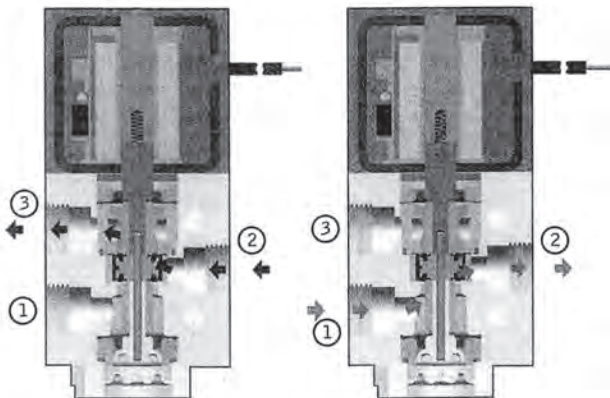
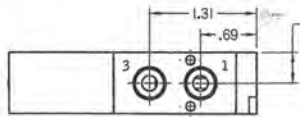
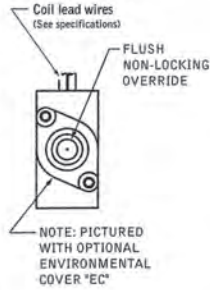
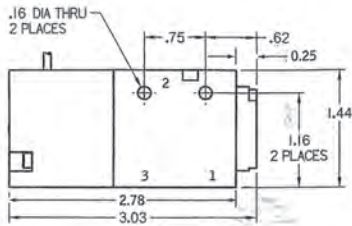
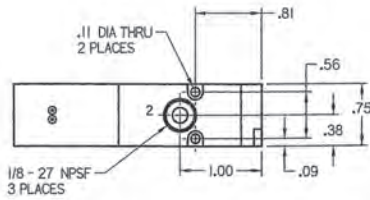


315/415 Series Valves

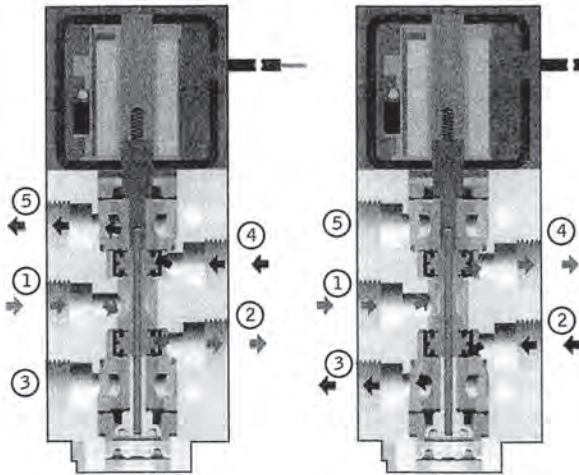
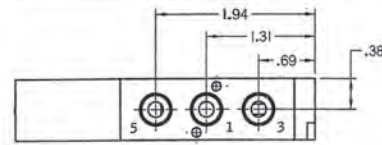
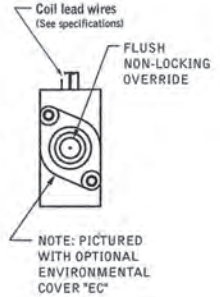
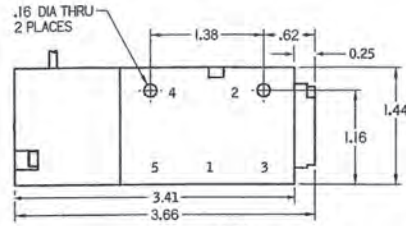
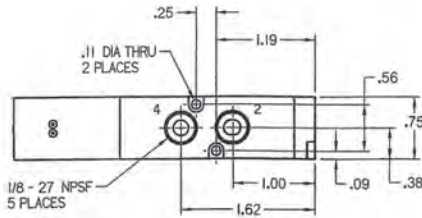
315 SERIES



315 Series Normal Condition

315 Series Actuated Condition

415 SERIES



415 Series Normal Condition

415 Series Actuated Condition

ANSI PIPING DIAGRAMS

SERIES	3-WAY NORMALLY CLOSED	3-WAY NORMALLY OPEN	SELECTOR	DIVERTER	2 WAY N.C.	2 WAY N.O.
315						
415						

315/415 SPECIFICATIONS

Features:	Line Mounted	Line Mount (2 & 3 - Gallery Bar Stock Manifold)
Port Sizes	315 1/8" NPSF 415 1/8" NPSF	1/4" NPSF Inlet & Exhausts
Port Identifications	315 Valve: Pressure = 1; Cylinder = 2; Exhaust = 3; 415 Valve: Pressure = 1; Cylinder = 2; Cylinder = 4; Exhausts Ports = 3 & 5	315 Manifold: Pressure = 1; Exhaust = 3; 415 Manifold: Pressure = 1; Exhaust = 3; Exhaust = 5
C_v (ANSI (NFPA) T3.21.3 - 1990)	0.42	
SCFM @ 100 psig	> 20	
Fill/Exhaust Time 0 - 90 psi	1 cu.in. (.028 / .025 sec.) 10 cu.in. (.19 / .23 sec.) 100 cu.in. (1.3 / 1.9 sec.)	
Voltage Tolerance	Plus 10%, minus 15% of rated voltage	
Manifold Type	315 Series, 415 Series: Fixed Length Bar Stock (2 -12 Stations) (Tap 1/4" NPSF)	
Sandwich Speed Control	315: N/A 415: Yes	
Coil Temperature Rise (any voltage)	95° F	
Rotatable Coil	Yes - Field Adjustable 180°	
Valve Function	315: Multi-purpose 2-Position / 3 -Way 415: 2-Position / 5-Ported / 4 - Way	
Manual Override	Flush Non-Locking	
Electrical Connections	22 AWG Black Cross Linked Polyethylene insulated lead wire 7 x 30 stranded/tinned copper conductor; 125° C / 600 V. UL Style 3173,3271, CSA Type CL 1251. & DIN 43650C 15mm style connector	
Lubrication	None required	
Voltagess	12VDC, 24VDC, 24 50/60, 120 50/60, 240 50/60	

Features:	Line Mounted	Line Mount (2 & 3 - Gallery Bar Stock Manifold)
Power Consumption (AC/DC)	5 Watts	
Stroke (Inches)	315 / 415: 0.022 (nominal)	
Surge Suppression	TSD - Option Code 50	
Weight	315: .315 lbs. (5.04 oz) 415: .390 lbs. (6.24oz)	
Agency Approvals	Consult Factory	
Type of Operation	Direct Acting Solenoid	
Coil	General Purpose Class B, continuous duty rated, encapsulated.	
Mounting Position	Any	
Media	Air, Inert Gases	
Pressure Range	28" Hg Vacuum to 125 psig	
Filtration	40 Micron recommended	
Response Time ON/OFF (Sec.)	315: 0.020 / 0.008 (DC) 415: 0.020 / 0.021 (AC)	
Effective Area (Sq. In.)	0.0123	
Maximum Cycle Rate (CPM)	2142 (DC); 1463 (AC)	
Materials	Buna-N, Brass, Anodized Aluminum, optional fluorocelastomer	
Ambient Temp Range	32° F to 125° F	
Leak Rate (max.)	4 cc/minute @ 100psig	
Package Rating	NEMA 4 (IP-65)	
Dimensions (Inches)	315 Series: .75 x 1.44 x 3.03 415 Series: .75 x 1.44 x 3.66	
Coil Testing	All valves are "HiPot" tested between coil windings and coil frame	
DIN Connector Specification	Micro Mini 9mm	
DIN Rail Mounting (35mm)	315: Yes 415: Yes	

FLOW RATES / C_v

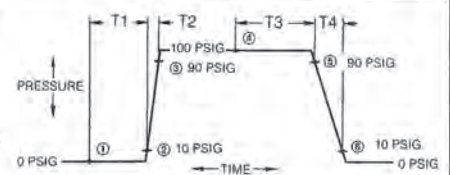
Humphrey recommends "fill/exhaust" times which are related to various chamber sizes, as the best method for calculating total valve and device (i.e., cylinder) response time. Humphrey recognizes the industry's use of flow coefficient C_v as a comparison standard.

Consequently, Humphrey offers three types of flow data. The National Fluid Power Association's (NFPA) standards for C_v , the SCFM flow rate determined by flowing to atmosphere, and Humphrey's preferred "fill/exhaust times."

Model	C_v	SCFM @100 PSIG	Fill Time (Sec) (0 to 90 PSIG) Chamber (cu. in.)			Exhaust Time (Sec) (100 to 10 PSIG) Chamber (cu. in.)		
			1	10	100	1	10	100
315	0.42	>20	.028	.19	1.3	.025	.23	1.9
415	0.42	>20	.028	.19	1.3	.025	.23	1.9

RESPONSE TIMES

Identification of response time areas



T1 times are measured from point (1) (coil energized) to point (2) (10% of supply pressure).

T2 times are measured from point(2) (detection of outlet pressure) to point (3) (90% of supply pressure).

T3 times are measured from point (4) (coil de-energization) to point (5) (10% of supply pressure exhausted from outlet port).

T4 times are measured from point (5) (detection of pressure drop) to point (6) (90% of supply pressure exhausted)

AC/DC Voltages

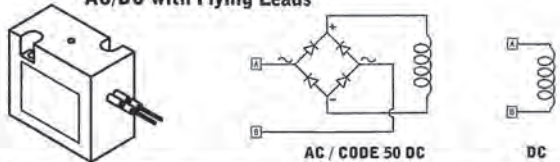
(Same for both 315 & 415 Series Valves)

Voltage	T1	T2	T3	T4
AC	.018	.002	.018	.003
DC	.018	.002	.005	.003

Time in seconds (nominal)

SOLENOID CIRCUIT SCHEMATICS

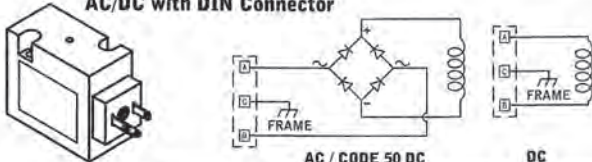
AC/DC with Flying Leads



AC / CODE 50 DC

DC

AC/DC with DIN Connector



AC / CODE 50 DC

DC

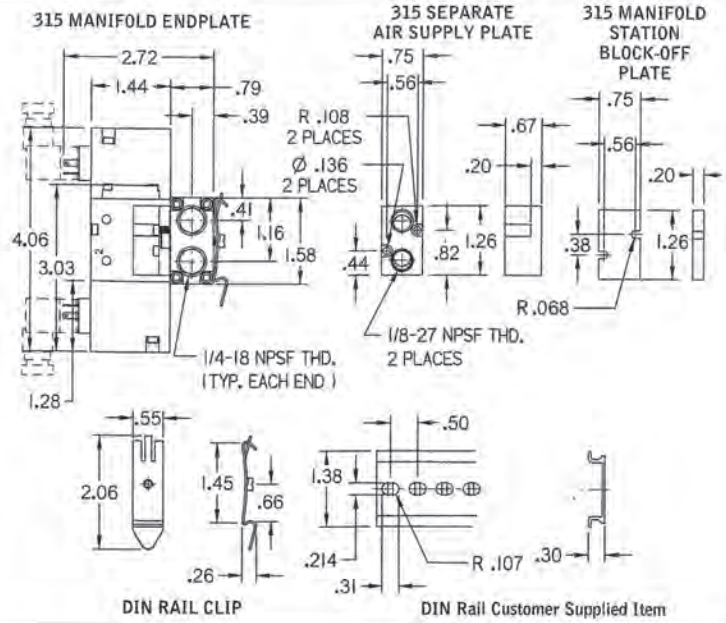
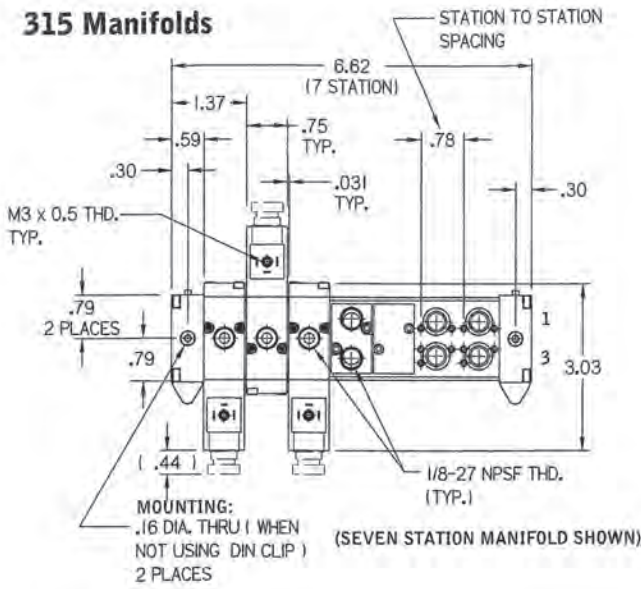
ELECTRICAL SPECIFICATIONS

Voltage	Resistance (Ohms) +/- 10%	Current (Milliamperes)
12VDC	28.8 Ω	420 mA
24VDC	115.2 Ω	210 mA
24 50/60	80.0 Ω	282 mA
120 50/60	2420.0 Ω	47 mA
240 50/60	9680.0 Ω	23 mA

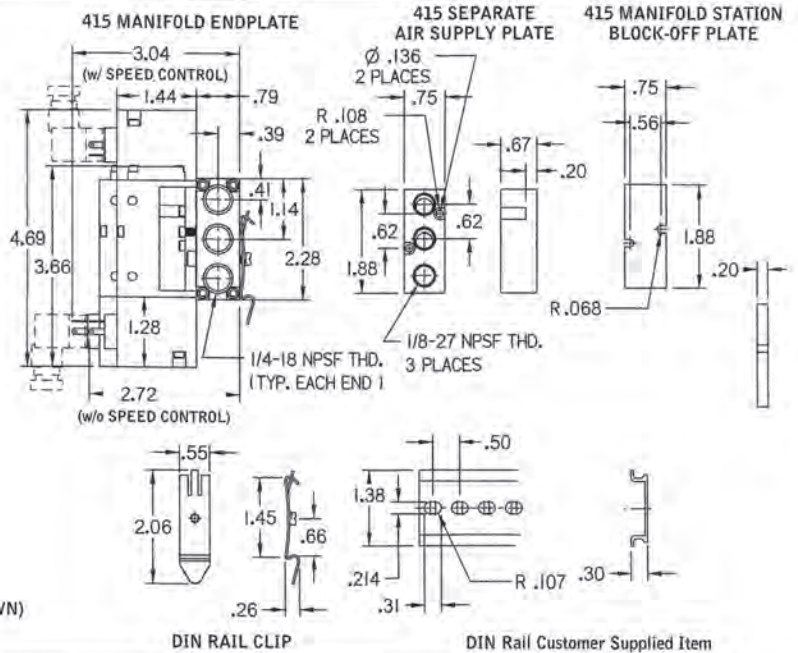
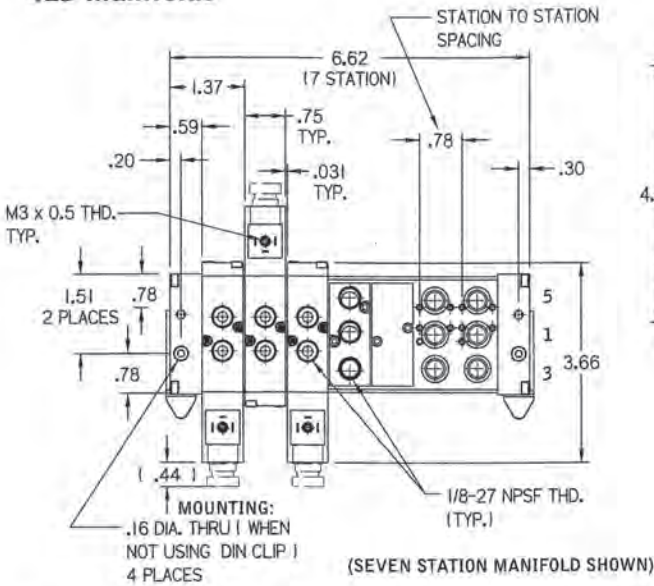
- All coils come standard with 24-inch black lead wires.
- Optional 72-inch lead wires are available Option Code (LL).
- Optional DIN connectors (Option Code 39)
- All AC coils are rated for 50/60 Hertz.
- All coils utilize Class B insulation materials.
- Resistance and current are nominal values.
- Valves are "HiPot" tested
- Ensure proper voltage supply per voltage label rating, +10% / -15% for AC or DC voltages.

MANIFOLDS


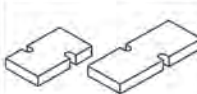

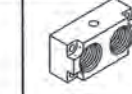


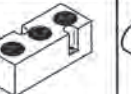
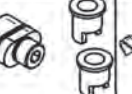

315 Manifolds



415 Manifolds



ACCESSORIES

								
Speed Control: 415-SC (includes (2) screws and (3) o-ring seals)	Manifold Station Block-off Plates: 315-BOP; 415-BOP	Manifold Plug (For use with 315 Series valves when mounted on a 415 Series manifold): 40062-1; 40062-5 (bag of five)	315 Manifold End Plate: 315M-EP (includes (2) end plates, (8) screws and (4) o-ring seals)	415 Manifold End Plate: 415M-EP (includes (2) end plates, (8) screws and (6) o-ring seals)	315 Separate Air Supply Plate: 315-SSP (includes (2) screws and (2) o-ring seals)	415 Separate Air Supply Plate: 415-SSP (includes (2) screws and (3) o-ring seals)	Isolator Plug: DP (For applications requiring two different pressures, or pressure and vacuum. Refer to Multi-pressure Manifolds section for further information and considerations.)	DIN Rail Clip: DRC (kit includes (2) clips and (2) screws)
Valve Mounting Kits: 315-MK (includes (2) screws and (2) o-ring seals); 415-MK (includes (2) screws and (3) o-ring seals)								

HOW TO ORDER

How to Order Valves

NOTE: Standard valves are furnished with 24-inch flying leads and a push, non-locking manual override. Option codes marked STD and NA are not used as part of the model number when ordering. OS indicates that the Option must be ordered separately and is not used as part of the Model Number.

NA = Not available
 OS = Order separately, additional charge for this option
 STD = Standard
 SP = Specify, additional charge for this option

A 1/8 inch pipe plug is included with each valve unit when ordering Option Code #2.

Model*	Option Code								Specify Voltage
315	2-way	with Mounting Bracket	72" Leads	DIN Connection	DC Surge Suppression	No Manual Override	Environmental Cover	Rotate Coil 180° from Standard**	12VDC 24VDC 24 50/60 120 50/60 240 50/60
415	2	21	LL	39	50	87	EC	RC	
	SP NA	SP	SP	SP	SP	SP	SP	SP	

Standard Valve Order Example: Model 315-21-39-EC-120 50/60

** Coil is field-adjustable 180°, or may be ordered from factory, rotated.

DIN Connector (Socket) Options

Model HS-2 DIN connector (only) for use with Option Code 39
 Model HS2 LED DIN connector with LED for use with Option Code 39 (12V, 24V, 120 VAC; specify voltage.)
 Model HS2-CLL Molded (6) ft. cable and assembly for use with Option Code 39 (DIN Connector).

Note: DIN Connector Options must be ordered separately.

SANDWICH SPEED CONTROL

Speed control sandwich mounts between the 415 Series valve unit and manifold assembly. The Speed Control is intended to be used for the metering of the compressed air flow from cylinder to exhaust (i.e., Port 2 - 3 and Port 4 - 5). For optimal access to the adjustment screws, we recommend that the adjustment screws be positioned on the same end as the valve unit's manual override.

Note: Since the Speed Control unit is symmetrical, it can be positioned on the same end as the solenoid.

How to Order Manifolds

315 Manifold

Manifold type	2-gallery, fixed length bar stock (2- 12 stations)
Tap	1/4" NPSF
Port Identification	Pressure = 1 Exhaust = 3

Model / 315 Series

315M-2	315M-8
315M-3	315M-9
315M-4	315M-10
315M-5	315M-11
315M-6	315M-12
315M-7	

Example: 315 Series 2 Station Manifold; Order: 315M-2

415 Manifold

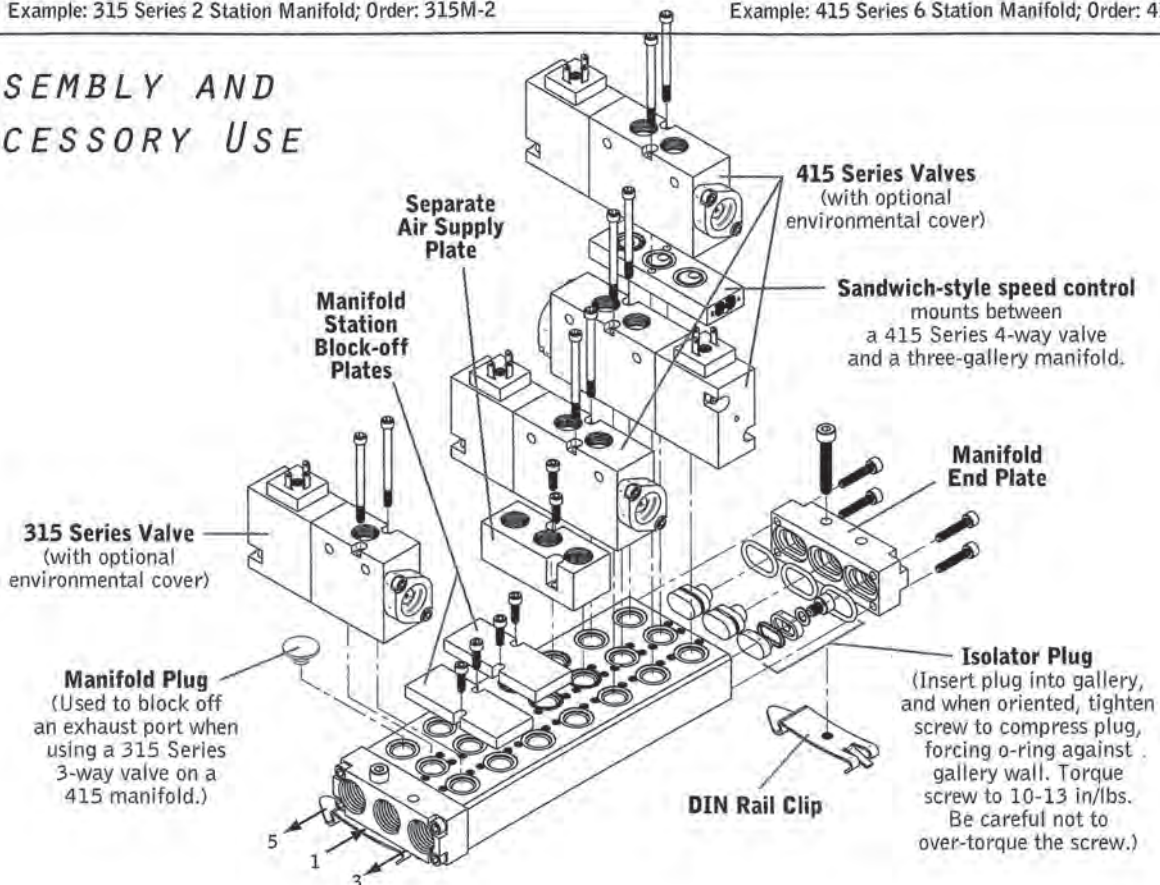
Manifold type	3-gallery, fixed length bar stock (2- 12 stations)
Tap	1/4" NPSF
Port Identification	Pressure = 1 Exhaust = 3 & 5

Model / 415 Series

415M-2	415M-8
415M-3	415M-9
415M-4	415M-10
415M-5	415M-11
415M-6	415M-12
415M-7	

Example: 415 Series 6 Station Manifold; Order: 415M-6

ASSEMBLY AND ACCESSORY USE



Troubleshooting

If valve fails to function when electrical power is supplied:

- 1) Check valve function using manual override. If valve functions by manual actuation, proceed to steps 2 and 3. If valve does not function, proceed to step 4. For valves without manual override, proceed to steps 2 and 3.
- 2) Check line voltage and compliance with valve electrical rating.
- 3) Check valve for inoperable (open) coil, measuring milliamps per Electrical Specifications Chart.
- 4) Check that the air supply has been delivered in adequate volume and pressure for proper functioning of the device. Ensure that there are no blockages due to air line contamination or defective/blocked fittings.

Mounting Valves and Accessories to Manifolds

315 & 415 Series Valves: When mounting valves to manifold, ensure that a o-ring seal is properly located in each cavity of the manifold prior to mounting a valve unit. By rotating the 315 Series valve (180°), it can be converted from a 3-way Normally-Closed to 3-way Normally-Open function. Using screws furnished, tighten to 10-13 inch-pounds of torque. Be careful not to over-torque the screws.

Accessories

When installing the 415 Series Speed Control (# 415 SC), take extra care to ensure that the o-rings are installed between the valve and speed control and speed control and manifold block.

When connecting the Separate Air Supply (# 315-SSP or 415-SSP) and/or Block-off Plate (# 315-BOP, 415-BOP), to its manifold, install a o-ring in each cavity of the manifold prior to mounting the accessory item. Using screws furnished, tighten to 10-13 inch-pounds of torque. Be careful not to over torque the screws. Appropriate o-rings and mounting screws are furnished with each accessory item.

Multi-pressure Manifolds

To create a dual pressure (DP) manifold. Install the Isolator Plug (DP) in-between the appropriate valve stations. See illustration on page 80e.

The accessory Isolator Plug (DP) has been pressure-tested to well beyond the rated limits of the valves, manifold and other accessory components. As such, it should remain fully functional in normal dual pressure or pressure/vacuum applications when all components are used within their rated limits. Humphrey Products cannot warrant the satisfactory performance of the Isolator Plug (DP) when any components are subjected to extreme environmental conditions such as excessive vibration, wide temperature variations, or other conditions beyond the control of Humphrey Products that might result in migration, leakage or failure of the Isolator Plug. Please determine the suitability of this product for your intended application prior to ordering and use.



Installation

Valves can be mounted in any position in most environments, in keeping with the specifications. 315/415 valves feature a Class B insulation system and molded coil for ambient temperatures from 32° F to 125°F (0° to 50° C).

Valves can be mounted by using the mounting holes provided. A DIN rail mounting clip is also available for manifolds. To order the DIN Rail Clip specify the DRC option code. Kit includes two clips and screws.

Lubrication

Humphrey 315/415 Series valves can be operated with or without air line lubrication, depending on the application. If air cylinders or other devices require lubrication, ensure that the lubricating oils are chemically compatible with BUNA-N elastomers and are of sufficient viscosity to assure adequate lubrication. The equivalent to turbine oil Class 1 (ISO VG32) is recommended. Avoid using thin or low viscosity oils (spindle oil, machine oil, etc.) since they do not provide a good residual film of lubrication.

Media / Pressure / Filtration

Humphrey 315/415 Series valves are designed for use with compressed air or inert gases from vacuum service (28"Hg) to 125 psig. Media should be inert gas and/or clean, dry air. When in doubt, install a filter with filtering capacity of 40 microns or less. Periodically, remove and clean or replace filter element. Consult factory if using other media.

Rotating the Solenoid (180 degrees)

Humphrey 315/415 Series valves are designed to allow the end-user to rotate the coil 180 degrees, by the removal of two screws and then simply rotating the coil into position. Prior to rotating the coil, be sure that the supply pressure has been disconnected and properly vented from the valve prior to attempting this conversion. Be careful not to mis-align the gasket or internal spring when tightening the solenoid. Mis-alignment can prevent proper operation and/or shorten the life of the valve. Caution should be taken when doing this in the field.

Warranty

All valves have a one-year warranty from date of manufacture. This warranty includes repair and/or replacement at no charge should the product be deemed defective due to workmanship and/or material. (See detailed Product Warranty in Humphrey's General Valve Catalog.)

Caution!

Compressed air is powerful and may be dangerous. Before attempting to remove or service a component from an air line or system, always disconnect the supply air and thoroughly exhaust the line or system. Never attempt to construct, operate, or service anything using compressed air unless you have been properly trained to do so. Failure to heed this warning could result in PROPERTY DAMAGE AND/OR SERIOUS, EVEN FATAL, PERSONAL INJURY. See additional warning on page 252.