HUMPHREY S310/410 SERIES
STACKING SOLENOID VALVES

TECHNICAL SECTION

Refer to page 4 for additional general product information.

GENERAL INFORMATION

DESCRIPTION

310
3-way, single solenoid, 2-position/spring return. Normally Open. Normally Closed, general purpose air valve, with one 1/8-inch external body outlet port, marked OUT.

MP310
ke S310, but has Multi-Pressure capability. Valve has three 1/8-inch external body ports, marked IN, EXH, and OUT. SMP310 used to introduce an alternate pressure to a given assembly of alves operating at a different pressure. It is also used to supply air and/or exhaust capability to a stacking assembly of valves.

S310
Same as 310 but specifically for vacuum service. See Media/ressure on page 4 for additional information.

410
4-way Normally Open/Normally Closed, single solenoid, 2-position/spring return, general purpose air valve, with two 1/8-inch external body outlet ports marked 1 and 2.

MP410
ike S410, but has Multi-Pressure capability. Valve has four 1/8-inch external body ports marked IN, EXH, 1 and 2. Model SMP410 used to introduce an alternate pressure to a given assembly of alves operating at a different pressure. It is also used to supply additional air and/or exhaust capability to a stacking assembly of valves.

410-70
ike S410, but offers the advantage of dual built-in flow controls.

MP410-70
ike SMP410, but offers the advantage of dual built-in flow controls.

NOTE: Valves with #10-32 Delivery ports are also available. Consult factory.

PORT IDENTIFICATION

Pressure Supply Port.
DIUT Delivery port for model 310.
Normally Open Delivery port for model 410/70.
Normally Closed Delivery port for model 410/70.
EXH Exhaust port, vent to atmosphere.

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.

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 225°F (0° to 50°C).

The stacking assembly is mounted using the 0.22 slotted mounting lugs in the End Plates and #10 screws. Four mounting lugs provided for mounting the assembly in two different planes.

When using hardened steel bolts to mount the stacking assembly, it is recommended that a flat washer be used between the screw head and the mounting lug.

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

USE AS A 3-WAY

S310
Model S310 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.

SMP310
Model SMP310 is like S310 but has Multi-Pressure capability for using an alternative supply pressure via the valve IN port. It also provides an individual EXH (exhaust) port.

Normally Closed: Connect supply pressure to IN port of End Plate Assembly or valve.

Normally Open: Connect supply pressure to EXH port of End Plate Assembly or valve (IN becomes exhaust).

Selector: Connect pressure #1 to IN port of End Plate Assembly or valve. Connect pressure #2 to EXH port of End Plate Assembly or valve. OUT is common.

Diverter: Connect pressure to OUT port of valve. Diverter ports are IN and EXH ports in End Plate Assembly or valve.

S410/SMP410
These 2-position 4-way valves can be used as a 3-way by plugging one of the two Delivery ports. Such use of a 4-way valve as a 3-way can simplify porting/pressurizing the stack of valves 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 and/or plugging various ports.

S310
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: Isolate non-threaded port located furthest from the valve coil with one Port Isolator; connect supply pressure to IN in the End Plate Assembly.

Normally Open 2-way: Isolate non-threaded port located nearest the valve coil with one Port Isolator; connect supply pressure to EXH in the End Plate Assembly.

S410
This 2-position, 4-way valve can be used either as a Normally Closed or Normally Open 2-way valve.

Normally Closed 2-way: Isolate valve exhaust port (non-threaded port adjacent to Delivery port 2) with Port Isolator. Plug valve Delivery port 1.

Normally Open 2-way: Isolate valve exhaust port (non-threaded port adjacent to Delivery port 2) with Port Isolator. Plug valve Delivery port 2.

MULTI-PRESSURE

Valves with prefix letters SMP can be used to create multiple pressures on the same valve assembly.

SMP310
This 3-way valve can be used to introduce a separate pressure into a stack of valves. If the valve is not located adjacent to an End Plate Assembly, isolate the valve's non-threaded side ports with four Port Isolators. Connect the separate supply pressure to the valve IN port for Normally Closed use, or the valve EXH port for Normally Open use. Note that valve does not have common supply and exhaust with other valves in the same assembly, but is isolated.

SMP410
This 4-way valve can be used to introduce a separate pressure to a stack of valves. If the valve is not located adjacent to an End Plate Assembly, isolate the valve's non-threaded side ports with four Port Isolators. Connect the separate supply to valve IN port.

MULTI-PRESSURE, ALTERNATE METHOD

Locate valve(s) for separate pressure on one end of assembly. Plugging the two side ports (those interfacing with the alternate pressure source) of the last valve to separate it from those operating at another pressure.

Connect separate pressure to End Plate Assembly. In this configuration, part of the assembly carries one pressure, the other part of the assembly carries another pressure.
3310/SMP310 SOLENOID VALVES

U.L. recognized

3310

3-way
2-position, spring return
Direct acting, single solenoid
Continuous duty coil
Non-locking manual override
24-inch lead wires
One 1/8-27 NPSF Delivery port (OUT)
One 8-90A Mounting Kit, consisting of two threaded spacers and two o-rings, supplied per valve.
Specify model VS310 for vacuum from 0" to 28" Hg.

SMP310

• 3-way, Multi-Pressure capability (external body ports)
• 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, EXH)
• One 8-90A Mounting Kit, consisting of two threaded spacers and two o-rings, supplied per valve
• Specify model VSMP310 for vacuum from 0" to 28" Hg.
S410/SMP410 SOLENOID VALVES

*U.L. recognized

S410
- 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
- Two 1/8-27 NPSF Delivery ports 1 and 2
- One 8-90A Mounting Kit, consisting of two threaded spacers and two o-rings, supplied per valve

SMP410
- 4-way, Normally Open/Normally Closed
- Multi-Pressure capability (external body ports)
- 2-position, spring return
- Direct acting, single solenoid
- Continuous duty coil
- Non-locking manual override
- 24-inch lead wires
- Four 1/8-27 NPSF ports (IN, Delivery ports 1 and 2, EXH)
- One 8-90A Mounting Kit, consisting of two threaded spacers and two o-rings, supplied per valve

These dimensions are typical for all SMP30 & SMP40 bodies.
3410-70/SMP410-70 SOLENOID VALVES

3410-70

- 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
- Two 1/8-27 NPSF Delivery ports 1 and 2
- One 8-90A Mounting Kit, consisting of two threaded spacers and two o-rings, supplied per valve

SMP410-70

- 4-way, Normally Open/Normally Closed
- Multi-Pressure capability (external body ports)
- 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 1/8-27 NPSF ports (IN, Delivery ports 1 and 2, EXH)
- One 8-90A Mounting Kit, consisting of two threaded spacers and two o-rings, supplied per valve
HUMPHREY VALVE END PLATE ASSEMBLIES

END PLATE ASSEMBLY FOR PREFIX "S" VALVES
PART NUMBER 7-900A

The End Plate Assembly, which consists of two end plates and fastening accessories, is mounted on each end of a completed assembly of valves. It also provides a method of mounting an assembled stack of valves.

STACKING ASSEMBLY INSTRUCTIONS

Any combination of S310/410 Stacking Series valves can be assembled to form a completed stack.

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

S310/410 Series valves can be ordered completely factory-assembled, ready for installation in your equipment. Consult factory for details.

TO ASSEMBLE A STACK OF VALVES

1. Hand tighten each set of threaded spacers (two supplied per valve) into units of equal length.

2. Ensure that o-ring seals (supplied) are placed in valve ports having o-ring grooves.

3. Place o-ring seals (two supplied) into End Plate possessing o-ring grooves, and thread spacers into this End Plate.

4. Assemble valves onto spacers using valve through-holes.

5. Secure entire assembly with ½-inch screws (supplied with End Plate) and tighten to 8 lb.·in. with 7/64-inch hex drive wrench (not supplied).
ORDER INFORMATION

310/410 Series Stackable Valves
1/2-inch ports, 3-way, 4-way

<table>
<thead>
<tr>
<th>Model</th>
<th>Option code</th>
<th>DIN-type connector</th>
<th>DC surge suppression</th>
<th>Flow controls</th>
<th>Locking manual override</th>
<th>No manual override</th>
<th>72&quot; lead wires</th>
<th>Metal oxide varistor</th>
<th>Voltage</th>
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</thead>
<tbody>
<tr>
<td>S310, SMP310</td>
<td>39</td>
<td>SP</td>
<td>SP</td>
<td>NA</td>
<td>SP</td>
<td>SP</td>
<td>SP</td>
<td>SP</td>
<td>12 VDC</td>
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<td>3-way, stackable</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>24 VDC</td>
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<tr>
<td>VS310, VSMP310 vacuum</td>
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<td>SP</td>
<td>SP</td>
<td>NA</td>
<td>SP</td>
<td>SP</td>
<td>SP</td>
<td>SP</td>
<td>24 VAC 50/60</td>
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<tr>
<td>3-way, stackable</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>100 VAC 50/60</td>
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<tr>
<td>S410, SMP410</td>
<td>70</td>
<td></td>
<td>SP</td>
<td>NA</td>
<td>SP</td>
<td>SP</td>
<td>SP</td>
<td>SP</td>
<td>120 VAC 50/60</td>
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<td>4-way, stackable</td>
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<td>200 VAC 50/60</td>
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<td>240 VAC 50/60</td>
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</table>

JTE: Standard valves are furnished with 24" flying lead wires and a non-locking manual override. Specify metric ports, add an "E" prefix (i.e., ES310 or EVS310).

ACCESSORIES

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-900A</td>
<td>End plate assembly (two end plates, two screws, two O-rings).</td>
</tr>
<tr>
<td>8-90A</td>
<td>Mounting kit (two spacers, two O-rings).</td>
</tr>
<tr>
<td>40-900A</td>
<td>Port isolator kit (two port isolators).</td>
</tr>
<tr>
<td>130-31</td>
<td>1/8-inch pipe plug.</td>
</tr>
<tr>
<td>HS-2</td>
<td>DIN receptacle for use with code 39 connector.</td>
</tr>
<tr>
<td>HS-2L</td>
<td>Lighted DIN receptacle for use with code 39 connector.</td>
</tr>
<tr>
<td>HS2-LED</td>
<td>LED DIN receptacle for use with code 39 connector.</td>
</tr>
</tbody>
</table>

HOW TO ORDER

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

Example: To order Model S310-LL 12VDC
- Long Leads 72" (S310-LL) 12VDC
- Without Manual Override (S310-LL 12VDC)

To order Model S410-70-87 120VAC
- Flow Controls (S410-70)
- Without Manual Override (S410-70-87) 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       STD = Standard
NA = Not available    SP = Specify; Additional charge for this option