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PROPORTIONAL CONTROLS

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ACCESSORIES

ENGINEERING DATA

Delta Power Company
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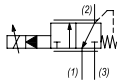
QUICK SELECTION GUIDE

PROPORTIONAL CONTROLS - Page PT1

PROPORTIONAL PRESSURE REDUCING / RELIEVING VALVES

DIRECT ACTING	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	1	700	4	50	slip-in	IP-DAR-43C-L	PT4
	1	5000	4	345	slip-in	IP-DAR-43C-H	PT4

PILOT OPERATED	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	7.9	700	30	50	slip-in	IP-PRZ-59	PT6
	7.9	700	30	50	7/8-14	EG-TRZ-42-L	PT8
	7.9	3500	30	241	7/8-14	EG-TRZ-42-H	PT10

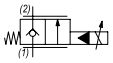
PROPORTIONAL PRESSURE RELIEF VALVES

NORMALLY CLOSED	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	12	3000	45	207	7/8-14	EE-PRB	PT14

NORMALLY OPEN	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	12	3000	45	207	7/8-14	EE-PRD	PT16

PROPORTIONAL PRESSURE RELIEF VALVES

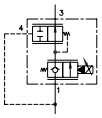
SPOOL TYPE	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	13.2	3500	50	245	7/8-14	EE-P2G	PT20
	23.7	3500	90	245	1 1/16-12	ET-P2S	PT22

POPPET TYPE	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	6.5	3500	25	245	3/4-16	EB-P2A	PT24
	12	3500	45	245	7/8-14	EE-P2A	PT26
	29	3500	110	245	1 1/16-12	ET-P2A	PT28

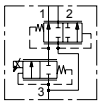
2 WAY NORMALLY OPEN PROPORTIONAL FLOW CONTROL VALVES

SPOOL TYPE	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	8	3500	30	245	7/8-14	EE-P2H	PT32

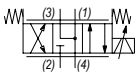
2 WAY NORMALLY CLOSED PRESS. COMPENSATED PROP. FLOW REGULATOR VALVES

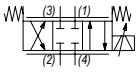
POPPET TYPE	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	12	3500	45	245	7/8-14	EG-F2A	PT36
	12	3500	45	245	1/16-12	EU-F2A	PT38

3 WAY NORMALLY CLOSED PRESS. COMPENSATED PROP. FLOW REGULATOR VALVES

SPOOL TYPE	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	6	3500	22	245	7/8-14	EF-F3G	PT42
	16	3500	60	245	1/16-12	EU-F3G	PT44

4W/3P PROPORTIONAL DIRECTIONAL CONTROL VALVES

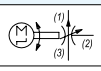
MOTOR SPOOL TYPE	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	3	3500	12	245	3/4-16	EQ-S4M	PT48
	6	3500	23	245	7/8-14	EG-S4M	PT50

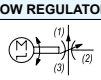
CYLINDER SPOOL TYPE	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	3	3500	12	245	3/4-16	EQ-S4P	PT52
	6	3500	23	245	7/8-14	EG-S4P	PT54

MOTORIZED CARTRIDGES - Page DC1

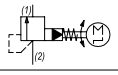
MOTORIZED FLOW REGULATORS

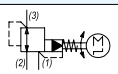
FLOW RESTRICTORS (NEEDLE VALVES)	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	12	3500	45	245	7/8-14	AE-NVA	DC4
	40	3500	150	245	1 5/16-12	AJ-NVA	DC6

2W PRES. COMPENSATED FLOW REGULATORS	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	24	3500	90	245	1 5/16-12	AJ-FCA	DC8

3W PRES. COMPENSATED FLOW REGULATORS	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	24	3500	90	245	1 5/16-12	AK-FCQ	DC10

MOTORIZED PRESSURE CONTROLS

RELIEF VALVES	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	37	3500	140	245	1 5/16-12	AJ-RVR	DC14

PRESSURE REDUCING VALVES	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	10	3000	38	207	7/8-14	AF-PRP	DC16

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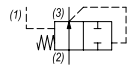
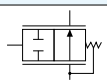
QUICK SELECTION GUIDE

MECHANICAL PRESSURE COMPENSATORS - Page MC1

2 WAY COMPENSATING/REDUCING VALVES

	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	8	3500	30	245	7/8-14	**DF-CP2**	MC4
	19	3500	70	245	Special	**QC-CP2**	MC6

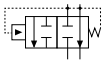
2 WAY RESTRICTIVE TYPE COMPENSATORS

	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	10	3500	38	245	7/8-14	**DF-TCS**	MC10

2 WAY BYPASS TYPE FOR 3 WAY FLOW CONTROL

	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	10	3500	38	245	7/8-14	**DF-PCR**	MC14
	40	3500	151	245	1 1/16 –12	**TR-PCA**	MC16
	40	3500	151	245	1 5/16–12	**SL-PCA**	MC18
	33	3500	120	245	Special	**QC-CP3**	MC20

4 WAY PRIORITY TYPE COMPENSATOR WITH BYPASS LINE

	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	10	3500	38	245	7/8-14	**DG-TCB**	MC24

COILS DATA - Page CT1

STANDARD COILS

TYPE	ID	WIDTH	HEIGHT	PAGE
PJ	1/2	36	38.5	CT4
A	13.3	30	39	CT5
V	13.2	37.5	50	CT6
L	16.1	37.5	50	CT7
Z	19.1	46.5	56	CT8
F	19.1	37	50	CT9

ACCESSORIES - Page AC1

DESCRIPTION	PAGE
Valve Bodies	AC2
Cavity Plugs	AC6
Manual Override Options	AC11
PILOT Piston Assemblies	AC13
Standard Knob Assemblies	AC14

ENGINEERING DATA - Page ED1

DESCRIPTION	PAGE
Cavity Data	ED2
General Installation Note	ED28
Valve Mnemonic Code	ED30

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PROPORTIONAL CONTROLS

Section / Description page

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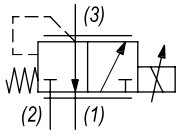
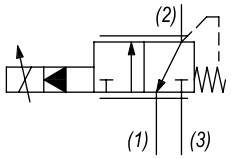
PROPORTIONAL PRESSURE REDUCING / RELIEVING VALVES

DIRECT ACTING	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	1	700	4	50	slip-in	**IP-DAR-43C-L**	PT4
	1	5000	4	345	slip-in	**IP-DAR-43C-H**	PT4

PILOT OPERATED	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	7.9	700	30	50	slip-in	**IP-PRZ-59-AM12**	PT6
	7.9	700	30	50	7/8-14	**EG-TRZ-42-L**	PT8
	7.9	3500	30	241	7/8-14	**EG-TRZ-42-H**	PT10

TYPICAL SCHEMATIC

Typical application for the IP-DAR-43 is the control of a metering spool on a directional valve.

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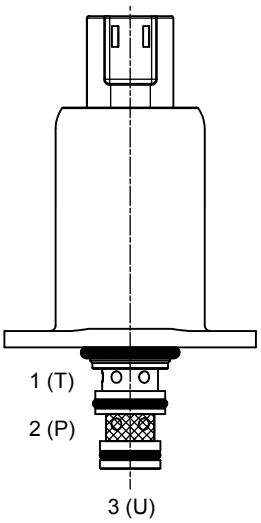
IP-DAR-43C DIRECT ACTING PROPORTIONAL, PRESSURE REDUCING/RELIEVING, SLIP-IN TYPE



DESCRIPTION

Special cavity, slip-in style flange retained, direct acting proportional, pressure reducing/relieving valve.

OPERATION

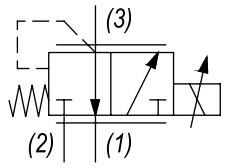
The IP-DAR-43C-AJ12 generates a variable pressure in response to a PWM (Pulse Width Modulated) current signal. With no current applied to the proportional solenoid, the inlet port 2 (P) is blocked and the regulated port 3 (U) is vented to port 1 (T). As current is increased, fluid pressure is proportionally controlled at the regulated port 3 (U). On attainment of proportionally determined pressure at 3 (U), the cartridge shifts to block flow at 2 (P), thereby regulating pressure at 3 (U). In this mode, the valve also will relieve 3 (U) to 1 (T) at a variable value over the set reducing pressure.

FEATURES

- Slip-in style.
- Efficient wet-armature construction.
- Integral waterproof coil.
- Integral waterproof coil.
- Continuous duty rated solenoid.

Flanged retained product. The coil is an integral part of the valve and is not serviceable. Eventual tank pressure exceeding 0 bar, has to be added to reduced pressure value.

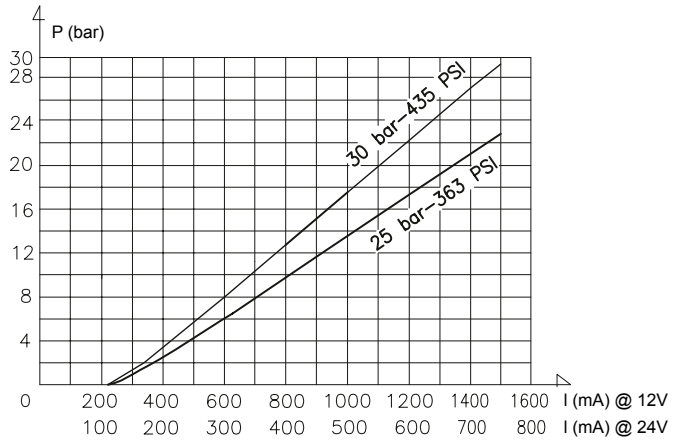
HYDRAULIC SYMBOL



PERFORMANCE

Reduced pressure (bar) vs. Current (mA)

12 V and 24 V Coil



VALVE SPECIFICATIONS

Nominal Flow	1 GPM (4 LPM) @ 8 bar Delta P
Max Inlet Pressure “H” version	5000 PSI (345 bar)
Max Inlet Pressure “L” version	700 PSI (50 bar)
Controlled Pressure Range	0÷25 bar / 0÷30 bar (see graph)
Reduced Pressure Tolerance	±5%
Max Back-Pressure at T Port	20 bar
Internal Leakage	15 ml/min @ 500 PSI (35 bar) inlet 35 ml/min @ 5000 PSI (350 bar) inlet
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/15/13
Media Operating Temp. Range	-30°C / +100°C
Weight	.54 lbs (.25 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cavity	T043
Cavity Tool Kit	K-T043
Flange Mounting Screws and Torque	M4x10 / 3ft-lbs (4 Nm)

COIL SPECIFICATIONS

Current Supply Characteristics	PWM (Pulse Width Modulation)
Rated Current Range	200÷1500 (12 V coil) 100÷750 (24 V coil)
PWM or Super-Imposed Dither Freq.	100-200 Hz
Coil Resistance (12 VDC)	5.4 Ohm ±5% at 68°F (20°C)
Coil Resistance (24 VDC)	22 Ohm ±5% at 68°F (20°C)
Max Power Consumption	12 Watt (20°C)
Protection Degree	IP 67 according to IEC 529
Coil Termination	Deutsch-Integral DT04-2P AMP Jr. Timer 84-9419
Color Connectors	Black

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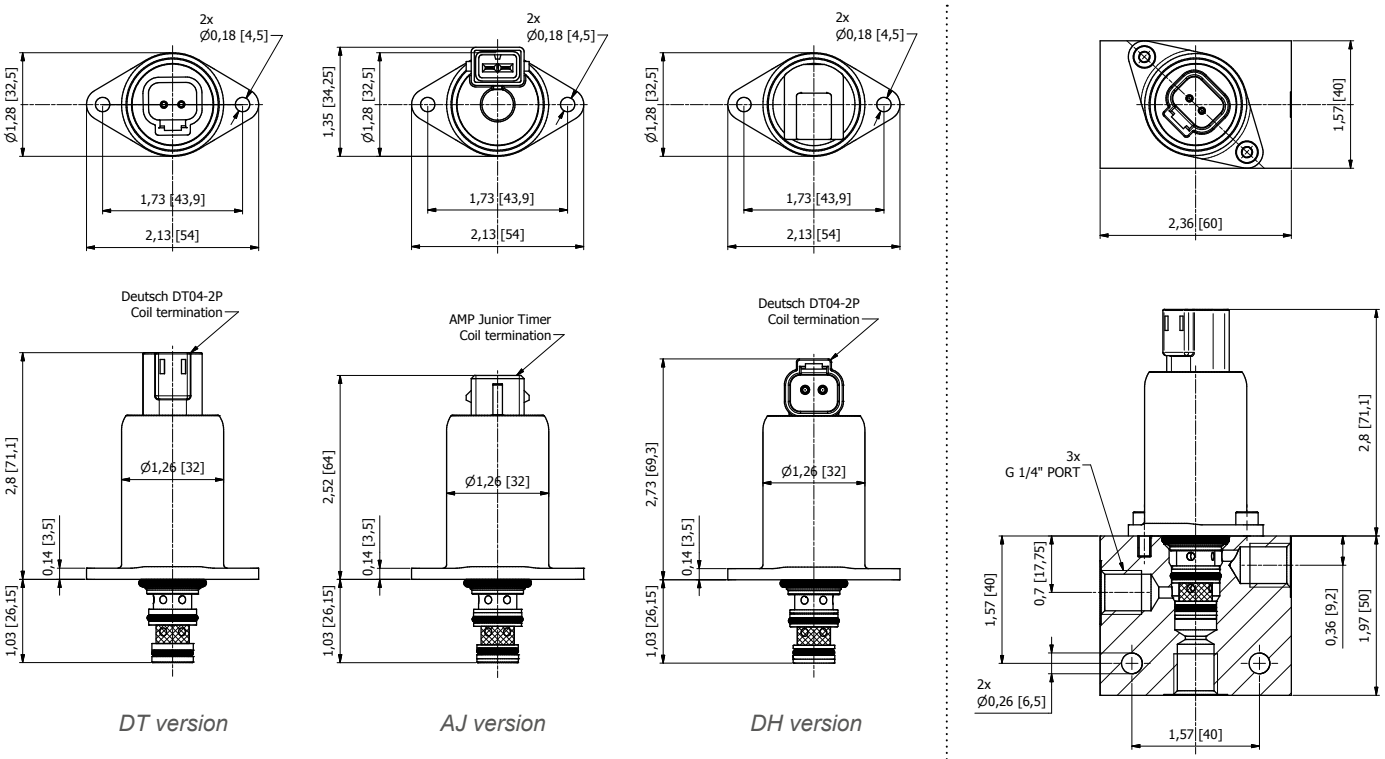
DIMENSIONS



DT version *AJ version* *DH version*

ORDERING INFORMATION

IP-DAR-43C – ____ – ____ – ____ – ____ – ____

COIL TERMINATION	VOLTAGE	INLET PRESSURE	MAX REGULATED PRESSURE	OPTIONS	BODIES
AJ - AMP Jr. Timer	**12** VDC	**L** - up to 700 PSI (50 bar)	**25** bar	**A0** - NBR seals and 300 µm (50 mesh) screen on port 2	**Blank** - Without body
DT - Deutsch DT04	**24** VDC	**H** - up to 5000 PSI (350 bar)	**30** bar		**N** - 1/4" BSP Ports
DH - Deutsch DT04 Horizontal					**S** - #6 SAE Ports

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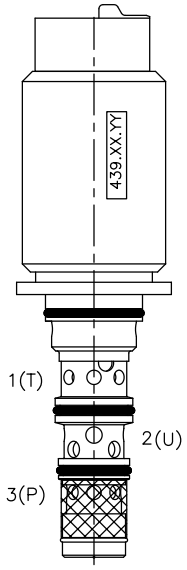
IP-PRZ-59-AM12 PILOT OPERATED PROPORTIONAL, PRESSURE REDUCING/RELIEVING, SLIP-IN TYPE



DESCRIPTION

Special cavity, flange retained, slip-in proportional pressure reducing/relieving valve.

OPERATION

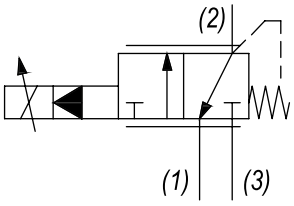
The IP-PRZ-59-AM12 generates a variable pressure in response to a PWM (Pulse Width Modulated) current signal. With no current applied to the proportional solenoid, the inlet port 3 (P) is blocked and the regulated port 2 (U) is vented to port 1 (T). As current is increased, fluid pressure is proportionally controlled at the regulated port 3 (P). On attainment of proportionally determined pressure at 2 (U), the cartridge shifts to block flow at 3 (P), thereby regulating pressure at 2 (U). In this mode, the valve also will relieve 2 (U) to 1 (T) at a variable value over the set reducing pressure.

FEATURES

- Economical slip-in style.
- Integral waterproof coil.
- Efficient wet-armature construction.
- Hardened parts for long life.

Flanged Retained Product. The coil (12 VDC) is an integral part of the valve and is not serviceable. Inlet pressure up to 50 bar. Max regulated pressure can be increased up to 35 bar (factory preset).

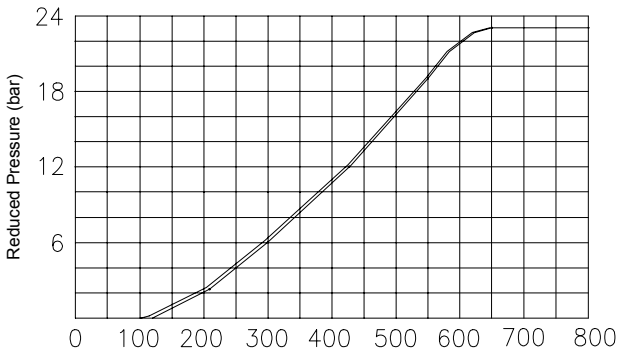
HYDRAULIC SYMBOL



PERFORMANCE

Reduced pressure (bar) vs. Current (mA)

12 V coil, 24 bar inlet pressure



Curve is attained with SAE 40 - Grade oil @ 50°C

VALVE SPECIFICATIONS

Nominal Flow	7.9 GPM (30 LPM) @ 3 bar DeltaP
Max Inlet Pressure	700 PSI (50 bar)
Controlled Pressure Range	(see graph)
Max Internal Leakage	<500 cc/min @ 35 bar
Viscosity Range	5 to 5000 cSt
Filtration	ISO 18/15/13
Media Operating Temp. Range	-30°C / +100°C
Weight	.63 lbs (.29 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cavity	T059
Cavity Tools Kit (form tool, reamer, tap)	K-T059
Flange Mounting Screws and Torque	M6x10 / 4 ft-lbs (6 Nm)

COIL SPECIFICATIONS

Current Supply Characteristics	PWM (Pulse Width Modulation)
Rated Current Range	100-900 mA
PWM or Super-Imposed Dither Frequency	100-150 Hz
Coil Resistance (12 VDC)	10 Ohm ±5% at 68°F (20°C)
Max Power Consumption	14 Watt
Protection Degree	IP 67 according to IEC 529
Coil Termination	AMP Superseal 1.5 Series 282080-1 Type
Color Connectors	Green

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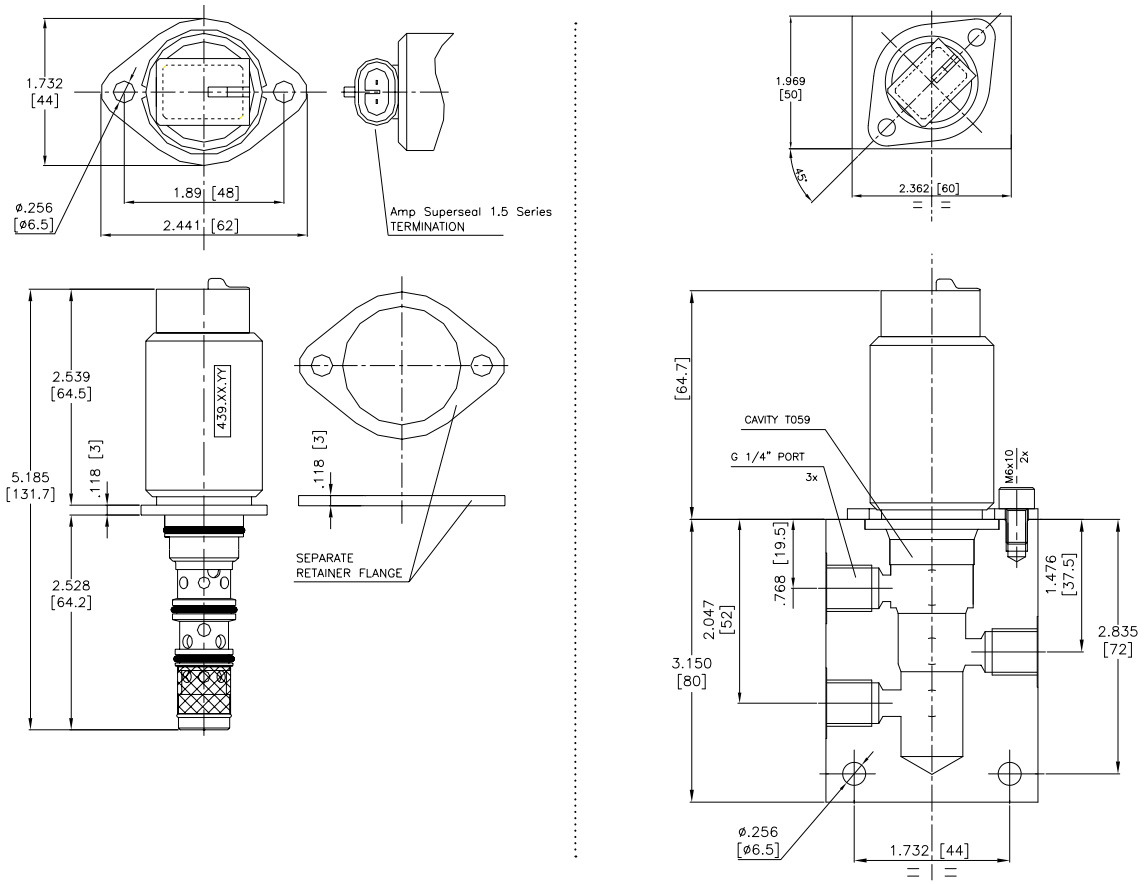
DIMENSIONS



ORDERING INFORMATION

IP-PRZ-59-AM12 – ____ – ____

OPTIONS		BODIES	
Buna Standard	**00**	**Blank**	Without Body
Buna, Screen	**A0**	**N**	1/4" BSP Ports
		S	#6 SAE Ports

NOTE: screen (on inlet port): mesh 47 (280 µm)

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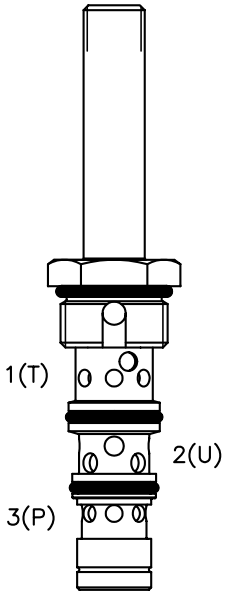
EG-TRZ-42-L PILOT OPERATED PROPORTIONAL, PRESSURE REDUCING/RELIEVING



DESCRIPTION

Special cavity, 7/8-14 thread, pilot operated proportional pressure reducing/relieving valve.

OPERATION

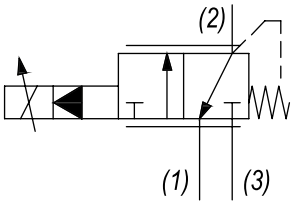
The EG-TRZ-42-L generates a variable pressure in response to a PWM (Pulse Width Modulated) current signal. With no current applied to the proportional solenoid, the inlet port 3 (P) is blocked and the regulated port 2 (U) is vented to port 1 (T).

As current is increased, fluid pressure is proportionally controlled at the regulated port 2 (U). On attainment of proportionally determined pressure at 2 (U), the cartridge shifts to block flow at 3 (P), thereby regulating pressure at 2 (U). In this mode, the valve also will relieve 2 (U) to 1 (T) at a variable value over the set reducing pressure.

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Unitized valve/coil.
- Continuous duty rated solenoid.

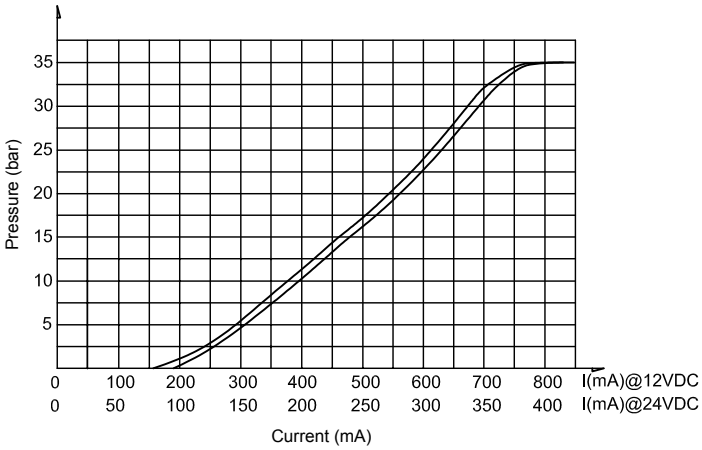
HYDRAULIC SYMBOL



PERFORMANCE

Pressure vs. Current characteristic

Inlet pressure 36 bar, Oil viscosity 46 cSt @ 45°C



VALVE SPECIFICATIONS

Nominal Flow	7.9 GPM (30 LPM)
Max Inlet Pressure	700 PSI (50 bar)
Controlled Pressure Range	(see graph)
Max Internal Leakage	700 cc/min @ 50 bar
Max Back-Pressure at T Port	20 bar
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/15/13
Media Operating Temp. Range	-30°C / +100°C
Weight	.63 lbs (.29 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	16 ft-lbs (30 Nm)
Coil Nut Torque Requirements	1-2 ft-lbs (2-3 Nm)
Cavity	T042
Cavity Tools Kit (form tool, reamer, tap)	K-T042

COIL SPECIFICATIONS

Current Supply Characteristics	PWM (Pulse Width Modulation)
Rated Current Range	100-1000 mA with 12 VDC Coil 50-500 mA with 24 VDC Coil
PWM or Super-Imposed Dither Frequency	150-200 Hz
Coil Resistance	7.8 Ohm ±5% at 68°F (20°C) 12 VDC 32 Ohm ±5% at 68°F (20°C) 24 VDC
Max Power Consumption	18 Watt

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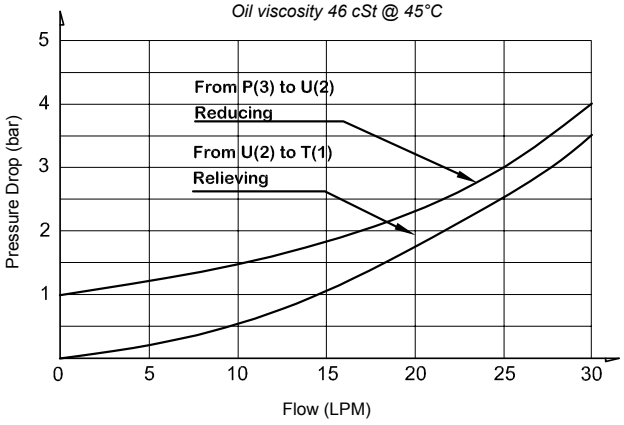
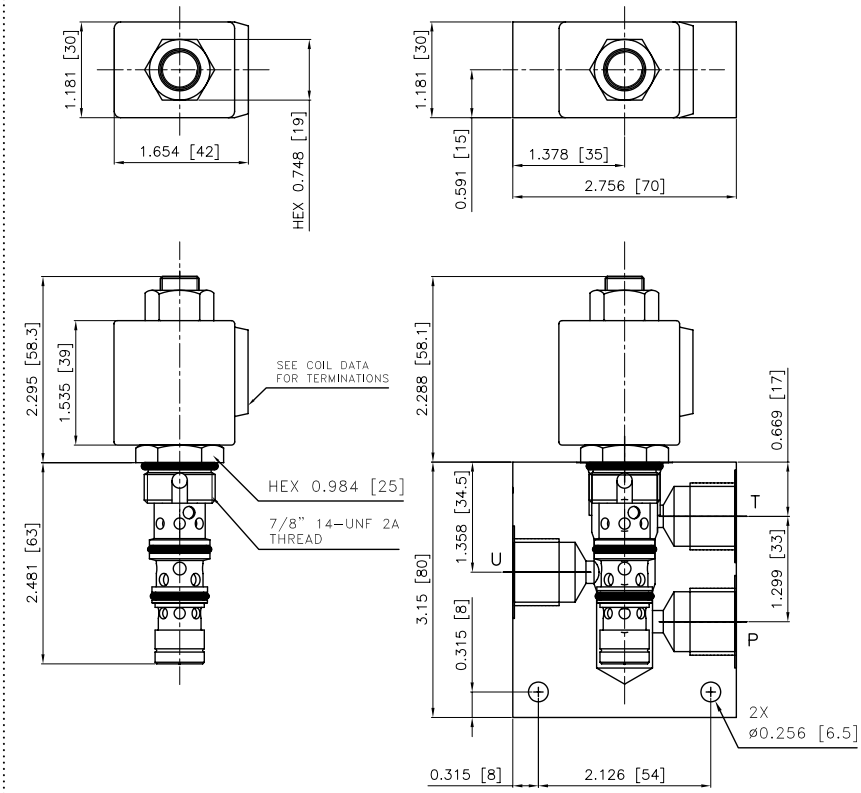
DIMENSIONS

Pressure Drop vs. Flow characteristic

Oil viscosity 46 cSt @ 45°C





ORDERING INFORMATION

Approximate Coil Weight: .42 lbs (.19 kg)

EG-TRZ-42-L - _____ **–** _____ **–** _____ **–** _____ **–** _____

MAX REGULATED PRESSURE	OPTIONS	"A" COIL TERMINATION	VOLTAGE	BODIES
35 bar	**00** - Buna Standard	**DL** - Double Lead	**12** - 12 VDC	**Blank** - Without body
	A0 - Buna Screen	**HC** - DIN 43650 (Hirschmann)	**24** - 24 VDC	**N** - 3/8" BSP Ports
		JT - AMP Jr. Timer		
		DT - Deutsch DT04 Horizontal		

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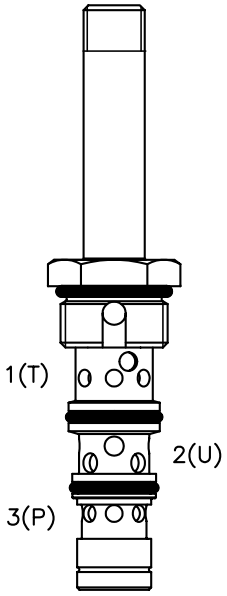
EG-TRZ-42-H PILOT OPERATED PROPORTIONAL, PRESSURE REDUCING/RELIEVING



DESCRIPTION

Special cavity, 7/8-14 thread, pilot operated proportional pressure reducing/relieving valve.

OPERATION

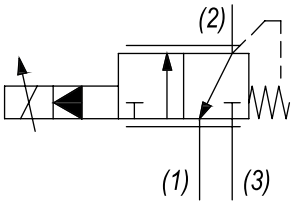
The EG-TRZ-42-H generates a variable pressure in response to a PWM (Pulse Width Modulated) current signal. With no current applied to the proportional solenoid, the inlet port 3 (P) is blocked and the regulated port 2 (U) is vented to port 1 (T).

As current is increased, fluid pressure is proportionally controlled at the regulated port 2 (U). On attainment of proportionally determined pressure at 2 (U), the cartridge shifts to block flow at 3 (P), thereby regulating pressure at 2 (U). In this mode, the valve also will relieve 2 (U) to 1 (T) at a variable value over the set reducing pressure.

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Unitized valve/coil.
- Continuous duty rated solenoid.

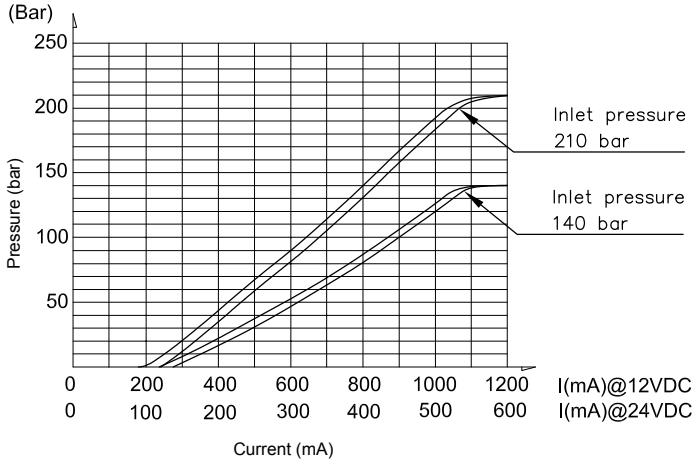
HYDRAULIC SYMBOL



PERFORMANCE

Pressure vs. Current characteristic

Oil viscosity 46 cSt @ 45°C



VALVE SPECIFICATIONS

Nominal Flow	7.9 GPM (30 LPM)
Max Inlet Pressure	3500 PSI (241 bar)
Controlled Pressure Range	(see graph)
Max Internal Leakage	1500 ml/min @ 200 bar inlet pressure
Max Back-Pressure at T Port	20 bar
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/15/13
Media Operating Temp. Range	-30°C / +100°C
Weight	.63 lbs (.29 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	16 ft-lbs (30 Nm)
Coil Nut Torque Requirements	1-2 ft-lbs (2-3 Nm)
Cavity	T042
Cavity Tools Kit (form tool, reamer, tap)	K-T042

COIL SPECIFICATIONS

Current Supply Characteristics	PWM (Pulse Width Modulation)
Rated Current Range	100-1200 mA with 12 VDC Coil 50-600 mA with 24 VDC Coil
PWM or Super-Imposed Dither Frequency	150-200 Hz
Coil Resistance	6.85 Ohm ±5% at 68°F (20°C) 12 VDC 27 Ohm ±5% at 68°F (20°C) 24 VDC
Max Power Consumption	21 Watt

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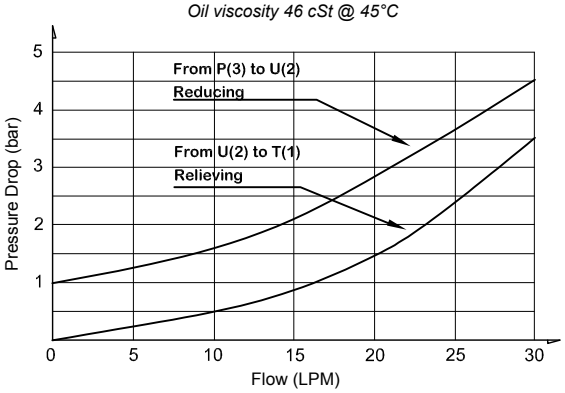
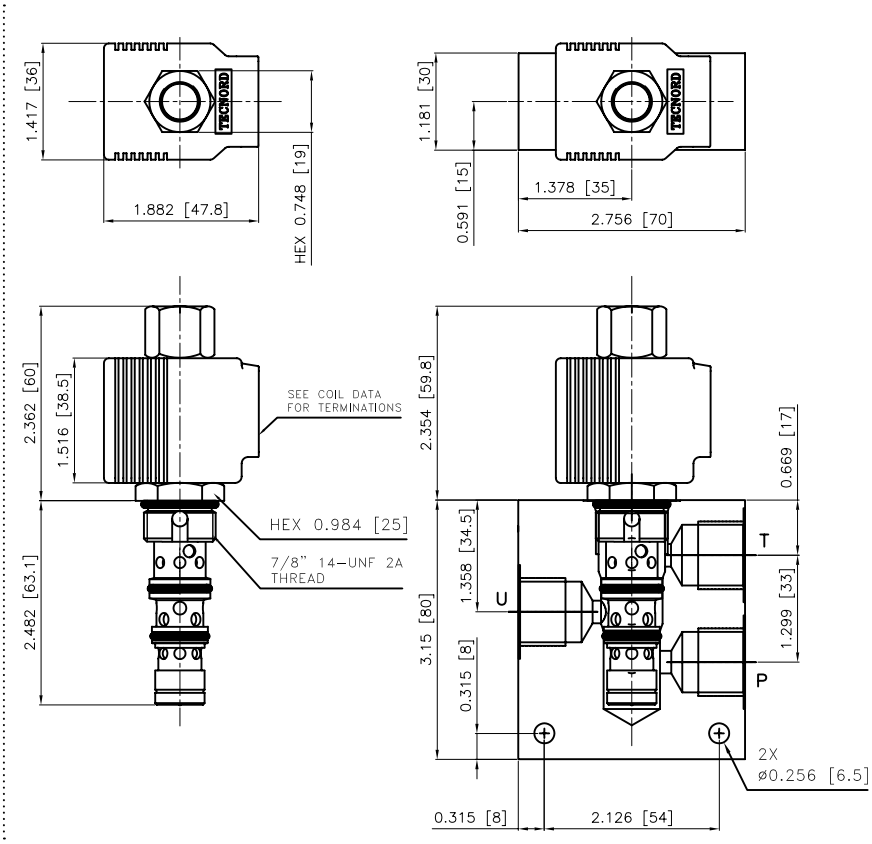
DIMENSIONS

Pressure Drop vs. Flow characteristic

Oil viscosity 46 cSt @ 45°C





ORDERING INFORMATION

Approximate Coil Weight: .42 lbs (.19 kg)

EG-TRZ-42-H - _____ **–** _____ **–** _____ **–** _____ **–** _____

MAX REGULATED PRESSURE	OPTIONS	"PJ" COIL TERMINATION	VOLTAGE	BODIES
140 bar	**00** - Polyurethane Standard	**DL** - Double Lead	**12** - 12 VDC	**Blank** - Without body
210 bar		**HC** - DIN 43650 (Hirschmann)	**24** - 24 VDC	**N** - 3/8" BSP Ports
		JT - AMP Jr. Timer		
		DT - Deutsch DT04 Horizontal		

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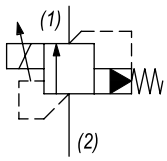
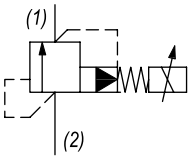
PROPORTIONAL PRESSURE RELIEF VALVES

NORMALLY CLOSED	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	12	3000	45	207	7/8-14	**EE-PRB**	PT14

NORMALLY OPEN	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	12	3000	45	207	7/8-14	**EE-PRD**	PT16

TYPICAL SCHEMATIC

Typical application for the PRL and PRB is for fan or motor speed control.

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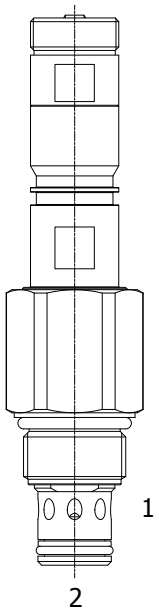
EE-PRB 2 WAY NORMALLY CLOSED, PROPORTIONAL RELIEF VALVE



DESCRIPTION

10 size, 7/8-14 thread, “Delta” series, solenoid operated, 2 way normally closed, pilot operated spool type relief valve.

OPERATION

The EE-PRB blocks flow from (2) to (1) until sufficient pressure is present at (2) to offset a spring induced force. As solenoid current is increased, it offsets a portion of this force, resulting in a lower relief pressure. Can be infinitely adjusted across a prescribed range in response to a PWM (Pulse Width Modulated) current. Pressure output is inversely proportional to the current input. With full current applied to the solenoid, the valve will free flow from (2) to (1), at approximately 100 PSI (7 bar).

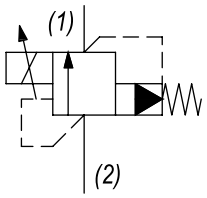
Note: backpressure on port (1) becomes additive to the pressure setting at a 1:1 ratio.

FEATURES

- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

Great for fan drive motor control.

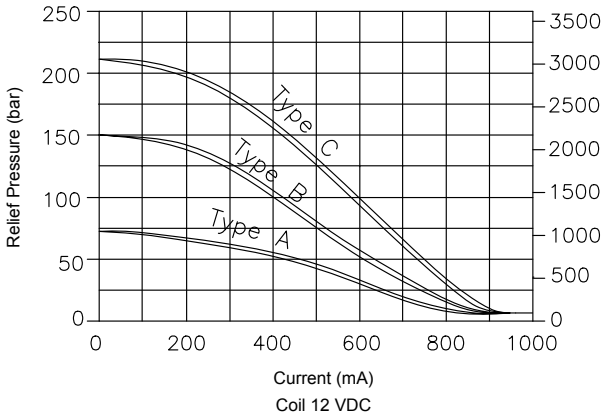
HYDRAULIC SYMBOL



PERFORMANCE

Relief pressure vs. Current

Costant flow 10 LPM (2.6 GPM)



VALVE SPECIFICATIONS

Nominal Flow	0÷20 GPM (0÷76 LPM)
Operating Range	100-3000 PSI (7-207 bar)
Typical Hysteresis	10% Max
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-30°C / +100°C
Weight	.62 lbs (.28 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements	2-3 ft-lbs (3-4 Nm)
Cavity	DELTA 2W
Cavity Tools Kit (form tool, reamer, tap)	40500000
Seal Kit	21191202

COIL SPECIFICATIONS

Current Supply Characteristics	PWM (Pulse Width Modulation)
Rated Current Range	100÷1000 mA
PWM or Super-Imposed Dither Frequency	120÷200 Hz
Coil Resistance (12 VDC)	7.2 Ohm ±5% at 68°F (20°C)

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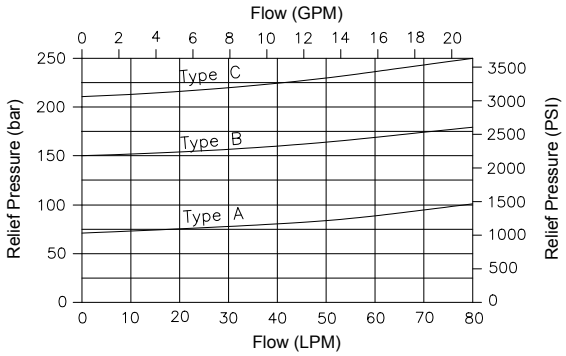
DIMENSIONS

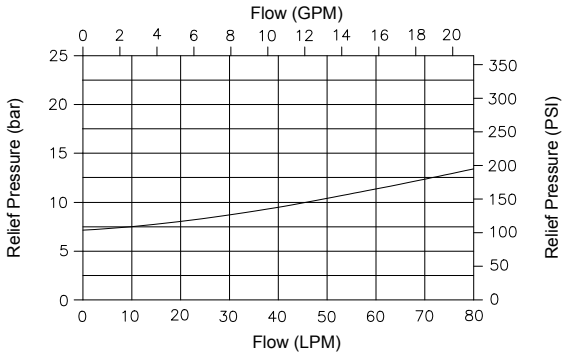
Relief pressure vs. Flow - No current applied

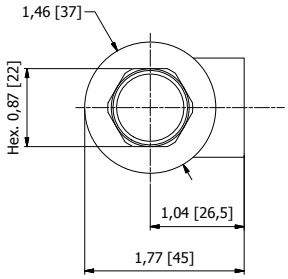
Costant flow 10 LPM (2.6 GPM)

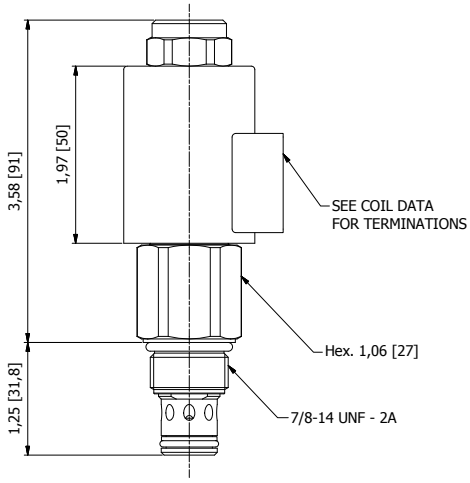


Pressure Drop vs. Flow

Coil energized







(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

Approximate Coil Weight: .47 lbs (.21 kg)

EE-PRB – ____ – ____ – ____ – ____

OPTIONS

Buna, 100-1015 PSI range (7-70 bar)	**0A**
Viton, 100-1015 PSI range (7-70 bar)	**VA**
Buna, 100-2175 PSI range (7-150 bar)	**0B**
Viton, 100-2175 PSI range (7-150 bar)	**VB**
Buna, 100-3000 PSI range (7-207 bar)	**0C**
Viton, 100-3000 PSI range (7-207 bar)	**VC**

"F" COIL TERMINATION

DIN 43650 (Hirschmann)	**HC**
Deutsch - Integral DT04-2P	**DI**
AMP Jr. Timer	**JT**

BODIES

Blank	Without Body
N	3/8" BSP Ports
S	#8 SAE Ports

VOLTAGE *(other voltages available on request)*

12	12 VDC
24	24 VDC

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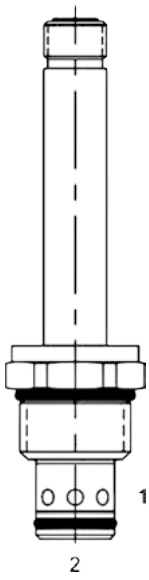
EE-PRD 2 WAY NORMALLY OPEN, PROPORTIONAL RELIEF VALVE



DESCRIPTION

10 size, 7/8-14 thread, “Delta” series, solenoid operated, 2 way normally open, pilot operated spool type relief valve.

OPERATION

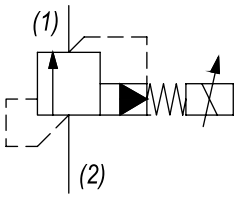
The EE-PRD blocks flow from (2) to (1) until sufficient pressure is present at (2) to offset the electrically induced solenoid force. Can be infinitely adjusted across a prescribed range in response to a PWM (Pulse Width Modulated) current. Pressure output is proportional to the current input.
With no current applied to the solenoid, the valve will free flow from (2) to (1) at approximately 50 PSI.
Note: backpressure on port (1) becomes additive to the pressure setting at a 1:1 ratio.

FEATURES

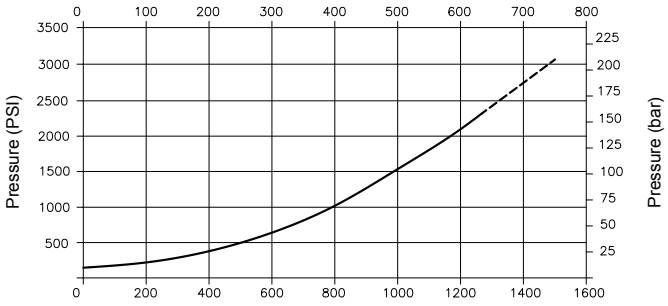
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

For best performance valve must be purged of air. Locate below reservoir or add check valve to return.

HYDRAULIC SYMBOL



PERFORMANCE



Current (mA) using 24 VDC Coil

VALVE SPECIFICATIONS

Nominal Flow	0-12 GPM (0-45 LPM)
Operating Range	50-3000 PSI (3-207 bar)
Typical Hysteresis	5%
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-30°C / +100°C
Weight	.30 lbs (.13 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 2W
Cavity Tools Kit (form tool, reamer, tap)	40500000
Seal Kit	21191202

COIL SPECIFICATIONS

Current Supply Characteristics	PWM (Pulse Width Modulation)
Rated Current Range	200-1500 mA
PWM or Super-Imposed Dither Frequency	500 Hz
Coil Resistance (12 VDC)	5.9 Ohm ±5% at 68°F (20°C)

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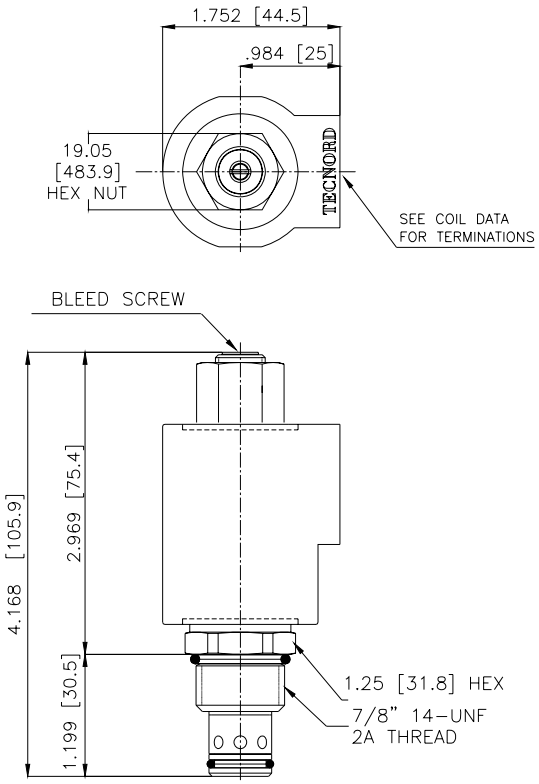
DIMENSIONS



(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

Approximate Coil Weight: .42 lbs (.19 kg)

EE-PRD – ____ – ____ – ____ – ____

OPTIONS

Buna Standard	**00**
Viton Standard	**V0**

"V" COIL TERMINATION

HC	DIN 43650 (Hirschmann)
DI	Deutsch - Integral DT04-2P
DL	Double Lead
JT	AMP Jr. Timer - Integral

VOLTAGE

12	12 VDC
24	24 VDC

BODIES

Blank	Without Body
N	3/8" BSP Ports
S	#8 SAE Ports

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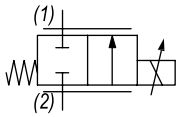
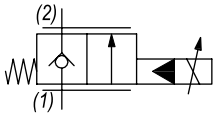
2 WAY NORMALLY CLOSED PROPORTIONAL FLOW REGULATOR VALVES

SPOOL TYPE	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	13.2	3500	50	245	7/8-14	**EE-P2G**	PT20
	23.7	3500	90	245	1 1/16-12	**ET-P2S**	PT22

POPPET TYPE	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	6.5	3500	25	245	3/4-16	**EB-P2A**	PT24
	12	3500	45	245	7/8-14	**EE-P2A**	PT26
	29	3500	110	245	1 1/16-12	**ET-P2A**	PT28

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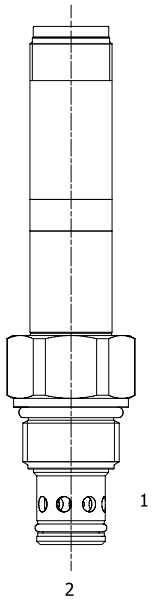
EE-P2G 2 WAY NORMALLY CLOSED, PROPORTIONAL FLOW CONTROL VALVE



DESCRIPTION

10 size, 7/8-14 thread, “Delta” series, solenoid operated, 2 way normally closed, proportional flow control valve.

OPERATION

When de-energized the EE-P2G blocks flow at ports (1) and (2). When energized, the valve allows flow from (2) to (1). Flow is proportional to the current applied to the coil. A compensator must be used to create a pressure compensated flow control function.

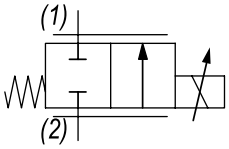
OPERATION OF MANUAL OVERRIDE OPTION: to override, turn the manual override screw clockwise. To release turn the manual override screw counterclockwise.

FEATURES

- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

Curves are attained with Tecnord QC-CP3 compensator.

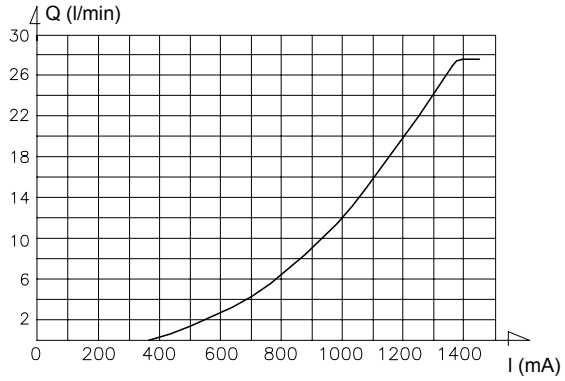
HYDRAULIC SYMBOL



PERFORMANCE

Flow vs. Current - “A” Version

Coil 12 VDC - Delta P = 14 bar - Oil 26 cSt (121 SSU) @ 50°C (104°F)



VALVE SPECIFICATIONS

Flow Range	See curves for various versions
Max System Pressure	3500 PSI (245 bar)
Leakage	Max 50 cc/min at 245 bar
Hysteresis	±3%
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-30°C / +100°C
Weight	.58 lbs (.26 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	26 ft-lbs (35 Nm)
Coil Nut Torque Requirements	2-3 ft-lbs (3-4 Nm)
Cavity	DELTA 2W
Cavity Tools Kit (form tool, reamer, tap)	40500000
Seal Kit	21191200

COIL SPECIFICATIONS

Current Supply Characteristics	PWM (Pulse Width Modulation)
Rated Current Range	400-1400 mA
PWM or Super-Imposed Dither Frequency	100-150 Hz
Coil Resistance (12 VDC)	7.2 Ohm ±5% at 68°F (20°C)

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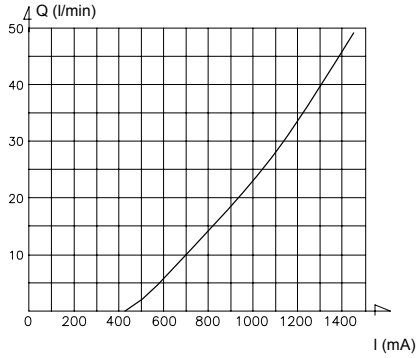
DIMENSIONS

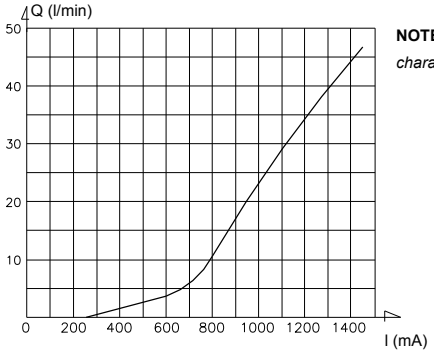
Flow vs. Current - "B" Version

Coil 12 VDC - Delta P = 14 bar - Oil 26 cSt (121 SSU) @ 50°C (104°F)

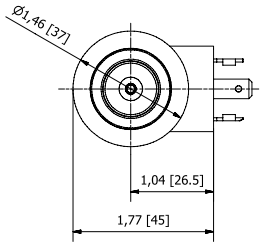


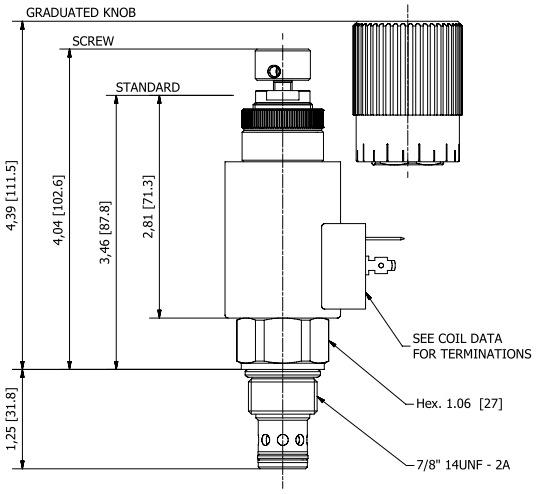
Flow vs. Current - "C" Version

Coil 12 VDC - Delta P = 14 bar - Oil 26 cSt (121 SSU) @ 50°C (104°F)



NOTE: *non linear characteristics*





(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

Approximate Coil Weight: .47 lbs (.21 kg)

EE-P2G – ____ – ____ – ____ – ____

OPTIONS

Buna, Push Type Override Standard	**AP**	Up to 22 l/min
Buna, Screw Type Override (Knob)	**AS**	Up to 22 l/min
Buna, Screw Type Override (Grad. Knob)	**AK**	Up to 22 l/min
Buna, Push Type Override Standard	**BP**	Up to 50 l/min
Buna, Screw Type Override (Knob)	**BS**	Up to 50 l/min
Buna, Screw Type Override (Grad. Knob)	**BK**	Up to 50 l/min
Buna, Push Type Override Standard	**CP**	Up to 50 l/min
Buna, Screw Type Override (Knob)	**CS**	Up to 50 l/min
Buna, Screw Type Override (Grad. Knob)	**CK**	Up to 50 l/min

"F" COIL TERMINATION

HC	DIN 43650 (Hirschmann)
DI	Deutsch-Integral DT04-2P
JT	AMP Jr. Timer

VOLTAGE

12	12 VDC
24	24 VDC

BODIES

Blank	Without Body
N	3/4" BSP Ports
S	#8 SAE Ports

NOTES: 1) Flows refer to a 14 bar Delta P
2) For other seals, consult factory

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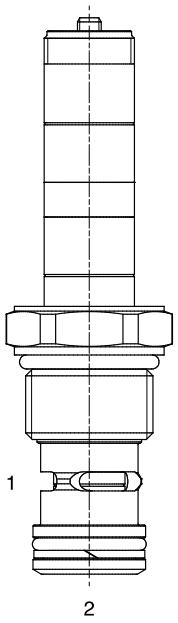
ET-P2S 2 WAY NORMALLY CLOSED, PROPORTIONAL FLOW CONTROL VALVE



DESCRIPTION

12 size, 1 1/16-12 thread, “Tecnord” series, solenoid operated, 2 way normally closed, proportional flow control valve.

OPERATION

When de-energized the ET-P2S blocks flow at ports (2) and (1). When energized, the valve allows flow from (1) to (2). Flow is proportional to the current applied to the coil. A compensator must be used to create a pressure compensated flow control function.

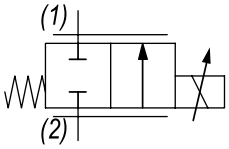
OPERATION OF MANUAL OVERRIDE OPTION: to override, turn the manual override screw counterclockwise. To release turn the manual override screw clockwise.

FEATURES

- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

Curves are attained with Tecnord QC-CP3 compensator.

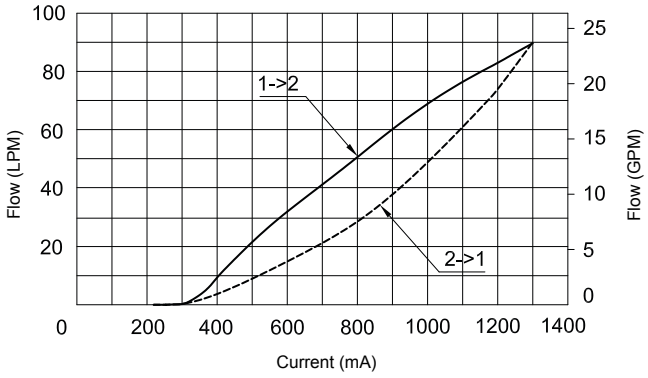
HYDRAULIC SYMBOL



PERFORMANCE

Flow vs. Current

Coil 12 VDC - Press. Drop = 14 bar - Oil 46 cSt (217 SSU) @ 50°C (122°F)



VALVE SPECIFICATIONS

Flow Range	See curves for various versions
Max System Pressure	3500 PSI (245 bar)
Leakage	Max 50 cc/min at 245 bar
Hysteresis	±3%
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-30°C / +100°C
Weight	.72 lbs (.32 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	37 ft-lbs (50 Nm)
Coil Nut Torque Requirements	2-3 ft-lbs (3-4 Nm)
Cavity	TECNORD 2W
Cavity Tools Kit (form tool, reamer, tap)	40500032
Seal Kit	21191200

COIL SPECIFICATIONS

Current Supply Characteristics	PWM (Pulse Width Modulation)
Rated Current Range	400-1400 mA
PWM or Super-Imposed Dither Frequency	100-150 Hz
Coil Resistance (12 VDC)	7.2 Ohm ±5% at 68°F (20°C)

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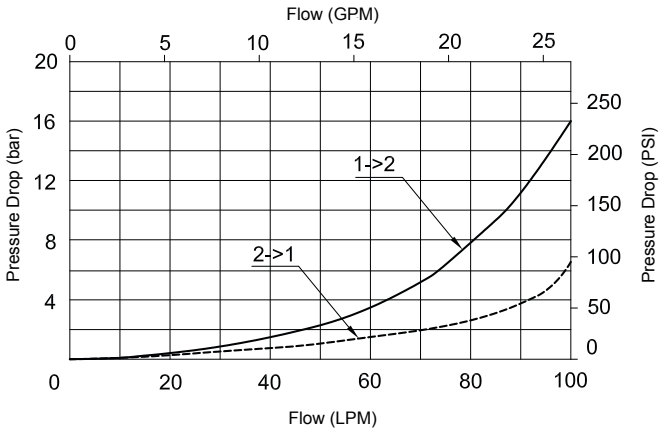
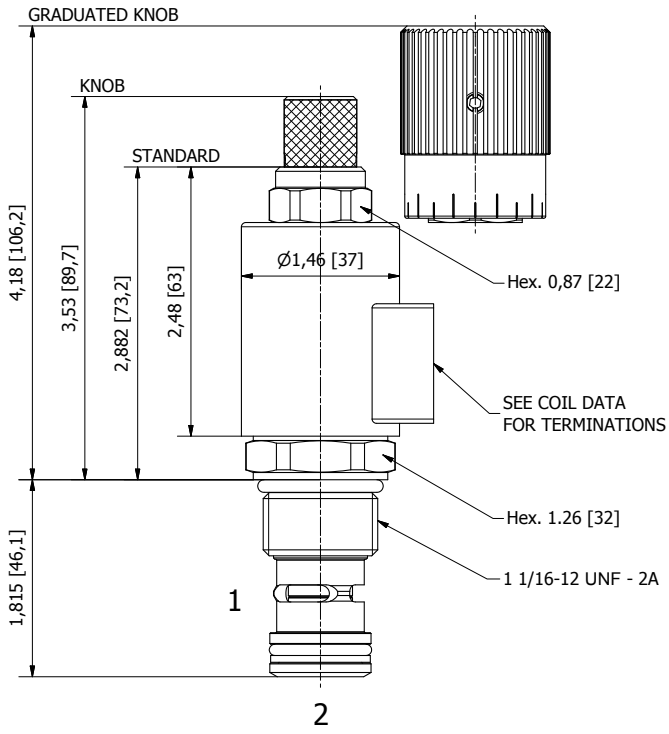
DIMENSIONS

Pressure Drop

With valve fully open - Oil 46 cSt (217 SSU) @ 50°C (122°F)





(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

Approximate Coil Weight: .47 lbs (.21 kg)

ET-P2S – ____ – ____ – ____ – ____

OPTIONS

Buna Standard	**C0**	Up to 90 l/min
Buna, Screw Type Override (Knob)	**CS**	Up to 90 l/min
Buna, Screw Type Override (Grad. Knob)	**CK**	Up to 90 l/min

"F" COIL TERMINATION

HC	DIN 43650 (Hirschmann)
DI	Deutsch-Integral DT04-2P
JT	AMP Jr. Timer

VOLTAGE

12	12 VDC
24	24 VDC

BODIES

Blank	Without Body
N	3/4" BSP Ports
S	#8 SAE Ports

NOTES: 1) Flows refer to a 14 bar Delta P
2) For other seals, consult factory

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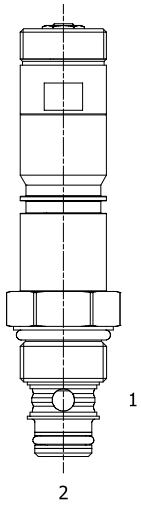
EB-P2A 2 WAY NORMALLY CLOSED, PROPORTIONAL FLOW CONTROL VALVE



DESCRIPTION

8 size, 3/4-16 thread, solenoid operated, 2 way normally closed poppet style, proportional flow control valve.

OPERATION

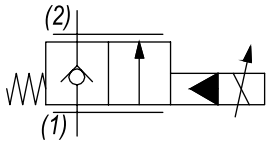
When de-energized the EB-P2A blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized, the valve allows flow from (1) to (2). Flow is proportional to current applied to the coil. A compensator must be used to create a pressure compensated flow control function.

FEATURES

- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

Curves are attained without pressure compensator. The valve can work with a pressure drop up to 200 bar.

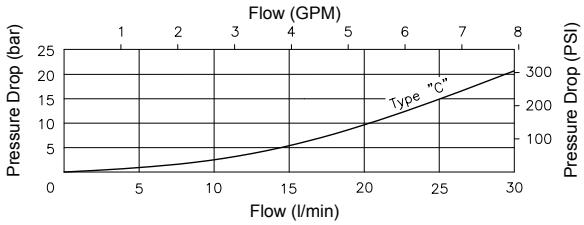
HYDRAULIC SYMBOL



PERFORMANCE

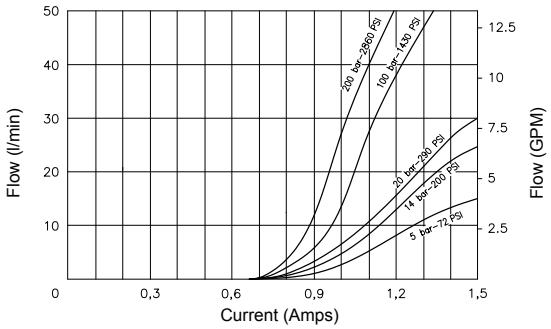
Pressure Drop

1 to 2 with valve completely open



Flow vs. Current at different Pressure Drop

Coil 12 VDC - hyd. - Oil 26 cSt (121 SSU) @ 40°C (104°F)



VALVE SPECIFICATIONS

Flow Range	See curves
Max System Pressure	3500 PSI (245 bar)
Leakage	0-10 drops / min @ 245 bar
Hysteresis	±3%
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-30°C / +100°C
Weight	.72 lbs (.32 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	19 ft-lbs (25 Nm)
Coil Nut Torque Requirements	2-3 ft-lbs (3-4 Nm)
Cavity	POWER 2W
Cavity Tools Kit (form tool, reamer, tap)	40500005
Seal Kit	21191102

COIL SPECIFICATIONS

Current Supply Characteristics	PWM (Pulse Width Modulation)
Rated Current Range	400-1400 mA
PWM or Super-Imposed Dither Frequency	100 Hz
Coil Resistance (12 VDC)	7.2 Ohm ±5% at 68°F (20°C)

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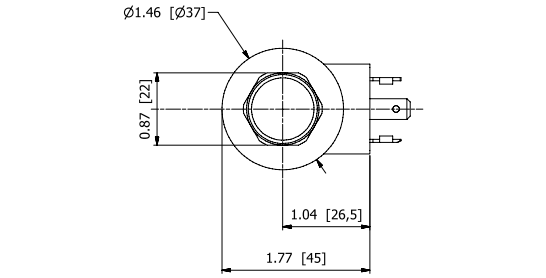
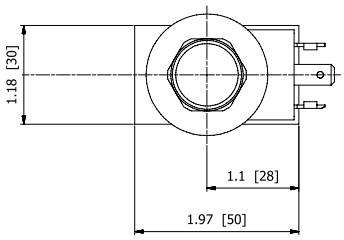
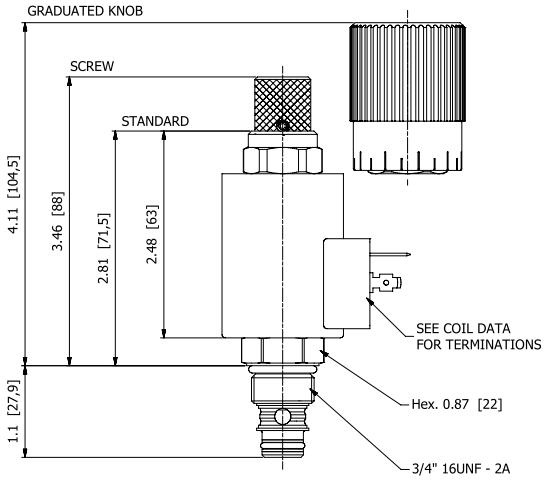
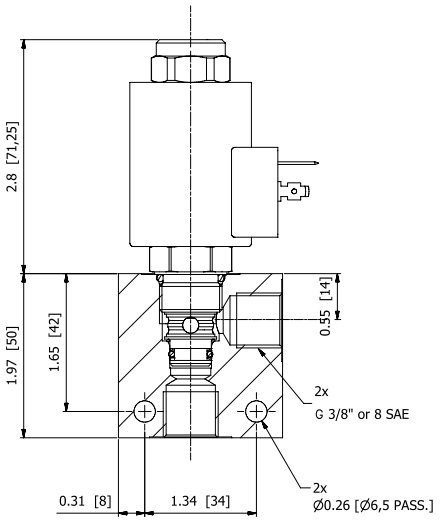
DIMENSIONS









(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

Approximate Coil Weight: .47 lbs (.21 kg)

EB-P2A – ____ – ____ – ____ – ____

OPTIONS

Buna Standard	**C0** Up to 25 l/min
Buna, Screw Type Override (Knob)	**CS** Up to 25 l/min
Buna, Screw Type Override (Grad. Knob)	**CK** Up to 25 l/min

"F" COIL TERMINATION

HC	DIN 43650 (Hirschmann)
DI	Deutsch-Integral DT04-2P
JT	AMP Jr. Timer

VOLTAGE

12	12 VDC
24	24 VDC

BODIES

Blank	Without Body
N	3/8" BSP Ports
S	#8 SAE Ports

NOTES: 1) Flows refer to a 14 bar Delta P
2) For other seals, consult factory

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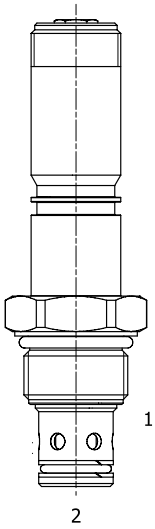
EE-P2A 2 WAY NORMALLY CLOSED, PROPORTIONAL FLOW CONTROL VALVE



DESCRIPTION

10 size, 7/8-14 thread, solenoid operated, 2 way normally closed poppet style, proportional flow control valve.

OPERATION

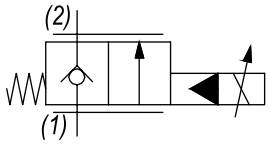
When de-energized the EE-P2A blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized, the valve allows flow from (1) to (2). Flow is proportional to current applied to the coil. A compensator must be used to create a pressure compensated flow control function.

FEATURES

- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

Curves are attained without pressure compensator. The valve can work with a pressure drop up to 200 bar.

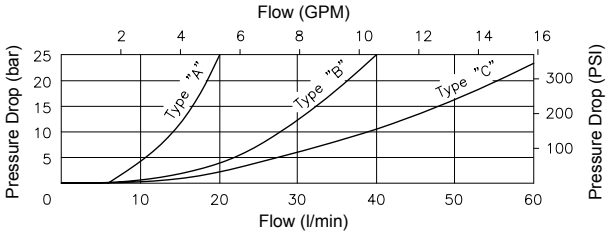
HYDRAULIC SYMBOL



PERFORMANCE

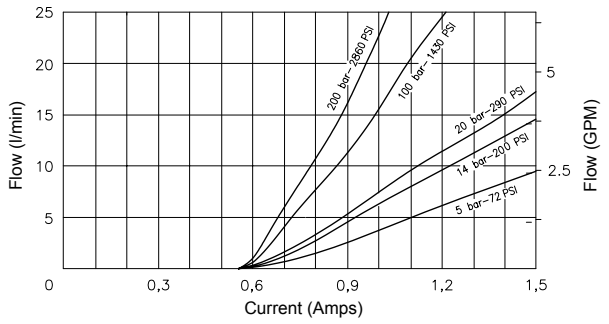
Pressure Drop

1 to 2 with valve completely open



Flow vs. Current at different Pressure Drop

***Poppet type A** - Coil 12 VDC - hyd. oil 26 cSt (121 SSU) @ 40°C (104°F)*



VALVE SPECIFICATIONS

Flow Range	See curves for various versions
Max System Pressure	3500 PSI (245 bar)
Leakage	0-10 drops / min @ 245 bar
Hysteresis	±3%
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-30°C / +100°C
Weight	.72 lbs (.32 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	26-35 ft-lbs (50 Nm)
Coil Nut Torque Requirements	2-3 ft-lbs (3-4 Nm)
Cavity	DELTA 2W
Cavity Tools Kit (form tool, reamer, tap)	40500000
Seal Kit	21191200

COIL SPECIFICATIONS

Current Supply Characteristics	PWM (Pulse Width Modulation)
Rated Current Range	400-1400 mA
PWM or Super-Imposed Dither Frequency	100 Hz
Coil Resistance (12 VDC)	7.2 Ohm ±5% at 68°F (20°C)

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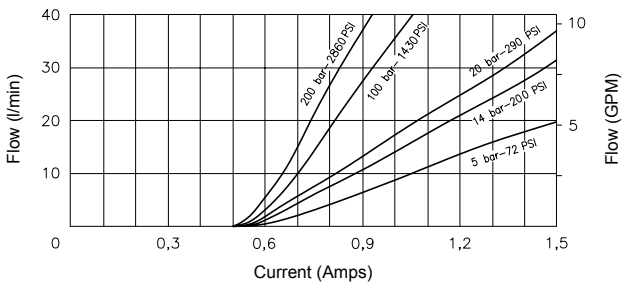
DIMENSIONS

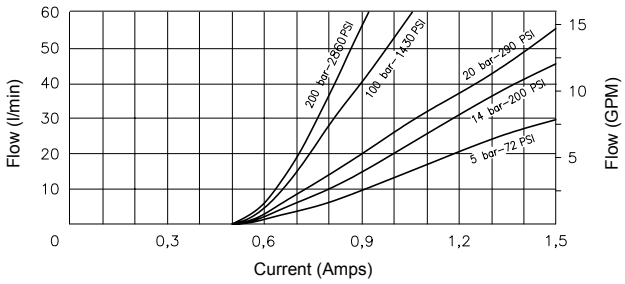
Flow vs. Current at different Pressure Drop

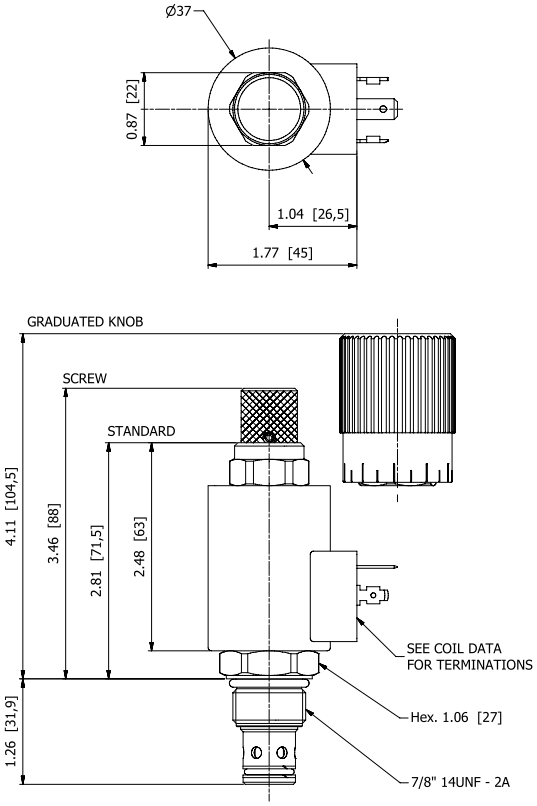
***Poppet type B** - Coil 12 VDC - hyd. oil 26 cSt (121 SSU) @ 40°C (104°F)*



Flow vs. Current at different Pressure Drop

***Poppet type C** - Coil 12 VDC - hyd. oil 26 cSt (121 SSU) @ 40°C (104°F)*





(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

Approximate Coil Weight: .47 lbs (.21 kg)

EE-P2A – ____ – ____ – ____ – ____

OPTIONS

Buna Standard	**A0**	Up to 15 l/min
Buna, Screw Type Override (Knob)	**AS**	Up to 15 l/min
Buna, Screw Type Override (Grad. Knob)	**AK**	Up to 15 l/min
Buna Standard	**B0**	Up to 30 l/min
Buna, Screw Type Override (Knob)	**BS**	Up to 30 l/min
Buna, Screw Type Override (Grad. Knob)	**BK**	Up to 30 l/min
Buna Standard	**C0**	Up to 45 l/min
Buna, Screw Type Override (Knob)	**CS**	Up to 45 l/min
Buna, Screw Type Override (Grad. Knob)	**CK**	Up to 45 l/min

"F" COIL TERMINATION

HC	DIN 43650 (Hirschmann)
DI	Deutsch-Integral DT04-2P
JT	AMP Jr. Timer

VOLTAGE

12	12 VDC
24	24 VDC

BODIES

Blank	Without Body
N	3/4" BSP Ports
S	#8 SAE Ports

NOTES: 1) Flows refer to a 14 bar Delta P
2) For other seals, consult factory

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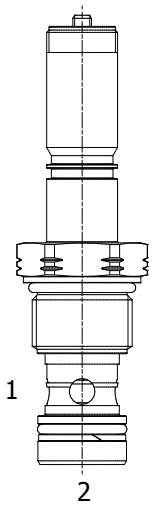
ET-P2A 2 WAY NORMALLY CLOSED, PROPORTIONAL FLOW CONTROL VALVE



DESCRIPTION

12 size, 1 1/16-12 thread, solenoid operated, 2 way normally closed poppet style, proportional flow control valve.

OPERATION

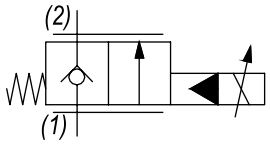
When de-energized the ET-P2A blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized, the valve allows flow from (1) to (2). Flow is proportional to current applied to the coil. A compensator must be used to create a pressure compensated flow control function.

FEATURES

- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

Curves are attained without pressure compensator. The valve can work with a pressure drop up to 200 bar.

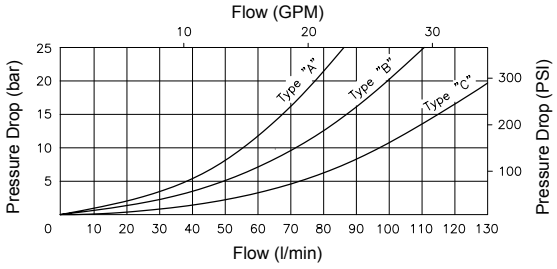
HYDRAULIC SYMBOL



PERFORMANCE

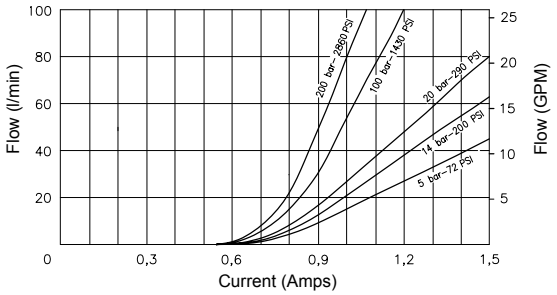
Pressure Drop

1 to 2 with valve completely open



Flow vs. Current at different Pressure Drop

***Poppet type A** - Coil 12 VDC - hyd. oil 26 cSt (121 SSU) @ 40°C (104°F)*



VALVE SPECIFICATIONS

Flow Range	See curves for various versions
Max System Pressure	3500 PSI (245 bar)
Leakage	0-10 drops / min @ 245 bar
Hysteresis	±3%
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-30°C / +100°C
Weight	.72 lbs (.32 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	37 ft-lbs (50 Nm)
Coil Nut Torque Requirements	2-3 ft-lbs (3-4 Nm)
Cavity	TECNORD 2W
Cavity Tools Kit (form tool, reamer, tap)	40500032
Seal Kit	21191200

COIL SPECIFICATIONS

Current Supply Characteristics	PWM (Pulse Width Modulation)
Rated Current Range	400-1400 mA
PWM or Super-Imposed Dither Frequency	100 Hz
Coil Resistance (12 VDC)	7.2 Ohm ±5% at 68°F (20°C)

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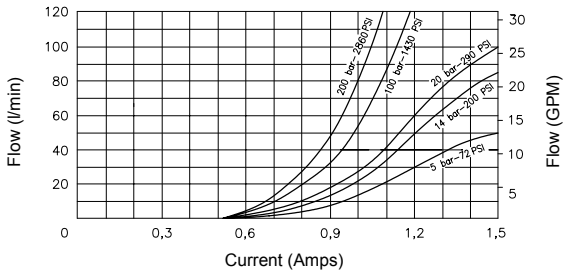
DIMENSIONS

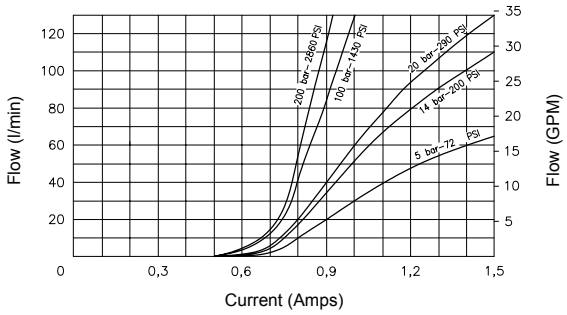
Flow vs. Current at different Pressure Drop

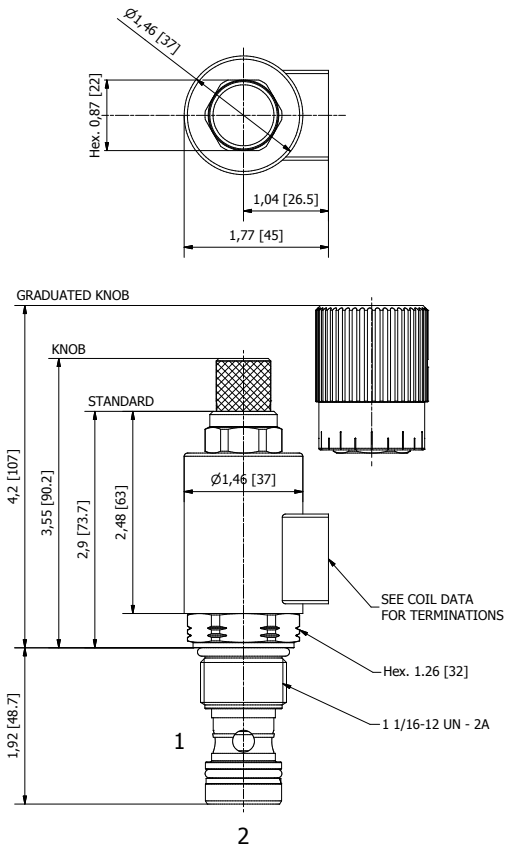
***Poppet type B** - Coil 12 VDC - hyd. oil 26 cSt (121 SSU) @ 40°C (104°F)*



Flow vs. Current at different Pressure Drop

***Poppet type C** - Coil 12 VDC - hyd. oil 26 cSt (121 SSU) @ 40°C (104°F)*





(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

Approximate Coil Weight: .47 lbs (.21 kg)

ET-P2A – ____ – ____ – ____ – ____

OPTIONS

Buna Standard	**A0**	Up to 65 l/min
Buna, Screw Type Override (Knob)	**AS**	Up to 65 l/min
Buna, Screw Type Override (Grad. Knob)	**AK**	Up to 65 l/min
Buna Standard	**B0**	Up to 85 l/min
Buna, Screw Type Override (Knob)	**BS**	Up to 85 l/min
Buna, Screw Type Override (Grad. Knob)	**BK**	Up to 85 l/min
Buna Standard	**C0**	Up to 110 l/min
Buna, Screw Type Override (Knob)	**CS**	Up to 110 l/min
Buna, Screw Type Override (Grad. Knob)	**CK**	Up to 110 l/min

"F" COIL TERMINATION

HC	DIN 43650 (Hirschmann)
DI	Deutsch-Integral DT04-2P
JT	AMP Jr. Timer

VOLTAGE

12	12 VDC
24	24 VDC

BODIES

Blank	Without Body
N	3/4" BSP Ports
S	#8 SAE Ports

NOTES: 1) Flows refer to a 14 bar Delta P
2) For other seals, consult factory

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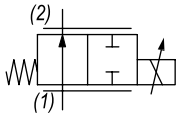
2 WAY NORMALLY OPEN PROPORTIONAL FLOW CONTROL VALVES

SPOOL TYPE	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	8	3500	30	245	7/8-14	**EE-P2H**	PT32

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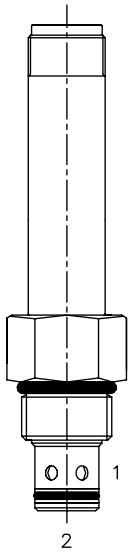
EE-P2H 2 WAY NORMALLY OPEN, PROPORTIONAL FLOW CONTROL VALVE



DESCRIPTION

10 size, 7/8-14 thread, solenoid operated, 2 way normally open, proportional flow control valve.

OPERATION

When de-energized the EE-P2H allows flow from (1) to (2). When fully energized, the valve blocks flow at port (1) and (2). Flow is proportional to current applied to the coil. A compensator must be used to create a pressure compensated flow control function.

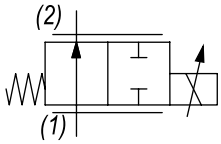
OPERATION OF MANUAL OVERRIDE OPTION: to override, turn the manual override screw clockwise. To release turn the manual override screw counterclockwise.

FEATURES

- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

Curve is attained with Tecnord QC-CP3 compensator at with various settings.

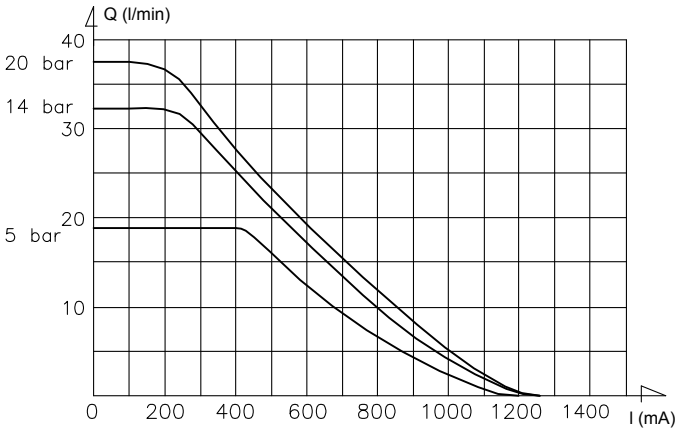
HYDRAULIC SYMBOL



PERFORMANCE

Flow (l/min) vs. Current (mA)

Coil 12 VDC - Delta P = 5, 14, 20 bar; Toil = 40°C



VALVE SPECIFICATIONS

Flow Range	See curve
Max System Pressure	3500 PSI (245 bar)
Leakage	Max 100 cc/min at 245 bar
Hysteresis	±4%
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-30°C / +100°C
Weight	.58 lbs (.26 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	26 ft-lbs (35 Nm)
Coil Nut Torque Requirements	2-3 ft-lbs (3-4 Nm)
Cavity	DELTA 2W
Cavity Tools Kit (form tool, reamer, tap)	40500000
Seal Kit	21191200

COIL SPECIFICATIONS

Current Supply Characteristics	PWM (Pulse Width Modulation)
Rated Current Range	400-1400 mA
PWM or Super-Imposed Dither Frequency	100-150 Hz
Coil Resistance (12 VDC)	7.2 Ohm ±5% at 68°F (20°C)

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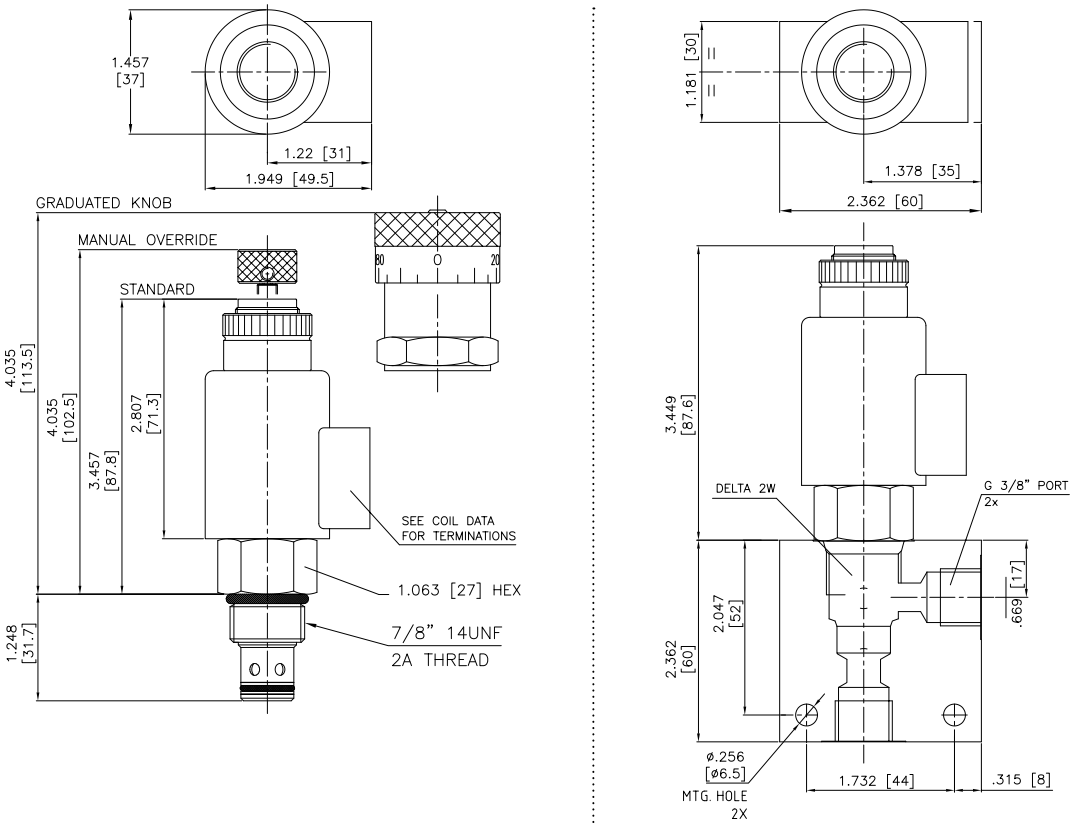
DIMENSIONS



(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

Approximate Coil Weight: .47 lbs (.21 kg)

EE-P2H – ____ – ____ – ____ – ____

OPTIONS

Buna, Push Type Override Standard	**0P**
Buna, Screw Type Override (Knob)	**0S**
Buna, Screw Type Override (Grad. Knob)	**0K**

"F" COIL TERMINATION

HC	DIN 43650 (Hirschmann)
DI	Deutsch-Integral DT04-2P
JT	AMP Jr. Timer

VOLTAGE

12	12 VDC
24	24 VDC

BODIES

Blank	Without Body
N	3/8" BSP Ports
S	#8 SAE Ports

NOTES: for other seals, consult factory.

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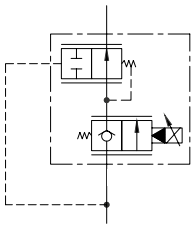
2 WAY NORMALLY CLOSED PRESSURE COMPENSATED PROPORTIONAL FLOW REGULATOR VALVES

POPPET TYPE	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	12	3500	45	245	7/8-14	**EG-F2A**	PT36
	12	3500	45	245	1/16-12	**EU-F2A**	PT38

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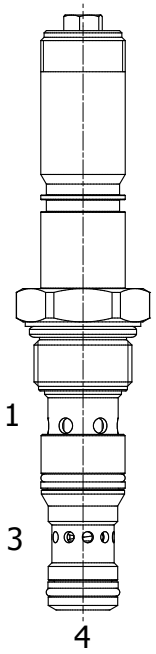
EG-F2A 2 WAY PRESSURE COMPENSATED PROPORTIONAL FLOW REGULATOR



DESCRIPTION

10 size, 7/8-14 thread, “Delta” series, solenoid operated, normally closed, poppet style, restrictive type 2 ways pressure compensated proportional flow regulator.

OPERATION

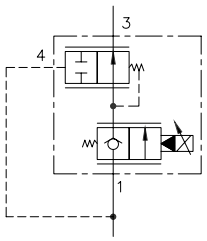
EG-F2A maintains a constant flow rate out of (2) regardless of load pressure variations in the circuit downstream of (1). When coil is not energized, there is no regulated flow out of (2). The valve begins to respond to load variations when the flow through the valve creates a pressure differential across the control spool.
Reverse flow from (2) to (1) returns through the control spool and is not compensated.
OPERATION OF MANUAL OVERRIDE OPTION: to override, turn the manual override screw counterclockwise. To release turn the manual override screw clockwise.

FEATURES

- Hardened parts for long-life.
- Industry common cavity.
- Excellent linearity and low hysteresis characteristics.
- Cartridges are voltage interchangeable.
- Optional coil voltages and terminations available.
- Unitized, molded coil design.
- Continuous duty rated solenoid.

Port (1) must be connected in the manifold to port (3).

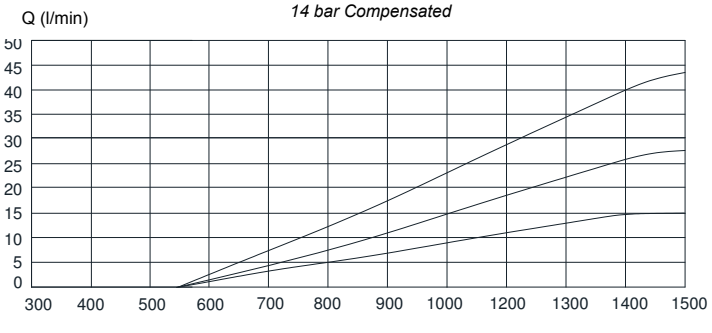
HYDRAULIC SYMBOL



PERFORMANCE

Flow (lt/min) vs. Current (mA - PWM @ 100 Hz)

14 bar Compensated



VALVE SPECIFICATIONS

Flow Range	See curves for various versions
Max System Pressure	3500 PSI (245 bar)
Leakage	0-10 drops / min @ 245 bar
Hysteresis	±5%
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-30°C / +100°C
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (41 Nm)
Coil Nut Torque Requirements	2-3 ft-lbs (3-4 Nm)
Cavity	DELTA 4W
Cavity Tools Kit (form tool, reamer, tap)	40500002

COIL SPECIFICATIONS

Current Supply Characteristics	PWM (Pulse Width Modulation)
Rated Current Range	400-1400 mA
PWM or Super-Imposed Dither Frequency	100 Hz
Coil Resistance (12 VDC)	7.2 Ohm ±5% at 68°F (20°C)

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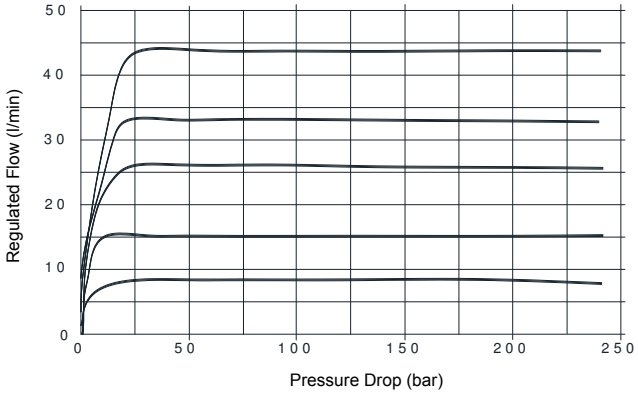
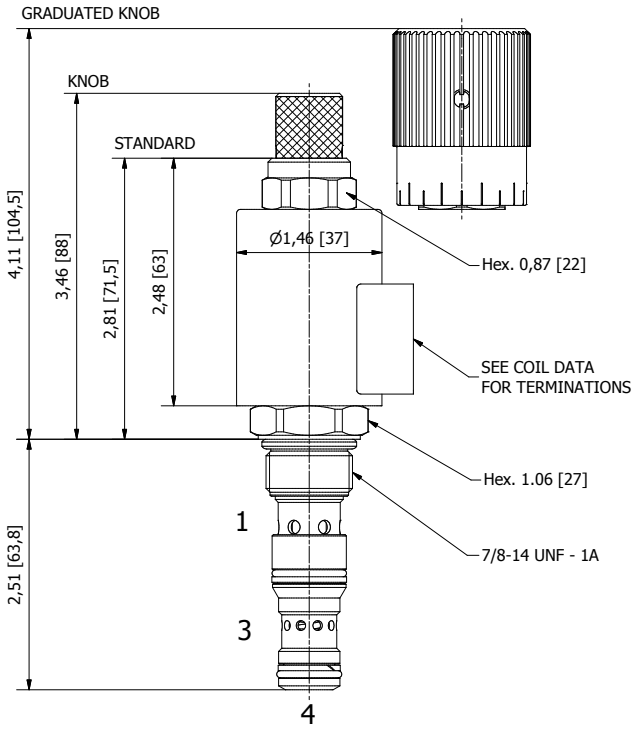
DIMENSIONS

Regulated Flow vs. Pressure

Coil 12 VDC - 130 Hz PWM - Oil 26 cSt (121 SSU) @ 50°C (104°F)





(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

Approximate Coil Weight: .47 lbs (.21 kg)

EG-F2A – ____ – ____ – ____ – ____

OPTIONS

Buna Standard	**A0**	Up to 15 l/min
Buna, Screw Type Override (Knob)	**AS**	Up to 15 l/min
Buna, Screw Type Override (Grad. Knob)	**AK**	Up to 15 l/min
Buna Standard	**B0**	Up to 30 l/min
Buna, Screw Type Override (Knob)	**BS**	Up to 30 l/min
Buna, Screw Type Override (Grad. Knob)	**BK**	Up to 30 l/min
Buna Standard	**C0**	Up to 45 l/min
Buna, Screw Type Override (Knob)	**CS**	Up to 45 l/min
Buna, Screw Type Override (Grad. Knob)	**CK**	Up to 45 l/min

"F" COIL TERMINATION

HC	DIN 43650 (Hirschmann)
DI	Deutsch-Integral DT04-2P
JT	AMP Jr. Timer

VOLTAGE

12	12 VDC
24	24 VDC

BODIES

Blank	Without Body
N	3/8" BSP Ports
S	#6 SAE Ports

NOTES: for other seals, consult factory.

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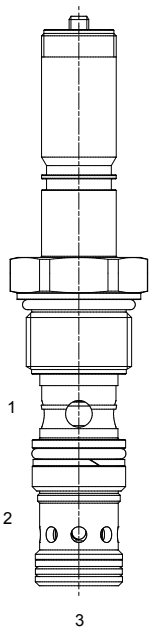
EU-F2A 2 WAY PRESSURE COMPENSATED PROPORTIONAL FLOW REGULATOR



DESCRIPTION

12 size, 1" 1/16-12 thread, "Tecnord" series, solenoid operated, normally closed, poppet style, restrictive type 2 ways pressure compensated proportional flow regulator.

OPERATION

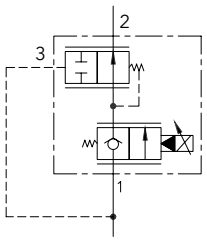
EU-F2A maintains a constant flow rate out of (2) regardless of load pressure variations in the circuit downstream of (1). When coil is not energized, there is no regulated flow out of (2). The valve begins to respond to load variations when the flow through the valve creates a pressure differential across the control spool.
Reverse flow from (2) to (1) returns through the control spool and is not compensated. The manual override increases flow by counter-clockwise rotation of the manual override knob.

FEATURES

- Hardened parts for long-life.
- Industry common cavity.
- Excellent linearity and low hysteresis characteristics.
- Cartridges are voltage interchangeable.
- Optional coil voltages and terminations available.
- Unitized, molded coil design.
- Continuous duty rated solenoid.

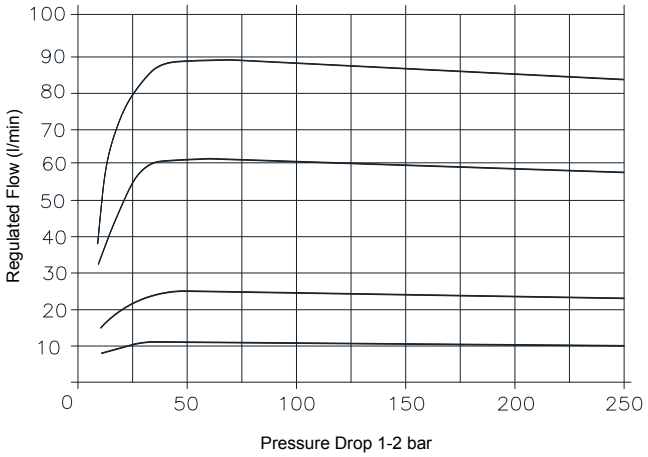
Port (1) must be connected in the manifold to port (3).

HYDRAULIC SYMBOL



PERFORMANCE

Regulated Flow vs. Pressure



VALVE SPECIFICATIONS

Flow Range	See curves for various versions
Max System Pressure	3500 PSI (245 bar)
Leakage	0-10 drops / min @ 245 bar
Hysteresis	±5%
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-30°C / +100°C
Weight	.72 lbs (.32 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	37 ft-lbs (50 Nm)
Coil Nut Torque Requirements	2-3 ft-lbs (3-4 Nm)
Cavity	TECNORD 3W
Cavity Tools Kit (form tool, reamer, tap)	40500034

COIL SPECIFICATIONS

Current Supply Characteristics	PWM (Pulse Width Modulation)
Rated Current Range	500-1400 mA
PWM or Super-Imposed Dither Frequency	100 Hz
Coil Resistance (12 VDC)	7.2 Ohm ±5% at 68°F (20°C)

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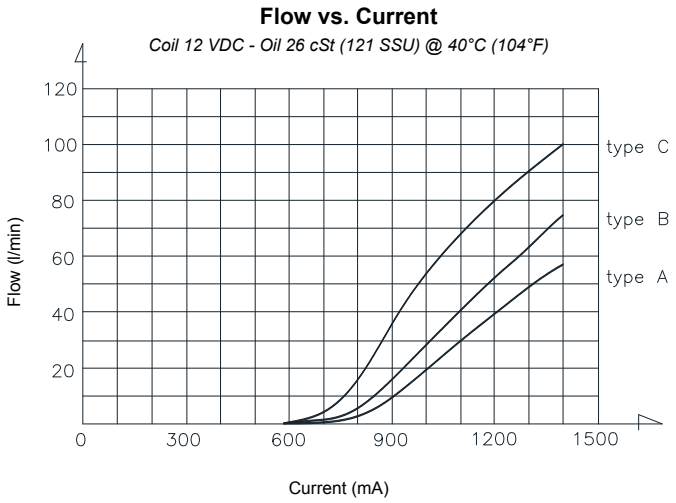
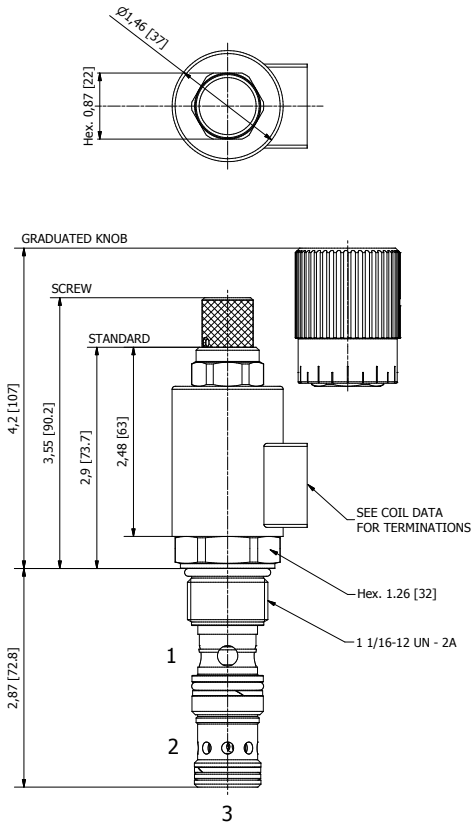
DIMENSIONS





(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

Approximate Coil Weight: .47 lbs (.21 kg)

EU-F2A – ____ – ____ – ____ – ____

OPTIONS

Buna Standard	**A0**	Up to 55 l/min
Buna, Screw Type Override (Knob)	**AS**	Up to 55 l/min
Buna, Screw Type Override (Grad. Knob)	**AK**	Up to 55 l/min
Buna Standard	**B0**	Up to 75 l/min
Buna, Screw Type Override (Knob)	**BS**	Up to 75 l/min
Buna, Screw Type Override (Grad. Knob)	**BK**	Up to 75 l/min
Buna Standard	**C0**	Up to 100 l/min
Buna, Screw Type Override (Knob)	**CS**	Up to 100 l/min
Buna, Screw Type Override (Grad. Knob)	**CK**	Up to 100 l/min

"F" COIL TERMINATION

HC	DIN 43650 (Hirschmann)
DI	Deutsch-Integral DT04-2P
JT	AMP Jr. Timer

VOLTAGE

12	12 VDC
24	24 VDC

BODIES

Blank	Without Body
N	3/4" BSP Ports
S	#8 SAE Ports

NOTES: for other seals, consult factory.

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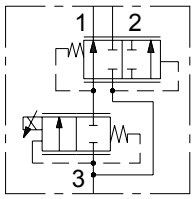
3 WAY NORMALLY CLOSED PRESSURE COMPENSATED PROPORTIONAL FLOW REGULATOR VALVES

SPOOL TYPE	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	6	3500	22	245	7/8-14	**EF-F3G**	PT42
	16	3500	60	245	1/16-12	**EU-F3G**	PT44

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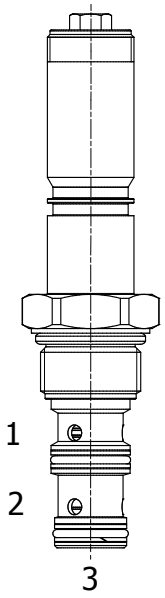
EF-F3G 3 WAY PRESSURE COMPENSATED PRIORITY TYPE PROP. FLOW REGULATOR



DESCRIPTION

10 size, 7/8-14 thread, “Delta” series, solenoid operated, normally closed, spool style, 3 ways priority type pressure compensated proportional flow regulator. It can also be used as a restrictive-type 2 way, pressure-compensated flow regulator when the bypass line (port 2) is blocked.

OPERATION

EF-F3G maintains a constant flow rate out of (1) regardless of load pressure variations in the circuit downstream of (3) and regardless bypass pressure variations in the circuit downstream of (2). Excess flow bypasses out of (2). When coil is not energized, there is no regulated flow out of (1).

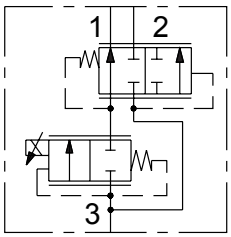
OPERATION OF MANUAL OVERRIDE OPTION: to override, turn the manual override screw counterclockwise. To release turn the manual override screw clockwise.

FEATURES

- Hardened parts for long-life.
- Industry common cavity.
- Excellent linearity and low hysteresis characteristics.
- Cartridges are voltage interchangeable.
- Optional coil voltages and terminations available.
- Unitized, molded coil design.
- Continuous duty rated solenoid.

It can be used as a restrictive 2-way pressure-compensated flow control valve, blocking bypass line port (2)

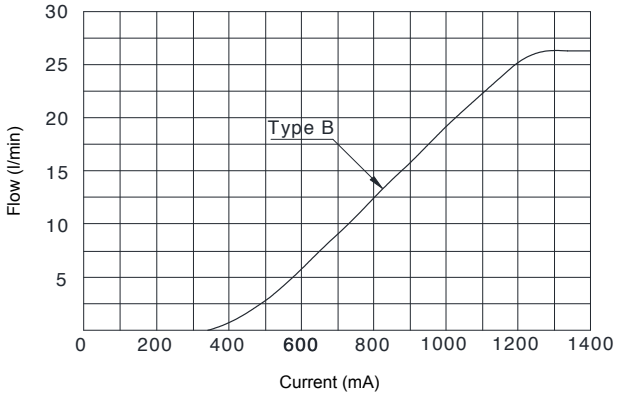
HYDRAULIC SYMBOL



PERFORMANCE

Flow vs. Current

Coil 12 VDC - 130 Hz PWM - Oil 26 cSt (121 SSU) @ 50°C (104°F)



VALVE SPECIFICATIONS

Flow Range	See curves for various versions
Max System Pressure	3500 PSI (245 bar)
Leakage	10 cu-in/min @ 3000 PSI 160 cc/min @ 207 bar
Hysteresis	±5%
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-30°C / +100°C
Weight	.49 lbs (.22 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (41 Nm)
Coil Nut Torque Requirements	2-3 ft-lbs (3-4 Nm)
Cavity	DELTA 3W
Cavity Tools Kit (form tool, reamer, tap)	40500001

COIL SPECIFICATIONS

Current Supply Characteristics	PWM (Pulse Width Modulation)
Rated Current Range	400-1400 mA
PWM or Super-Imposed Dither Frequency	120-140 Hz
Coil Resistance (12 VDC)	7.2 Ohm ±5% at 68°F (20°C)

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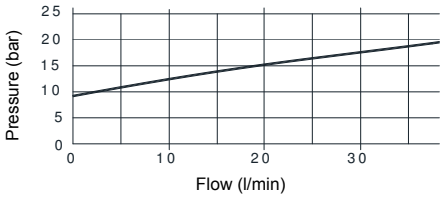
DIMENSIONS

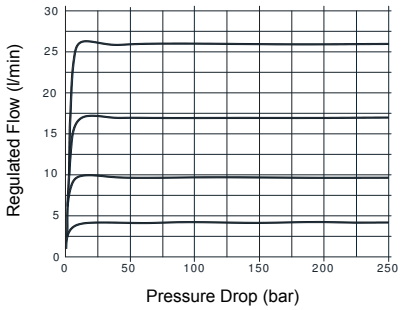
Pressure Drop 3→2 (bar)

Oil 26 cSt (121 SSU) @ 50°C (104°F)



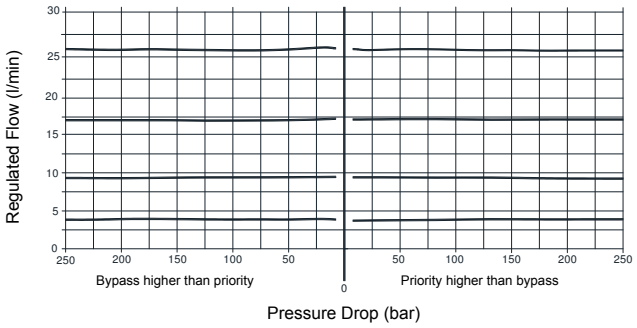
Regulated Flow vs. Pressure

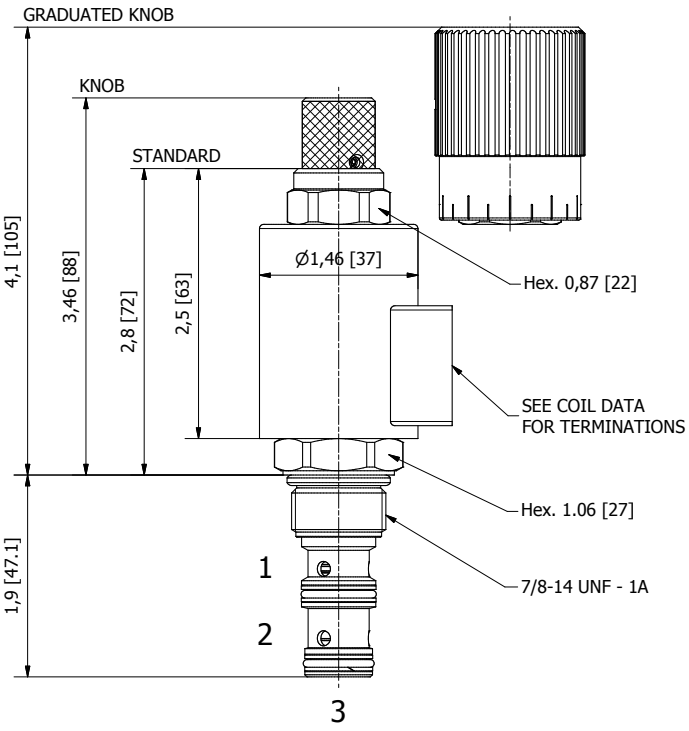
***2 WAYS** - Coil 12 VDC - 130 Hz PWM - Oil 26 cSt (121 SSU) @ 50°C (104°F)*



Pres. Compensation from Inlet to Work Port or Bypass Port

***3 WAYS** - Coil 12 VDC - 130 Hz PWM - Oil 26 cSt (121 SSU) @ 50°C (104°F)*





(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

Approximate Coil Weight: .47 lbs (.21 kg)

EF-F3G – _____ – _____ – _____ – _____

OPTIONS

Buna Standard	**B0**	Up to 25 l/min
Buna, Screw Type Override (Knob)	**BS**	Up to 25 l/min
Buna, Screw Type Override (Grad. Knob)	**BK**	Up to 25 l/min

"F" COIL TERMINATION

HC	DIN 43650 (Hirschmann)
DI	Deutsch-Integral DT04-2P
JT	AMP Jr. Timer

VOLTAGE

12	12 VDC
24	24 VDC

BODIES

Blank	Without Body
N	3/8" BSP Ports
S	#6 SAE Ports

NOTES: 1) For other flow settings, consult factory.
2) For other seals, consult factory.

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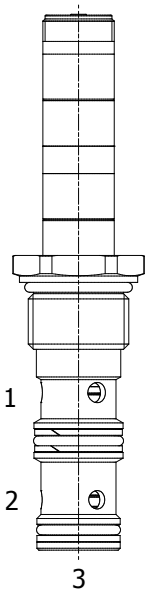
EU-F3G 3 WAY PRESSURE COMPENSATED PRIORITY TYPE PROP. FLOW REGULATOR



DESCRIPTION

12 size, 1" 1/16-12 thread, "Tecnord" series, solenoid operated, normally closed, spool style, 3 ways priority type pressure compensated proportional flow regulator. It can also be used as a restrictive-type 2 way, pressure-compensated flow regulator when the bypass line (port 2) is blocked.

OPERATION

EU-F3G maintains a constant flow rate out of (1) regardless of load pressure variations in the circuit downstream of (3) and regardless bypass pressure variations in the circuit downstream of (2). Excess flow bypasses out of (2). When coil is not energized, there is no regulated flow out of (1).

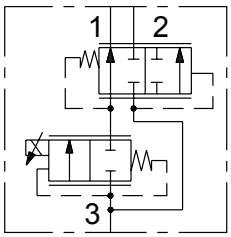
OPERATION OF MANUAL OVERRIDE OPTION: to override, turn the manual override screw counterclockwise. To release turn the manual override screw clockwise.

FEATURES

- Hardened parts for long-life.
- Industry common cavity.
- Excellent linearity and low hysteresis characteristics.
- Cartridges are voltage interchangeable.
- Optional coil voltages and terminations available.
- Unitized, molded coil design.
- Continuous duty rated solenoid.

It can be used as a restrictive 2-way pressure-compensated flow control valve, blocking bypass line port (2)

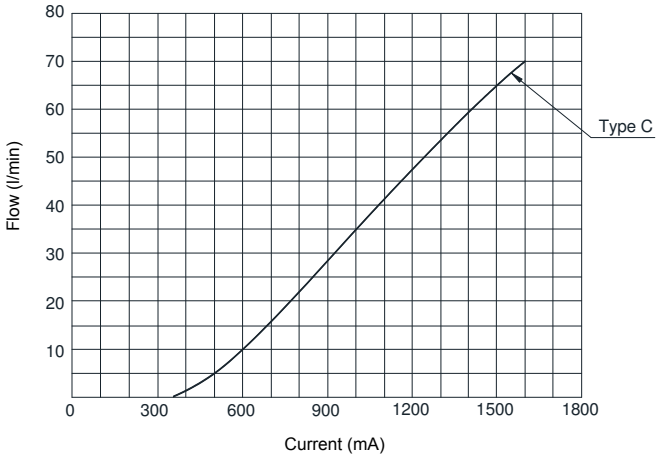
HYDRAULIC SYMBOL



PERFORMANCE

Flow vs. Current

Coil 12 VDC - 130 Hz PWM - Oil 26 cSt (121 SSU) @ 50°C (104°F)



VALVE SPECIFICATIONS

Flow Range	See curves for various versions
Max System Pressure	3500 PSI (245 bar)
Leakage	15.7 cu-in/min @ 3000 PSI 250 cc/min @ 207 bar
Hysteresis	±5%
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-30°C / +100°C
Weight	.75 lbs (.34 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	37 ft-lbs (50 Nm)
Coil Nut Torque Requirements	2-3 ft-lbs (3-4 Nm)
Cavity	TECNORD 3W
Cavity Tools Kit (form tool, reamer, tap)	40500034

COIL SPECIFICATIONS

Current Supply Characteristics	PWM (Pulse Width Modulation)
Rated Current Range	400-1400 mA
PWM or Super-Imposed Dither Frequency	120-140 Hz
Coil Resistance (12 VDC)	7.2 Ohm ±5% at 68°F (20°C)

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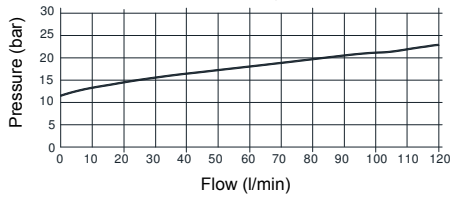
DIMENSIONS

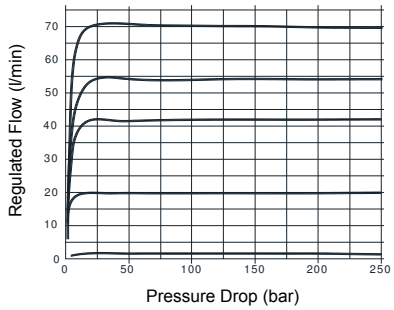
Pressure Drop 3→2 (bar)

Oil 26 cSt (121 SSU) @ 50°C (104°F)



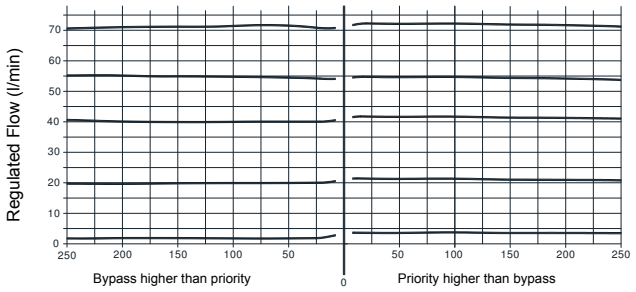
Regulated Flow vs. Pressure

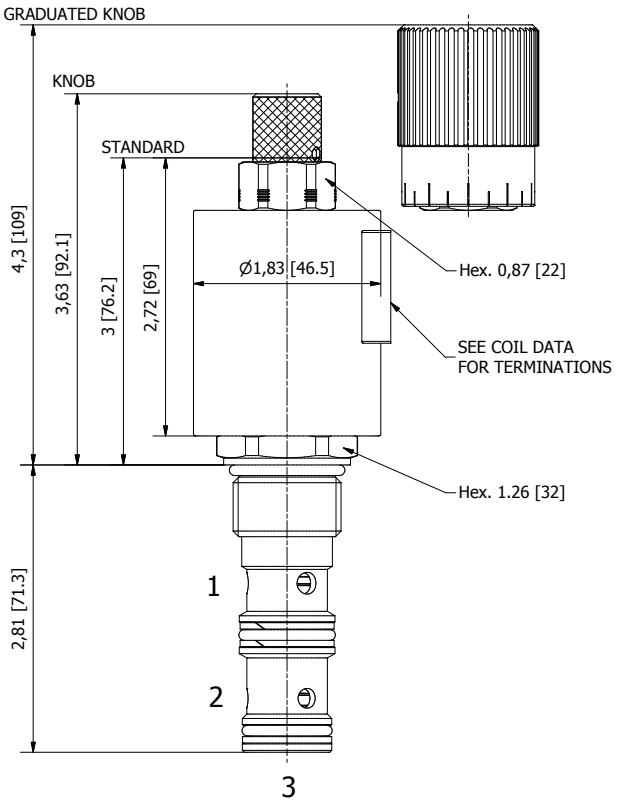
***2 WAYS** - Coil 12 VDC - 130 Hz PWM - Oil 26 cSt (121 SSU) @ 50°C (104°F)*



Pres. Compensation from Inlet to Work Port or Bypass Port

***3 WAYS** - Coil 12 VDC - 130 Hz PWM - Oil 26 cSt (121 SSU) @ 50°C (104°F)*





(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

Approximate Coil Weight: .47 lbs (.21 kg)

EU-F3G – ____ – ____ – ____ – ____

OPTIONS

Buna Standard	**C0** Up to 60 l/min
Buna, Screw Type Override (Knob)	**CS** Up to 60 l/min
Buna, Screw Type Override (Grad. Knob)	**CK** Up to 60 l/min

"Z" COIL TERMINATION

HC	DIN 43650 (Hirschmann)
DI	Deutsch-Integral DT04-2P
JT	AMP Jr. Timer

VOLTAGE

12	12 VDC
24	24 VDC

BODIES

Blank	Without Body
N	3/4" BSP Ports
S	#8 SAE Ports

NOTES: 1) For other flow settings, consult factory.
2) For other seals, consult factory.

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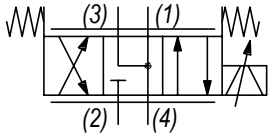
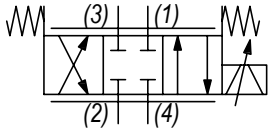
4W/3P PROPORTIONAL DIRECTIONAL CONTROL VALVES

MOTOR SPOOL TYPE	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	3	3500	12	245	3/4-16	**EQ-S4M**	PT48
	6	3500	23	245	7/8-14	**EG-S4M**	PT50

CYLINDER SPOOL TYPE	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	3	3500	12	245	3/4-16	**EQ-S4P**	PT52
	6	3500	23	245	7/8-14	**EG-S4P**	PT54

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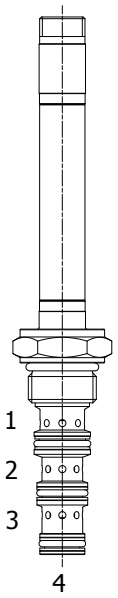
EQ-S4M 4 WAY 3 POSITION, MOTOR SPOOL, PROPORTIONAL DIRECTIONAL VALVE

NEW



DESCRIPTION

8 size, 3/4-16 thread, “Power” series, solenoid operated, 4 way 3 position, Motor Spool, proportional directional valve.

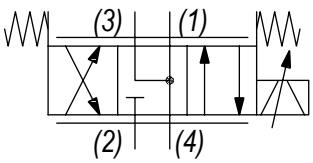
OPERATION

EQ-S4M, when de-energized, blocks flow at (2) and allows flow between (1), (3) and (4). When coil (S1) is energized, flow is allowed from (3) to (4), and from (2) to (1). When coil (S2) is energized, flow is allowed from (3) to (2), and from (4) to (1). Flow is proportional to the current applied to the coil. A compensator must be used to create a pressure compensated flow control function.

FEATURES

- Hardened parts for long-life.
- Industry common cavity.
- Excellent linearity and low hysteresis characteristics.
- Cartridges are voltage interchangeable.
- Optional coil voltages and terminations available.
- Unitized, molded coil design.
- Continuous duty rated solenoid.

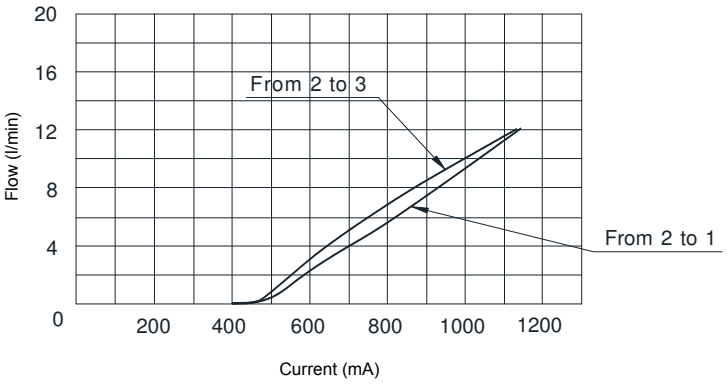
HYDRAULIC SYMBOL



PERFORMANCE

Flow vs. Current

Coil 12 VDC - 130 Hz PWM - Oil 26 cSt (121 SSU) @ 50°C (104°F)



VALVE SPECIFICATIONS

Flow Range	See curves for various versions
Max System Pressure	3500 PSI (245 bar)
Leakage	10 cu-in/min 160 cc/min bar @ 210 bar
Hysteresis	±5%
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-30°C / +100°C
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	18 ft-lbs (26 Nm)
Coil Nut Torque Requirements	2-3 ft-lbs (3-4 Nm)
Cavity	POWER 4W
Cavity Tools Kit (form tool, reamer, tap)	40500029

COIL SPECIFICATIONS

Current Supply Characteristics	PWM (Pulse Width Modulation)
Rated Current Range	400-1400 mA
PWM or Super-Imposed Dither Frequency	100-200 Hz
Coil Resistance (12 VDC)	6.85 Ohm ±5% at 68°F (20°C)

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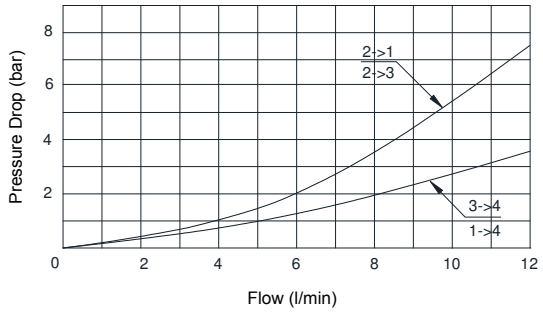
DIMENSIONS

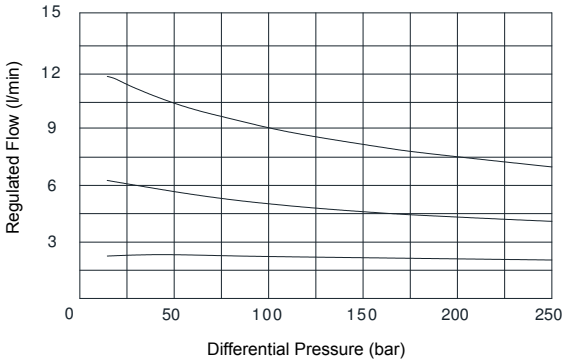
Pressure Drop vs. Flow

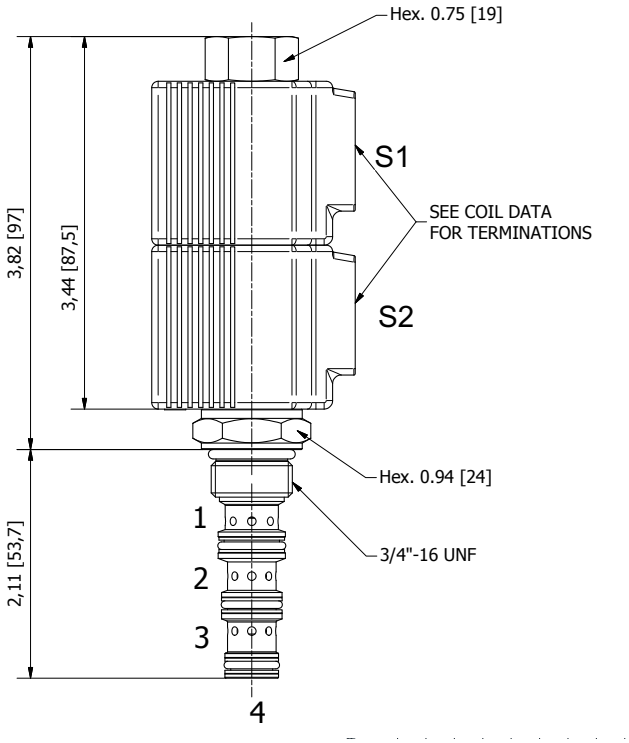
Coil 12 VDC - 130 Hz PWM - Oil 26 cSt (121 SSU) @ 50°C (104°F)



Pressure Compensation from Inlet to Work Port

Coil 12 VDC - 130 Hz PWM - Oil 26 cSt (121 SSU) @ 50°C (104°F)





(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

Approximate Coil Weight: .47 lbs (.21 kg)

EQ-S4M – ____ – ____ – ____ – ____

OPTIONS
Buna Standard **B0** Up to 8 l/min
Buna Standard **C0** Up to 12 l/min

"PJ" COIL TERMINATION
JH DIN 43650 (Hirschmann)
JD Deutsch-Integral DT04-2P
JA AMP Jr. Timer

VOLTAGE
12 12 VDC
24 24 VDC

BODIES
Blank Without Body
N 3/8" BSP Ports
S #6 SAE Ports

NOTES: for other seals, consult factory.

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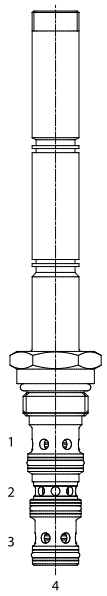
EG-S4M 4 WAY 3 POSITION, MOTOR SPOOL, PROPORTIONAL DIRECTIONAL VALVE

NEW



DESCRIPTION

10 size, 7/8-14 thread, “Delta” series, solenoid operated, 4 way 3 position, Motor Spool, proportional directional valve.

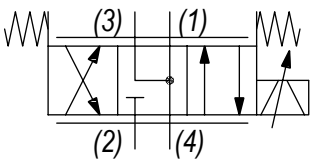
OPERATION

EG-S4M, when de-energized, blocks flow at (2) and allows flow between (1), (3) and (4). When coil (S1) is energized, flow is allowed from (3) to (4), and from (2) to (1). When coil (S2) is energized, flow is allowed from (3) to (2), and from (4) to (1). Flow is proportional to the current applied to the coil. A compensator must be used to create a pressure compensated flow control function.

FEATURES

- Hardened parts for long-life.
- Industry common cavity.
- Excellent linearity and low hysteresis characteristics.
- Cartridges are voltage interchangeable.
- Optional coil voltages and terminations available.
- Unitized, molded coil design.
- Continuous duty rated solenoid.

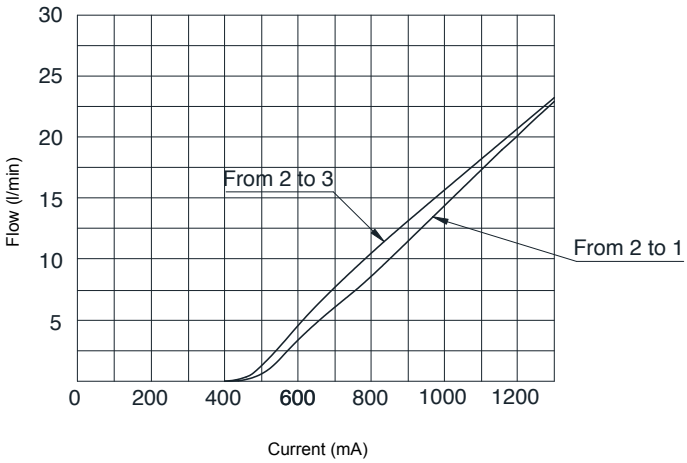
HYDRAULIC SYMBOL



PERFORMANCE

Flow vs. Current

Coil 12 VDC - 130 Hz PWM - Oil 26 cSt (121 SSU) @ 50°C (104°F)



VALVE SPECIFICATIONS

Flow Range	See curves for various versions
Max System Pressure	3500 PSI (245 bar)
Leakage	15 cu-in/min 250 cc/min bar @ 210 bar
Hysteresis	±5%
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-30°C / +100°C
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Coil Nut Torque Requirements	2-3 ft-lbs (3-4 Nm)
Cavity	DELTA 4W
Cavity Tools Kit (form tool, reamer, tap)	40500002

COIL SPECIFICATIONS

Current Supply Characteristics	PWM (Pulse Width Modulation)
Rated Current Range	400-1400 mA
PWM or Super-Imposed Dither Frequency	100-200 Hz
Coil Resistance (12 VDC)	7.2 Ohm ±5% at 68°F (20°C)

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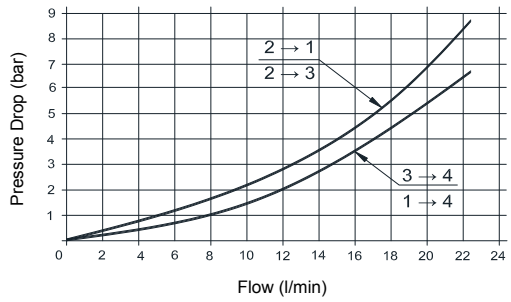
DIMENSIONS

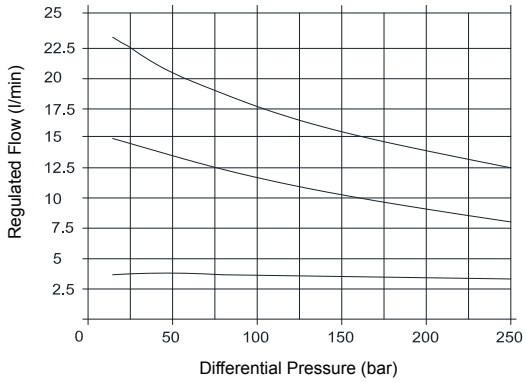
Pressure Drop vs. Flow

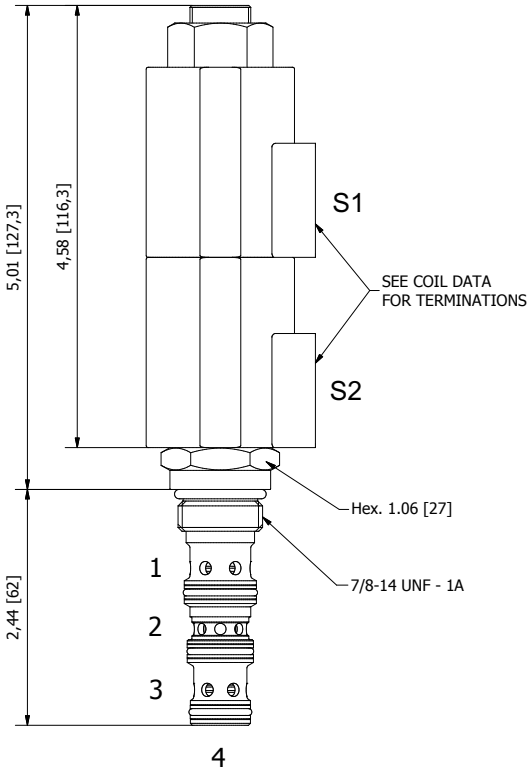
Coil 12 VDC - 130 Hz PWM - Oil 26 cSt (121 SSU) @ 50°C (104°F)



Pressure Compensation from Inlet to Work Port

Coil 12 VDC - 130 Hz PWM - Oil 26 cSt (121 SSU) @ 50°C (104°F)





(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

Approximate Coil Weight: .47 lbs (.21 kg)

EG-S4M – ____ – ____ – ____ – ____

OPTIONS
Buna Standard **B0** Up to 22 l/min

"L" COIL TERMINATION
HC DIN 43650 (Hirschmann)
DT Deutsch-Integral DT04-2P

VOLTAGE
12 12 VDC
24 24 VDC

BODIES
Blank Without Body
N 3/8" BSP Ports
S #6 SAE Ports

NOTES: for other seals, consult factory.

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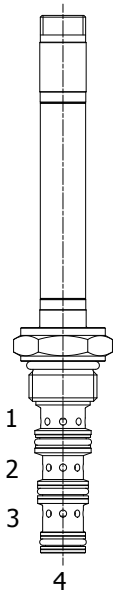
EQ-S4P 4 WAY 3 POSITION, CYLINDER SPOOL, PROPORTIONAL DIRECTIONAL VALVE

NEW



DESCRIPTION

8 size, 3/4-16 thread, “Power” series, solenoid operated, 4 way 3 position, Cylinder Spool, proportional directional valve.

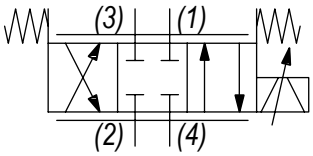
OPERATION

EQ-S4P, when de-energized, blocks flow to all ports. When coil (S1) is energized, flow is allowed from (3) to (4), and from (2) to (1). When coil (S2) is energized, flow is allowed from (3) to (2), and from (4) to (1). Flow is proportional to the current applied to the coil. A compensator must be used to create a pressure compensated flow control function.

FEATURES

- Hardened parts for long-life.
- Industry common cavity.
- Excellent linearity and low hysteresis characteristics.
- Cartridges are voltage interchangeable.
- Optional coil voltages and terminations available.
- Unitized, molded coil design.
- Continuous duty rated solenoid.

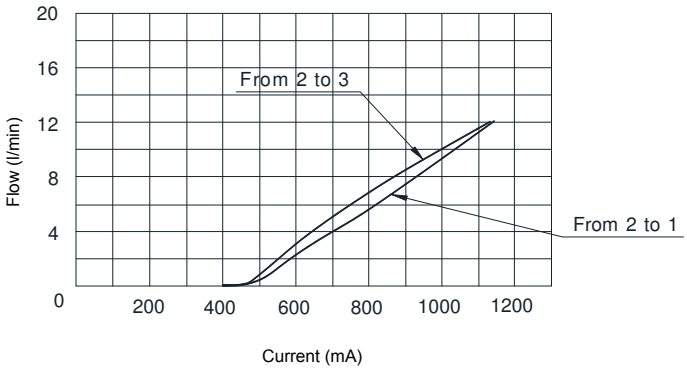
HYDRAULIC SYMBOL



PERFORMANCE

Flow vs. Current

Coil 12 VDC - 130 Hz PWM - Oil 26 cSt (121 SSU) @ 50°C (104°F)



VALVE SPECIFICATIONS

Flow Range	See curves for various versions
Max System Pressure	3500 PSI (245 bar)
Leakage	10 cu-in/min 160 cc/min bar @ 210 bar
Hysteresis	±5%
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-30°C / +100°C
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	18 ft-lbs (26 Nm)
Coil Nut Torque Requirements	2-3 ft-lbs (3-4 Nm)
Cavity	POWER 4W
Cavity Tools Kit (form tool, reamer, tap)	40500029

COIL SPECIFICATIONS

Current Supply Characteristics	PWM (Pulse Width Modulation)
Rated Current Range	400-1400 mA
PWM or Super-Imposed Dither Frequency	100-200 Hz
Coil Resistance (12 VDC)	6.85 Ohm ±5% at 68°F (20°C)

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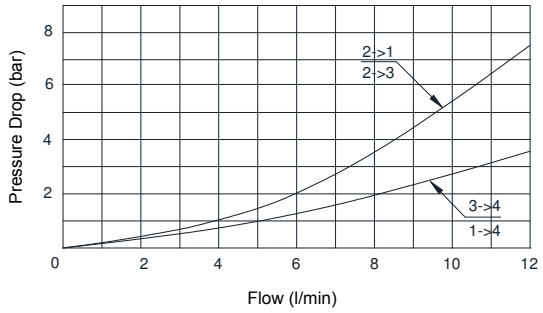
DIMENSIONS

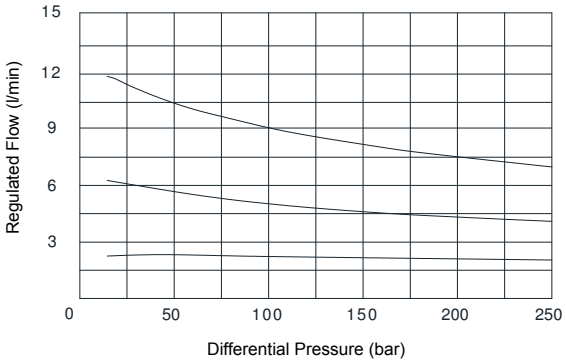
Pressure Drop vs. Flow

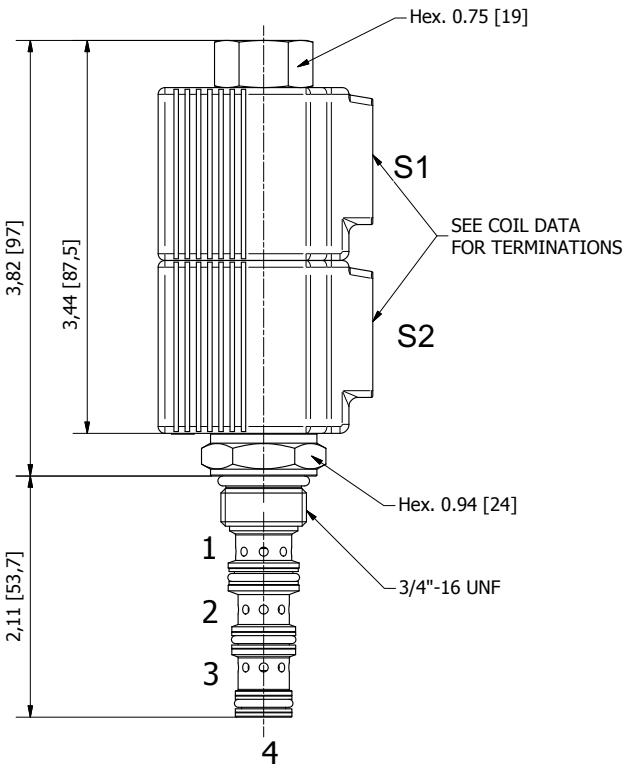
Coil 12 VDC - 130 Hz PWM - Oil 26 cSt (121 SSU) @ 50°C (104°F)



Pressure Compensation from Inlet to Work Port

Coil 12 VDC - 130 Hz PWM - Oil 26 cSt (121 SSU) @ 50°C (104°F)





(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

Approximate Coil Weight: .47 lbs (.21 kg)

EQ-S4P – ____ – ____ – ____ – ____

OPTIONS
Buna Standard **B0** Up to 8 l/min
Buna Standard **C0** Up to 12 l/min

"PJ" COIL TERMINATION
HC DIN 43650 (Hirschmann)
DT Deutsch-Integral DT04-2P

VOLTAGE
12 12 VDC
24 24 VDC

BODIES
Blank Without Body
N 3/8" BSP Ports
S #6 SAE Ports

NOTES: for other seals, consult factory.

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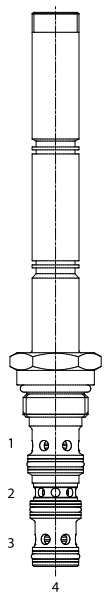
EG-S4P 4 WAY 3 POSITION, CYLINDER SPOOL, PROPORTIONAL DIRECTIONAL VALVE

NEW



DESCRIPTION

10 size, 7/8-14 thread, “Delta” series, solenoid operated, 4 way 3 position, Cylinder Spool, proportional directional valve.

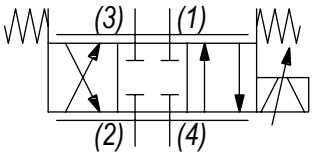
OPERATION

EG-S4P, when de-energized, blocks flow to all ports. When coil (S1) is energized, flow is allowed from (3) to (4), and from (2) to (1). When coil (S2) is energized, flow is allowed from (3) to (2), and from (4) to (1). Flow is proportional to the current applied to the coil. A compensator must be used to create a pressure compensated flow control function.

FEATURES

- Hardened parts for long-life.
- Industry common cavity.
- Excellent linearity and low hysteresis characteristics.
- Cartridges are voltage interchangeable.
- Optional coil voltages and terminations available.
- Unitized, molded coil design.
- Continuous duty rated solenoid.

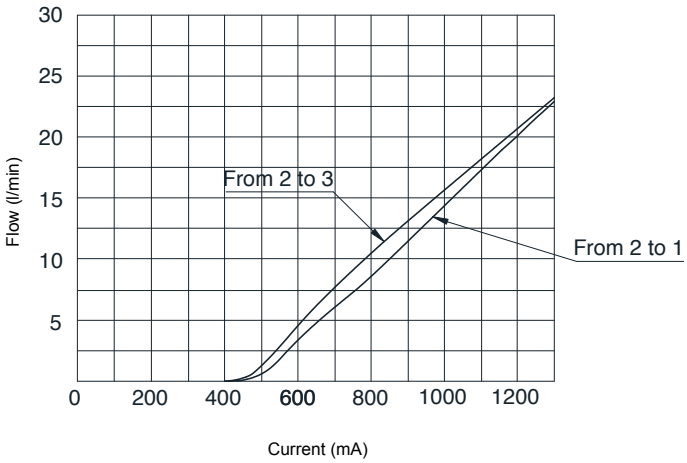
HYDRAULIC SYMBOL



PERFORMANCE

Flow vs. Current

Coil 12 VDC - 130 Hz PWM - Oil 26 cSt (121 SSU) @ 50°C (104°F)



VALVE SPECIFICATIONS

Flow Range	See curves for various versions
Max System Pressure	3500 PSI (245 bar)
Leakage	15 cu-in/min 250 cc/min bar @ 210 bar
Hysteresis	±5%
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-30°C / +100°C
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Coil Nut Torque Requirements	2-3 ft-lbs (3-4 Nm)
Cavity	DELTA 4W
Cavity Tools Kit (form tool, reamer, tap)	40500002

COIL SPECIFICATIONS

Current Supply Characteristics	PWM (Pulse Width Modulation)
Rated Current Range	400-1400 mA
PWM or Super-Imposed Dither Frequency	100-200 Hz
Coil Resistance (12 VDC)	7.2 Ohm ±5% at 68°F (20°C)

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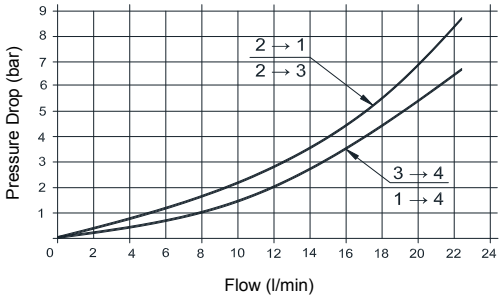
DIMENSIONS

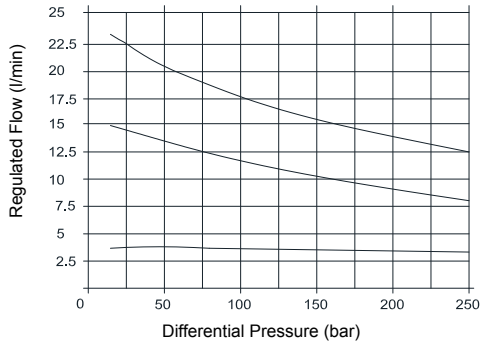
Pressure Drop vs. Flow

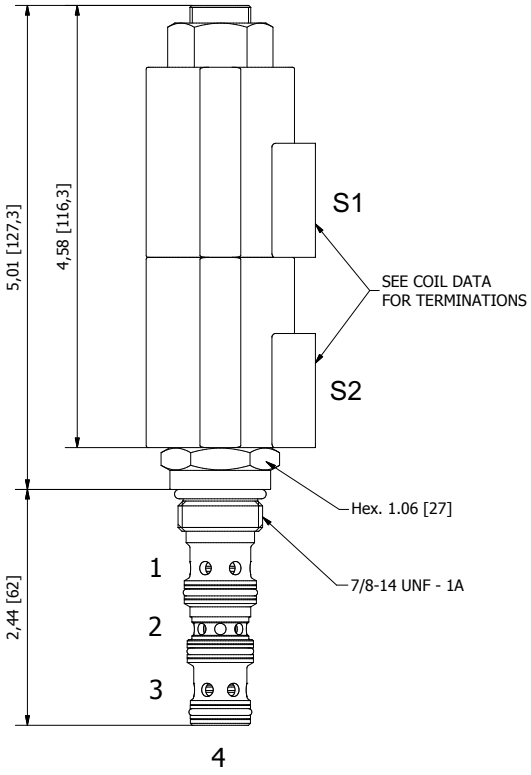
Coil 12 VDC - 130 Hz PWM - Oil 26 cSt (121 SSU) @ 50°C (104°F)



Pressure Compensation from Inlet to Work Port

Coil 12 VDC - 130 Hz PWM - Oil 26 cSt (121 SSU) @ 50°C (104°F)





(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

Approximate Coil Weight: .47 lbs (.21 kg)

EG-S4P – ____ – ____ – ____ – ____

OPTIONS
Buna Standard **B0** Up to 22 l/min

"L" COIL TERMINATION
HC DIN 43650 (Hirschmann)
DT Deutsch-Integral DT04-2P

VOLTAGE
12 12 VDC
24 24 VDC

BODIES
Blank Without Body
N 3/8" BSP Ports
S #6 SAE Ports

NOTES: for other seals, consult factory.

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MOTORIZED CARTRIDGES

Section / Description page

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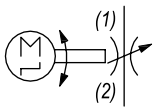
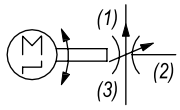
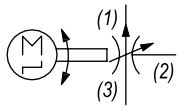
MOTORIZED FLOW REGULATORS

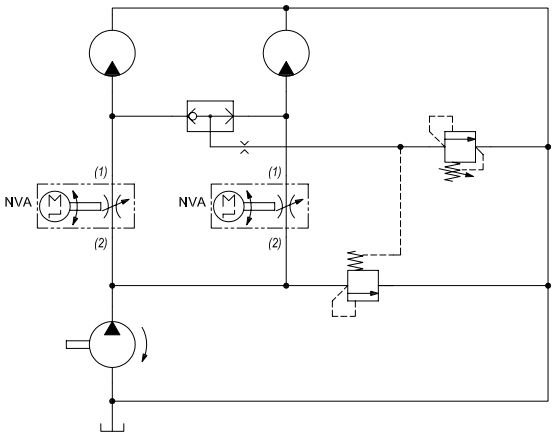
FLOW RESTRICTORS (NEEDLE VALVES)	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	12	3500	45	245	7/8-14	**AE-NVA**	DC4
	40	3500	150	245	1 5/16-12	**AJ-NVA**	DC6

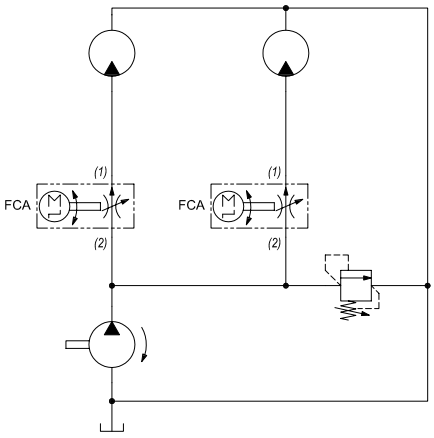
2W PRES. COMPENSATED FLOW REGULATORS	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	24	3500	90	245	1 5/16-12	**AJ-FCA**	DC8

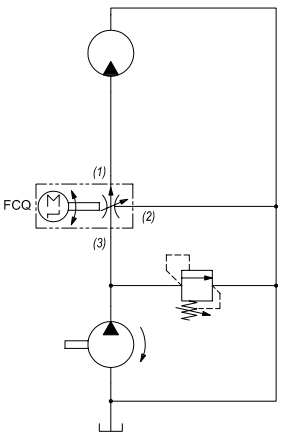
3W PRES. COMPENSATED FLOW REGULATORS	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	24	3500	90	245	1 5/16-12	**AK-FCQ**	DC10

TYPICAL SCHEMATIC

Motorized flow control valves are useful in controlling flow to an actuator in applications which do not require frequent flow adjustment. Since they only require power when a flow setting change is required, they can provide an advantage over proportional flow controls which require continuous power to the coil to maintain flow.
In the example below, two AE-NVA's are used to provide independent, pressure compensated flow control to their respective hydraulic motors, while excess pump flow is bypassed to tank across a pressure compensating element, such as a TR-PCA-0P. In this circuit, maximum attainable flow rate across the AE-NVA is dependent upon the pressure setting of the compensator.
The Super series AJ-FCA provides pressure compensated, restrictive flow control up to 25gpm.
The AK-FCQ provides pressure compensated, priority flow control up to 25gpm.







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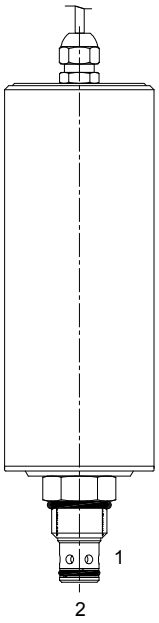
AE-NVA MOTORIZED NEEDLE FLOW CONTROL VALVE



DESCRIPTION

10 size, 7/8-14 thread, “Delta” series, motorized needle flow control valve.

OPERATION

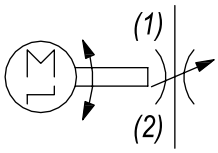
The AE-NVA can be adjusted to any position between fully open and fully closed applying electrical power to the motor. The amount of valve opening does not change unless the electric motor is activated. When adjusted open, the valve allows flow from (1) to (2) and (2) to (1). When fully closed the valve blocks flow from (1) to (2) and (2) to (1).

FEATURES

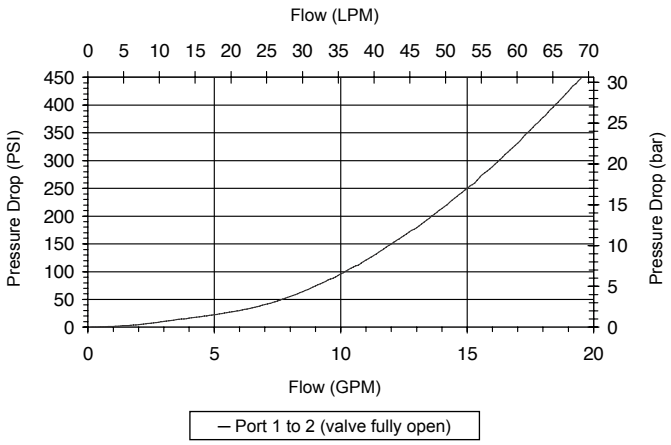
- Hardened parts for long life.
- Industry common cavity.

Adjustable via 12/24 VDC signal, no electronic driver required. A built-in position transducer with an analog output is available on request.

HYDRAULIC SYMBOL



PERFORMANCE



VALVE SPECIFICATIONS

Max Controlled Flow	12 GPM (45 LPM) @ 13 bar Delta P
Rated Operating Pressure	3500 PSI (245 bar)
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	1.68 lbs (.76 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Current Draw	300 mA (12 VDC) / 150 mA (24 VDC)
Electrical Connection	Double lead wire - Length: 60-70 cm
Cavity	DELTA 2W
Cavity Tools Kit (form tool, reamer, tap)	40500000
Seal Kit	21191200

Gear ratio	Response time (full closed to full open)
100	7 sec.
250	14 sec.
500	28 sec.

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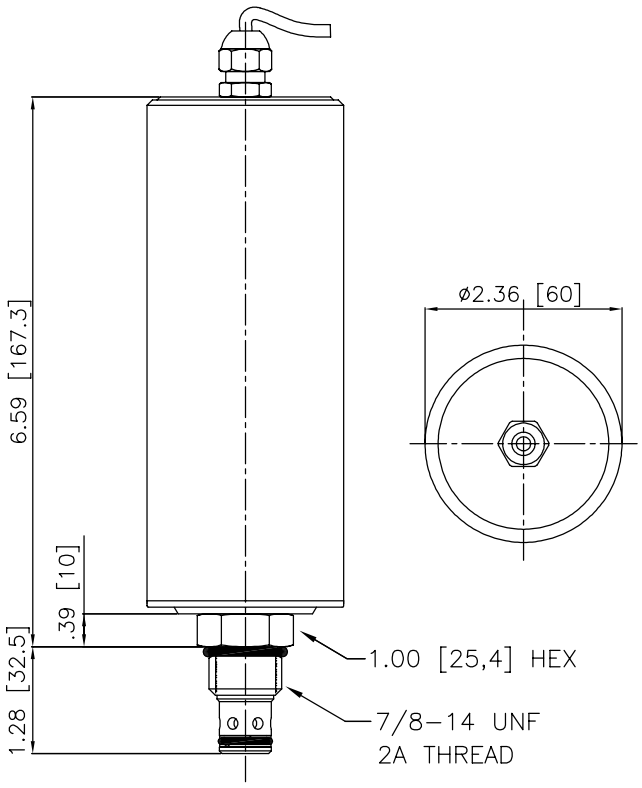
DIMENSIONS



(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

AE-NVA – ____ – ____ – ____ – ____

OPTIONS
Buna Standard **00**

GEAR RATIO
R500
R250
R100

VOLTAGE
24 24 VDC
12 12 VDC

BODIES
Blank Without Body
N 3/8" BSP Ports
S #6 SAE Ports

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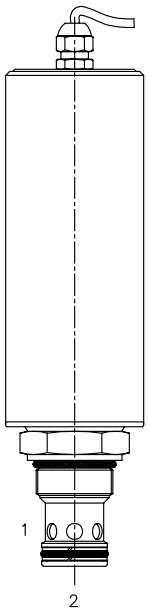
AJ-NVA MOTORIZED NEEDLE FLOW CONTROL VALVE



DESCRIPTION

16 size, 1 5/16-12 thread, “Super” series, motorized needle flow control valve.

OPERATION

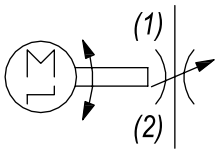
The AJ-NVA can be adjusted to any position between fully open and fully closed by applying electrical power to the motor. The amount of valve opening does not change unless the electric motor is activated. When adjusted open, the valve allows flow from (1) to (2) and (2) to (1). When fully closed the valve blocks flow from (1) to (2) and (2) to (1).

FEATURES

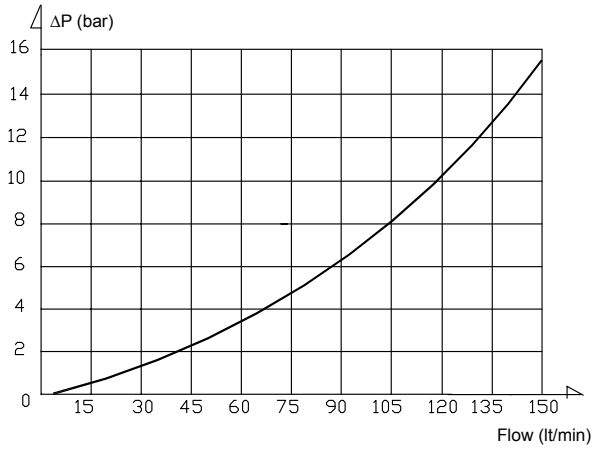
- Hardened parts for long life.
- Industry common cavity.

Adjustable via 12/24 VDC signal, no electronic driver required. A built-in position transducer with an analog output is available on request.

HYDRAULIC SYMBOL



PERFORMANCE



VALVE SPECIFICATIONS

Max Controlled Flow	40 GPM (150 LPM) @ 15 bar Delta P
Max Operating Pressure	3500 PSI (245 bar)
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	2.24 lbs (1.02 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Current Draw	300 mA (12 VDC) / 150 mA (24 VDC)
Electrical Connection	Double lead wire - Length: 50-60 cm
Cavity	SUPER 2W
Cavity Tools Kit (form tool, reamer, tap)	40500017
Seal Kit	21191401

Gear ratio	Response time (full closed to full open)
100	12 sec.
250	28 sec.
500	55 sec.

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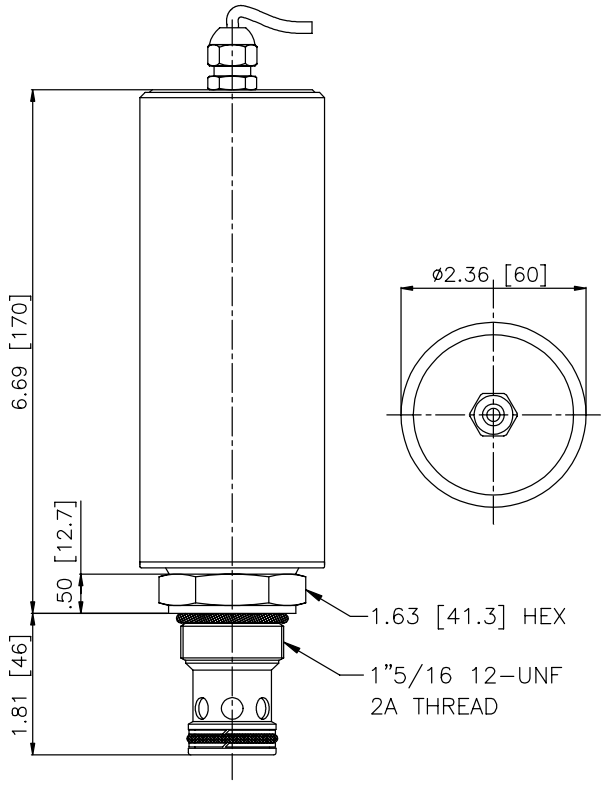
DIMENSIONS



(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

AJ-NVA – ____ – ____ – ____ – ____

OPTIONS
Buna Standard **00**

GEAR RATIO
R500
R250
R100

VOLTAGE
24 24 VDC
12 12 VDC

BODIES
Blank Without Body
N 3/4" BSP Ports
S #12 SAE Ports

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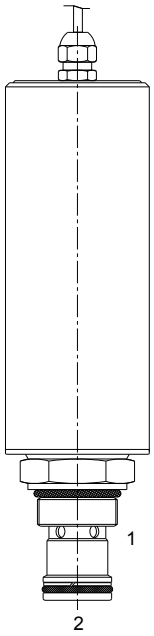
AJ-FCA MOTORIZED ADJUSTABLE PRESSURE COMPENSATED FLOW CONTROL VALVE



DESCRIPTION

16 size, 1 5/16-12 thread, “Super” series, motorized adjustable pressure compensated flow control valve.

OPERATION

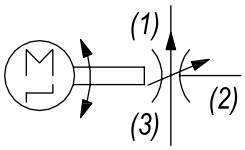
The AJ-FCA maintains a constant flow rate out of (1) regardless of load pressure changes in the circuit downstream of (1). The valve begins to respond to load changes when the flow through the valve creates a pressure differential across the control orifice greater than 100 PSI (6.9 bar), with accurate flow maintenance from 100 to 3500 PSI (6.9 to 240 bar).
Reverse flow (1) to (2) returns through the control orifice and is non-compensated.

FEATURES

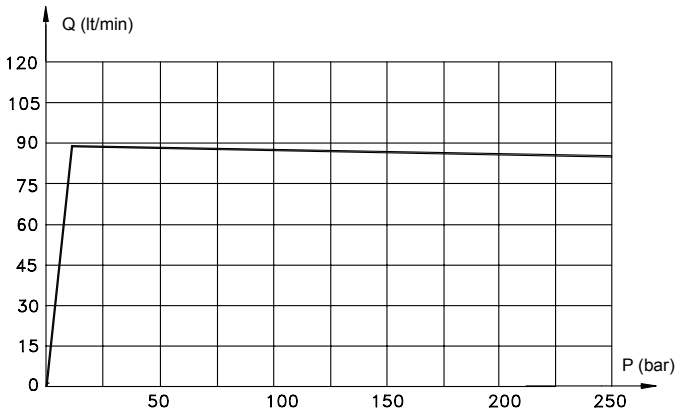
- Hardened parts for long life.
- Industry common cavity.
- Fine low-torque adjustment.

Adjustable via 12/24 VDC signal, no electronic driver required. A built-in position transducer with an analog output is available on request.

HYDRAULIC SYMBOL



PERFORMANCE



VALVE SPECIFICATIONS

Max Controlled Flow	24 GPM (90 LPM)
Max Operating Pressure	3500 PSI (245 bar)
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	2.24 lbs (1.02 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Current Draw	300 mA (12 VDC) / 150 mA (24 VDC)
Electrical Connection	Double lead wire - Length: 50-60 cm
Cavity	SUPER 2W
Cavity Tools Kit (form tool, reamer, tap)	40500017
Seal Kit	21191400

Gear ratio options (see ordering code)	Response time (full closed to full open)
100	9 sec.
250	22 sec.
500	45 sec.

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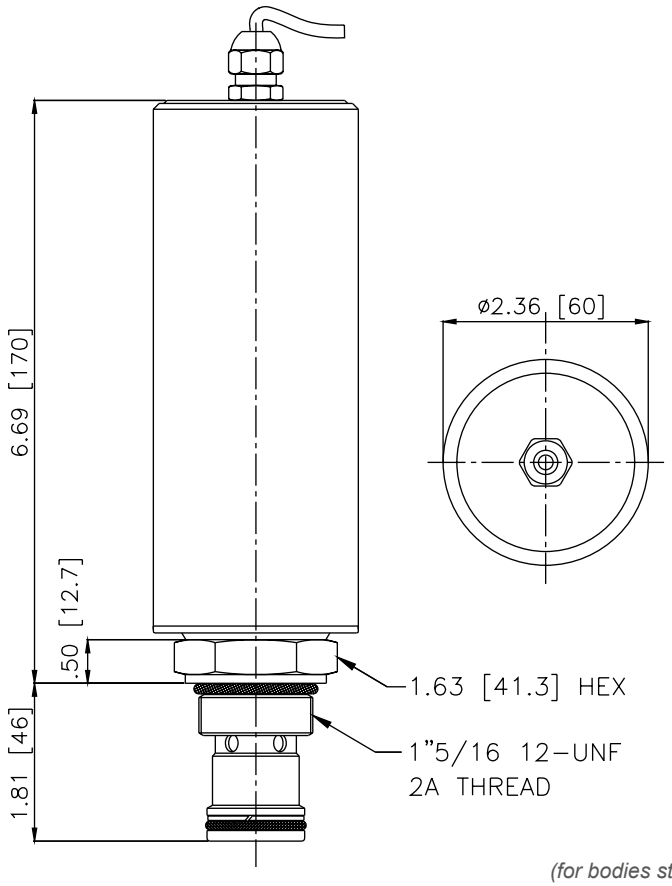
DIMENSIONS



(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

AJ-FCA – ____ – ____ – ____ – ____

OPTIONS
Buna Standard **00**

GEAR RATIO
R500
R250
R100

VOLTAGE
24 24 VDC
12 12 VDC

BODIES
Blank Without Body
N 3/4" BSP Ports
S #12 SAE Ports

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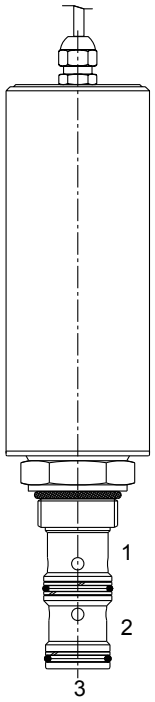
AK-FCQ MOTORIZED ADJUSTABLE PRIORITY FLOW CONTROL VALVE



DESCRIPTION

16 size, 1 5/16-12 thread, “Super” series, motorized adjustable priority flow control valve.

OPERATION

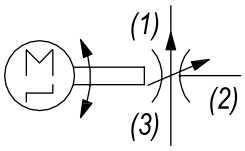
The AK-FCQ allows pressure compensated flow from (3) to (1) regulated the pressure present at (3). Excess flow passes out (2). The spring chamber is constantly vented at (1).

FEATURES

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

Adjustable via 12/24 VDC signal, no electronic driver required. A built-in position transducer with an analog output is available on request.

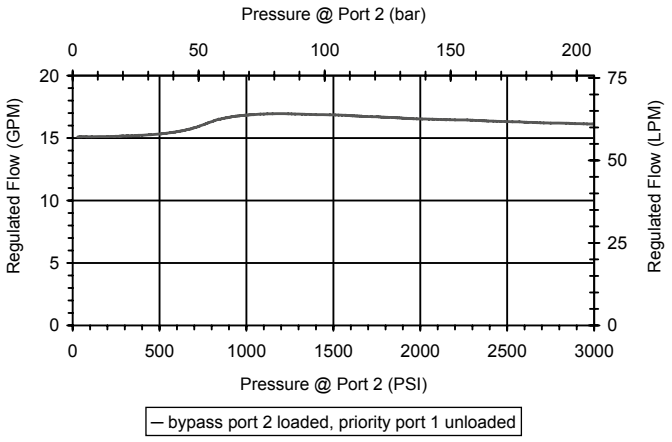
HYDRAULIC SYMBOL

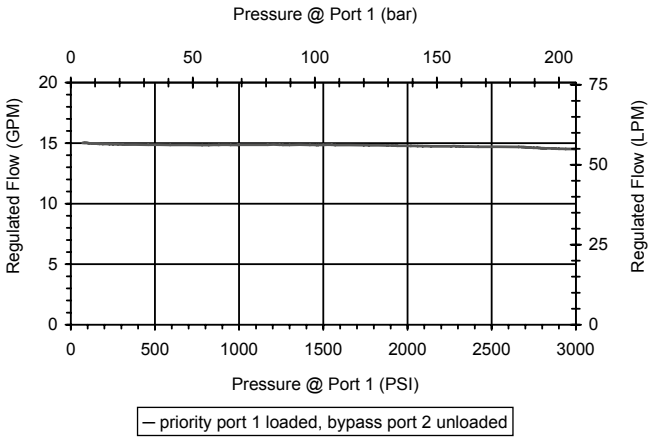


VALVE SPECIFICATIONS

Max Regulated Flow	24 GPM (90 LPM)
Rated Operating Pressure	3500 PSI (245 bar)
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	2.34 lbs (1.06 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Current Draw	300 mA (12 VDC) / 150 mA (24 VDC)
Electrical Connection	Double lead wire - Length: 50-60 cm
Cavity	SUPER 3W
Cavity Tools Kit (form tool, reamer, tap)	40500018
Seal Kit	21191404

PERFORMANCE





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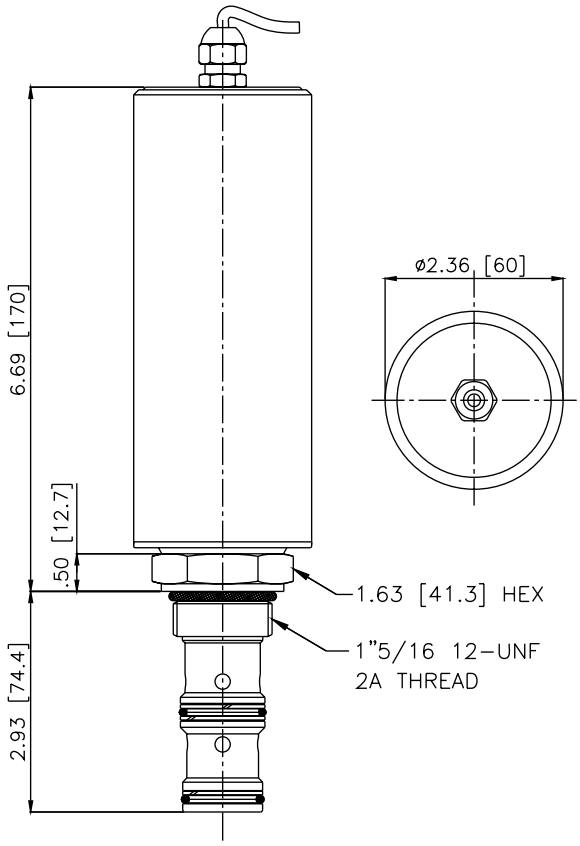
DIMENSIONS



Gear ratio options (see ordering code)	Response time (full closed to full open)
100	9 sec.
250	22 sec.
500	45 sec.

(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

AK-FCQ – ____ – ____ – ____ – ____

OPTIONS
Buna Standard **00**

GEAR RATIO
R500
R250
R100

VOLTAGE
24 24 VDC
12 12 VDC

BODIES
Blank Without Body
N 3/4" BSP Ports
S #12 SAE Ports

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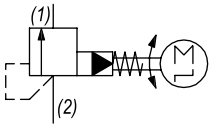
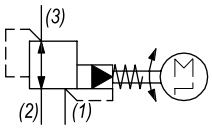
MOTORIZED PRESSURE CONTROLS

RELIEF VALVES	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	37	3500	140	245	1 5/16-12	**AJ-RVR**	DC14

PRESSURE REDUCING VALVES	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	10	3000	38	207	7/8-14	**AF-PRP**	DC16

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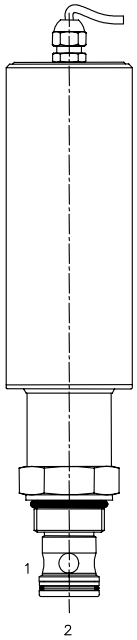
AJ-RVR MOTORIZED PILOT OPERATED RELIEF VALVE



DESCRIPTION

16 size, 1 5/16-12 thread, “Super” series, motorized adjustable pilot-operated pressure relief valve.

OPERATION

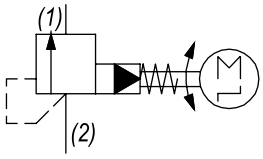
The AJ-RVR blocks flow from (2) to (1) until sufficient pressure is present at (2). The setting of the AJ-RVR can be adjusted to any value between 14 and 245 bar (200-3500 PSI) applying electrical power to the motor. The setting does not change unless the electrical motor is activated. Reverse flow (1) to (2) occurs when the pressure at (1) is at least 2.1 bar (30 PSI) higher then at port (2).

FEATURES

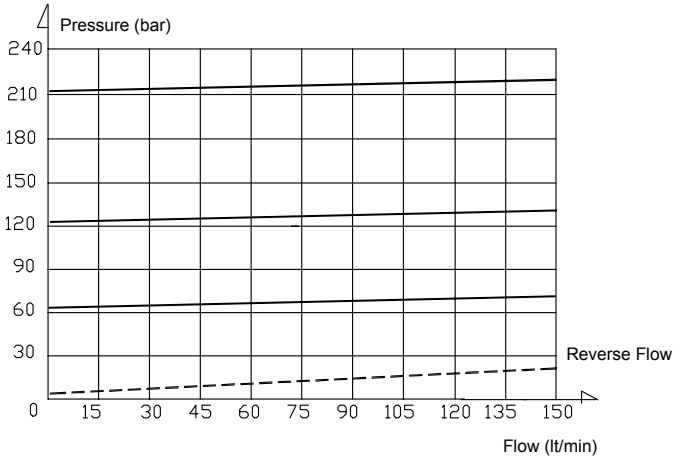
- Hardened parts for long life.
- Industry common cavity.
- Fine low-torque adjustment.

Adjustable via 12/24 VDC signal, no electronic driver required. A built-in position transducer with an analog output is available on request.

HYDRAULIC SYMBOL



PERFORMANCE



VALVE SPECIFICATIONS

Max Controlled Flow	37 GPM (140 LPM)
Max Operating Pressure	3500 PSI (245 bar)
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	2.24 lbs (1.02 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Current Draw	300 mA (12 VDC) / 150 mA (24 VDC)
Electrical Connection	Double lead wire - Length: 50-60 cm
Cavity	SUPER 2W
Cavity Tools Kit (form tool, reamer, tap)	40500017
Seal Kit	21191400

Gear ratio options (see ordering code)	Response time (full closed to full open)
250	12 sec.
500	27 sec.

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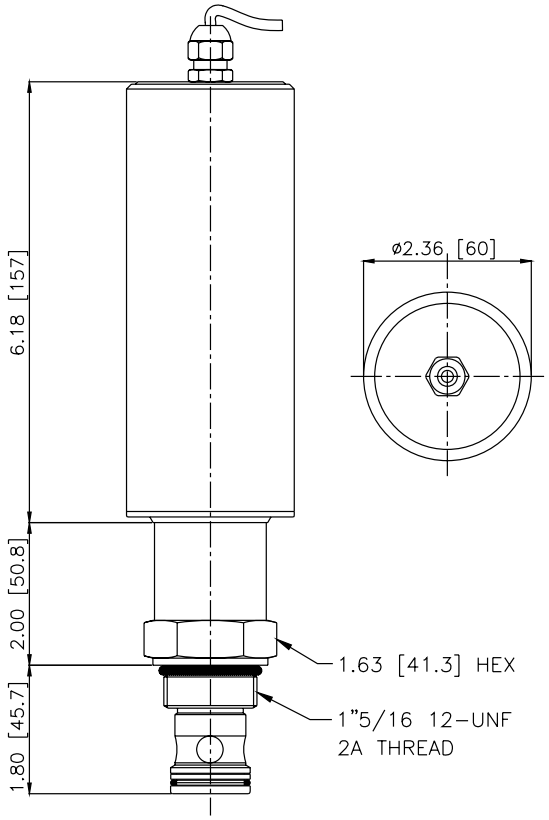
DIMENSIONS



(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

AJ-RVR – ____ – ____ – ____ – ____

OPTIONS
Buna Standard **00**

GEAR RATIO
R250
R100

VOLTAGE
24 24 VDC
12 12 VDC

BODIES
Blank Without Body
N 3/4" BSP Ports
S #12 SAE Ports

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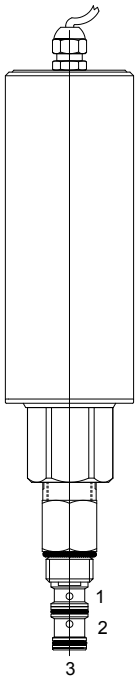
AF-PRP MOTORIZED PRESSURE REDUCING, RELIEVING VALVE



DESCRIPTION

10 size, 7/8-14 thread, “Delta” series, motorized adjustable pressure reducing, relieving valve, pilot opearated.

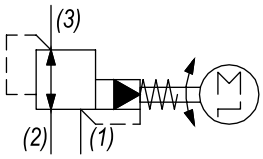
OPERATION

The AF-PRP can be adjusted to any position between fully open and fully closed applying electrical power to the motor. When a pre-determined pressure is reached at (3), the spool shifts to restrict input flow at (2), thereby reducing (restricting) flow. If valve and pressure at port (3) exceeds setting, spool shift to open passage at port (1), thereby regulating pressure at port (3) by relieving excess flow.

FEATURES

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

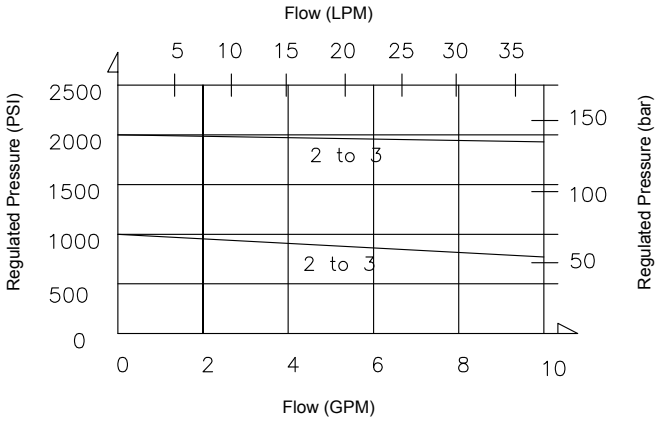
HYDRAULIC SYMBOL

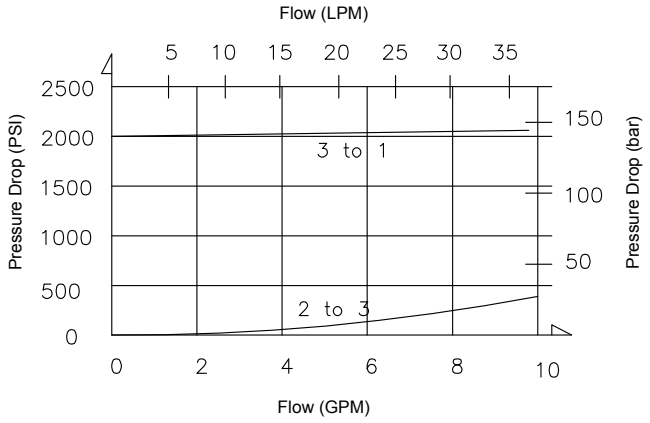


VALVE SPECIFICATIONS

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
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	.59 lbs (.27 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 3W
Cavity Tools Kit (form tool, reamer, tap)	40500001
Seal Kit	21191206

PERFORMANCE





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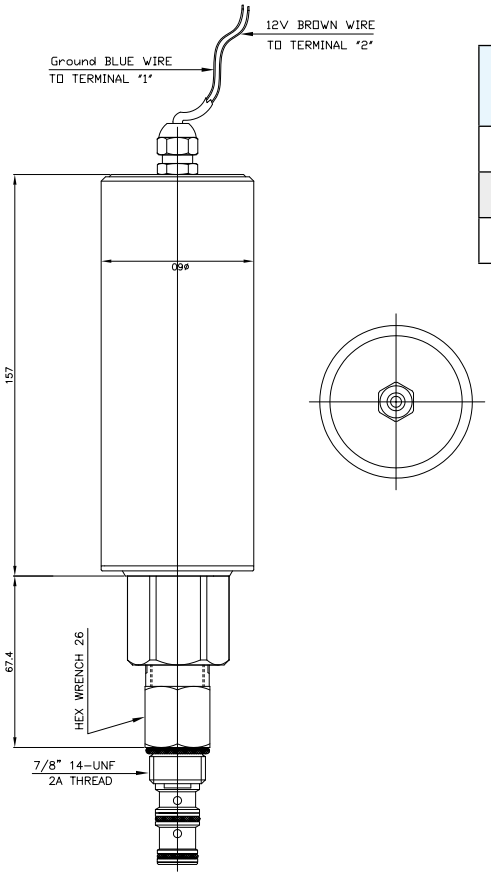
DIMENSIONS



Gear ratio	Response time (full closed to full open)
100	7 sec.
250	14 sec.
500	28 sec.

(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

AF-PRP – ____ – ____ – ____ – ____

OPTIONS
Buna Standard **00**

GEAR RATIO
R500
R250
R100

VOLTAGE
24 24 VDC
12 12 VDC

BODIES
Blank Without Body
N 3/8" BSP Ports
S #6 SAE Ports

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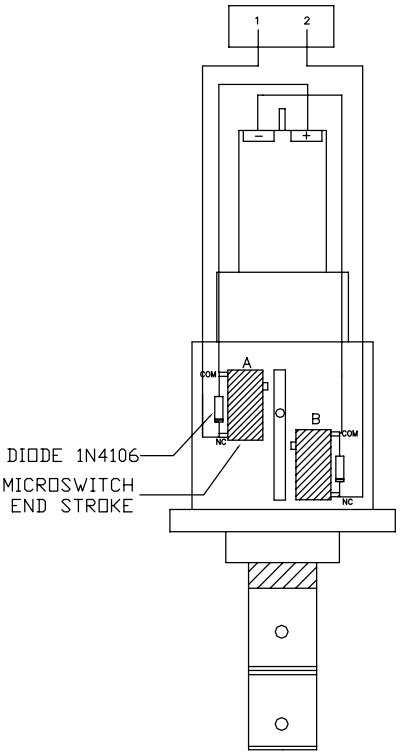
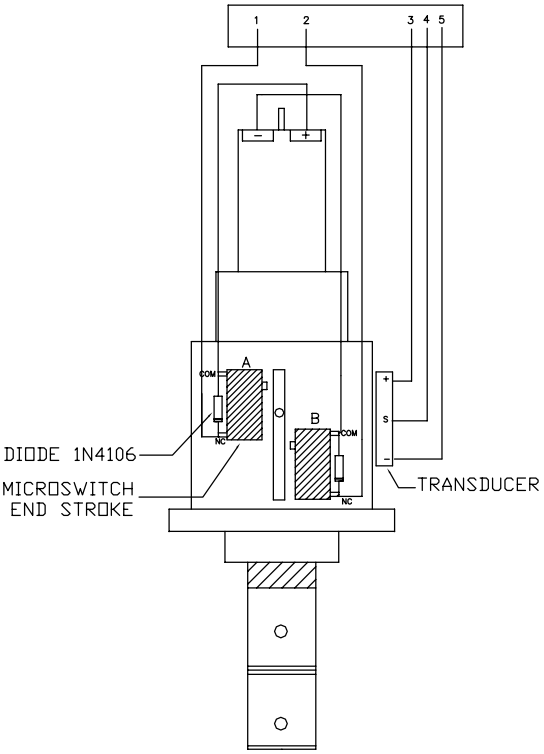
ELECTRICAL CONNECTIONS



Version without position transducer

1 + Supply (BLUE)
2 - Supply (BROWN)

ROTATION
Anticlockwise Connect 1 at +12 V and 2 at Gnd (valve opening till end of stroke A)
Clockwise (valve closing) Connect 2 at +12 V and 1 at Gnd (valve opening till end of stroke B)



Version with position transducer

1 + Supply (RED)
2 - Supply (BLACK)
3 + Transducer supply (BLU)
4 Transducer output signal (YELLOW/GREEN)
5 Transducer supply (BROWN)

ROTATION
Anticlockwise Connect 1 at +12 V and 2 at Gnd (valve opening till end of stroke A)
Clockwise (valve closing) Connect 2 at +12 V and 1 at Gnd (valve opening till end of stroke B)

Note: an electronic card with a led to monitor the valve position is available (**Ordering code**: 24.1003.005)

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MECHANICAL PRESSURE COMPENSATORS

Section / Description page

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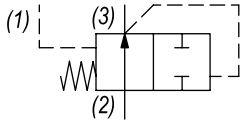
2 WAY COMPENSATING/REDUCING VALVES

	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	8	3500	30	245	7/8-14	**DF-CP2**	MC4
	19	3500	70	245	Special	**QC-CP2**	MC6

TYPICAL SCHEMATIC

Typical application for the CP2 is in a proportional circuit to achieve pressure compensated flow control.
The pressure compensator is located upstream of the orifice and is spring biased to an open position.

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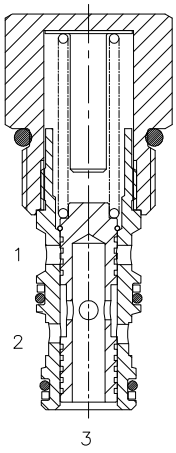
DF-CP2 PRESSURE COMPENSATING/REDUCING VALVE



DESCRIPTION

10 size, 7/8-14 thread, “Delta” series, 2 ways pressure compensating/reducing valve.

OPERATION

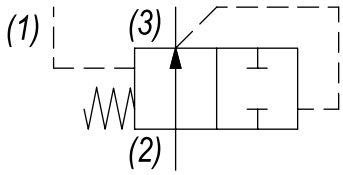
The DF-CP2 allows pressure compensated flow from (2) to (3) regulated by the pressure present at (1). Pressure differential between (3) and (1) is fixed at 8/14/18 bar (according to the pressure settings). These are minimum values, increasing with the flow because of the pressure drop through the valve (see graph).When used with (1) connected to a drain line, it works as pressure reducing valve.

FEATURES

- Hardened parts for long life.
- Industry common cavity.
- Spring range 8 to 18 bar.

Pressure compensator for 2 way flow control, typically used with an external orifice inline with port (3). Port (1) should sense upstream pressure of orifice.

HYDRAULIC SYMBOL



PERFORMANCE

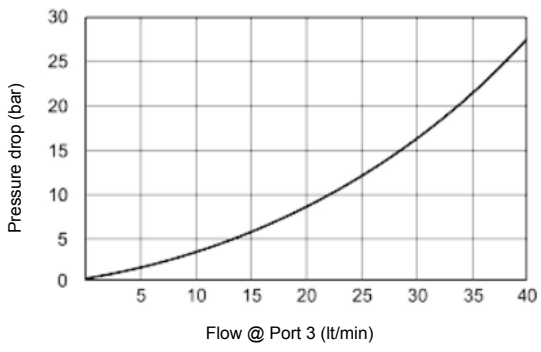
Actual Test Data (Cartridge Only)

VALVE SPECIFICATIONS

Nominal Flow	8 GPM (30 LPM)
Rated Operating Pressure	3500 PSI (245 bar)
Typical Internal Leakage (150 SSU)	35 ml/min @ 250 bar
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-25° to +95°C
Weight	.35 lbs (.16 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	33 ft-lbs (45 Nm)
Cavity	DELTA 3W
Cavity Tools Kit (form tool, reamer, tap)	40500001
Seal Kit	210902025

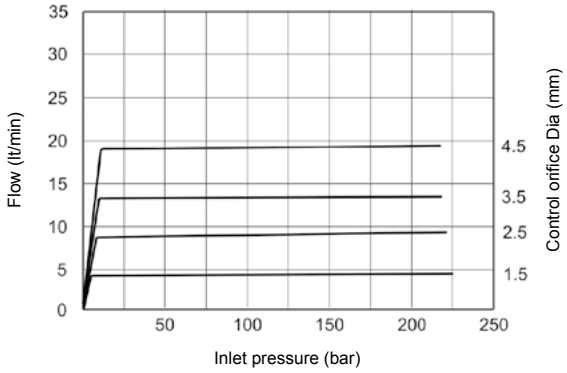
Pressure Drop (bar) vs. Flow (lt/min)

For various pressure compensator settings (bar)



DF-CP2 008 - Flow (lt/min) vs. inlet pressure (bar)

For various orifice diameters (mm)



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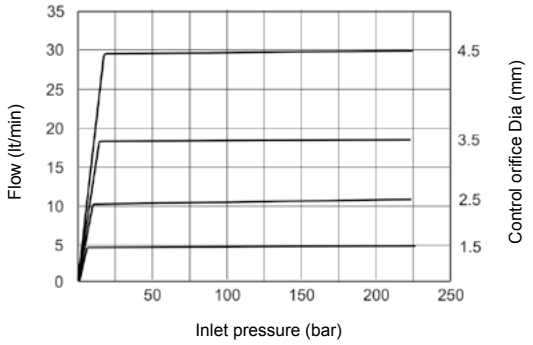
DIMENSIONS

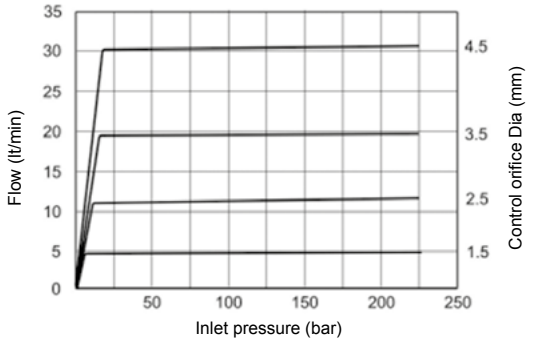
DF-CP2 014 - Flow (lt/min) vs. inlet pressure (bar)

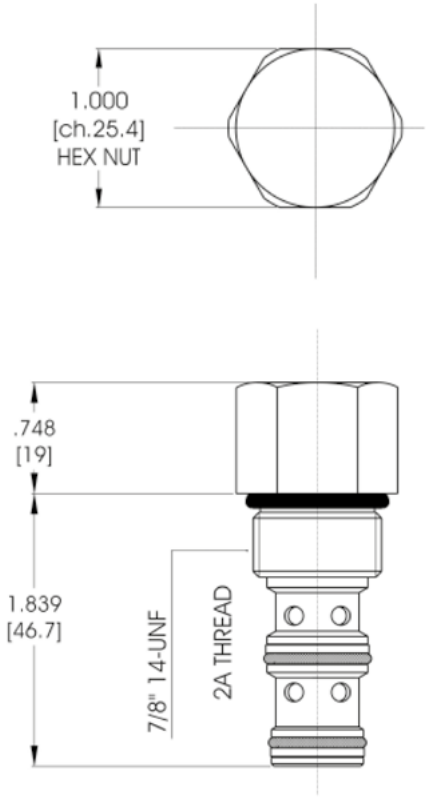
For various orifice diameters (mm)



DF-CP2 018 - Flow (lt/min) vs. inlet pressure (bar)

For various orifice diameters (mm)





(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

DF-CP2 – ____ – ____ – ____

OPTIONS

Buna Standard	**00**
Viton Standard	**V0**

PRESSURE SETTINGS

008	8 bar (115 PSI)
014	14 bar (200 PSI)
018	18 bar (260 PSI)

Differential Pressure Across
External Controlling Orifice

BODIES

Blank	Without Body
N	3/8" BSP Ports
S	#6 SAE Ports

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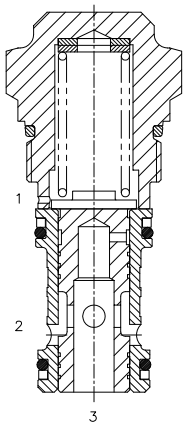
QC-CP2 PRESSURE COMPENSATING/REDUCING VALVE



DESCRIPTION

Special cavity, 2 ways pressure compensating/reducing valve.

OPERATION

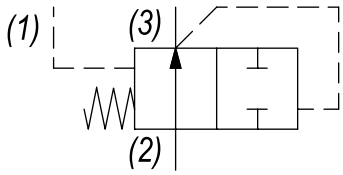
The QC-CP2 allows pressure compensated flow from (2) to (3) regulated by the pressure present at (1). Pressure differential between (3) and (1) is fixed at 8/14/18/24 bar (according to the pressure settings). These are minimum values, increasing with the flow because of the pressure drop through the valve (see graph). When used with (1) connected to a drain line, it works as a fix setting pressure reducing valve.

FEATURES

- Hardened parts for long life.
- Spring range 8 to 24 bar.

Pressure compensator for 2 way flow control, typically used with an external orifice inline with port (3). Port (1) should sense upstream pressure of orifice.

HYDRAULIC SYMBOL



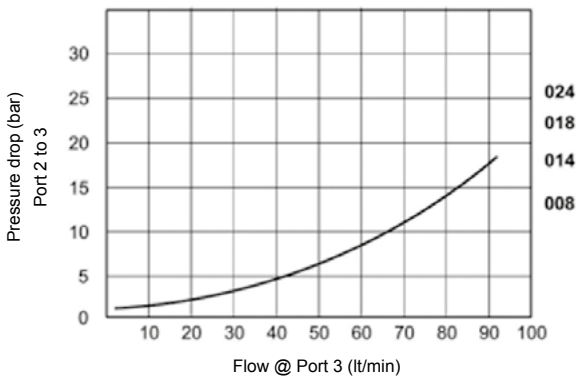
PERFORMANCE

Actual Test Data (Cartridge Only)

VALVE SPECIFICATIONS

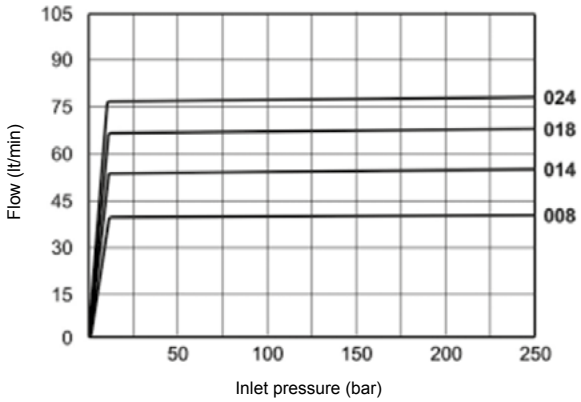
Nominal Flow	19 GPM (70 LPM)
Rated Operating Pressure	3500 PSI (245 bar)
Typical Internal Leakage (150 SSU)	35 ml/min @ 250 bar
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-40° to 250°F (-40° to 120°C)
Weight	.35 lbs (.16 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	52 ft-lbs (70 Nm)
Cavity	T031 (Special)
Cavity Tools Kit (form tool, reamer, tap)	K-T031
Seal Kit	210902012

Pressure drop (bar) vs. flow (lt/min)



Flow (lt/min) vs. inlet pressure (bar)

For various press. compensator valve settings - Re: control orifice diameter: 5.5 mm



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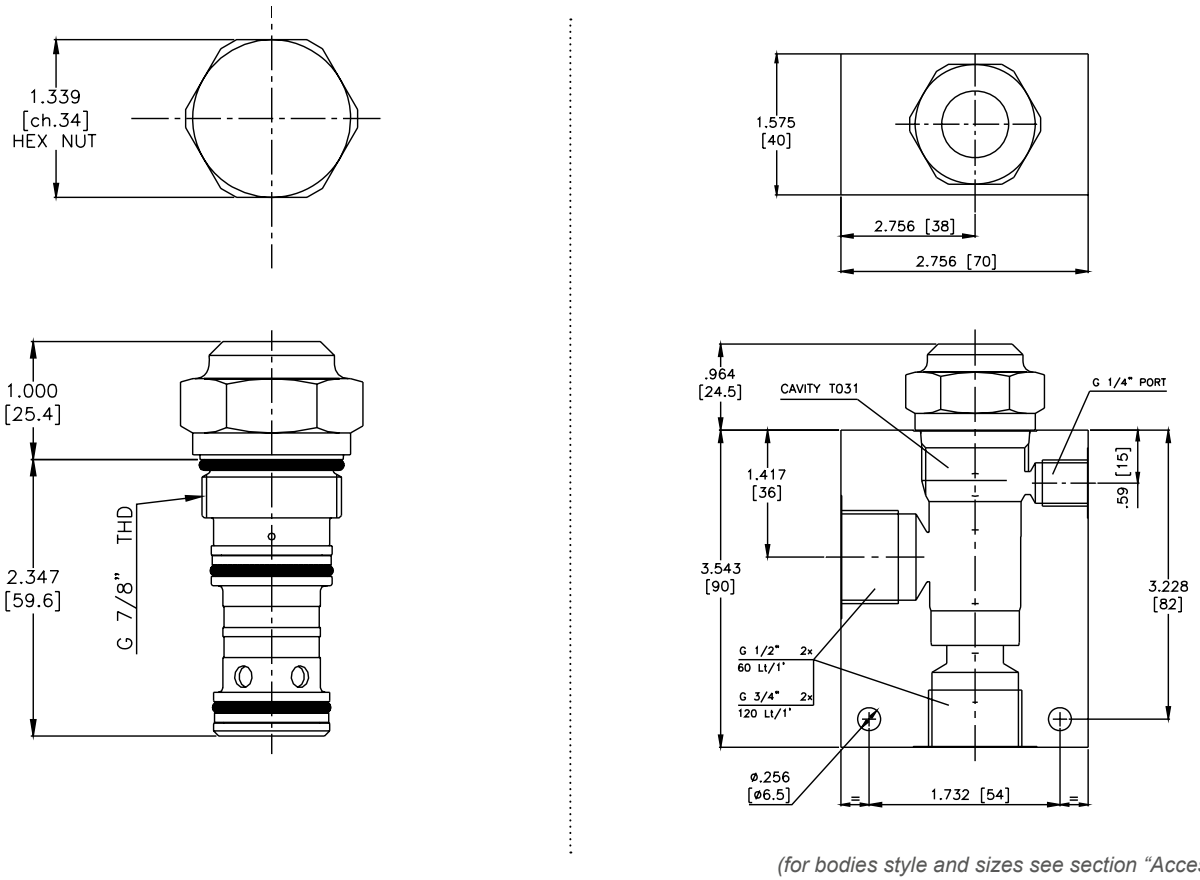
DIMENSIONS



(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

QC-CP2 – ____ – ____ – ____

OPTIONS

Buna Standard	**00**
Viton Standard	**V0**

BODIES

Blank	Without Body
N	1/2" BSP Ports
S	#8 SAE Ports

PRESSURE SETTINGS

008	8 bar (115 PSI)
014	14 bar (200 PSI)
018	18 bar (260 PSI)
024	24 bar (340 PSI)

Differential Pressure Across
External Controlling Orifice

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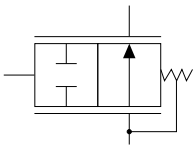
2 WAY RESTRICTIVE TYPE COMPENSATORS

	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	10	3500	38	245	7/8-14	**DF-TCS**	MC10

TYPICAL SCHEMATIC

Typical application for the TCS is in a proportional circuit to achieve pressure compensated flow control.
The pressure compensator is located downstream of the proportional valve and is spring biased to an open position.

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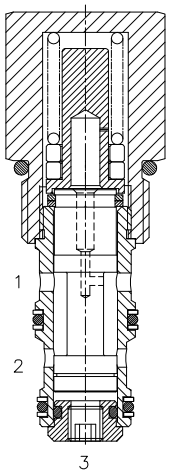
DF-TCS PRESSURE COMPENSATING VALVE, RESTRICTIVE TYPE



DESCRIPTION

10 size, 7/8-14 thread, “Delta” series, pressure compensating valve, restrictive type.

OPERATION

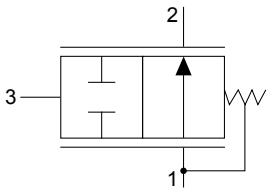
The DF-TCS allows pressure compensated flow from (1) to (2) regulated the pressure present at (3). Pressure differential between (1) and (3) is fixed at 8/24 bar (according to the pressure settings). These are minimum values increasing with the flow because of the pressure drop through the valve (see graph).

FEATURES

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

Pressure compensator for 2 way flow control, typically used with an external orifice inline with port (3). Port (1) should sense upstream pressure of orifice.

HYDRAULIC SYMBOL



PERFORMANCE

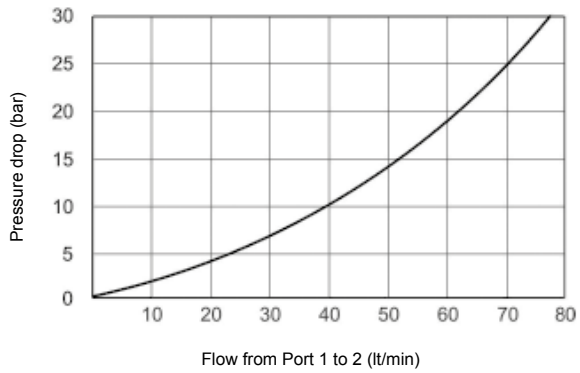
Actual Test Data (Cartridge Only)

VALVE SPECIFICATIONS

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	3500 PSI (245 bar)
Typical Internal Leakage (150 SSU)	35 ml/min @ 250 bar
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	.35 lbs (.16 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	33 ft-lbs (45 Nm)
Cavity	DELTA 3W
Cavity Tools Kit (form tool, reamer, tap)	40500001
Seal Kit	210902026

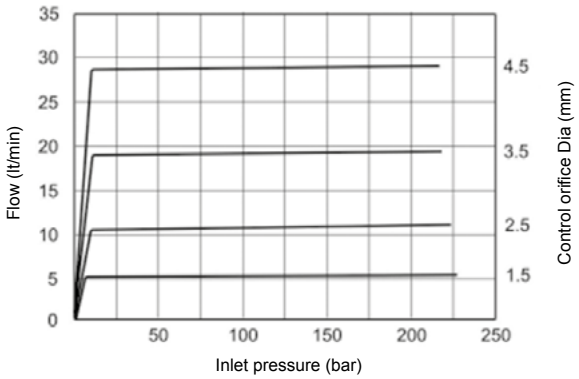
Pressure Drop (bar) vs. Flow (lt/min)

For various pressure compensator settings (bar)



DF-TCS 008 - Flow (lt/min) vs. inlet pressure (bar)

For various orifice diameters (mm)



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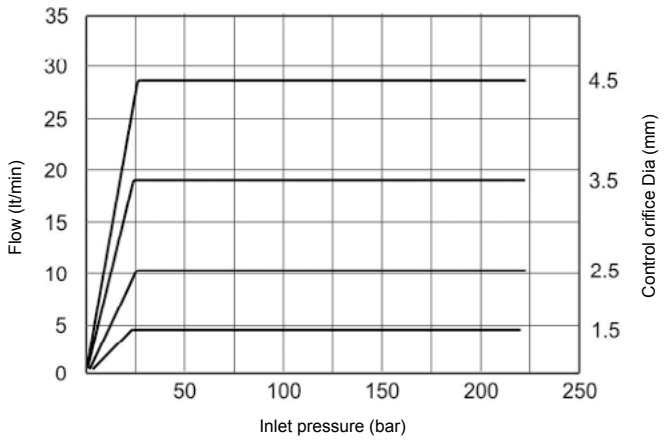
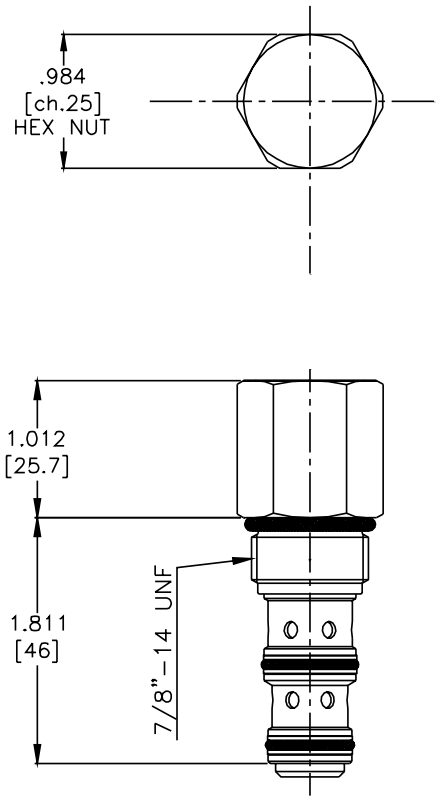
DIMENSIONS

DF-TCS 024 - Flow (lt/min) vs. inlet pressure (bar)

For various orifice diameters (mm)





(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

DF-TCS – ____ – ____ – ____

OPTIONS

Buna Standard	**00**
Viton Standard	**V0**

PRESSURE SETTINGS

008	8 bar (115 PSI)
024	24 bar (340 PSI)

Differential Pressure Across
External Controlling Orifice

BODIES

Blank	Without Body
N	3/8" BSP Ports
S	#6 SAE Ports

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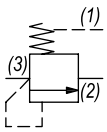
2 WAY BYPASS TYPE FOR 3 WAY FLOW CONTROL

	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	10	3500	38	245	7/8-14	**DF-PCR**	MC14
	40	3500	151	245	1 1/16 –12	**TR-PCA**	MC16
	40	3500	151	245	1 5/16–12	**SL-PCA**	MC18
	33	3500	120	245	Special	**QC-CP3**	MC20

TYPICAL SCHEMATIC

Typical application for the PCR, PCA and CP3 is in a proportional circuit to achieve pressure compensated flow control or as main stage of a ventable relief valve. The pressure compensator is bypass located and is spring biased to a closed position. The PCA-0V version is commonly used as main stage of a ventable relief valve.

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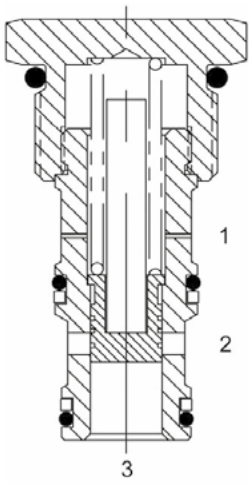
DF-PCR PRESSURE COMPENSATING VALVE, BYPASS TYPE FOR 3 WAY FLOW CONTROL



DESCRIPTION

10 size, 7/8-14 thread, “Delta” series, pressure compensating regulator valve.

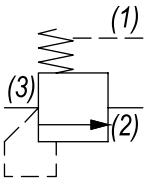
OPERATION

The DF-PCR-0P with an orifice between ports (3) and (1) maintains a constant flow rate from (3) regardless of load pressure changes in the system upstream of (3), or in the bypass leg at (2) as long as pressure at (2) is less than (1). The valve’s spool maintains a constant differential pressure across an external orifice, thereby regulating the hydraulic flow rate from (3) to (2), (see options table for pressure ranges).
When used with an orifice as described above, as a priority type regulator, delivering pump flow first to (3), then bypassing excess to (2). All ports may be fully pressurized.

FEATURES

- Hardened parts for long life.
- Industry common cavity.
- Spring range from 3 to 21 bar.

HYDRAULIC SYMBOL



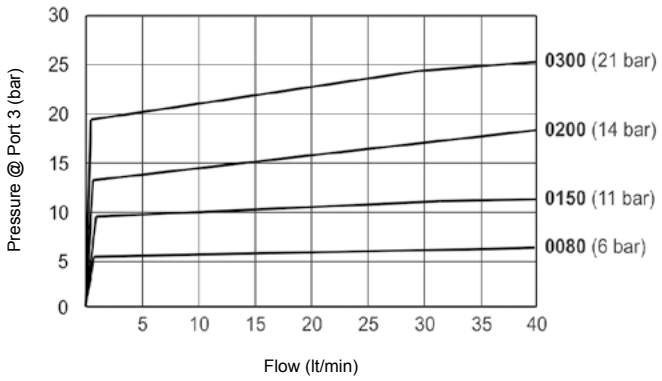
Pressure compensator for 3 way flow control, typically used with an external orifice between ports (3) and (1). Port (1) should sense upstream pressure of orifice. Can be used as a logic element.

PERFORMANCE

Actual Test Data (Cartridge Only)

Pressure (bar) vs. flow (lt/min)

For various pressure settings



VALVE SPECIFICATIONS

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	3500 PSI (245 bar)
Typical Internal Leakage (150 SSU)	35 ml/min @ 250 bar
Seat Ratio	Area of Pilot is equal to the area at Port (3)
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	.19 lbs (.08 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	45 ft-lbs (33 Nm)
Cavity	DELTA 3W
Cavity Tools Kit (form tool, reamer, tap)	40500001
Seal Kit	21191206

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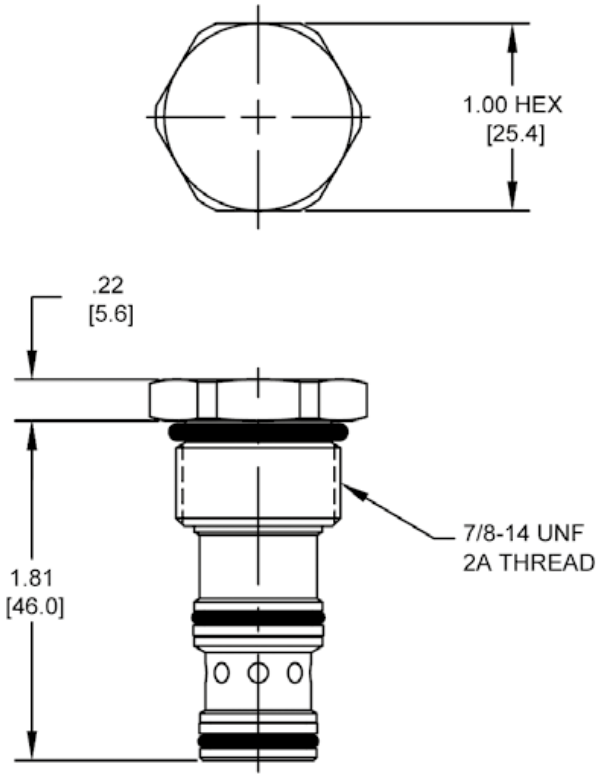
DIMENSIONS



(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

DF-PCR – ____ – ____ – ____

OPTIONS

Buna Standard	**00**
Viton Standard	**V0**

PRESSURE SETTINGS

0040	3 bar (40 PSI)
0080	6 bar (80 PSI)
0150	10.5 bar (150 PSI)
0200	14 bar (200 PSI)
0300	21 bar (300 PSI)

BODIES

Blank	Without Body
N	3/8" BSP Ports
S	#6 SAE Ports

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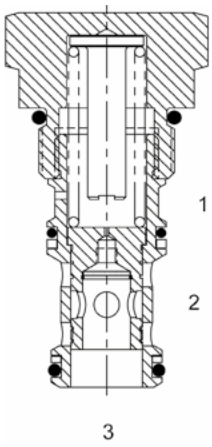
TR-PCA PRESSURE COMPENSATING VALVE, BYPASS TYPE FOR 3 WAY FLOW CONTROL



DESCRIPTION

12 size, 1 1/16-12 thread, “Tecnord” series, pressure compensating regulator valve.

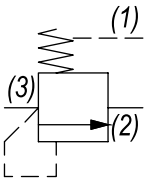
OPERATION

The TR-PCA-0P with an orifice between ports (3) and (1) maintains a constant flow rate from (3) regardless of load pressure changes in the system upstream of (3), or in the bypass leg at (2) as long as pressure at (2) is less than (1). The valve’s spool maintains a constant differential pressure across an external orifice, thereby regulating the hydraulic flow rate across this external orifice (see options table for pressure ranges). When used with an orifice as described above, it functions as a priority type regulator, delivering pump flow first to the external orifice, then bypassing excess to (2). All ports may be fully pressurized. The TR-PCA-0V with a dump valve and a pilot relief valve at (1) acts as main stage of a ventable relief valve.

FEATURES

- Hardened parts for long life.
- Industry common cavity.
- Spring range from 20 to 230 PSI.

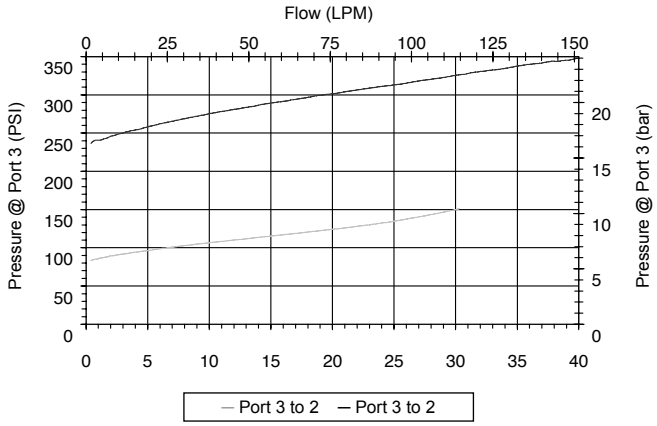
HYDRAULIC SYMBOL



Can be used as a logic element. TR-PCA-0P is commonly used as a bypass flow regulator (90 and 150 PSI recommended). TR-PCA-0V is commonly used as the main stage of a ventable relief valve (50 and 90 PSI recommended).

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	40 GPM (151 LPM)
Rated Operating Pressure	3500 PSI (245 bar)
Seat Ratio	Area of Pilot is equal to the area at Port (3)
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	.54 lbs (.24 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	70 ft-lbs (95 Nm)
Cavity	TECNORD 3W
Cavity Tools Kit (form tool, reamer, tap)	40500034
Seal Kit	21191306

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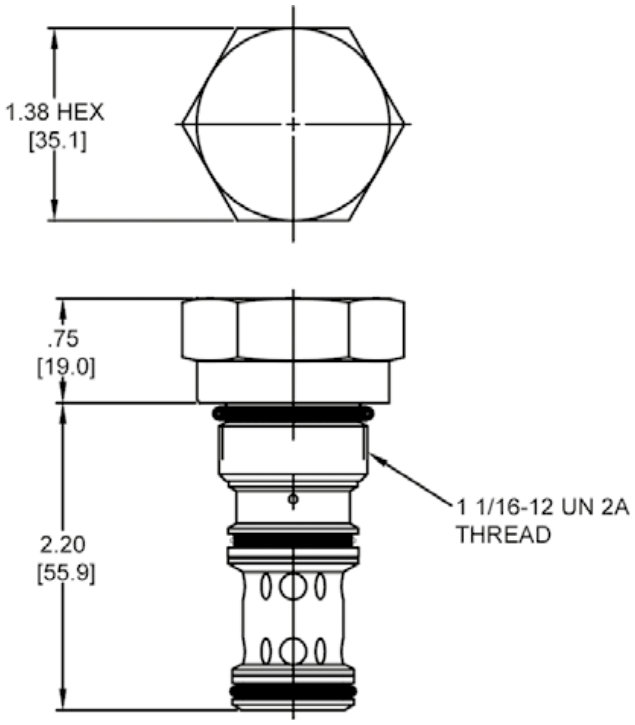
DIMENSIONS



(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

TR-PCA – ____ – ____ – ____

OPTIONS

Buna, Pilot to Close	**0P**
Viton, Pilot to Close	**VP**
Buna, Vent to Open	**0V**
Viton, Vent to Open	**VV**

BODIES

Blank	Without Body
N	3/4" BSP Ports
S	#12 SAE Ports

Δ P SETTINGS @ 1 GPM with Pilot Vented

0020	1.4 bar (20 PSI)
0050	3.5 bar (50 PSI)
0090	6.3 bar (90 PSI)
0150	10.5 bar (150 PSI)
0230	16.1 bar (230 PSI)

±10%

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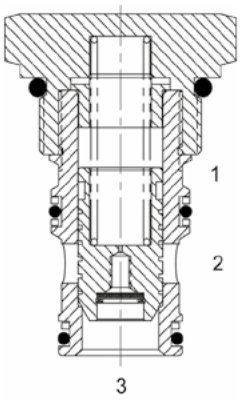
SL-PCA PRESSURE COMPENSATING VALVE, BYPASS TYPE FOR 3 WAY FLOW CONTROL



DESCRIPTION

12 size, 1 5/16-12 thread, “Super” series, pressure compensating regulator valve.

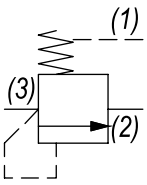
OPERATION

The SL-PCA-0P with an external orifice between ports (3) and (1) maintains a constant flow rate across the external orifice, regardless of load pressure changes in the system upstream of (3), or in the bypass leg at (2) as long as pressure at (2) is less than (1). The valve’s spool maintains a constant differential pressure across the external orifice, thereby regulating the hydraulic flow rate across the external orifice (see options table for pressure ranges). When used with an orifice as described above, it functions as a priority type regulator, delivering pump flow first to the external orifice, then bypassing excess to (2). All ports may be fully pressurized. The SL-PCA-0V with a dump valve and a pilot relief valve at (1) acts as main stage of a ventable relief valve.

FEATURES

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

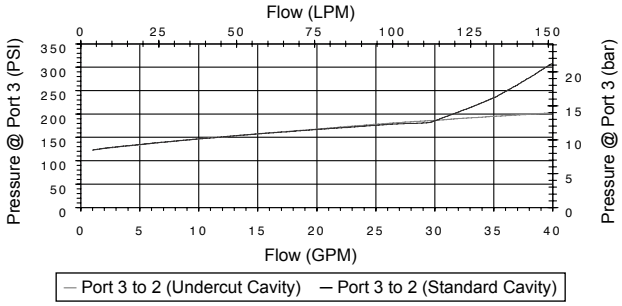
HYDRAULIC SYMBOL

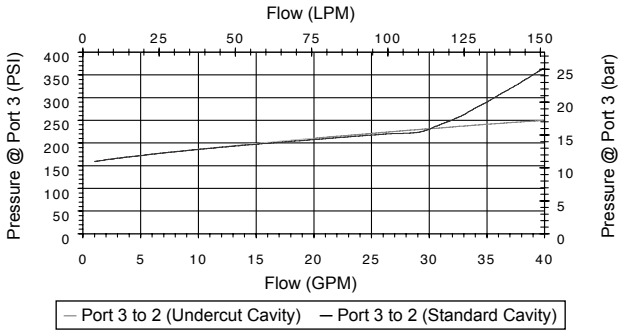


Can be used as a logic element. SL-PCA-0P is commonly used as a bypass flow regulator (100 PSI recommended). SL-PCA-0V is commonly used as the main stage of a ventable relief valve (50 and 100 PSI recommended).

PERFORMANCE

Actual Test Data (Cartridge Only)





VALVE SPECIFICATIONS

Nominal Flow	40 GPM (151 LPM)
Rated Operating Pressure	3500 PSI (245 bar)
Seat Ratio	Initially area of Pilot is 1.2 times the area at Port (3), then 1:1
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	.70 lbs (.32 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Cavity	SUPER 3W SHORT
Cavity Tools Kit (form tool, reamer, tap)	40500021
Seal Kit	21191406

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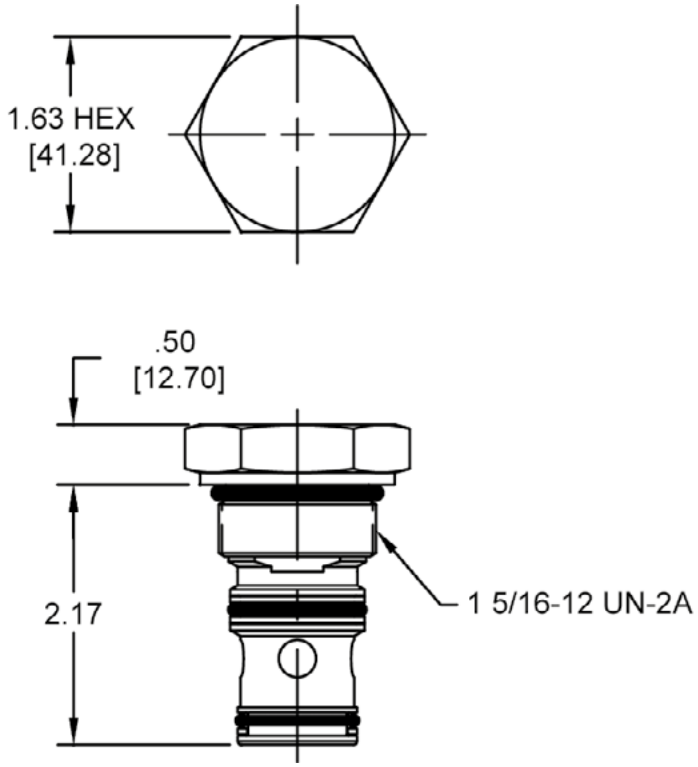
DIMENSIONS



(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

SL-PCA – ____ – ____ – ____

OPTIONS

Buna, Pilot to Close	**0P**
Viton, Pilot to Close	**VP**
Buna, Vent to Open	**0V**
Viton, Vent to Open	**VV**
Buna, Pilot to Close with Seals	**0B**
Viton, Pilot to Close with Seals	**VB**
Buna, Vent to Open with Seals	**0C**
Viton, Vent to Open with Seals	**VC**

BODIES

Blank	Without Body
N	3/4" BSP Ports
S	#12 SAE Ports

Δ P SETTINGS @ 1 GPM with Pilot Vented

0020	1.4 bar (20 PSI)
0050	3.5 bar (50 PSI)
0100	7 bar (100 PSI)
0150	10.5 bar (150 PSI)

±20%

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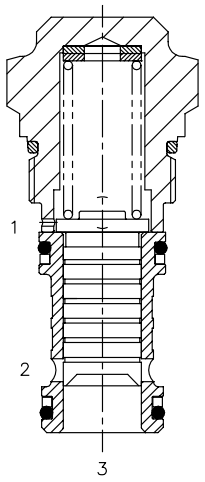
QC-CP3 PRESSURE COMPENSATING VALVE, BYPASS TYPE FOR 3 WAY FLOW CONTROL



DESCRIPTION

Special cavity, pressure compensating valve, bypass type, for 3 way flow control, normally closed.

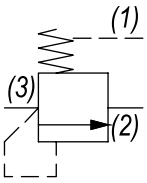
OPERATION

The QC-CP3 with an orifice between ports (3) and (1) maintains a constant flow rate from (3) regardless of load pressure changes in the system upstream of (3), or in the bypass leg at (2) as long as pressure at (2) is less than (1). The valve's spool maintains a constant differential pressure across an external orifice, thereby regulating the hydraulic flow rate from (3) to (2), (see options table for pressure ranges). When used with an orifice as described above, as a priority type regulator, delivering pump flow first to (3), then bypassing excess to (2). All ports may be fully pressurized.

FEATURES

- Hardened parts for long life.
- Spring range from 8 to 24 bar.

HYDRAULIC SYMBOL



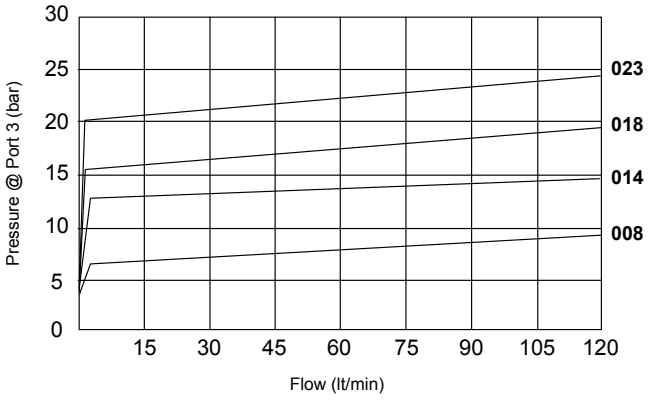
Pressure compensator for 3 way flow control, typically used with an external orifice between ports (3) and (1). Port (1) should sense upstream pressure of orifice.

PERFORMANCE

Actual Test Data (Cartridge Only)

Pressure (bar) vs. flow (lt/min)

For various pressure compensator settings



VALVE SPECIFICATIONS

Nominal Flow	33 GPM (120 LPM)
Rated Operating Pressure	3500 PSI (245 bar)
Typical Internal Leakage (150 SSU)	35 ml/min @ 250 bar
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	.35 lbs (.16 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	52 ft-lbs (70 Nm)
Cavity	T031 (Special)
Cavity Tools Kit (form tool, reamer, tap)	K-T031
Seal Kit	210902321

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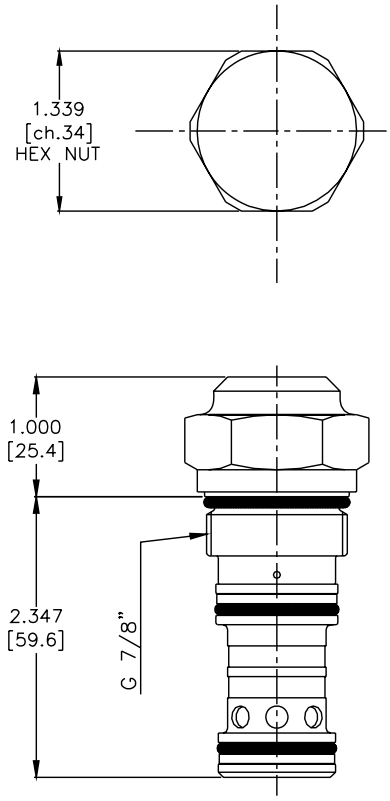
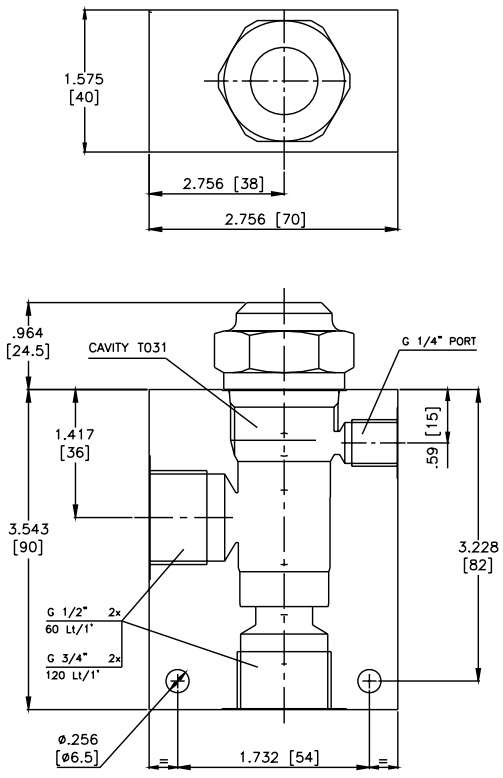
DIMENSIONS





(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

QC-CP3 – ____ – ____ – ____

OPTIONS

Buna Standard	**00**
Viton Standard	**V0**

BODIES

Blank	Without Body
N	1/2" BSP Ports
S	#8 SAE Ports

PRESSURE SETTINGS

008	8 bar (115 PSI) @ 60 l/min
014	14 bar (200 PSI) @ 60 l/min
018	18 bar (260 PSI) @ 60 l/min
023	23 bar (330 PSI) @ 60 l/min

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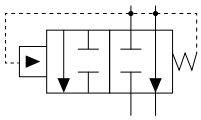
4 WAY PRIORITY TYPE COMPENSATOR WITH BYPASS LINE

	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	10	3500	38	245	7/8-14	**DG-TCB**	MC24

TYPICAL SCHEMATIC

Typical application for the TCB is in a proportional circuit to achieve pressure compensated flow control. The pressure compensator is located downstream of the proportional valve to achieve a pressure compensated flow control on the priority line, opening a secondary bypass line, when the differential pressure becomes too high, for all flow in excess of that demanded the control orifice.

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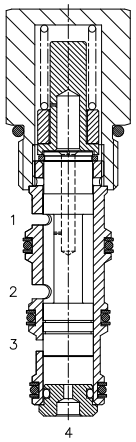
DG-TCB PRESSURE COMPENSATING VALVE, RESTRICTIVE TYPE WITH BYPASS



DESCRIPTION

10 size, 7/8-14 thread, “Delta” series, pressure compensating valve, restrictive type with bypass.

OPERATION

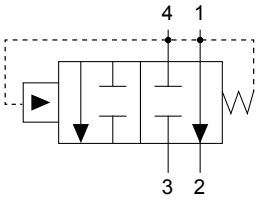
The DG-TCB allows pressure compensated or proportional flow from (1) to (2) regulated by the pressure differential across (1) and (4) with a bypass of (4) to (3). The spring chamber is constantly connected at (1).

FEATURES

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

Bypass line (3) can be pressurized.

HYDRAULIC SYMBOL



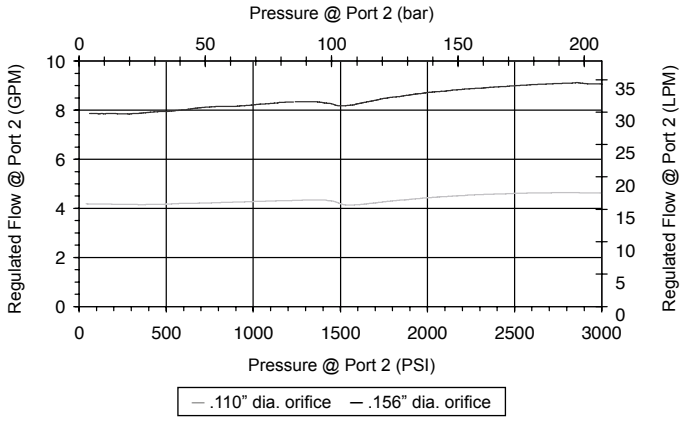
PERFORMANCE

Actual Test Data (Cartridge Only)

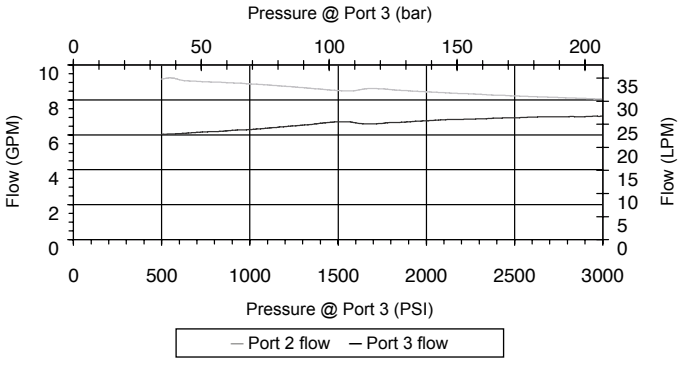
VALVE SPECIFICATIONS

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	3500 PSI (245 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min) per path
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	.38 lbs (.17 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 4W
Cavity Tools Kit (form tool, reamer, tap)	40500002
Seal Kit	21191214

10 GPM supply flow, .110” orifice, 150 PSI spring - 15 GPM supply flow, .156” orifice, 150 PSI spring - 1500 PSI load on port 3



Priority port 2 load: 1500 - 1700 PSI, .156” dia orifice, 15 GPM supply not intended for differential pressure > 1500 PSI port 4 to port 3



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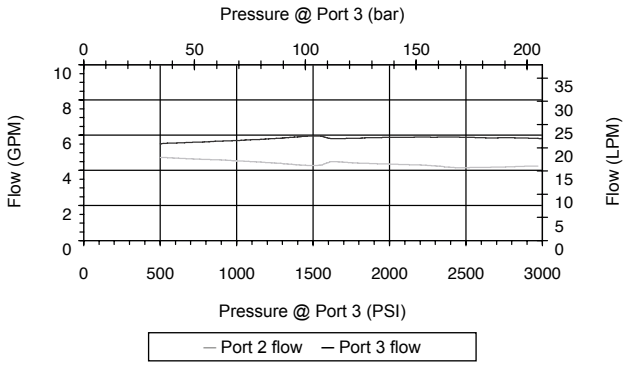
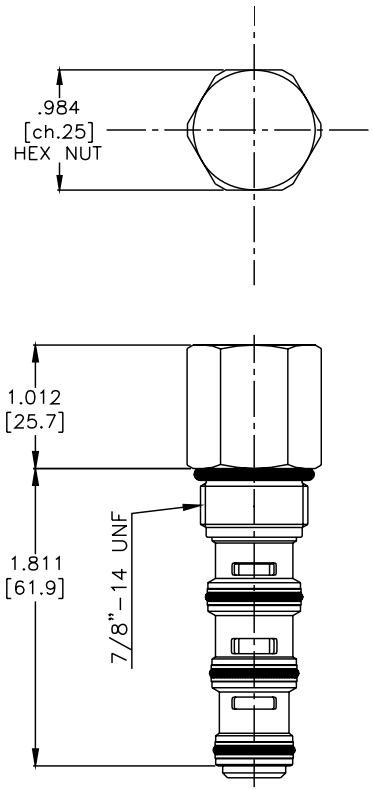
DIMENSIONS

Priority port 2 load: 1500 - 1700 PSI, .110" dia orifice, 10 GPM supply
not intended for differential pressure > 1500 PSI port 4 to port 3





(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

DG-TCB – ____ – ____ – ____

OPTIONS

Buna Standard	**00**
Viton Standard	**V0**

PRESSURE SETTINGS

014	14 bar (200 PSI)
020	20 bar (285 PSI)
032	32 bar (460 PSI)

Differential Pressure Across
External Controlling Orifice

BODIES

Blank	Without Body
N	3/8" BSP Ports
S	#6 SAE Ports

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COILS TECNORD

Section / Description page

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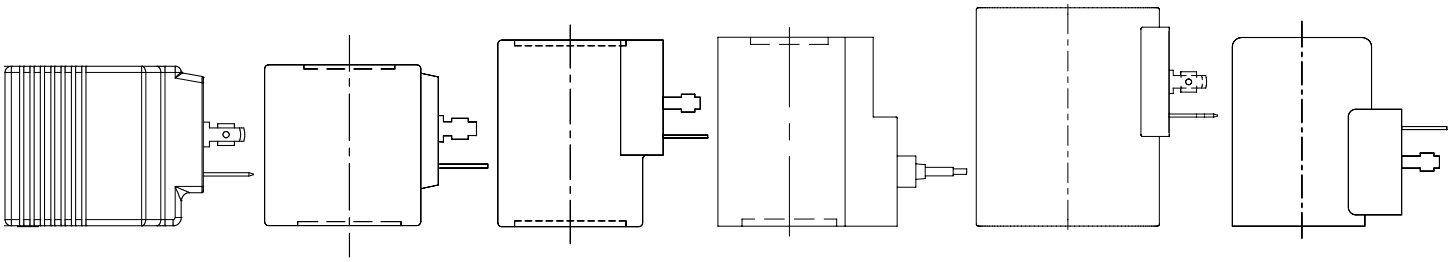
COIL DATA



STANDARD COILS

TYPE	ID	WIDTH	HEIGHT	PAGE
PJ	1/2	36	38.5	CT4
A	13.3	30	39	CT5
V	13.2	37.5	50	CT6
L	16.1	37.5	50	CT7
Z	19.1	46.5	56	CT8
F	19.1	37	50	CT9

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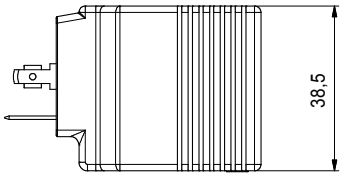
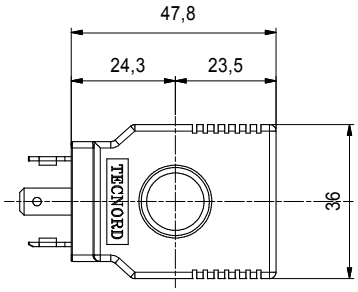
COIL DATA - “P” TYPE “J” COIL





DESCRIPTION

1/2 inch (13 mm) Immersion Proof Coil.
Color identification: black

FEATURES

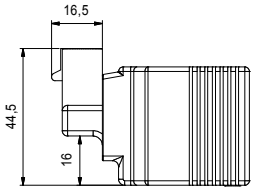
One piece encapsulated design that is:

- Weatherproof
- Immersion proof
- Thermal shock/dunk tested
- No external metal shell
- Internal arc suppression diode available on request

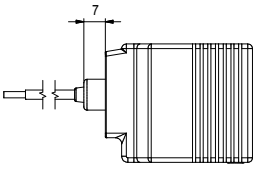
COIL SPECIFICATION

Wattage	21 Watts Nominal
Duty Rating	Continuous Duty ±10% rated voltage at 120°F (49°C) ambient
Min Current for Actuation	80% of rated current at room temperature
Magnet Wire Class	H
Heat insulation Class	F
Ambient Temperature Range	-30° to 60°C
Encapsulation Material	Thermo-Plastic, resistant to moisture, caustic solutions, fungus, and vibrations

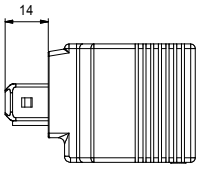
JA



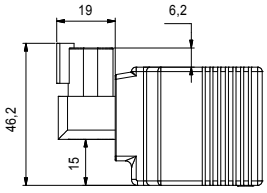
JL



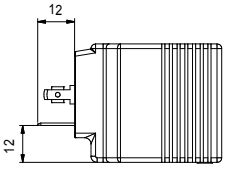
JJ



JD



JH



ORDERING INFORMATION

P – – –

Approximate Coil Weight: .42 lbs (.19 kg)

TERMINATIONS		VOLTAGE	
“J” Coil AMP Superseal - Integral	**JA**	**12**	12 VDC / 6.8 Ohm
“J” Coil Double lead	**JL**	**24**	24 VDC / 27 Ohm
“J” Coil AMP Jr. Timer - Integral	**JJ**	**26**	26 VDC / 32 Ohm
“J” Coil Deutsch - Integral DT04-2P	**JD**		
“J” Coil DIN 43650 (Hirschmann)	**JH**		

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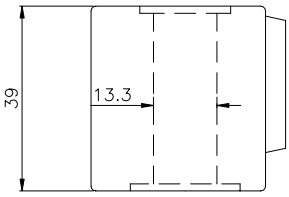
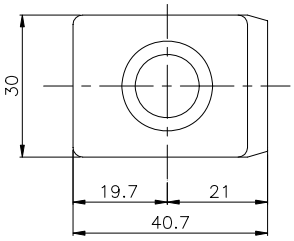
COIL DATA - "A" TYPE





DESCRIPTION

1/2 inch (13 mm) Immersion Proof Coil.
Color identification: black

FEATURES

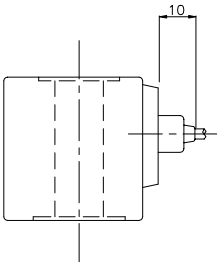
One piece encapsulated design that is:

- Immersion proof
- No external metal shell
- Internal arc suppression diode available on request

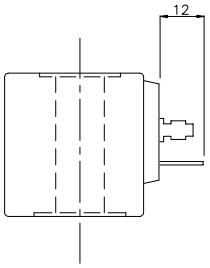
COIL SPECIFICATION

Wattage	18 Watts Nominal
Duty Rating	Continuous Duty ±10% rated voltage at 120°F (49°C) ambient
Min Current for Actuation	80% of rated current at room temperature
Magnet Wire Class	H (200°C)
Heat insulation Class	H (180°C)
Ambient Temperature Range	-30° to 60°C
Protection degree	Up to IP 65 (with connector and suitable seals)
Encapsulation Material	Glass filled polyester, resistant to moisture, caustic solutions, fungus and vibration

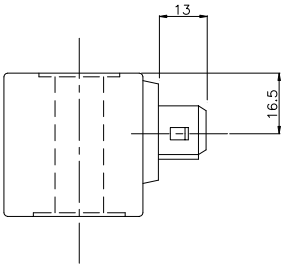
ADL



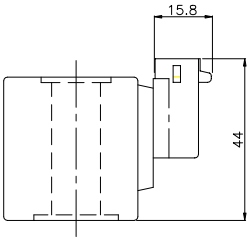
AHC



AJT



AMP



ORDERING INFORMATION

A – _____ – _____

Approximate Coil Weight: .42 lbs (.19 kg)

TERMINATIONS		
Double Lead	**DL**	**12**
DIN 43650 (Hirschmann)	**HC**	**24**
AMP Junior Timer - Integral	**JT**	**22**
Metri-Pack - Integral	**MP**	

VOLTAGE

12 VDC / 1.5 A
24 VDC / 0.75 A
220 VAC / rectified 0.06 A
without internal rectifier (for HC termination only)
supply voltage must be externally rectified

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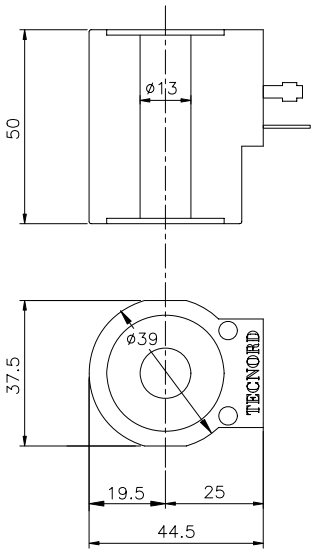
COIL DATA - "V" TYPE



DESCRIPTION

1/2 inch (13 mm) Immersion Proof Coil.
Color identification: black

FEATURES

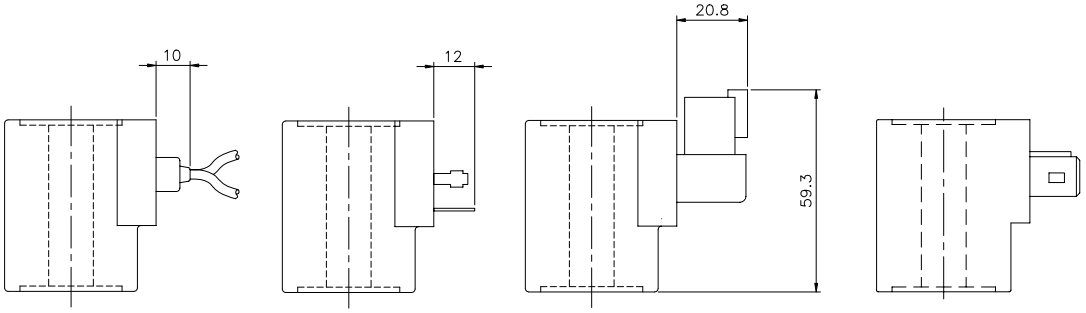
One piece encapsulated design that is:

- Immersion proof
- No external metal shell
- Internal arc suppression diode available on request

COIL SPECIFICATION

Wattage	24 Watts Nominal
Duty Rating	Continuous Duty ±10% rated voltage at 120°F (49°C) ambient
Min Current for Actuation	80% of rated current at room temperature
Magnet Wire Class	H (200°C)
Heat insulation Class	H (180°C)
Ambient Temperature Range	-30° to 60°C
Protection degree	Up to IP 65 (with connector and suitable seals)
Encapsulation Material	Glass filled polyester, resistant to moisture, caustic solutions, fungus and vibration

VDL **VHC** **VDI** **VJT**



ORDERING INFORMATION

V – ____ – ____

Approximate Coil Weight: .56 lbs (.25 kg)

TERMINATIONS		
Double Lead	DL	12
DIN 43650 (Hirschmann)	HC	24
AMP Junior Timer - Integral	JT	22
Deutsch - Integral DT04-2P	DI	

VOLTAGE

12 VDC / 2.03 A
24 VDC / 1.01 A
220 VAC / rectified 0.06 A
without internal rectifier (for HC termination only)
supply voltage must be externally rectified

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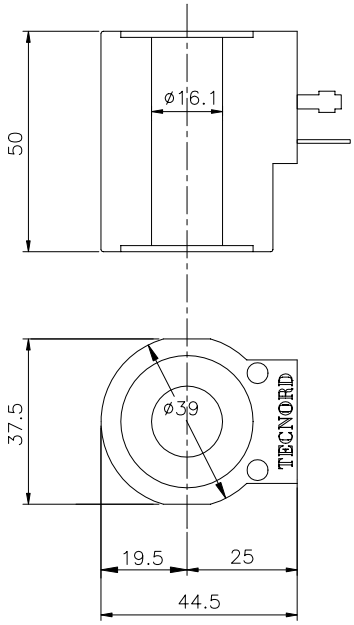
COIL DATA - "L" TYPE



DESCRIPTION

1/2 inch (13 mm) Immersion Proof Coil.
Color identification: black

FEATURES

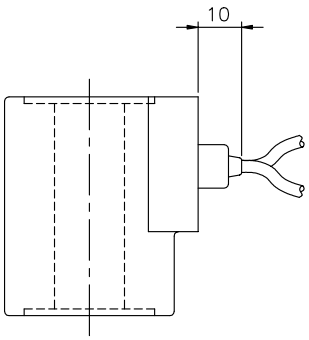
One piece encapsulated design that is:

- Immersion proof
- No external metal shell
- Internal arc suppression diode available on request

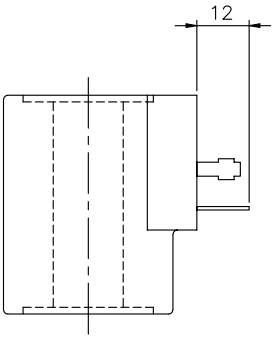
COIL SPECIFICATION

Wattage	24 Watts Nominal
Duty Rating	Continuous Duty ±10% rated voltage at 120°F (49°C) ambient
Min Current for Actuation	80% of rated current at room temperature
Magnet Wire Class	H (200°C)
Heat insulation Class	H (180°C)
Ambient Temperature Range	-30° to 60°C
Protection degree	Up to IP 65 (with connector and suitable seals)
Encapsulation Material	Glass filled polyester, resistant to moisture, caustic solutions, fungus and vibration

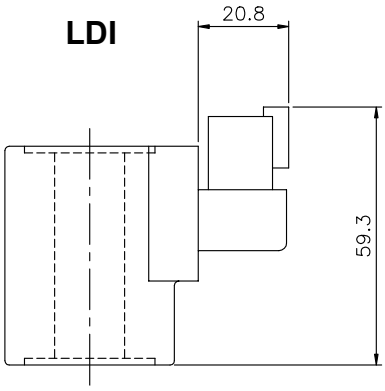
LDL



LHC



LDI



ORDERING INFORMATION

L – _____ – _____

Approximate Coil Weight: .69 lbs (.31 kg)

TERMINATIONS		VOLTAGE
Double Lead	**DL**	**12** 12 VDC / 2.03 A
DIN 43650 (Hirschmann)	**HC**	**24** 24 VDC / 1.01 A
Deutsch - Integral DT04-2P	**DI**	**22** 220 VAC / rectified 0.06 A *without internal rectifier (for HC termination only) supply voltage must be externally rectified*

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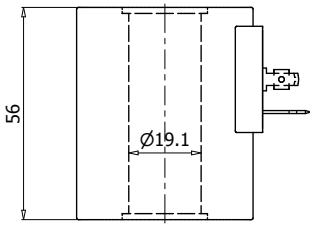
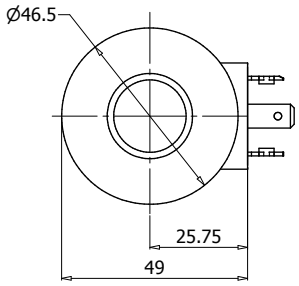
COIL DATA - "Z" TYPE





DESCRIPTION

3/4 inch (19 mm) Immersion Proof Coil.
Color identification: black

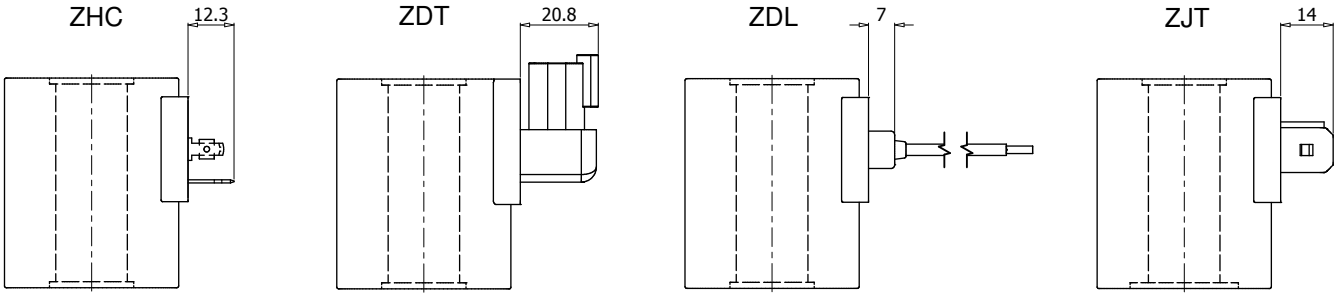
FEATURES

One piece encapsulated design that is:

- Immersion proof
- No external metal shell
- Internal arc suppression diode available on request

COIL SPECIFICATION

Wattage	27 Watts Nominal
Duty Rating	Continuous Duty ±10% rated voltage at 120°F (49°C) ambient
Min Current for Actuation	80% of rated current at room temperature
Magnet Wire Class	H
Heat insulation Class	F
Ambient Temperature Range	-30° to 60°C
Protection degree	Up to IP 65 (with connector and suitable seals)
Encapsulation Material	Glass filled polyester, resistant to moisture, caustic solutions, fungus and vibration



ORDERING INFORMATION

Z – ____ – ____

Approximate Coil Weight: .56 lbs (.25 kg)

TERMINATIONS		VOLTAGE
Double Lead	DL	12
DIN 43650 (Hirschmann)	HC	24
AMP Junior Timer - Integral	JT	22
Deutsch - Integral DT04-2P	DI	

VOLTAGE

12 VDC
24 VDC
220 VAC
without internal rectifier (for HC termination only)
supply voltage must be externally rectified

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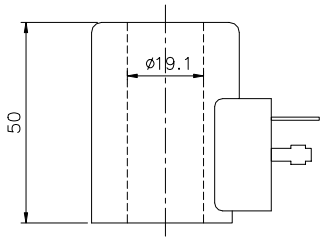
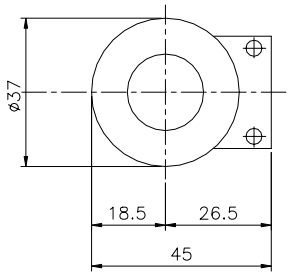
COIL DATA - "F" TYPE





DESCRIPTION

3/4 inch (19 mm) Immersion Proof Coil.
Color identification: silver metallic envelope

FEATURES

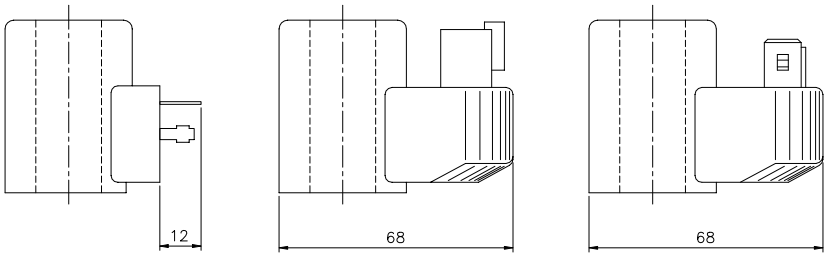
One piece encapsulated design that is:

- Immersion proof
- No external metal shell
- Internal arc suppression diode available on request

COIL SPECIFICATION

Wattage	20 Watts Nominal
Duty Rating	Continuous Duty ±10% rated voltage at 120°F (49°C) ambient
Min Current for Actuation	80% of rated current at room temperature
Magnet Wire Class	H (200°C)
Heat insulation Class	H (180°C)
Ambient Temperature Range	-30° to 60°C
Protection degree	Up to IP 65 (with connector and suitable seals)
Encapsulation Material	Glass filled polyester, resistant to moisture, caustic solutions, fungus and vibration

FHC **FDI** **FJT**



ORDERING INFORMATION

F – _____ – _____

Approximate Coil Weight: .49 lbs (.22 kg)

TERMINATIONS		VOLTAGE	
DIN 43650 (Hirschmann)	**HC**	**12**	12 VDC / 1.66 A
AMP Junior Timer - Integral	**JT**	**24**	24 VDC / 0.83 A
Deutsch - Integral DT04-2P	**DI**		

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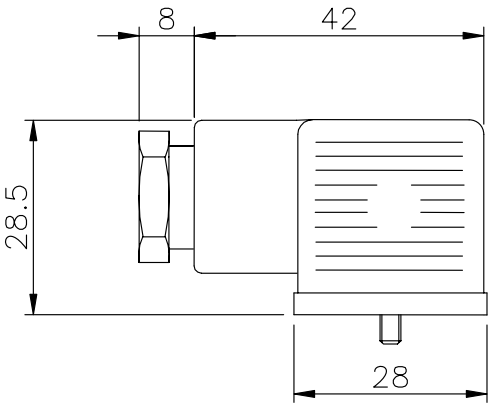
ACCESSORIES

CONNECTORS FOR THE DIN 43650 (HIRSCHMANN) TERMINATION

Standard connector dimensions and with internal VDR resistor against overvoltage peak



TECHNICAL DATA	
Number of poles	2 + Earth
Max operating current	10 A
Contact resistance	< 4 mOhm
Max. wire cross section	1.5 mm^2
Cable diameter	6 - 8 mm
Cable gland size	Pg 9
Protection class	IP 65

ORDERING INFORMATION	
DESCRIPTION	**CODE**
Standard	50.1004.002
With VDR resistor	50.1004.025

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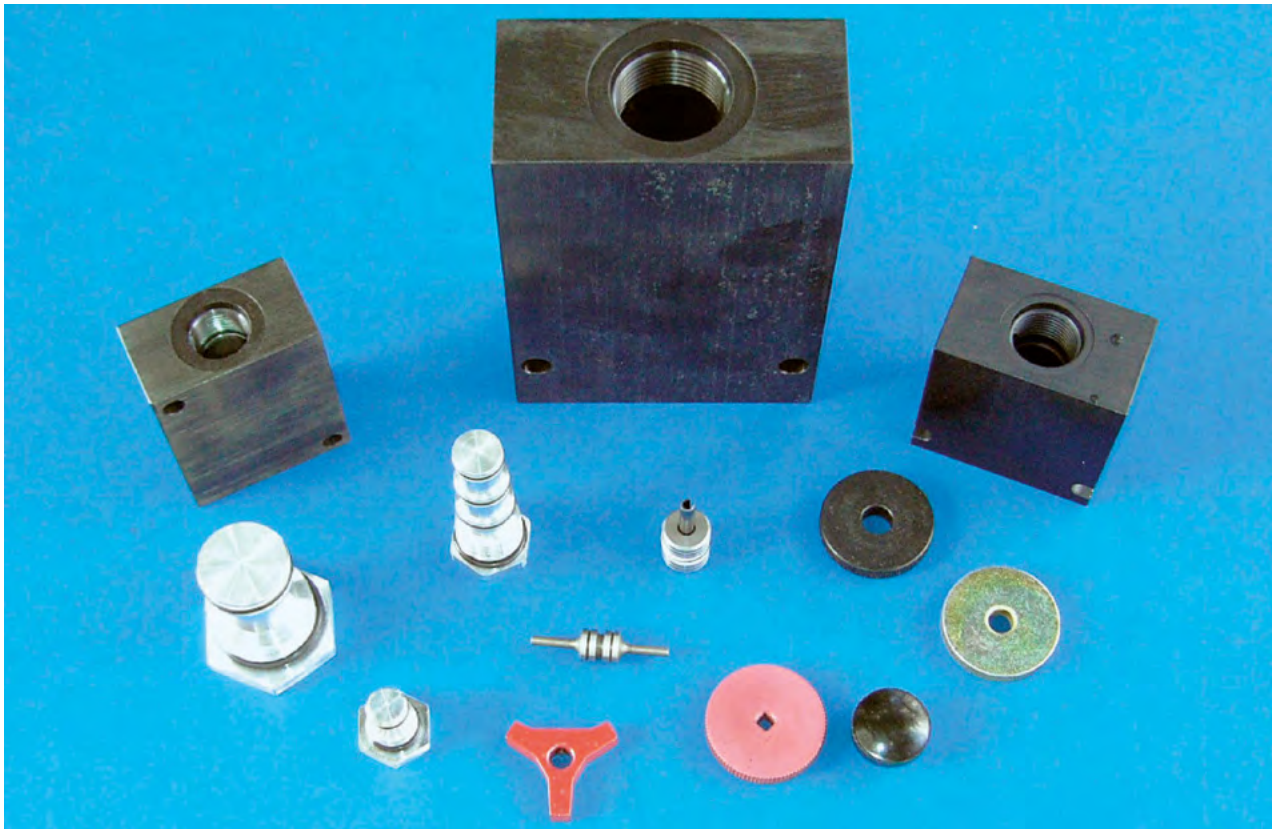
ACCESSORIES



Section / Description page

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VALVE BODIES - TECNORD

	STANDARD BODIES (ALUMINIUM)								
	PORT SIZE	P/N	STYLE / SIZE	DIMENSIONS					
				A	B	C	D	E	F
	1/4 BSP	13.1011.002	3W-5/8	30	50	60	25	52	34
	#6SAE	13.1011.142	3W-5/8	30	50	60	25	52	34
	1/4 BSP	13.1011.124	2W-3/4	30	50	50	23	42	34
	3/8 BSP	13.1011.125	2W-3/4	30	50	50	23	42	34
	#6 SAE	13.1011.144	2W-3/4	30	50	50	23	42	34
	3/8 BSP	13.1011.116	2W-7/8	30	60	60	25	52	44
	1/2 BSP	13.1011.115	2W-7/8	30	60	60	25	52	44
	#8 SAE	13.1011.147	2W-7/8	30	60	60	25	52	44
	3/8 BSP	13.1011.118	3W-7/8	30	60	70	30	62	44
	#6 SAE	13.1011.148	3W-7/8	30	60	70	30	62	44
	3/8 BSP	13.1011.121	4W-7/8	30	60	85	30	77	44
	#6 SAE	13.1011.149	4W-7/8	30	60	85	30	77	44
	3/4 BSP	13.1011.130	2W-1 1/16	50	80	80	40	70	60
	#12 SAE	13.1011.138	2W-1 1/16	50	80	80	40	70	60
	3/4 BSP	13.1011.131	3W-1 1/16	50	80	100	40	80	60
	#12 SAE	13.1011.139	3W-1 1/16	50	80	100	40	80	60
	3/4 BSP	13.1011.008	2W-1 5/16	50	80	80	34	60	60
	#12 SAE	13.1011.137	2W-1 5/16	50	80	80	34	60	60
	3/4 BSP	13.1011.153	3W-1 5/16	50	80	100	40	80	60
	3/4 BSP	13.1011.155	3W-1 5/16 SHORT	50	90	85	45	65	70
	#12 SAE	13.1011.154	3W-1 5/16	50	80	100	40	80	60

The following bodies are for the slip-in style cartridges. Contact factory for price and availability

	3/8 BSP	13.1011.042/A	3W-cavity 042	30	70	80	35	72	54
	1/4 BSP	13.1011.086	3W-cavity 043	40	60	50	30	40	40
	#8 SAE	13.1011.191	3W-cavity 059	50	90	80	45	73	76
	1/4 BSP	13.1011.080	3W-cavity 059	50	90	80	30	73	76

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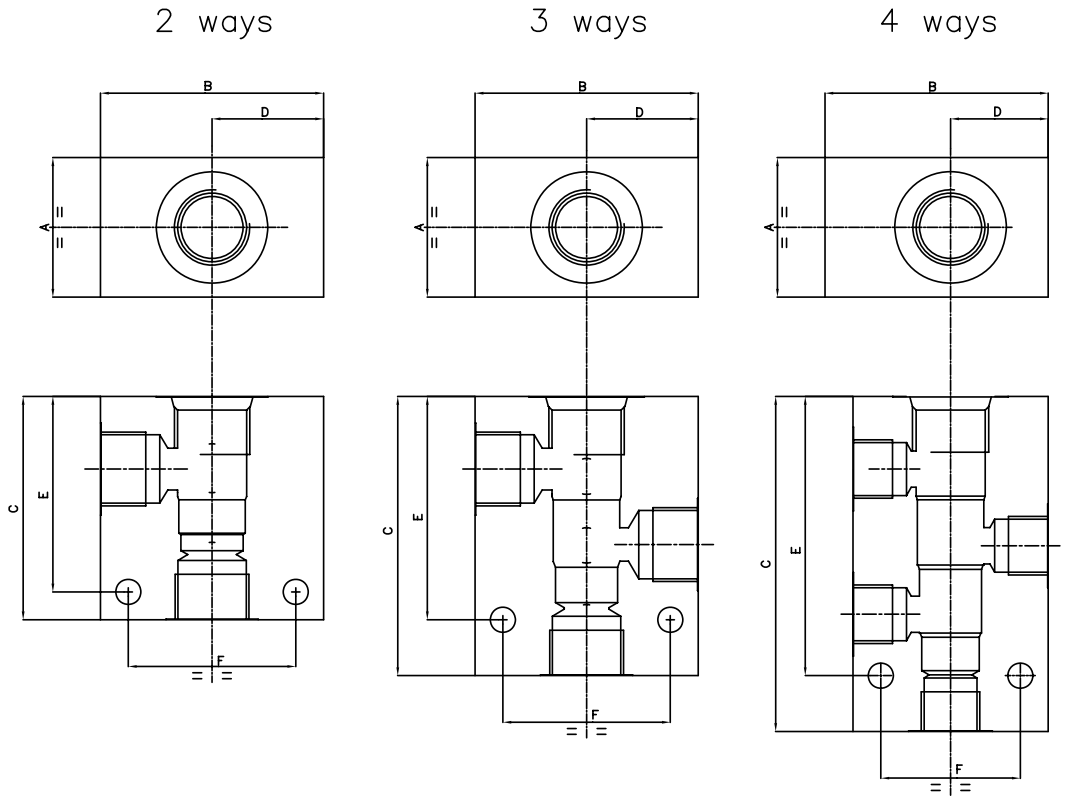
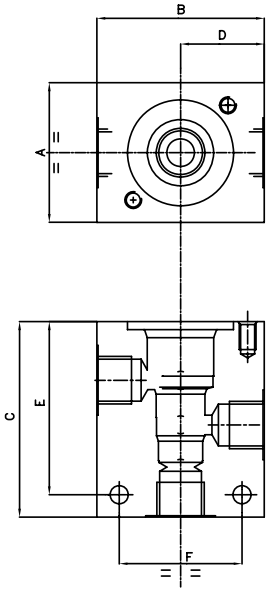
VALVE BODIES - TECNORD

Standard



Special
(for slip–in style cartridges)



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STANDARD BODIES - DELTA

BODY	PORT SIZE	P/N	STYLE / SIZE	DIMENSIONS					
				A	B	C	D	E	F
AN	1/4 NPT	30102126	2W-5/8	1.25	2.0	1.5	1.0	1.0	1.5
AS	#6 SAE	30102346	2W-5/8	1.25	2.0	1.5	1.0	1.0	1.5
CN	1/4 NPT	30102097	3W-5/8	1.25	2.0	2.25	1.0	1.875	1.5
CS	#6SAE	30102373	3W-5/8	1.25	2.5	2.25	1.25	1.875	2.0
DN	1/4 NPT	30102110	4W-5/8	1.25	2.0	2.75	1.0	2.375	1.5
DS	#6SAE	30102288	4W-5/8	1.25	2.0	2.75	1.125	2.375	1.5
BN	1/4 NPT	30102127	2W-3/4	1.25	2.0	2.0	1.0	1.5	1.5
BS	#6SAE	30102466	2W-3/4	1.25	2.0	2.0	1.125	1.5	1.5
PN	1/4 NPT	30102534	3W-3/4	1.25	2.25	2.5	1.125	2.0	1.75
PS	#6SAE	30102533	3W-3/4	1.25	2.25	2.5	1.125	2.0	1.75
QN	1/4 NPT	30102536	4W-3/4	1.25	2.25	3.0	1.125	2.5	1.75
QS	#6SAE	30102535	4W-3/4	1.25	2.25	3.0	1.125	2.5	1.75
EN	3/8 NPT	30102006	2W-7/8	1.5	2.0	2.125	1.0	1.625	1.5
ES	#8 SAE	30102359	2W-7/8	1.5	2.0	2.0	1.25	1.5	1.75
FN	1/4 NPT	30102015	3W-7/8	1.5	2.0	2.5	1.0	1.5	1.5
FS	#6SAE	30102360	3W-7/8	1.5	2.5	2.5	1.25	2.125	2.25
GN	1/4 NPT	30102014	4W-7/8	1.5	2.0	3.25	1.0	2.125	1.5
GS	#6SAE	30102367	4W-7/8	1.5	2.5	3.25	1.25	2.875	2.25
TS	#12 SAE	30102813	2W-1 1/16	1.75	2.75	3.09	1.69	0.84	2.20
US	#10 SAE	30102815	3W-1 1/16	1.75	3.0	3.87	1.5	2.0	2.30
RS	#10 SAE	30102638	SHORT 3W-1 1/16	2.0	3.0	3.25	1.5	2.70	2.38
VS	#10 SAE	30102816	4W-1 1/16	1.75	3.0	4.75	1.5	3.0	2.30
JN	3/4 NPT	30102334	2W-1 5/16	2.0	3.0	3.0	1.875	2.25	2.438
JS	#12 SAE	301022331	2W-1 5/16	2.0	3.0	3.0	1.875	2.25	2.438
KS	#12 SAE	30102576	3W-1 5/16	2.0	4.0	4.0	2.0	3.125	3.38
LS	#12 SAE	30102575	SHORT 3W-1 5/16	2.0	3.5	3.5	1.875	2.75	2.88
NS	#12 SAE	30102577	4W-1 5/16	2.0	4.0	5.25	2.0	4.25	3.38
OS	#12 SAE	30102589	5W-1 5/16	2.0	4.0	5.75	2.0	4.75	3.38

The following bodies are for the slip-in style cartridges. Contact factory for price and availability

E1/2	1/2 NPT	30102336	2W-7/8	1.5	2.5	2.5	1.50	2.0	2.0
E#6	#6 SAE	30102364	2W-7/8	1.5	2.0	2.0	1.25	1.50	1.75
F3/8	3/8 NPT	30102370	3W-7/8	1.5	2.0	2.5	1.25	2.125	2.25
F#8	#8 SAE	30102354	3W-7/8	1.5	2.5	2.75	1.25	2.125	2.00
G#8	#8 SAE	30102362	4W-7/8	1.5	2.0	2.25	1.25	2.875	2.25
J14	#14 SAE	30102332	2W-1 5/16	2.0	3.0	3.0	1.875	2.25	2.438
J16	#16 SAE	30102333	2W-1 5/16	2.0	3.0	3.0	1.875	2.25	2.438

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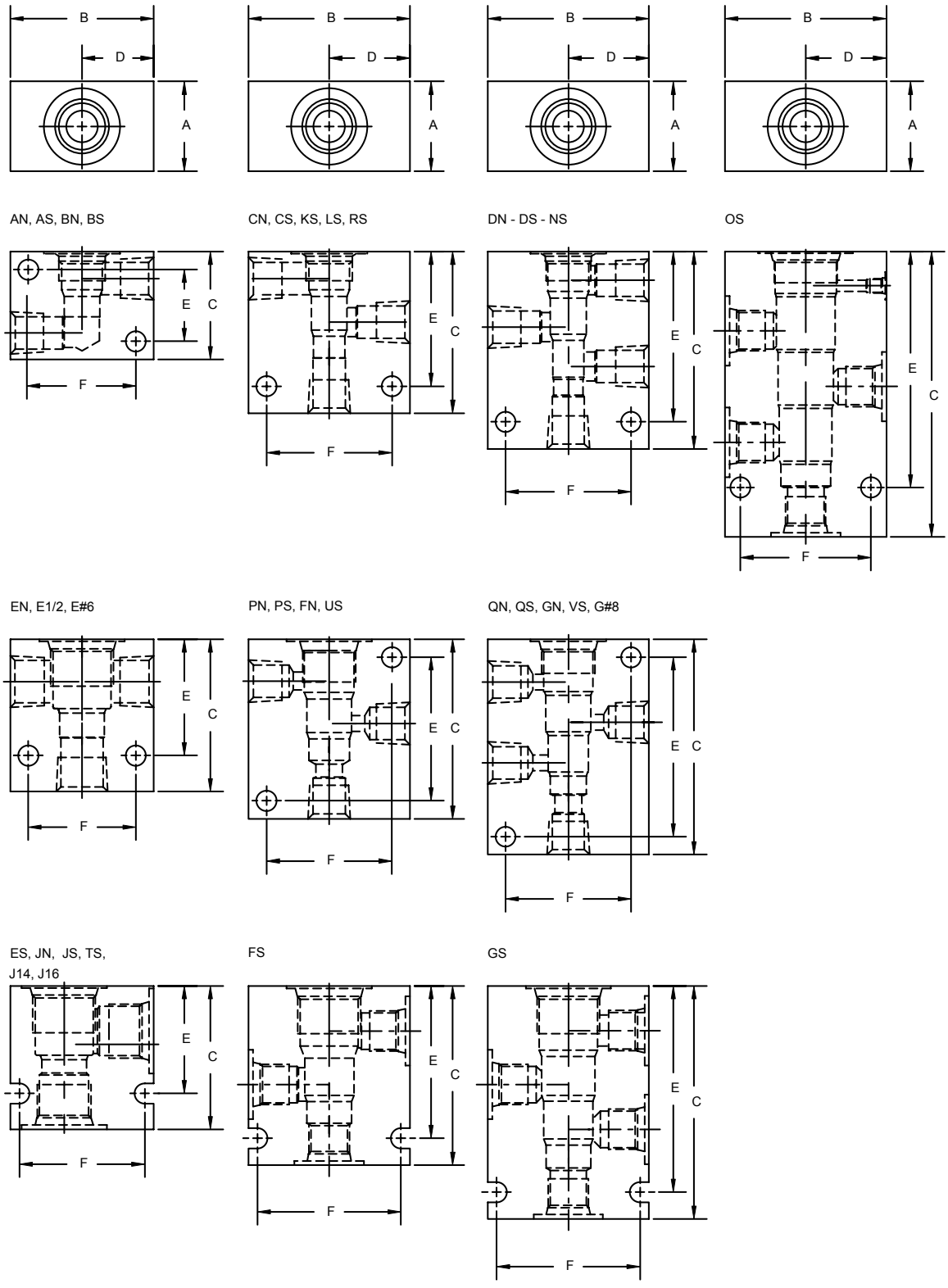
STANDARD BODIES



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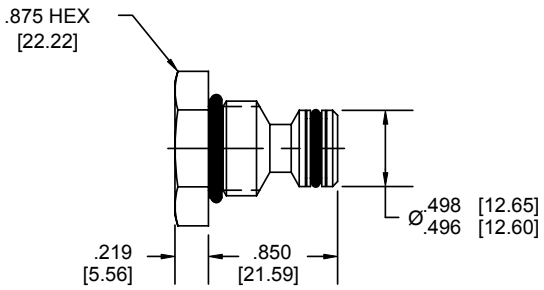
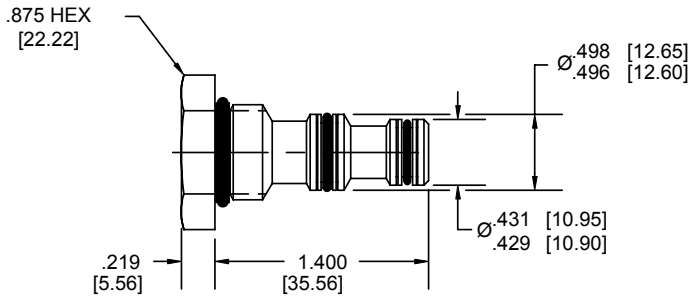
MINI SERIES CAVITY PLUGS

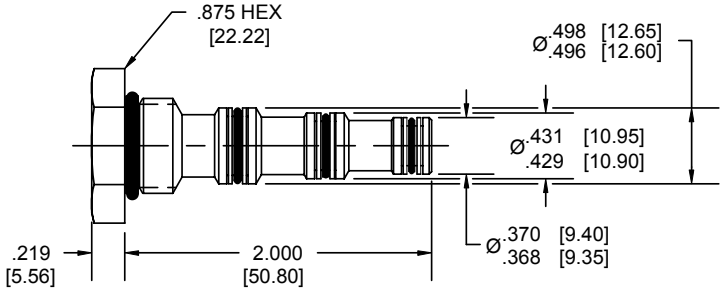
NOTE: dimensions in brackets are millimeters



2W 2P CAVITY PLUG
MA SERIES



3W 2P CAVITY PLUG
MC SERIES



4W 2P CAVITY PLUG
MD SERIES

ORDERING INFORMATION

– –

Standard Model Number			Options
2 Way	**MA**	**00**	Standard Buna
3 Way	**MC**	**V0**	Standard Viton
4 Way	**MD**		

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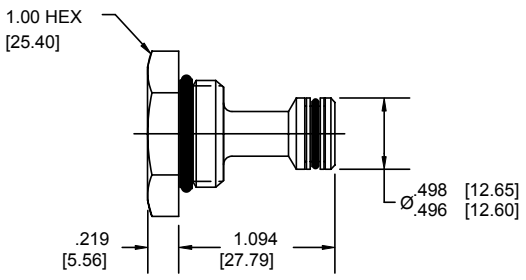
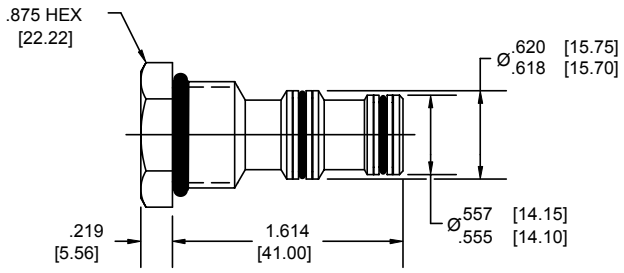
POWER SERIES CAVITY PLUGS

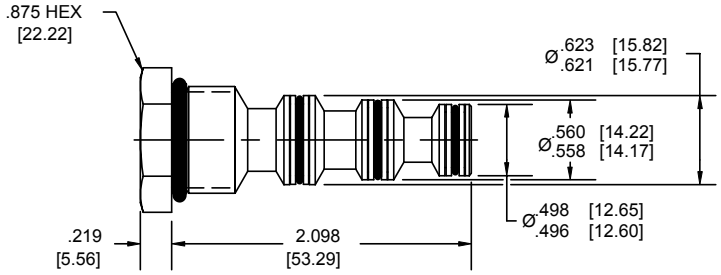
NOTE: dimensions in brackets are millimeters



2W 2P CAVITY PLUG
PB SERIES



3W 2P CAVITY PLUG
PP SERIES



4W 2P CAVITY PLUG
PQ SERIES

ORDERING INFORMATION

Standard Model Number		–		–	Options
2 Way	**PB**		**00**		Standard Buna
3 Way	**PP**		**V0**		Standard Viton
4 Way	**PQ**				

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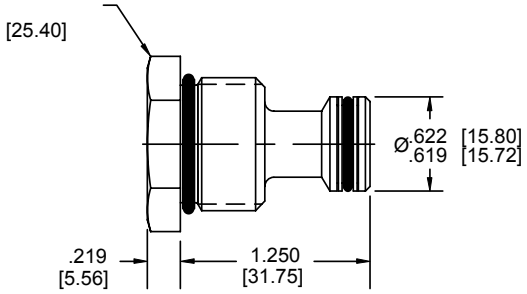
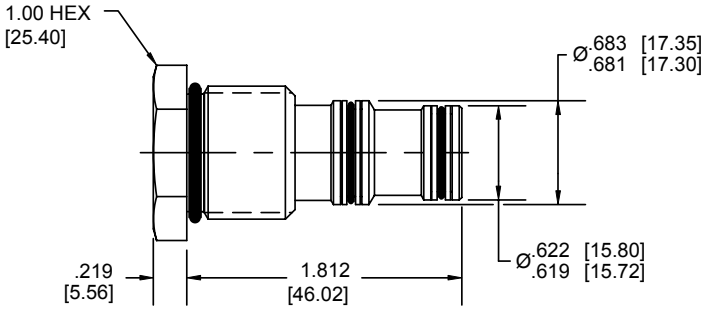
DELTA SERIES CAVITY PLUGS

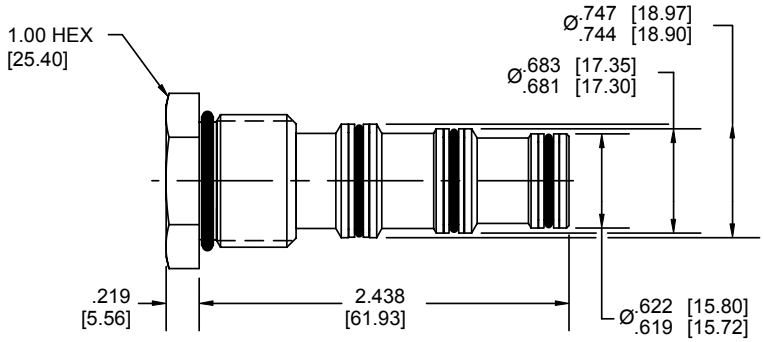
NOTE: dimensions in brackets are millimeters



2W 2P CAVITY PLUG
DE SERIES



3W 2P CAVITY PLUG
DF SERIES



4W 2P CAVITY PLUG
DG SERIES

ORDERING INFORMATION

– –

Standard Model Number			Options
2 Way	**DE**	**00**	Standard Buna
3 Way	**DF**	**V0**	Standard Viton
4 Way	**DG**		

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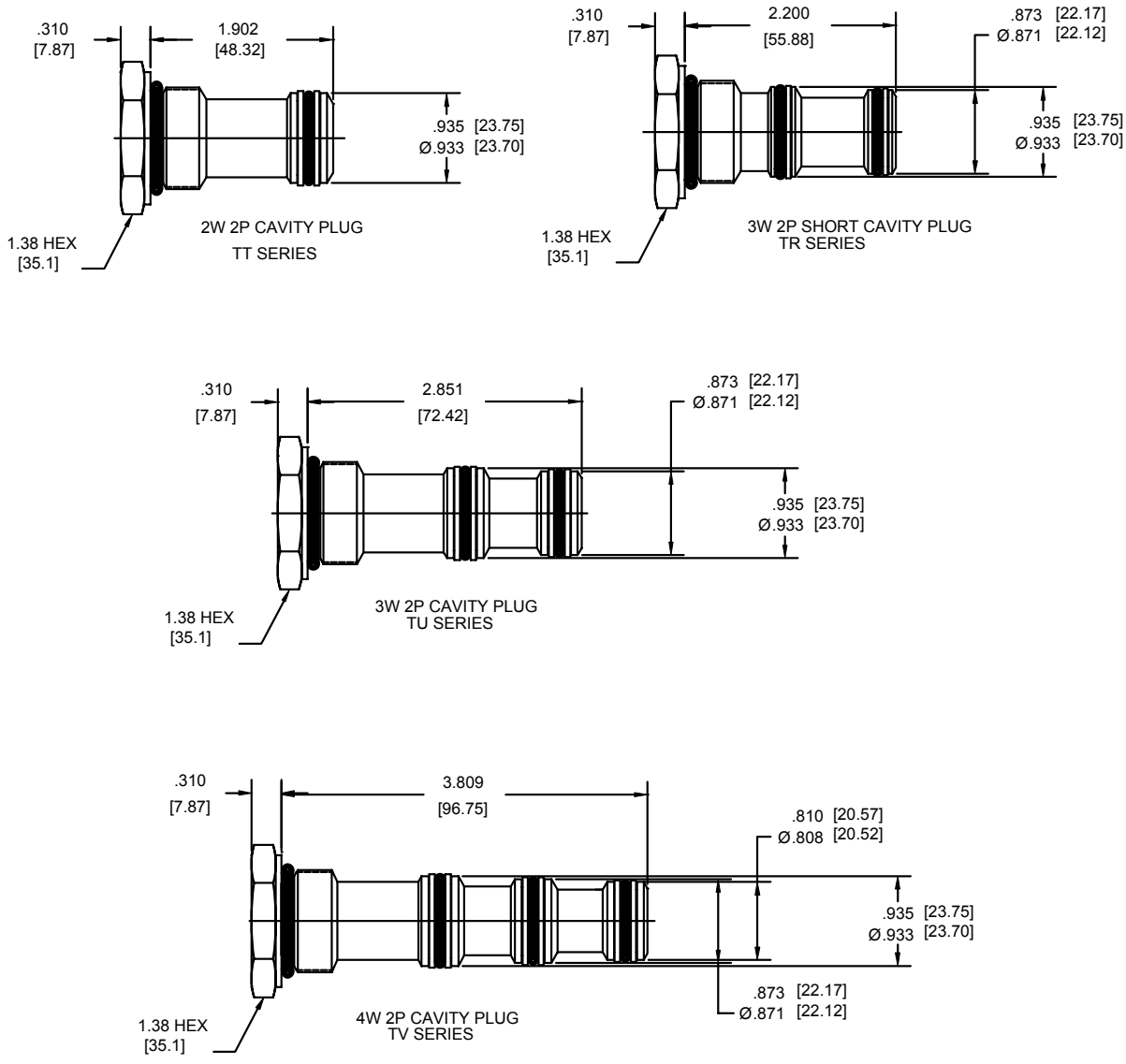
TECNORD SERIES CAVITY PLUGS

NOTE: dimensions in brackets are millimeters



ORDERING INFORMATION

– –

Standard Model Number			Options
2 Way	**TT**	**00**	Standard Buna
3 Way	**TU**	**V0**	Standard Viton
3 Way Short	**TR**		
4 Way	**TV**		

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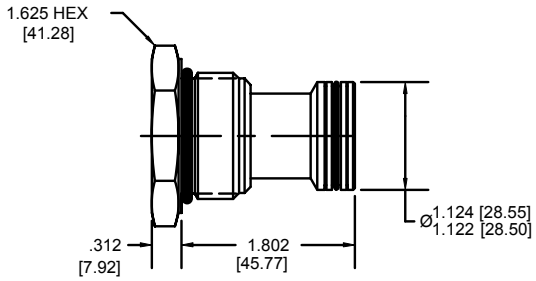
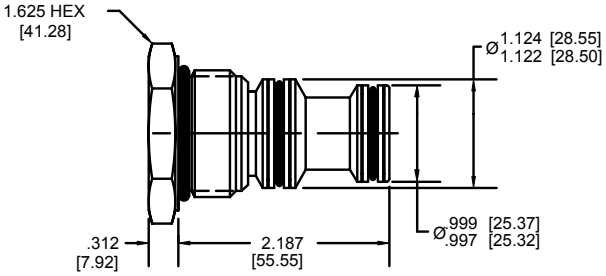
SUPER SERIES CAVITY PLUGS

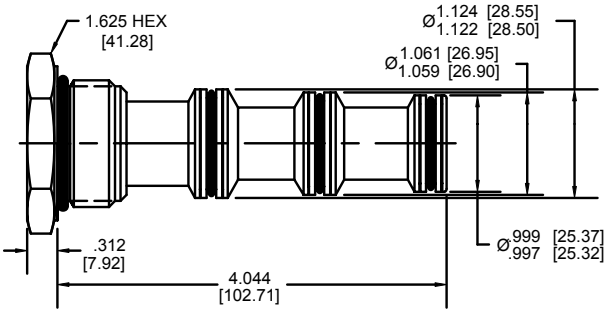
NOTE: dimensions in brackets are millimeters



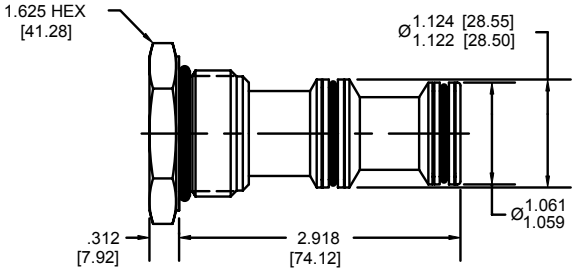
2W 2P CAVITY PLUG
SJ SERIES



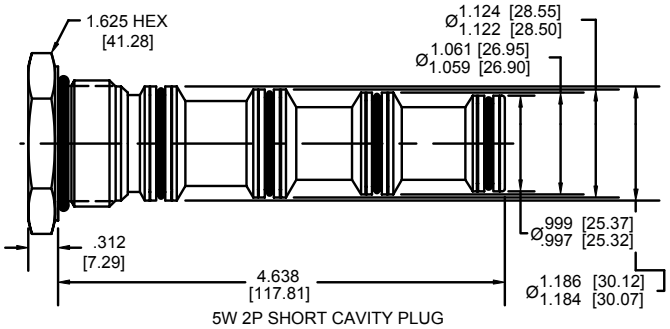
3W 2P SHORT CAVITY PLUG
SL SERIES



4W 2P CAVITY PLUG
SM SERIES



3W 2P CAVITY PLUG
SK SERIES



5W 2P SHORT CAVITY PLUG
SO SERIES

ORDERING INFORMATION

– –

Standard Model Number		Options	
2 Way	**SJ**	**00**	Standard Buna
3 Way Short	**SL**	**V0**	Standard Viton
3 Way	**SK**		
4 Way	**SM**		
5 Way Short	**S0**		

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MANUAL OVERRIDE OPTIONS

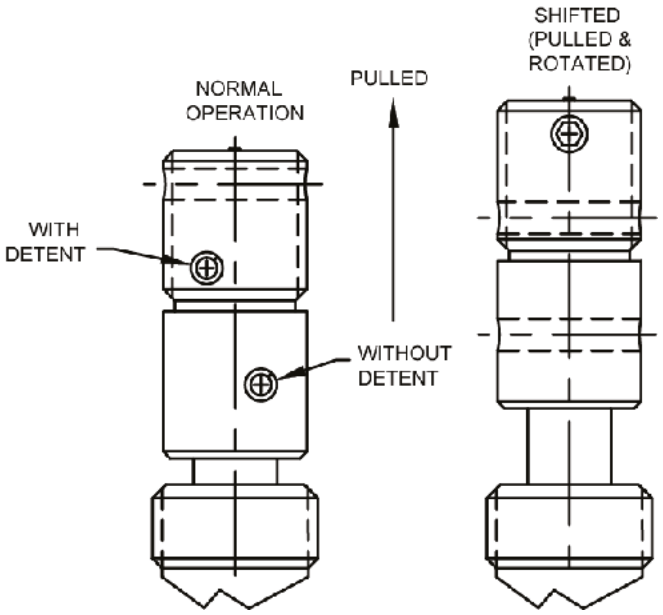
PULL TYPE MANUAL OVERRIDE OPTION

Pull Type Manual Override Option Standard override option for pull type solenoid valves.

This override is offered with or without the detent option.

With detent option, pull and rotate180 degrees, when released the override will remain in that position. To return to the normal operating position, Rotate knob 180 degrees and release.

Without the detent option, knob must be pulled and held to maintain override position.



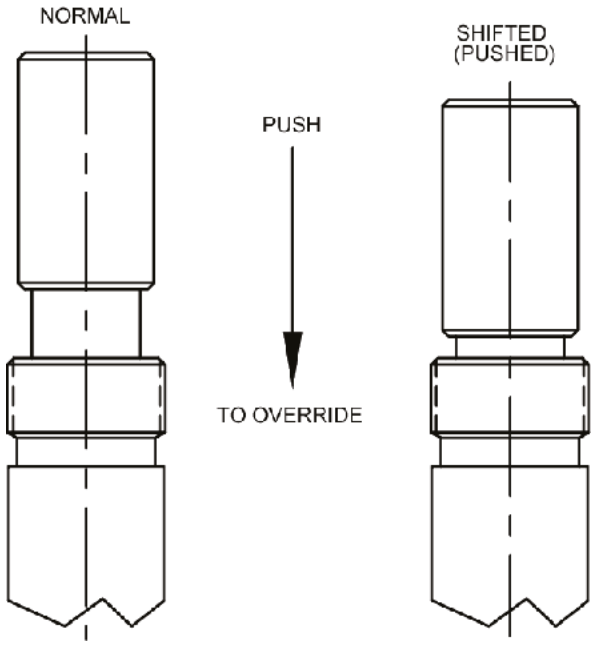
PUSH TYPE MANUAL OVERRIDE OPTION

Standard push type override option used for 4W3P valves.

To activate override option, push knob and Hold, when released, the valve returns to normal operation position.

Note: override option only functions in the push (S1 coil) direction.

This override option is intended for emergency use only and is not intended for continuous duty operation.



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MANUAL OVERRIDE OPTIONS

ROTARY TYPE MANUAL OVERRIDE OPTION

Standard rotary override option for normally open valves.

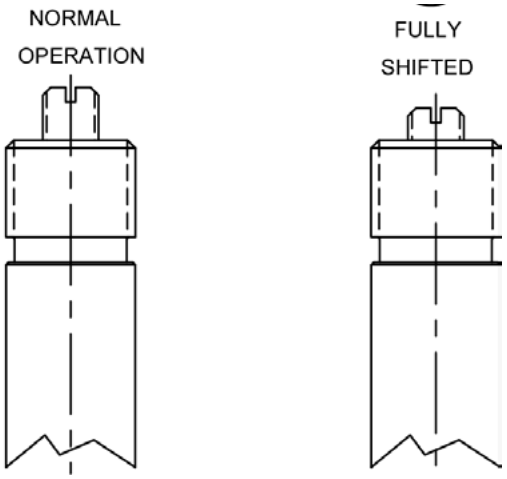
This override option is offered with or without a knob.

To activate override option, fully rotate using a flat tip screwdriver or the knob in a clockwise direction.

To de-activate override, fully rotate using a flat tip screwdriver or the knob in a counter clockwise direction.

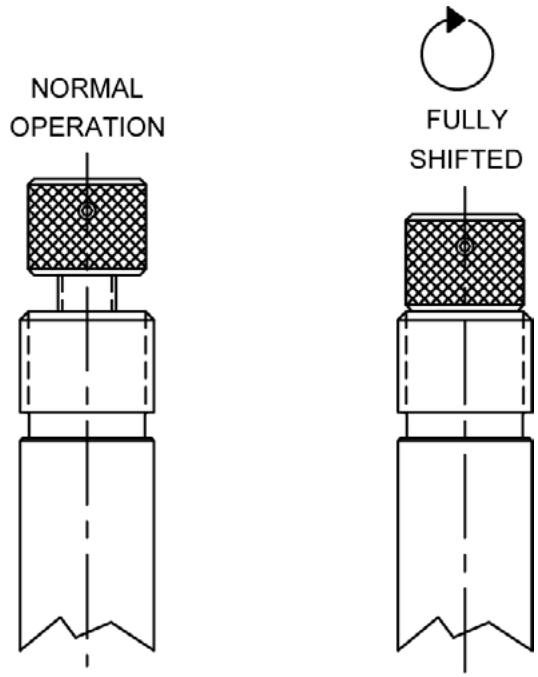
Note: not rotating override fully in either direction will result in partial shifting of valve.

WARNING: Over torque of manual override could result in valve damage.



Note: rotary Pull Type Manual Override Option (Pull type Valves-Reference Models HB-S2A & HB-S2B).

Because HB-S2A & HB-S2B are Pull type Valves, “fully in” is the normal state and “fully out” is “fully shifted” state so opposite of what is shown in image.”



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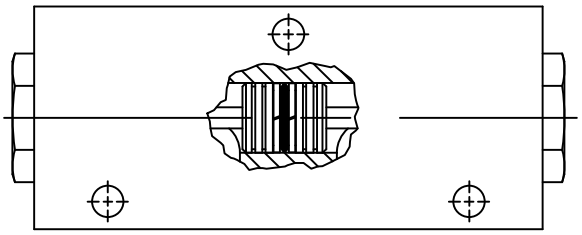
PILOT PISTON ASSEMBLIES



DESCRIPTION

These pistons are used in a manifold to create pilot operated valve assemblies, such as pilot operated checks.

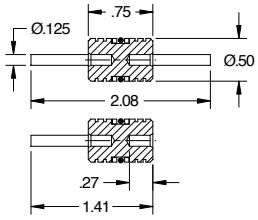
FEATURES

- O-rings on piston are optional.
- One piece design or pressed fit dowel pins
- Single or double pilot piston options.

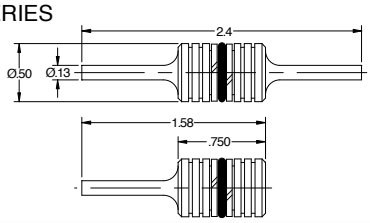
PISTION SPECIFICATIONS

VALVE SERIES	VALVE SERIES	VALVE SERIES
MINI	.193	6.7:1
POWER	.250	4:1
DELTA	.312	4:1
SUPER	.590	3.7:1

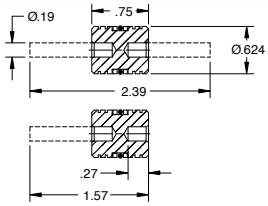
MINI SERIES



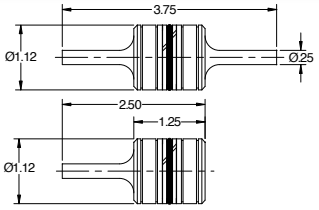
POWER SERIES

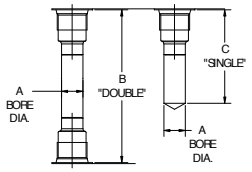


DELTA SERIES



SUPER SERIES



CAVITY INFORMATION	SERIES	BORE DIAMETER	DOUBLE - SPOTFACE DIM.	SINGLE - SPOTFACE DIM.
		A	B	C
	MINI	.500/.502	3.313	2.031
	POWER	.500/.502	4.250	2.406
	DELTA	.625/.627	4.500	2.750
	SUPER	1.126/1.128	6.938	4.000

ORDERING INFORMATION

– – –

PISTON		SEALS		PILOT PIN OPTIONS	
MINI Series .500 DIA	**M**	**B**	Buna	**S**	Single
POWER Series .500 DIA	**P**	**V**	Viton	**D**	Double
DELTA Series .625 DIA	**D**	**O**	Omit		
SUPER Series 1.12 DIA	**S**				

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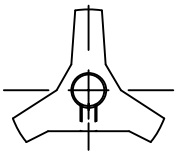
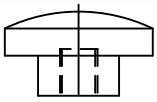
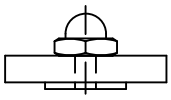
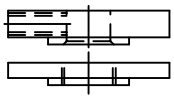
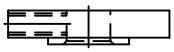
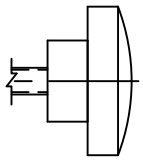
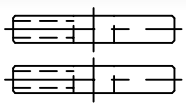
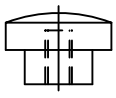
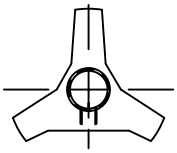
STANDARD KNOB ASSEMBLIES

	22020047 34502032 66700059	**MINI SERIES**
	34502000	**DELTA SERIES**
	22020005 34502006 36202008	**DELTA SERIES**
	22020004 34502004 34502003 66700027	**DELTA SERIES**
	22020003 34502003 66700027	**DELTA SERIES**
	34502008	**DELTA SERIES**
	22020049 34502017 66700059	**DELTA SERIES** **SUPER SERIES**
	34502024	**POWER SERIES**
	22020058 34502019 66700059	**POWER SERIES**

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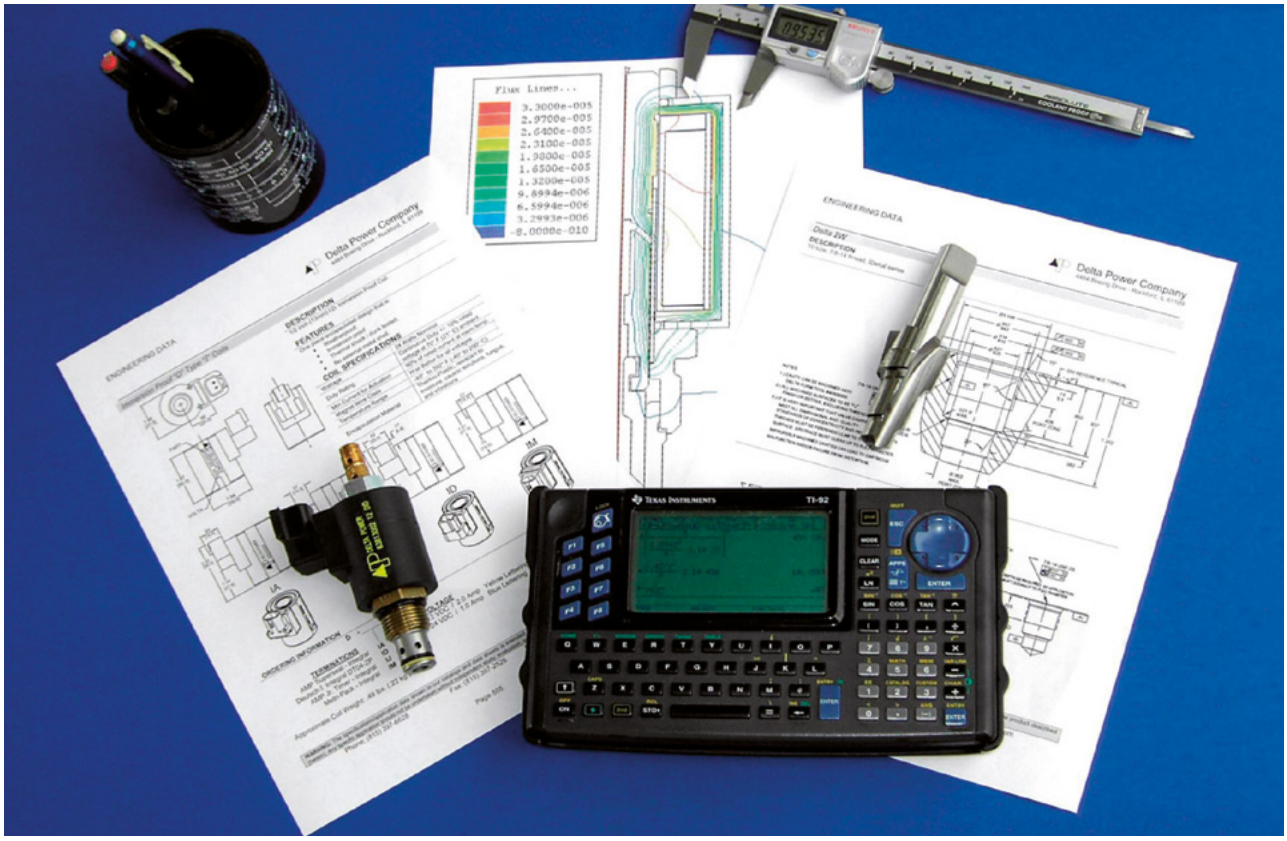
ENGINEERING DATA



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CAVITY DATA

SERIES	SIZE	THREAD SIZE	TOOLS KIT	PAGE
T043		SLIP-IN	K-T043	ED3
T059		SLIP-IN	K-T059	ED4
T042		7/8-14 UNF 2B	K-T042	ED5
MINI 2 WAY	7	5/8-18 UNF 2B	40500003	ED6
MINI 3 WAY	7	5/8-18 UNF 2B	40500004	ED7
MINI 4 WAY	7	5/8-18 UNF 2B	40500006	ED8
POWER 2 WAY	8	3/4-16 UNF 2B	40500005	ED9
POWER 3 WAY	8	3/4-16 UNF 2B	40500024	ED10
POWER 4 WAY	8	3/4-16 UNF 2B	40500029	ED11
DELTA 2 WAY	10	7/8-14 UNF 2B	40500000	ED12
DELTA 2 WAY SPECIAL	10	7/8-14 UNF 2B	40500028	ED13
DELTA 3 WAY	10	7/8-14 UNF 2B	40500001	ED14
DELTA 4 WAY	10	7/8-14 UNF 2B	40500002	ED15
TECNORD 2 WAY	12	1 1/16-12 UNF 2B	40500032	ED16
TECNORD 3 WAY SHORT	12	1 1/16-12 UNF 2B	40500033	ED17
TECNORD 3 WAY	12	1 1/16-12 UNF 2B	40500034	ED18
TECNORD 4 WAY	12	1 1/16-12 UNF 2B	40500035	ED19
TECNORD 5 WAY SHORT	12	1 1/16-12 UNF 2B	40500037	ED20
SUPER 2 WAY	16	1 5/16-12 UNF 2B	40500017	ED21
SUPER 3 WAY SHORT	16	1 5/16-12 UNF 2B	40500021	ED22
SUPER 3 WAY	16	1 5/16-12 UNF 2B	40500018	ED23
SUPER 4 WAY	16	1 5/16-12 UNF 2B	40500019	ED24
SUPER 5 WAY SHORT	16	1 5/16-12 UNF 2B	40500020	ED25
SUPER 5 WAY	16	1 5/16-12 UNF 2B	40500038	ED26
QS SPECIAL 3W	10	M20 X 1.5-H6	40500012	ED27

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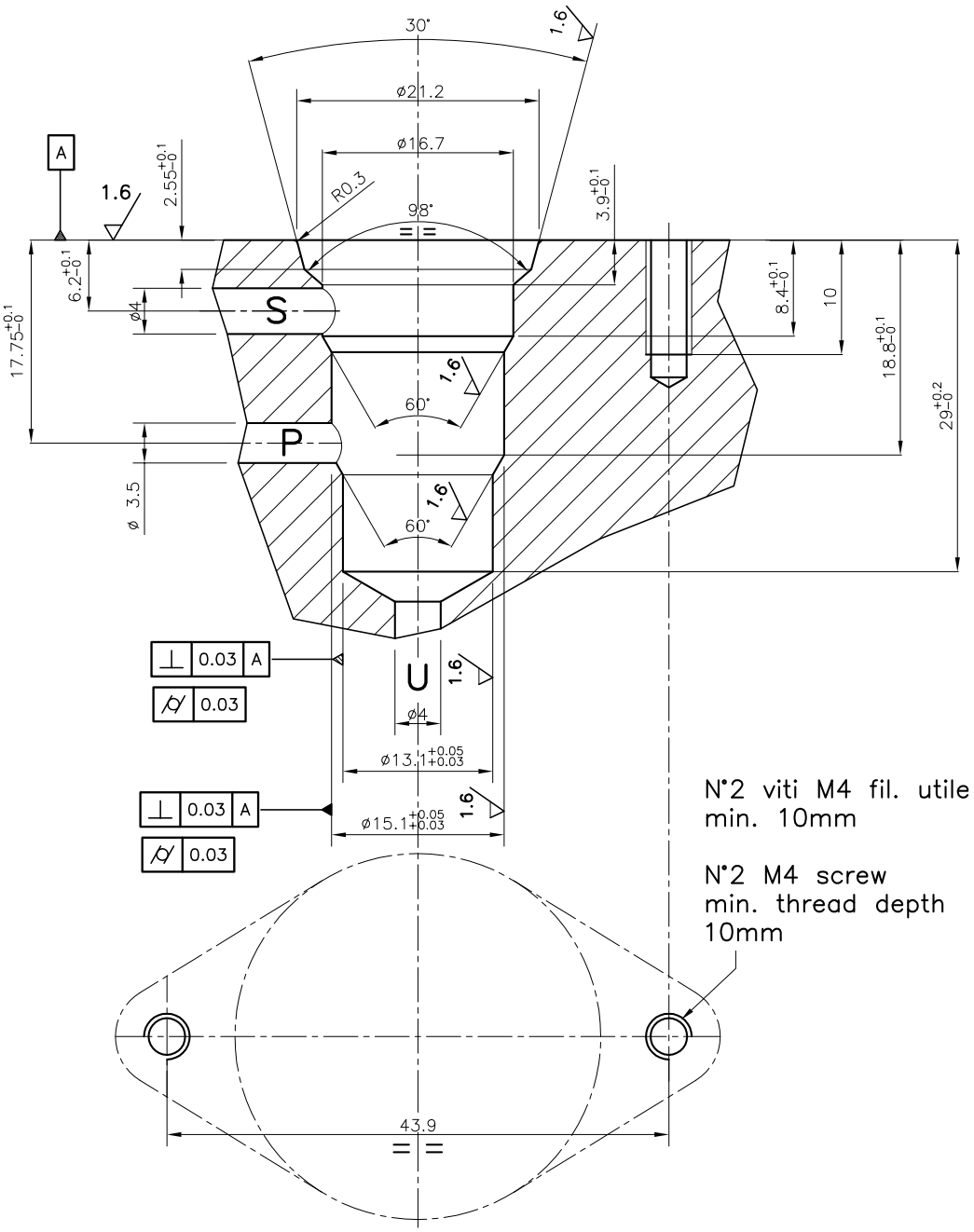
T043 SLIP-IN CAVITY FOR IP-DAR-43 CARTRIDGE



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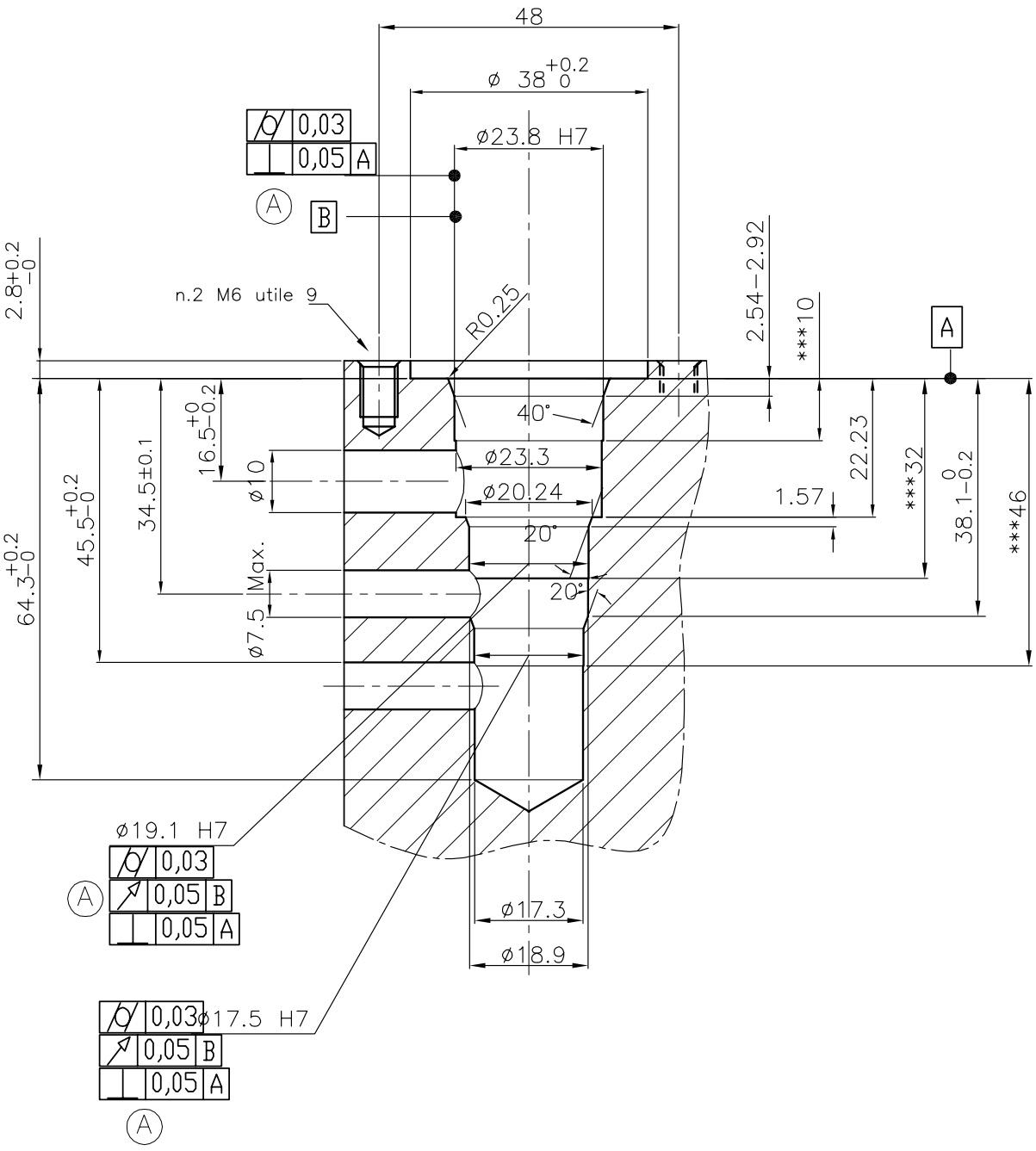
T059 SLIP-IN CAVITY FOR IP-PRZ-59 CARTRIDGE



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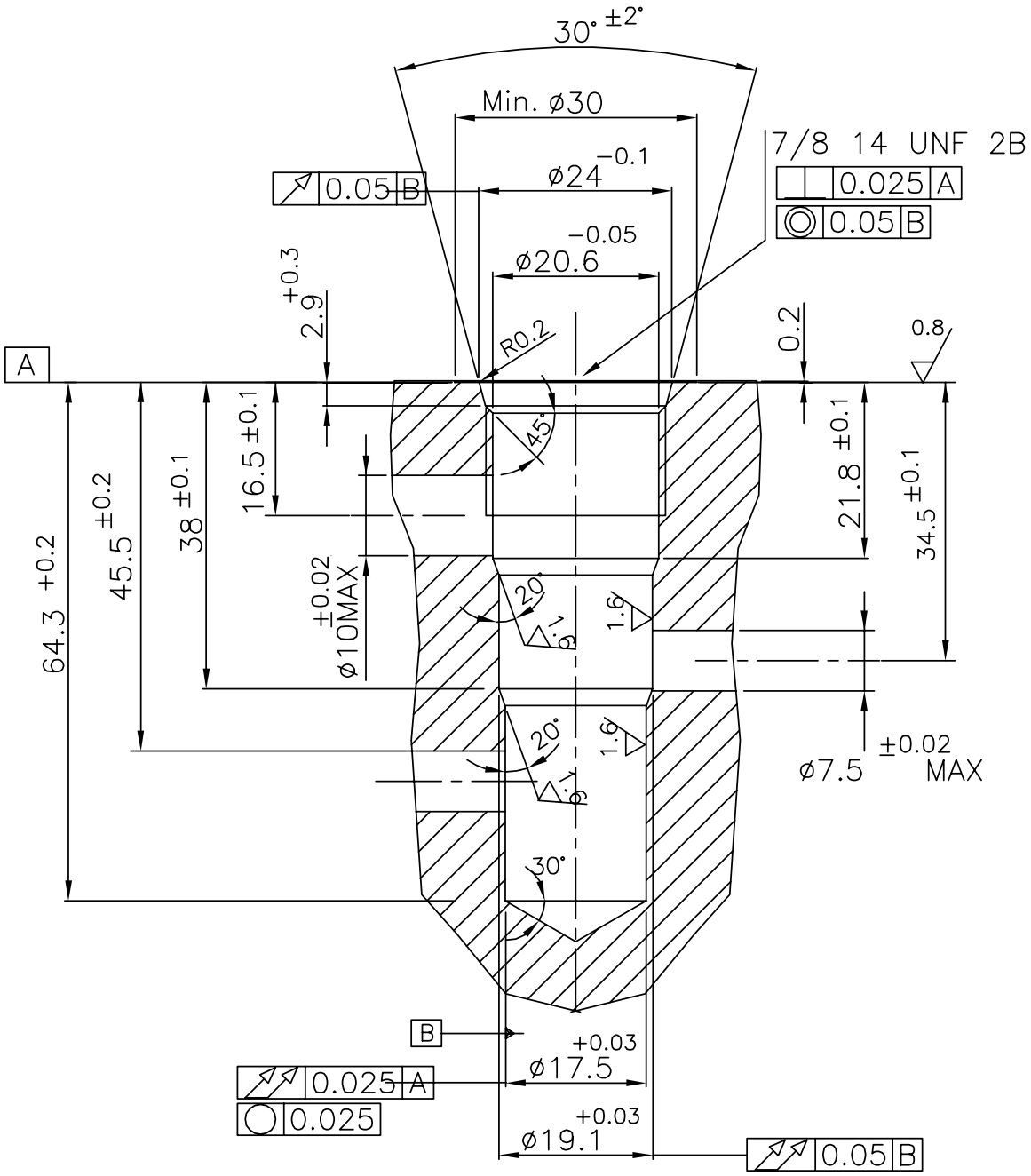
T042 CAVITY FOR EG-TRZ-42 CARTRIDGE, 7/8” - 14 THREAD



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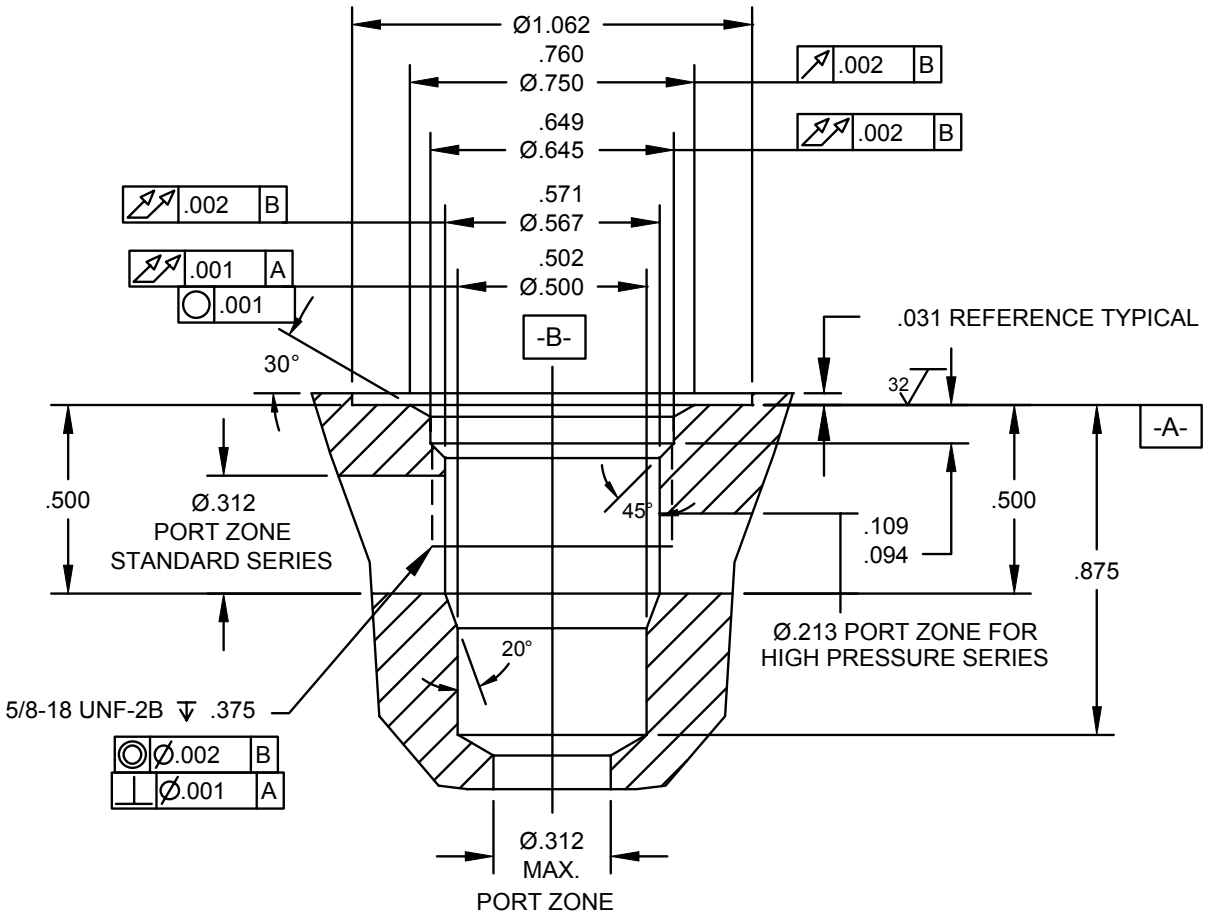
MINI 2W 7 SIZE, 5/8-18 THREAD “MINI” SERIES



NOTES:

1. CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500003.
2. ALL MACHINED SURFACES TO BE $^{32}\surd$ FINISH OR BETTER, EXCLUDING THREADS.
3. IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.
4. PORT ZONE IS Ø.213 MAXIMUM AT PORT #1 ONLY FOR BHIGH PRESSURE SERIES MINI VALVES (HA-***-**).

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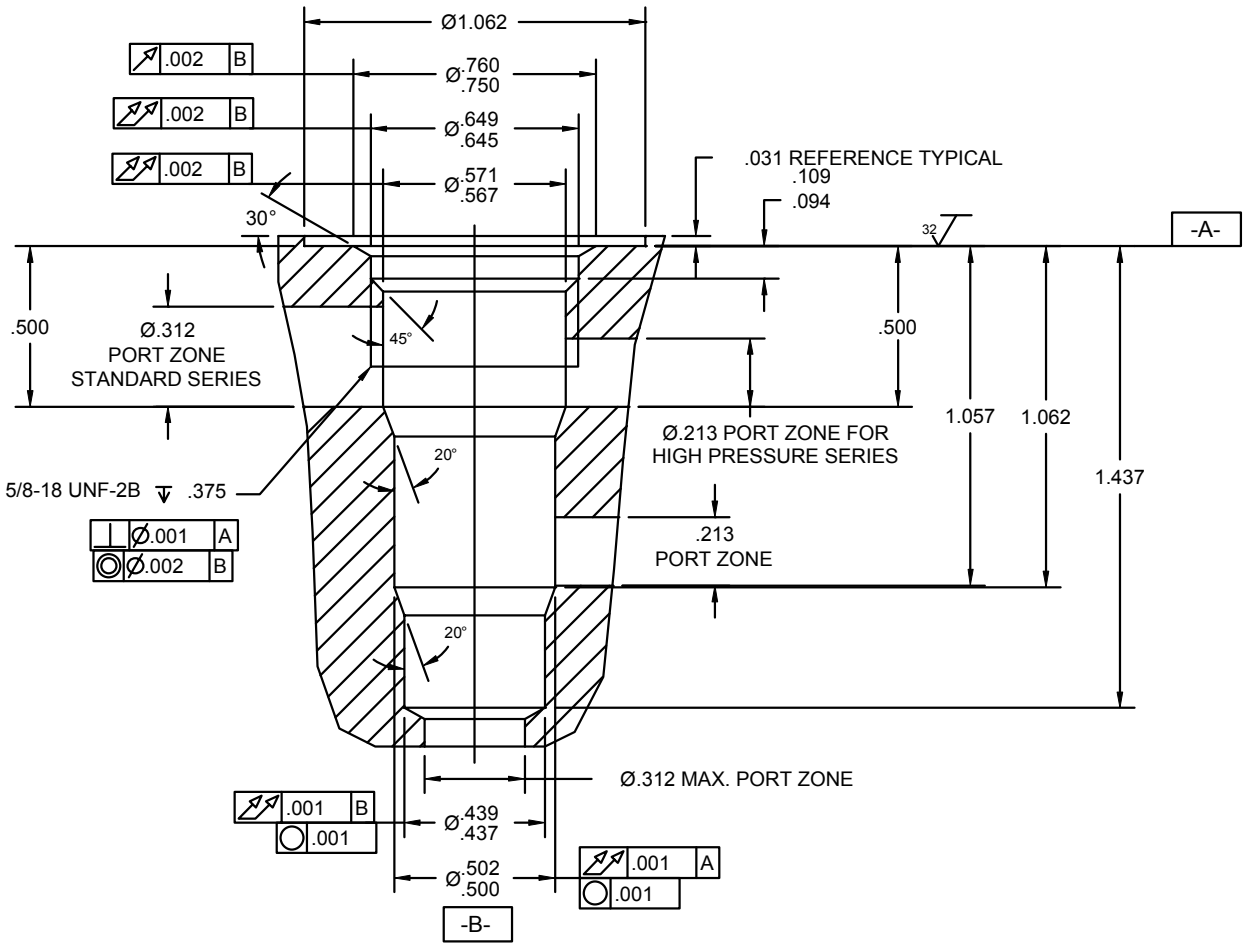
MINI 3W 7 SIZE, 5/8-18 THREAD "MINI" SERIES



NOTES:

1. CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500004.
2. ALL MACHINED SURFACES TO BE $^{32}\surd$ FINISH OR BETTER, EXCLUDING THREADS.
3. IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.
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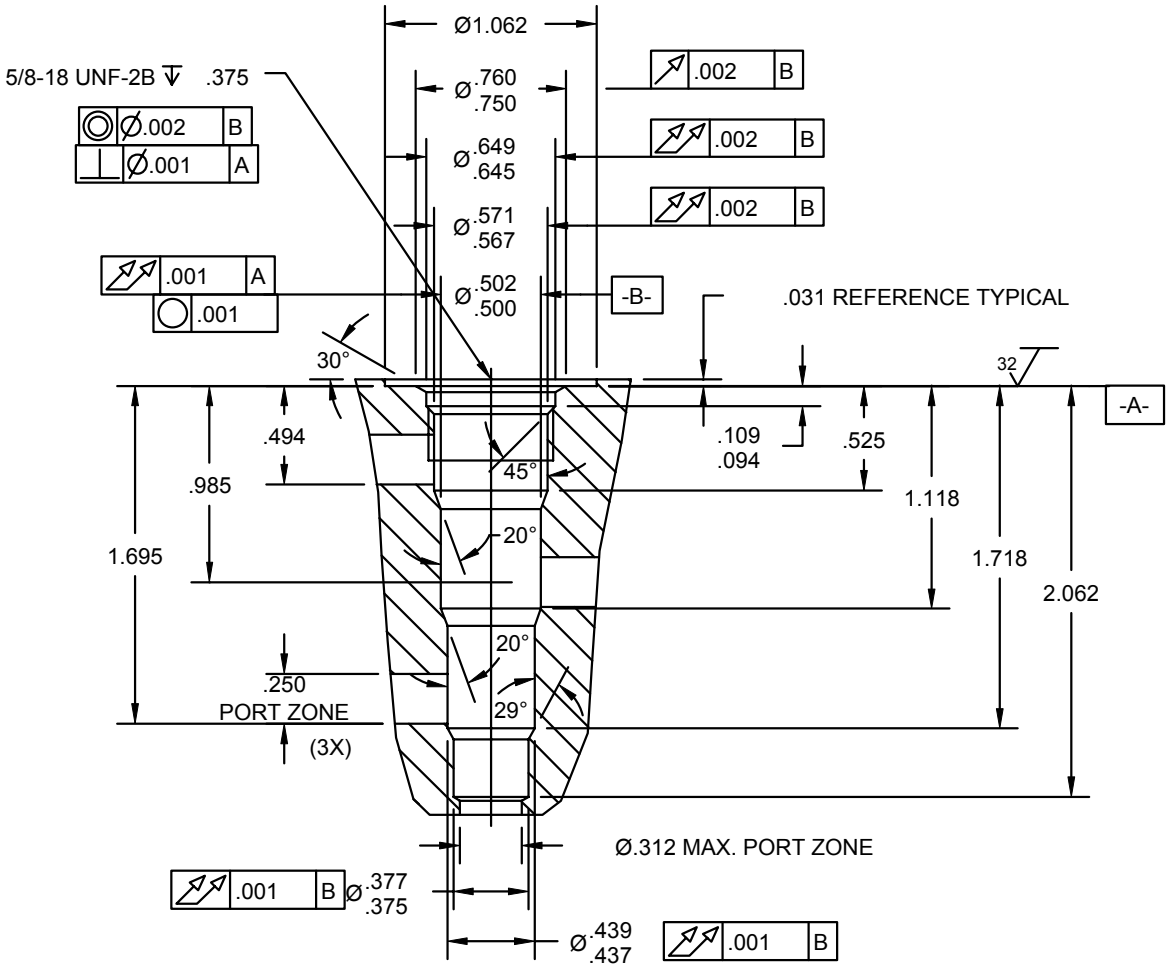
MINI 4W 7 SIZE, 5/8-18 THREAD "MINI" SERIES



NOTES:

1. CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500006.
2. ALL MACHINED SURFACES TO BE $^{32}\surd$ FINISH OR BETTER, EXCLUDING THREADS.
3. IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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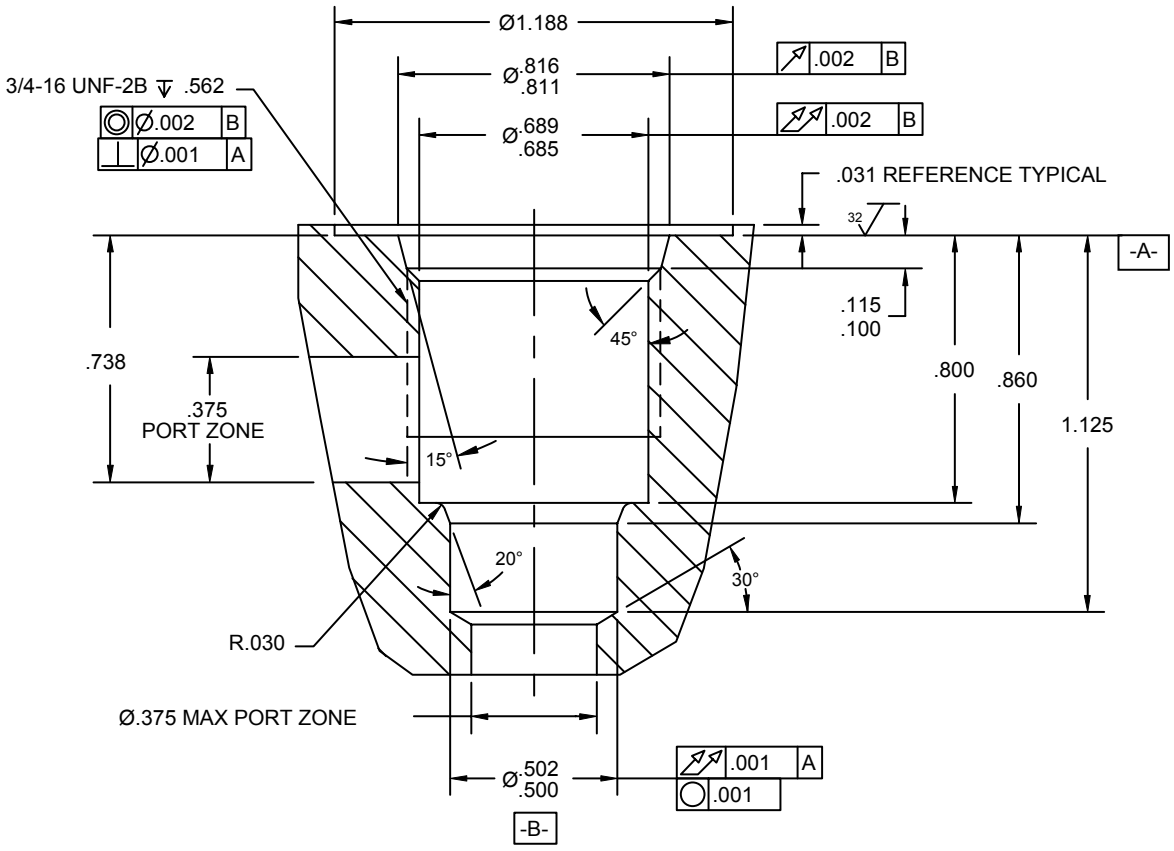
POWER 2 WAY 8 SIZE, 3/4-16 THREAD "POWER" SERIES



NOTES:

1. CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500005.
2. ALL MACHINED SURFACES TO BE $^{32}\surd$ FINISH OR BETTER, EXCLUDING THREADS.
3. IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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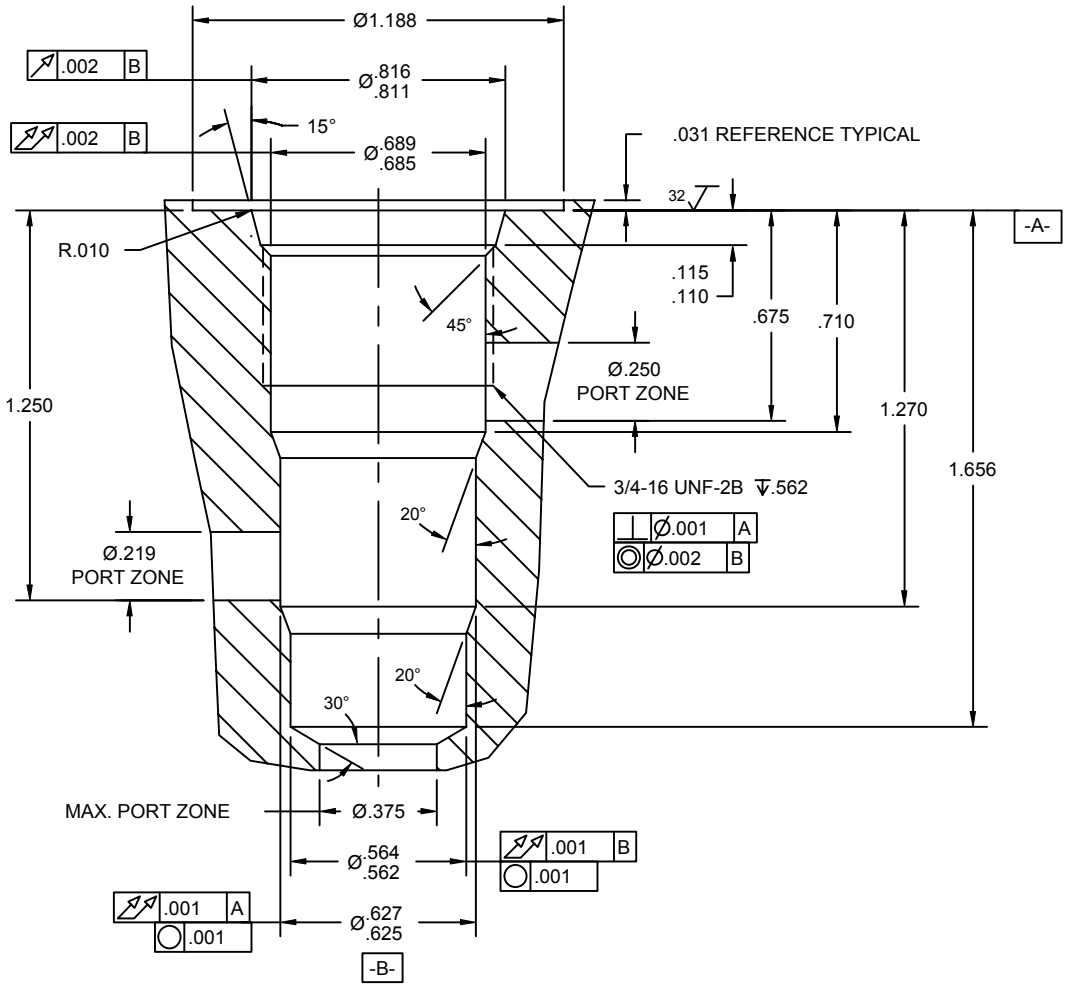
POWER 3 WAY 8 SIZE, 3/4-16 THREAD "POWER" SERIES



NOTES:

1. CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500024.
2. ALL MACHINED SURFACES TO BE $^{32}\surd$ FINISH OR BETTER, EXCLUDING THREADS.
3. IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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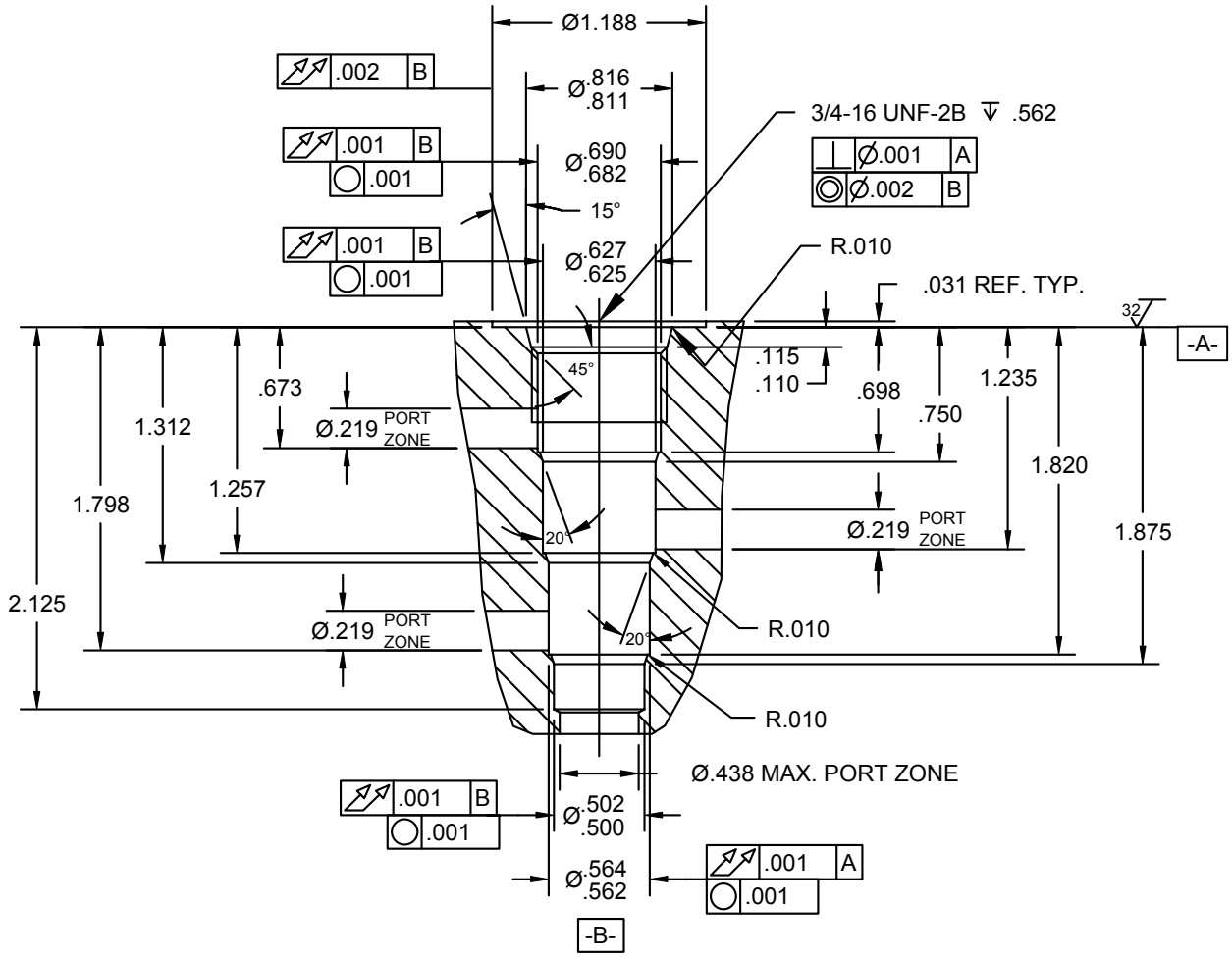
POWER 4 WAY 8 SIZE, 3/4-16 THREAD "POWER" SERIES



NOTES:

1. CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500029.
2. ALL MACHINED SURFACES TO BE 32√ FINISH OR BETTER, EXCLUDING THREADS.
3. IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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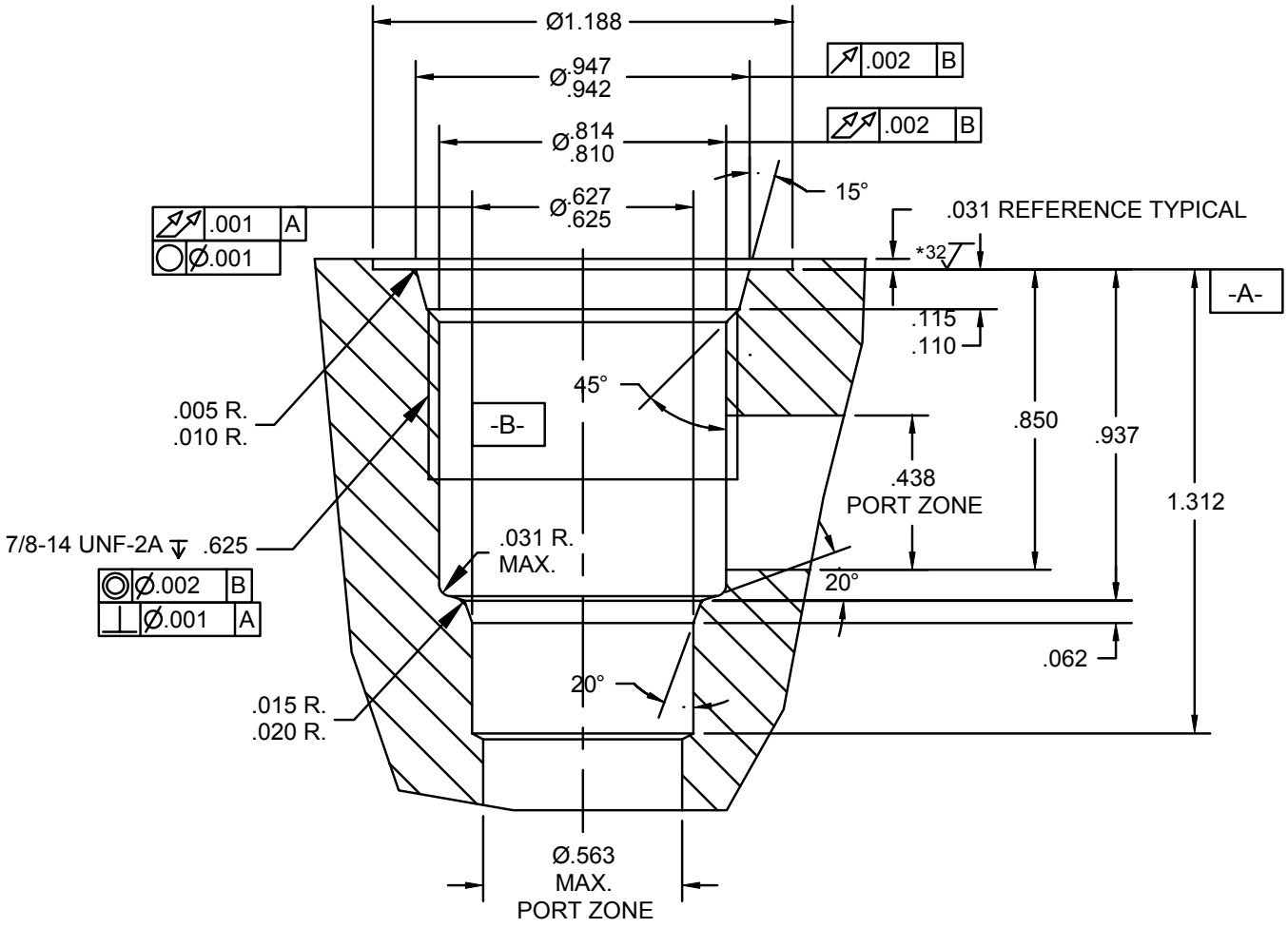
DELTA 2 WAY 10 SIZE, 7/8-14 THREAD "DELTA" SERIES



NOTES:

1. CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500000.
2. ALL MACHINED SURFACES TO BE $^{32}\surd$ FINISH OR BETTER, EXCLUDING THREADS.
3. IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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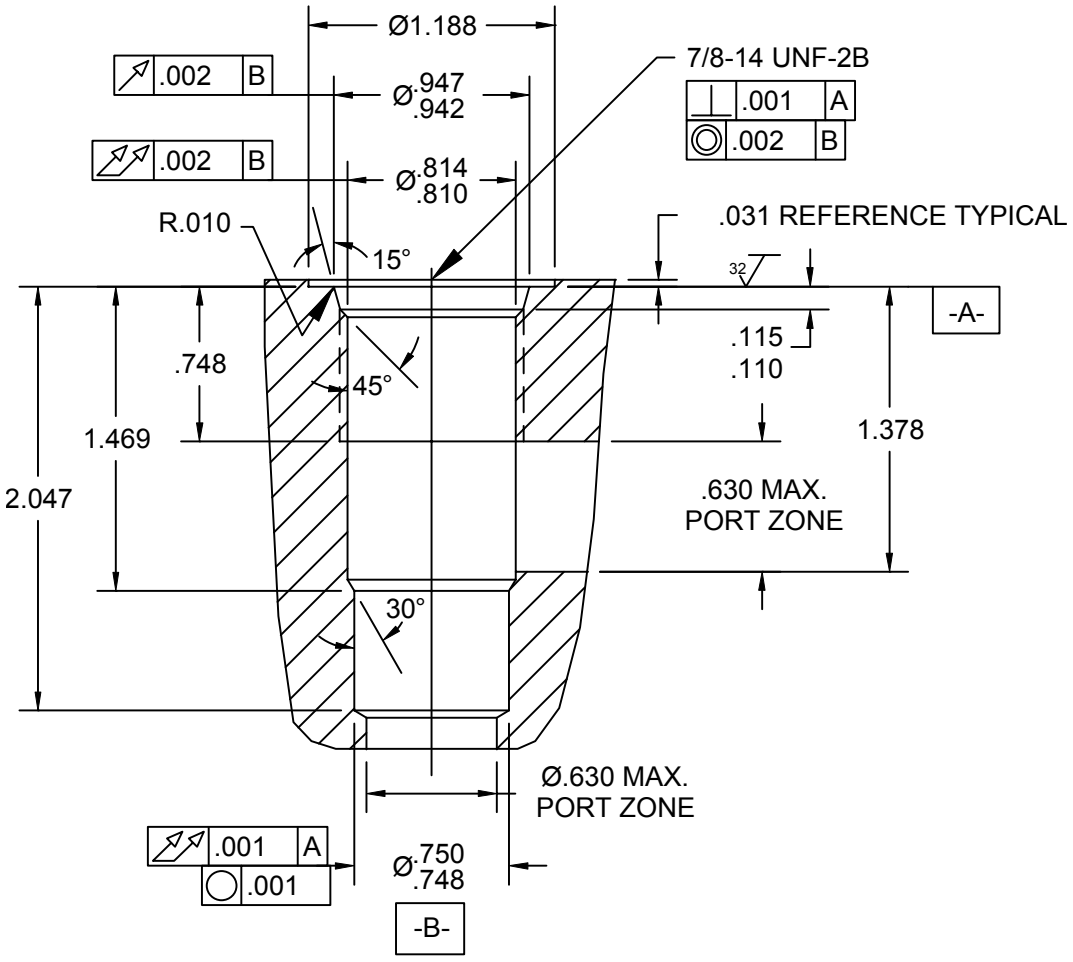
DELTA 2 WAY SPECIAL 10 SIZE, 7/8-14 THREAD "DELTA" SERIES



NOTES:

1. CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500028.
2. ALL MACHINED SURFACES TO BE $^{32}\surd$ FINISH OR BETTER, EXCLUDING THREADS.
3. IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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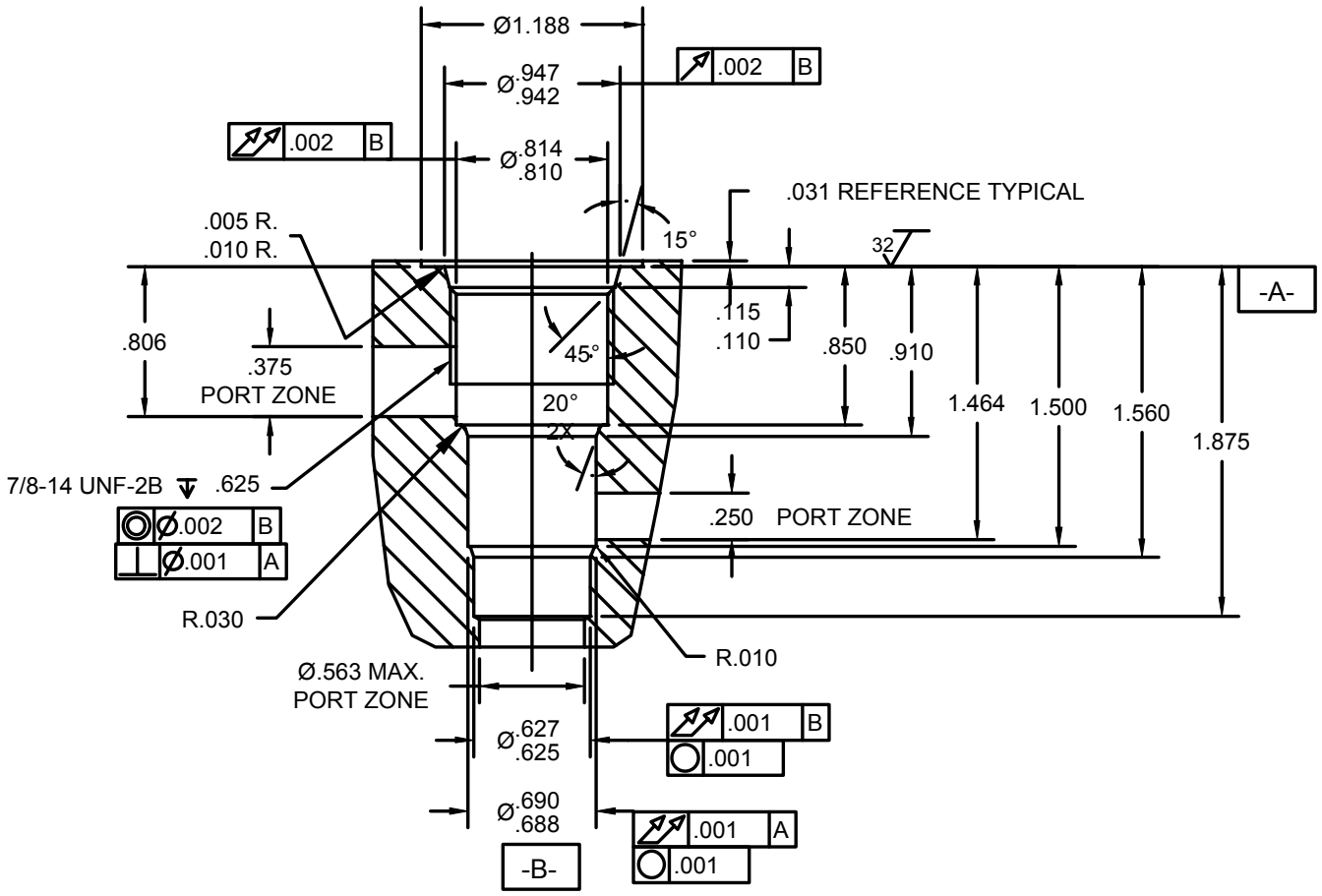
DELTA 3 WAY 10 SIZE, 7/8-14 THREAD "DELTA" SERIES



NOTES:

1. CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500001.
2. ALL MACHINED SURFACES TO BE $^{32}\sqrt{}$ FINISH OR BETTER, EXCLUDING THREADS.
3. IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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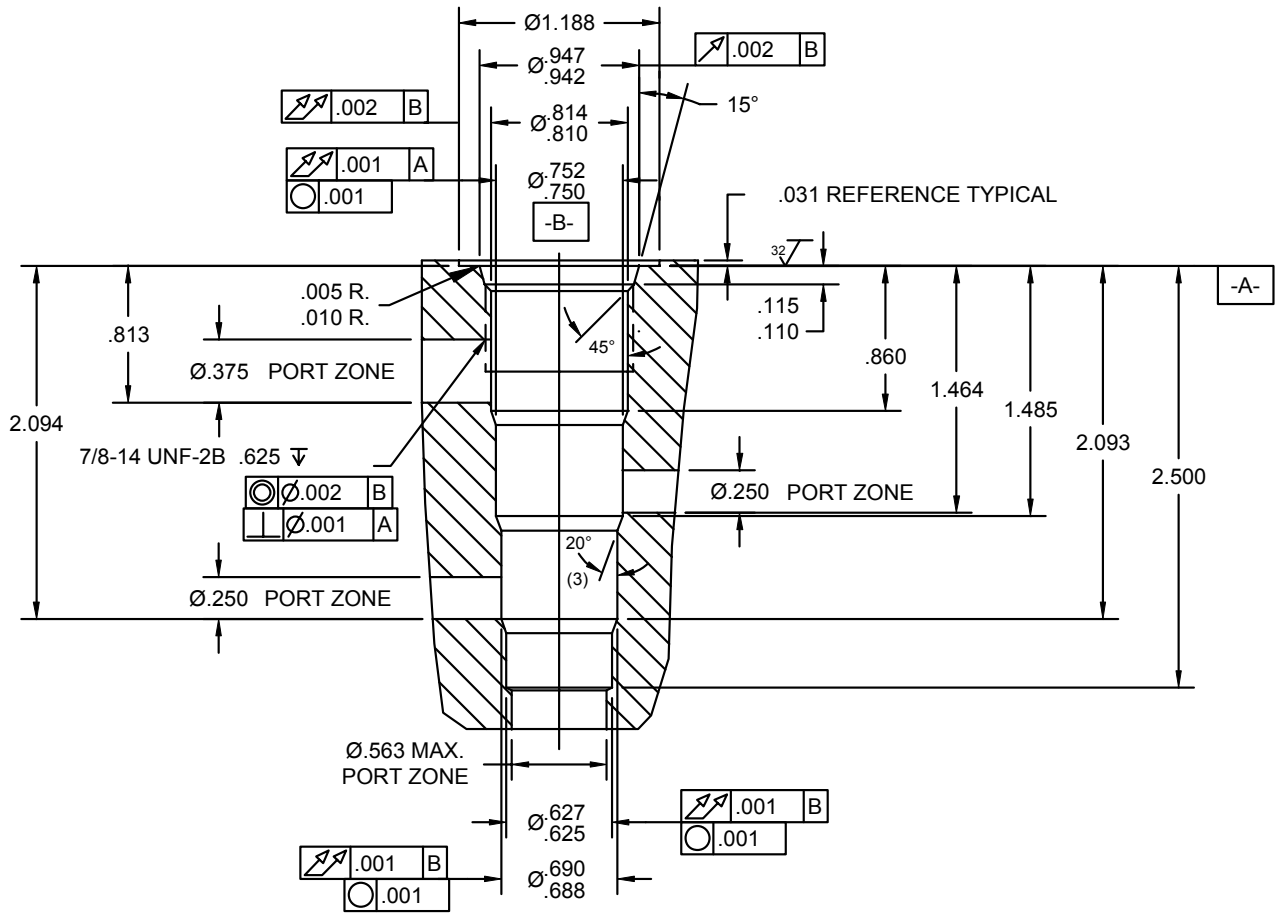
DELTA 4 WAY 10 SIZE, 7/8-14 THREAD "DELTA" SERIES



NOTES:

1. CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500002.
2. ALL MACHINED SURFACES TO BE 32√ FINISH OR BETTER, EXCLUDING THREADS.
3. IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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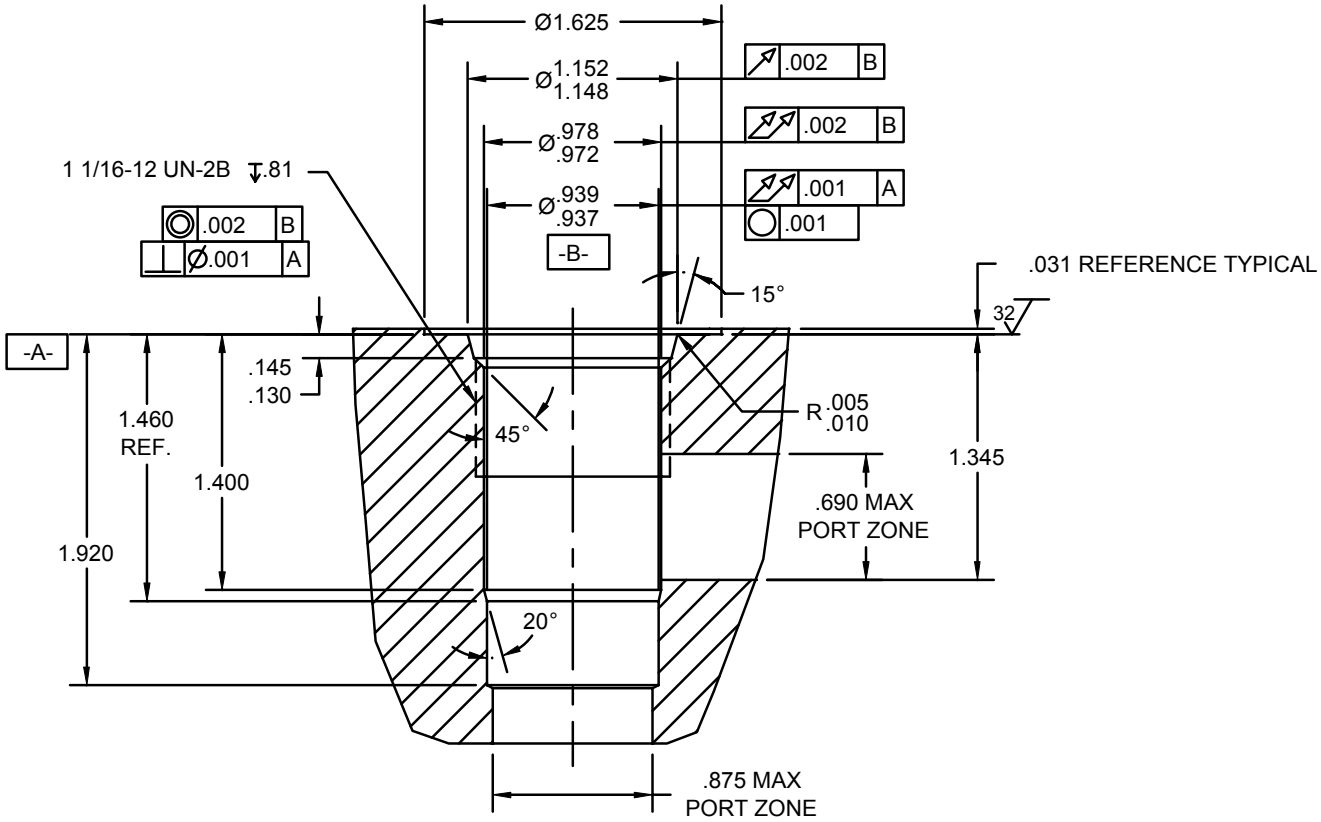
TECNORD 2 WAY 12 SIZE, 1 1/16-12 THREAD "TECNORD" SERIES



NOTES:

1. CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500032.
2. ALL MACHINED SURFACES TO BE $^{32}\sqrt{}$ FINISH OR BETTER, EXCLUDING THREADS.
3. IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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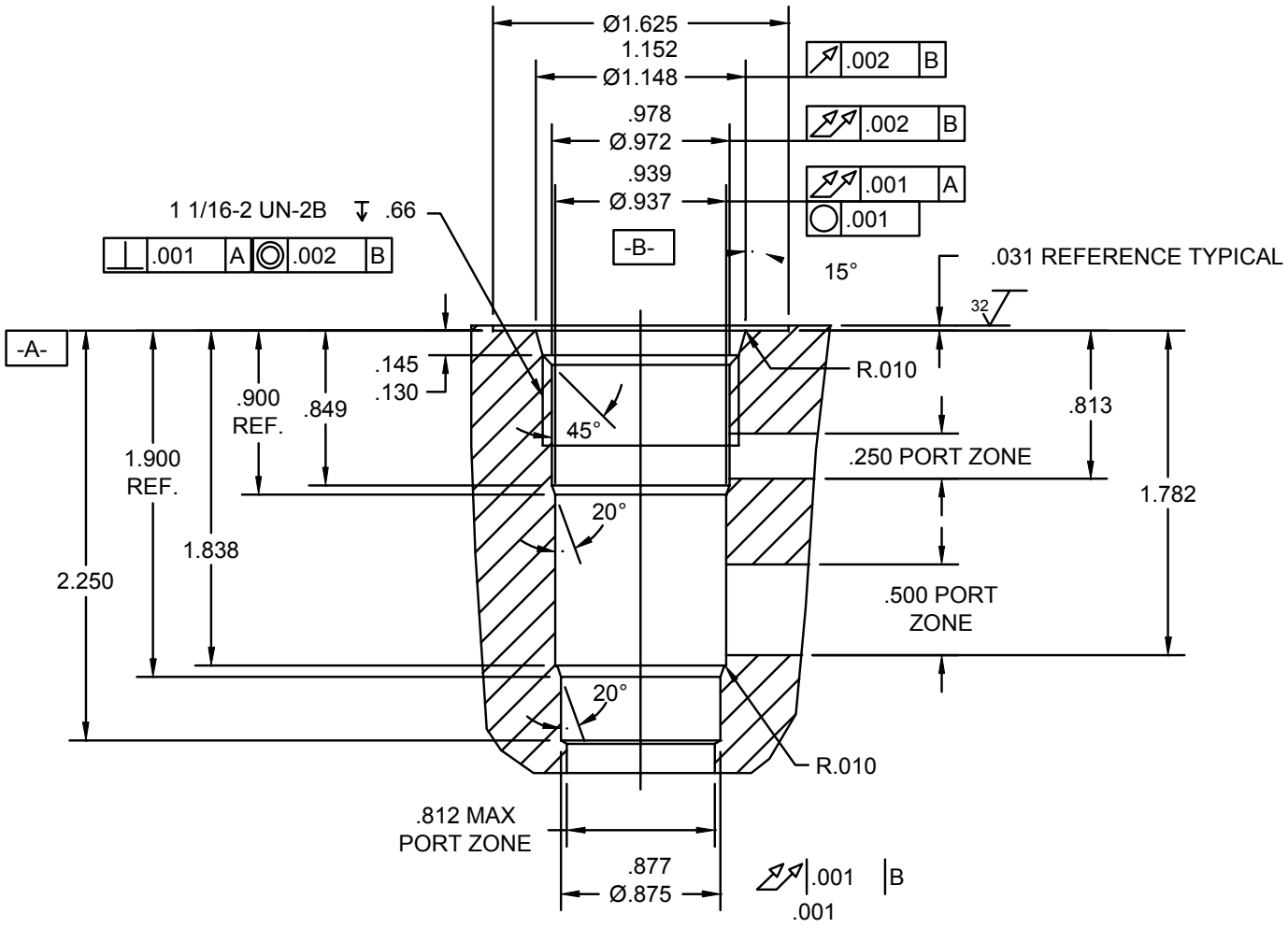
TECNORD 3 WAY SHORT 12 SIZE, 1 1/16-12 THREAD "TECNORD" SERIES



NOTES:

1. CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500033.
2. ALL MACHINED SURFACES TO BE $^{32}\surd$ FINISH OR BETTER, EXCLUDING THREADS.
3. IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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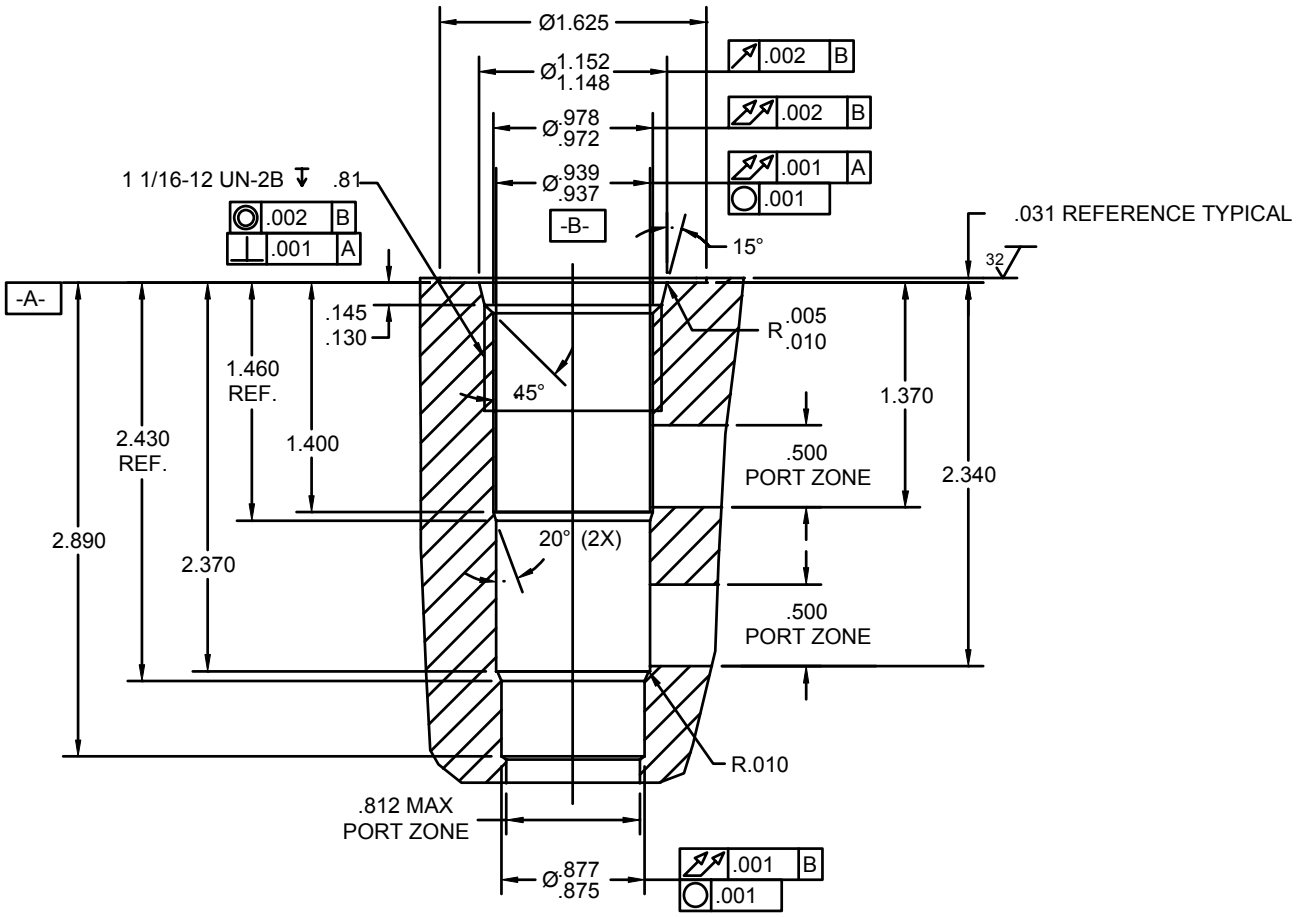
TECNORD 3 WAY 12 SIZE, 1 1/16-12 THREAD "TECNORD" SERIES



NOTES:

1. CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500034.
2. ALL MACHINED SURFACES TO BE $^{32}\sqrt{}$ FINISH OR BETTER, EXCLUDING THREADS.
3. IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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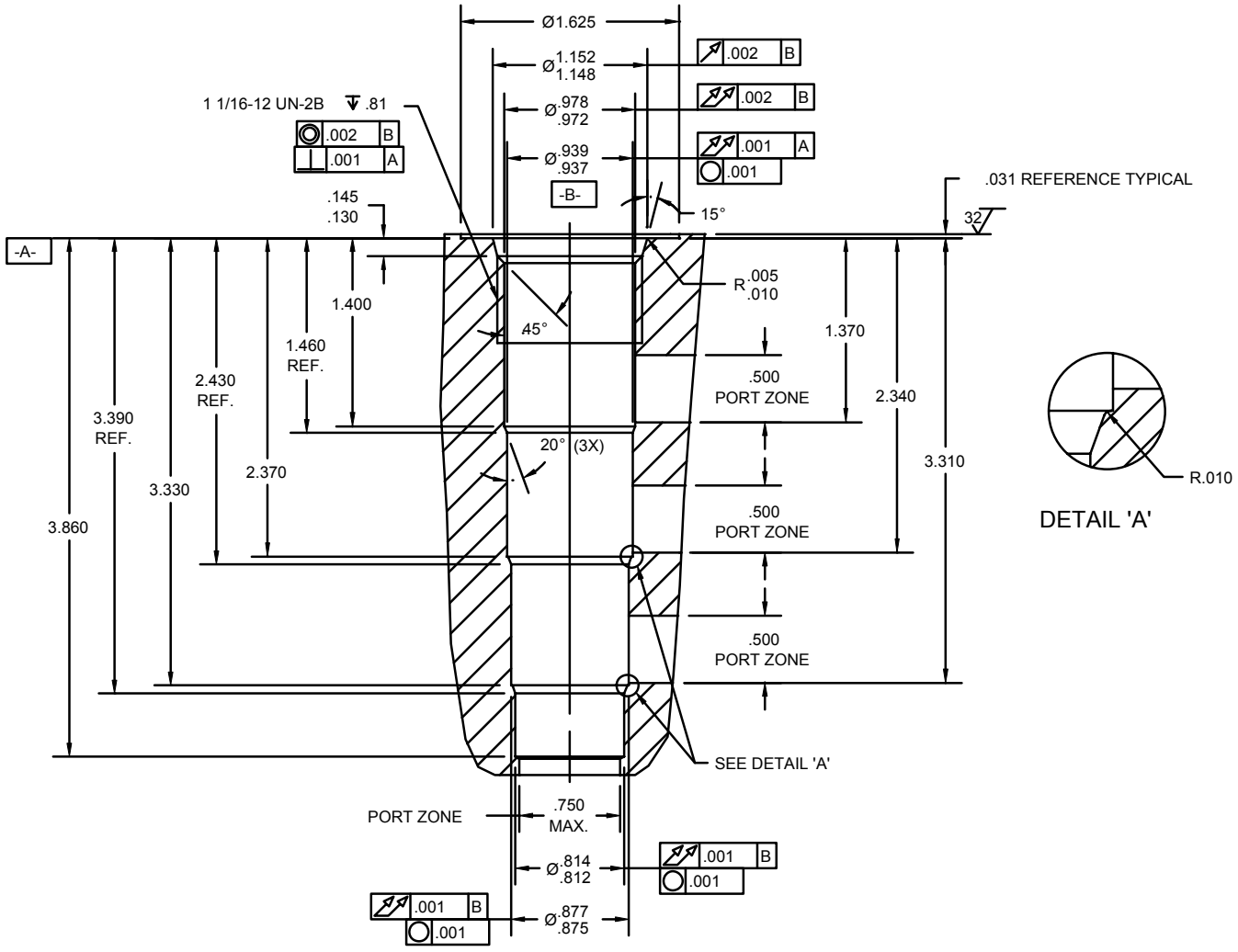
TECNORD 4 WAY 12 SIZE, 1 1/16-12 THREAD "TECNORD" SERIES



NOTES:

1. CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500035.
2. ALL MACHINED SURFACES TO BE 32√ FINISH OR BETTER, EXCLUDING THREADS.
3. IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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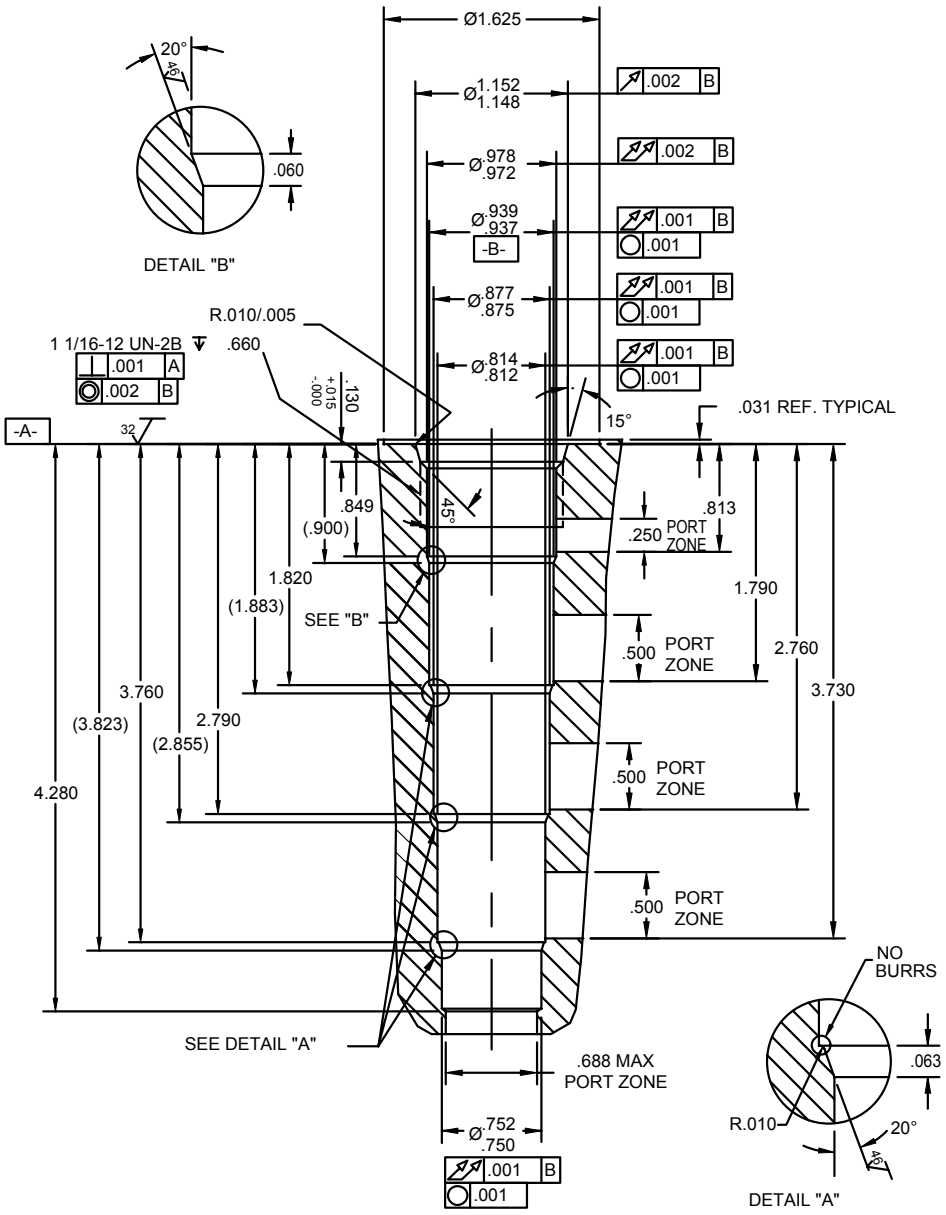
TECNORD 5 WAY SHORT 12 SIZE, 1 1/16-12 THREAD "TECNORD" SERIES



NOTES:

1. CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500037.
2. ALL MACHINED SURFACES TO BE 32√ FINISH OR BETTER, EXCLUDING THREADS.
3. IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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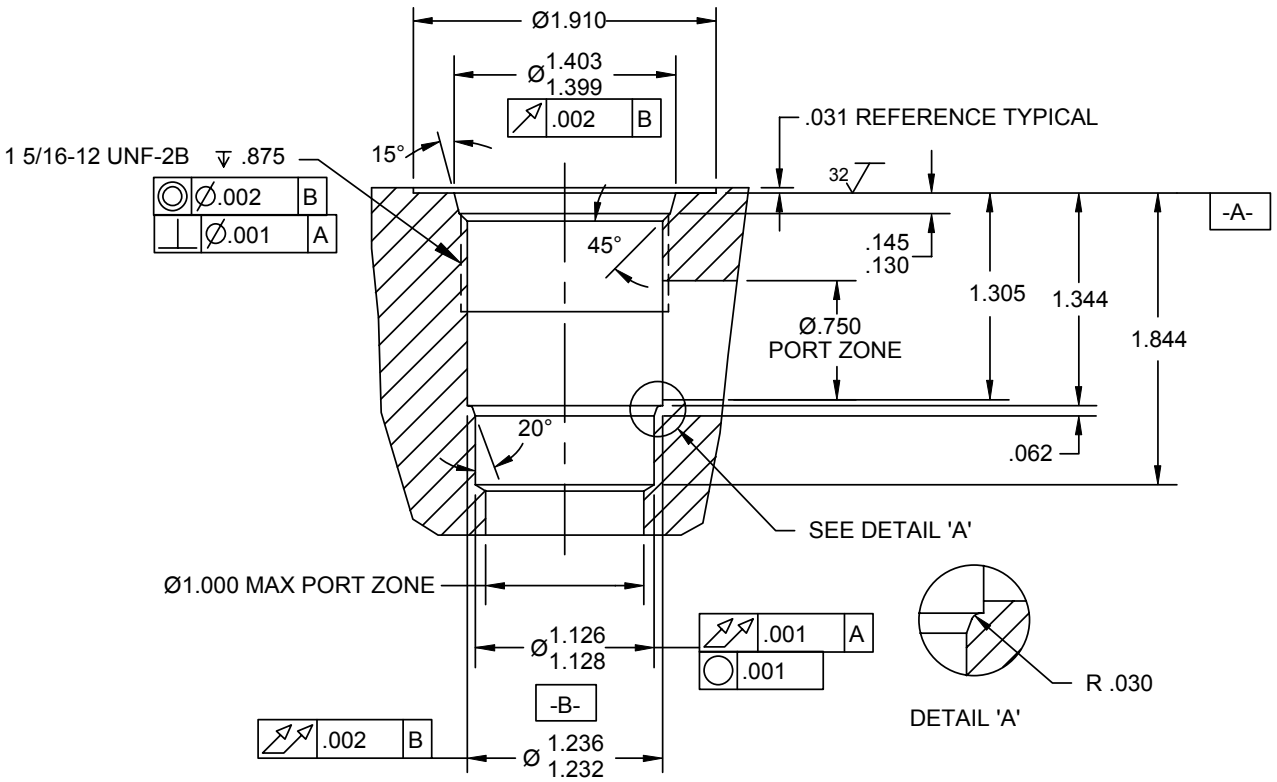
SUPER 2 WAY 16 SIZE, 1 5/16-12 THREAD “SUPER” SERIES



NOTES:

1. CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500017.
2. ALL MACHINED SURFACES TO BE $^{32}\surd$ FINISH OR BETTER, EXCLUDING THREADS.
3. IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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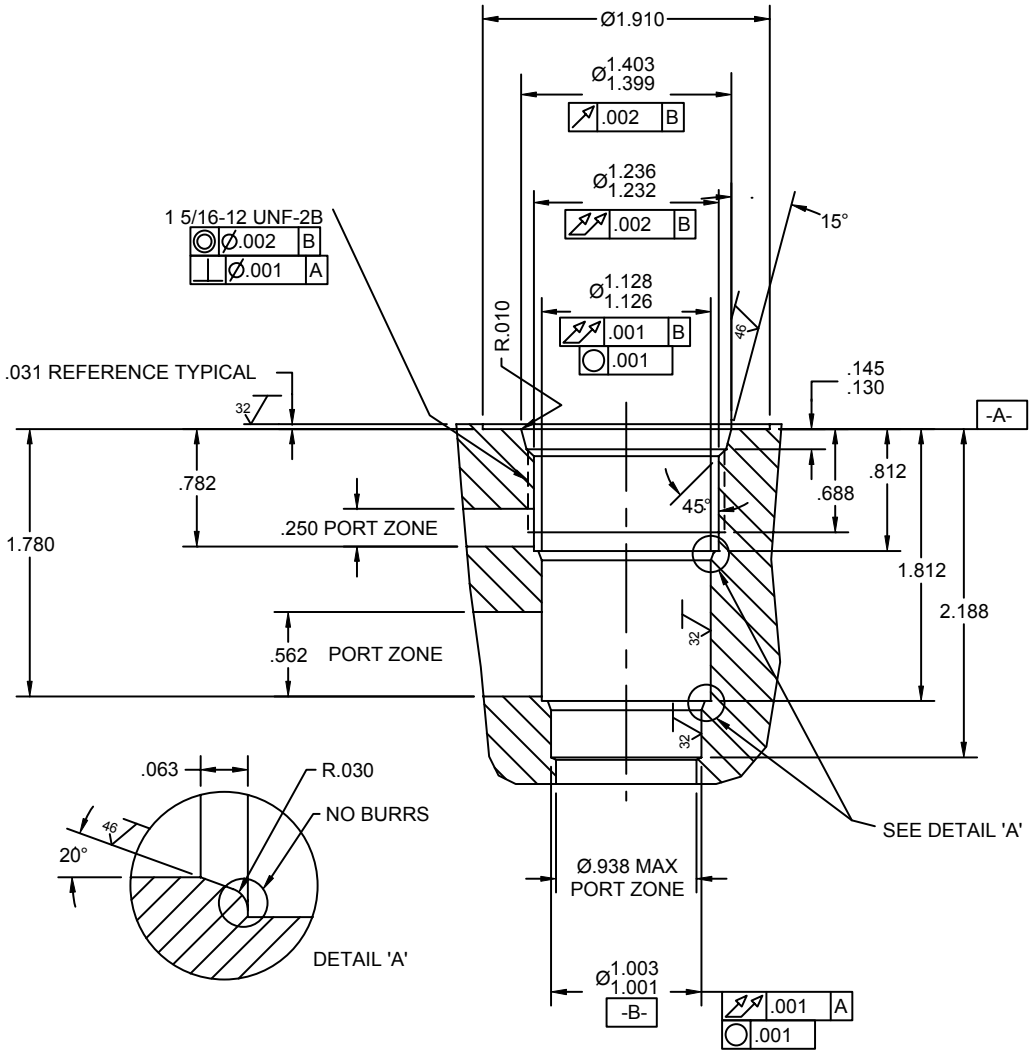
SUPER 3 WAY SHORT 16 SIZE, 1 5/16-12 THREAD "SUPER" SERIES



NOTES:

1. CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500021.
2. ALL MACHINED SURFACES TO BE $^{32}\sqrt{}$ FINISH OR BETTER, EXCLUDING THREADS.
3. IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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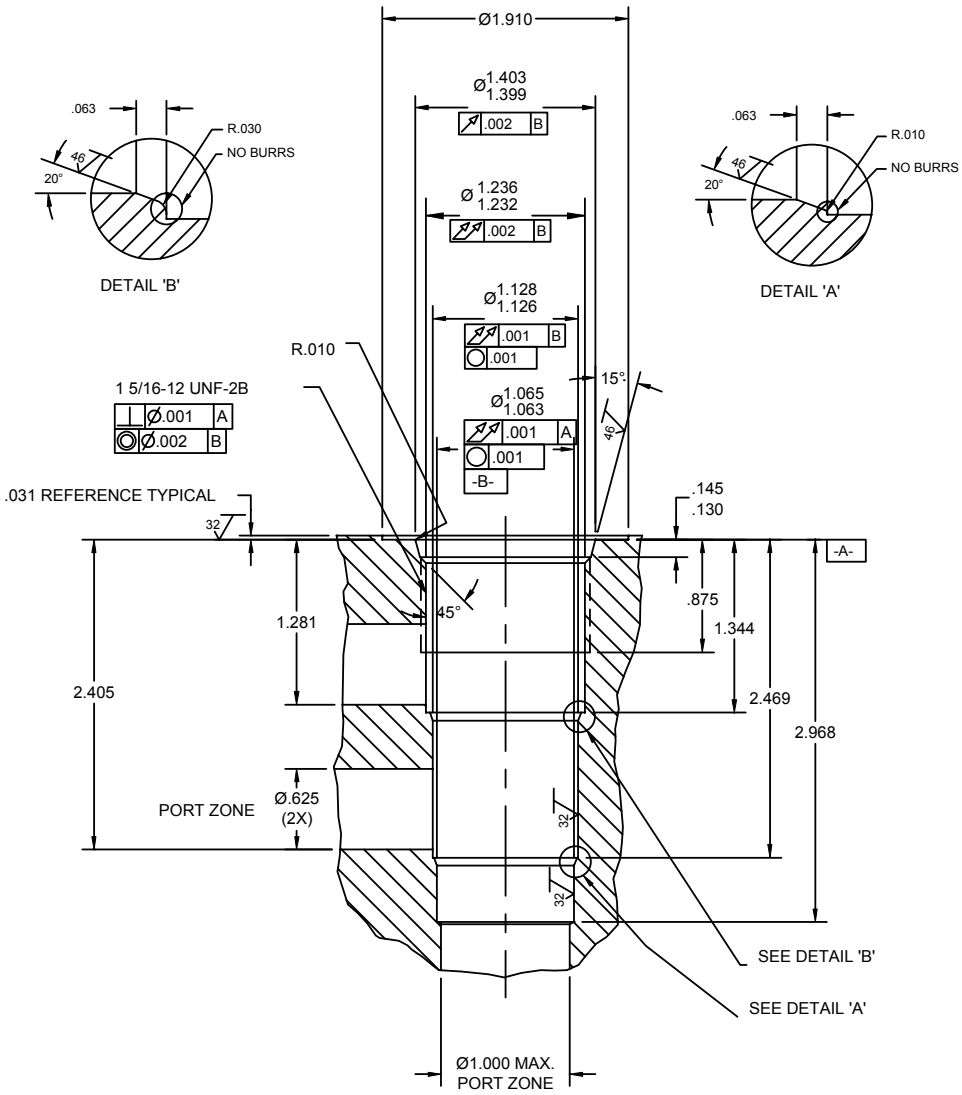
SUPER 3 WAY 16 SIZE, 1 5/16-12 THREAD "SUPER" SERIES



NOTES:

1. CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500018.
2. ALL MACHINED SURFACES TO BE $^{32}\sqrt{}$ FINISH OR BETTER, EXCLUDING THREADS.
3. IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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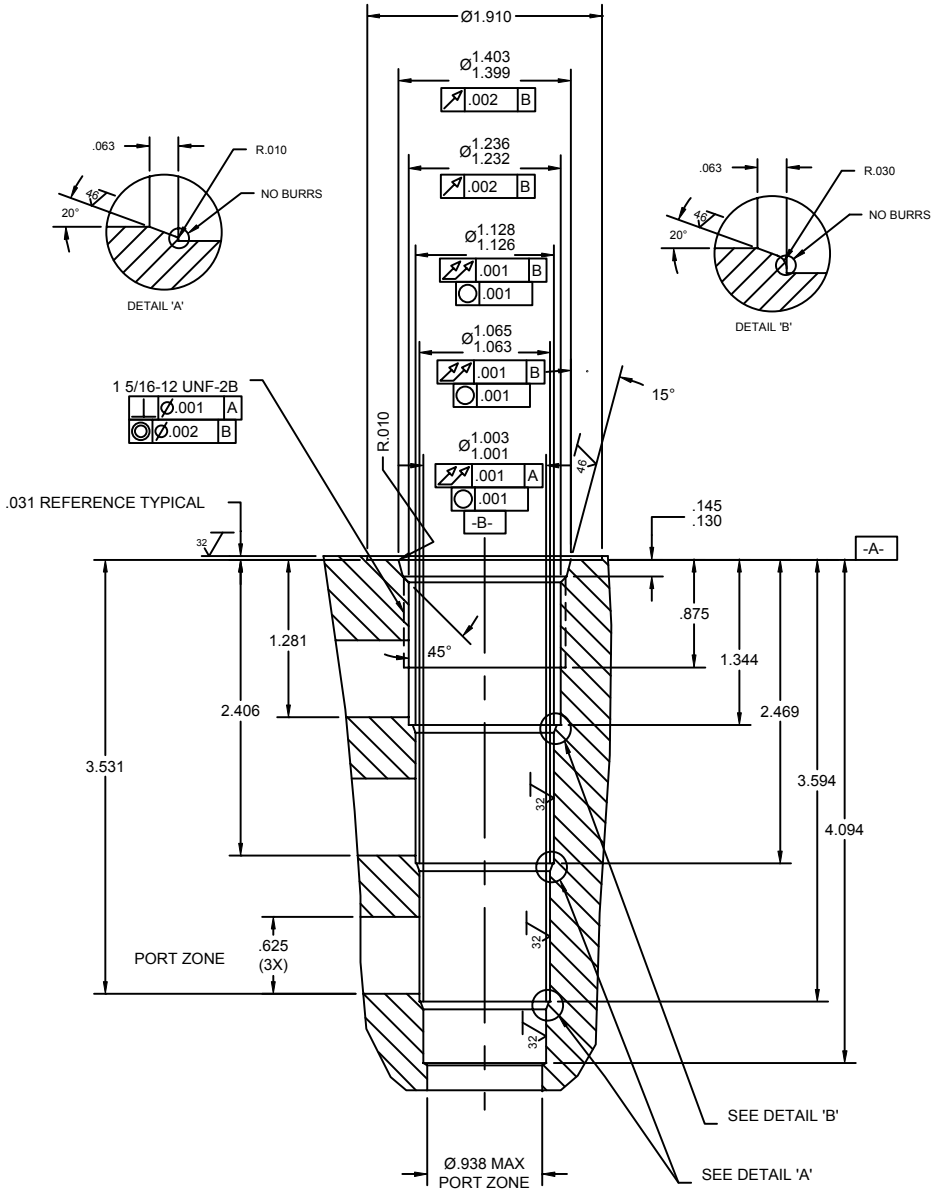
SUPER 4 WAY 16 SIZE, 1 5/16-12 THREAD “SUPER” SERIES



NOTES:

1. CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500019.
2. ALL MACHINED SURFACES TO BE $^{32}\surd$ FINISH OR BETTER, EXCLUDING THREADS.
3. IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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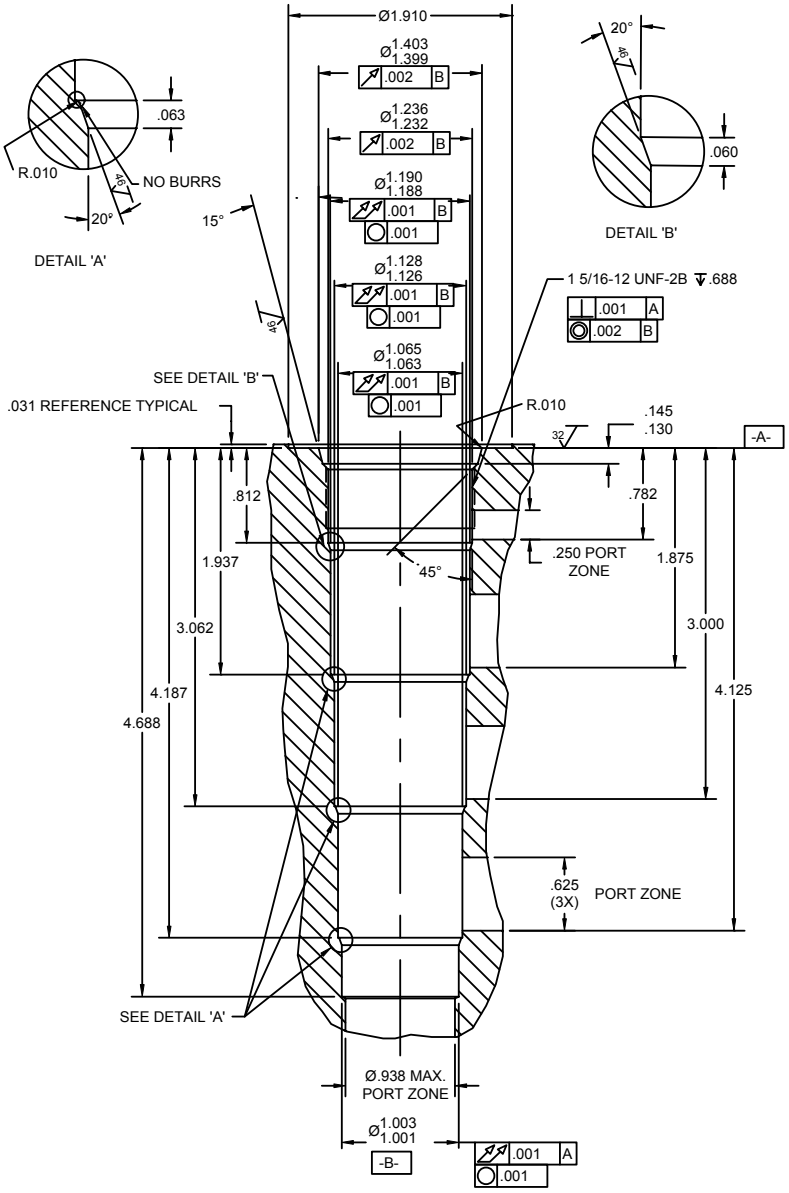
SUPER 5 WAY SHORT 16 SIZE, 1 5/16-12 THREAD "SUPER" SERIES



NOTES:

1. CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500020.
2. ALL MACHINED SURFACES TO BE $^{32}\sqrt{}$ FINISH OR BETTER, EXCLUDING THREADS.
3. IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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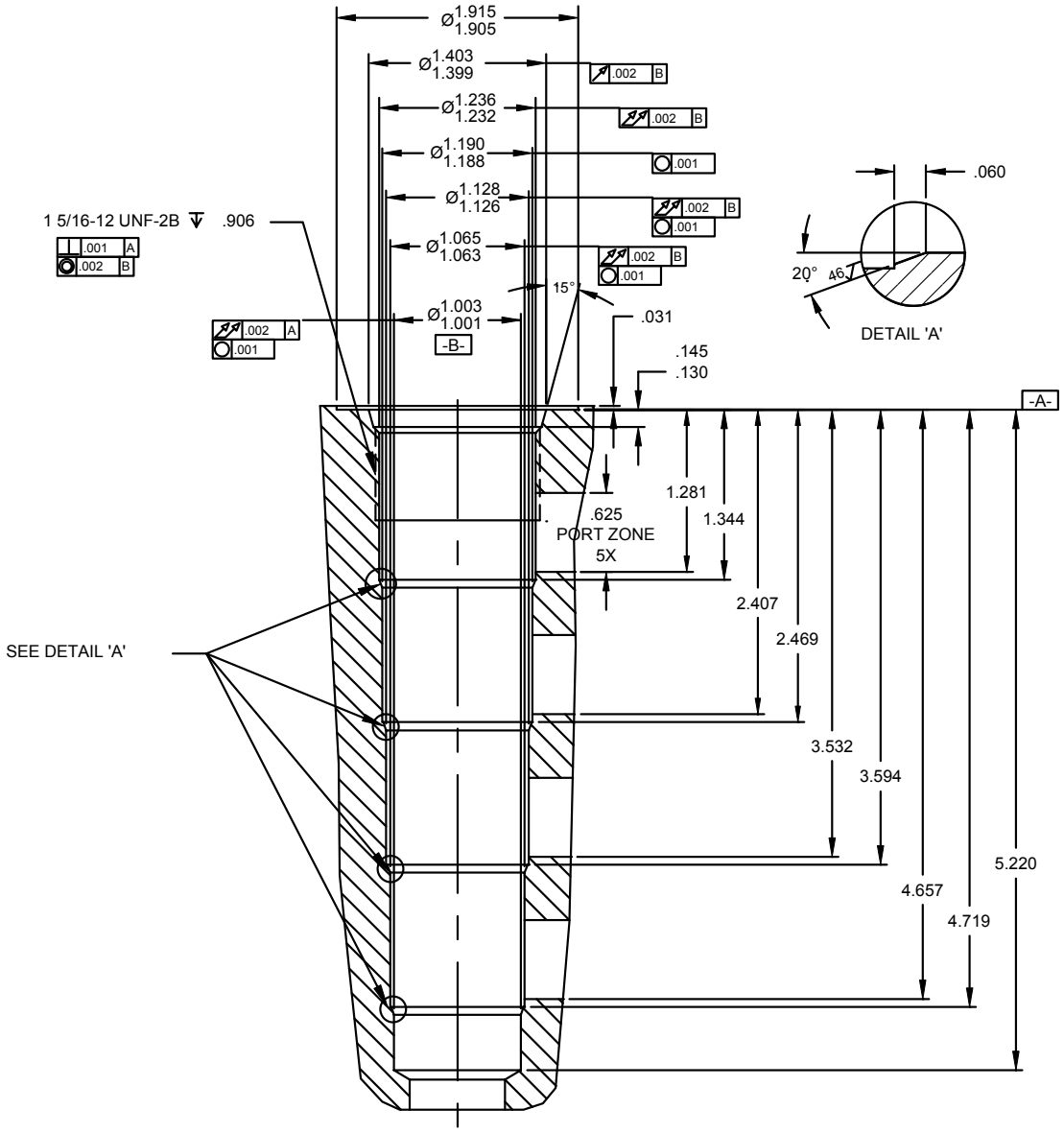
SUPER 5 WAY 16 SIZE, 1 5/16-12 THREAD “SUPER” SERIES



NOTES:

1. CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500038.
2. ALL MACHINED SURFACES TO BE $^{32}\sqrt{}$ FINISH OR BETTER, EXCLUDING THREADS.
3. IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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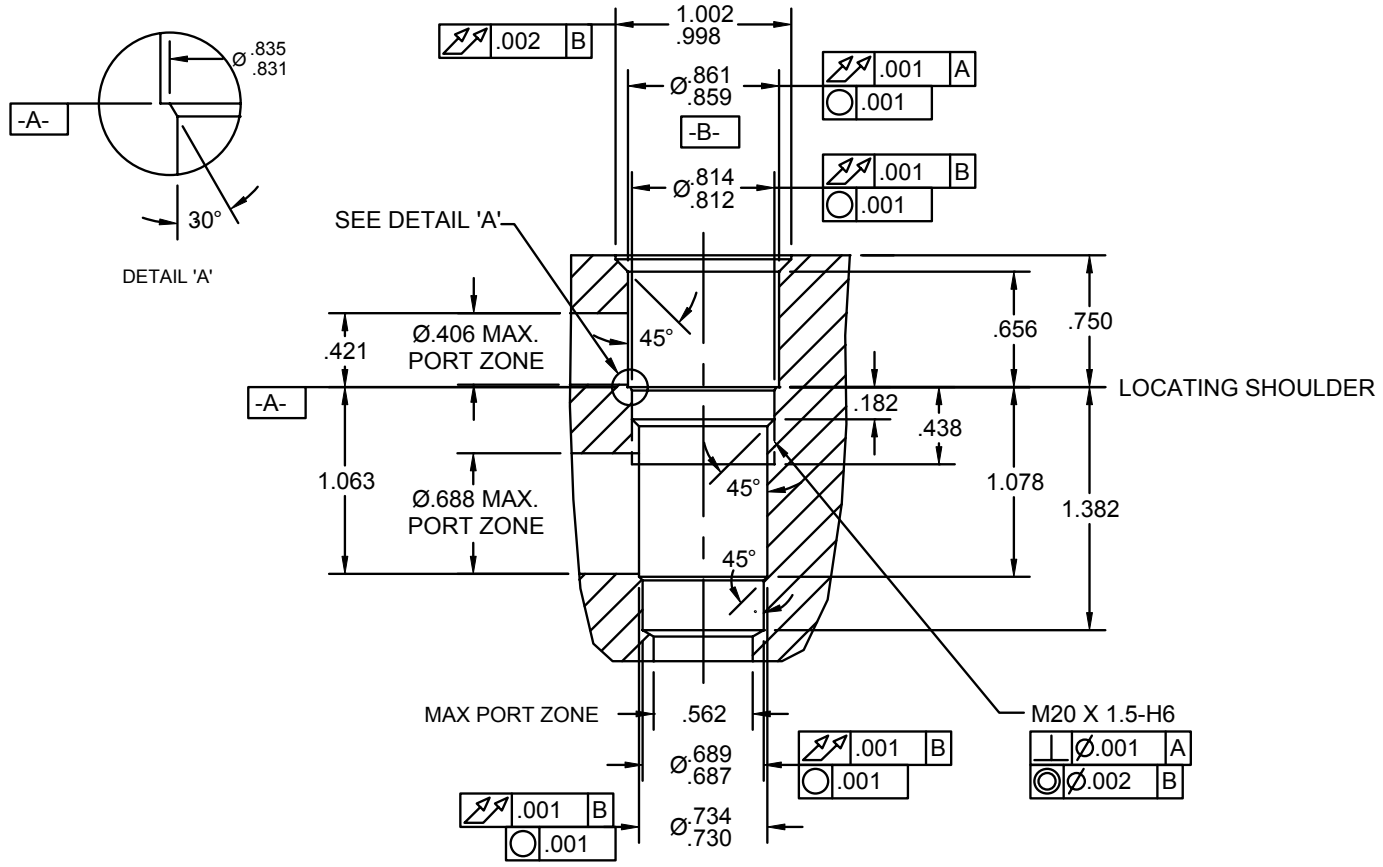
QS SPECIAL 3 WAY METRIC M20-1.5-H6 THREAD "SPECIAL" SERIES



NOTES:

1. CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500012.
2. ALL MACHINED SURFACES TO BE $^{32}\sqrt{}$ FINISH OR BETTER, EXCLUDING THREADS.
3. IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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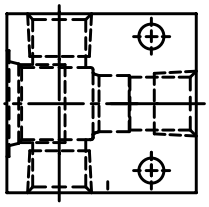
GENERAL INSTALLATION NOTE



VALVE BODIES

Check the cartridge brochure to assure correct plumbing.

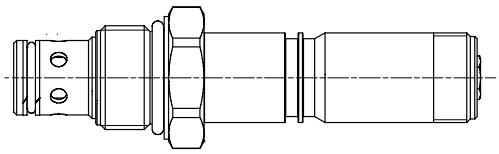
Inspect the cavity for burrs and any irregular machining which would damage 0-rings at assembly.

Shims may be required behind the block for panel mounting.

ASSEMBLY

Dip the cartridge in clean oil before installing.

Screw the cartridge in by hand until the top 0-ring is touching to the proper torque specification the manifold, then wrench tighten given below.



TORQUE SPECIFICATIONS

Final Cartridge Tightening:

Series	Torque
5/8 MINI	14-20 Nm (10-15 ft-lbs)
3/4 POWER	27-34 Nm (20-25 ft-lbs)
7/8 DELTA	34-40 Nm (25-30 ft-lbs)
1 1/16 TECNORD	81-95 Nm (60-70 ft-lbs)
1 5/16 SUPER	108-122 Nm (80-90 ft-lbs)

Adjusting Holding Parts:

Part	Torque
Nut	4-8 Nm (3-5 ft-lbs)
Knob	4-8 Nm (3-5 ft-lbs)

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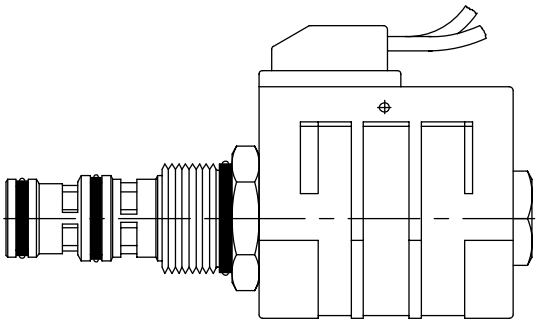
GENERAL CARTRIDGE VALVE INSTALLATION NOTES

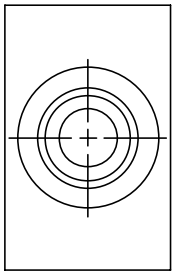


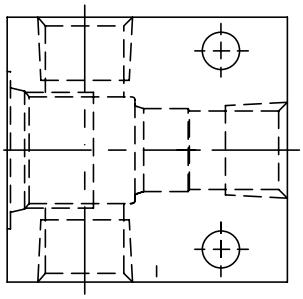
CARTRIDGES

Inspect the cartridge to assure there is no external contaminant present.
Check O-rings and back-up rings to assure they are intact and in the correct position. The O-rings should always be toward the high pressure port or between doubled back-up rings on bidirectional applications.

COILS

It is sometimes easier to remove the coil from the cartridge valve to install terminations or make connections with conduit, etc. If this is the case, reinstall the coil by tightening the coil nut to 4-6 ft lbs per spec sheet. CAUTION: DO NOT OVER TORQUE Tube will be stretched and damaged, causing valve to fail.





VALVE BODIES

Check the cartridge brochure to assure correct plumbing.
Inspect the cavity for burrs and any irregular machining which would damage 0-rings at assembly. Shims may be required behind the block for panel mounting.

ASSEMBLY

Dip the cartridge in clean oil before installing.
Screw the cartridge in by hand until the top 0-ring is touching the manifold, then wrench tighten to the proper torque specification given below.

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VALVE MNEMONIC CODE

First letter is the valve series:

M = MINI (5/8")
P = POWER (3/4")
D = DELTA (7/8")
T = TECNORD (1 1/16")
S = SUPER (1 5/16")
I = INLINE/UNITIZED
E = ELECTRONIC PROPORTIONAL
A = MOTORIZED
Q = SPECIALS
H = 4000/5000 PSI RATED

The second letter is the cavity: *M= Inline S= Special*

	MINI	POWER	DELTA	TECNORD	SUPER
2 WAY	A	B	E	T	J
3 WAY	C	P	F	U	K
3 Way Short				R	L
4 WAY	D	Q	G	V	N
5 Way Short				X	O
5 Way					I

The third letter is the type of valve:

R = RELIEF
C = CHECK & LOAD HOLDING
N = NEEDLE
P = PRESSURE CONTROLLED
S = SOLENOID
M = MANUAL
F = FLOW CONTROL

The third, fourth, and fifth characters combined describe the valve function. It is these characters that are stampes on the valve. Examples:

S2A = SOLENOID 2 WAY POPPET
S3A = SOLENOID 3 WAY SPOOL
S4A = SOLENOID 4 WAY CRISS SPOOL
RVA = RELIEF DIRECT ACTING
MCB = MAN NC DETENT
P2A = PROPORTIONAL 2 WAY
PRP = PRESSURE REDUCING
CVC = GUIDED BALL CHECK
FCH = FLOW CONT REV FLOW
NVB = NEEDLE COARSE ADJ

The sixth and seventh characters combined cover the o-ring, screen, override, knob and other options. Example:

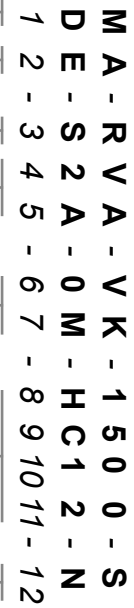
00 = STANDARD DEFAULT CONFIGURATION
VK = VITON O-RINGS, KNOB ADJUSTMENT
B3 = BUNA, SCREEN, OVERRIDE NONDETENT

The eighth through eleventh characters describe the solenoid, flow range, or pressure range. Pressure or flow is specified as a range or a particular setting. Example:

DL12 = DUAL LEAD 12 VDC
DS24 = DUAL SPADE 24VDC
HC24 = HIRSCHMANN 24 VDC
CL11 = CONDUIT LEAD 120VAC
0005 = 5 PSI CRACK
1500 = 1500 MAX PRESS
03.0 = 3 GPM MAX FLOW
6-10 = 6 TO 10 G.P.M. FLOW RANGE

The final character is the body port style:

N = BSP / NPT
S = SAE



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