

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.

Some 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.

The following are registered trademarks of the companies indicated: Delrin, Zytel, E.I., duPont; Rylton, Phillips Petroleum.

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.

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

MH6681 (N)
CSA LR41336

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 Mini-Mizer® 3-Way Air Valves

* Available with U.L. Rating, consult factory

Mini-Mizer 3-way and 4-way miniature air valves, shown here and on the following pages, are designed to conform to the stringent requirements of today's high-tech applications. Their low-power epoxy-encapsulated coils make them suitable for microprocessor control and their compact design adds little bulk or weight to the end-product.

Mini-Mizer 3-way valves require no lubrication. They are direct-operating, two position, single-solenoid valves that feature quiet operation, low heat rise, and quick-connect electrical spade terminals or optional plug-in electrical connectors.

These versatile valves have body mounting holes that permit mounting in any position: on mounting base, on single- or double-surface manifolds, or directly onto printed circuit boards. (See Options for Mini-Mizer Air Valves on following pages.) Valve exhaust may be captured or muffled as required. (Use Humphrey Muffler #150-30A.)



3E1

Model 3E1 is a universal valve offering four different functions according to piping: normally open, normally closed, diverter, or selector. Sub-base is #10-32 ported. The position of electrical terminals can be changed by rotating valve 180° on sub-base or by rotating the molded coil at the factory.



M3E1

Model M3E1 is a version of the 3E1 for mounting on MZ1 and DMZ1 Series manifold modules. Common normally closed supply. Position of electrical terminals can be changed by rotating valve on the manifold or by rotating the molded coil at the factory.



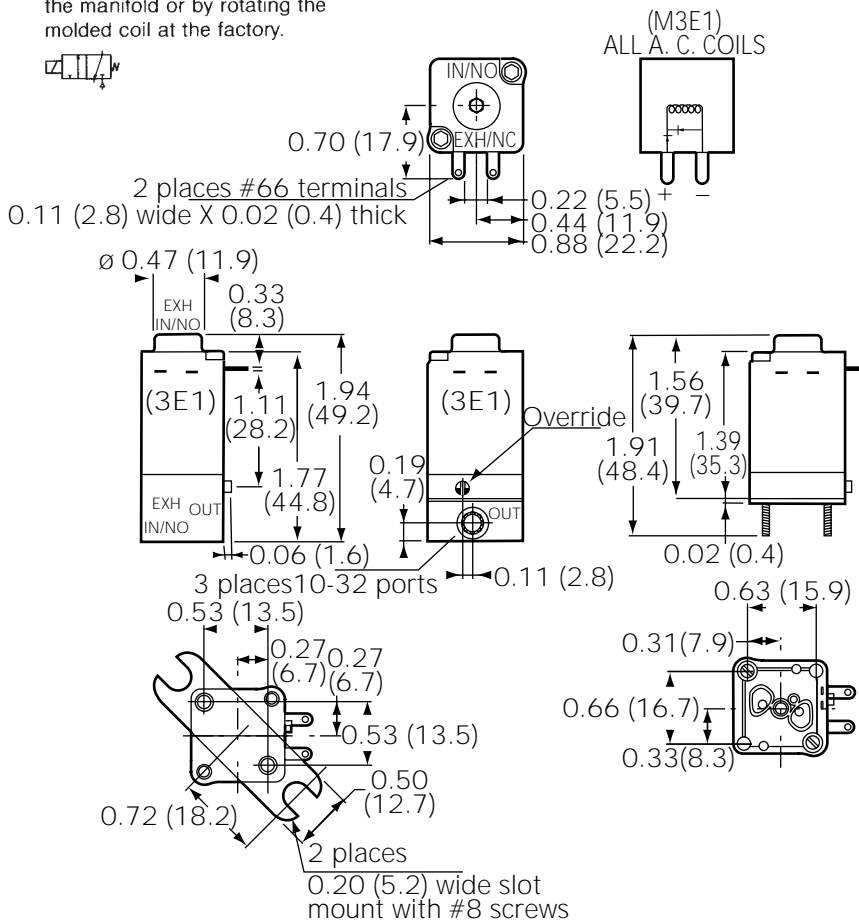
3E1-80

Model 3E1-80 is identical to 3E1. Code 80 features a push type non-locking manual override.



M3E1-80

Model M3E1-80 is identical to 3E1-80. Code 80 features a push type non-locking manual override.





3E1-81

Model 3E1-81 is identical to 3E1. Code 81 features a rotating locking manual override.



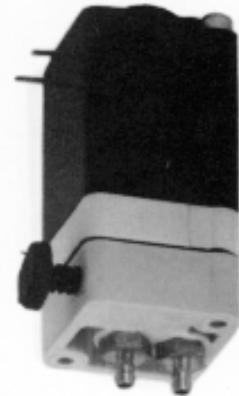
M3E1-81

Model M3E1-81 is identical to 3E1-81. Code 81 features a rotating locking manual override.



M3E1-81-MTL

Model M3E1-MTL is identical to M3E1 but has machine-threaded mounting screws for use on Mini-Mizer MTL and MCTL Series metal manifolds.



3E1-PCM

Model 3E1-PCM is a version of 3E1 designed for mounting directly to printed circuit boards. Valve mounts to PC board with mounting barb which attaches from opposite side of board. Bottom inlet/outlet streamlines plumbing. Pin connectors speed board mounting using either solder connections or pin receptacles. Exhaust can be captured using Humphrey TAC brass fittings and common pneumatic tubing.

Specifications

MEDIA:
Compressed Air (Consult factory for others)

PRESSURE RANGE:
0 to 100 psig (0 to 7.0 bars)

TEMPERATURE RANGE:
0 to 150°F (-17.8 to 65.6°C)

OPERATING SPEEDS:
To 600 CPM

MATERIALS:
Ryton, Epoxy Molded Coil, Stainless Steel, Zinc Plated Steel, Brass, Zytel, Buna N
LUBRICATION Not required
FILTRATION Recommended, 40 Microns Minimum

Air Flow to Atmosphere

Weight

MODEL	25 PSIG (1.7 BARS)		100 PSIG (7.0 BARS)		ACTUAL	
	CFM	LPM	CFM	LPM	LBS	KGS
M/3E1	0.40	11.3	1.3	36.8	0.13	0.06

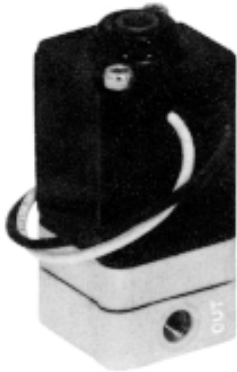
Electrical Specifications

MODEL	VOLTAGE	COIL NUMBER	WATTS	AMPS	OHMS	HEAT RISE (°C)	ON TIME SECONDS	OFF TIME SECONDS
M/3E1	24 DC	46-601	0.5	0.021	1152	11.3	0.005	0.006
	120 AC	46-600	1.0	0.012	5832	16.8	0.005	0.020

Lead Wire: UI Style 1180-2230, 200°C, 300 Volts, Teflon PT FE Insulation, Black and White, #22 AWG.

Fill/Exhaust Times (Seconds)

MODEL	SUPPLY PRESSURE							
	At 50 psig (3.5 bars)				At 100 psig (7.0 bars)			
	Chamber Fill 0-40 psig (0-2.8 bars)		Exhaust 50-10 psig (3.5-.7 bars)		Chamber Fill 0-80 psig (0-5.5 bars)		Exhaust 100-20 psig (7.0-1.4 bars)	
	FILL	EXHAUST	FILL	EXHAUST	FILL	EXHAUST	FILL	EXHAUST
M/3E1	1.480	2.130	16.300	23.800	1.580	2.750	17.000	30.500



3E1-38

Model 3E1-38 is identical to 3E1. Code 38 features 18" (457mm) 22AWG (.065) stranded wire, extending from the coil for electrical connection. Longer, non-standard 72" (1830mm) leads are available as special order. Consult factory.



M3E1-38

Model M3E1-38 is identical to 3E1-38 for mounting on MZ1 or DMZ1 manifolds.



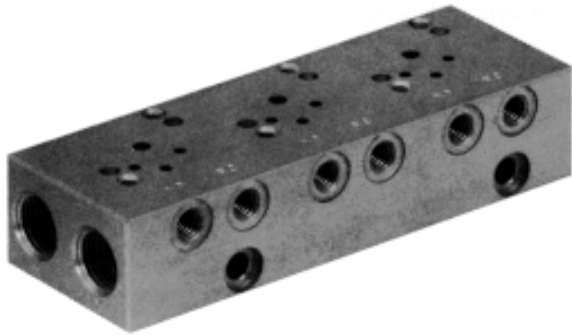
3E1-39

Model 3E1-39 is identical to 3E1. Code 39 is a plug-in (DIN) electrical connector.



M3E1-39

Model M3E1-39 is identical to 3E1-39 for mounting on MZ1 or DMZ1 manifolds.



Mini-Mizer MTL, DMTL, and MCTL Series Metal Manifolds

Manifolds permit centralized location of control valves, simplify plumbing and reduce installation and maintenance costs. Valves and manifolds can be sub-assembled and placed in the end product as complete, control units, saving the time and labor involved by installing valves individually.

Three different series of durable aluminum manifolds are offered as alternatives to the MZ1 and DMZ1 manifold modules. The one-piece aluminum design eliminates the assembly time required for manifold modules. Valves mount to manifold easily with machine threaded mounting screws.

MTL Series. For use with M3E1-MTL valves. Mount one valve per manifold station. Available 1 through 16 stations. Inter-

changeable with MZ1 manifold module, except mounting holes.

DMTL Series. For use with M3E1-MTL valves. Mount two valves per station, one on each side of manifold. Available 1 through 16 stations; accommodates up to 32 valves. Interchangeable with DMZ1 manifold module, except mounting holes.

MCTL Series. For use with M3E1-MTL 3-way valves. Mount one valve per station. Available 2 through 8 stations.



MZ1

Model MZ1 is a manifold module that accepts one Mini-Mizer valve. Individual MZ1 modules snap together and assemble into as many stations as application requires. This design permits easy installation and replacement of valves. Each common station should be connected with a #31-663A Port Connector (one supplied per MZ1), and valves should be mounted only after manifold assembly is complete.

Manifolds and valves can be sub-assembled and placed in the end-product as a unified control element, thereby saving the time and labor of installing components individually. For use with M3E1 or M4E1 valves.



8-5A

Model 8-5A is a mounting base for the 3E1 valve. Furnished with two screws machined for metal and two plastite screws to use with the 3E1 valve.



8-65A

Model 8-65A is a block-off plate for use on MZ1, DMZ1, MTL, DMTL, and MCTL manifolds to suspend the use of a station. It is frequently used to provide for future addition of valves as control functions are added.



DMZ1

Model DMZ1 is similar to the Model MZ1, but accepts two M3E1 valves, one on each major surface of the module. Model DMZ1 may be used in combination with Model MZ1. For use with two M3E1s.

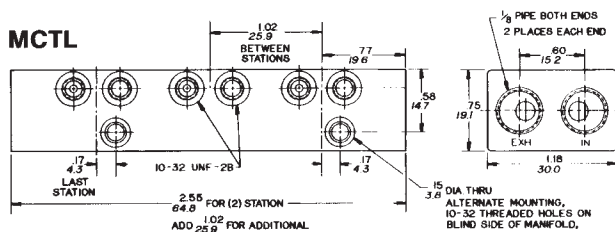
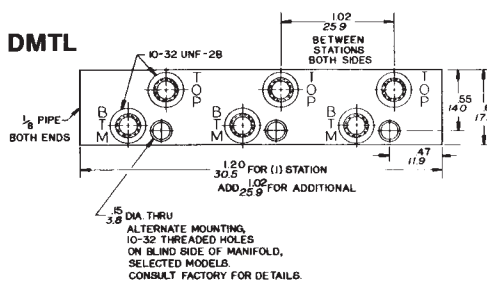
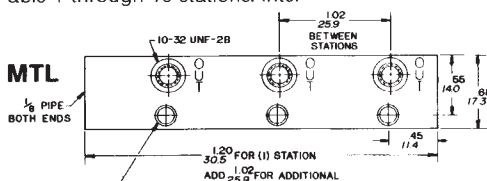
31-663A

Model 31-663A is a port connector for use with MZ1 and DMZ1 manifold modules to supply pressure from one 1/8-inch port to the next.



31-662A

Model 31-662A is a station separator for use with MZ1 and DMZ1 manifold modules to isolate a station



Humphrey Options for Mini-Mizer® Air Valves

Several options are available for Mini-Mizer air valves to extend their versatility and to simplify system design in several applications.



Code 39

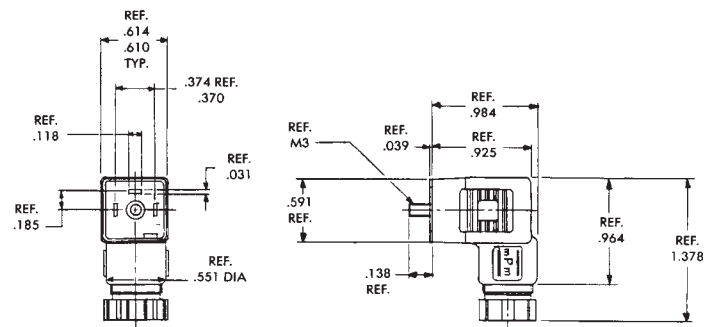
Humphrey Code 39 is an internationally accepted plug-in electrical connector available for all Mini-Mizer 3-way valves. This connector features screw-together sockets, which form a fast, easy, and secure solderless electrical connection.

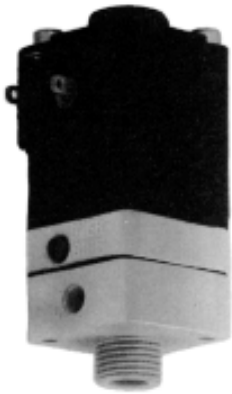


Sockets (Order separately)

Model HS-2. This socket is available for all Mini-Mizer valves. Color is black.

Model HS-2L. This socket is available for Mini-Mizer valves with 5VDC, 12VDC, and 24VDC. Has indicator light and is housed in clear plastic. Specify voltage when ordering.





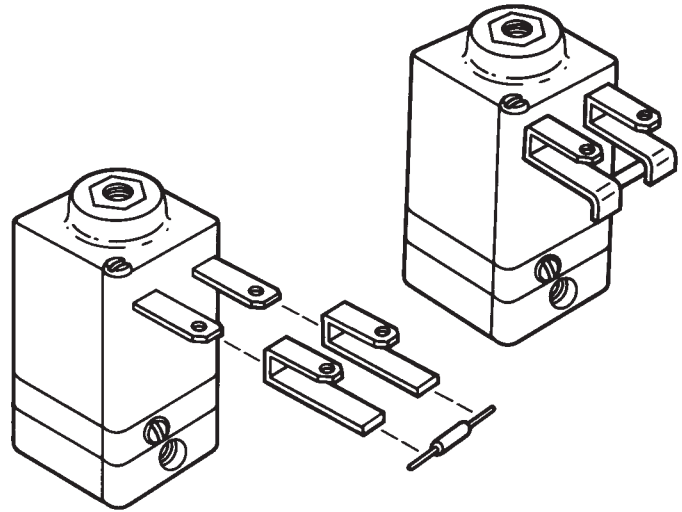
3E1-39-81-BOU

Model 3E1-BOU is a Model 3E1 Mini-Mizer valve equipped with a threaded bottom outlet that permits close connection to an air-piloted valve, air cylinder, or similar device. This permits reduction of "dead" air volumes, conserves consumption of compressed air or other media, and promotes faster response. "BOU" base is brass.



3E1-TSD

Model 3E1-TSD is a 3E1 Mini-Mizer air valve equipped with integral voltage-suppression diodes to protect drive components from voltage spikes, such as those generated by the collapse of the magnetic field when a coil is de-energized. The elimination of external voltage suppressors simplifies system design. Available for DC voltages only.



28-651A

Model 28-651A is a terminal adaptor for voltage suppression diodes to permit customer field installation on standard dual-terminal 3-way valves. Two adaptors are

required per valve. Adaptors are supplied in bags of ten each. (Single 1000 volt, 1 amp. silicon diodes are supplied separately. Part #47-63 in bags of 10.)

MINI-MIZER SERIES

#10-32 ports, 3-way & 4-way, Direct operating

VALVES

Option Code	Mounting Base	Spade Terminals	Flying Leads (18")	DIN Connector	Flow Control	Manual Override		Specify Voltage with option code	
						non-locking	locking	AC	DC
			38	39	70	80	81	AC	DC
Model 3E1	OS	STD	SP	SP	NA	SP	SP	SP	N/C
3E1-BOU	NA	STD	SP	SP	NA	SP	SP	SP	N/C
3E1-PCM	NA	STD	NA	NA	NA	SP	SP	SP	N/C
3E1-ADP	NA	STD	SP	SP	NA	SP	SP	SP	N/C
3E1-TSD	OS	STD	SP	SP	NA	SP	SP	SP	N/C
M3E1	NA	STD	SP	SP	NA	SP	SP	SP	N/C
M3E1-MTL	NA	STD	SP	SP	NA	SP	SP	SP	N/C

MANIFOLDS

Model	Description
MZ1	Manifold module. Accepts one M3E1 valve.
DMZ1	Manifold module. Accepts two M3E1 valves.
MTL*	Metal manifold. Accepts one M3E1-MTL valve per station.
DMTL*	Metal manifold. Accepts two M3E1-MTL valves per station.
MCTL*	Metal manifold with captured exhaust.

*You put in number of stations to complete model number. Example: MTL-4 Multi-pressure application (MZ1 only), specify "w/separate supply."

ACCESSORIES

Model	Description
8-5A	Mounting Base, with 2 screws.
PF**	Plug Fitting, #10-32.
BF**	Barbed Fitting, #10-32 thread to 1/8" O.D. hose.
BF1**	Barbed Fitting, 1/4" O.D. hose.
PBF**	Barbed Fitting, 1/8" pipe.
150-30A**	Muffler, #10-32 thread.
31-663A	Port Connector for MZ1 or DMZ1 (formerly 31-661A).
31-662A	Station Separator for MZ1 or DMZ1 (formerly 31-660A).
8-65A	Block-off Plate for MZ1 or DMZ1.
HS-2	DIN Connector for use w/Code 39.
HS-2L	DIN Connector . . . w/light for use w/Code 39 (5VDC, 12VDC, 24VDC only).
28-650A**	Insulated receptacles.
28-651A**	Suppression, Diode Terminal.
47-63A**	1000V, 1 amp, Silicon Diode.

**Order by quantity of bags only.

NOTE: Valves, Manifolds, and Accessories are shipped detached, ready to be mounted according to specific application requirements.

HOW TO ORDER

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

Example: To Order Model 3E1-81 12VDC

3-Way Operation	3E1
Rotating locking manual override	(3E1-81)
Voltage 12VDC	(3E1-81 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	STD=Standard
NA =Not available	SP=Specify, additional charge for this option
OS =Order separately, additional charge for this option	