



Manufacturer of Air Control Valves

MAC VALVES, INC.

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We are pleased to announce the release and availability of the MI/O-67® Fieldbus Platform. Our initial release includes several different protocol options in addition to several modules to ensure a complete system package. Below are some of the general features of the platform.

- MI/O-67® utilizes existing MAConnect® technology with MI/O-67® specific part numbers
- 5 protocols offered for flexibility of different customer systems
- Digital, Analog and PowerPlus™ modules to accommodate any I/O or additional valves needed
- Designed to meet IP67 washdown specifications (with appropriate valve series modifications)

The remainder of this bulletin outlines specific details on each module and provides information on ordering for both the MI/O-67® platform and various MAConnect® valve series.

MI/O-67® Communications Module

The Communications Module is the brains of the MI/O-67® platform and is the minimum required module to implement a fieldbus solution. There are 5 protocols available:

- EtherNet/IP®
- EtherCAT®
- POWERLINK®
- PROFINET®
- Modbus/TCP®

Each Communication Module is capable of driving up to 32 solenoids (32 singles, 16 doubles max or any combination of the two up to 32 solenoids) on the MAConnect® stack. The module has a capability of outputting 8 A max (0.5 A max per channel) to the MAConnect® stack. You can connect up to 12 additional add-on modules to each Communication Module and have 8A shared across those additional modules. All of the MI/O-67® modules operate on a 24VDC negative common setup. The node is attached to the MAConnect® stack via a valve series specific adapter.

The Communications Modules is available in both a 7/8" 4-pin mini and 7/8" 5-pin mini power configuration and incorporates two Ethernet M12 ports for pass through communication to other network devices. The valve power is brought in on different pins than the electronics power, for isolation purposes, and both have the capability to handle up to 8A.



In addition to the hardware information laid out above there are additional software and training tools available for distributor and customer use. These software tools include digital manuals, IP configuration tool, Webconfig tool, and Add On Instructions (AOI) profiles for each module. The associated configuration files (EDS, ESI, etc.) are available on both the MAC Valves website and through our authorized distributors - MAC Distribution Network (MDN) – www.macvalves.com/distributors . Videos are posted to the MAC Valves YouTube® page to show simple configuration tips and techniques - <https://www.youtube.com/channel/UCo0r68iGvJJYBqogfAW7wjQ>

All modules attach via binding clip assemblies (4 clips come with each communications module and 2 clips come with each additional module). You will not need to order the clips separately for assembly, except to stocking spares. Please note that each MI/O-67® assembly requires an end plate kit (M-M0001-01) and associated MI/O-67® valve series adapter.

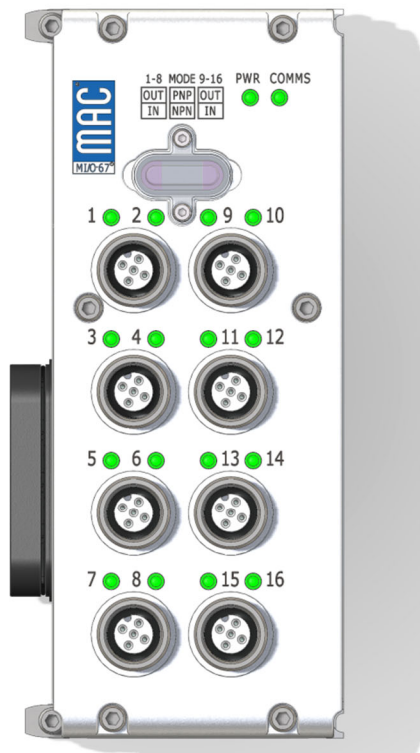


MI/O-67® Digital I/O Module

The Digital I/O module allows for flexibility and configurability in a single part number. With the MAC Digital I/O module you can change the entire module between NPN and PNP input mode and will also have control over the number of inputs and outputs. The configuration options for I/O include (configurable through dip switches):

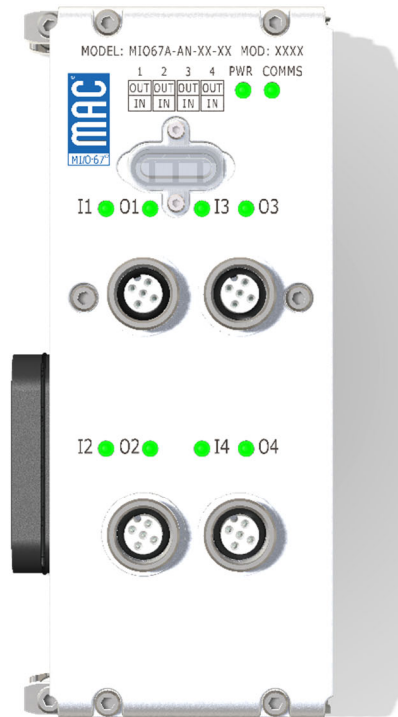
- 0 inputs, 16 outputs
- 16 inputs, 0 outputs
- 8 inputs, 8 outputs

Each channel has 2 I/O points per M12 connector and has fault detection as a standard. Max output is 0.5A per channel from the shared 8A electronics power.



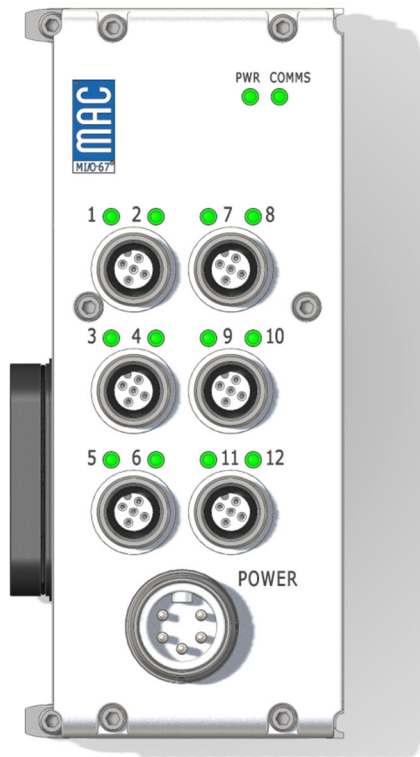
MI/O-67® Analog I/O Modules

The Analog I/O modules are available in either current (4-20 mA) or voltage (0-10 VDC) for the MI/O-67® platform. Like the Digital I/O module, these modules are also dip switch configurable for inputs and outputs. Each Analog I/O module comes with a selectable input or output per M12 connector. Each module also includes fault detection as standard.



MI/O-67® PowerPlus™ Module

The PowerPlus™ module gives you an additional 12 output points at 0.5A per channel. The setup is similar to the Digital Module in that there are two outputs per M12 connector. The PowerPlus™ module requires you to bring in up to an additional 6A of independent power via a 7/8" 5-pin mini power connector to power these additional outputs for valves and other devices. The power is isolated to the individual module outputs and gets communication power from the Communication Module.

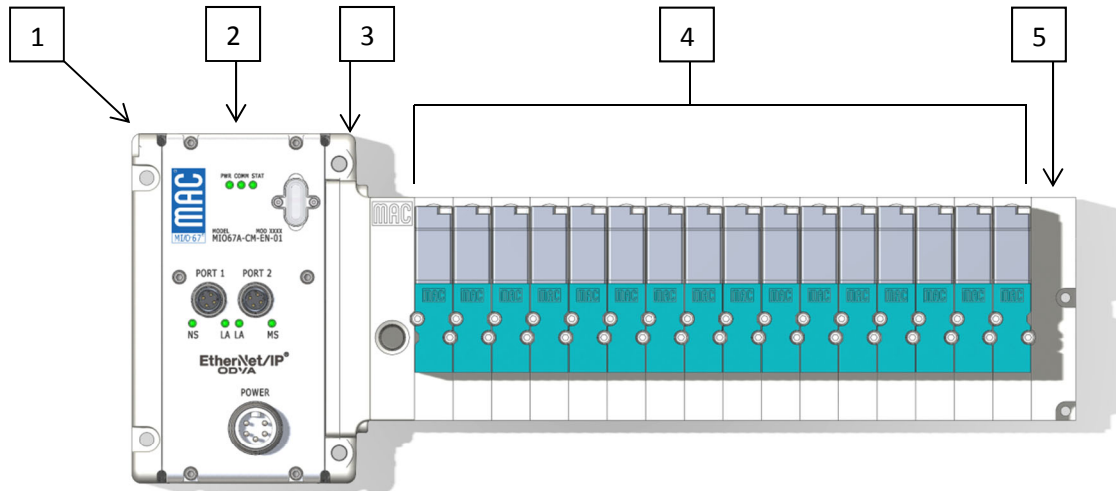


MI/O-67® MACConnect® Series

There are three different MACConnect® series adapters available which are the 36/46, 42, and 92 series. In the past with smaller MACConnect® series you were limited to 16 solenoids; with the release of the MI/O-67® MACConnect® series part numbering, you now can utilize up to 32 solenoid outputs as a standard (only 32 solenoid output boards will be available on MI/O-67® MACConnect® series). Please note that on the new 36/46 and 42 series MACConnect® bases there is a limitation of 26 solenoids that may be energized at a given time if you are using 5.4W coils. Additional releases will be added as new adapters are developed. As with previous MACConnect® series releases, bases can be wired for single or double solenoid and you will need to order these as such. Note that a single solenoid valve placed on a base wired for double solenoid will consume two outputs.

With further inquiries please reach out to your local MAC distributor (www.macvalves.com/distributor) to provide technical assistance and with support in ordering of MI/O-67® and the accompanied MACConnect® series valves.

36/46 Series

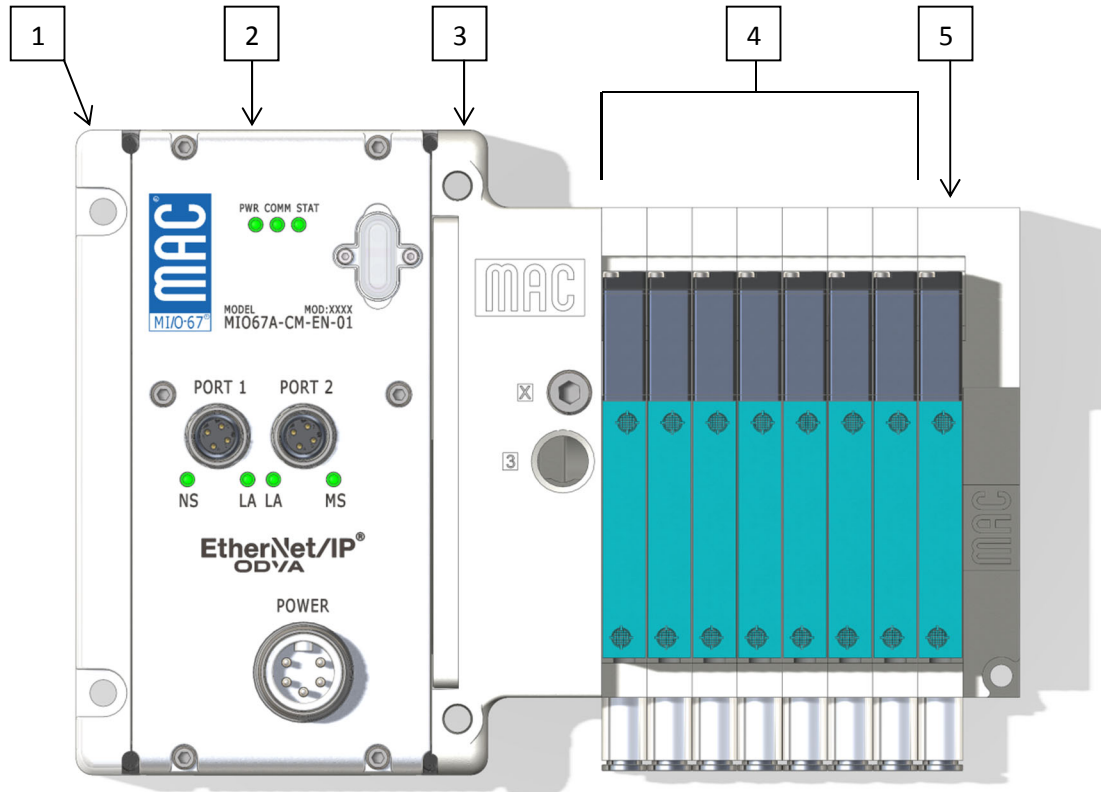


BOM for Above Stack:

1. (1) M-M0001-01
2. (1) MIO67A-CM-EN-01
3. (1) M-46019-01
4. (16) 46A-LMA-1C-JDAP-1FA
5. (1) M-46018-01-16

- End-Plate Kit for MI/O-67®
- MI/O-67® EtherNet/IP® Communications Module
- 46 Series MI/O-67® MACConnect® Interface Adapter
- 46 Series Valves with MI/O-67® Bases
- 46 Series MACConnect® End-Plate Kit

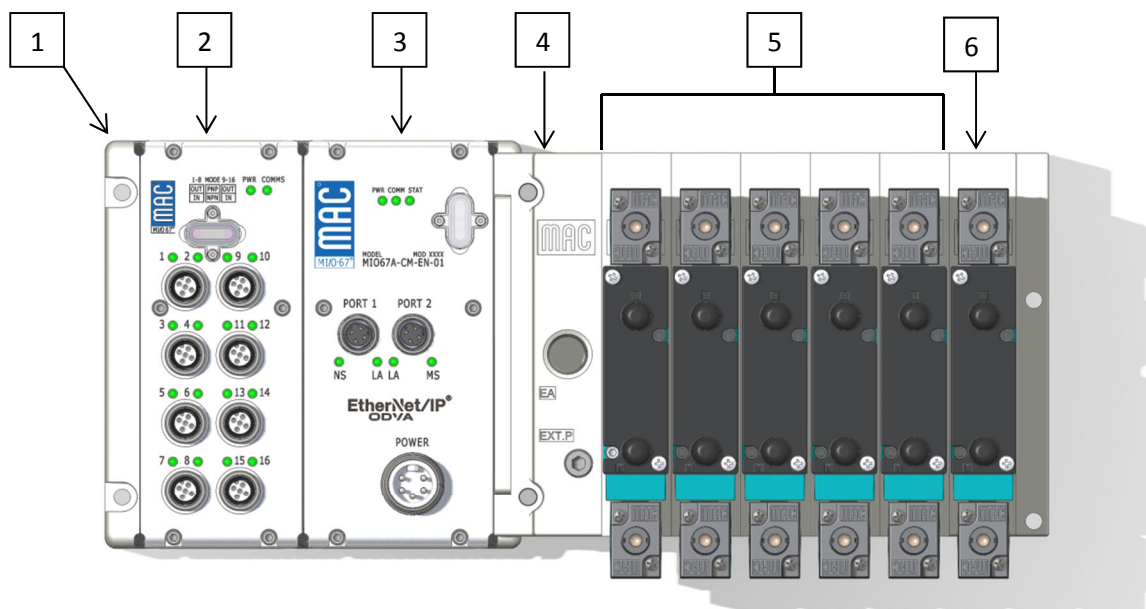
42 Series



BOM for Above Stack:

- | | |
|-----------------------------|---|
| 1. (1) M-M0001-01 | End-Plate Kit for MI/O-67® |
| 2. (1) MIO67A-CM-EN-01 | MI/O-67® EtherNet/IP® Communications Module |
| 3. (1) M-42023-01-08 | 42 Series MI/O-67® MACConnect® Interface Adapter |
| 4. (7) 42A-AMA-D11-GDAP-1DJ | 42 Series Middle Station Valves with MI/O-67® Bases |
| 5. (1) 42A-AMA-D31-GDAP-1DJ | 42 Series End Station Valve with MI/O-67® Base |

92 Series

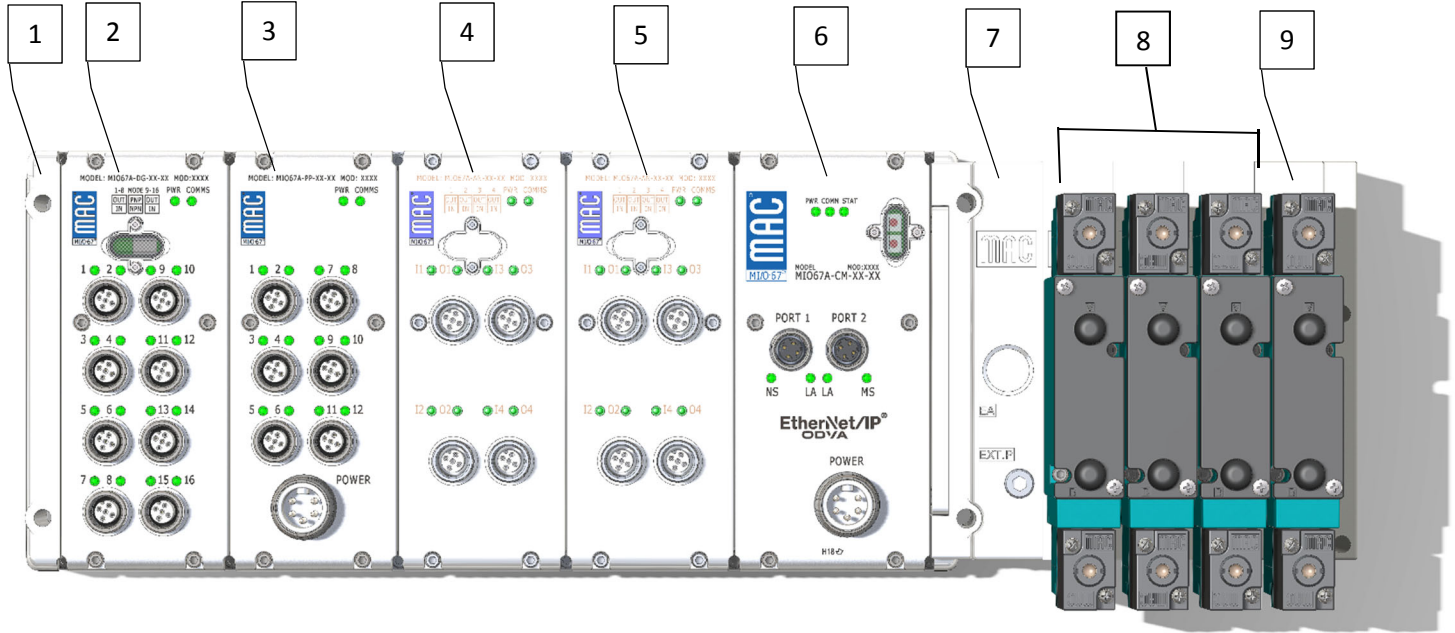


BOM for Above Stack:

1. (1) M-M0001-01
2. (1) MIO67A-DG-01-01
3. (1) MIO67A-CM-EN-01
4. (1) M-92048-01-06
5. (5) 92B-BAB-B1K-DM-DDAP-1DM
6. (1) 92B-BAB-B3K-DM-DDAP-1DM

- End-Plate Kit for MI/O-67®
- MI/O-67® Digital I/O Module
- MI/O-67® EtherNet/IP® Communications Module
- 92 Series MI/O-67® MACConnect® Interface Adapter
- 92 Series Middle Station Valves with MI/O-67® Bases
- 92 Series End Station Valve with MI/O-67® Base

92 Series Loaded Stack



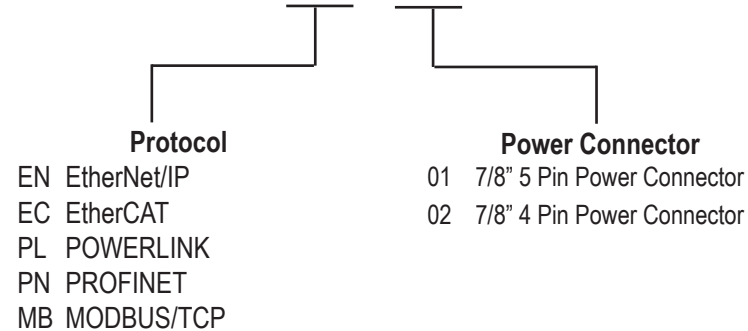
BOM for Above Stack:

- | | | |
|--------|-------------------------|---|
| 1. (1) | M-M0001-01 | End-Plate Kit for MI/O-67® |
| 2. (1) | MIO67A-DG-01-01 | MI/O-67® Digital I/O Module |
| 3. (1) | MIO67A-PP-01-01 | MI/O-67® PowerPlus™ Module |
| 4. (1) | MIO67A-AN-01-02 | MI/O-67® Configurable 0-10 VDC Analog I/O Module w/ 24VDC Power |
| 5. (1) | MIO67A-AN-02-02 | MI/O-67® Configurable 4-20 mA Analog I/O Module w/ 24VDC Power |
| 6. (1) | MIO67A-CM-EN-01 | MI/O-67® EtherNet/IP® Communications Module |
| 7. (1) | M-92048-01-06 | 92 Series MI/O-67® MACConnect® Interface Adapter |
| 8. (3) | 92B-BAB-B1K-DM-DDAP-1DM | 92 Series Middle Station Valves with MI/O-67® Bases |
| 9. (1) | 92B-BAB-B3K-DM-DDAP-1DM | 92 Series End Station Valve with MI/O-67® Base |



How To Order MI/O-67® Module

MIO67A - CM - XX - XX



Additional Modules

MIO67A-DG-01-01	Configurable Digital I/O
MIO67A-AN-01-01	0-10 VDC Analog I/O
MIO67A-AN-02-01	4-20 mA Analog I/O
MIO67A-AN-01-02	Configurable 0-10 VDC Analog I/O with 24 VDC Power
MIO67A-AN-02-02	Configurable 4-20 mA Analog I/O with 24 VDC Power
MIO67A-PP-01-01	Power Plus
M-M0001-01	End Plate Assembly
N-M0001	Binding Clip Assembly



How To Order

92 Series MAConnect® for MI/O-67®

92B - X X X - X X X - DX - D X X X - X X X

Pilot Valve

Valve Function	Body Type and Exhaust Options	Body Electrical Options	Port Size and Thread Type	Manifold Configuration
0 Base Only	0 Base Only	0 Base Only	0 Valve Only	0 Valve Only
A Sgl Sol Sgl Pressure	A Plug-In Std Exh	A No Light in Top	B 1/4" NPTF	1 Side Cyl. Ports (Middle Station)
B Dbl Sol Sgl Pressure	C* Plug-In w/Pilot Exh to Main Exhaust	B Light in Top	C 3/8" NPTF	2 Bottom Cyl. Ports (Middle Station)
C Sgl Sol Dual Pressure		F Suppression Diode, Blocking Diode & Light	E 1/4" BSPPL	3 Side Cyl. Ports (End Station)
D Dbl Sol Dual Pressure			F 3/8" BSPPL	4 Bottom Cyl. Ports (End Station)
E Dbl Sol 3 Pos Closed Center			H 1/4" BSPTR	5 Side Cyl. Ports- Selector Manifold (Middle Station)
F Dbl Sol 3 Pos Open Center			J 3/8" BSPTR	
G Dbl Sol 3 Pos Press Center				
H Dbl Sol 3 Pos Dual Press Press Cen				
J Dbl Sol 3 Pos Dual Press Close Cen				
K Dbl Sol 3 Pos Dual Press Open Cen				
L Sgl Sol Sgl Press w/Mem Spring				
N Sgl Sol Dual Press w/Mem Spring				

*Must use "DU" Pilot Body

Note:

MI/O-67® Modules Are Always On The Left With The Stack To The Right And Cylinder Ports Facing You.

Order Example

1	M-M0001-01	MI/O-67® End Plate Assembly
1	MIO67A-CM-EN-01	MI/O-67® EtherNet/IP
1	M-92048-01-07	Interface Adapter (Int Pilot, NPT Threads, For 7 Valves) Assembly
6	92B-AAB-C1J-DM-DDAP-1DM	6 Middle Station Valves, Sgl Sol, Light In Top, Int Pilot, Side Cyl, 3.8" NPTF
1	92B-AAB-C3J-DM-DDAP-1DM	1 End Station Valve, Sgl Sol, Light In Top, Int Pilot, Side Cyl, 3/8" NPTF

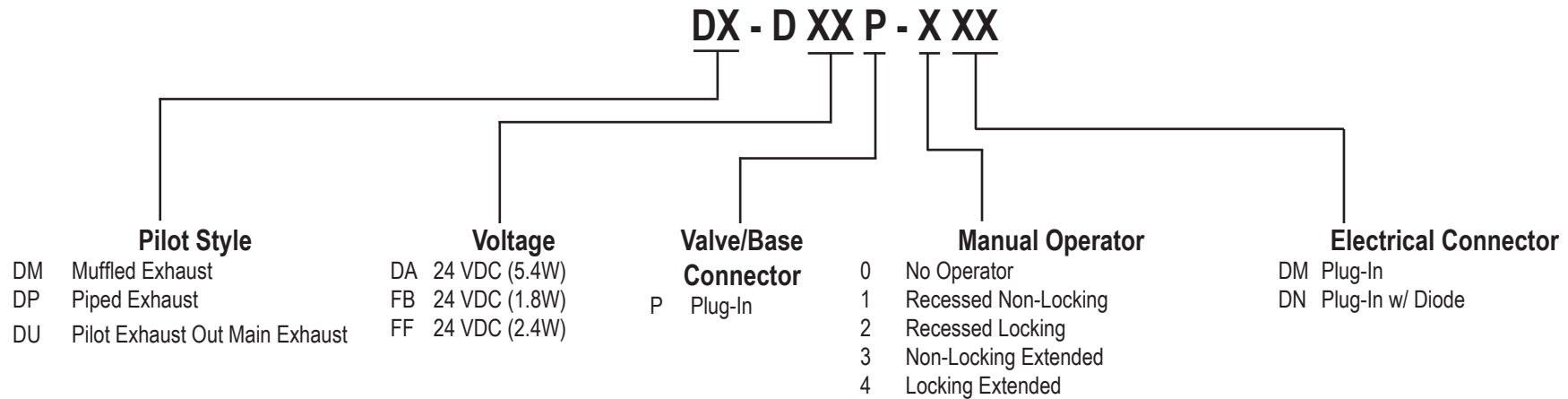
Int/Ext Pilot

MAConnect® Plug-In for MI/O-67®

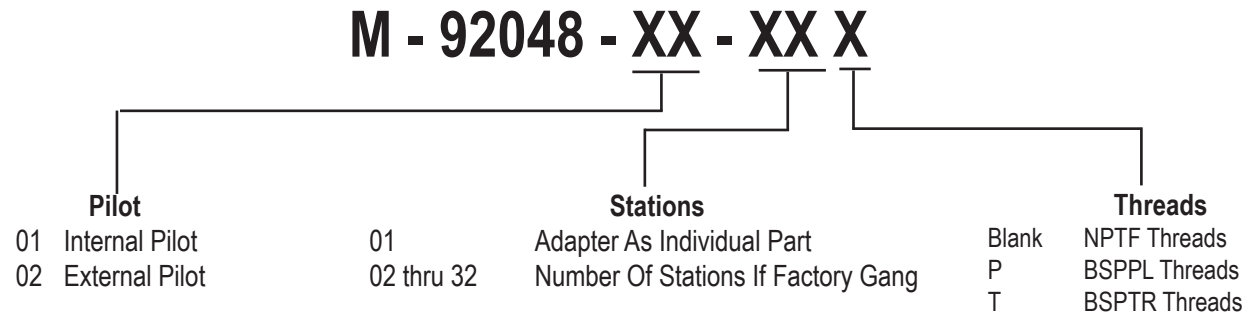
0	Valve Only
Internal Pilot	
J	Sgl. Solenoid Plug-In (32 Outputs)
K	Dbl. Solenoid Plug-In (32 Outputs)
External Pilot	
S	Sgl. Solenoid Plug-In (32 Outputs)
T	Dbl. Solenoid Plug-In (32 Outputs)



How To Order MI/O-67® 92 Series Pilot Valve

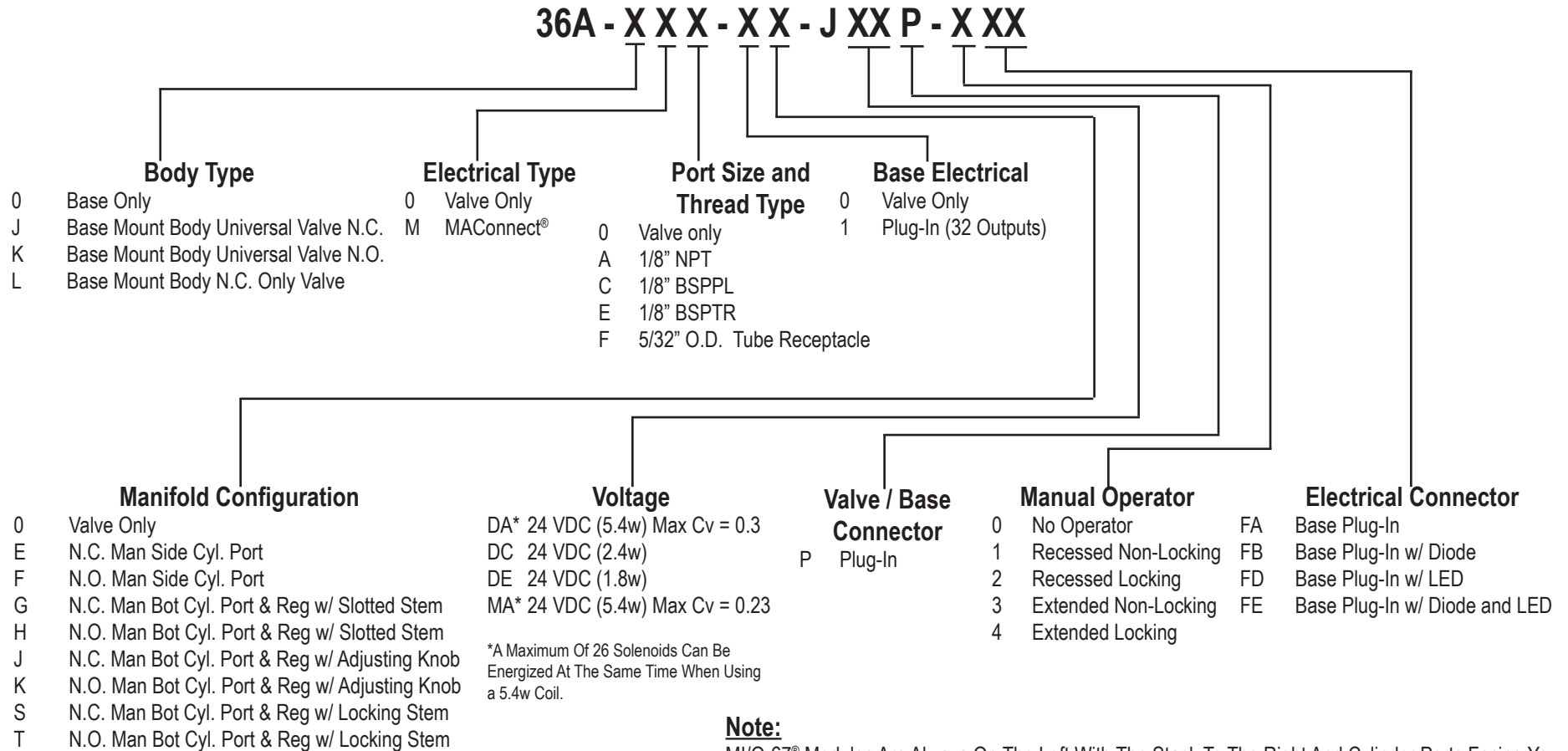


How To Order MI/O-67® Interface Adapter for 92 Series



How To Order

36 Series MAConnect® for MI/O-67®



Note:

MI/O-67® Modules Are Always On The Left With The Stack To The Right And Cylinder Ports Facing You.

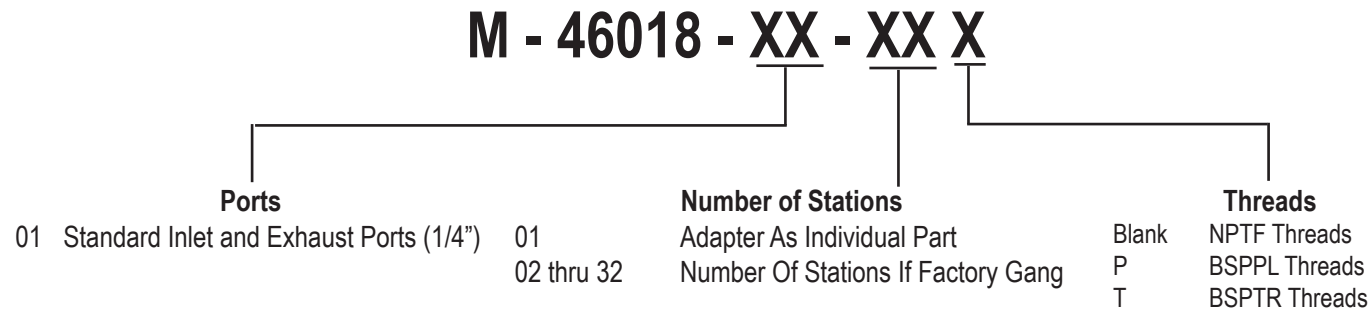
Order Example

1	M-M0001-01	MI/O-67® End Plate
1	MIO67A-CM-EN-01	MI/O-67® EtherNet/IP
1	M-46019-01	MI/O-67® Interface Adapter w/ NPTF Ports
6	36A-JMA-1E-JDAP-FA	6 Middle Station Valves, Normally Closed Universal w/ Normally Closed Manifold And NPTF Ports
1	M-46018-01-06	End Plate Assembly w/ NPTF Ports For 6 Valves



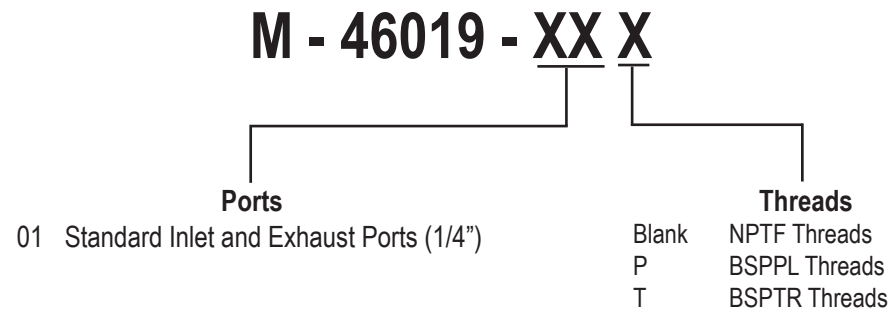
How To Order

MI/O-67® End Plate Kit for 36 Series



How To Order

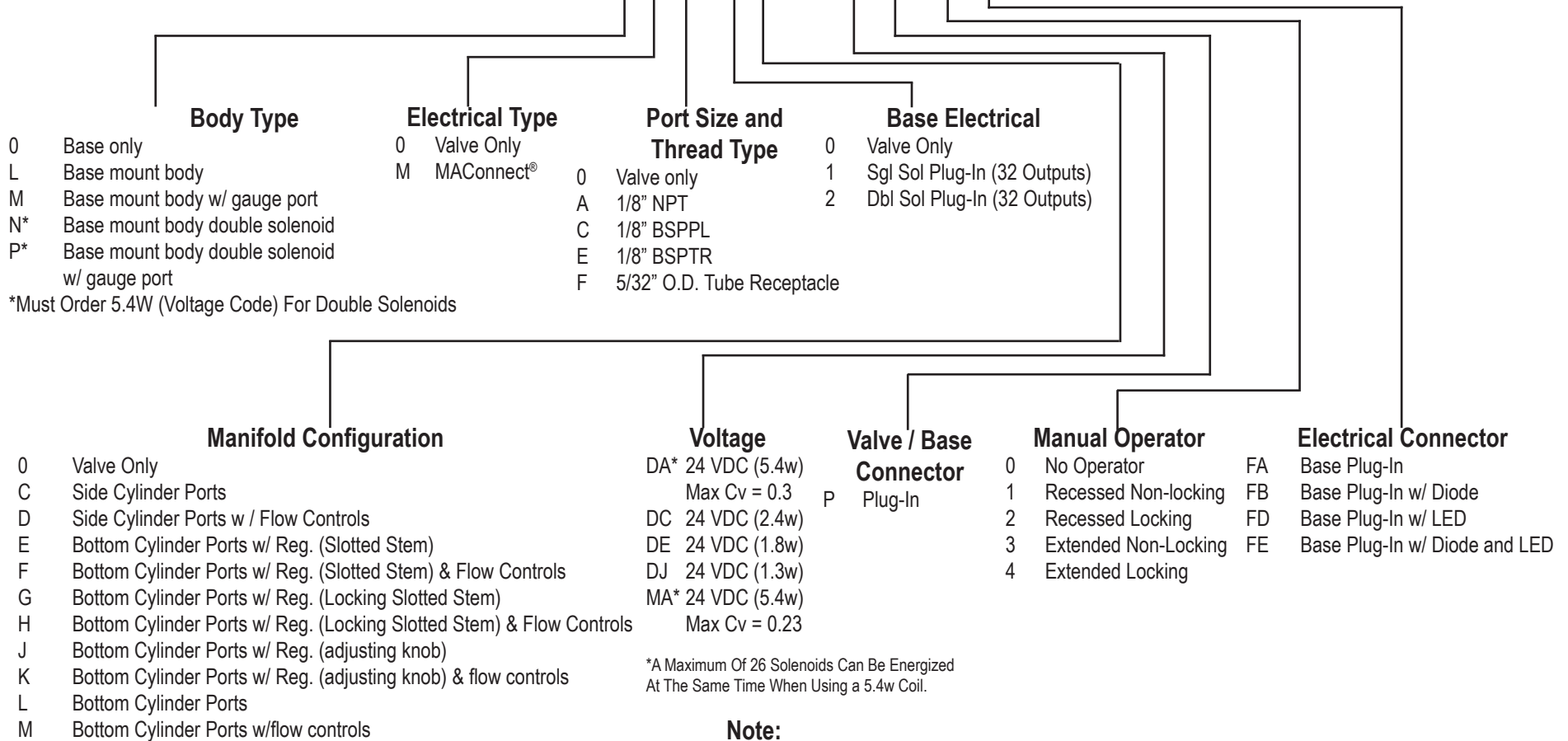
MI/O-67® Interface Adapter for 36 Series



How To Order

46 Series MAConnect® for MI/O-67®

46A - X X X - X X - J XX P - X XX



Note:

MI/O-67® Modules Are Always On The Left With The Stack To The Right And Cylinder Ports Facing You.

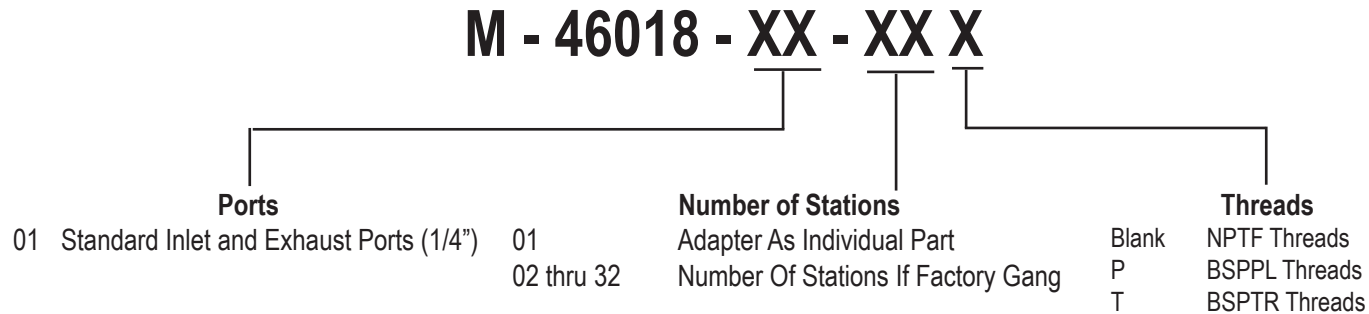
Order Example

1	M-M0001-01	MI/O-67® End Plate
1	MIO67A-CM-EN-01	MI/O-67® EtherNet/IP
1	M-46019-01	MI/O-67® Interface Adapter w/ NPTF Ports
6	46A-LMA-1C-JDAP-FA	6 Middle Station Valves, w/ 32 Outputs And NPTF Ports
1	M-46018-01-06	End Plate Assembly w/ NPTF Ports For 6 Valves



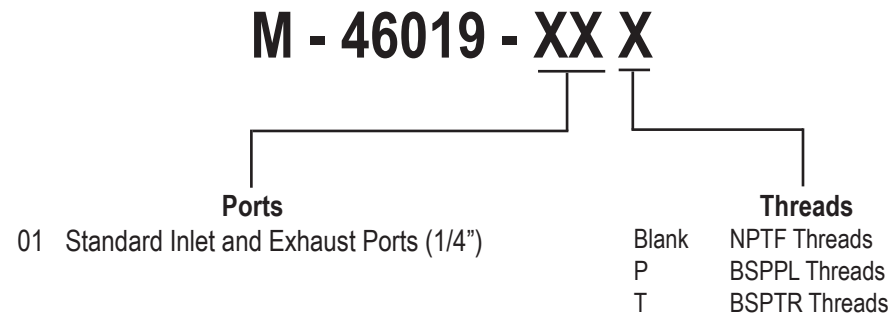
How To Order

MI/O-67® End Plate Kit for 46 Series



How To Order

MI/O-67® Interface Adapter for 46 Series



How To Order

42 Series MAConnect® for MI/O-67®

42A - X X X - X X X - GXXP - X XX

Solenoid Assembly

Valve Function		Pilot Exhaust Options		Internal / External Pilot And Body Plug-In		Port Size and Thread Type	
0	Base Only	0	Base Only	0	Base Only	0	Valve Only
A	2 Position Sgl Press Sgl Solenoid	M	Pilot Exh Muffled	A	Int Pilot Sgl Press	A	#10-32
B	2 Position Sgl Press Dbl Solenoid	P	Pilot Exh Piped #10-32	B	Int Pilot Dual Press (From #3)	B	M5 (NPTF thru ports)
C	2 Position Dual Press Sgl Solenoid	R	Pilot Exh Piped M5	C	Int Pilot Dual Press (From #5)	D	6mm O.D. Tube Receptacle (NPTF thru ports)
D	2 Position Dual Press Dbl Solenoid	U	Pilot Exh Out Main Exh	D	Ext Pilot From Base	E	1/4" O.D. Tube Receptacle (NPTF thru ports)
E	3 Position Closed Center				Double Solenoid	F	M7 (NPTF thru ports)
F	3 Position Open Center			E	Int Pilot Sgl Press w/ LED	G	M5 (BSPPL thru ports)
H	3 Position Dual Press Press Center			F	Int Pilot Dual Press (From #3) w/ LED	J	6mm O.D. Tube Receptacle (BSPPL thru ports)
R	2 Position Sgl Solenoid Universal			G	Int Pilot Dual Press (From #5) w/ LED	K	1/4" O.D. Tube Receptacle (BSPPL thru ports)
S	2 Position Dual Solenoid Universal			H	Ext Pilot From Base w/ LED	L	M7 (BSPPL thru ports)
				J	Int Pilot Sgl Press w/ LED and Diode	M	M5 (BSPTR thru ports)
				K	Int Pilot Dual Press (From #3) w/ LED and Diode	P	6mm O.D. Tube Receptacle (BSPTR thru ports)
				L	Int Pilot Dual Press (From #5) w/ LED and Diode	R	1/4" O.D. Tube Receptacle (BSPTR thru ports)
				M	Ext Pilot From Base w/ LED and Diode	S	M7 (BSPTR thru ports)

Note:

MI/O-67® Modules Are Always On The Left With The Stack To The Right And Cylinder Ports Facing You.

Order Example

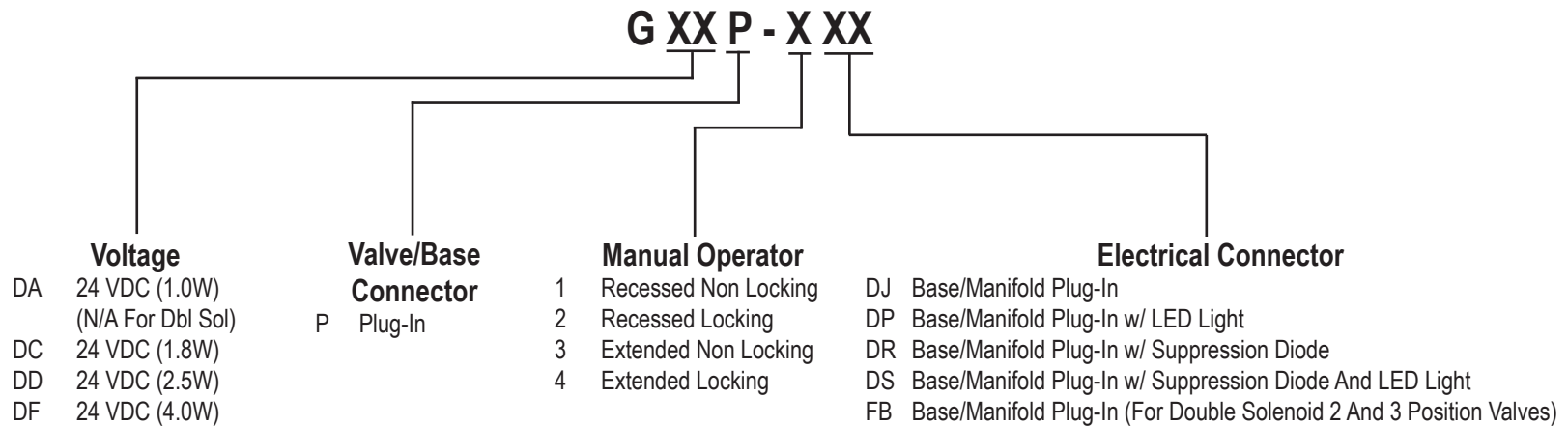
1	M-M0001-01	MI/O-67® End Plate
1	MIO67A-CM-EN-01	MI/O-67® EtherNet/IP
1	M-42023-01-06	MI/O-67® Interface Adapter, 6 Stations w/ NPTF Ports
5	42A-AMA-A11-GDAP-1DJ	5 Middle Station Valves w/ #10-32 Ports
1	42A-AMA-A31-GDAP-1DJ	End Station Valve w/ NPTF Threads And #10-32 Cylinder Ports

Manifold Configuration		Int/Ext Pilot MAConnect® Plug-In for MI/O-67®	
0	Valve Only	0	Valve Only
1	Side Cyl. Ports (Middle Station)	1	Int Pilot Sgl. Solenoid Plug-In (32 Outputs)
2	Bottom Cyl. Ports (Middle Station)	2	Int. Pilot Dbl. Solenoid Plug-In (32 Outputs)
3	Side Cyl. Ports (End Station)	5	Ext. Pilot Sgl. Solenoid Plug-In (32 Outputs)
4	Bottom Cyl. Ports (End Station)	6	Ext. Pilot Dbl. Solenoid Plug-In (32 Outputs)



How To Order

MI/O-67[®] 42 Series Solenoid Assembly



Note: A Maximum Of 26 Solenoids Can Be Energized At The Same Time When Using a 5.4w Coil.

How To Order

MI/O-67[®] Interface Adapter for 42 Series

