

HUMPHREY M310/410 SERIES SUBBASE MOUNTED SOLENOID VALVES

TECHNICAL SECTION

Refer to page 4 for additional general product information.

GENERAL INFORMATION

DESCRIPTION

M310

A 3-way, single solenoid, 2-position/spring return, Normally Open or Normally Closed, general purpose air valve.

VM310

Same as M310 but specifically for vacuum service. See Media/Pressure on page 4 for additional information.

M410

A 4-way Normally Open/Normally Closed, single solenoid, 2-position/spring return, general purpose air valve.

M410-70

Like M410, but offers the advantage of dual built-in flow controls.

SB-1

Subbase with two 1/8-inch outlet ports, marked 1 and 2.

SBMP-1

Subbase with Multi-Pressure capability. Model SBMP-1 has four 1/8-inch external body ports marked IN, EXH, 1 and 2. This subbase is used to introduce an alternate pressure into a given assembly of valves operating at a different pressure. It is also used to supply additional air and/or exhaust capability to a subbase mounted assembly of valves.

PORT IDENTIFICATION

IN	Pressure Supply port
1	Normally Open Delivery port*
2	Normally Closed Delivery port**
EXH	Exhaust port, vent to atmosphere

*Port #1 is not functional when using valve Model M310.

**Port #2 is also the Delivery port when using Model 310.

INSTALLATION

CAUTION: Compressed air is powerful and may be dangerous. Before attempting to remove 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 **SERIOUS, EVEN FATAL, PERSONAL INJURY**.

Any combination of M310/410 subbase mounted valves can be assembled to form a completed manifold.

If manifold consists of a large number of valves or if several valves are to be actuated simultaneously, SBMP-1 subbases can be used to feed additional supply air to the manifold, and to provide additional exhaust capacity.

M310/410 Series valves and subbases (or subbases themselves) can be ordered completely factory-assembled, ready for installation in your equipment. Consult factory for details.

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

The subbase manifold assembly is mounted using the slotted mounting hole in each End Cap, and #10 socket head cap screws or fillister head screws. One mounting hole is provided in each End Cap for mounting the finished assembly.

For simplicity, when mixing valves with different functions on the same subbase manifold, consider locating valves of one common function on one end of the assembly. Use Port Isolators to separate the last valve of a common function from other valves in the assembly, then mix/match valves of other functions at the opposite end of the assembly.

USE AS A 3-WAY

M310

Model M310 is a 2-position, 3-way valve and thus is ready for 3-way use. Use either Normally Open, Normally Closed, or as a Selector or Diverter.

The Humphrey 1/8-27 NPTF Port Plug #130-31 can be used to accomplish the following.

Normally Open: Connect supply pressure to EXH. Port 2 is delivery port. IN is exhaust port.

Normally Closed: Connect supply pressure to IN. Port 2 is delivery port. EXH is exhaust port.

NOTE: Port #1 is not functional when using valve Model M310.

Selector: Connect pressure #1 to IN port.
Connect pressure #2 to EXH port.
Delivery port 2 is common.

Diverter: Connect pressure to Delivery port 2.
Diverting Delivery ports are IN and EXH.

M410/M410-70

These 2-position 4-way valves can be used as 3-ways by plugging one of the two Delivery ports. Such use of a 4-way as a 3-way can simplify porting/pressurizing the subbase manifold when combinations of 3-way NC, 3-way NO, and 4-way valves are used.

The Humphrey 1/8-27 NPTF Port Plug #130-31 can be used to accomplish the following:

Normally Closed 3-way: Plug Delivery port 1.

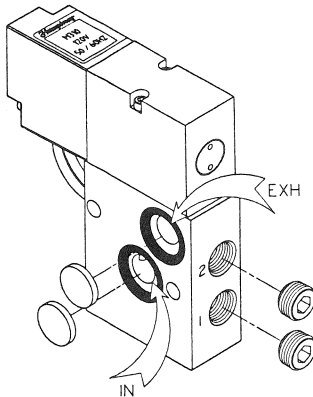
Normally Open 3-way: Plug Delivery port 2.

USE AS A 2-WAY

All of these valves can also be used as 2-way valves by isolating in and/or plugging various ports. Port 2 is always the delivery port.

M310

This 2-position, 3-way valve can be used either as a Normally Closed or Normally Open 2-way valve.



The Humphrey Port Isolator Kit #40-900A and the 1/8-27 NPTF Port Plug #130-31 can be used to accomplish the following:

Normally Closed 2-way: When all valves on a subbase assembly are to be used as Normally Closed 2-ways: Use Port Isolators to isolate internal subbase EXH ports. (Internal EXH ports correspond with EXH ports in End Caps.) Also plug external EXH ports when using the Model SBMP-1 subbase, and the appropriate End Cap EXH port. Connect supply pressure to IN.

When one or more valves in a multi-valve assembly are to be used as Normally Closed 2-ways in a subbase assembly consisting of mixed valve functions, locate them on one end of the assembly. Use Port Isolators to isolate the internal subbase EXH ports. Also plug external EXH ports when using the Model SBMP-1 subbase, and the appropriate End Cap EXH port. Separate the subbase on the last Normally Closed 2-way valve from valves of another function by using Port Isolators. Connect supply pressure to IN.

Normally Open 2-way: When all valves on the subbase assembly are to be used as Normally Open 2-ways: Use Port Isolators to isolate internal subbase IN ports. (Internal IN ports correspond with IN ports in End Caps.) Also plug external IN ports when using the Model SBMP-1 subbase, and the appropriate End Cap IN port. Connect supply to EXH.

When one or more valves are to be used as Normally Open 2-ways in a subbase assembly consisting of mixed valve functions, locate them on one end of the assembly. Use Port Isolators to isolate the internal subbase IN ports. Also plug external IN ports when using the Model SBMP-1 subbase, and the appropriate End Cap IN port. Separate the subbase on the last Normally Open 2-way valve from valves of another function by using Port Isolators. Connect supply pressure to EXH for these valves.

M410

This 2-position, 4-way valve can be used either as a Normally Closed or Normally Open 2-way valve.

Normally Closed 2-way: Plug #1 Delivery port. Use a Port Isolator to plug internal subbase EXH port. (Internal EXH port corresponds with EXH port in End Cap.) Also plug external EXH port when using the Model SBMP-1 subbase, and the appropriate End Cap EXH port. Connect supply pressure to IN.

Normally Open 2-way: Plug #2 Delivery port. Use a Port Isolator to plug internal subbase IN port. (Internal IN port corresponds with IN port in End Cap.) Also plug external IN port when using the Model SBMP-1 subbase, and the appropriate End Cap IN port. Connect supply pressure in EXH.

MULTI-PRESSURE

Model SBMP-1 subbases can be used to create multiple pressures on a common subbase assembly. Use Port Isolators to isolate the subbase to be used with a separate pressure.

M310

Connect supply pressure to the IN port of the individual subbase for a Normally Closed 3-way.

Connect supply pressure to the EXH port of the individual subbase for a Normally Open 3-way. IN port of the subbase becomes the exhaust port.

M410

Isolate the subbase and connect supply pressure to the IN port of the subbase.

MULTI-PRESSURE, ALTERNATE METHOD

Locate subbase(s) for separate pressure on one end of assembly. Use Port Isolators to plug the internal side ports (those interfacing with the alternate pressure source) of the last subbase to separate it from those operating at another pressure.

Connect separate pressure to End Cap. In this configuration, part of the assembly operates on one pressure, the other part operates on another pressure.

M310/410 VALVES AND SUBBASES



M310

- 3-way
- 2-position, spring return
- Direct acting, single solenoid
- Continuous duty coil
- Non-locking manual override
- 24-inch lead wires
- Three 1/8-27 NPSF ports: In, Out, and Exhaust
- Two #3-48 x 1.25 socket head cap screws to mount valve to subbase, and four o-ring valve/subbase seals
- Specify Model VM310 for vacuum from 0" to 28" Hg.



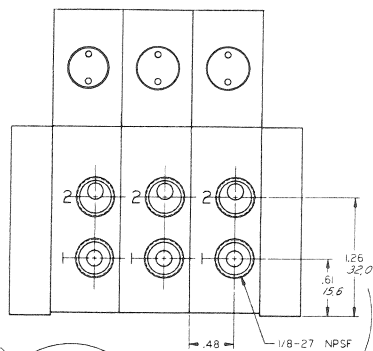
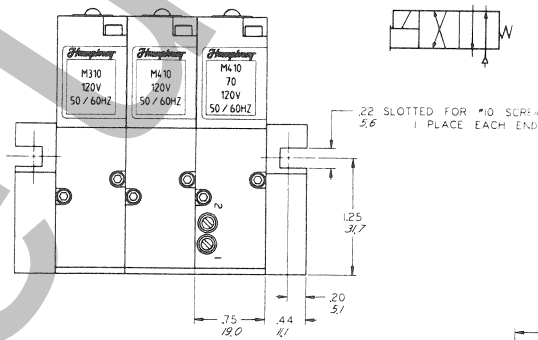
M410

- 4-way, Normally Open/Normally Closed
- 2-position, spring return
- Direct acting, single solenoid
- Continuous duty coil
- Non-locking manual override
- 24-inch lead wires
- Four internal ports: In, Delivery ports 1 & 2, Exhaust
- Screws and o-rings are same as M310

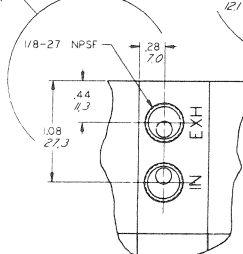


M410-70

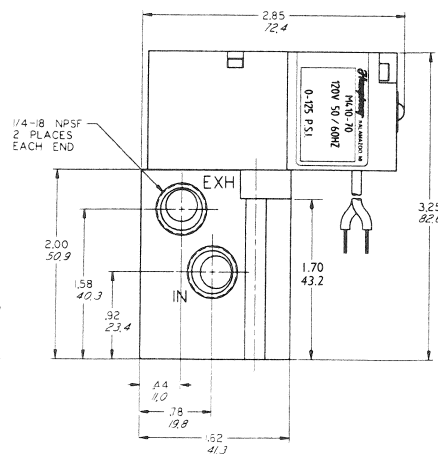
- 4-way, Normally Open/Normally Closed
- 2-position, spring return
- Direct acting, single solenoid
- Continuous duty coil
- Individual flow controls for each Delivery port exhaust
- Non-locking manual override
- 24-inch lead wires
- Four internal ports: In, Delivery ports 1 & 2, Exhaust
- Screws and o-rings are same as M310



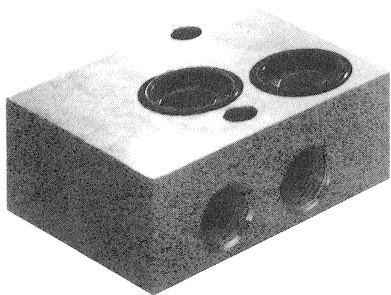
THESE DIMENSIONS ARE FOR THE ADDITIONAL PORTS IN THE SBMP-1 SUBBASE ONLY



THESE DIMENSIONS ARE TYPICAL FOR THE SB-1 AND SBMP-1 SUBBASES

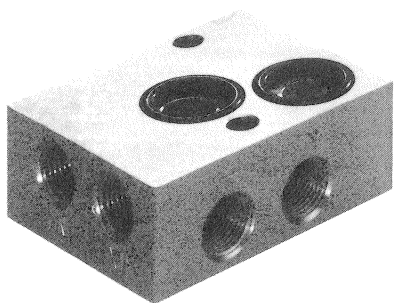


MANIFOLD END PLATE ASSEMBLIES



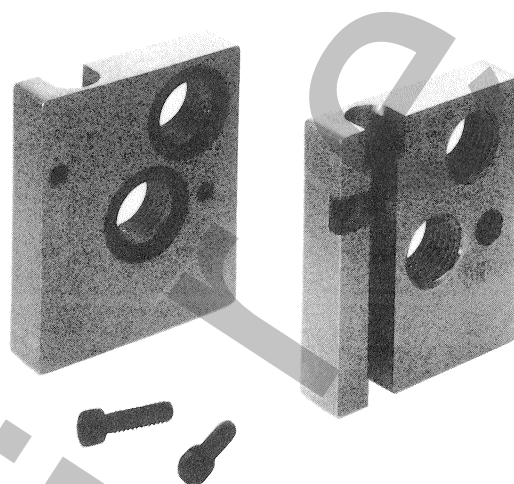
B-1

Subbase accepts any M310/410 Series valve
Two delivery ports, marked 1 & 2
Port 1 is Normally Open, Port 2 is Normally Closed
Two tie rod spacers, and two o-rings for inter-
subbase seal



BMP-1

Subbase accepts any M310/410 Series valve
Four ports: Two delivery ports marked 1 & 2
(Port 1 is Normally Open, Port 2 is Normally Closed);
plus one separate IN, and one separate EXH port
Two tie rod spacers, and two o-rings for inter-
subbase seal



END PLATE ASSEMBLY FOR
PREFIX M VALVES
PART NUMBER 7-100A

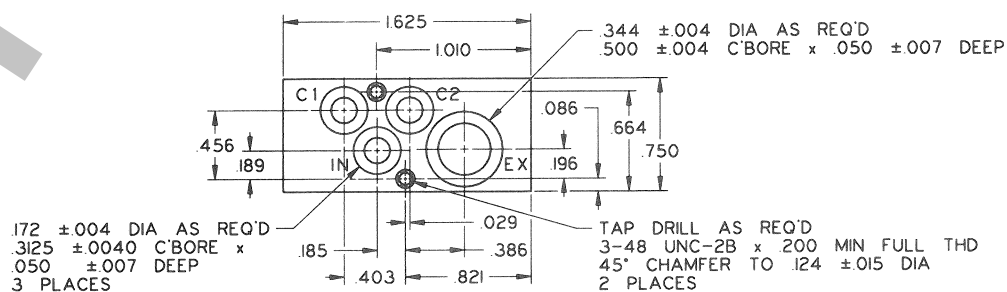
The End Plate Assembly, which consists of two sub-base end caps and fastening accessories, is mounted on each end of a completed subbase valve assembly. Tighten screws to 8 lb. •in. of torque. Two slotted holes provide a method of mounting a subbase assembly. Includes two o-rings to seal subbase to end cap, and two #6-32 x .5 socket head cap screws to secure tie rod spacers.

BLOCK-OFF PLATE

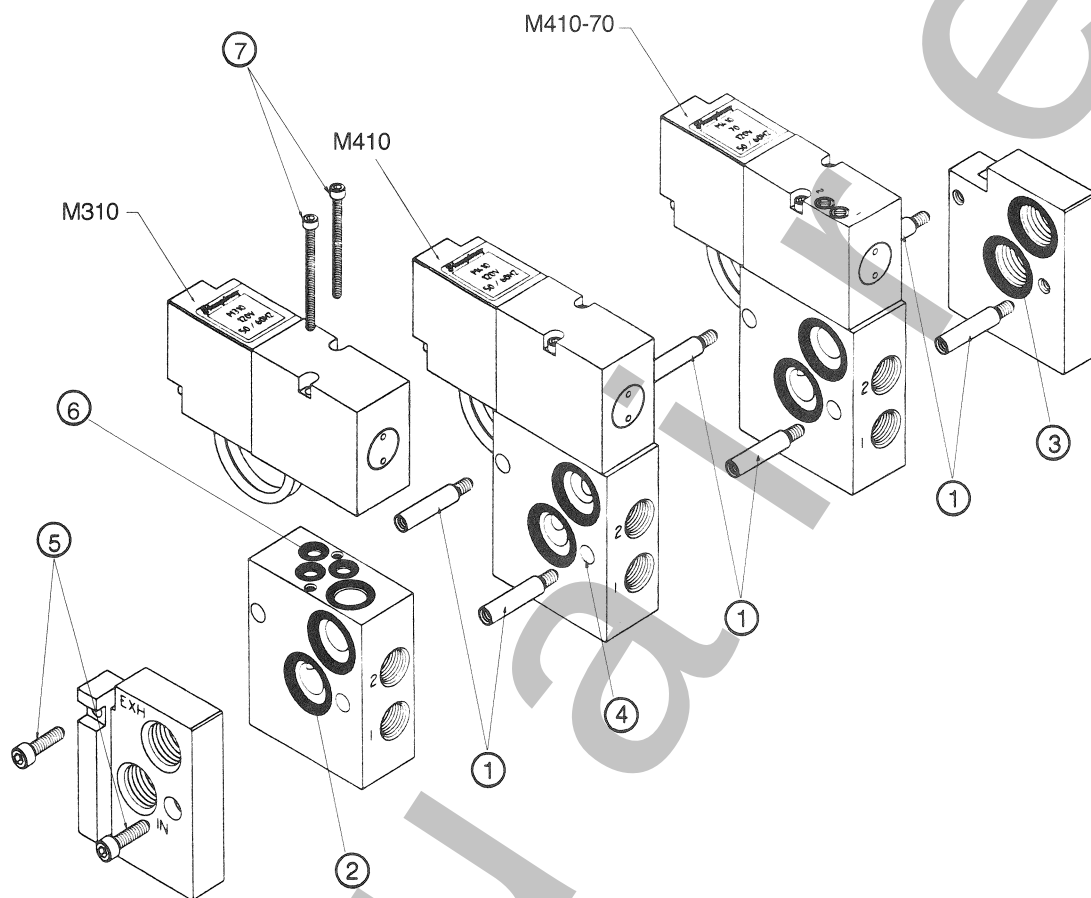
Model 8-310A anodized aluminum block-off plate is used to suspend the use of any SB-1 or SBMP-1 subbase. It can also be used to permit future valve additions related to machine options. Supplied with screws and o-rings to mate with subbase.

PORTING FOOTPRINT

Model 310, M410, and M410-70 valves can be mounted to your equipment or to special manifolds using the dimensional data shown below.



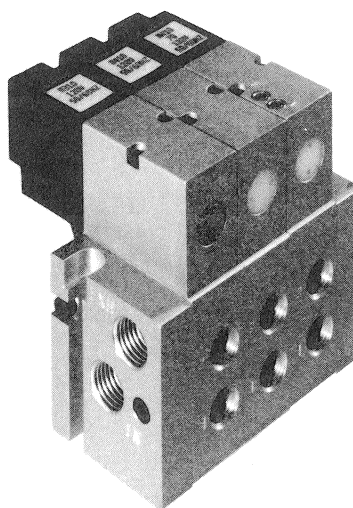
MANIFOLD ASSEMBLY INSTRUCTIONS



TO ASSEMBLE A VALVE MANIFOLD

1. Hand tighten each set of threaded spacers (two supplied per subbase) into units of equal length.
2. Ensure that o-ring seals (supplied) are placed in subbase side ports having o-ring grooves.
3. Place o-ring seals (two supplied) into End Cap possessing o-ring grooves, and thread spacers into this End Cap.
4. Assemble subbases onto spacers using subbase through-holes.
5. Secure entire assembly with #6-32 x .50-inch screws (supplied with End Caps) and tighten with $\frac{7}{64}$ -inch hex drive wrench (not supplied).
6. Place o-rings (four per subbase, supplied with valve) onto the valve mounting surface on the subbases. (Light weight grease assists in maintaining o-ring position during assembly.)
7. Mount valves to subbase assembly with #3-48 x 1.25 socket head cap screws supplied with valve. Use 2 lb. •in. of torque.

NOTE: Coils face away from subbase Delivery ports.



ORDER INFORMATION

M310/410 Series Subbase Mounted Valves
 1/8-inch ports, 3-way, 4-way

VALVES

Model	Option description									Voltage
	Conduit connector	DIN-type connector	Transient Suppression Diode (TSD)*	Flow Control	Locking manual override	No manual override	72" lead wires	Metal oxide varistor	Rotated coil (180°)	
Option code	36	39	50	70	81	87	LL	MOV	RC	
M310 3-way, subbase mounting				NA						12 VDC, 24 VDC 24 VAC 50/60 100 VAC 50/60 120 VAC 50/60 200 VAC 50/60 240 VAC 50/60
VM310 vacuum 3-way, subbase mounting		SP	SP		SP	SP	SP	SP	SP	
M410 4-way, subbase mounting				SP						

OTE: Standard valves are furnished with 24" flying lead wires and a non-locking manual override.

*DC voltages only.

SUBBASES AND ACCESSORIES

Model	Description
SB-1*	Subbase with two delivery ports. 8-90A Mounting Kit supplied.
SBMP-1*	Subbase with two delivery ports, and one IN and one EXH port. 8-90A Mounting Kit supplied.
7-100A*	End Plate Assembly (two subbase End Plates, two o-rings, and two screws). Use with prefix letter M valves.
8-90A	Mounting Kit (two spacers, two o-rings).
8-90B	Two spacers (only) for Mounting Kit.
8-100A	Valve Mounting Kit (two screws, four o-rings).
28-650A	Space connector for use with terminals on Code 39 DIN-type coils.
40-900A	Port Isolator Kit (two port isolators).
HS-2	DIN receptacle for use with Code 39 connector.
HS-2L	Lighted DIN receptacle for use with Code 39 connector.
HS-2LED	LED DIN receptacle for use with Code 39 connector.

To specify metric ports, add an "E" prefix (i.e., ESB-1 or E7-100A).

HOW TO ORDER

Starting with Model Number specify options in order from left to right.

example: To order Model M310-LL 12VDC
 Long Leads 72" (M310-LL)
 Voltage 12VDC (M310-LL 12VDC)

To order Model M410-70-87 120VAC
 Flow Controls (M410-70)
 Without Manual Override (M410-70-87)
 Voltage 120VAC (M410-70-87 120VAC)

Remember: Option Codes marked STD and NA are not used as part of the Model Number when ordering. N/C indicates no charge but Option Code must be included in the Model Number. SP indicates that Option must be specified when ordering. Specified Options become part of the Model Number.

N/C = No charge
 NA = Not available

STD = Standard
 SP = Specify; Additional charge for this option