HUMPHREY SELECTION GUIDE

Organized by Port Size

SOLENOID

2-, 3-way

M3	C_v	10-32	C_v	1/8"	C_v	1/4"	C_v	3/8"	C_v	1/2"	C_v	3/4"	C_v
H010E1	0.01	3E1	0.01	31E1	0.09	(V)062E1	0.12			(VA/VV)500(A)E1	2.16	(VA)590(A)E1	2.56
H041E1	0.08	M3E1	0.01	M31E1	0.06	T062E1	0.11			500E2	2.16	(VA)590(A)E2	2.56
H040 E1	0.08	M3E1-81-MTL	0.01	310	0.12	125E1	0.19			501E1	2.20		
		3E1-PCM	0.01	S310	0.15	T125E1	0.17			501E2	2.20		
		3E1-39-BOU	0.01	M310	0.12	(VA/VV)250(A)E	0.63						
		3E1-TSD	0.01	(VA)125(A)E1L	0.24	250E2	0.63						
		H(V)030E1	0.03	M125E1LW	0.17	320	1.00						
		H110E1	0.23	H181E1	0.57								
		H111E1	0.23										

4-way

M3	C_v	10-32	C_v	1/8"	C_v	1/4"	C_v	3/8"	C_v	1/2"	C_v	3/4"	C_v
H040 4E1	0.08	401	0.05	41E1	0.03	42E1	0.43			501-4E1	1.80		
H040 4E2	0.08	M401	0.05	M41E1	0.03	M42E1	0.39			501-4E2	1.80		
		402	0.04	MC41E1	0.03	42E2	0.43						
		M402	0.04	410	0.14	062-4E1	0.07						
		H030-4E1	0.03	410-70	0.14	125-4E1	0.11						
		H110-4E1	0.23	S410	0.13	T062-4E1	0.07						
		H110-4E2	0.23	S410-70	0.13	T125-4E1	0.11						
		H113-4E2	0.21	M410	0.13	M42E2	0.39						
				M410-70	0.13	250-4E1	0.58						
				H180-4E1	0.57	250-4E2	0.88						
				H180-4E2	0.57	H240-4E1	0.88						
				H183-4E2	0.50	H243-4E2	0.83						
						S420	1.00						
						M420	1.00						

AIR PILOTED

2-, 3-way

M3	C_v	10-32	C_v	1/8"	C_v	1/4"	C_v	3/8"	C_v	1/2"	C_v	3/4"	C_v
		2P	0.09	31P	0.29	(VA/VV)250A	0.63			(VA)500A	2.20	(VA)590A	3.73
		3P	0.09	(VA)125A	0.22	250AA	0.85			500AB	2.20	590AB	3.73
				125AA	0.23	250AL	0.65			500AG	2.20	590AG	3.73
				125LA	0.15	250AH	0.50			501A	2.41		
				125AH	0.17					501AA	2.49		

4-way

M3	C_v	10-32	C_v	1/8"	C_v	1/4"	C_v	3/8"	C_v	1/2"	C_v	3/4"	C_v
		4P	0.11	41P	0.29	42A	0.38			501-4A	1.89		
		4PP	0.11	41PP	0.28	42A2	0.35			501-4AA	1.89		
		110-4A	0.23	H180-4A	0.50	M42A2	0.32						
		110-4A2	0.23	H180-4A2	0.50	250-4A	0.49						
						250-4AA	0.75						

MANUAL/MECHANICAL

2-, 3-way

M3	C_v	10-32	C_v	1/8"	C_v	1/4"	C_v	3/8"	C_v	1/2"	C_v	3/4"	C_v
		2P	0.09	31P	0.29	250PL	0.83			501V	2.20	590C	3.85
		2V	0.09	31V	0.29	250P	0.84			(V)500C	2.20		
		3P	0.09	125PLG	0.22	250HO	0.83						
		3V	0.09	125P	0.22	250F	0.83						
				125HO	0.22	(V)250C	0.83						
				125B	0.23	250T	0.83						
				125MP	0.22	(V)250V	0.83						
				125MC	0.22								
				125MOC	0.22								
				125C	0.22								
				125T	0.22								
				(V)125V	0.22								

4-way

M3	C_v	10-32	C_v	1/8"	C_v	1/4"	C_v	3/8"	C_v	1/2"	C_v	3/4"	C_v
		4P	0.11	41P	0.29	42P	0.39						
		4PP	0.11	41PP	0.29	42PP	0.39						
		4PPX	0.29	41PPX	0.29	M42P	0.32						
		4PP/PPX	0.29	41PP/PPX	0.29	M42PP	0.29						
		4V	0.11	41V	0.29	M42PA	0.29						
				41T	0.09	250-4F	0.75						
				41R	0.09	250-4H	0.75						

Humphrey® General Guidelines

Don't take chances

Compressed air is an extremely powerful medium. Always take maximum precautions when handling any component of a compressed air system.

Never attempt to construct, replace, operate or service any component of a compressed air system unless you have been specifically and properly trained to do so.

Always disconnect the supply air and exhaust the air system before attempting to remove or service a component of that system.

Failure to heed these warnings could result in SERIOUS, EVEN FATAL, PERSONAL INJURY.

Use the right valve

Humphrey valves are general purpose air valves designed for use in general industrial applications in accordance with the limitations described in this catalog for each valve. The specifications of individual products are subject to change without notice. Consult factory for specific information concerning valve/application compatibility

Each Humphrey valve is tested before it leaves our factory to assure the valve's conformance to catalog specifications.

Any use or application which deviates from the valve's specifications will void the warranty unless Humphrey has provided specific and written authorization beforehand.

Use the right lubrication

Except where model specifications state "No lubrication required," all Humphrey valves require appropriate lubrication. Humphrey recommends a non-detergent, 20w or 30w, mineral-based petroleum oil for most of its valves.

Some lubricants may cause swelling or deterioration of the valve's seals, therefore lubricant/seal compatibility must be confirmed. Read specifications carefully. If there is any doubt, consult factory.

Use the right air supply

The valved medium, including the lubricants and other substances it may contain, must be compatible with the materials of which the valve is constructed. Read the specifications carefully; if there is any doubt, consult factory.

Sone valve models are vulnerable to contaminated or moisture-laden compressed air. To promote proper functioning and long life in such instances, appropriate air treatment equipment should be installed. Consult your supplier of air filters, regulators, and lubricators.

Use proper service procedures

Never attempt to service a Humphrey valve or any system component unless you have been properly trained to do so. A properly trained person will never attempt to remove or service a component of a compressed air system unless the compressed air has been disconnected and the system thoroughly exhausted.

Some Humphrey valves can be repaired in the field. Humphrey makes available factory seal repair kits (SRKs) and individual valve components for this purpose. All repaired valves should be tested for conformance to specifications before they are returned to service. Field repairing of Humphrey valves voids their warranty.

Design a proper system

Always strive to design systems which are safe as well as efficient. Either eliminate potential hazards completely or install safety features which neutralize them.

Give special consideration to any potential for accidental actuation of a valve. Either select a model that resists accidental actuation or mount the valve to prevent unintended actuation.

Consider the adverse consequences of individual component failure and design to prevent or minimize these consequences. Design a system that will fail safe under conditions of pressure variation, pressure loss, or other system failures.

Read the component literature carefully. If a model is not completely understood, do not apply it without first consulting the factory.

Size valves properly. A model having a capacity insufficient to the system may cause the entire system to be inefficient. Always note the size of the valve orifice — this is often more important than the pipe connection.

The circuit drawings in this catalog are intended *only* as examples of circuits in which certain components might typically be used. They are not to be considered recommendations of specific applications. The proper, safe functioning of any system must be insured by the system's designer or user.

Specifications subject to change without notice.
All port connections are available in metric sizes. Specify metric port threads by using letter E as a model number prefix. The bottom number in all drawing dimensions is shown in millimeters.

MH6681 (N)

HUMPHREY PRODUCTS
CSA LR41336

KILGORE AND SPRINKLE ROADS P O BOX 2008, KALAMAZOO MI 49003

The following models are UL RECOGNIZED for component use.

Models 3E1, M3E1 valves; Models DMZ1, MZ1 manifolds.

Models 31E1, 41E1, M31E1, M41E1, MC41E1 valves; Models MM-2 through -7, MMC-2 through -7 manifolds.

Models 062-4E1, 062-4E2, 062E1, 062E2, VO62E1 valves, may be prefixed by T. Models TM-1R through -12R manifolds.

Models 125-4E1, 125E1, V125E1 valves, may be prefixed by T. Models TM-1R through -12R manifolds.

Model 310 may be prefixed by E, EM, ES, ESMP, EV, EVM, EVS, EVSMP, M, S, SMP, V, VM, VS, VSMP, may be suffixed by 2, 21, 39, 50, 81, 87, LL, MOV, RC, or SA, suffixed by UR.

Model 410 may be prefixed by E, EM, ES, ESMP, M, S, SMP, may be suffixed by 21, 39, 50, 70, 81, 87, LL, MOV, RC, or SA, suffixed by UR.

Models 250E1, 250E2.

The following models are UL LISTED for General use.

Model 062-4E1 with or without suffix 21, followed by 36, with or without suffixes 61 and/or 70.

Models 062E1, VO62E1 followed by 2 or 3, followed by 10 or 11, with or without suffix 20 or 21, followed by 36, with or without suffix 61.

Model 125-4E1 may be prefixed by T, with or without suffix 21, followed by 36, with or without suffix 60 or 70,

Model 125E1 may be prefixed by T, suffixed by 2 or 3, followed by 10 or 11, with or without suffix 20 or 21, followed by 36, may be followed by 60.

Model V125E1 followed by 2 or 3, followed by 10 or 11, with or without suffix 20 or 21, followed by 36, may be followed by 60.

Model V125E1 followed by 2 or 3, followed by 10 or 11, with or without suffix 20 or 21, followed by 36.

Models 250-4E1, 250-4E2 with or without suffix 21.

Model 250E1 followed by 2 or 3, followed by 10 or 11, followed by 20 or 21, followed by 36, with or without suffix 61.

Models TM-1L thru -12L manifolds.

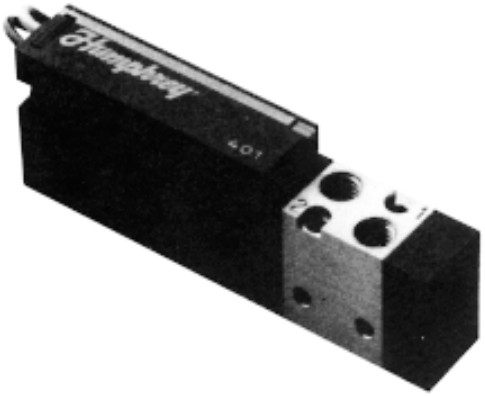
Humphrey 401/402 Micro Solenoid Valves

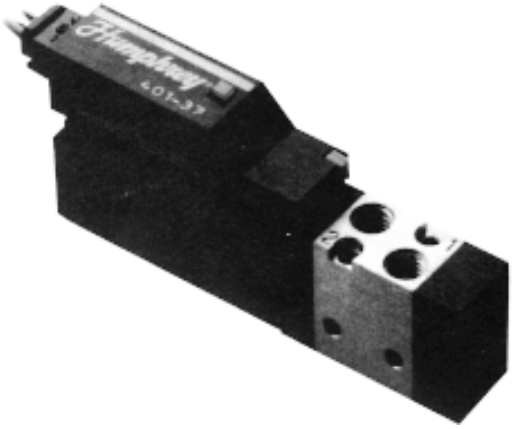
Humphrey introduces the first 10 millimeter-wide micro solenoid air valves designed and manufactured in the United States.

The new 400 Series direct acting micro solenoid valves feature small size, light weight, and a poppet design field proven by years of reliable service in thousands of tough applications worldwide.

Other attributes of these single or double solenoid valves are low AC or DC power consumption, electrical plug connectors, surge suppression circuit, indicator light, and manual override. They can be mounted directly in the media supply line or on two different subbases or two styles of manifolds.

Humphrey's 400 Series valves meet the challenges of new technology's demanding pneumatic control applications.



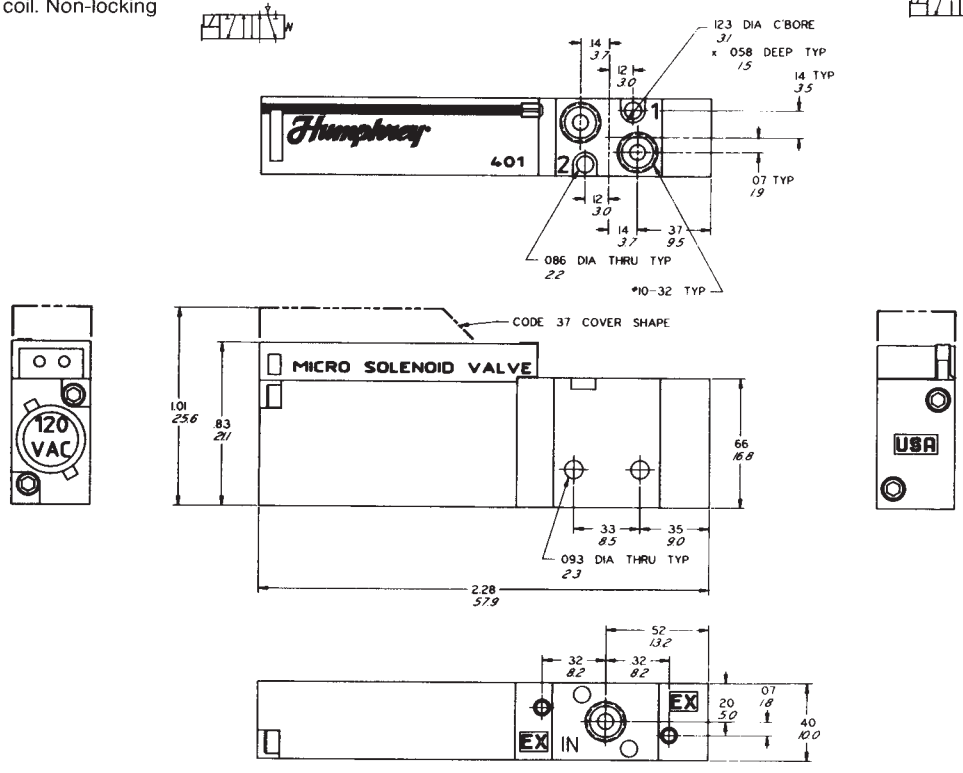


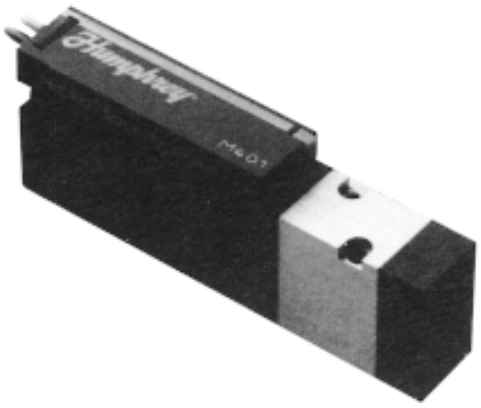
401

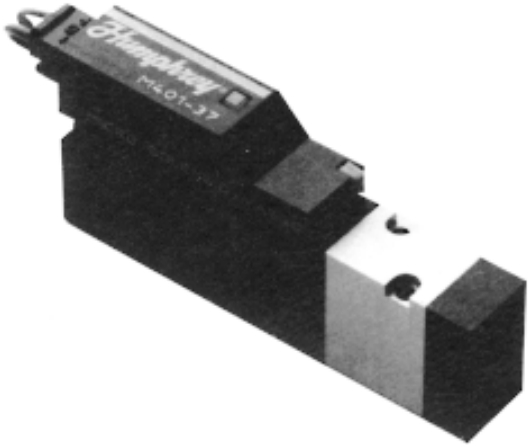
Model 401 is a 4 way, 5 port, 2 position, spring return valve. Direct acting, with a single solenoid and 12 inch lead wires exiting the solenoid cover via rubber grommet. Continuous duty coil. Non-locking manual override. 10-32 threaded IN and Delivery ports. Exhaust ports not threaded. Use in-line or with manifold (MO/MO-70) mounting.

401-37

Model 401-37 is identical to 401. Electrical connector features 12 inch leads pre-wired to custom electrical plug connector which attaches to circuit board within solenoid cover. Integral red LED indicator light illuminates when power is applied to the valve.

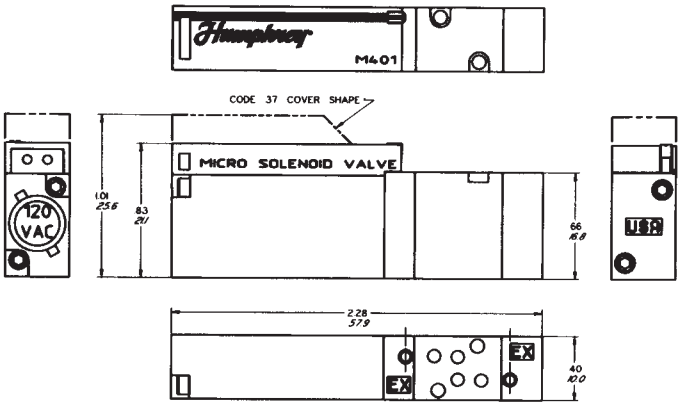




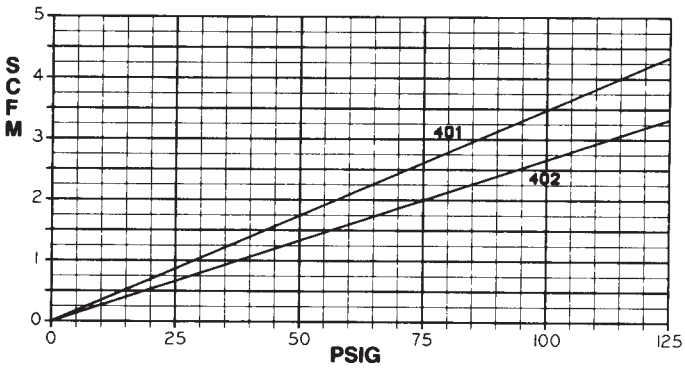


M401

Model M401 is similar to 401. Use with subbase (SO1/SO1-70) or with manifold (MO/MO-70) mounting.



401/402 Air Flow To Atmosphere



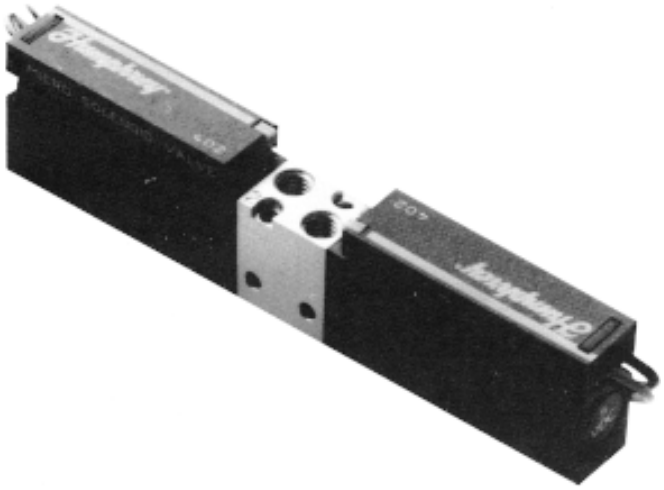
M401-37

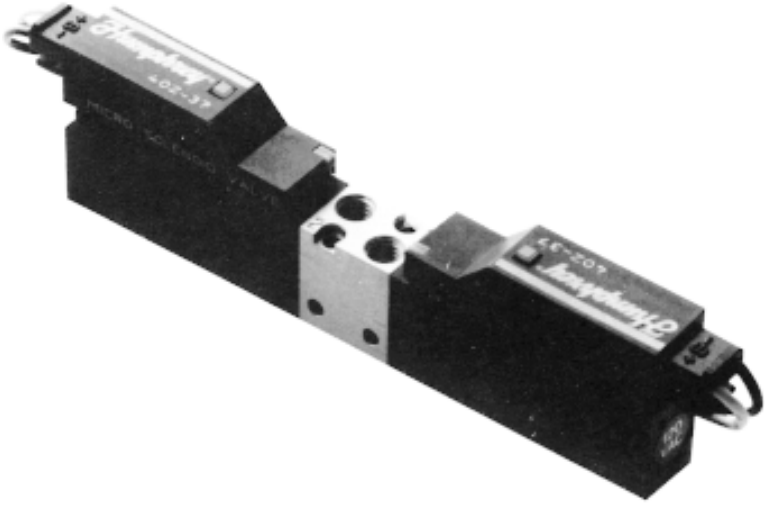
Model M401-37 is similar to 401-37. Use with subbase (SO1/SO1-70) or with manifold (MO/MO-70) mounting.

Specifications

	401 Models
Media	Air, Vacuum, or Inert Gases
Pressure Range	28" Hg. Vacuum to 125 PSIG (8.5 bar)
Ambient Temperature Range	32 to 125°F (0 to 52°C)
Temperature Rise (Any Voltage)	90°F (35°C)
SCFM @ 100 PSIG (7.0 bar)	3.5
C_V	.05
Fill.Exhaust @ 100 PSIG (7.0 bar)	
1 cu. in.	.06/.10 sec.
10 cu. in.	.60/1.0 sec.
100 cu. in.	6.0/10.0 sec.
Leak Rate (Max. allowed)	4 cubic centimeters/minute @ 100 PSIG (7.0 bar)
Type of Operation	Direct Solenoid
Effective Area	.003 square inches (1.98mm²)
Stroke	.018 inches (.46mm)
Power Consumption (AC/DC)	2 Watts
Response Time (On/Off)	.010/.005 sec.
Maximum Cycle Rate (Cycles/Min.)	2400 DC (Grommet) 1200 AC (Code 37) 1200 AC
Voltage Tolerance	± 10% of Rated Voltage
Lubrication	Not Required
Filtration	40 Micron Recommended
Weight	1.12 oz. (32g.)
Materials	Aluminum, Stainless Steel, Buna, Plastic, Steel, Brass, Urethane
Lead Wire	PVC Insulated hook up wire UL 1007, CSA TR-64 300 Volts, 80°C 24 AWG - 7/32 Stranding

Humphrey Micro Valves — Double Solenoid



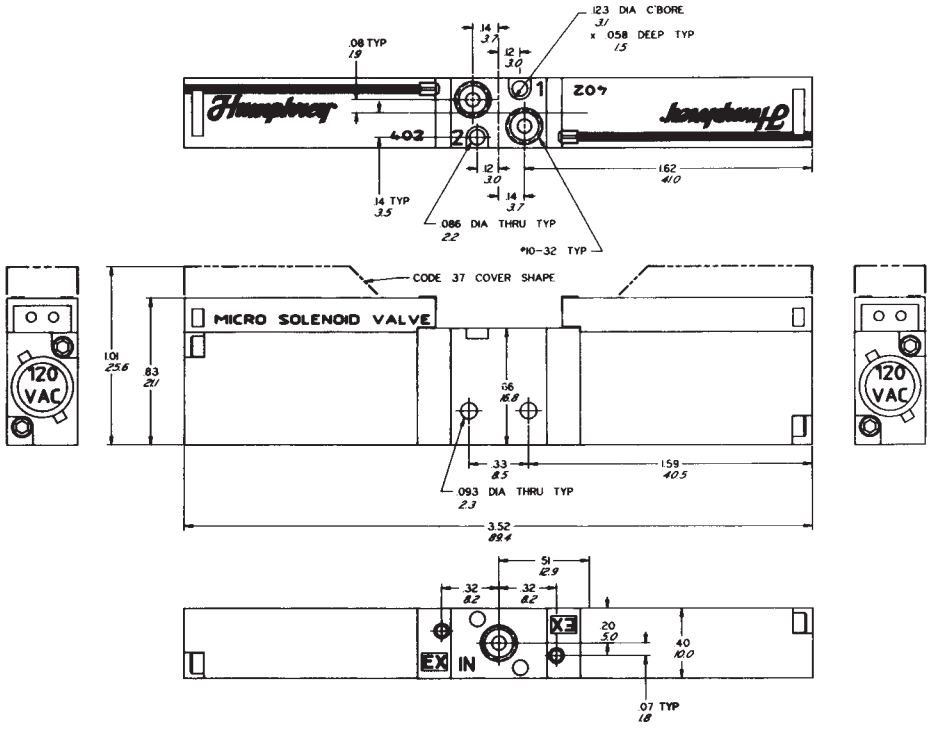


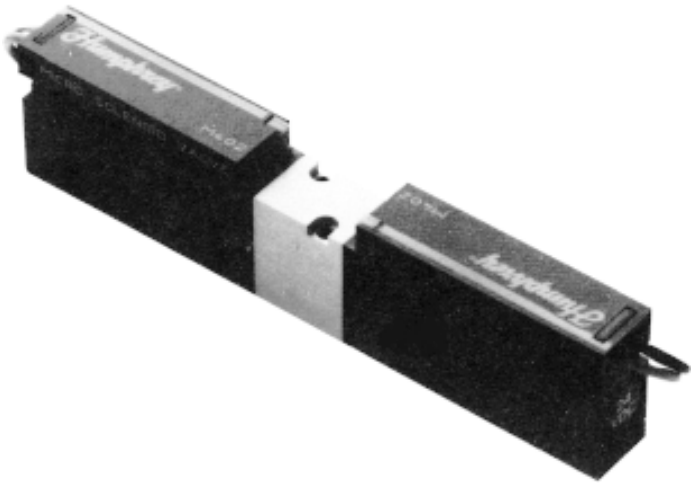
402

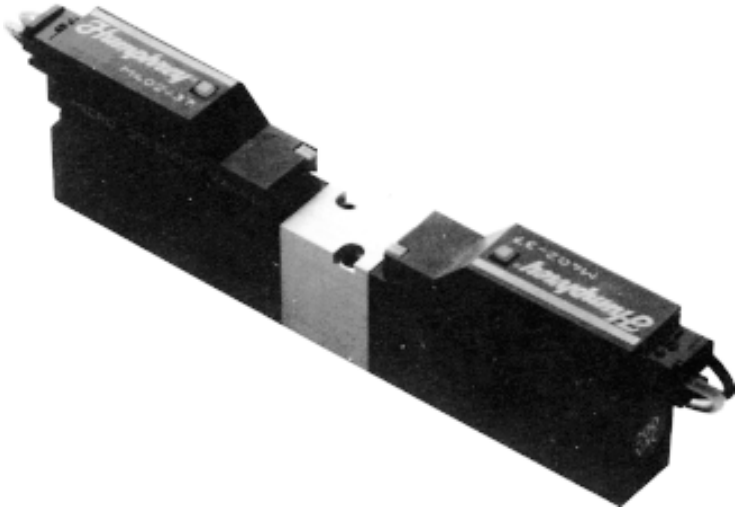
Model 402 is a 4 way, 5 port, 2 position detented valve. Direct acting, with a double solenoid and 12 inch lead wires exiting solenoid covers via rubber grommet. Continuous duty coil. Dual non-locking manual override. 10-32 threaded IN and Delivery ports. Exhaust ports not threaded. Use inline or with manifold (MO/MO-70) mounting.

402-37

Model 402-37 is similar to 402. Electrical connector features 12 inch leads pre-wired to custom electrical plug connector which attaches to circuit board within solenoid cover. Integral red LED indicator light illuminates when power is applied to the valve.

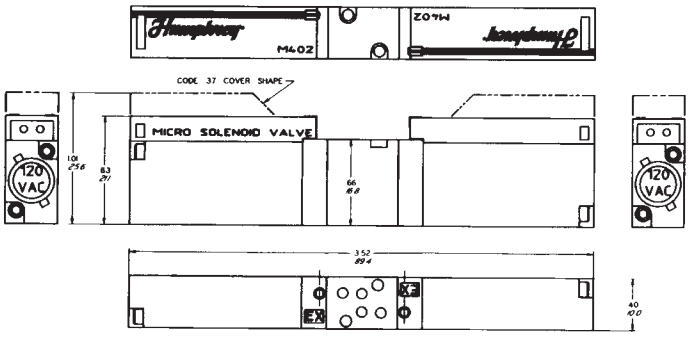






M402

Model M402 is similar to 402.
Use with subbase (SO1/SO1-70) or
with manifold (MOC/MOC-70) mounting



M402-37

Model M402-37 is similar to
402-37. Use with subbase
(SO1/SO1-70) or with manifold
(MOC/MOC-70) mounting.

Specifications

	402 Models
Media	Air or Inert Gases
Pressure Range	30 to 125 PSIG (2 to 8.5 bar)
Ambient Temperature Range	32 to 125°F (0 to 52°C)
Temperature Rise (Any Voltage)	90°F (35°C)
SCFM @ 100 PSIG (7.0 bar)	2.7
C_v	.04
Fill.Exhaust @ 100 PSIG (7.0 bar)	
1 cu. in.	.07/.11 sec.
10 cu. in.	.70/1.1 sec.
100 cu. in.	7.0/11.0 sec.
Leak Rate (Max. allowed)	4 cubic centimeters/minute @ 100 PSIG (7.0 bar)
Type of Operation	Direct Solenoid
Effective Area	.003 square inches (1.98mm²)
Stroke	.018 inches (.46mm)
Power Consumption (AC/DC)	2 Watts
Response Time (On/Off)	.010/.010 sec.
Maximum Cycle Rate (Cycles/Min.)	2400 DC, AC
Voltage Tolerance	± 10% of Rated Voltage
Lubrication	Not Required
Filtration	40 Micron Recommended
Weight	1.92 oz. (54g.)
Materials	Aluminum, Stainless Steel, Buna, Plastic, Steel, Brass, Urethane
Lead Wire	PVC Insulated hook up wire UL 1007, CSA TR-64 300 Volts, 80°C 24 AWG - 7/32 Stranding

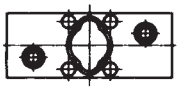
MO MANIFOLDS

MO manifolds accept any combination of 401 or 402 valves using valve's delivery ports as cylinder ports. This simplifies plumbing and increases inventory flexibility. Made of one piece anodized aluminum and available in 2-16 stations, these manifolds have a common inlet and common captured exhaust. Manifold has no cylinder outlet ports. Valve delivery ports (1 & 2) are cylinder outlet ports. Mounting screws and gasket furnished for each manifold station. Available with optional Code 70 flow controls at each station.

MOC MANIFOLDS

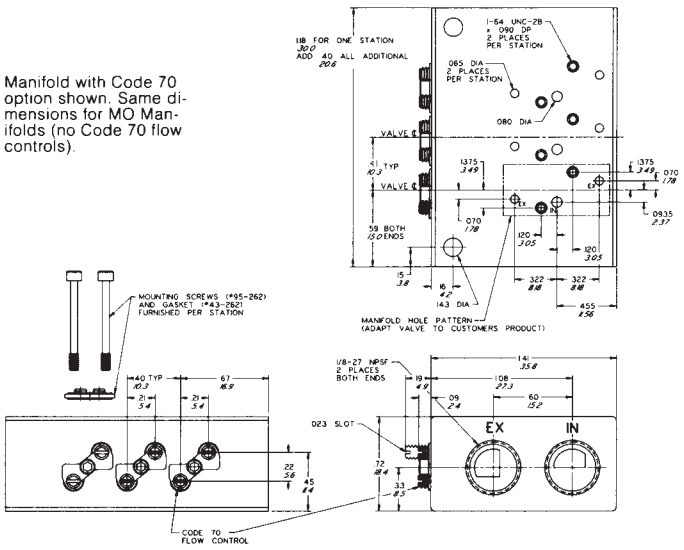
MOC manifolds accept any combination of M401 or M402 manifold valves. Integral cylinder outlet ports (2 per station) permit valve installation or removal without disconnecting any plumbing. Made of one piece anodized aluminum and available in 2-16 stations, these manifolds have a common inlet and common captured exhaust. Manifolds have integral cylinder outlet ports (2 per station). Mounting screws and gasket furnished for each mainfold station. Available with optional Code 70 flow controls at each station.

MO Manifold Gasket Configuration



Gasket #43-262

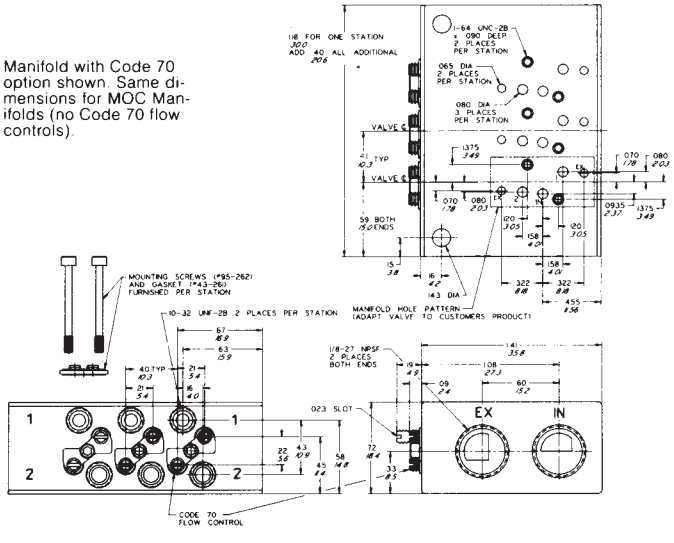
Manifold with Code 70 option shown. Same dimensions for MO Manifolds (no Code 70 flow controls).



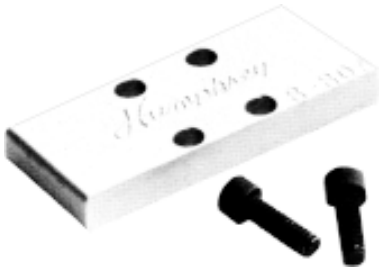
MOC Manifold Gasket Configuration

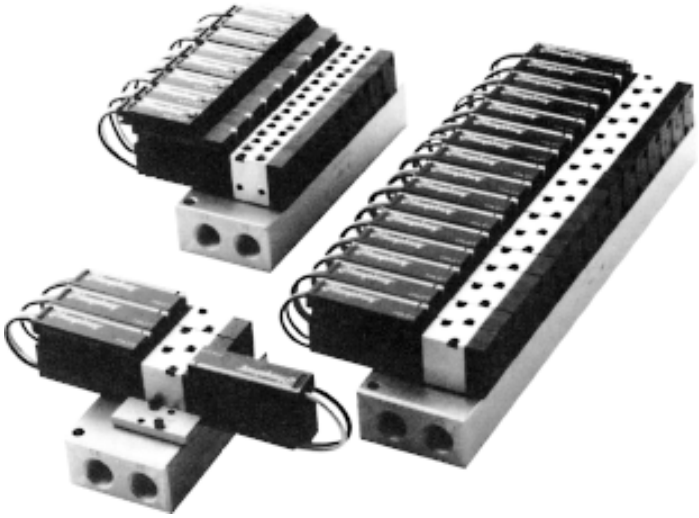
Gasket #43-261

Manifold with Code 70 option shown. Same dimensions for MOC Manifolds (no Code 70 flow controls).



Humphrey Block-off Plate — Valve Manifold Assemblies

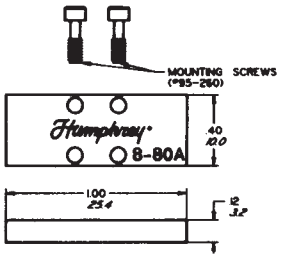




401, 402, 8-80A
on MO3-70 Manifold

BLOCK-OFF PLATE

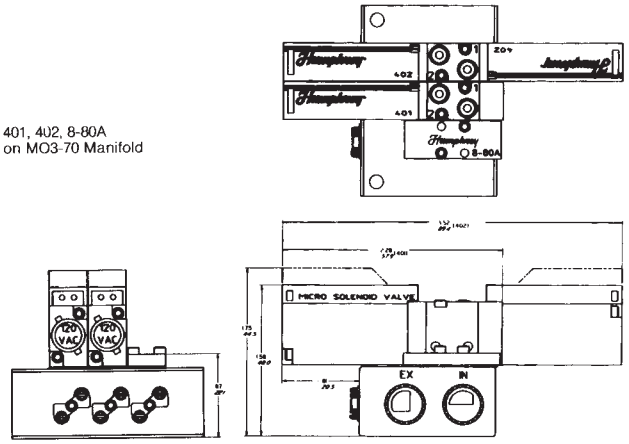
Model 8-80A anodized aluminum block-off plate is used to suspend use of any station on any MO or MOC manifold. It is frequently used to permit future valve additions as related to machine option. Mounting screws furnished; use gasket furnished with manifold station. Weight: 0.07 oz. (2 gms.)



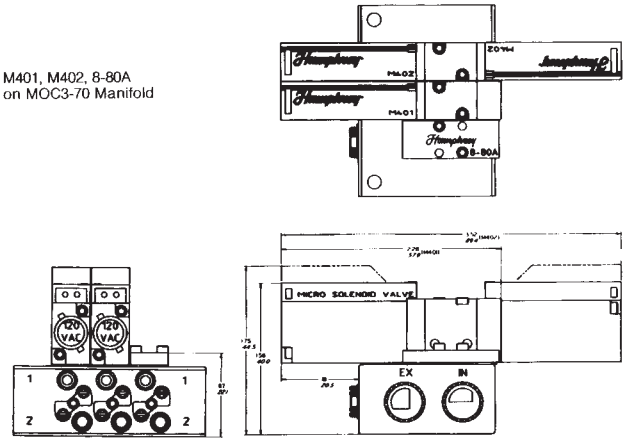
VALVE MANIFOLD ASSEMBLIES

NOTE: Some fittings may protrude beyond valve body side requiring use of washers or shim stock to space valve away from non-manifold mounting surfaces.

401, 402, 8-80A
on MO3-70 Manifold



M401, M402, 8-80A
on MOC3-70 Manifold



Valve Manifold Assemblies

Manifold mounting permits convenient sub-assembly of control valves and other components for installation as a complete pneumatic control unit for the user's product. This procedure saves labor and expense by eliminating individual valve and flow control installation or service of single or multiple valves without disrupting plumbing. Manifold mounting frequently saves space and simplifies plumbing.

Humphrey's manifolds offer the added advantage of accepting combinations of both single and double solenoid valves.

The 8-80A block-off plate can be installed on any station of either manifold.

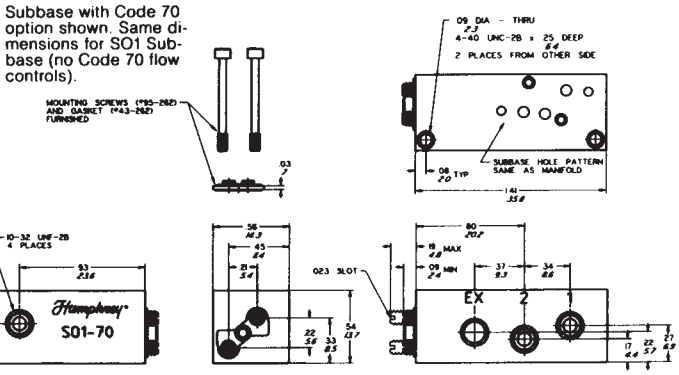
Humphrey SO1-SO1-70 Subbase — Valve Subbase Assemblies

SO1 SUBBASE

SO1 subbase permits independent mounting of any M401, M401-37, M402, or M402-37 valve. Provides any alternative to mounting valve individually with body mounting holes. Provides a permanent plumbing device and facilitates changing valves. Permits captured exhaust of single valve units. Mounting screws and gasket furnished. Weight: 0.6 oz. (17 gms.)

S01-70 SUBBASE

SO1-70 subbase provides the same features as SO1 subbase with the addition of Code 70 flow controls. Saves space, streamlines plumbing and reduces cost.

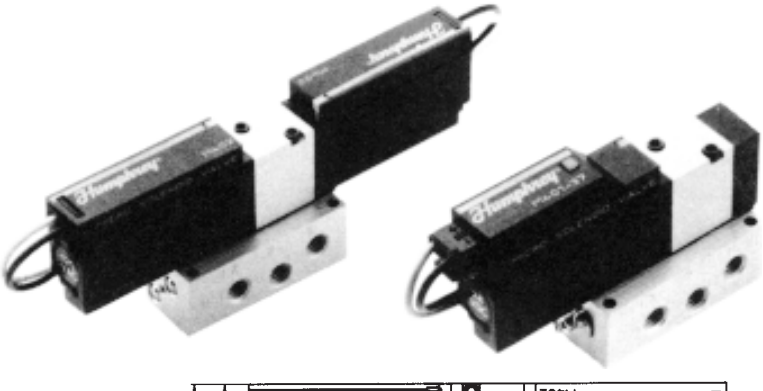


VALVE SUBBASE ASSEMBLIES

Subbase mounting provides the convenience of manifold mounting for single valve units and offers an alternative to mounting valves individually with body mounting holes. Subbases provide a permanent plumbing device which enables valves to be changed quickly without disturbing plumbing. They are also capable of capturing exhaust and can be ordered with Code 70 flow contols.

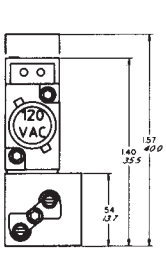
Subbases accept either single or double solenoid valves as well as the 8-80A block-off plate.

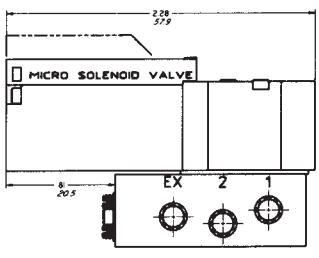
NOTE: Some fitting may protrude beyond valve body side requiring use of washers or shim stock to space valve away from non-manifold mounting surfaces.

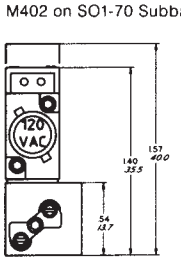


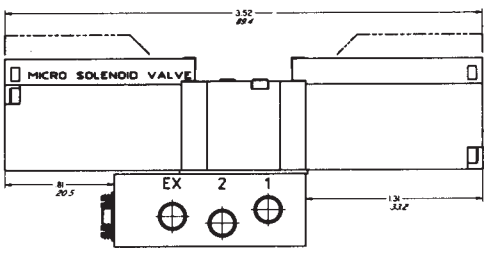
M401 on SO1-70 Subbase

M402 on SO1-70 Subbase









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 (specifically, 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 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
401	0.05	3.5	.06	.60	6.0	.10	1.0	10.0
402	0.04	2.7	.07	.70	7.0	.11	1.1	11.0

Note: Manifolds cause some reduction of flow rates.

Example of how to calculate fill/exhaust times:

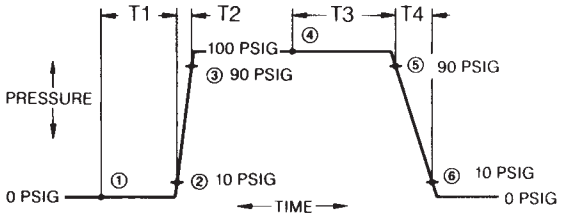
Model 401, 24VDC — Two Air Lines (0.125 I.D. x 36-inch long)
100 PSIG supply — Air Cylinder (1.062-inch bore x 4-inch stroke)
Volume = 0.785 x Diameter squared x stroke or length

Cylinder Volume	= 3.54 cubic inches
Air Line Volume	= 0.44 cubic inches
Total Circuit Volume	= 3.98 or 4 cubic inches

T1 Time to Energize Valve	= 0.010 sec.
Time to Fill 4 cubic inches = 40% of 0.6 sec. for 10 cubic inches	= 0.240 sec.
T3 Time to De-energize Valve	= 0.005 sec.
Time to Exhaust 4 cubic inches = 40% of 1 sec. for 10 cubic inches	= 0.400 sec.
Total Cycle Time	= 0.655 sec.*

*Although this result is not exact, it is sufficient for most application needs and provides a simple, straightforward system.

RESPONSE TIMES



Identification of response time areas:

T1 times are measured from point [1] (valve energization) to point [2] (10% of supply pressure detected at valve outlet port).

T2 times are measured from point [2] (valve energized) to point [3] (90% of supply pressure).

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

T4 times are measured from point [5] (valve energized) to point [6] (90% of supply pressure exhausted).

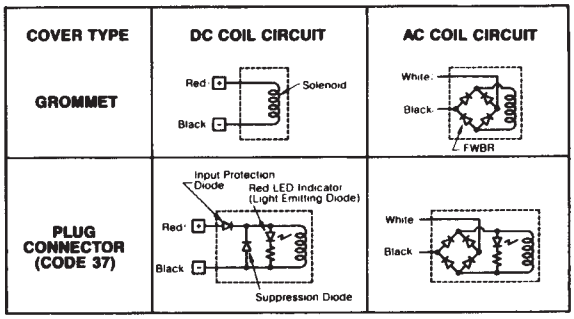
AC/DC Voltages

Model	T1	T2	T3	T3*	T4
401	.010 sec.	.002 sec.	.005 sec.	.014 sec.	.005 sec.
402†	.010 sec.	.002 sec.	.010 sec.	—	.002 sec.

*DC coils with suppression diode and AC coils. Measured at 70°F (21°C) with 100% voltage and 100 PSIG supply. Times shown are median performance of valves tested.

†When de-energized, double solenoid models rely upon pressure to maintain position. Therefore, they may require longer electrical signal duration when used with larger bore cylinders, to permit pressure/flow conditions to stabilize. Transient pressure surges may cause valve shift or leak. Exercise care in selecting valve for specific application.

SOLENOID CIRCUIT SCHEMATICS



Cautions:

1. Valves with plug connector (Code 37) and DC coils incorporate polarity protection. Improper voltage polarity prohibits valve operation; although no damage will result.
2. Both solenoids of couble solenoid type valves (402/M402) should not be energized simultaneously. Energizing both coils results in valve assuming an unpredictable postion.
3. External drive circuitry resulting in solenoid current leakages of greater than three milliamps (AC or DC) may cause improper valve operation.
4. Ensure proper voltage supply per voltage label, ± 10% for AC or DC voltages.

ELECTRICAL SPECIFICATION CHART

All coils are continuous duty and conform to Class B insulation system (266°F/130°C). AC coils rated for 50/60 Hz.

Voltage	Cover Type* Grommet	Cover Type* Code 37	Resistance (Ohms)	Current (Milliamperes)
5VDC	•		12.5	400
5VDC		•	8.7	485
12VDC	•		72.0	170
12VDC		•	63.0	180
24VDC	•		288.0	85
24VDC		•	270.0	90
24VAC	•	•	241.0	95
100VAC	•	•	4,660.0	22
120VAC	•	•	6,750.0	20
200VAC	•	•	18,970.0	11
240VAC	•	•	27,370.0	10

*Grommet - DC has coil only. AC has coil and full wave bridge rectification.
Code 37 - DC has coil, LED, input protection and suppression diodes. AC has coil, LED and full wave bridge rectification.

Resistance and Current are nominal values.

Valve assemblies (coils, circuits, connectors, etc.) are "Hi-Pot" tested to 1,750 VAC for 1 second.

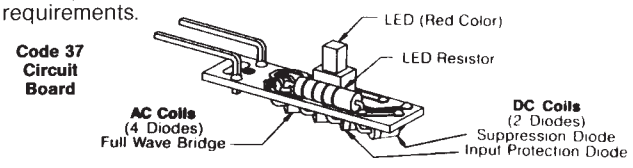
CIRCUIT BOARD COMPONENTS

Drawing shows components incorporated into miniature circuit board used with plug connector type cover (Code 37). Circuit board is not used with grommet type cover except for AC voltages which incorporate full wave bridge diodes. Therefore, suppression and input protection diodes are furnished with Code 37 only.

Suppression diode protects other electronic components from valve's solenoid generated voltage transients ("noise").

Input protection diode prevents circuit (suppression diode/LED) damage in event of improper voltage polarity connection.

Modifications to electrical components and circuitry may be accomplished (space permitting) to satisfy a customer's unique requirements.



401/402 Micro Solenoid Series
#10-32 ports, 4-way, Direct operating

VALVES

	Electrical Plug Connector	Specify Voltage
Option Code	37	See Below
Model 401	SP	SP
M401	SP	SP
402	SP	SP
M402	SP	SP

Available Voltages
5VDC
12VDC
24VDC
100VAC
120VAC
200VAC
240VAC

MANIFOLDS

	Flow Controls	Description
Option Code	70	
MO	SP	2-16 station, annodized aluminum manifold without cylinder ports. Includes mounting screws and gasket.
MOC	SP	2-16 station, annodized aluminum manifold with cylinder ports. Includes mounting screws and gasket.

SUBBASES & ACCESSORIES

Model	Description
SO1	**Subbase Assemply**
	1-258 Subbase
	43-261 Gasket
	95-262 Screws (2 req'd)
	33-260 Ball (2 req'd)
8-80A	Block Off Plate Assembly
	8-80 Block Off Plate
	43-262 Gasket
	95-260 Screws (2 req'd)
SO1-70	Subbase Assembly With Flow Controls
	30-260 Retainer
	90-33 O-Ring (2 req'd)
	97-260 Adjusting Screws (2 req'd)
PL1A	DC Plug Connector Assembly
PL1B	AC Plug Connector Assembly
28-260A	Contacts (Box of 10)*
25-260	Connector
151-11	1/16″ Hex Drive Tool
151-20	Humphrey Handy Wrench

*Order by quantity of boxes only.

HOW TO ORDER

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

Example: To Order Model 401-37 12VDC

4-Way Operation, Single solenoid	(401)
Electrical Plug Connector	(401-37)
Voltage 12VDC	(401-37 12VDC)

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. OS indicates that Option must be ordered separately and is not used as part of the Model Number.

N/C = No charge
NA = Not available
OS = Order separately, additional charge for this option
STD = Standard
SP = Specify, additional charge for this option