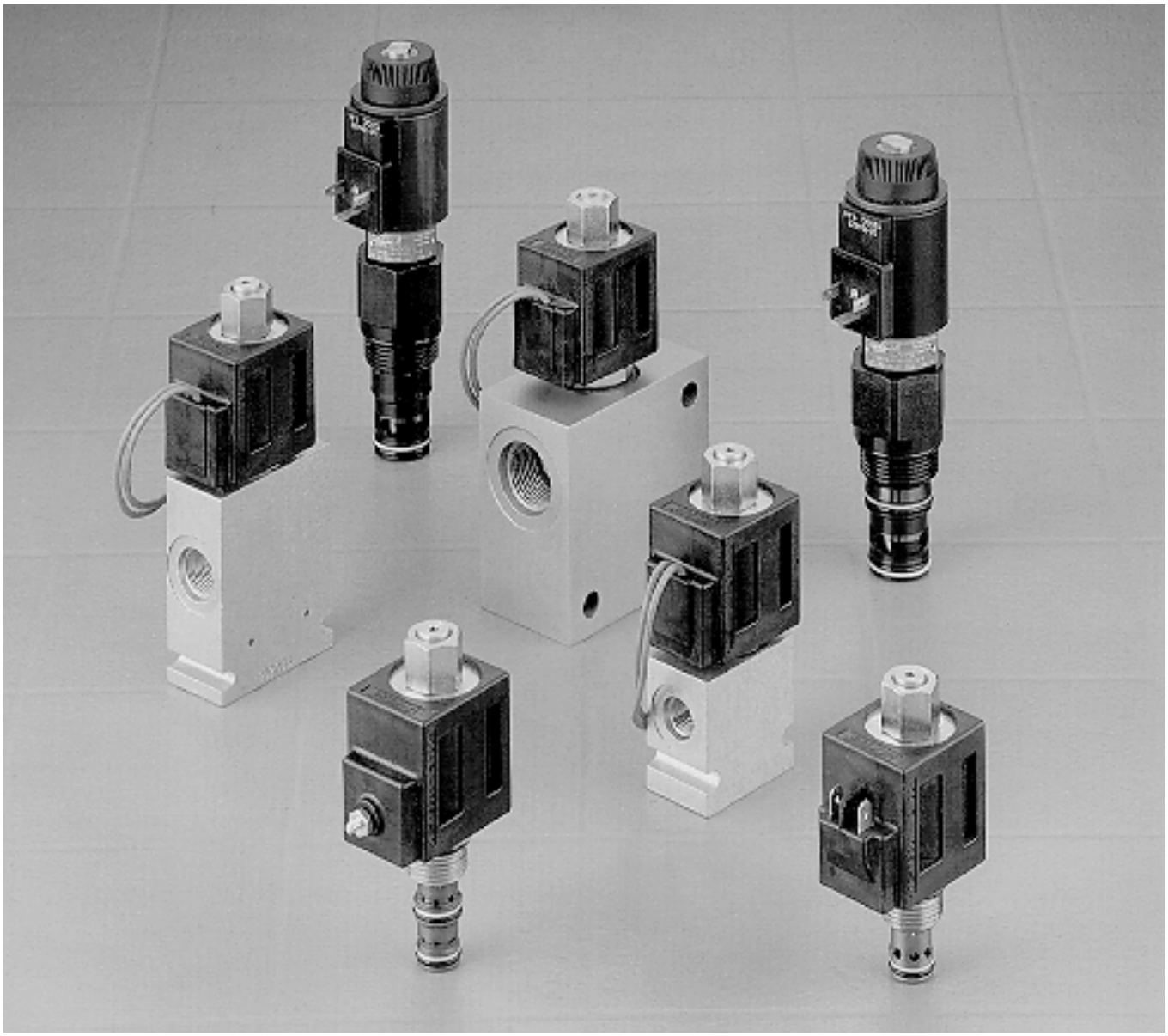
Proportional Valves

Screw-in Cartridge Valves

Maximum Pressure 280 bar (4000 psi) - Maximum Flow 160 l/min (42 USgpm)



Contents

Application Data

Fluid Cleanliness

Proper fluid condition is essential for long and satisfactory life of hydraulic components and systems. Hydraulic fluid must have the correct balance of cleanliness, materials, and additives for protection against wear of components, elevated viscosity, and inclusion of air.

Essential information on the correct methods for treating hydraulic fluid is included in Vickers publication 561 “Vickers Guide to Systemic Contamination Control” available from your local Vickers distributor or by contacting Vickers, Incorporated. Recommendations on filtration and the selection of products to control fluid condition are included in 561.

Recommended cleanliness levels, using petroleum oil under common conditions, are based on the highest fluid pressure levels in the system and are coded in the chart below. Fluids other than petroleum, severe service cycles, or temperature extremes are cause for adjustment of these cleanliness codes. See Vickers publication 561 for exact details.

Introduction

For seventy five years, Vickers has provided its customers with quality products and innovative solutions for all their power and motion control needs.

We are committed to maintaining this position by offering the most comprehensive range of cartridge valves for industrial and mobile equipment.

This catalog gives basic specifications for the complete line of Vickers screw-in proportional control valves. Its purpose is to provide a quick, convenient reference tool when choosing Vickers proportional valves or when designing a system using these components.

The products featured in this catalog represent the very best in screw-in proportional control valve technology.

> *Products in this catalog have been fatigue tested for one million cycles at 132% or 10 million cycles at 115% of rated pressure.*

Two pressure ratings are shown for products featured in this catalog – typical application pressure and fatigue pressure. The typical application pressure is the maximum recommended operating pressure for the valve in a given system. The fatigue pressure rating is the maximum pressure for the valve to be free for infinite life from metal fatigue.

The EPV10 has several outstanding performance features which give it a unique position in the screw-in cartridge valve market. Valve gain linearity, flow force pressure compensation characteristics above 20 bar (300 psi) and low internal leakage.

The EPV16 is a proportionally controlled two-way valve of the poppet type. The main poppet amplifies a small flow through the pilot circuit and is comparable to a transistor. As the transistor uses small currents to control larger currents, the hydraulic valve transistor or VALVISTOR uses the pilotflow to control the main stage flow with servo–like response. flow to control

ERV1-10 is an electric, proportionally controlled, internally pilot operated, spool type screw-in relief valve. It is capable of handling flows from 3,8-60,0 l/min (1-15 USgpm) at pressures from 35-210 bar (500-3000 psi). Also available is an ERV1-16 which is capable of handling flows from 7,6-132 l/min. (2-35 USgpm) at pressures from 35-210 bar (100-500 psi).

ERV2-10 is a low flow electric proportionally controlled relief valve similar to the ERV1-10. This valve is rated for flows from 0,2-2,8 l/min (0.05-0.75 USgpm) and pressures up to 35 bar (500 psi).

EPRV1-10 is an electric, proportionally controlled, internally pilot operated, spool type, screw-in pressure reducing/relieving valve. It is capable of handling flows from 0-7,6 l/min (0-20 USgpm) at set pressures from 14-35 bar (200-500 psi). Also available is an ERV1-16 which is capable of handling flows from 0-38 l/min (0-10 USgpm) at set pressures from 14-35 bar (200-500 psi).

Vickers proportional pressure and flow control valves are designed to be easily controlled by the simplest of DC electrical devices such as a 12 volt battery and a potentiometer.

In most cases the valves may also be simply controlled, directly, by even the most sophisticated control circuit, such as the “analog out” of a computer control system. In many cases, because of the coil’s low current draw, the valve can be operated accurately and directly without intermediate power supplies. Current draw at the coil can be less than one amp when a 12 volt rated coil is used, or less than 0.5 amp when a 24 volt rated coil is used.

Varying the voltage at the coil is one of the simplest means of control available. Any of the Vickers DC coils will work on most of these valves simply by varying the voltage between 0 and 75% of the rated coil voltage. It should be noted that as the operating temperature of a coil increases, the solenoid force decreases. Therefore if the voltage is held constant as the coil heats up then valve pressure (or flow) will decrease. Electrical current controls significantly, but not totally, overcome this problem. Closed–loop electrical control with feedback from the parameter to be monitored will provide the most accurate control.

Valve Features and Benefits

- All operating parts are hardened steel, ground and honed for long life and low leakage
- Designed for maximum flexibility and minimal space requirements
- All exposed cartridge surfaces are zinc dichromate plated to resist corrosion
- Reliable, economical and compact
- Rated flows up to 160 l/min (42 USgpm)
- Optional nose–in, side–out or side–in, nose out flow direction (EPV16 series)

Coil Features and Benefits

The valves in this catalog are offered with a choice of two and three standard voltages and several types of electrical connections. For other coil ratings and connections, consult your Vickers representative.

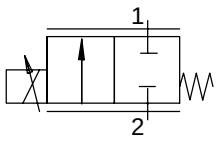
- Variety of voltages and terminations
- Coils are interchangeable for serviceability on the EPV10 and EPV16.
- Coils are interchangeable for serviceability on the ERV1-10, EPV1-16, EPRV1-10 and EPRV1-16.
- Compact, one-piece weather-proof encapsulated design. Eliminates need for extra seals.
- An arc suppression diode molded into the coil is available as a standard option on ERV and EPRV valves.

WARNING: Application of these products beyond published performance specifications may cause valve malfunction which may result in personal injury and/or damage to the machine.

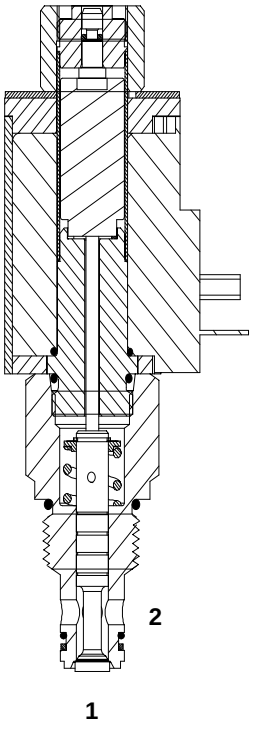
WARNING: For pressures over 210 bar (3000 psi) use steel housing.

EPV10
Proportional flow control valve

Functional Symbol



Sectional View



Description

The EPV10 is a direct acting, uni-directional, poppet type, 2-way, 2-position, normally closed proportional flow control valve.

Operation

In the de-energized position, flow is blocked from port 2 to port 1, with no reverse flow permitted. When energized, flow is allowed from port 2 to port 1 in direct proportion to the command signal applied to the solenoid coil.

Ratings and specifications

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (at port 2) . . . . . 350 bar (5075 psi)

Cartridge fatigue pressure (infinite life) . . . . . 350 bar (5075 psi)

Rated flow . . . . . 0 - 30 l/min (0 - 8 USgpm)

Operating ambient temperature . . . . . -30 to 90°C (-22° to 194°F)

Cavity . . . . . C-10-2 (See page 26)

Fluids . . . . . Anti-wear hydraulic oils with Buna-N seals (standard)
Phosphate esters (non–alkyl) with Viton® seals are available by request
Viton® is a registered trademark of E.I. DuPont Co.

Weight cartridge only . . . . . 0,78 kg. (1.72 lbs.)

Filtration . . . . . 70–210 bar (1000–3000 psi) Cleanliness code 17/**15/12**

Standard housing materials . . . . . Aluminum

Typical hysteresis . . . . . Less than 4% of rated current at 10 bar pressure drop – Pulse Width Modulated (PWM)

Internal leakage . . . . . 10 cm^3 maximum @ 140 bar (2000 psi) and oil viscosity of 30 cSt

Oil viscosity range . . . . . 10–800 cSt

Nominal supply voltage . . . . . 12/24 VDC

Minimum current for full function . . . . . 1.4 / 0.7 amp

Pulse frequency . . . . . 100 - 200 ± 10 Hz

Electrical requirements . . . . . 1.4 amps max @ 12 VDC

Threshold current . . . . . Adj. from 400 - 800 mamp (12 VDC)
Adj. from 200 - 400 mamp (24 VDC)
Adj. from 600 - 1400 mamp (12 VDC)
Adj. from 300 - 700 mamp (24 VDC)

Coil current for maximum flow . . . . . 0.7 amps max @ 24 VDC

Recommended PWM frequency . . . . 100 - 200 Hz application dependent

Coil resistance @ 20°C (86°F) 12V 6.5Ω
24V 25.0Ω

Power consumption @ rated current and 20°C coil temperature . . . . . 12V 12.8 watts
24V 12.8 watts

Ramp . . . . . Optional

Cartridge seal kit 02–317580

Model Code

EPV10

EPV 10 -(A) - ** - * - (*) - * - **

1 2 3 4 5 6 7 8

1 Function

EPV - Electro-proportional flow control valve

2 Size

10 - 10 Size

3 Valve housing material
Omit for cartridge only

A - Aluminum

Maximum operating pressure
210 bar (3000 psi)

4 Port size

0 - Cartridge only

Code	Port size	Housing number
3G	3/8" BSPP	876703
6H	SAE 6	876700
8H	SAE 8	876701

See page 29 for housings

5 Voltage rating

12D - 12VDC
24D - 24VDC

6 Manual override option

Blank - No manual override
M - Pin type
S - Screw type

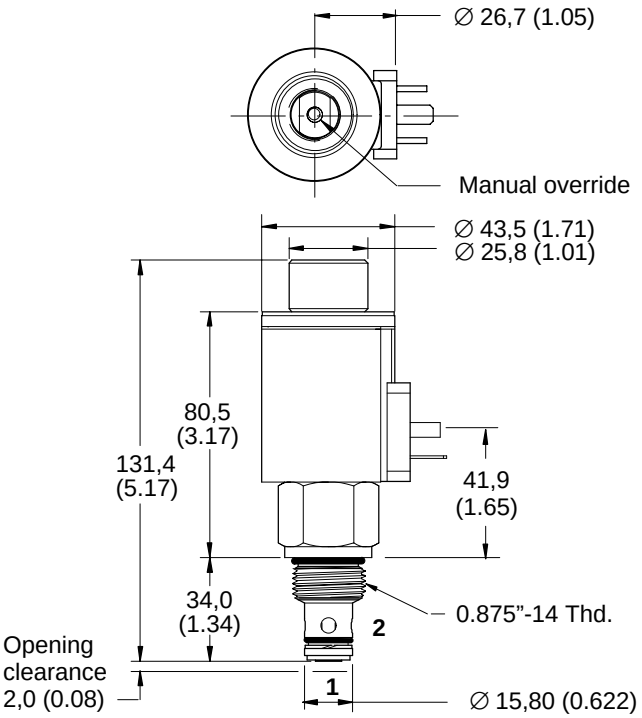
7 Coil/Connector types

Connector	Coil part number	
Blank - No coil	12VDC	24VDC
W -Leadwire (DC only)	02–154072	02–154073
Q -Spade terminals (DC only)	02–317154	02–317155
U - DIN 43650	02–154070	02–154071
Y - Metri-Pak*	02–308808	02–308809
F - Weather-Pack	02–308810	02–308811

**Preferred Packard connector*

8 Design number

Dimensions
mm (inch)

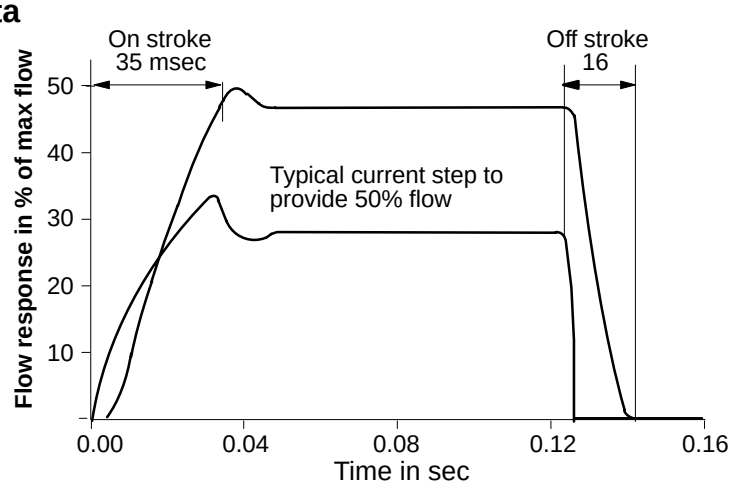


Valve is shown with "U" coil. See page 31 for coil information.
Torque cartridge in housing 47–54 Nm (35–40 lbf ft)

WARNING:
The cavity should be machined to the 14,29 (0.562) maximum diameter and 36,00 (1.417) maximum depth (See Cavity, page 26).

WARNING: When using the "Screw Type" override, care must be taken to return the override back to its neutral position before activating the valve. Failure to take this precaution may result in personal injury or damage to the machine.

Step Response Data

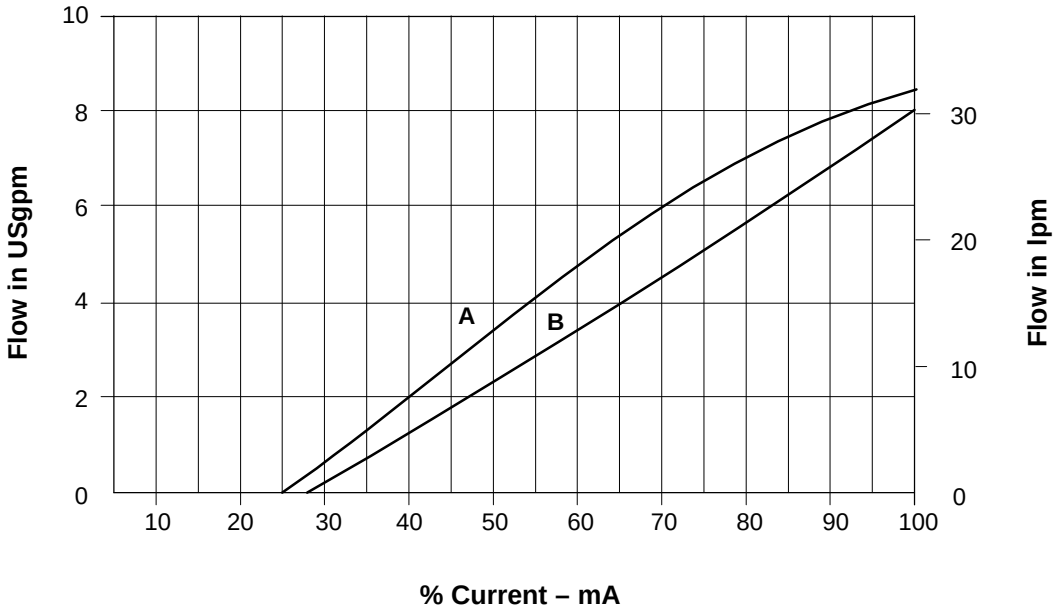


Flow vs Current

With 10 bar differential between inlet and outlet

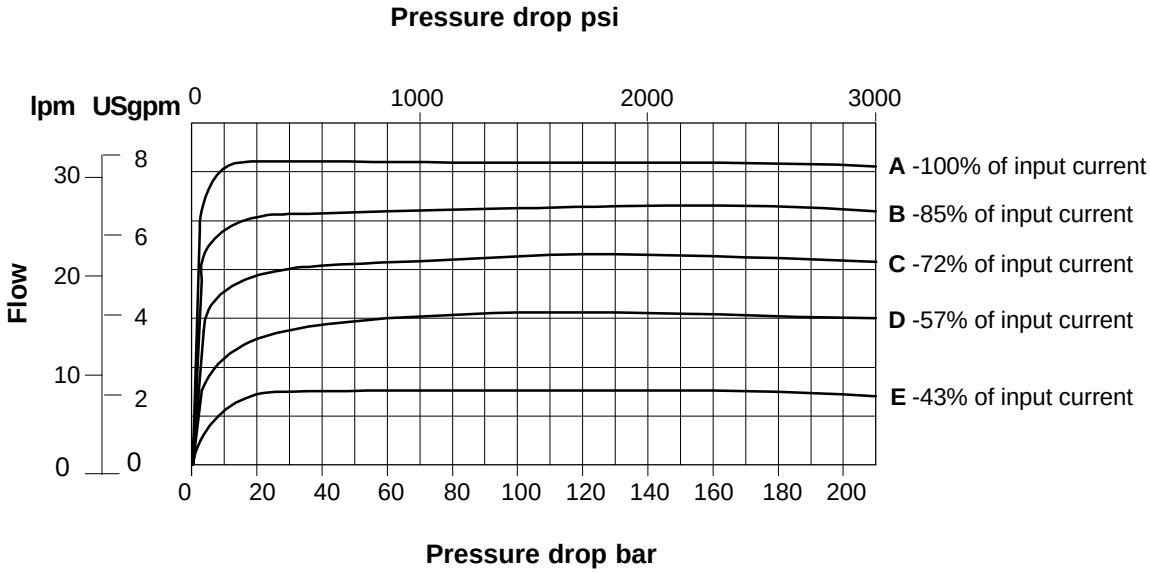
A – 210 bar (3000 psi) pressure drop from Port 2 to Port 1

B –10 bar (150 psi) pressure drop from Port 2 to Port 1



Flow vs Pressure Drop

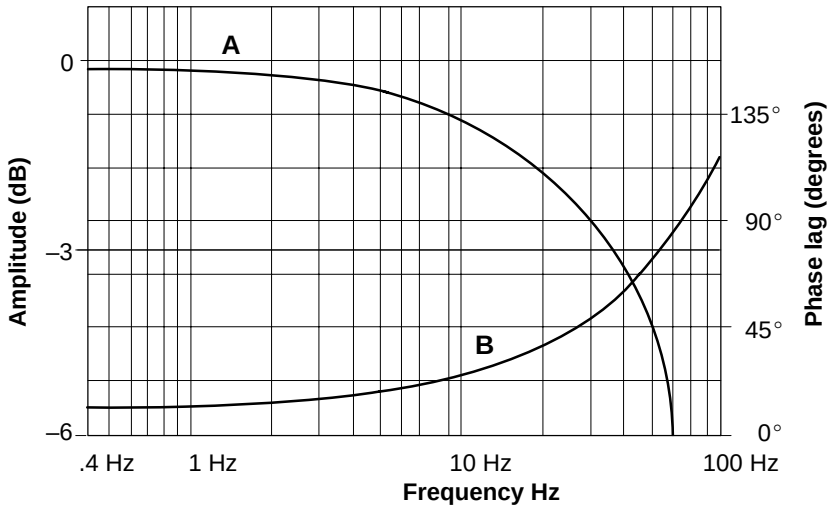
Per % of Input Current



Typical Flow Response

For an amplitude of ±40% maximum stroke (center to offset) about the 50% position.

ΔP = 10 bar (150 psi)



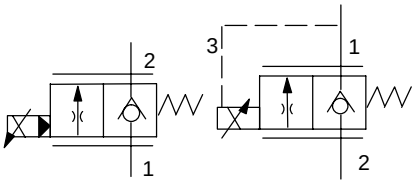
A –dB

B –Phase Lag

EPV16 Valvistor®

Proportional flow control valve

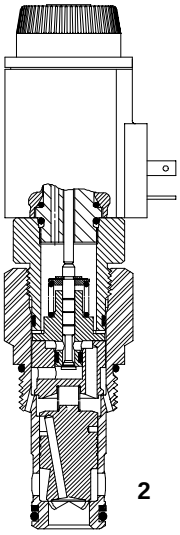
Functional Symbols



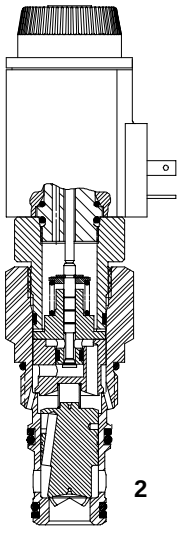
EPV16–A **EPV16–B**

Sectional Views

EPV16-A Side-out, nose-in



EPV16-B Side-in, nose-out



Description

The EPV16 is a 2-way, normally closed, pressure compensated, poppet type, screw-in, cartridge electro-proportional flow control valve.

Operation

"A" style (nose in, side out) - In the de-energized position this valve remains closed from port 1 to port 2. When current is applied to the coil, a controlled increasing flow will be allowed from port 1 to port 2, in proportion to the current applied.

"B" style (side in, nose out) - in the de-energized position the valve remains closed from port 2 to port 1. When current is applied to the coil, a controlled increasing flow will be allowed from port 2 to port 1. In both examples free reverse flow is allowed in the opposite direction.

Ratings and specifications

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure	280 bar (4000 psi)
Cartridge fatigue pressure (infinite life)	280 bar (4000 psi) NFPA rated
Rated flow	0 to 160 l/min (42 USgpm)
Operating media temperature	–30° + 90°C (–22° to + 194°F)
Cavity	C-16-3S (undercut) (See page 27)
Fluids	Antiwear hydraulic oils with Buna–N seals (standard) Phosphate esters (non–alkyl) with Viton® seals are available by request *Viton® is a registered trademark of E.I. DuPont Co.*
Weight cartridge only	1 kg. (2.2 lbs.)
Filtration	70–210 bar (1000–3000 psi) Cleanliness code 17/**15/12** 210+ bar (3000+ psi) Cleanliness code 15/**13/11**
Standard housing materials	Aluminum or steel
Typical hysteresis	Less than 4% of rated current @ 10 bar pressure drop–Pulse width Modulated (PWM)
Internal leakage @ 140 bar (2000 psi) and oil viscosity 30cSt	EPV16A 50 cm^3/min maximum EPV16B 10 cm^3/min maximum
Oil viscosity range	10-800 cSt
Nominal supply voltage	12/24 VDC
Minimum current for full function	1.4/0.7 amp
Pulse frequency	100 ± 10 Hz
Electrical requirements	1.4 amps @ 12 VDC
Threshold current	Adj. from 400 - 800 mamp (12 VDC) Adj. from 200 - 400 mamp (24 VDC) Adj. from 600 - 1400 mamp (12 VDC) Adj. from 300 - 700 mamp (24 VDC)
Coil current for maximum flow	0.7 amps @ 24 VDC
Recommended PWM frequency	65–150 Hz application dependent, 100 Hz typ
Coil resistance @ 20°C (68°F)	12V 6.5Ω/24V 25.0Ω
Power consumption @ rated current and 20°C coil temperature	12V 12.8 watts 24V 12.8 watts
Ramp	Optional
Cartridge seal kit	02-154069

**EPV 16 - * - ** - * - * * * - * * * - * - * - * * *

1 2 3 4 5 6 7 8 9 10

1 Function

EPV - Electro proportional valve

2 Size

16 - 16 size

3 Flow direction

A - Nose-in, side-out
B - Side-in, nose-out

4 Rated flow @ 10 bar ΔP

04 - 40 l/min (10.5 USgpm)
06 - 60 l/min (16 USgpm)
10 - 100 l/min (26 USgpm)
16 - 160 l/min (42 USgpm)

5 Valve housing material
Omit for cartridge only

A - Aluminum
S - Steel

Aluminum housings can be used for pressures up to 210 bar (3000 psi)

Steel housings **must** be used for operating pressures **above** 210 bar (3000 psi)

6 Port size

0 - Cartridge only

Code	Port size	Housing number			
		Aluminum		Steel	
		EPV16–A	EPV16–B	EPV16–A	EPV16–B
4G	1/2" BSPP	02–185448	02–166607	02–180050	02–165500
6G	3/4" BSPP	02–185449	02–161582	02–180051	02–164931
10H	SAE 10	02–185446	02–170238	———	———
12H	SAE 12	02–185447	02–166609		
10T	SAE 10	———	———	02–180048	02–161983
12T	SAE 12			02–180049	02–161982
5C	CETOP5 (NFPA D05) interface (Requires steel body)				

See page 30 for housings

7 Voltage rating

12D - 12VDC
24D - 24VDC

8 Manual override option*

Blank - No manual override
M - Pin type
S - Screw type

***Manual override is available in two different configurations, either push pin type or screw type. The push pin type is used when system pressure does not exceed 210 bar (3000 psi). The screw type can be used at any system pressure

9 Coil/Connector types

Connector	Coil part number	
Blank - No coil	12VDC	24VDC
W - Leadwire (DC only)	02–154072	02–154073
Q - Spade terminals (DC only)	02–317154	02–317155
U - DIN 43650	02–154070	02–154071
Y - Metri-Pak*	02–308808	02–308809
F - Weather-Pack	02–308810	02–308811

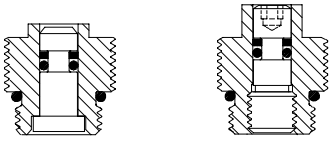
**Preferred Packard connector*

See page 31 for coil information.

10 Design number

WARNING: When using the "Screw Type" override, care must be taken to return the override back to its neutral position before activating the valve. Failure to take this precaution may result in personal injury or damage to the machine.

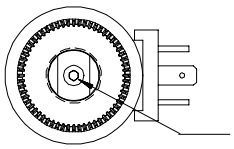
M - Pin type manual override option **S - Screw type manual override option**



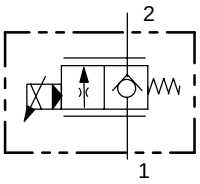
CAUTION: A separate check valve is required down stream to isolate the EPV valve from load forces when the EPV is used to hold a load.

mm (inch)

EPV16-A
Nose-in, side-out

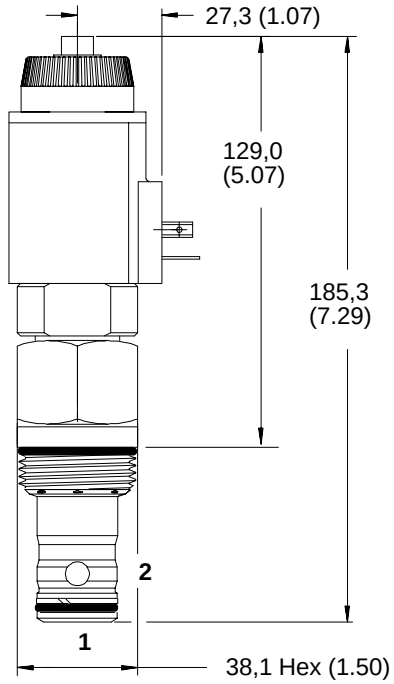


Screw type
actuator (shown)
3 mm hex socket

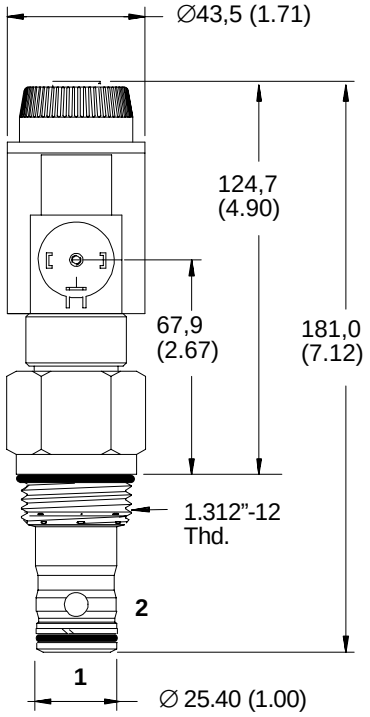


Note: When stand alone housings are used, the folowing guidelines apply:

EPV16-A: Port 3 is to be plugged.
EPV16-B: Port 3 is to be connected to port 1 in order to provide the required feedback flow path.



With manual actuator



No manual actuator

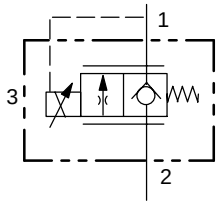
Valves are shown with “U” coil. See page 31 for coil information.

Torque cartridge in aluminum housing 108–122 Nm (80–90 lbf ft)

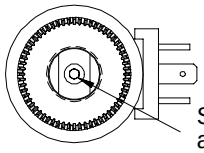
Torque cartridge in steel housing 136–149 Nm (100–110 lbf ft)

mm (inch)

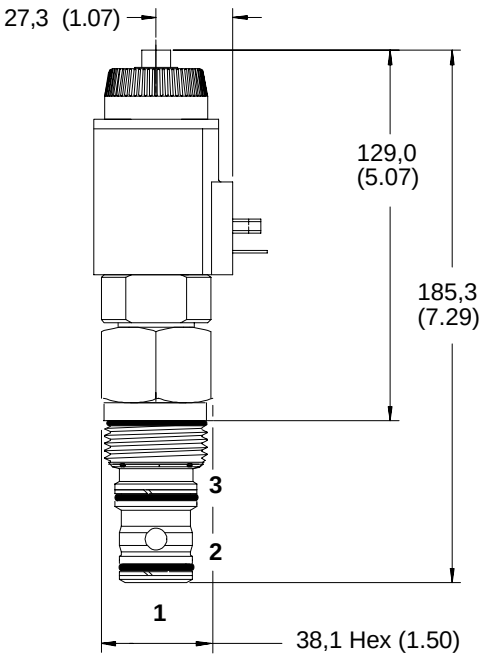
EPV16-B
Side-in, nose-out



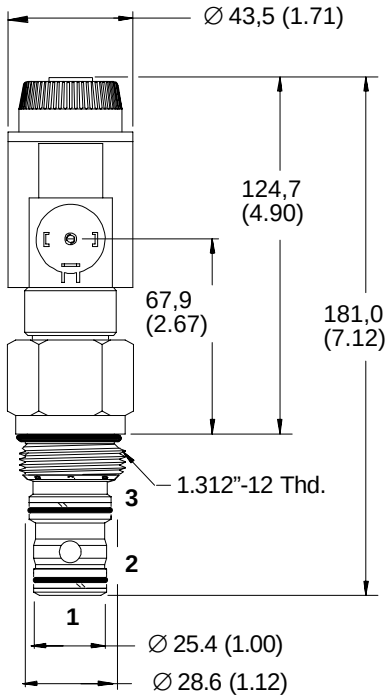
Required external connection with standard C-16-3S cavity



Screw type
actuator (shown)
3 mm hex socket



With manual actuator

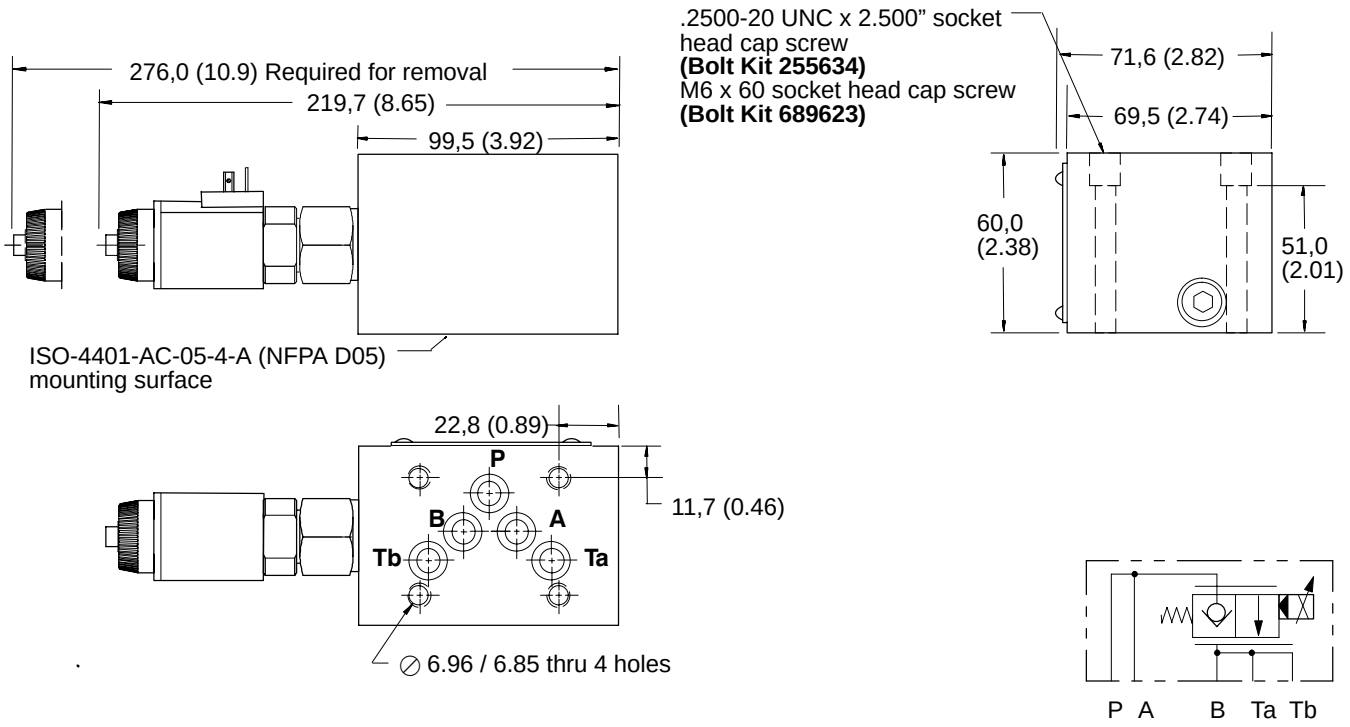


No manual actuator

For EPV16-B (flow 2 to 1), Port 3 must be connected to Port 1 externally to the cartridge, either by passages in the cavity block or external plumbing. When purchased with undercut body, this connection is included in the body and Port 3 is not machined. A separate external port connection is not required for EPV16-A (flow 1 to 2).

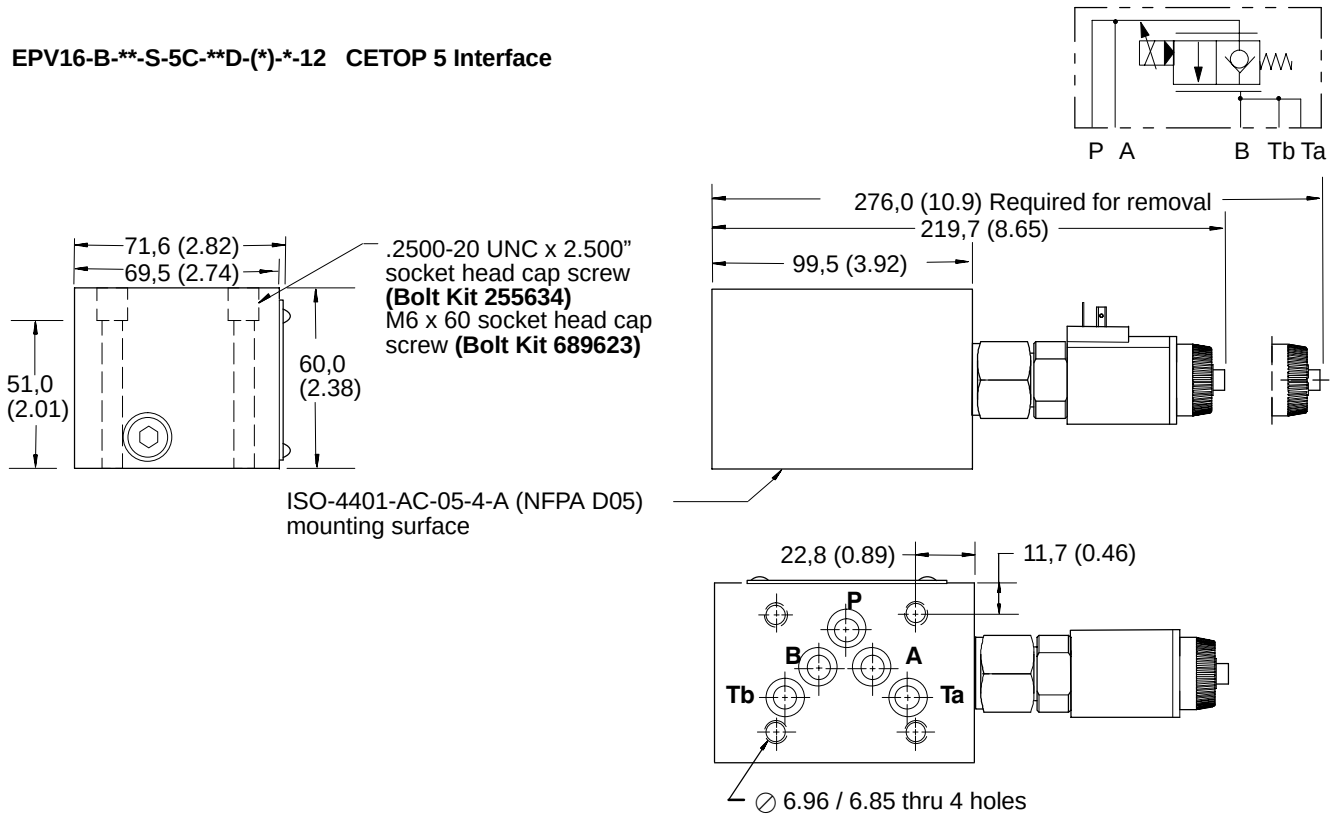
EPV16-A--S-5C-**D-(*)-*-12 CETOP 5 Interface**

mm (inch)

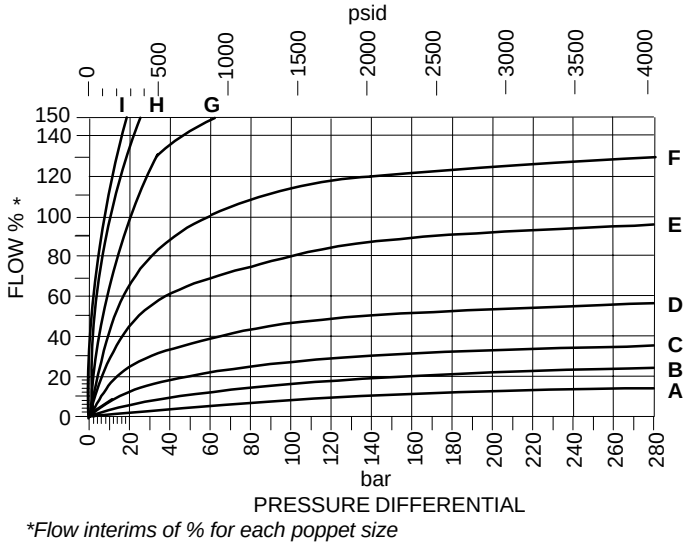


CETOP5 Seal Kit 02–319667

EPV16-B--S-5C-**D-(*)-*-12 CETOP 5 Interface**



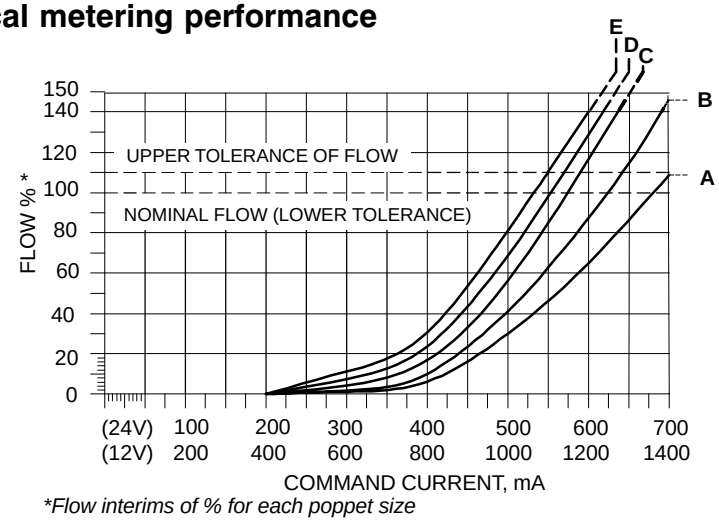
Typical pressure compensation



**Flow interims of % for each poppet size*

Command Current		
	12V	24V
A –	600 mA	300 mA
B –	700 mA	350 mA
C –	800 mA	400 mA
D –	900 mA	450 mA
E –	1000 mA	500 mA
F –	1100 mA	550 mA
G –	1200 mA	600 mA
H –	1300 mA	650 mA
I –	1400 mA	700 mA

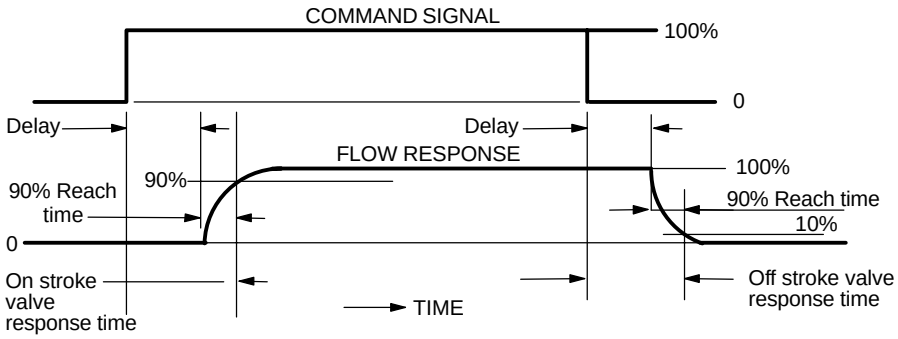
Typical metering performance



**Flow interims of % for each poppet size*

Pressure Differential		
A –	10 bar	150 psi
B –	20 bar	300 psi
C –	50 bar	700 psi
D –	100 bar	1500 psi
E –	200 bar	3000 psi

Step response definition of terms

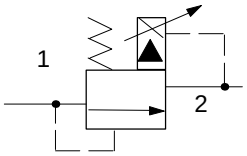


Pressure Drop @120 l/min (30 USgpm)

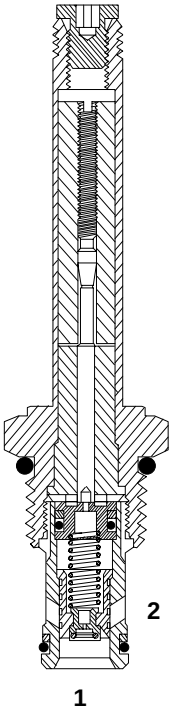
Pressure drop ΔP	On Stroke		Off Stroke	
	Delay	Reach 90%	Delay	Reach 90%
21 bar (300 psi)	24 ms	35 ms	5 ms	15 ms
105 bar (1500 psi)		17 ms		7 ms

ERV1-10
Proportionally controlled pressure relief valve

Functional Symbol



Sectional View



Description

The ERV1-10 is an electric, proportionally controlled, internally pilot operated, spool type, screw-in relief valve.

Operation

This valve remains closed between port 1 and 2 until the predetermined pressure setting has been reached at port 1, overcoming the electrical force and unseating the spool to allow flow from port 2.

Ratings and specifications

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports) . . . . . 2-210 bar (30-3000 psi)

Cartridge fatigue pressure (infinite life) . . . . . 210 bar (3000 psi)

Rated flow . . . . . 3,8-60,0 l/min (1-15 USgpm)

Cavity . . . . . C-10-2 (See page 26)

Standard housing materials . . . . . Aluminum

Temperature range . . . . . -40 to 120°C (-40° to 248°F)

Fluids . . . . . All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.

Filtration . . . . . Cleanliness code 18**/16/13**

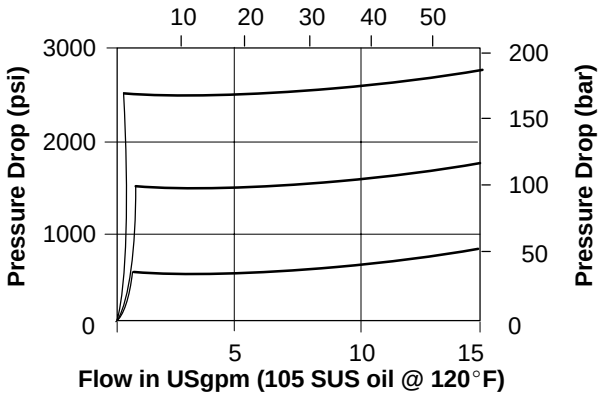
Weight cartridge and coil . . . . . 0,44 kg. (0.98 lbs.)

Seal kits . . . . . 565803 Buna-N
565086 Viton®

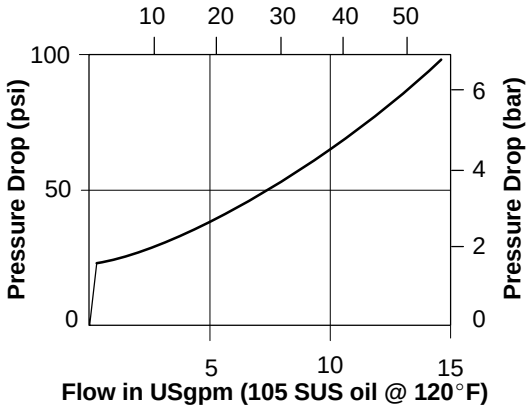
Viton® is a registered trademark of E.I. DuPont Co.

Pressure Override Characteristics

Pressure override, energized
Flow in lpm (21,8 cSt oil @ 49° C)



Pressure override, de-energized
Flow in lpm (21,8 cSt oil @ 49° C)



ERV1 - 10 (V)-* - ** - *** ***

1 2 3 4 5 6 7

1 Function

ERV1 - Proportional relief valve

2 Size

10 - 10 Size

3 Seals

Blank- Buna-N
V - Viton

4 Maximum pressure (factory set)

Customer to specify setting in increments of 7 bar (100 psi) and coded in hundreds within the 35-210 bar range (500-3000 psi) range.
Example:
5 - 35,0 (500 psi)

5 Port size

0 – Cartridge only

Code	Port size	Housing number
6T	SAE 6	566151
2G	1/4" BSPP	876702
3G	3/8 " BSPP	876703
6H	SAE 6	876700
8H	SAE 8	876701

See page 29 for housings

6 Voltage rating

00	-	No coil
12D	-	12VDC
24D	-	24VDC
36D	-	36VDC
12B	-	12VDC/w diode*
24B	-	24VDC/w diode*

*optional arc suppressing diode

7 Connector types

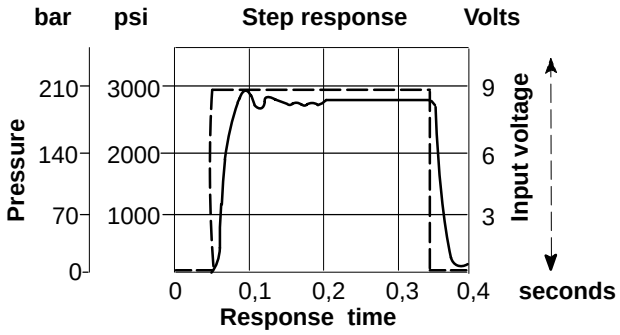
Blank – No coil

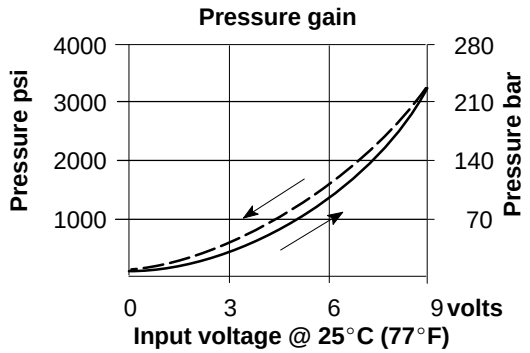
Voltage	**G** - ISO 4400 DIN 43650	**P** - 1/2" NPT conduit port w/ leadwire	**Q** - Spade terminals	**W** - Leadwire	**N** - Deutsch	**Y** - Amp JR
12D	02-178086	02-178078	02-178070	02-178063	02-178093	02-178711
24D	02-178087	02-178079	02-178073	02-178065	02-178094	02-178712
36D	02-178089	02-178080	02-178075	02-178066	02-178095	02-178713
12B	02-178840		02-178834	02-178832	02-178842	02-178762
24B	02-178841		02-178835	02-178833	02-178843	02-178846

Valve is shown with "W" coil. See page 33 for coil information and dimensions.

Performance characteristics

Cartridges only Zero outlet pressure



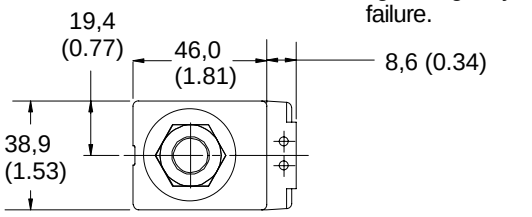


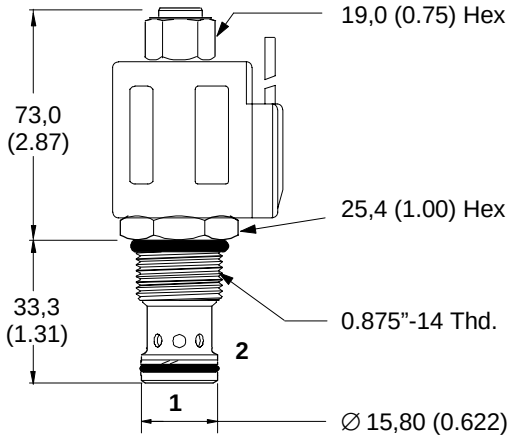
Dimensions

mm (inch)

Torque cartridge in housing 47-54 Nm (35-40 lbf ft)

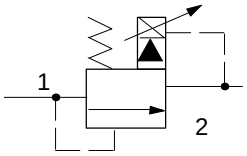
WARNING
Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Over–tightening may cause valve failure.



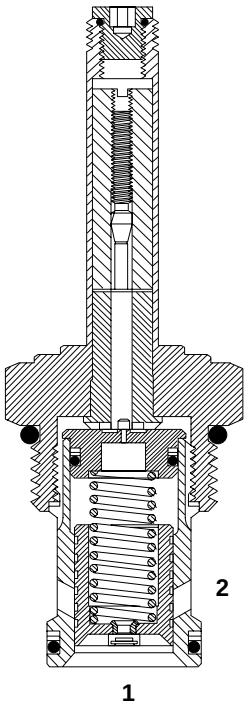


ERV1-16
Proportionally controlled pressure relief valve

Functional Symbol



Sectional View



Description

The ERV1-16 is an electric, proportionally controlled, internally pilot operated, spool type, screw-in relief valve.

Operation

This valve remains closed between port 1 and 2 until the predetermined pressure setting has been reached at port 1, overcoming the electrical force and unseating the spool to allow flow from port 2.

Ratings and specifications

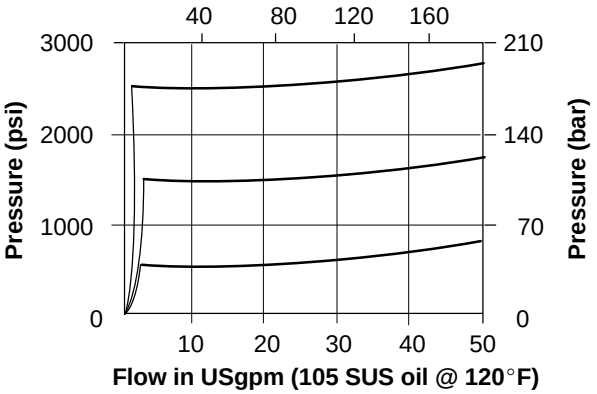
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	3,5-210 bar (50-3000 psi)
Cartridge fatigue pressure (infinite life)	210 bar (3000 psi)
Rated flow	7,6-132,0 l/min (2-35 USgpm)
Cavity	C-16-2 (See page 26)
Standard housing materials	Aluminum
Temperature range	-40 to 120°C (-40° to 248°F)
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18**/16/13**
Weight cartridge and coil	0,44 kg. (0.98 lbs.)
Seal kits	565810 Buna-N 889609 Viton®

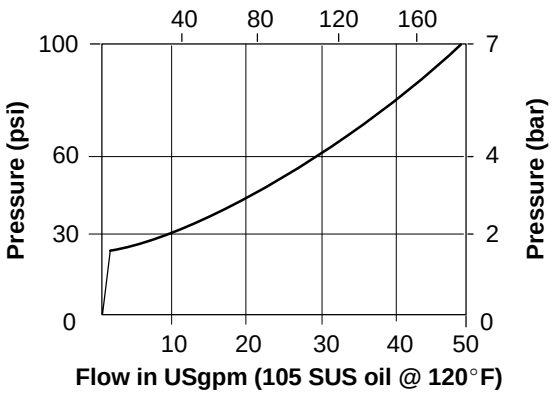
Viton® is a registered trademark of E.I. Dupont Co.

Pressure Override Characteristics

Pressure override, energized



Pressure override, de-energized



ERV1 -16 (V)- * * * - * * * - * * * * *

1 2 3 4 5 6 7

1 Function

ERV1 - Proportional relief valve

2 Size

16 - 16 Size

3 Seals

Blank- Buna-N
V - Viton

4 Maximum pressure (factory set)

Customer to specify setting in increments of 7 bar (100 psi) and coded in hundreds within the 35-210 bar range (500-3000 psi) range.
Example:
5 - 35,0 (500 psi)

5 Port size

0 - Cartridge only

Code	Port size	Housing number
12T	SAE 12	566149
4G	1/2" BSPP	876716
6G	3/4 " BSPP	876718
10H	SAE 10	876717
12H	SAE 12	566113

See pages 28 and 29 for housings

6 Voltage rating

00	-	No coil
12D	-	12VDC
24D	-	24VDC
36D	-	36VDC
12B	-	12VDC/w diode*
24B	-	24VDC/w diode*

*optional arc suppressing diode

7 Connector types

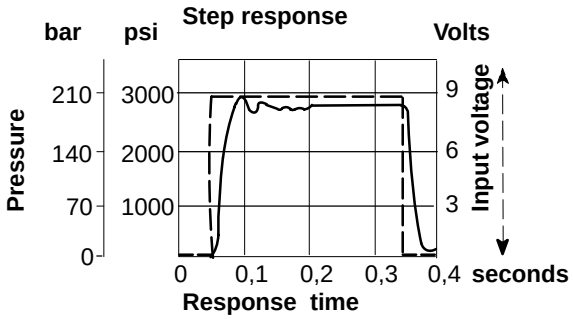
Blank- No coil

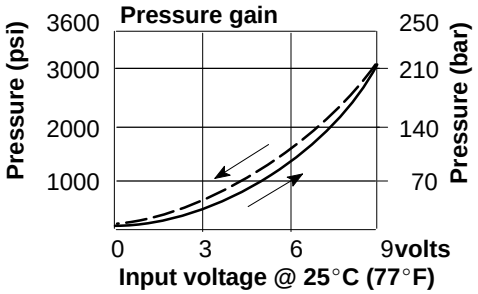
Voltage	**G** - ISO 4400 DIN 43650	**P** - 1/2" NPT conduit port w/ leadwire	**Q** - Spade terminals	**W** - Leadwire	**N** - Deutsch	**Y** - Amp JR
12D	02-178086	02-178078	02-178070	02-178063	02-178093	02-178711
24D	02-178087	02-178079	02-178073	02-178065	02-178094	02-178712
36D	02-178089	02-178080	02-178075	02-178066	02-178095	02-178713
12B	02-178840		02-178834	02-178832	02-178842	02-178762
24B	02-178841		02-178835	02-178833	02-178843	02-178846

Valve is shown with "W" coil. See page 33 for coil information and dimensions.

Performance characteristics

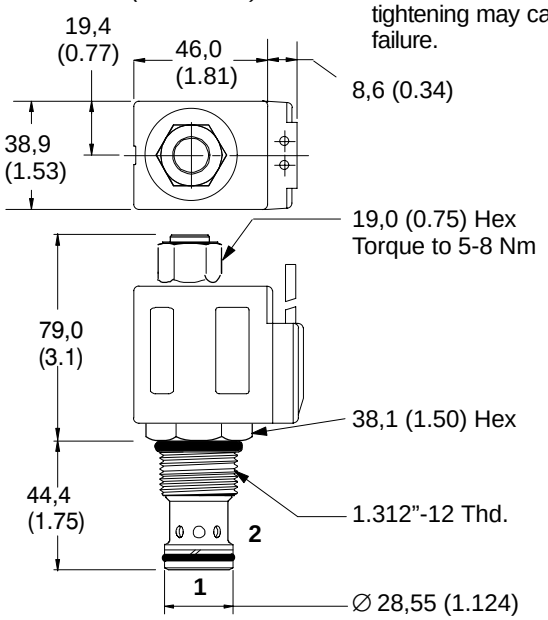
Cartridges only Zero outlet pressure





Dimensions

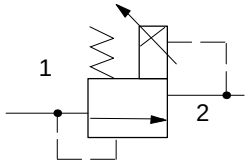
mm (inch)
Torque cartridge in housing 108-122 Nm (80-90 lbf ft)



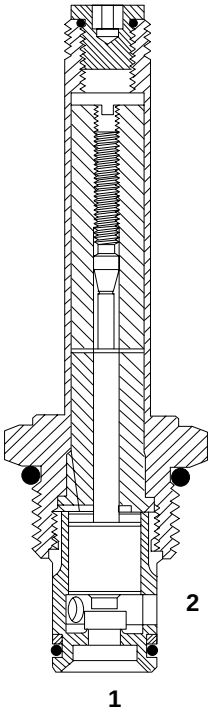
WARNING
Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Over–tightening may cause valve failure.

ERV2-10
Proportionally controlled pressure relief valve

Functional Symbol



Sectional View



Description

The ERV2-10 is an electric, proportionally controlled, internally pilot operated, spool type screw-in relief valve.

Operation

This valve remains closed between port 1 and 2 until the predetermined pressure setting has been reached at port 1, overcoming the electrical force and unseating the spool to allow flow from port 2.

Ratings and specifications

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports) . . . . . 0-35 bar (0-500 psi)

Cartridge fatigue pressure rated (infinite life) . . . . . 35 bar (500 psi)

Rated flow . . . . . 0,2-2,8 l/min (0.05-0.75 USgpm)

Cavity . . . . . C-10-2 (See page 26)

Standard housing materials . . . . . Aluminum

Temperature range . . . . . -40 to 120°C (-40° to 248°F)

Fluids . . . . . All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.

Filtration . . . . . Cleanliness code 18**/16/13**

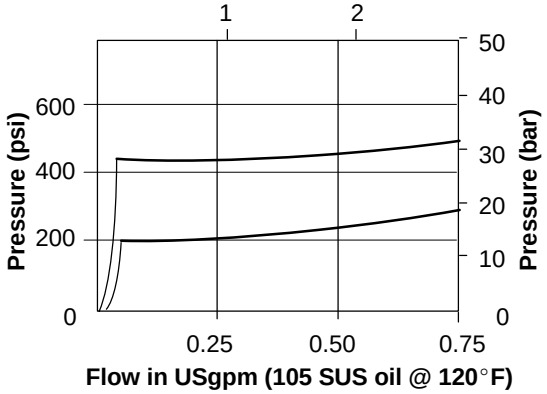
Weight cartridge and coil . . . . . 0,43 kg. (0.95 lbs.)

Seal kits . . . . . 565803 Buna-N
566086 Viton®

Viton® is a registered trademark of E.I. DuPont Co.

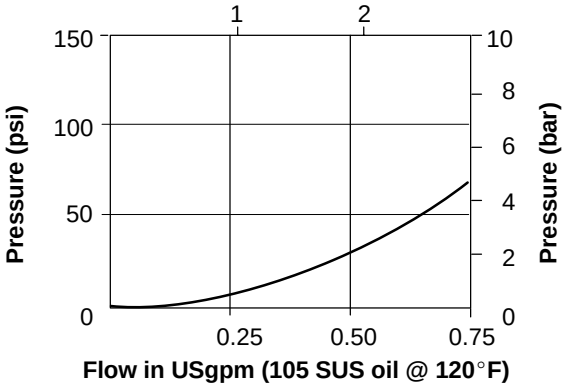
Pressure Override Characteristics

Pressure override, energized
Flow in lpm (21,8 cSt oil @ 49° C)



Flow in USgpm (105 SUS oil @ 120°F)

Pressure override, de-energized
Flow in lpm (21,8 cSt oil @ 49° C)



Flow in USgpm (105 SUS oil @ 120°F)

ERV2 - 10 (V) - * * * - * * - * * * * * **

1 2 3 4 5 6 7

1 Function

ERV2 - Proportional relief valve

2 Size

10 - 10 Size

3 Seals

Blank- Buna-N
V - Viton

4 Maximum pressure (factory set)

Customer to specify setting in increments of 7 bar (100 psi) and coded in hundreds within the 0-35 bar range (0-500 psi) range.
Example:
5 - 35,0 (500 psi)

5 Port size

0 - Cartridge only

Code	Port size	Housing number
6T	SAE 6	566151
2G	1/4" BSPP	876702
3G	3/8 " BSPP	876703
6H	SAE 6	876700
8H	SAE 8	876701

See page 29 for housings

6 Voltage rating

00	-	No coil
12D	-	12VDC
24D	-	24VDC
36D	-	36VDC
12B	-	12VDC/w diode*
24B	-	24VDC/w diode*

*optional arc suppressing diode

7 Connector types

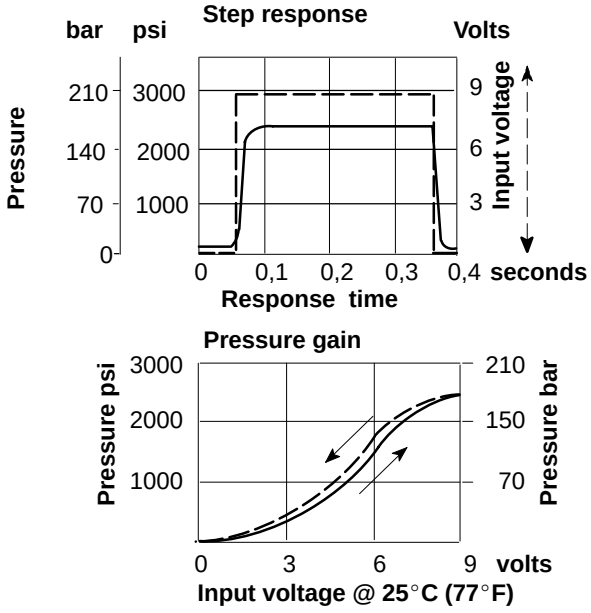
Blank- No coil

Voltage	**G** - ISO 4400 DIN 43650	**P** - 1/2" NPT conduit port w/ leadwire	**Q** - Spade terminals	**W** - Leadwire	**N** - Deutsch	**Y** - Amp JR
12D	02-178086	02-178078	02-178070	02-178063	02-178093	02-178711
24D	02-178087	02-178079	02-178073	02-178065	02-178094	02-178712
36D	02-178089	02-178080	02-178075	02-178066	02-178095	02-178713
12B	02-178840		02-178834	02-178832	02-178842	02-178762
24B	02-178841		02-178835	02-178833	02-178843	02-178846

Valve is shown with "W" coil. See page 33 for coil information and dimensions.

Performance characteristics

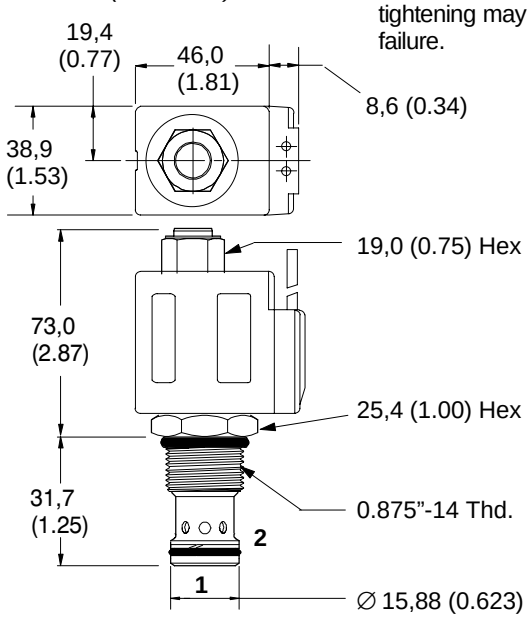
Cartridges only Zero outlet pressure



Dimensions

mm (inch)

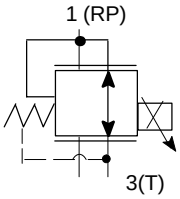
Torque cartridge in housing 47-54 Nm (35-40 lbf ft)



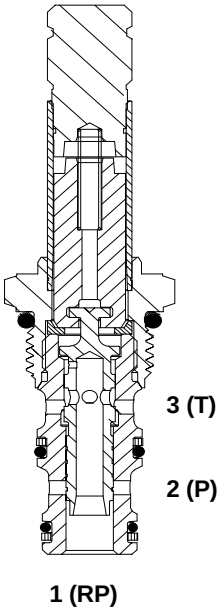
WARNING
Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Over–tightening may cause valve failure.

EPRV2-8
Proportional pressure reducing-relieving valve

Functional Symbol



Sectional View



Description

The EPRV2-8 is a proportional, pressure reducing-relieving, sliding spool, electrically controlled, screw-in cartridge type valve.

Operation

In the de-energized position, pressure inlet port 2 is closed and reduced pressure port 1 is open to return port 3. As electrical current is increased, port 2 opens to port 1 and port 3 closes, proportionally increasing pressure at port 1. If the pressure at port 1 exceeds the setting of the valve, the spool will shift further and relieve to port 3.

Ratings and specifications

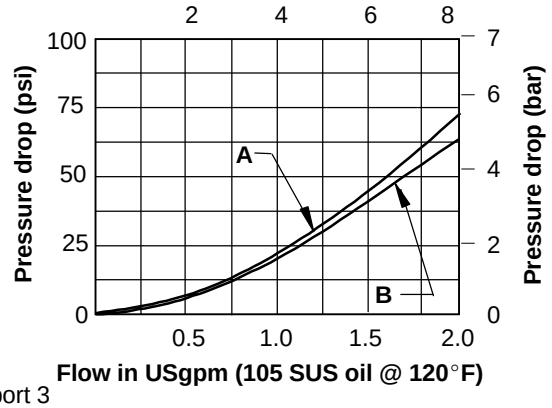
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Maximum inlet pressure	35 bar (500 psi)
Cartridge fatigue pressure (infinite life)	35 bar (500 psi)
Reduced pressure range	0-22 bar (0-320 psi)
Maximum operating flow	7,6 L/min (2 USgpm)
Cavity	C-8-3 (See page 27)
Standard housing materials	Aluminum
Temperature range	-40 to 120°C (-40° to 248°F)
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18**/16/13**
Recommended PWM frequency	150 Hz
Hysteresis @ 150 Hz PWM	5%
Weight including coil	0,29 kg. (0.64 lbs.)
Seal kits	02-179451 Buna-N 02-179452 Viton®

Viton® is a registered trademark of E.I. DuPont Co.

Performance Characteristics

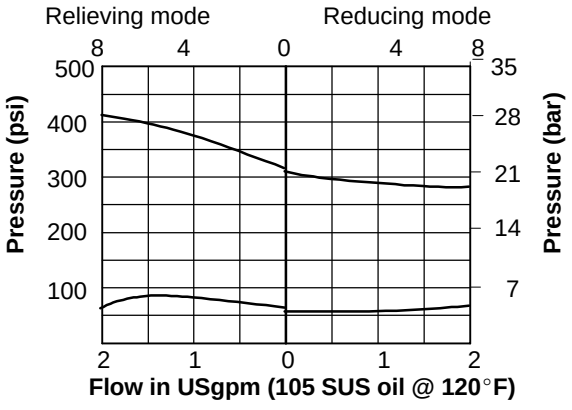
Pressure drop vs flow
Flow in lpm (21,8 cSt oil @ 49° C)



Flow in USgpm (105 SUS oil @ 120°F)

A–Port 1 to port 3
B–Port 2 to port 1

Pressure vs flow
Flow in lpm (21,8 cSt oil @ 49° C)



Flow in USgpm (105 SUS oil @ 120°F)

Model Code

EPRV2-8

EPRV2 – 8 (V) – (A) – ** – * * ***

1 2 3 4 5 6 7 8

1 Function

EPRV2 - Proportional reducing/relieving valve

2 Size

8 - 8 Size

3 Seals

Blank - Buna-N
V - Viton

4 Valve housing material
Omit for cartridge only

A - Aluminum

5 Port size

0- Cartridge only

Code	Port size	Housing number
4T	SAE 4	02-160741
6T	SAE 6	02-160742
2G	1/4" BSPP	02-160739
3G	3/8" BSPP	02-160740

See page 29 for housings

6 Voltage rating

00	-	No coil
12D	-	12VDC
24D	-	24VDC
12B	-	12VDC/w diode*
24B	-	24VDC/w diode*

*optional arc suppressing diode

7 Connector types

Blank - No coil

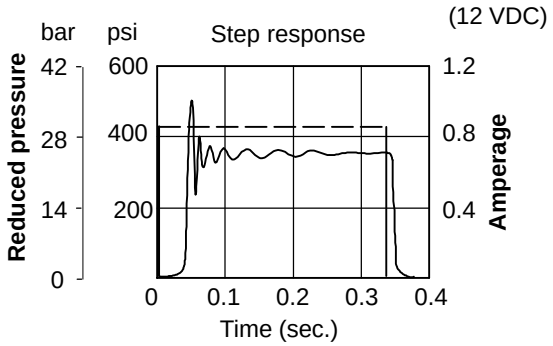
Voltage	**G** - ISO 4400 DIN 43650	**P** - 1/2" NPT conduit port w/ leadwire	**Q** - Spade terminals	**W** - Leadwire	**N** - Deutsch	**Y** - Amp JR
12D	02-160690	02-160684	02-160681	02-160678	02-160958	02-178001
24D	02-160691	02-160685	02-160682	02-160679	02-160959	02-178002
12B	02-178810	–	02-178804	02-178802	02-160953	02-160957
24B	02-178811	–	02-178805	02-178803	02-178812	02-178815

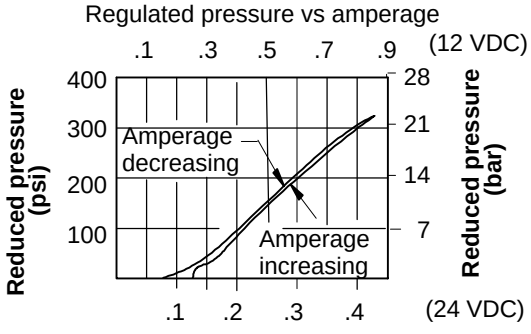
8 Coil

S - 8 series, 16w

Valve is shown with "N" coil. See page 32for coil information and dimensions.

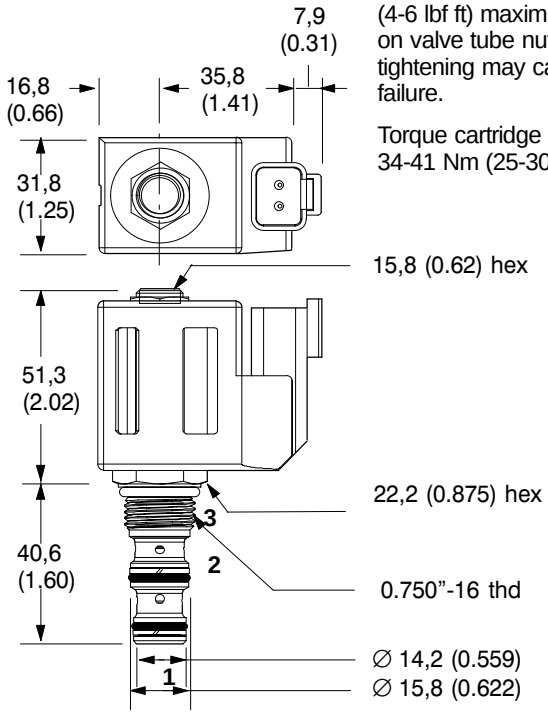
Performance characteristics





Dimensions

mm (inch)

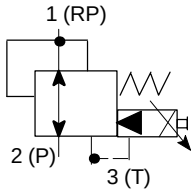


WARNING
Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Over-tightening may cause valve failure.

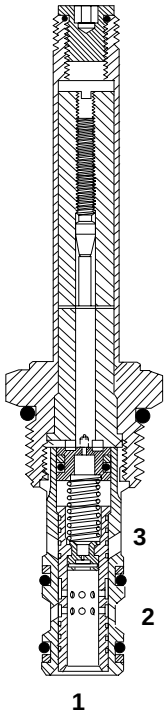
Torque cartridge in housing 34-41 Nm (25-30 lbf ft)

EPRV1-10
Proportional pressure reducing-relieving valve

Functional Symbol



Sectional View



Description

The EPRV1-10 is an electric, proportionally controlled, internally pilot operated, spool type, screw-in, pressure reducing/relieving valve.

Operation

This valve remains open from port 2 to port 1 (port 3 must be vented). Once the predetermined pressure is reached at port 1, the spool shifts to restrict the inlet flow at port 2, which regulates the pressure at port 1. If the pressure at port 1 exceeds the setting of the valve, the spool will shift farther and relieve to port 3.

Ratings and specifications

Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

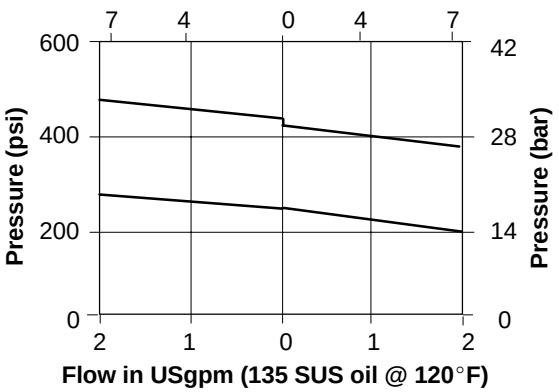
Typical application pressure (all ports)	3,5-35 bar (50-500 psi)
Cartridge fatigue pressure (infinite life)	35 bar (500 psi)
Rated flow	0-7,6 l/min (0-2.0 USgpm)
Cavity	C-10-3 (See page 27)
Standard housing materials	Aluminum
Temperature range	-40 to 120°C (-40° to 248°F)
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18**/16/13**
Weight including coil	0,44 kg. (0.98 lbs.)
Seal kits	565804 (Buna-N) 889599 Viton®

Viton® is a registered trademark of E.I. DuPont Co.

Pressure Override Characteristics

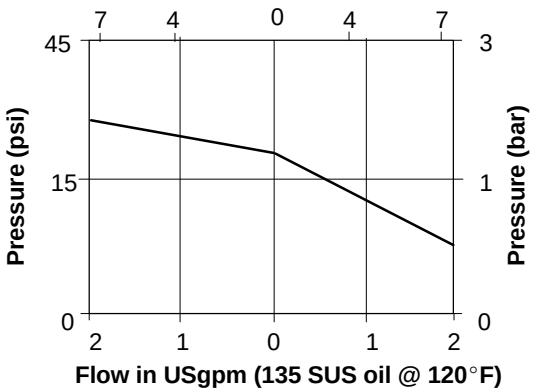
Pressure override, energized

Flow in lpm (28,0 cSt oil @ 49° C)



Pressure override, de-energized

Flow in lpm (28,0 cSt oil @ 49° C)



EPRV1 -10 (V) -- ** - *** ***

1 2 3 4 5 6 7

1 Function

EPRV1 -Proportional reducing/relieving valve

2 Size

10 - 10 Size

3 Seals

Blank - Buna-N
V - Viton

4 Maximum pressure (factory set)

Customer to specify setting in increments of 7 bar (100 psi) and coded in hundreds within the 14,0-35,0 bar range (200-500 psi) range.
Example:
5 - 35,0 (500 psi)

5 Port size

0 - Cartridge only

Code	Port size	Housing number
3B	3/8" BSPP	02-173358
6T	SAE 6	566162
2G	1/4 " BSPP	876702
3G	3/8" BSPP	876714
6H	SAE 6	876704
8H	SAE 8	876711

See page 28 for housings

6 Voltage rating

00	-	No coil
12D	-	12VDC
24D	-	24VDC
12B	-	12VDC/w diode*
24B	-	24VDC/w diode*

*optional arc suppressing diode

7 Connector types

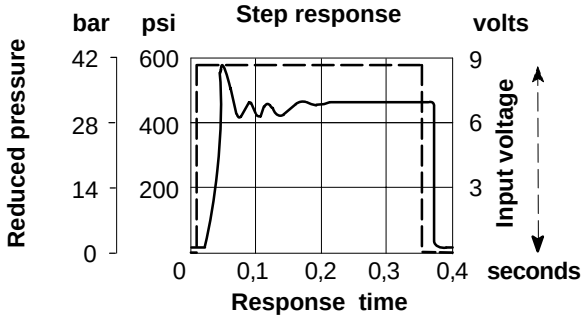
Blank - No coil

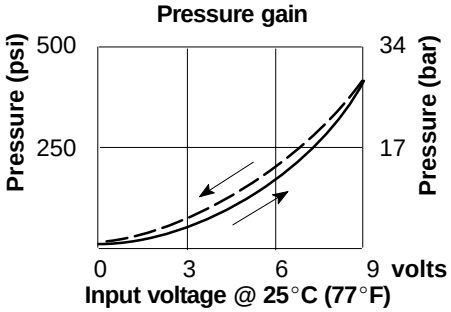
Voltage	**G** - ISO 4400 DIN 43650	**P** - 1/2" NPT conduit port w/ leadwire	**Q** - Spade terminals	**W** - Leadwire	**N** - Deutsch	**Y** - Amp JR
12D	02-178086	02-178078	02-178070	02-178063	02-178093	02-178711
24D	02-178087	02-178079	02-178073	02-178065	02-178094	02-178712
12B	02-178840		02-178834	02-178832	02-178842	02-178762
24B	02-178841		02-178835	02-178833	02-178843	02-178846

Valve is shown with "W" coil. See page 33 for coil information and dimensions.

Performance characteristics

Cartridges only Zero outlet pressure



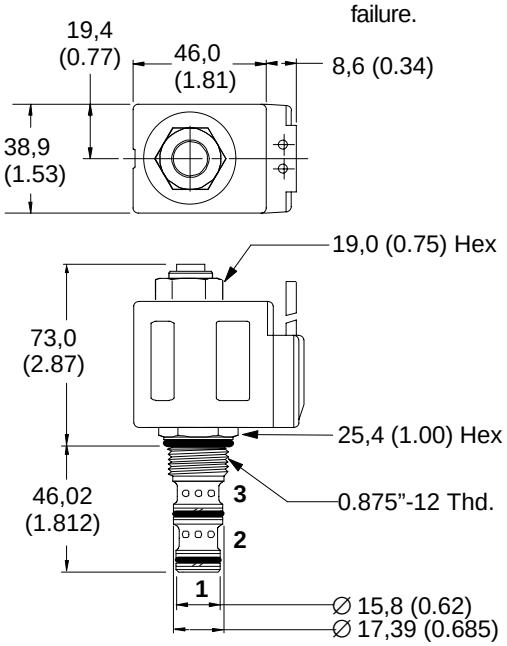


Dimensions

mm (inch)

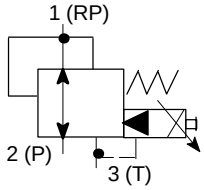
Torque cartridge in housing 47-54 Nm (35-40 lbf ft)

WARNING
Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Over–tightening may cause valve failure.

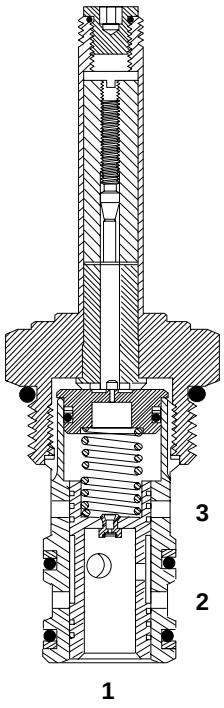


EPRV1-16
Proportional pressure reducing-relieving valve

Functional Symbol



Sectional View



Description

The EPRV1-16 is an electric, proportionally controlled, internally pilot operated, spool type, screw-in pressure reducing/relieving valve.

Operation

This valve remains open from port 2 to port 1 (port 3 must be vented). Once the predetermined pressure is reached at port 1, the spool shifts to restrict the inlet flow at port 2, which regulates the pressure at port 1. If the pressure at port 1 exceeds the setting of the valve, the spool will shift farther and relieve to port 3.

Ratings and specifications

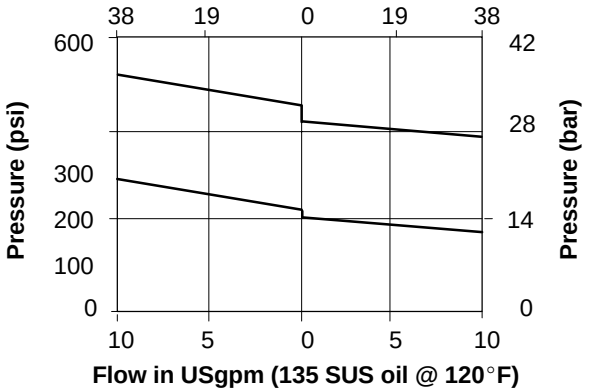
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports)	3,5-35 bar (50-500 psi)
Cartridge fatigue pressure (infinite life)	35 bar (500 psi)
Rated flow	0-38,0 l/min (0-10 USgpm)
Cavity	C-16-3 (See page 27)
Standard housing materials	Aluminum
Temperature range	-40 to 120°C (-40° to 248°F)
Fluids	All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration	Cleanliness code 18**/16/13**
Weight including coil	0,9 kg. (2.0 lbs.)
Seal kits	565811 Buna-N 889599 Viton®

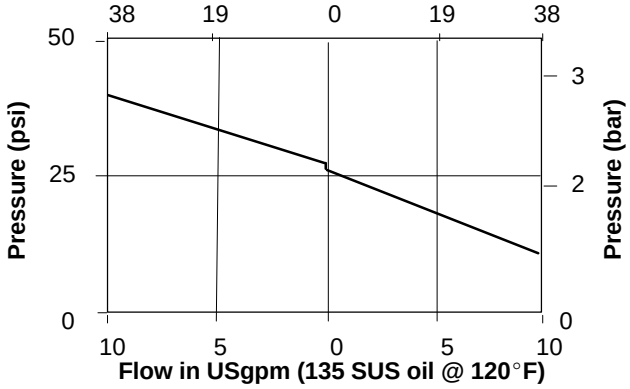
Viton® is a registered trademark of E.I. DuPont Co.

Pressure Override Characteristics

Pressure override, energized
Flow in lpm (28,0 cSt oil @ 49° C)



Pressure override, de-energized
Flow in lpm (28,0 cSt oil @ 49° C)



EPRV1 - 16 (V) - * * - * * * - * * * *

1 2 3 4 5 6 7

1 Function

EPRV1- Proportional reducing/relieving valve

2 Size

16 - 16 Size

3 Seals

Blank - Buna-N
V - Viton

4 Maximum pressure (factory set)

Customer to specify setting in increments of 7 bar (100 psi) and coded in hundreds within the 14,0-35,0 bar range (200-500 psi) range.
Example:
5 - 35,0 (500 psi)

5 Port size

0 - Cartridge only

Code	Port size	Housing number
6B	3/4" BSPP	02-175465
12T	SAE 12	566152
6G	3/4 " BSPP	876722
10H	SAE 10	876721
12H	SAE 12	876723

See pages 28 and 29 for housings

6 Voltage rating

00 - No coil
12D - 12VDC
24D - 24VDC
12B - 12VDC/w diode*
24B - 24VDC/w diode*
*optional arc suppressing diode

7 Connector types

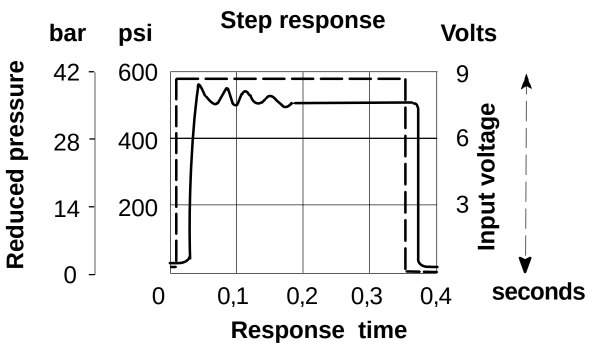
Blank - No coil

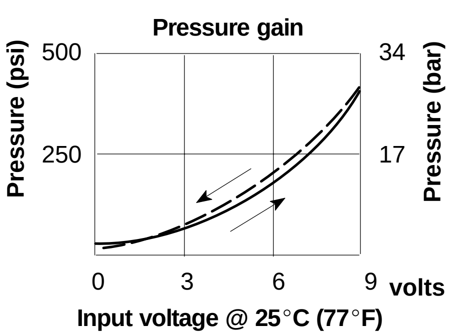
Voltage	**G** - ISO 4400 DIN 43650	**P** - 1/2" NPT conduit port w/ leadwire	**Q** - Spade terminals	**W** - Leadwire	**N** - Deutsch	**Y** - Amp JR
12D	02-178086	02-178078	02-178070	02-178063	02-178093	02-178711
24D	02-178087	02-178079	02-178073	02-178065	02-178094	02-178712
12B	02-178840		02-178834	02-178832	02-178842	02-178762
24B	02-178841		02-178835	02-178833	02-178843	02-178846

Valve is shown with "W" coil. See page 33 for coil information and dimensions.

Performance characteristics

Cartridges only Zero outlet pressure



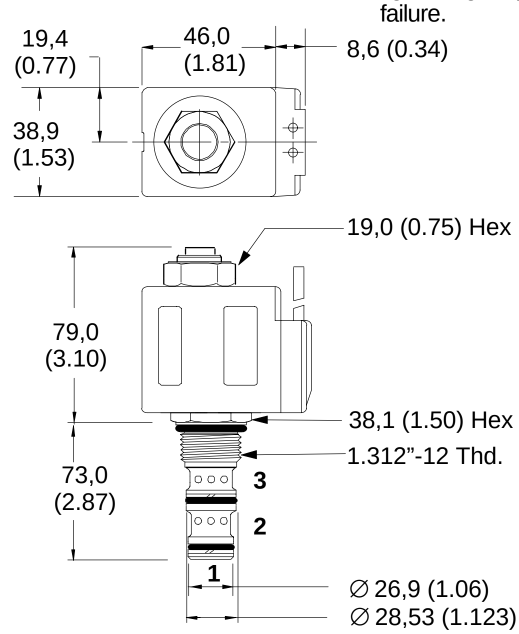


Dimensions

mm (inch)

Torque cartridge in housing 108-122 Nm (80-90 lbf ft)

WARNING
Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Over–tightening may cause valve failure.



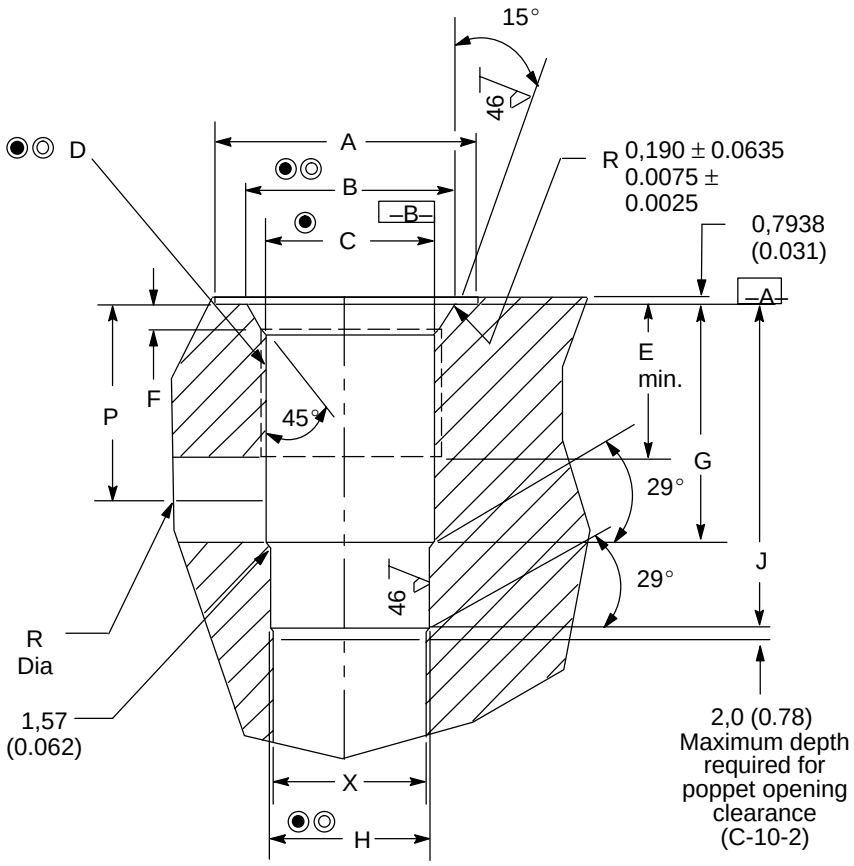
C-**-2 Cavity Dimensions

Dimensions
mm (inch)

Cavity bores can be machined accurately in aluminum or steel. The necessary UNF, or UN threads may be machined using standard small tools, possibly already in your machine shop or from a local tool supplier. For in depth advice on the machining of cavities, consult your Vickers sales specialist.

Either you, our customer, or Vickers can design and manufacture customized manifolds or housings dedicated to individual applications. We call the resulting valve packages Modular Circuit Designs (MCDs). Cartridges selected for your application can be accomodated in one or more MCDs, according to your requirements.

WARNING:
For EPV-10, the cavity should be machined to the 14,29 (0.562) maximum diameter and 36,00 (1.417) maximum depth.



2-way cavity

◉ These diameters ⌖ 0,051 mm (.002 inch) B unless otherwise specified.

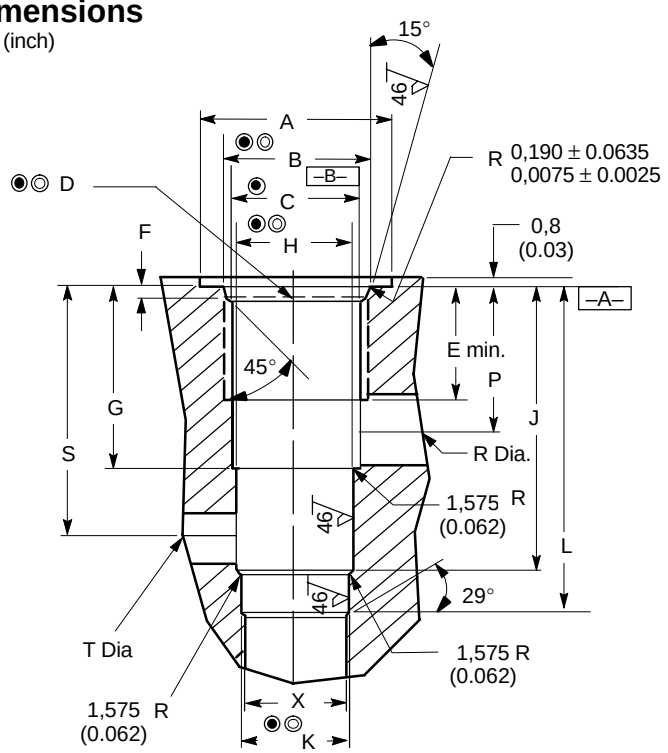
◎ These diameters ⊥ 0,025 mm (.001 inch) A unless otherwise specified.

Cavity mm (inch)	**A Spotface**	**B +0,051 0 (+0.002 0)**	**C +0,051 0 (+0.002 0)**	**D Thread**	**E Full Thread**	**F**	**G**	**H ±0,0254 (±0.001)**	**J**	**P**	**R Max. Dia.**	**X Max. Dia.**
C–10–2	30,16 (1.188)	24,00 (0.945)	20,62 (0.812)	.875”–14	15,88 (0.625)	2,54/2,92 (0.100/0.115)	23,80 (0.937)	15,90 (0.626)	33,32 (1.312)	18,26 (0.718)	11,11 (0.437)	14,29 (0.562)
C–16–2	44,45 (1.750)	35,58 (1.401)	31,34 (1.234)	1.312”–12	22,22 (0.875)	3,30/3,68 (0.130/0.145)	34,14 (1.344)	28,62 (1.127)	46,84 (1.844)	24,60 (0.968)	19,05 (0.750)	19,05 (0.750)

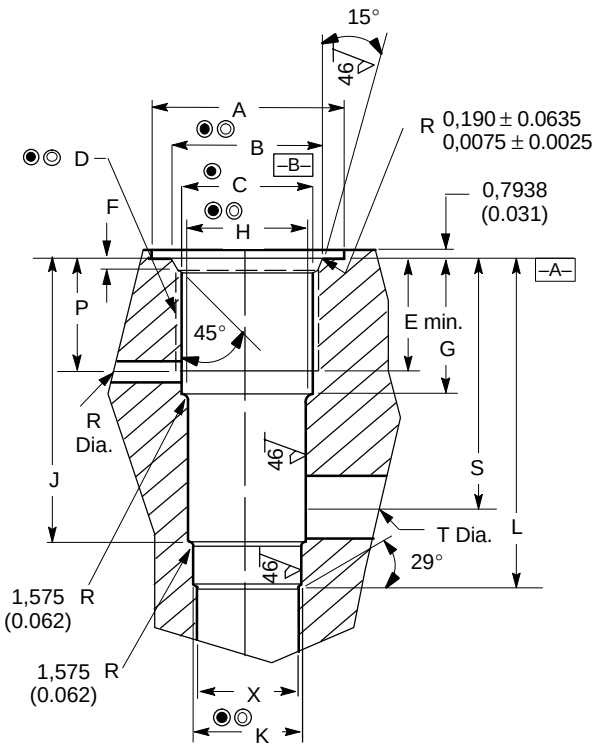
C-**-3 Cavity Dimensions

Dimensions

mm (inch)



3-way cavity



3-way short cavity (S)

◉ These diameters | 0,051 mm (.002 inch) | B | unless otherwise specified.

◎ These diameters | ⊥ | 0,025 mm (.001 inch) | A | unless otherwise specified.

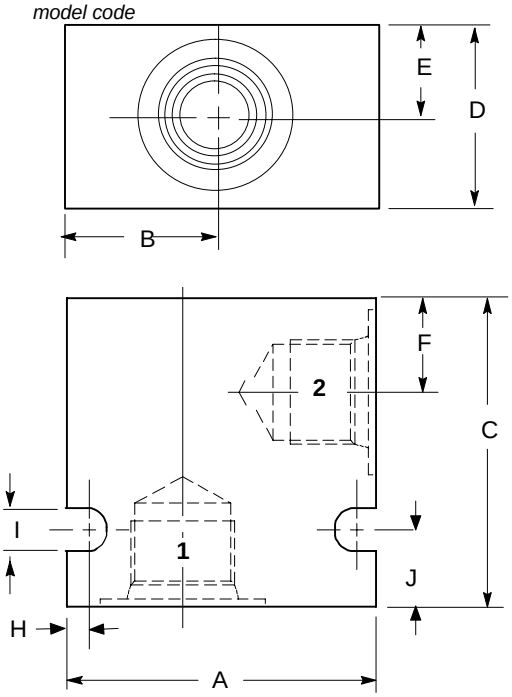
Cavity mm (inch)	**A Spotface**	**B +0,051 0 (+0.002 0)**	**C +0,051 0 (+0.002 0)**	**D Thread**	**E Full Thread**	**F**	**G**	**H ±0,0254 (±0.001)**	**J**	**K ±0,0254 (±0.001)**	**L**
C–8–3	30,16 (1.188)	20,65 (0.813)	17,47 (0.688)	0.750”–16	12,70 (0.500)	2,65/2,92 (0.100/0.115)	18,24 (0.718)	15,90 (0.626)	33,26 (1.270)	14,30 (0.563)	43,26 (1.703)
C–10–3	30,16 (1.188)	24,00 (0.945)	20,62 (0.812)	0.875”–14	15,88 (0.625)	2,54/2,92 (0.100/0.115)	21,59 (0.850)	17,50 (0.689)	38,10 (1.500)	15,90 (0.626)	47,62 (1.875)
C–16–3	44,45 (1.750)	35,58 (1.401)	31,34 (1.234)	1.312”-12	22,22 (0.875)	3,30/3,68 (0.130/0.145)	34,14 (1.344)	28,62 (1.127)	62,71 (2.469)	27,02 (1.064)	75,39 (2.968)
C–16–3S	44,45 (1.750)	35,58 (1.401)	31,34 (1.234)	1.312”-12	17,46 (0.687)	3,30/3,68 (0.130/0.145)	20,62 (0.812)	28,62 (1.127)	46,02 (1.812)	25,45 (1.002)	55,58 (2.188)

Cavity mm (inch)	**P**	**R Max. Dia.**	**S**	**T Max. Dia.**	**X Max. Dia.**
C–8–3	14,68 (0.578)	5,94 (0.234)	28,98 (1.141)	5,94 (0.234)	12,70 (0.501)
C–10–3	18,26 (0.719)	6,35 (0.250)	34,13 (1.344)	6,35 (0.250)	14,29 (0.562)
C–16–3	24,60 (0.968)	15,88 (0.625)	53,18 (2.093)	15,88 (0.625)	19,05 (0.750)
C–16–3S	16,67 (0.656)	6,35 (0.250)	37,31 (1.468)	15,88 (0.625)	19,05 (0.750)

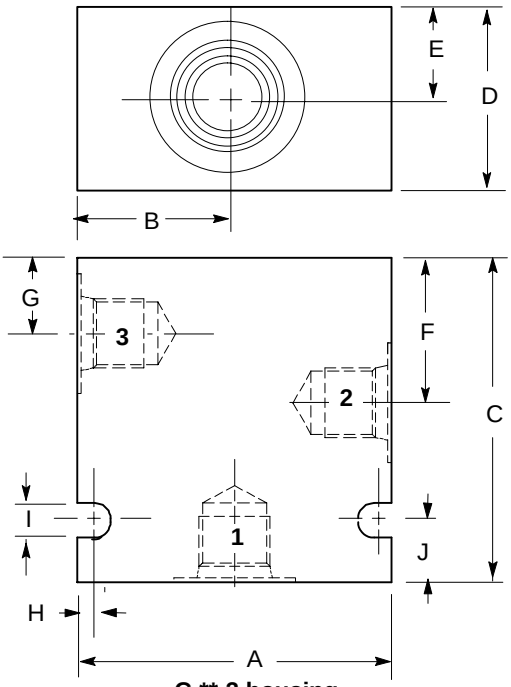
C-**-2 & 3 Aluminum Housings (Light Duty)

Housing	All Ports	Part Number
C-10-2	3/8” BSPP	02-175462
	SAE 6	566151
C-16-2	3/4” BSPP	02-175463
	SAE 12	566149
C-10-3	3/8” BSPP	02–173358
	SAE 6	566162
C-16-3	3/4” BSPP	02–175465
	SAE 12	566152

Note:BSPP porting is designated by “B” in the model code
SAE porting is designated by “T” in the model code



C--2 housing**



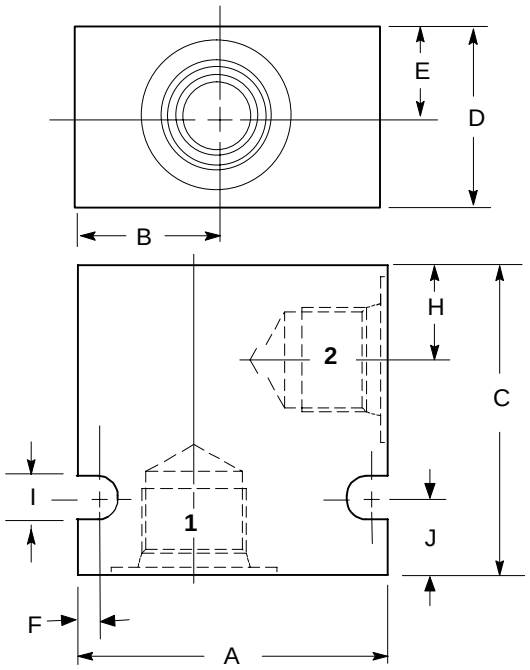
C--3 housing**

Housing mm (inch)	A	B	C	D	E	F	G	H	I	J	Mass kg (lb.)
C-10-2	50,8 (2.00)	19,0 (0.75)	50,8 (2.00)	31,7 (1.25)	15,9 (0.62)	19,0 (0.75)	–	3,1 (0.12)	7,1 (0.28)	12,7 (0.50)	0,1 (0.35)
C-16-2	76,2 (3.0)	28,5 (1.12)	76,2 (3.00)	47,6 (1.87)	23,8 (0.94)	25,4 (1.00)	–	4,0 (0.16)	8,6 (0.34)	19,0 (0.75)	0,5 (1.21)
C-10-3	63,5 (2.50)	31,7 (1.25)	66,6 (2.62)	31,7 (1.25)	15,8 (0.62)	34,9 (1.37)	19,0 (0.75)	3,1 (0.12)	7,1 (0.28)	12,7 (0.50)	0,3 (0.64)
C-16-3	101,6 (4.00)	50,8 (2.00)	107,9 (4.25)	50,8 (2.00)	25,4 (1.00)	53,9 (2.12)	25,4 (1.00)	4,0 (0.16)	8,6 (0.33)	25,4 (1.00)	1,0 (2.3)

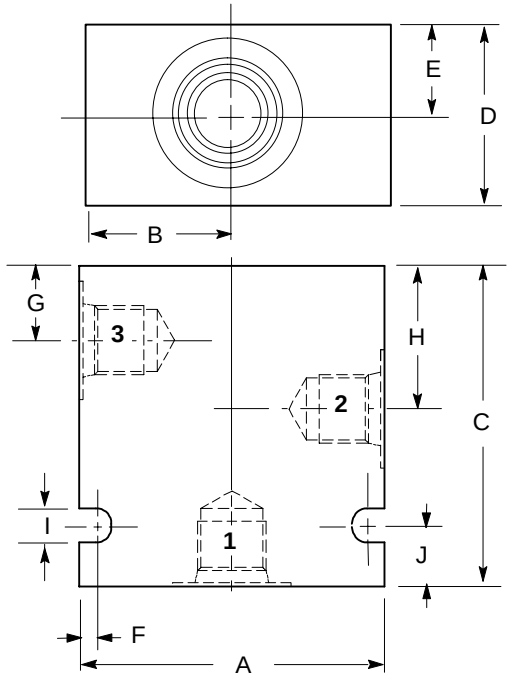
C-**-2 & 3 Aluminum Housings (Fatigue Rated)

Housing	All Ports	Part Number	Housing	All Ports	Part Number	Housing	All Ports	Part Number
C-10-2	1/4” BSPP	876702	C-8-3	1/4” BSPP	02-160739	C-16-3	1/2” BSPP	876720
	3/8” BSPP	876703		3/8” BSPP	02-160740		3/4” BSPP	876722
	SAE 6	876700		SAE 6	02-160741		SAE 10	876721
	SAE 8	876701		SAE 8	02-160742		SAE 12	876723
C-16-2	1/2” BSPP	876716	C-10-3	1/4” BSPP	876705			
	3/4” BSPP	876718		3/8” BSPP	876714			
	SAE 10	876717		SAE 6	876704			
	SAE 12	566113		SAE 8	876711			

Note: . . . BSPP porting is designated by “G” in the model code SAE porting is designated by either “H” or “T” in the model code



C--2 housing**



C--3 housing**

Housing mm (inch)	A	B	C	D	E	F	G	H	I	J	Mass kg (lb.)
C-10-2	63,5 (2.50)	25,4 (1.00)	63,5 (2.50)	50,8 (2.00)	25,4 (1.00)	9,5 (0.37)	–	20,8 (0.81)	7,1 (0.28)	19,0 (0.75)	0,4 (1.00)
C-16-2	88,9 (3.50)	34,9 (1.37)	88,9 (3.50)	63,5 (2.50)	31,7 (1.25)	10,3 (0.40)	–	28,4 (1.11)	8,7 (0.34)	25,4 (1.00)	1,2 (2.75)
C-8-3	63,5 (2.50)	31,8 (1.25)	82,6 (3.25)	38,1 (1.50)	19,0 (0.75)	3,4 (0.13)	15,5 (0.61)	29,8 (1.17)	7,1 (0.28)	13,0 (0.51)	0,4 (0.83)
C-10-3	76,2 (3.00)	38,1 (1.50)	76,2 (3.00)	50,8 (2.00)	25,4 (1.00)	9,5 (0.37)	20,8 (0.81)	36,6 (1.44)	7,1 (0.28)	19,0 (0.75)	0,7 (1.65)
C-16-3	88,9 (3.50)	34,9 (1.37)	88,9 (3.50)	63,5 (2.50)	31,7 (1.25)	10,3 (0.40)	28,4 (1.11)	57,0 (2.24)	8,7 (0.34)	25,4 (1.00)	2,0 (4.50)

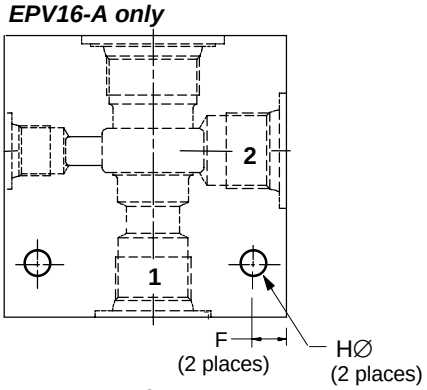
C-**-3S (modified) Housings

C-16-3S Aluminum/steel housing (modified)

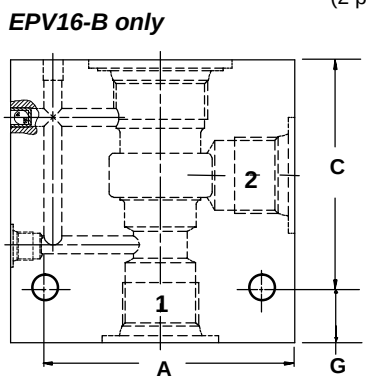
When ordered in a stand alone body, the port 2 annulus is undercut to ensure the maximum performance in extreme operating conditions at full rated flow. Internal feedback flow passages for either the EPV16-A or the EPV16-B flow directions are provided for in these bodies, which do not have the third port as normally contained in the standard C-16-3S body.

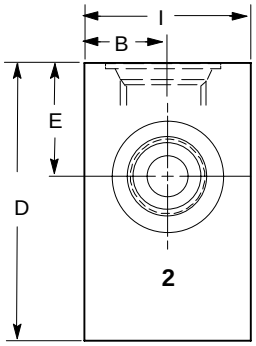
The EPV16 is also available for industrial applications mounted in a body with a CETOP 5 (NFPA D05) interface.

EPV16-A only



EPV16-B only





Note:
BSPP porting is designated by "G" in the model code
SAE porting is designated by either "H" or "T" in the model code

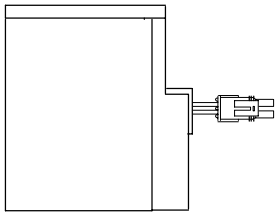
Code	Port size	Housing number			
		Aluminum		Steel	
		EPV16–A	EPV16–B	EPV16–A	EPV16–B
4G	1/2" BSPP	02–185448	02–166607	02–180050	02–165500
6G	3/4" BSPP	02–185449	02–161582	02–180051	02–164931
10H	SAE 10	02–185446	02–170238	———	———
12H	SAE 12	02–185447	02–166609		
10T	SAE 10	———	———	02–180048	02–161983
12T	SAE 12			02–180049	02–161982
5C	CETOP5 (NFPA D05) interface (Requires steel body)				

Housing mm (inch)	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H ∅**	**I**	**Mass kg (lb.) Alum.**	**Mass kg (lb.) Steel**
C-16-3S (modified)	76,2 (3.00)	30,2 (1.19)	79,2 (3.12)	100,8 (3.97)	38,1 (1.50)	12,7 (0.50)	21,6 (0.85)	8,7 (0.34)	60,4 (2.38)	2,0 (4.50)	6,0 (13.5)

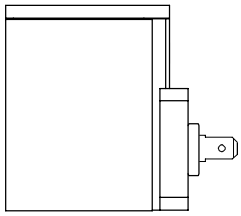
EPV Coils

Coil kits

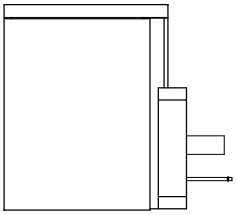
“F”- Weather–Pack



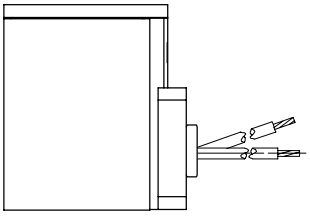
“Q” - Spade terminal



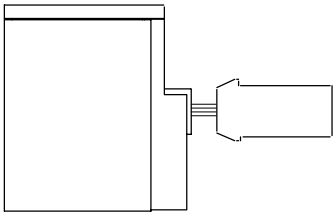
“U”- DIN 43650



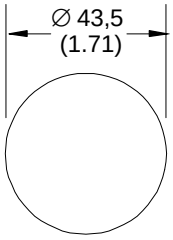
“W” 610 mm (24 inch) lead wire



“Y”- Metri–Pak



Note: Width – all configurations



Voltage	COIL PART NUMBERS				
	F Connector	Q Connector	U Connector	W Connector	Y Connector
12 VDC	02–308810	02–317154	02–154070	02–154072	02–308808
24 VDC	02–308811	02–317155	02–154071	02–154073	02–308809

Specifications

Standard Voltages	Amperes*	Lead Color
12 DC	1.32	red
24 DC	0.66	black

*Nominal voltage @ 25°C (77°F)

Control

Rheostat specifications

Caution: The coils tend to run hot if used in other than intermittent operations.

12 VDC operation 10-12 Ω, 20-25 watts
24 VDC operation 25-30 Ω, 20-25 watts

Power plug options: (indoor applications)

EHH-AMP-702
EPAD-SA–1A6-10

These require 24 VDC power supply to power plug and 12 VDC coil.

Amplifier card: (indoor applications)

EEA-PAM-523

(Requires 24 VDC power supply and either 12VDC or 24 VDC coil.

Joy stick suppliers: (outdoor applications)

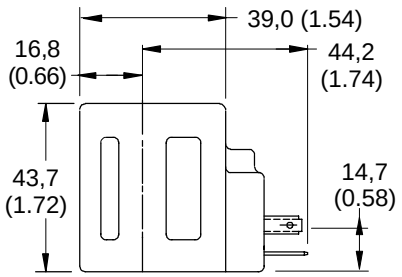
OEM Controls, Inc, Shelton, CT
P-Q Controls, Inc, Bristol, CT

EPRV 8-Series Coils

Coil Dimensions

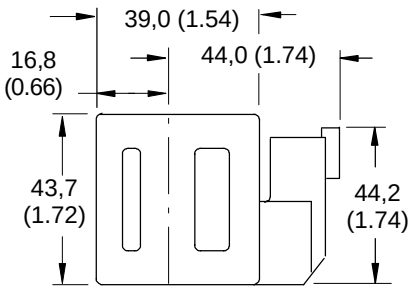
millimeter (inch)

“G”- DIN connector

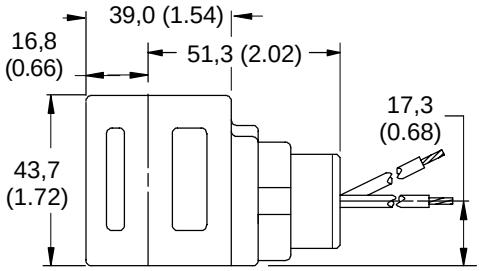


DIN 43650 connector for “G”style coil – 02–166796

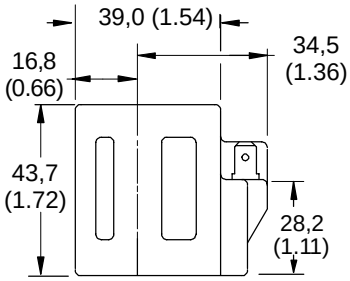
“N”- Deutsch Type connector



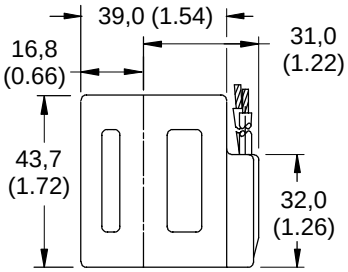
“P”- 1/2” NPT conduit



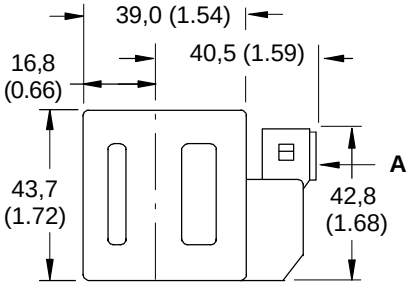
“Q” - Spade terminal



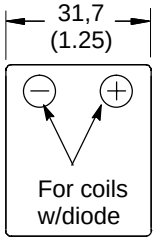
“W” 610 mm (24 inch) lead wire



“Y” - AMP JR. connector



View A
Note: width - all configurations



Voltage w/o diode	COIL PART NUMBERS					
	G Connector	N Connector	P Connector	Q Connector	W Connector	Y Connector
12 VDC	02–160690	02–160958	02–160684	02–160681	02–160678	02–178001
24 VDC	02–160691	02–160959	02–160685	02–160682	02–160679	02–178002
12 VDC*	02–178810	02–160953	N/A	02–178804	02–178802	02–160957
24 VDC*	02–178811	02–178812		02–178805	02–178803	02–178815

*optional arc suppression diode

Specifications

Standard Voltages	Amperes*	Lead Color
12 DC	1.32	red
24 DC	0.66	black

*Nominal voltage @ 25°C (77°F)

Duty Rating
Continuous from 85% to 110% of nominal voltage

Operating Temperature –100°C (212°F)
continuous @ nominal voltage

Lead Wires – 18 gauge, 610 mm (24” long), UL style 3173 CSA CL 1251 (meets SAE J1128 XLPE style SXL)

Wattage –All coils are nominally 16 watts @ 25°C (77°F)

Encapsulent –P.E.T.

Magnet Wire –U.L. class N, 200°C (392°F) NEMA pub. no. MW 1000, section MW 35–C (single)

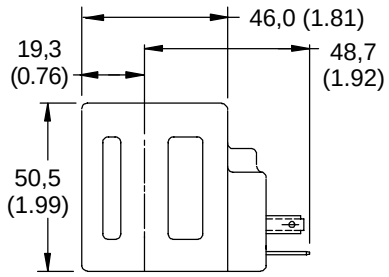
Flyback diode (arc suppressor)
Maximum recurrent peak reverse voltage – 800 V (optional)

For other voltages and connectors contact a Vickers representative.

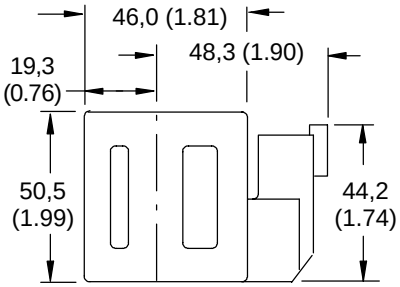
ERV, EPRV 10/16–Series Coils

Dimensions
millimeter (inch)

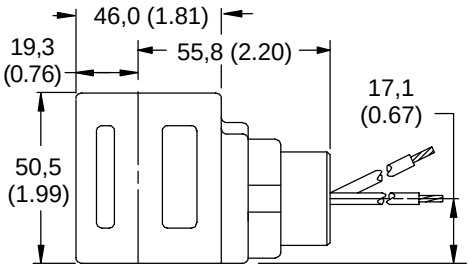
“G”- DIN connector



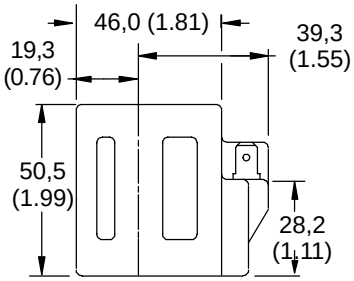
“N”- Deutsch Type connector



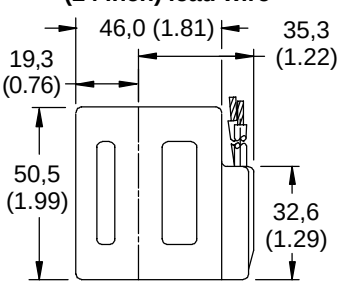
“P”- 1/2” NPT conduit



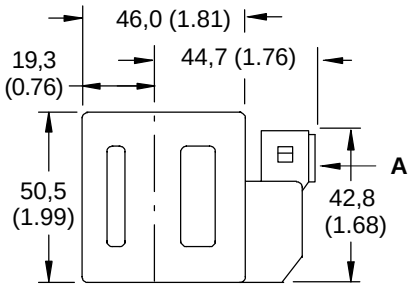
“Q” - Spade terminal



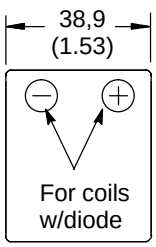
“W” 610 mm (24 inch) lead wire



“Y” - AMP JR. connector



View A
Note: width - all configurations



Voltage	COIL PART NUMBERS					
	G Connector	N Connector	P Connector	Q Connector	W Connector	Y Connector
12 VDC	02-178086	02-178093	02-178078	02-178070	02-178063	02-178711
24 VDC	02-178087	02-178094	02-178079	02-178073	02-178065	02-178712
36 VDC	02-178089	02-178095	02-178080	02-178075	02-178066	02-178713
12 VDC*	02–178840	02–178842	N/A	02–178834	02–178832	02–178762
24 VDC*	02–178841	02–178843		02–178835	02–178833	02–178846

*optional arc suppressing diode

Specifications

Standard Voltages	Amperes*	Lead Color
12 VDC	1.50	red
24 VDC	0.75	black
36 VDC	0.50	blue

*Nominal voltage @ 25°C (77°F)

Duty Rating
Continuous from 85% to 110% of nominal voltage

Lead Wires –18 gauge, 610 mm (24”) long, UL style 3173 CSA CL 1251 (meets SAE J1128 XLPE style SXL)

Wattage – All coils are nominally 20 watts @ 25°C (77°F)

Magnet Wire – U.L. class N, 200°C (392°F) NEMA pub. no. MW 1000, section MW 35–C (single)

Operating Temperature – 100°C (212°F) continuous @ nominal voltage

Encapsulent – P.E.T.

***Flyback diode** (arc suppressor) Maximum recurrent peak reverse voltage – 800 V (optional)

Supporting Products

Roughing Tools

Roughers are basically step drills which leave .030” per cutting diameter and .015” above all radii for the finishing reamer, with an additional .015” depth in the cavity bottom as clearance.

The roughing tool is necessary to prepare the cavity for the finishing reamer, which has not been designed for the primary forming or bottom cutting.

We offer two types of roughers, one for aluminum and one for steel. The aluminum rougher is manufactured with a 4 facet point and polished flutes. The steel rougher is supplied with a standard drill point. Both types will work in either material, however, longevity of an aluminum tool will be sacrificed when used continually in steel.

Cavity	Material	Model Code	Assembly Number
2–Way			
C-10-2	Aluminum	RT-10-2-A-8030	889509
C-16-2	Aluminum	RT-16-2-A-8031	889515
3–Way			
C–8–3	Aluminum / Steel	RT1–8–3–AS–8291	02–162384
C-10-3	Aluminum	RT-10-3-A-8038	889511
C-16-3	Aluminum	RT-16-3-A-8039	565825
3–Way Short			
C-16-3S	Aluminum	RT-16-3S-A-8044	02-165582
C-16-3S	Steel	RT-16-3S-S-8045	566704

Finishing Tools

These finishing tools have been designed as precision reamers for finishing operations only. They are not intended for primary forming or bottom cutting operations. Vickers recommends that a finishing tool only be used in a properly roughed hole. Failure to conform to this practice will produce unsatisfactory size and finishes and possibly break the tool.

Cavity	Material	Model Code	Assembly Number
2-Way			
C-10-2	Aluminum / Steel	FT-10-2-AS-8048	566235
C-16-2	Aluminum / Steel	FT-16-2-AS-8078	565832
3-Way			
C–8–3	Aluminum / Steel	FT–8–3–AS–8295	02–171292
C-10-3	Aluminum / Steel	FT-10-3-AS-8050	565834
C-16-3	Aluminum / Steel	FT-16-3-AS-8080	565836
3-Way Short			
C-16-3S	Aluminum / Steel	FT-16-3S-AS-8081	889356

Finishing Form Tools Speed & Feed for Aluminum 6061–T6 (T651)

This information is recommended as a good starting point. Speeds and/or feeds may be increased or decreased depending on actual machining conditions.

NOTE: Finish form tools may require 1/2 to 1–1/2 second dwell to obtain necessary finish.

CNC MACHINE TOOL			**BRIDGEPORT / LAGUN TYPE MACHINES**		
Tool Size	RPM	IPM	Tool Size	RPM	IPM
C-10-2	600	4	C-10-2	800-1000	6-5
C-10-3			C-10-3		
C-16-2			C-16-2	250	2 1/2
C-16-3			C-16-3		
C-16-3S			C-16-3S		

Index