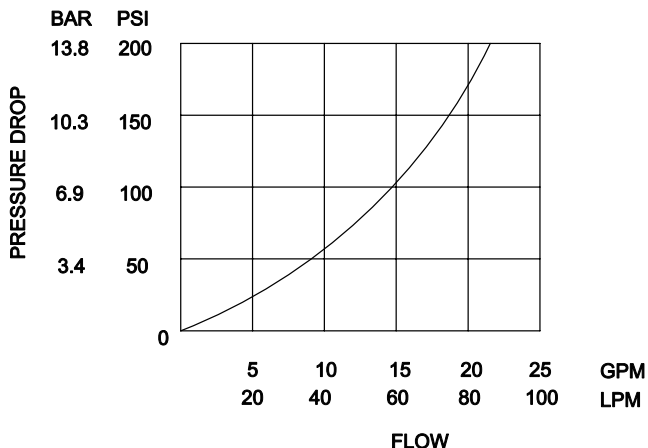
HYDRAULIC SYMBOL



May be used as metering product. All ports closed in transition. See chart for fully open and fully closed pressure drop.

PERFORMANCE

Actual Test Data (Cartridge Only)



ABOVE CURVE IS WITH HYDRAULIC OIL 150 SSU AT 100°F.

VALVE SPECIFICATIONS

Nominal Flow	25 GPM (95 LTR/M)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	1 cu in/min (16 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-40° to 250°F (-40° to 120°C)
Weight	3.42 lbs (1.55 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid

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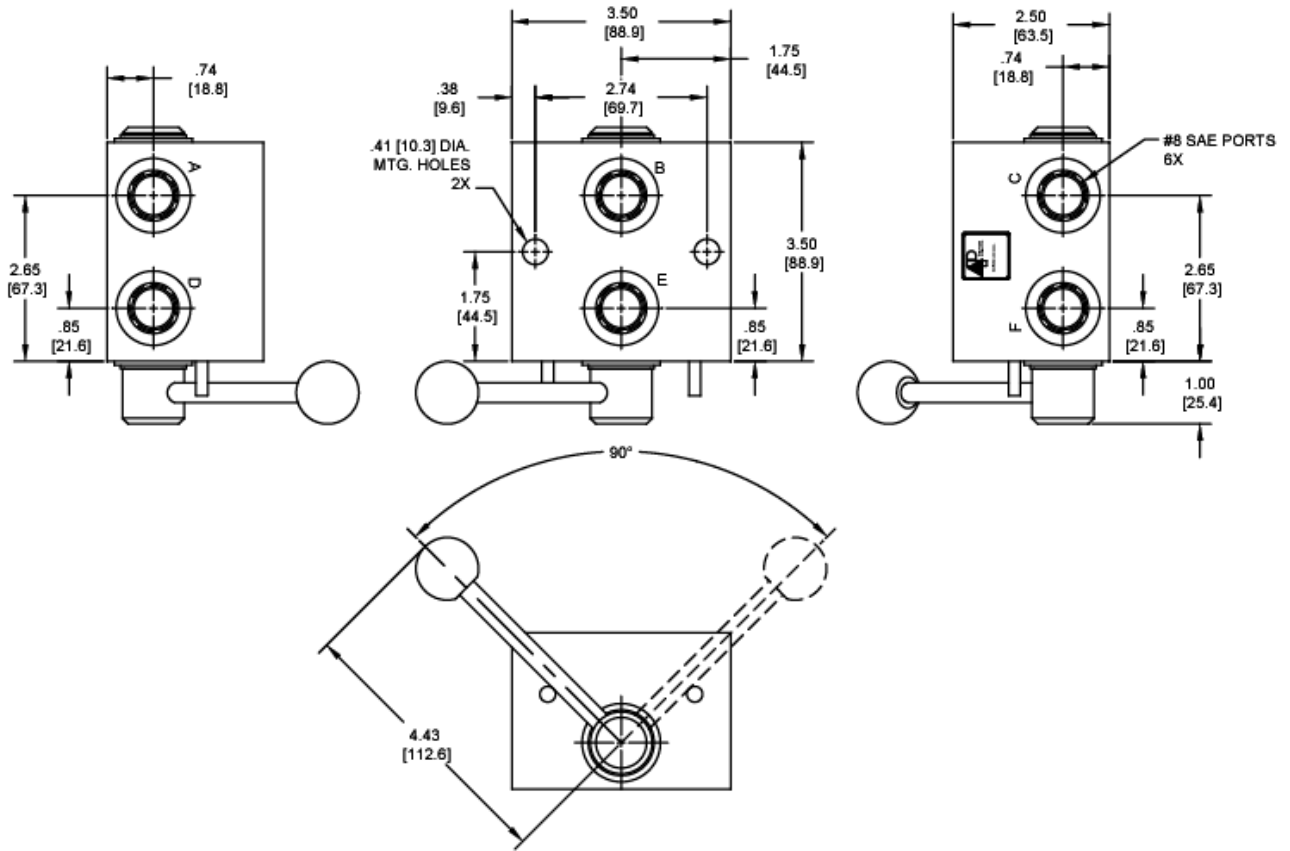


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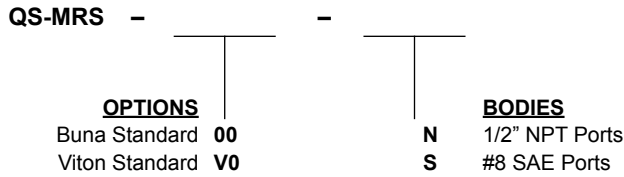


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DIMENSIONS



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