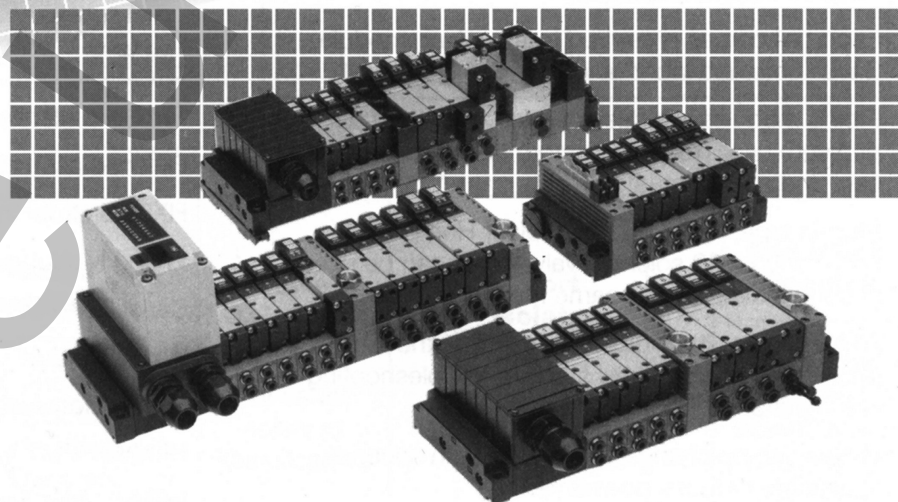


FM - SOLID MANIFOLD

Solid Manifolds

distributed by:



Humphrey[®]

MAKING AUTOMATION WORK

HUMPHREY FM SOLID MANIFOLD – HX88M SERIES

The new Humphrey FM Solid Manifold is a collection of valves, vacuum generators, wiring modules, and piping modules that comes to you in a completed manifold assembly, customized to your specific requirements.

The labor intensive tasks of assembly, wiring, plumbing, and mounting are virtually eliminated.

You order the components you want, and it arrives at your door ready for you to mount to your equipment, connect to your PLC and hook up to your actuators.

Both compact and versatile, the FM Manifold is also supremely useful for a wide range of applications, from the control of individual machines and processes, to full-fledged factory automation.

You can combine both directional control valves and vacuum generating devices on the same manifold.

What's more, the entire unit can be operated by a serial relay communication module that also conveniently mounts directly on the manifold. You can control up to 32 manifolds and 512 solenoid valves through one twisted pair cable.

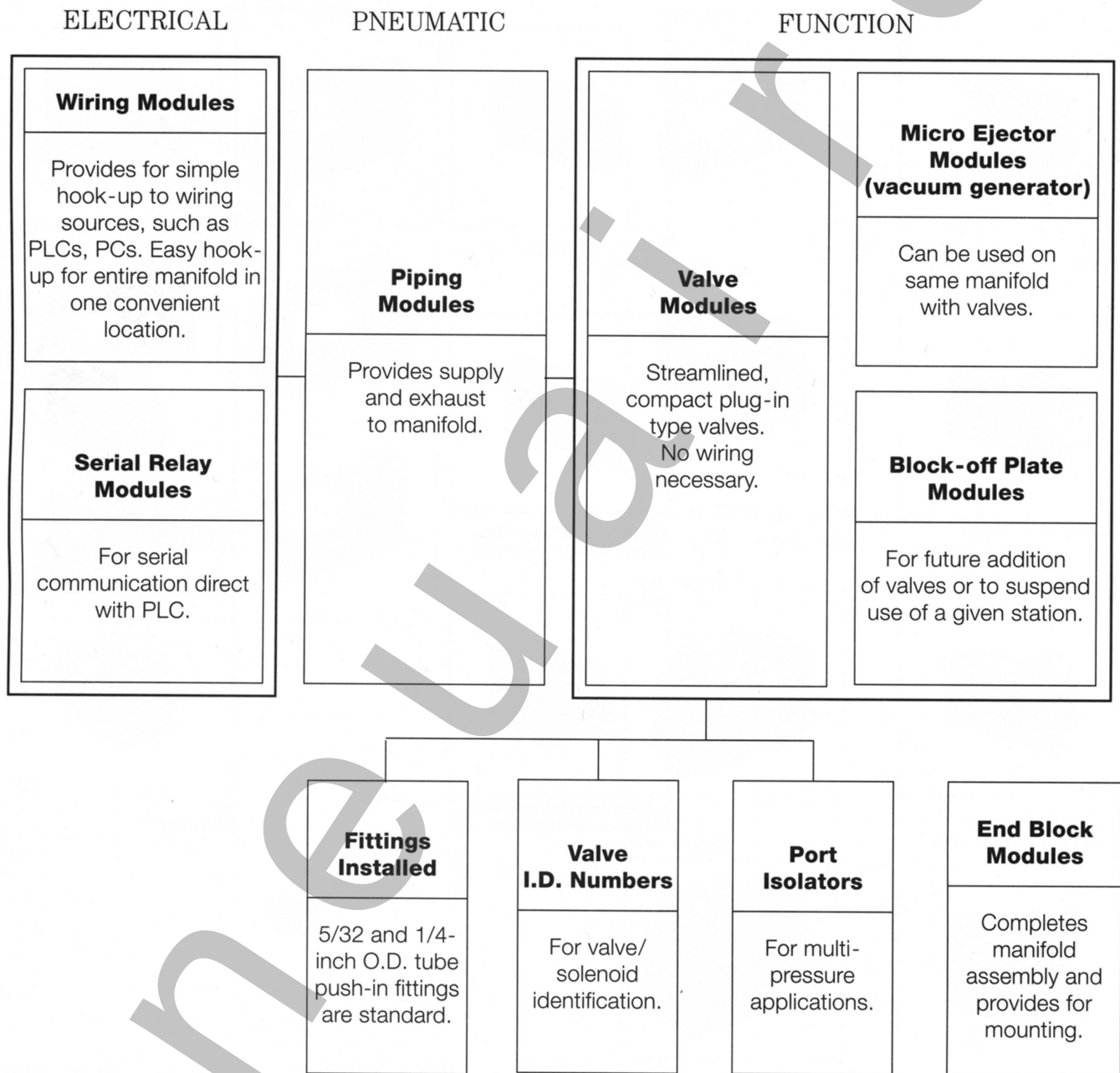
- Comes to you completely assembled. Saves installation time and labor.
- Each coil comes pre-wired to the wiring module. Saves time and labor of wiring coils individually.
- Piping modules are designed for single or multi-pressure use. You can custom tailor pressure to each individual actuator.
- Plug-in type, high flow, low power Humphrey H110 and H180 solenoid valves that can be used in combination on the same manifold.
- All manifolds are completely tested at the factory prior to shipment. Initial start-up troubleshooting is eliminated.
- Valves can be changed on the spot, in seconds. Drastically reduces downtime.

The Humphrey FM Solid Manifold.
Solid value. Solid performance. Solid choice.

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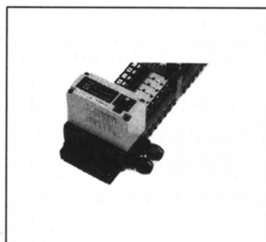
MODULES PROVIDE VARIOUS FUNCTIONS TO CREATE A COMPLETED FM MANIFOLD



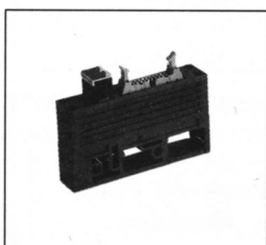
HUMPHREY FM SOLID MANIFOLD – HX88M SERIES

MODULE OPTIONS

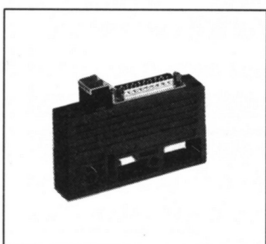
Wiring Modules



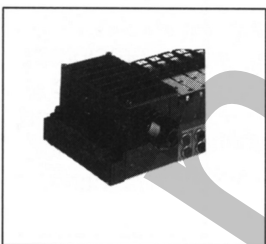
Serial Relay Unit: accepts serial communication from PLCs for up to 16 solenoids.



20-pin flat Cable Connector: accommodates up to 16 solenoids.

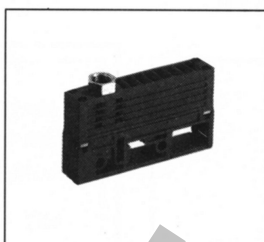


25-pin D-sub Connector: accommodates up to 16 solenoids.

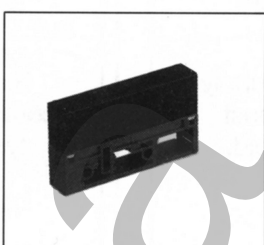


Junction box: includes 18 terminals to accommodate 16 solenoids.

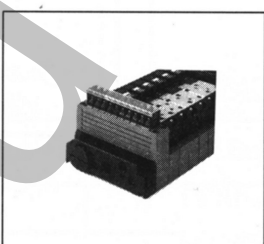
Piping Modules



Female threaded pressure (P) port and exhaust muffler.

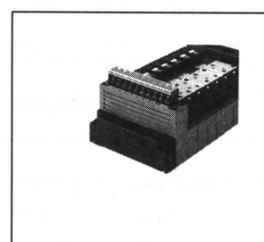


Female threaded pressure (P) and exhaust (R) ports on top of module.

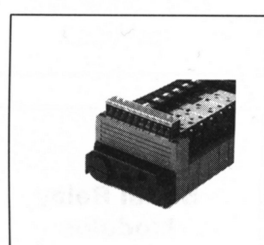


End Block Piping Module provides mounting and piping connections.

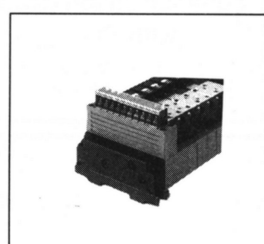
End Blocks



Module only



Supply and exhaust piping



End block with DIN rail mounting

Valve Module (3 port, 5 port)

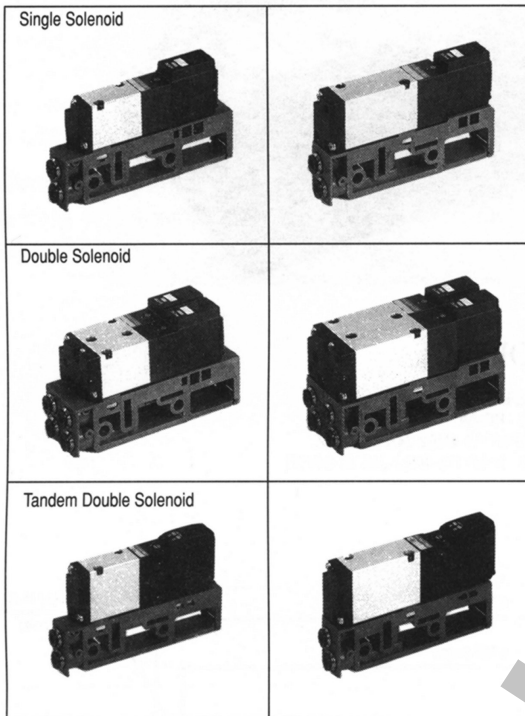
Manifold Subbase Porting

H110 Series

Width 0.591 in. (15mm)

H180 Series

Width 0.709 in. (18mm)



Voltages: 120VAC, 12VDC, 24VDC
Tandem Double Solenoid: 24VDC only.

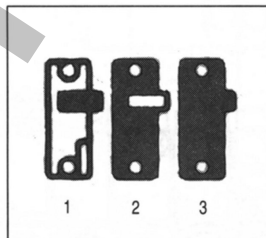
Delivery Port Plugs

HFMP1 – Plug for $\frac{5}{32}$ inch O.D. tube
HFMP2 – Plug for $\frac{1}{4}$ inch O.D. tube
Sold in bag of 10.



Port Isolators

1 – Blocks P port
2 – Blocks R port
3 – Blocks P, R ports

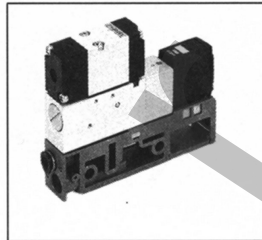


Micro Ejector Modules

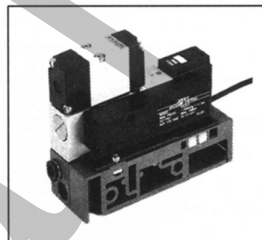
HME07 Series vacuum generator

with On/Off Solenoid Valve

w/o Vacuum Switch

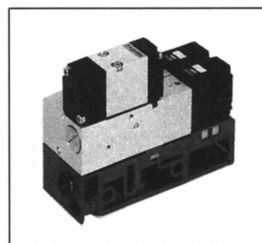


w/ Vacuum Switch

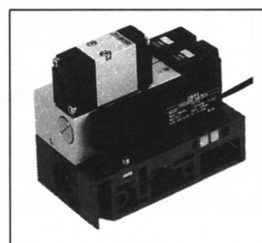


with On/Off Solenoid Valve and
Blow-off Solenoid Valve

w/o Vacuum Switch



w/ Vacuum Switch



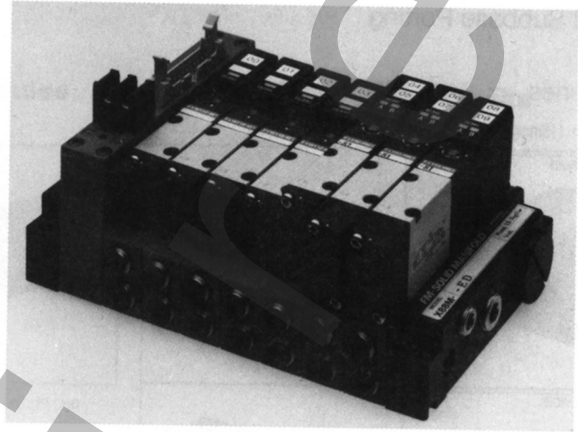
Block-off Plate Module



ASSEMBLY EXAMPLE #1

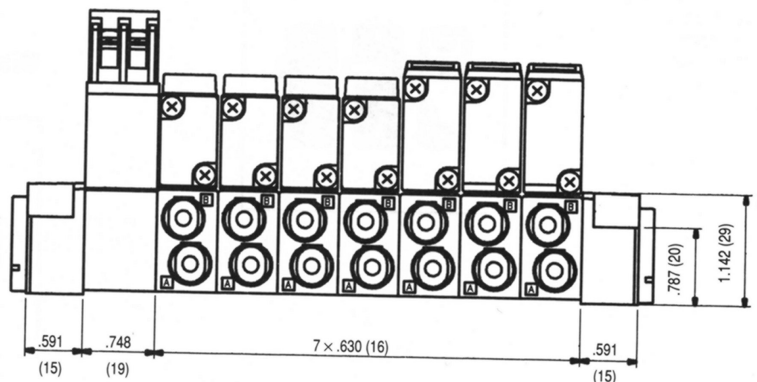
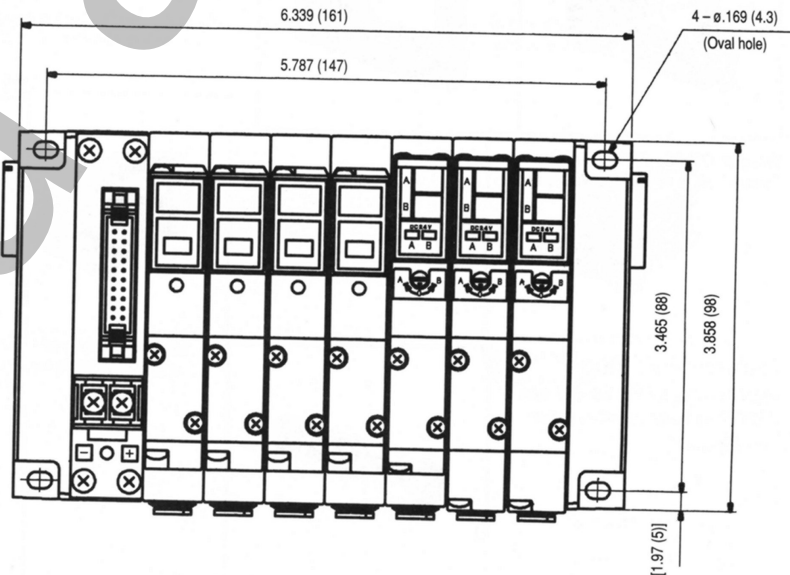
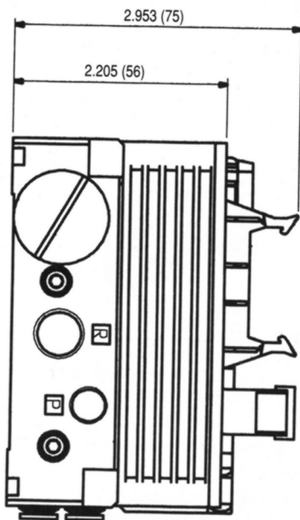
HX88M-ED

Arrives ready for use. This unit features a ribbon cable connector and power supply terminals. Simply mount the manifold, insert pneumatic tubing in valve delivery port quick fittings, connect supply and exhaust piping to End Block and plug in the cable connector. This particular manifold features a combination of single and double solenoid, 2- and 3-position directional control valves. All valves are pre-wired to the wiring module.



HOW TO ORDER

HX88M-ED stn 1 - HFMC-F200
 stn 2 ~ 5 - HFMW110-4E1-J4S-24VDC
 stn 6 - HFMY110-4ME2-J4S-81-24VDC
 stn 7 ~ 8 - HFMY113-4ME2-J4S-81-24VDC

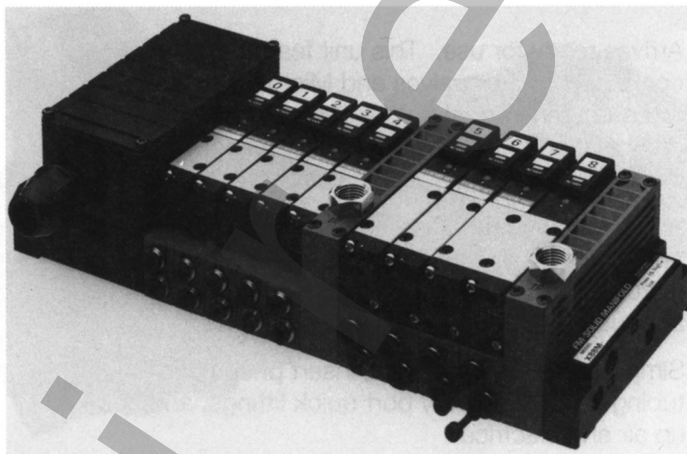


ASSEMBLY EXAMPLE #2

HX88M

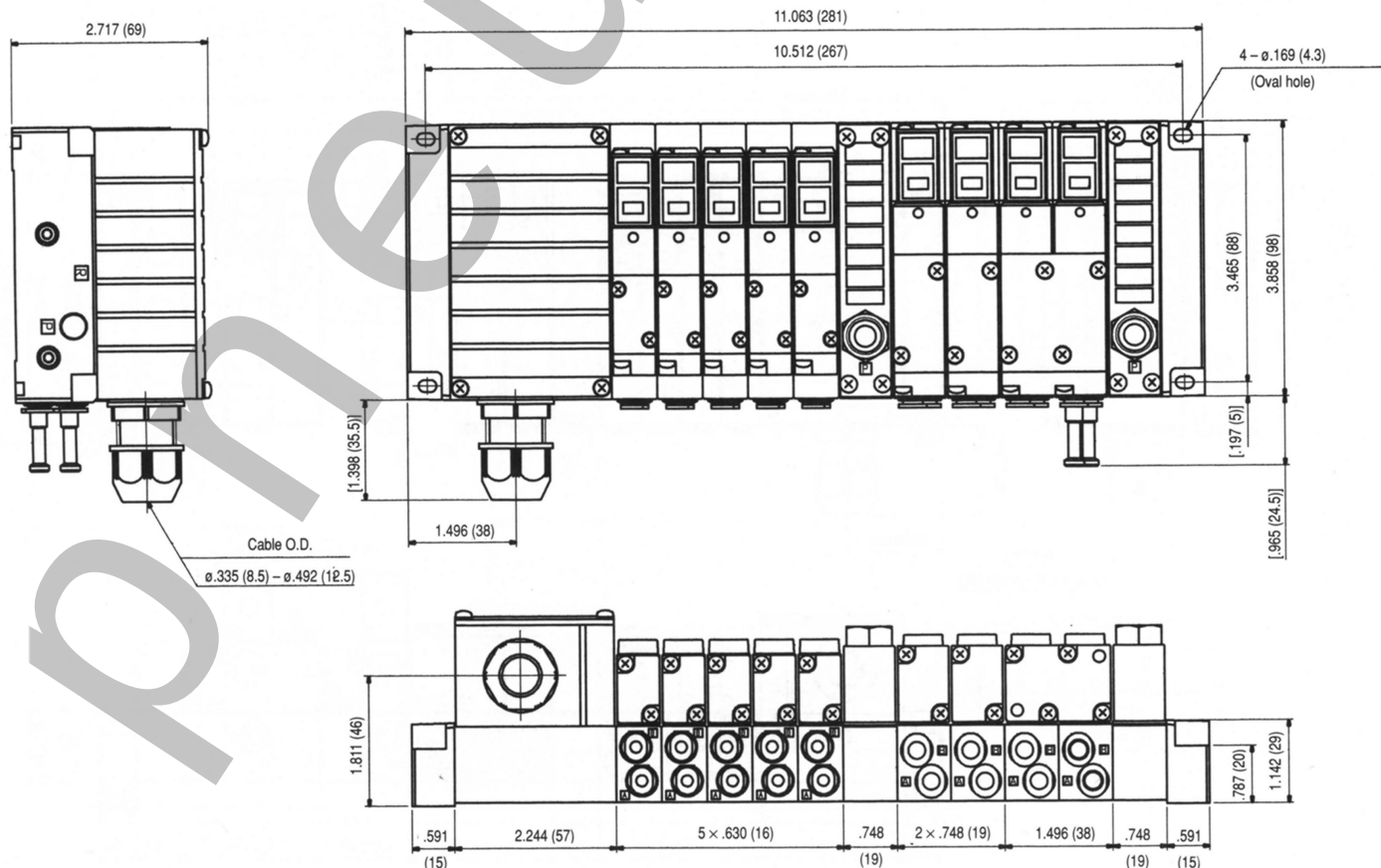
Arrives ready for use. This unit features an electrical junction box cable connector. There are two sizes of solenoid valves on the manifold. One is for controlling actuators up to 1 1/2-inch bore. The larger models are for controlling actuators up to 2 1/2-inch bore. A port isolator blocks supply and exhaust cavities between stations 7 and 9 for multiple pressures connected at stations 7 and 12.

Simply mount the manifold, insert pneumatic tubing in the valve delivery ports, and hook up air and electrical.



HOW TO ORDER

HX88M stn.1 - HFMC-T180-LS
 stn 2 ~ 6 - HFMW110-4E1-J4S-120VAC
 stn 7 - HFMP-FR02
 stn 8 - HFMB-A
 stn 9 ~ 10 - HFMW180-4E1-J1S-120VAC
 stn 11 - HFMW180-4KE2-J1S-120VAC
 stn 12 - HFMP-FR02



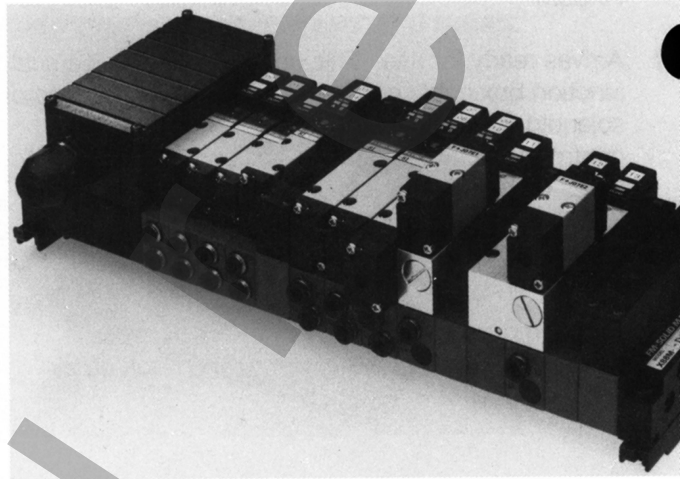
ASSEMBLY EXAMPLE #3

HX88M-DN

Arrives ready for use. This unit features a combination of air valves and Micro Ejectors (vacuum generators) on the same manifold. Such a combination of pressure and vacuum components is ideal for pick-and-place applications.

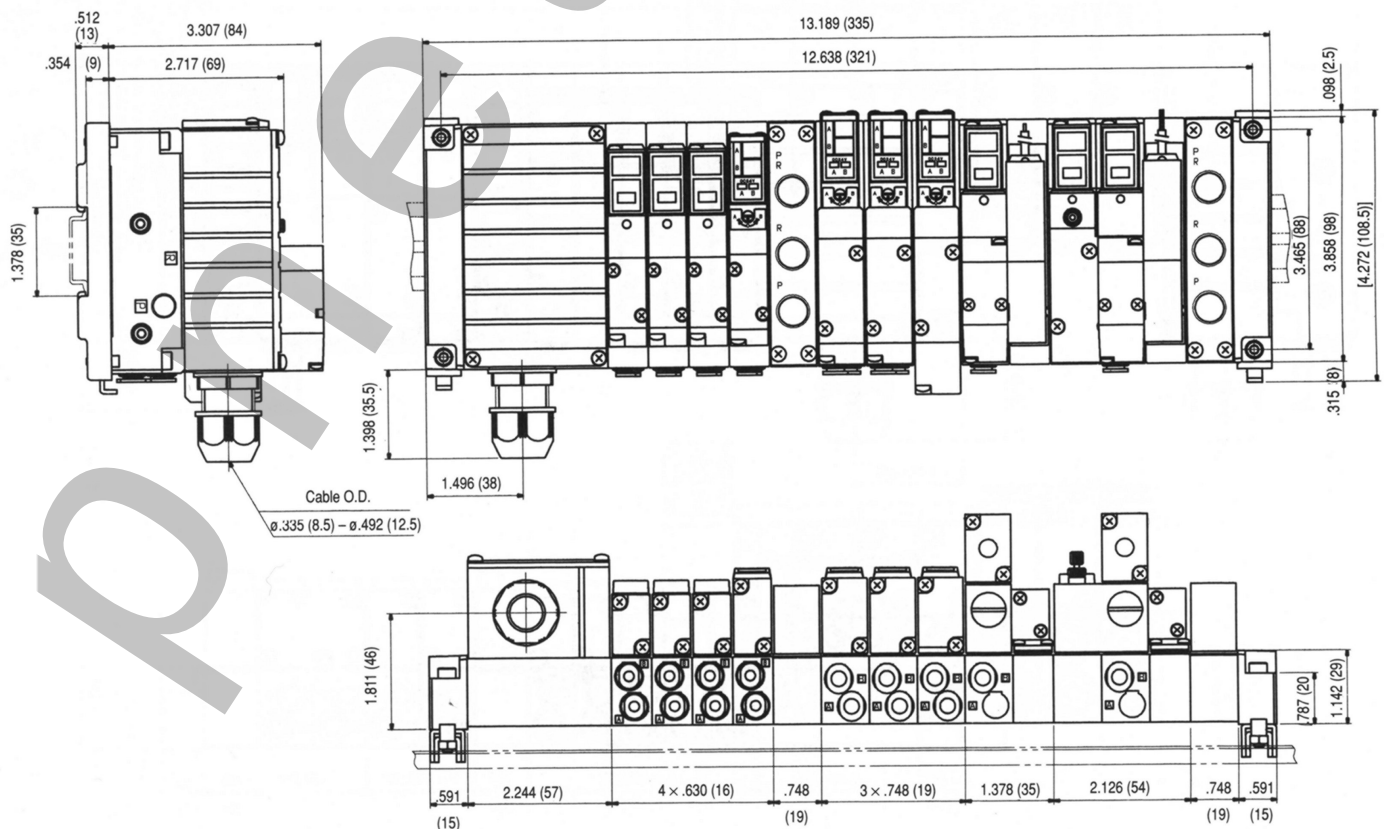
An extra piping module has been added to ensure of adequate supply pressure capacity. Micro Ejectors feature electric switches that sense the presence of adequate vacuum levels.

Simply mount the manifold, insert pneumatic tubing in valve delivery port quick fittings, and hook up air and electrical.



HOW TO ORDER

HX88M-DN stn.1 - HFMC-T180-LS
 stn 2 ~ 4 - HFMW110-4E1-J4S
 stn 5 - HFMY110-4ME2-J4S-81
 stn 6 - HFMP-PR02S
 stn 7 ~ 8 - HFMY180-4ME2-J1S-81
 stn 9 - HFMY183-4ME2-J1S-81
 stn 10 - HF MJ07E1-J1S-E
 stn 11 - HF MJ07E2-J1S-E
 stn 12 - HFMP-PR02S

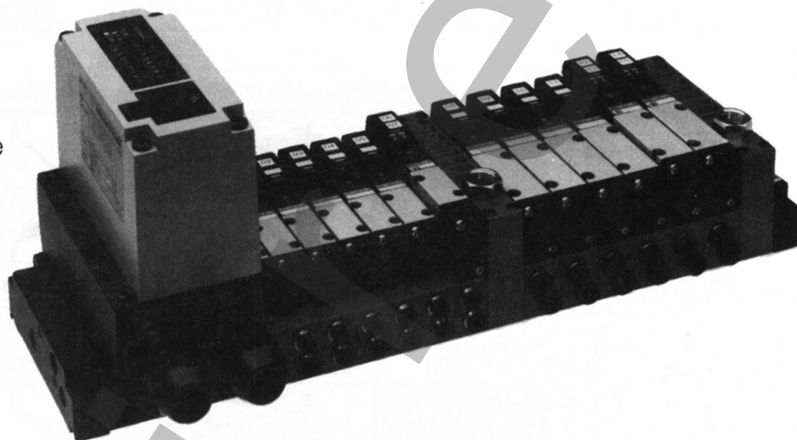


ASSEMBLY EXAMPLE #4

HX88M Serial Relay

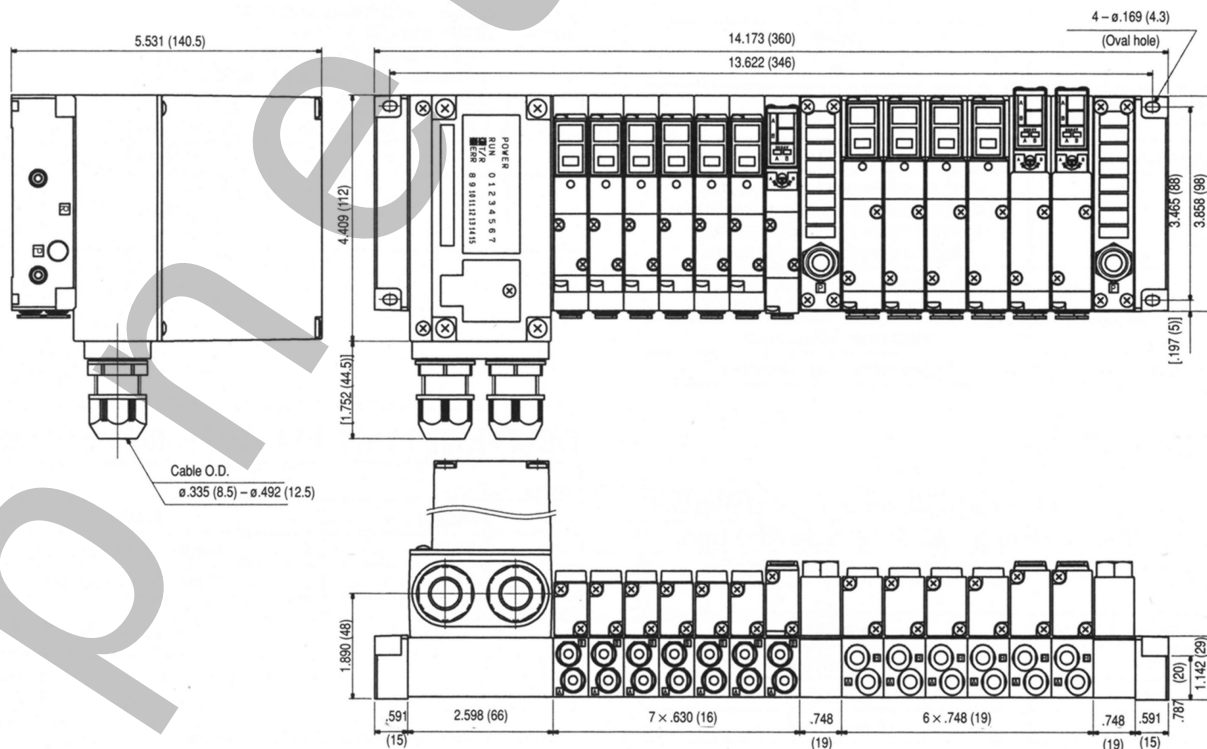
Arrives ready for use. This unit features a combination of single and double solenoid, 4-way, 2- and 3-position valves. It also features a serial relay module shown mounted on the left side of the manifold in the accompanying photograph. With the serial relay module, you can control up to 32 manifolds and 512 solenoid valves through one twisted pair cable.

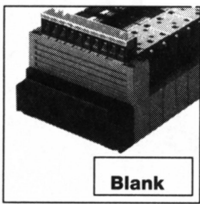
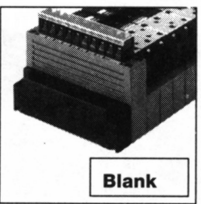
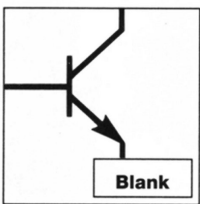
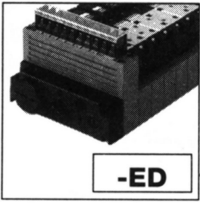
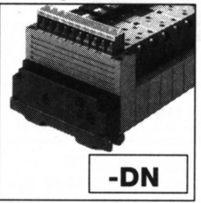
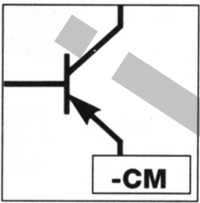
Simply mount the manifold, insert pneumatic tubing in valve delivery port quick fittings, and hook up air and electrical.



HOW TO ORDER

HX88M stn. 1 - HFMT-OR
 stn 2 ~ 7 - HFMW110-4E1-J4S
 stn 8 - HFMY113-4ME2-4JS-81
 stn 9 - HFMP-FR02
 stn 10 ~ 13 - HFMW180-4E1-J1S
 stn 14 ~ 15 - HFMY180-4ME2-J1S-81
 stn 16 - HFMP-FR02



Manifold	End Block	Mounting	Common Terminal Wiring	Module Location No.	Module Description
HX88M	-ED		-CM	No.1 No.2 No.n	HFMC-F200 HFMJ07E1 HMW110-4E1
 End Block Module Blank  End Block Mount Blank  Positive Common Blank  End Block Piping -ED  DIN Rail Mounting Bracket -DN  Negative Common -CM					

*Select your choice of wiring, piping, valve, or Micro Ejector (vacuum generator) modules form the following pages

*One set of valve I.D. number stickers is supplied with each manifold

SPECIFICATIONS

Item	Series
	HX88M
Media	Air
Operating pressure range – psig (kgf/cm ²)	20 ~ 100 (1.5 ~ 7.1)
Operating temperature °F (°C)	41 ~ 122 (0 ~ 50)
Wiring methods	Each solenoid pre-wired to wiring module. Select from: flat cable connector module, D-sub connector module, wiring conduit connector module, or serial communication module.
End Block	Mounting type, mounting and piping type, both with or without DIN rail mount
Manifold mounting	Direct mount/DIN rail mount
Common terminal wiring	Positive common/negative common

PORT ISOLATORS

By using port isolators, usage of two or three pressures is possible. When ordering, call out the desired port isolator at the appropriate location in the manifold.

Model	Function
HFMB-A	P, R port blocked
HFMB-P	P port blocked
HFMB-R	R port blocked

Port isolators cannot be disassembled and relocated in the manifold after shipment from factory.

ORDER EXAMPLE

HX88M-DN stn 1 - HFMC-D250-UNC
 stn 2 ~ 5 - HFMW110-4E1-J4S-24VDC
 stn 6 ~ 7 - HFMY113-4E2-J4S-24VDC
 stn 8 - HFMP-PR02S
 stn 9 - HFMW180-4E1-J1S-24VDC
 stn 10 ~ 11 - HFMY180-4E2-J1S-24VDC
 stn 12 - HFMP-PR02S

DELIVERY PORT PLUGS (sold separately)

Model	Function
HFMP1	Plug for 5/32-inch O.D. tube
HFMP2	Plug for 1/4-inch O.D. tube

Sold in bag of ten.

HUMPHREY FM-SOLID MANIFOLD

THINGS TO BE CONSIDERED WHEN SELECTING MANIFOLD MODULES

VALVES

H110 (C_v 0.23) and H180 (C_v 0.57) valves can be combined on the same manifold.

Manifolds accommodate up to 20 individual modules with a maximum of 16 solenoids.

When several valves on a given manifold are to be actuated simultaneously (more than eleven H110 models, or more than five H180 models), consider adding an extra Piping Module in the middle of the manifold to assure adequate supply pressure and exhaust capability.

PIPING

Always complete the manifold by specifying your choice of End Blocks. Consider manifold End Block Piping option (Code “-ED”).

COMMON WIRING

The standard wiring configuration is positive (+) common for use with open collector outputs of programmable controllers.

When the programmable controller output is a “sourcing” positive (+) common output, the manifold must be a negative (–) common type (Option -CM).

VOLTAGES

The following chart shows voltage ratings for wiring modules.

MODULES AND VOLTAGES

			12VDC	24VDC	120VAC	Solenoids
Wiring	Parallel Wiring	HFMC-F200	●	●	★	16
		HFMC-D250-UNC	●	●	●	
		HFMC-T180-LS	●	●	●	
Serial relay	Serial relay	HFMT-□	★	●	★	
Micro ejector (vacuum generator)		HFMJ-□	●	●	★	–

● Voltage is available.

★ Voltage is not available.

MODULE LOCATION

There are some manifold locations where wiring modules cannot be installed. Please note the following chart.

Locations	Wiring Module			Serial Relay module	Piping Module	Valve module	Micro Ejectors (vacuum generator) module
	-F200	-D250-UNC	-T180-LS				
Left	●	●	●	●	●	●	●
Middle	●	●	★	★	●	●	●
Right	●	●	★	★	●	●	●

● Installation possible at any location.

★ Installation is not possible.

EXHAUST INTERFERENCE

Exhaust interference can occur when there is simultaneous valve operation, combination of 3-port valve usage, all female port type piping usage, external exhaust piping installation, etc.

HOW TO ORDER WIRING MODULES

Wiring module	Wiring model	Description
HFMC	-F200	Flat cable connector
	-D250-UNC	D-sub connector
	-T180-LS ^{NOTE}	Junction box

NOTE: Wire at the terminals in the box and pull through bushing. Cannot be installed in the middle of the manifold.

HOW TO ORDER SERIAL RELAY MODULES

Basic model	PLC ^{NOTE}
HFMT	-OR, -MB, -FJ, -SP, -HT, -MS

NOTE: PLC makers: -OR = OMRON; -MB = MITSUBISHI; -FJ = FUJII; -SP = SHARP; -HT = HITACHI; -MS = MATSUSHITA

HOW TO ORDER PIPING MODULES

Piping module ^{NOTE}	1/4 Port thread	Description
HFMP	-FR	1/4 NPT female P port w/ muffler exhaust
	-PR	All ports female threaded

NOTE: P port piping specifications:

-FR: Female thread (R port muffler)

-PR: Female thread (All ports female thread)

NOTE: -FR02 type has replacement filter elements available.

HOW TO ORDER MICRO EJECTOR (vacuum generator) MODULES

Ejector module basic model	Specific ejector model	Valve function	Delivery port	Manual override	Electronic vacuum	Voltages
		Norm. closed: Blank Norm. open: -11 ^{NOTE}		Non-locking: Blank Locking: -83	None: Blank With switch: -E	
HFMJ	07E1	-11	-J4S (5/32-inch O.D. tube quick fitting)	-83	-E	12 VDC 24 VDC
	07E2		-J1S (1/4-inch O.D. tube quick fitting)			

NOTE: N/C is for vacuum braking air control solenoid valve on E2 type models.

N/O is for air supply control solenoid valve only.

Filter elements are available as part number HME07MA-F.

Filter should be replaced regularly.

HOW TO ORDER BLOCK-OFF PLATE MODULE

Description	Block-off plate module basic model	Specific model	Delivery port
Single or Double solenoid	HFMW	110-BP	-J4S (5/32-inch O.D. tube quick fitting)
Tandem Double solenoid	HFMY	180-BP	-J1S (1/4-inch O.D. tube quick fitting)

HOW TO ORDER VALVE MODULES

Valve module basic model	Specific module model	2- or 3-way valves	2- or 3-way valves	3-position, 4-way valves	Module porting options	Manual override	Voltages
		3-way: Blank 2-way: -2	Norm. closed: Blank Norm. open: -11	Blocked center: Blank Exhaust center: -13 Pressure center: -14		Non-locking: Blank Locking: -83 (HFMW) -81 (HFMY)	
HFMW	110E1	-2	-11		Straight quick fitting for 5/32-in. O.D. tube: -J4S Straight quick fitting for 1/4-in tube: -J1S	-83	12 VDC 24 VDC 120VAC ^{NOTE 1}
	110-4E1						
	110-4KE2						
	113-4KE2			-13, -14			
	180E1	-2	-11				
	180-4E1						
	180-4KE						
	183-4KE2			-13, -14			
HFMY	110-4ME2				Straight quick fitting for 5/32-in. O.D. tube: -J4S Straight quick fitting for 1/4-in tube: -J1S	-81 ^{NOTE 2}	24 VDC
	113-4ME2			-13, -14			
	180-4ME2						
	183-4ME2			-13, -14			

NOTE 1: 120 VAC applies to Wiring Modules HFMW-D250-UNC and HFMW-T180-LS only.

NOTE 2: Prefix HFMY valves can only be ordered with Code -81.

NOTE 3: The HFMW and HFMY valve subbase plug-in shapes are different. Consequently, valves and modules of the two different types are not interchangeable.

To order valve only:

HFMW Series: Substitute prefix HF1W for HFMW.

HFMY Series: Substitute prefix HF1Y for HFMY.

Example: To order Model H110-4E1, specify HF1W110-4E1. Be sure to include any options and the desired voltage.

HUMPHREY HOW TO ORDER WORKSHEET

ORDER
ONLINE

HX88M - ____ - ____ - ____ - stn. 1

stn. 2

stn. 3

stn. 4

stn. 5

stn. 6

stn. 7

stn. 8

stn. 9

stn. 10

stn. 11

stn. 12

stn. 13

stn. 14

stn. 15

stn. 16

stn. 17

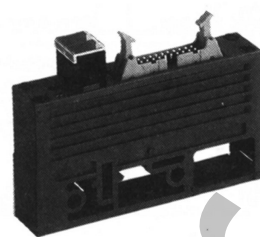
stn. 18

stn. 19

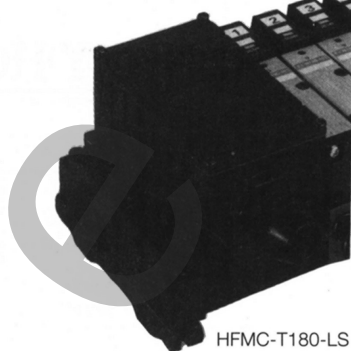
stn. 20

FM-SOLID MANIFOLD – HX88M SERIES

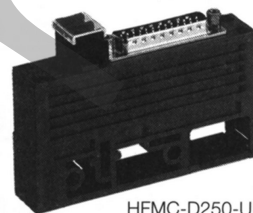
WIRING MODULES



HPMC-F200



HPMC-T180-LS



HPMC-D250-UNC

FEATURES

Factory installed wiring lowers cost and saves space. Each solenoid has been prewired from the coil to the wiring module. A simple hook-up to the wiring module is all that is required.

FLAT CABLE CONNECTOR

20 pin flat cable connector accommodates up to 16 solenoids.

D-SUB CONNECTOR

25 pin D-sub connector accommodates up to 16 solenoids.

WIRING MODULE SPECIFICATIONS

Model	Description	Connection
HPMC-F200	Flat cable connector	Box type long clip
HPMC-D250-UNC	D-sub connector	-UNC: #4-40 UNC
HPMC-T180-LS	Junction box	Terminal thread: M3

MODULE WEIGHT

Model	Weight – oz. (gf)
HPMC-F200	3.4 (95)
HPMC-D250-UNC	3.4 (95)
HPMC-T180-LS	15.3 (435)

JUNCTION BOX

4 wiring ports enable flexible wiring. 18 terminals accommodate up to 16 solenoids.

SERIAL RELAY TYPE

Use serial communications to control up to 16 solenoids per manifold, via a simple twisted pair hookup. See following pages.

WIRING SPECIFICATIONS

Possible number of solenoids per module.

Piping module type	No. of solenoids	No. of pins
HPMC-F200	16	20 pins
HPMC-D250-UNC	16	25 pins
HPMC-T180-LS	16	18 terminals

NOTE: -4E1 type solenoid = 1 pc; -4KE2 type solenoid = 2 pcs.

WIRING CONNECTIONS

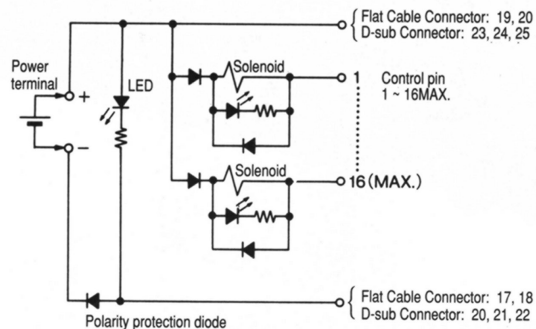
HFCM-F200

Flat cable connector (12VDC, 24VDC)

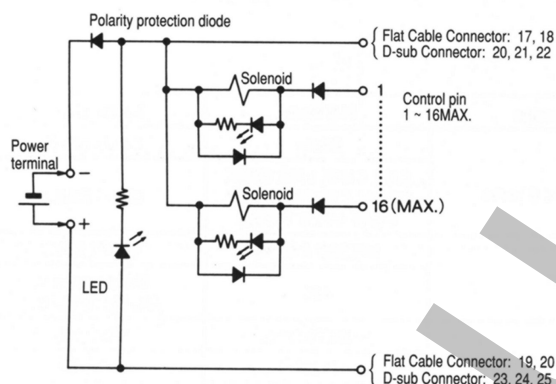
HFCM-D250

D-sub connector (12VDC, 24VDC)

Positive (+) common (standard)



Negative (-) common (-CM)



PIN LOCATIONS

For HFMW Single and Double Solenoid Assemblies

Pin No.	1	2	3	4	5	6	7	8	...n pcs
Solenoid No.	S1	S2	S3	S4	S5	S6	S7	S8	
Module No.	1	2	3	4	5	6	7	8	

For HFMW Single Solenoid and HFMY Tandem Double Solenoid Assemblies

Pin No.	1	2	3	4	5	6	...n pcs
Solenoid No.	SOLA	SOL B	(SOLA)	SOLA	SOL B	(SOLA)	
Module No.	1	2	3	4	5	6	

WIRING MODULE PIN LOCATIONS^{NOTE}

(1) HFCM-F200

Flat cable connector

19	17	15	13	11	9	7	5	3	1
20	18	16	14	12	10	8	6	4	2

1-16: Control pin
17, 18: (-) Pin (in module)
19, 20: (+) Pin (in module)

(2) HFCM-D250-UNC

D-sub connector

1	3	5	7	9	11	13	15	17	19	21	23	25
2	4	6	8	10	12	14	16	18	20	22	24	

1-16: Control pin
20, 21, 22: (-) Pin (in module)
23, 24, 25: (+) Pin (in module)

NOTE: Pin numbers above are set according to the connecting order to solenoids.
*Other line up order for D-sub connector and flat cable connector is possible. Consult factory.

(3) HFCM-T180-LS

Junction Box Terminal

1	3	5	7	9	11	13	15	17
2	4	6	8	10	12	14	16	18

1-16: Control terminal
17, 18: Common terminal (in module)

Screw Terminals

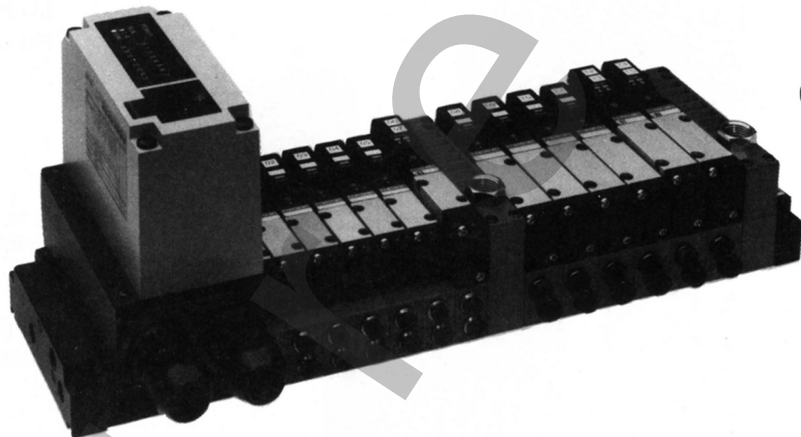
Each screw terminal used for Serial Relay, Junction Box, and Power Supply terminal stands features a wire clamp. Spade terminals are not required.

If desired, use of AMP #327717 spade tongue terminal is recommended for all screw terminals.

NOTE: Positive (+) common standard. Order -CM for Negative (-) common.

SERIAL RELAY MODULES

ORDER
ONLINE



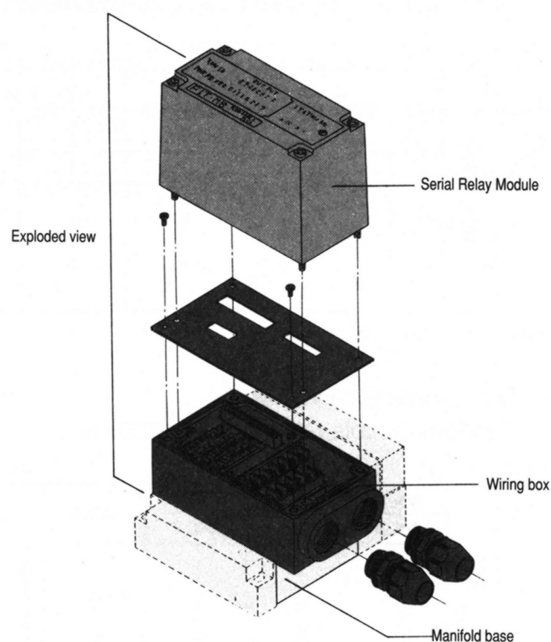
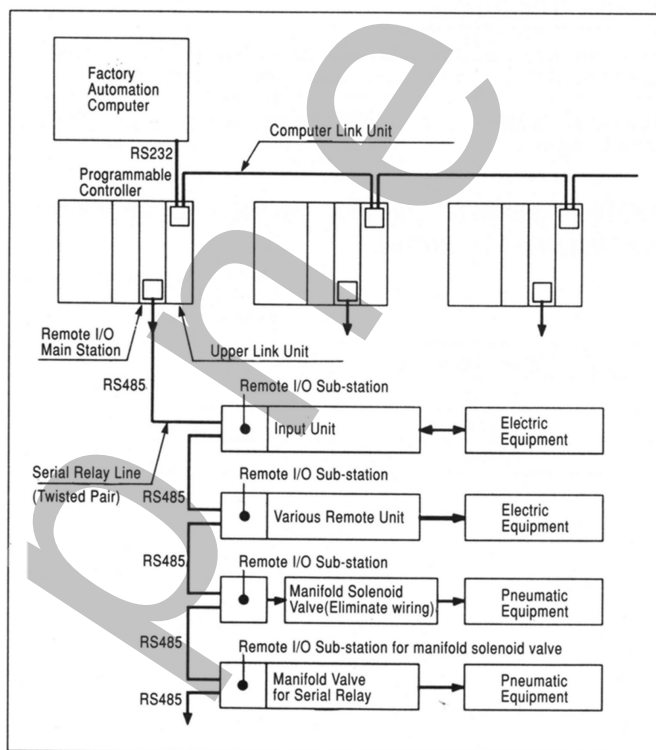
The Serial Relay System provides a direct connection from the PC's remote I/O (Input/Output) Main Station to the manifold solenoid valves' remote I/O Substation. This is accomplished with one twisted pair cable which remotely controls the entire process.

The serial interface utilizes serial communication and manifold mounted, plug-in type solenoid valves to eliminate the mass amount of wiring associated with conventional valve systems. It is possible to control up to 32 manifolds and 512 solenoid valves through one twisted pair cable.

- Greatly simplifies wiring and makes maintenance easy.
- Program alterations can be made with a minimum of downtime.

- All types of automation processes can be controlled from a distance of up to 650 feet (200 meters).
- Available for Omron, Mitsubishi, Hitachi and other programmable logic controllers.

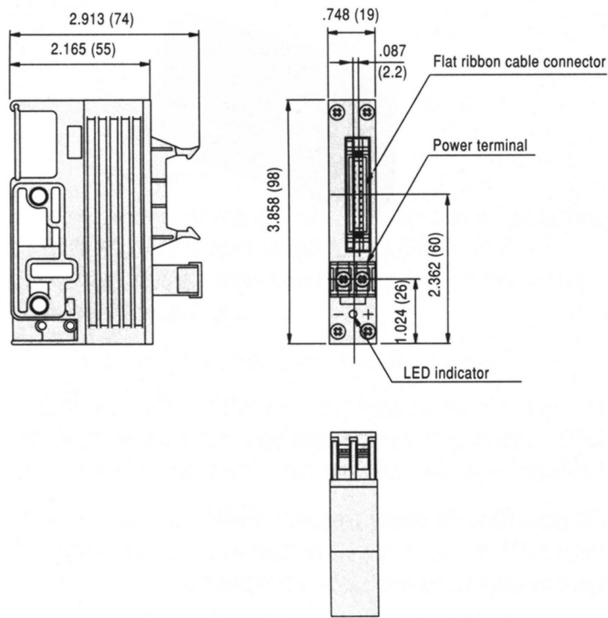
Manufacturer	PLC Model	Master Station
Omron SYSMAC C Series	C200H	C200H-RM201
	C120, C120F, C500, C500F, C1000H, C1000HF, C2000H, C2000, CV500, CV1000	C500H-RM201
Mitsubishi	MELSEC-A Series	AJ71PT 32-S3
	A2C	Direct connect to A2C CPU (P21/R21)
Hitachi HIZAC-H Series	H-300/700/2000	REM-MMH
	H-200	RIOH-TM



NOTE: End Block adds 0.039 in. (1mm) to overall height of finished manifold assembly.

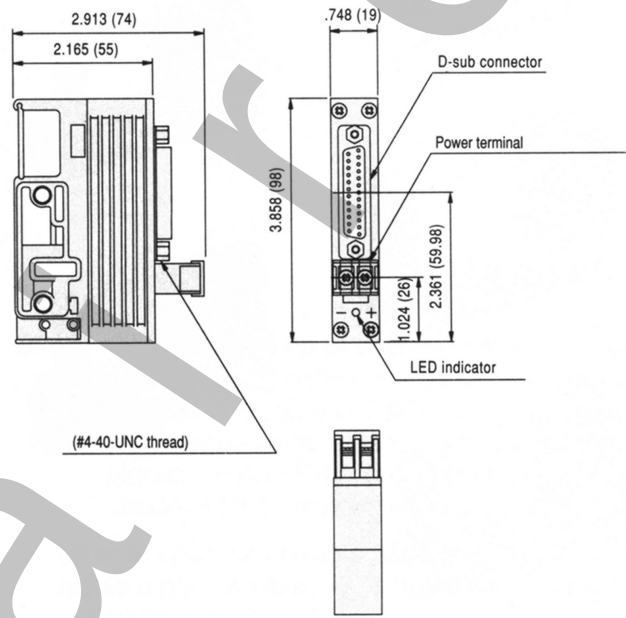
HFMC-F200

Flat ribbon cable connector



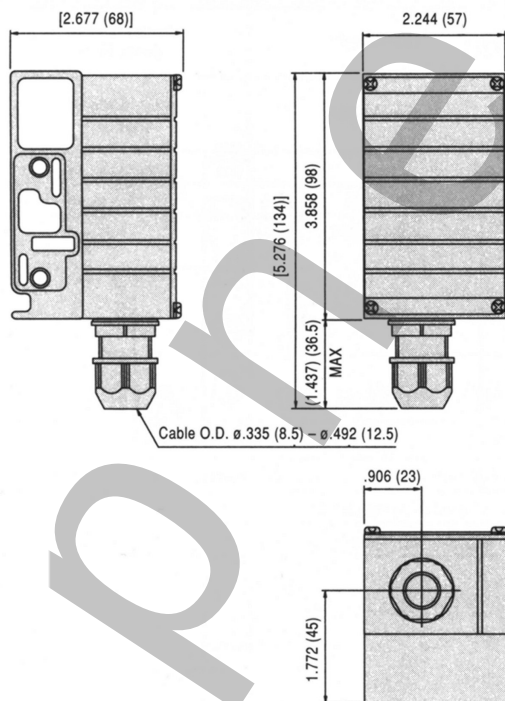
HFMC-D250-UNC

25 pin D-sub connector



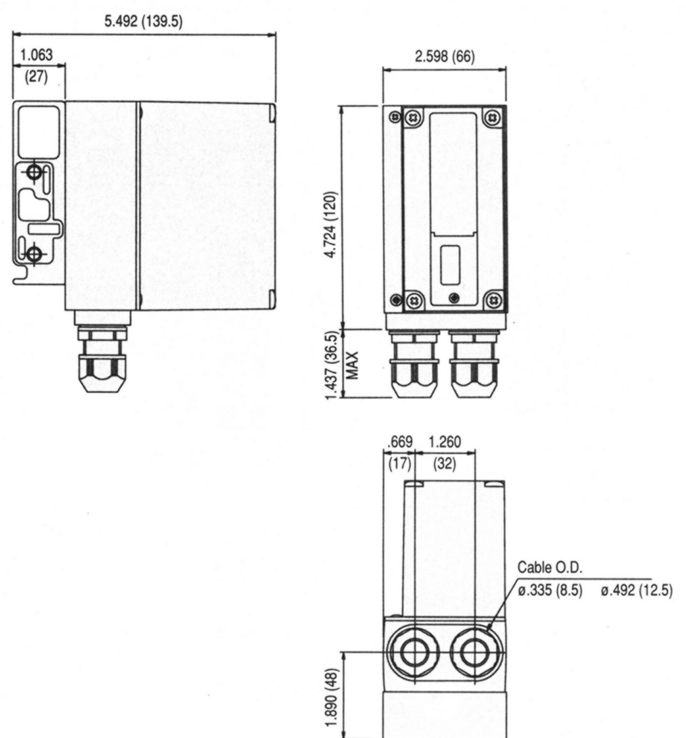
HFMC-T180-LS

Junction box



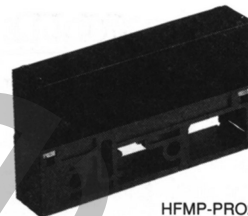
HFMT-□

Serial relay



FM-SOLID MANIFOLD – HX88M SERIES

PIPING MODULES



HFMP-PRO2S



HFMP-FR02

Piping modules are used to connect supply air and to vent exhausting air. Two different types are offered: One has a 1/4-inch NPT supply port and breather/muffler exhaust to atmosphere. The other module has three 1/4-inch NPT ports: supply, captured exhaust and captured pilot exhaust.

When several valves on a given manifold are to be actuated simultaneously, consider adding a piping module to assure adequate supply and exhaust capability.

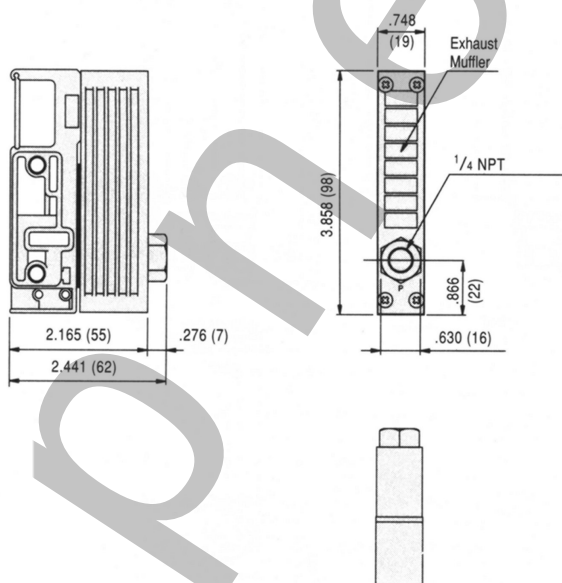
When multiple pressures are required, use a piping module together with a port isolator.

- P-port female thread type, HFMP-FR02 1/4-inch NPT supply port. Exhausts to atmosphere through breather/muffler. Muffler element can be replaced.
- All port female thread type, HFMP-PRO2S three 1/4-inch NPT ports: supply, exhaust, and pilot exhaust. Use in captured exhaust applications.
- Consider use of End Block Piping type (HX88M-ED) for alternative plumbing methods.

WIRING MODULE DIMENSION DIAGRAMS

in. (mm)

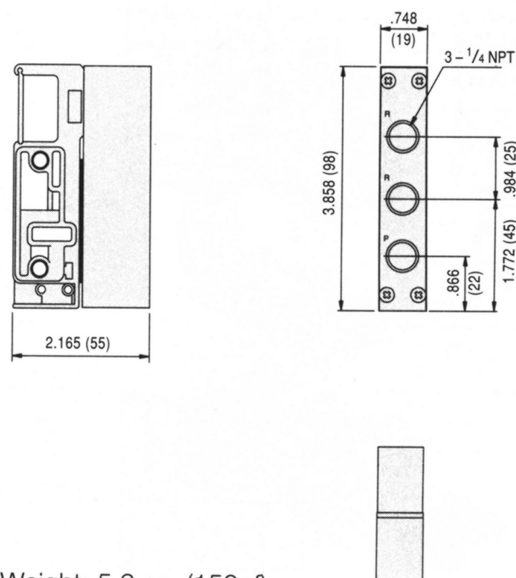
HFMP-FR02



Weight: 3.4 oz. (95gf)

NOTE: Replacement muffler elements available.

HFMP-PRO2S

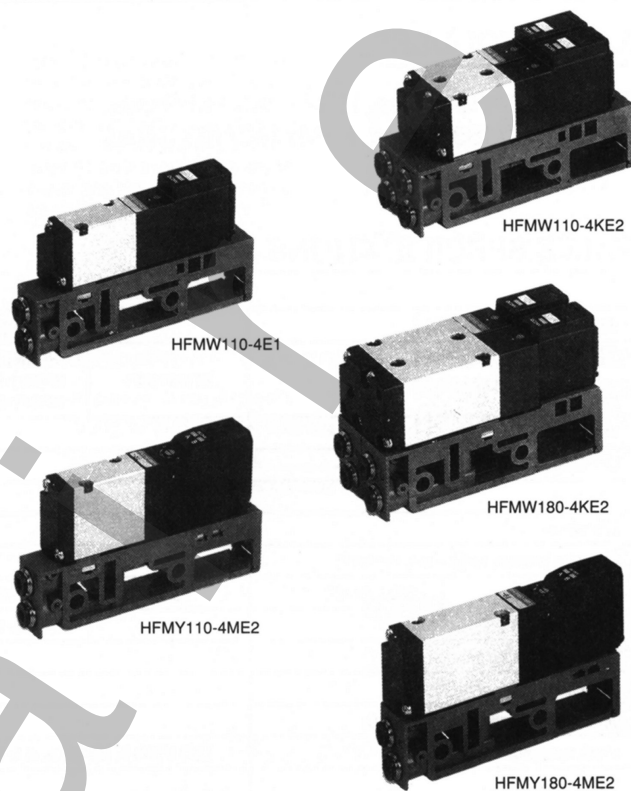


Weight: 5.3 oz. (150gf)

FM-SOLID MANIFOLD – HX88M SERIES

VALVE MODULES

- Incorporates compact and dependable Humphrey H110 (C_v 0.23) and H180 (C_v 0.57) high flow solenoid valves that can be used in combination on the same manifold.
- Tandem double solenoid models save even more space.
- Compact plug-in type valves connect and disconnect easily.
- Low power coils with LED and Manual Override are standard.



MANIFOLD SUBBASE PORTING

- $\frac{5}{32}$ -inch and $\frac{1}{4}$ -inch O.D. tube quick fittings for valve A, B delivery ports, installed.

VALVE MODULE SPECIFICATIONS

Basic model and valve functions

Solenoid valve H110 series	HFMW110E1	HFMW110-4E1 HFMW110-4KE2 HFMY110-4ME2	HFMW113-4KE2 HFMY113-4ME2
Solenoid valve H180 series	HFMW180E1	HFMW180-4E1 HFMW180-4KE2 HFMY180-4ME2	HFMW183-4KE2 HFMY183-4ME2
No. of positions	2 position		3 position
No. of ports	2, 3 port	5 port	
Valve functions	N/C standard	Single solenoid	All ports blocked (standard)
	N/O option	Double solenoid Tandem double solenoid	Pressure center and exhaust center optional Double solenoid Tandem double solenoid

DELIVERY PORT (A, B PORTS) OPTIONS

Valve module	Module option code	Description
Any	-J4S	Straight quick fitting for $\frac{5}{32}$ " O.D. tubing
Any	-J1S	Straight quick fitting for $\frac{1}{4}$ " O.D. tubing

FM-SOLID MANIFOLD – HX88M SERIES

VALVE MODULES

HFMW110/113 Series, HFMY110/113 Series,
HFMW180/183 Series, HFMY180/183 Series

VALVE SPECIFICATIONS

Solenoid valve		H110 Series			H180 Series		
Item		HFMW110E1	HFMW110-4E1 HFMW110-4KE2 HFMY110-4ME2	HFMW113-4KE2 HFMY113-4ME2	HFMW180E1	HFMW180-4E1 HFMW180-4KE2 HFMY180-4ME2	HFMW183-4KE2 HFMY183-4ME2
Media		Air					
Operating method		Internal pilot					
Flow (Cv)		0.23		0.21	0.57		0.50
Lubrication		Not recommended					
Operating pressure range – psig (kgf/cm ²)		20 ~ 100 (1.5 ~ 7.1)					
Response time ON/OFF – ms ^{NOTE}	12VDC, 24VDC	15/20	15/20	15/30	15/20	15/25	15/35
	120VAC	15/15	15/15	15/20	15/15	15/15	15/20
Maximum operating cycles – c/s		5					
Maximum holding time – ms		50					
Operating temperature range – °F (°C)		40 ~ 122 (5 ~ 50)					
Shock resistance – m/s ² (G)		1373.0 {140.0} (294.2 {30.0} to stem)			294.2 {30.0}	1373.0 {140.0} (294.2 {30.0} to stem)	
Mounting direction		Mount in any direction					

NOTE: Response time at air pressure of 71 psig (5 kgf/cm²)

SOLENOID SPECIFICATIONS

Methods		12VDC	24VDC	120VAC
		Surge suppression Flywheel diode Surge suppression transistor*		Shading ring
Voltage range		10.8 ~ 13.2 (12 ± 10%)	21.6 ~ 26.4 (24 ± 10%)	90 ~ 132
Current (Rated Voltage)	Frequency Hz	–	–	50/60
	Start mA (r.m.s.)	–	–	36/32
	Holding mA (r.m.s.)	140 (1.7W)	75 (1.8W) 50* (1.2W)	24/20
Allowable Leakage mA		8	4/2*	4
Type of Insulation		Type B		
Insulation resistance MΩ		Minimum 100		
Connection		Plug-in type		
Color of LED indicator		Red		Yellow
Surge suppression		Flywheel diode/Transistor		Varistor

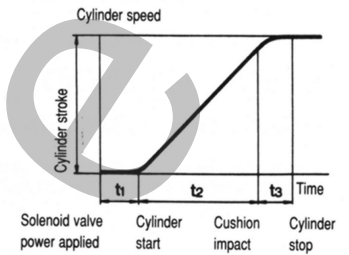
* For tandem double solenoid valves only.

MODULE WEIGHT

Model	Weight – oz. (gf)	
	-J4S	-J1S
HFMW110E1	4.3 (122)	4.2 (118)
HFMW110-4E1	4.3 (122)	4.2 (118)
HFMW110-4KE2	9.0 (254)	8.7 (246)
HFMW113-4KE2	9.0 (254)	8.7 (246)
HFMY110-4ME2	5.4 (152)	5.2 (148)
HFMY113-4ME2	5.7 (162)	5.6 (158)
HFMW180E1	5.7 (162)	5.6 (158)
HFMW180-4E1	5.7 (162)	5.6 (158)
HFMW180-4KE2	11.8 (334)	11.5 (326)
HFMW183-4KE2	11.8 (334)	11.5 (326)
HFMY180-4ME2	6.6 (187)	6.5 (183)
HFMY183-4ME2	7.1 (202)	7.0 (198)

VALVE PERFORMANCE

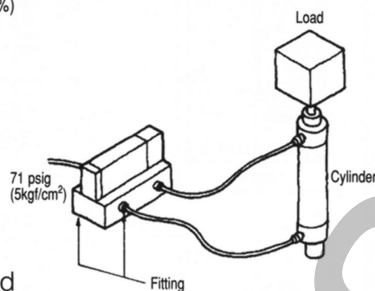
In order to obtain required time for cylinder to make one stroke, add cylinder's delay time t_1 (delay time between activating valve and actual starting time of cylinder) to the time t_2 at the maximum speed. If there is a cushion time, add the cushion time. General cushion time t_3 is around 0.2 seconds.



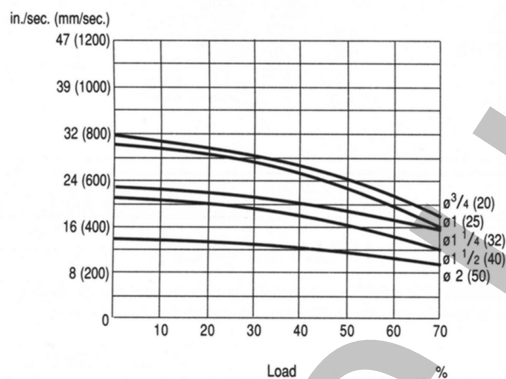
Measurement requirements

- Air pressure: 71 psig (5 kgf/cm²)
- 1/4" I.D. tubing x 35" long
- Load ratio = $\frac{\text{Load}}{\text{Cylinder theoretical thrust}}$ (%)
- Cylinder stroke: 6 in. (152)

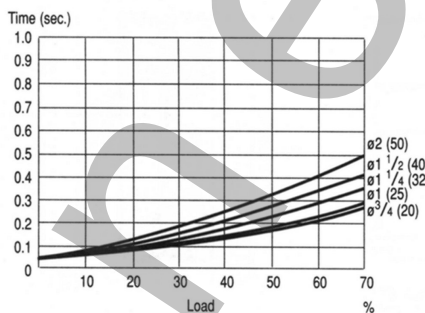
HFMW110-4E1
HFMW110-4KE2
HFMW113-4KE2
HFMY110-4ME2
HFMY113-4ME2



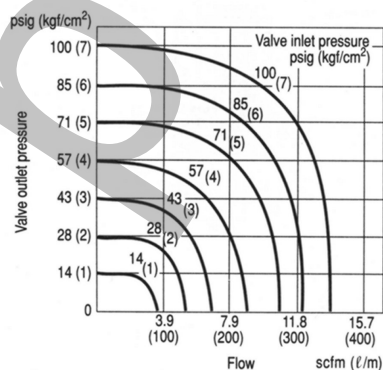
Maximum operating speed



Delay time



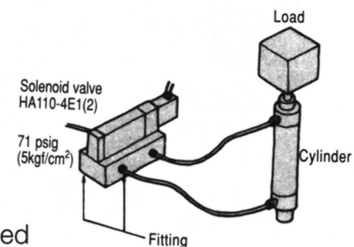
Flow



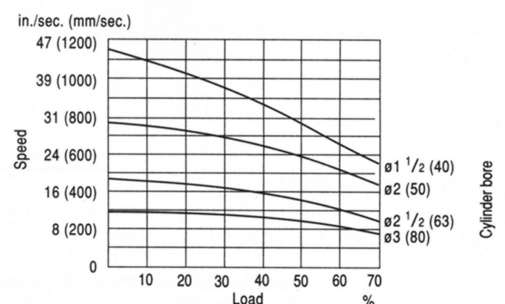
Measurement requirements

- Air pressure: 71 psig (5 kgf/cm²)
- Tubing: 1/4" (6.35) I.D. x 35" (890) long
- Load ratio = $\frac{\text{Load}}{\text{Cylinder theoretical thrust}}$ (%)
- Cylinder stroke: 6 in. (152)

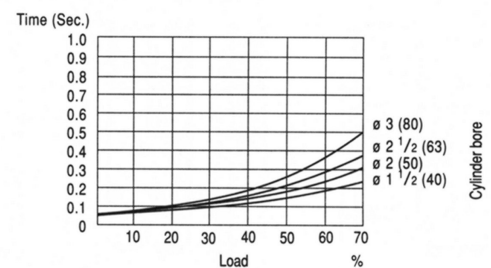
HFMW180-4E1
HFMW180-4KE2
HFMW183-4KE2
HFMY180-4ME2
HFMY183-4ME2



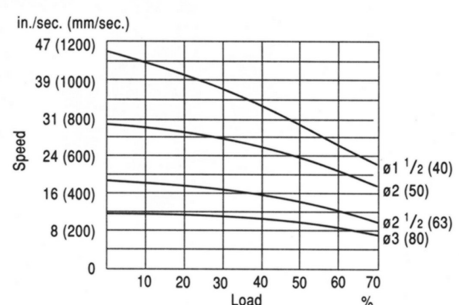
Maximum operating speed



Delay time



Flow



HFMW VALVE DIMENSION DIAGRAMS

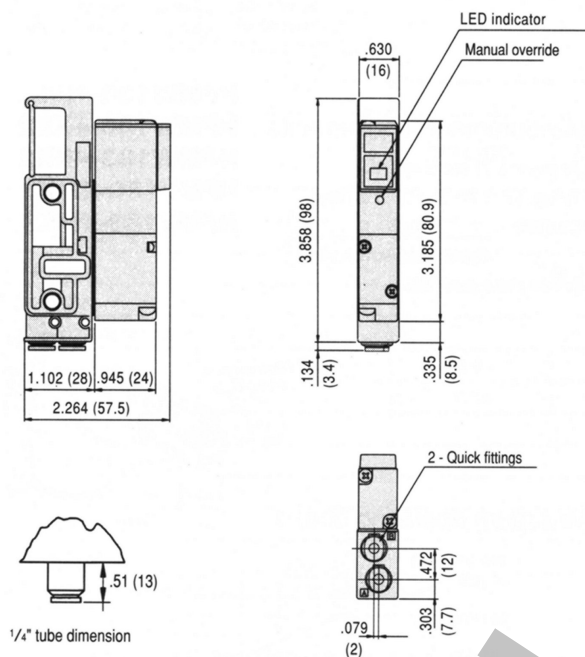
in. (mm)

NOTE: End Block adds 0.039 in. (1mm) to overall height of finished manifold assembly.

SINGLE SOLENOID

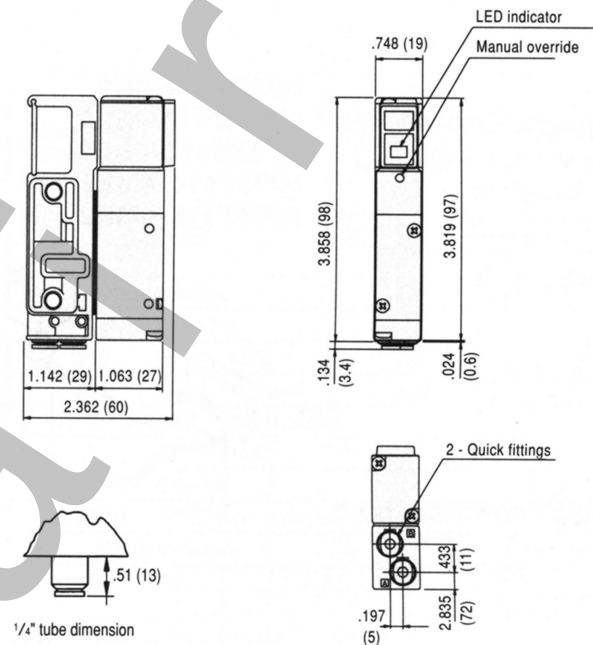
HFMW110E1, HFMW110-4E1

Drawing shows delivery ports with 5/32-inch quick fittings (Option -J4S). For dimensions of delivery ports with 1/4-inch quick fittings (Option -J1S), use inset in lower left corner.



HFMW180E1, HFMW180-4E1

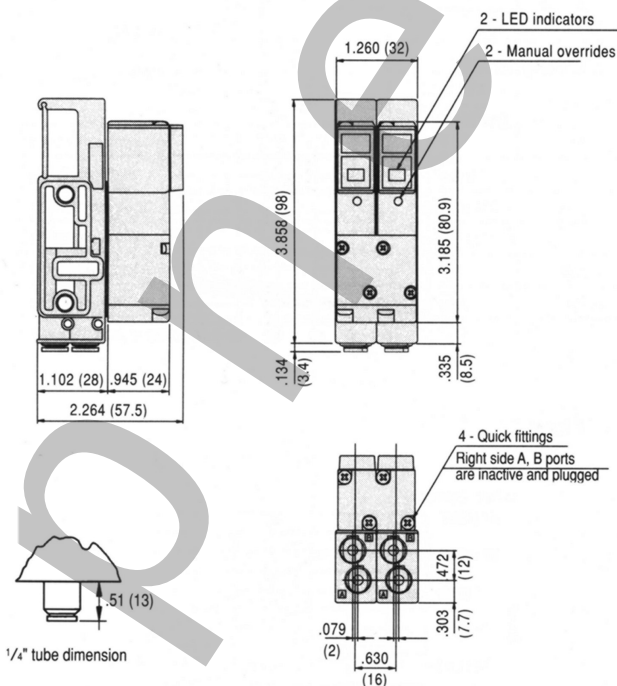
Drawing shows delivery ports with 5/32-inch quick fittings (Option -J4S). For dimensions of delivery ports with 1/4-inch quick fittings (Option -J1S), use inset in lower left corner.



DOUBLE SOLENOID

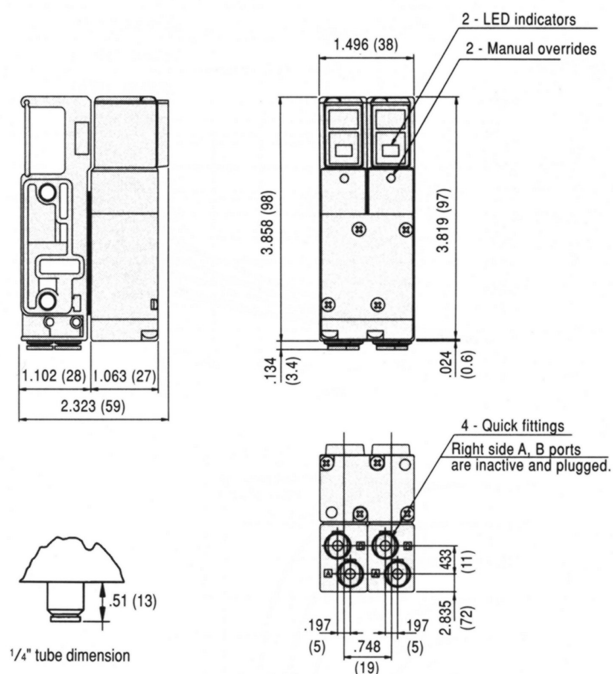
HFMW-110-4KE2, HFMW113-4KE2

Drawing shows delivery ports with 5/32-inch quick fittings (Option -J4S). For dimensions of delivery ports with 1/4-inch quick fittings (Option -J1S), use inset in lower left corner.



HFMW-180-4KE2, HFMW183-4KE2

Drawing shows delivery ports with 5/32-inch quick fittings (Option -J4S). For dimensions of delivery ports with 1/4-inch quick fittings (Option -J1S), use inset in lower left corner.



HFMY VALVE DIMENSION DIAGRAMS

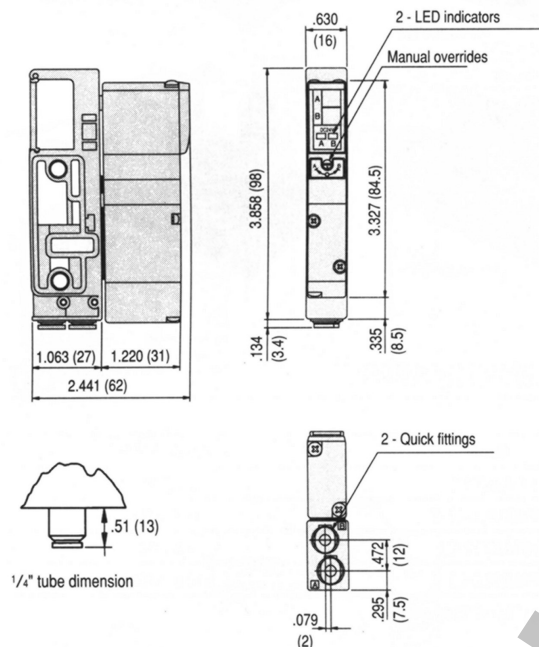
in. (mm)

NOTE: End Block adds 0.039 in. (1mm) to overall height of finished manifold assembly.

TANDEM DOUBLE SOLENOID

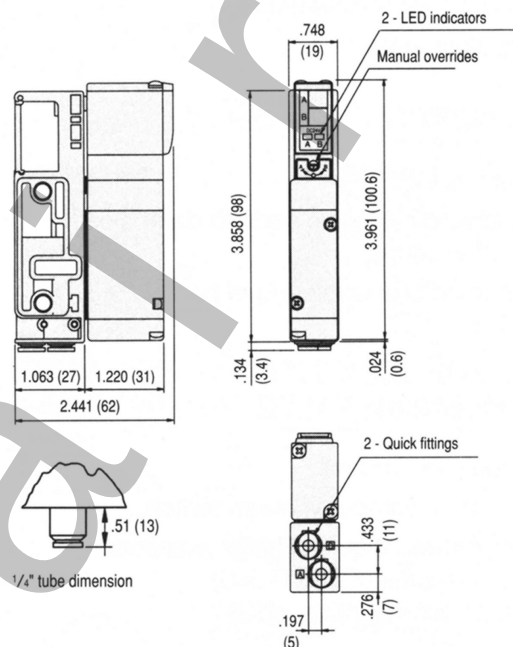
HFMY110-4ME2

Drawing shows delivery ports with 5/32-inch quick fittings (Option -J4S). For dimensions of delivery ports with 1/4-inch quick fittings (Option -J1S), use inset in lower left corner.



HFMY180-4ME2

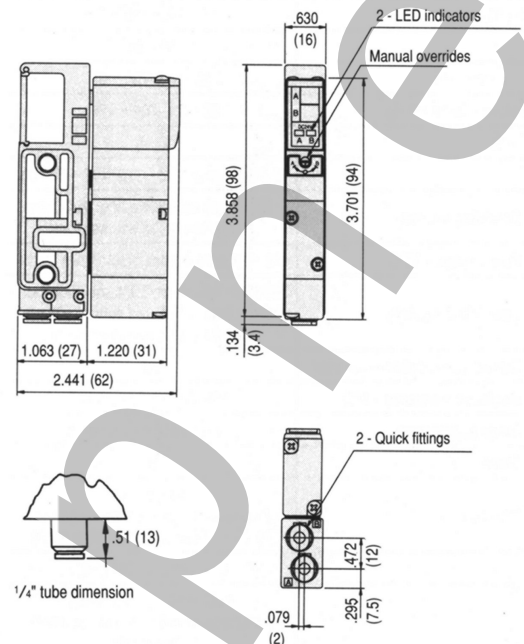
Drawing shows delivery ports with 5/32-inch quick fittings (Option -J4S). For dimensions of delivery ports with 1/4-inch quick fittings (Option -J1S), use inset in lower left corner.



TANDEM DOUBLE SOLENOID

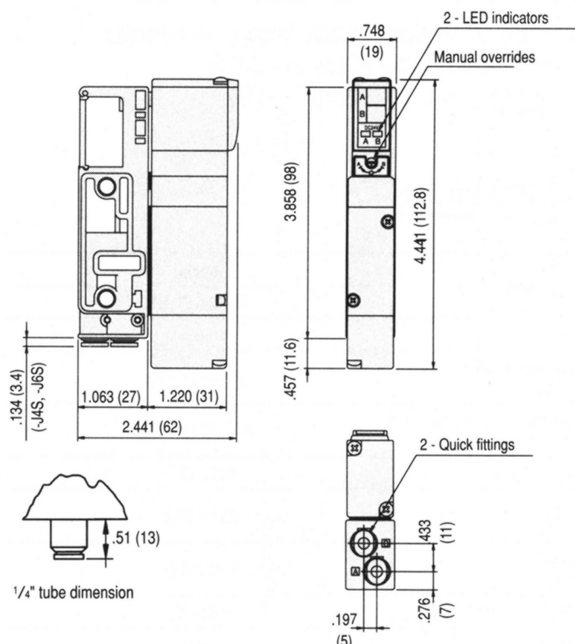
HFMY113-4ME2

Drawing shows delivery ports with 5/32-inch quick fittings (Option -J4S). For dimensions of delivery ports with 1/4-inch quick fittings (Option -J1S), use inset in lower left corner.



HFMY183-4ME2

Drawing shows delivery ports with 5/32-inch quick fittings (Option -J4S). For dimensions of delivery ports with 1/4-inch quick fittings (Option -J1S), use inset in lower left corner.



MICRO EJECTOR (Vacuum Generators) MODULES

FEATURES

- All vacuum functions, generating and control, can be done in one module.
- All wiring and piping from one location.
- Nozzle size: .028-inch (0.7mm)
- Vacuum: 25.6" Hg. (-650mm Hg.)
- Small size, light weight.

VACUUM SWITCH

- Control vacuum setting.
- Monitor individual vacuum pads to determine presence of vacuum.
- Monitor loading and unloading of parts.

EJECTOR MODULE WITH SINGLE SOLENOID VALVE

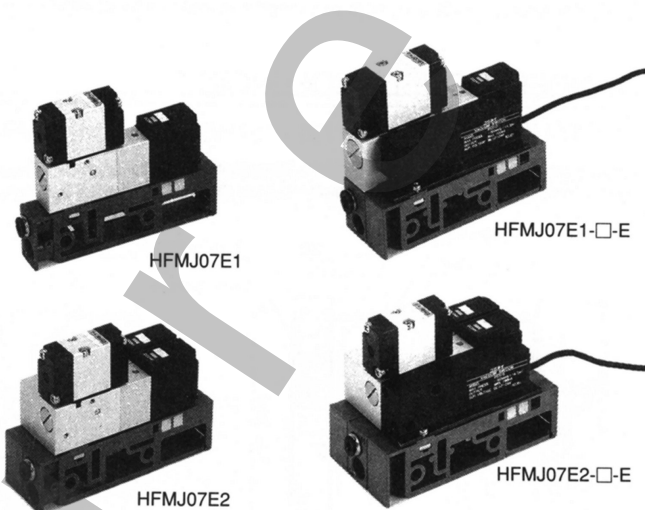
- Turns vacuum on and off.
- Available with or without vacuum switch.
- Two sizes of straight quick fittings available:
5/32-inch O.D. tube (Option -J4S)
1/4-inch O.D. tube (Option -J1S)

EJECTOR MODULE WITH DOUBLE SOLENOID VALVE

- Turns vacuum on and off.
- Includes solenoid valve for vacuum blow-off.
- Available with or without vacuum switch.
- Two sizes of straight quick fittings available:
5/32-inch O.D. tube (Option -J4S)
1/4-inch O.D. tube (Option -J1S)

SPECIFICATIONS

Item	Model
	HFMJ07E1/E2
Media	Air
Operating pressure range – PSIG (kgf/cm ²)	15 ~ 85 (1 ~ 6)
Operating temperature °F (°C) (atmosphere or media)	40 ~ 122 (5 ~ 50)
Nozzle size – in. (mm)	0.028 (0.7)
Maximum vacuum in. Hg (mm Hg)	25.6 (-650)
Flow at vacuum scfm (ℓ/min.)	0.49 (12.5)
Air consumption – scfm (ℓ/min.)	0.81 (23)
Lubrication	None
Filtration – μm	30
Mounting direction	Any direction



MODULE WEIGHTS

oz. (g)

Model	Weight ^{NOTE}
HFMJ07E1-□	8.1 (230)
HFMJ07E1-□-E	11.6 (330)
HFMJ07E2-□	14.5 (410)
HFMJ07E2-□-E	18.0 (510)

NOTE: Add .4 oz. (12g) of fitting weight.

ELECTRONIC VACUUM SWITCH SPECIFICATIONS

Item	Option Code	
	-E	
Media	Air or inert gas	
Temperature – °F (°C)	14 ~ 140 (-10 ~ 60)	
Humidity – %RH	35 ~ 95	
Pressure range – in. (mm) Hg	30 ~ 0 (-760 ~ 0)	
Maximum set pressure – in. (mm) Hg	30 ~ 3 (-760 ~ -76)	
Differential ^{NOTE} – %	2 ~ 9	
Repeatability	± 3% FS max. (32 ~ 122° F/0 ~ 50° C)	
Electric specifications	Operating method	NPN open collector output, N/O type (ON when below set pressure)
	Power range – VDC	12 ~ 24 ± 10% (max. ripple Vp-p 10%)
	Open/close capacity	30VDC • 100mA max. Internal drop-out power: Max. 1V at load current 100mA, Max. 0.4V at load current 16mA
	Current consumption – mA max.	20
	Insulation resistance – MΩ	(500 VDC) Minimum 100
	Surge suppression	Zenar diode standard
Mechanical features	Shock – G	50
	Vibration	10 ~ 55 Hz (vibration range – length 1.5mm) or 10 CT (XYZ axis. 2 hours max each)
LED	LED indicator ON (red)	
Lead wire	PVC: 0.14 sq. x 3 centers (white/black/red) x 19.6 in. (500mm) (entire length)	
Mounting	Any direction	
Material (Body cover)	Plastic	

NOTE: Set pressure at 25.5" Hg (-650mm Hg).

MICRO EJECTOR MODULE DIAGRAMS

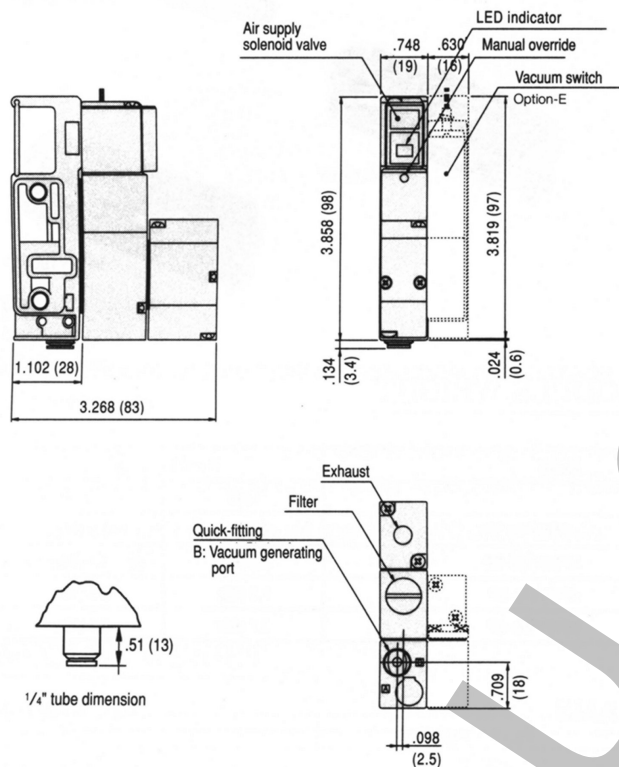
in. (mm)

NOTE: End Block adds 0.039 in. (1mm) to overall height of finished manifold assembly.

SINGLE SOLENOID

HFMJ07E1

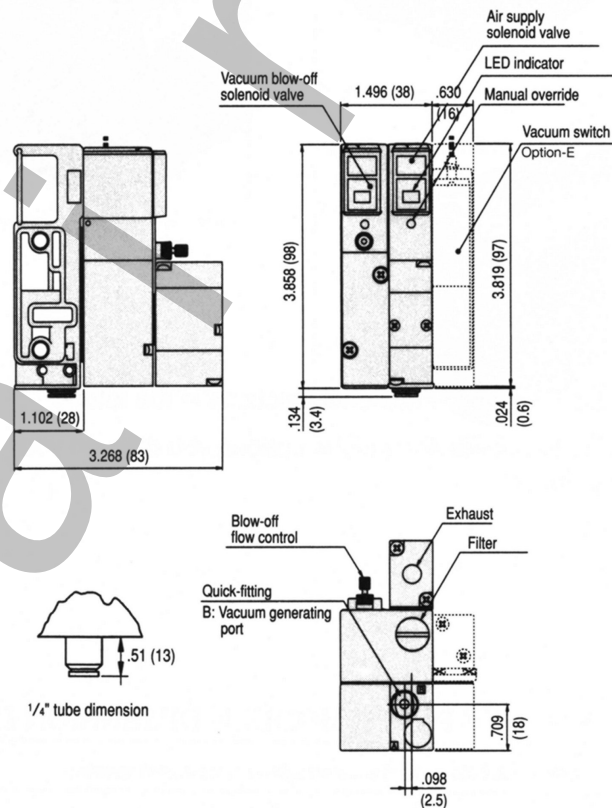
Drawing shows delivery ports with 5/32-inch quick fittings (Option -J4S). For dimensions of delivery port with 1/4-inch quick fitting (Option -J1S), use inset in lower left corner.



DOUBLE SOLENOID

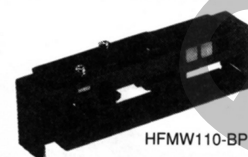
HFMJ07E2

Drawing shows delivery ports with 5/32-inch quick fittings (Option -J4S). For dimensions of delivery port with 1/4-inch quick fitting (Option -J1S), use inset in lower left corner.

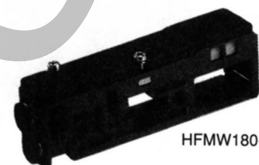


FM-SOLID MANIFOLD – HX88M SERIES

BLOCK-OFF PLATE MODULES



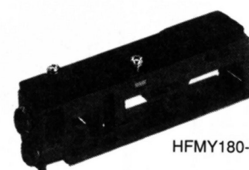
HFMW110-BP



HFMW180-BP



HFMY110-BP



HFMY180-BP

- Use to provide additional functions in the future.
- Use to provide for various options you offer on your equipment.

MODULE WEIGHT

Model	Weight – oz. (gf)	
	-J4S	-J1S
HFMW110-BP	2.2 (62)	2.0 (58)
HFMW180-BP	3.2 (92)	3.1 (88)
HFMY110-BP	2.2 (62)	2.0 (58)
HFMY180-BP	3.2 (92)	3.1 (88)

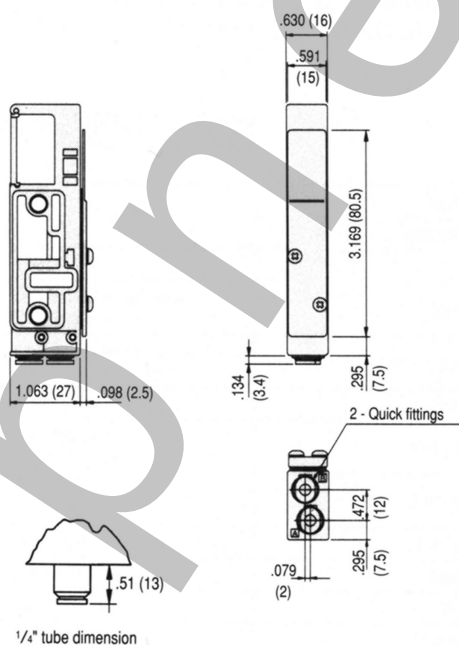
BLOCK-OFF PLATE MODULE DIMENSION DIAGRAMS

in. (mm)

NOTE: End Block adds 0.039 in. (1mm) to overall height of finished manifold assembly.

HFMW110-BP, HFMY110-BP

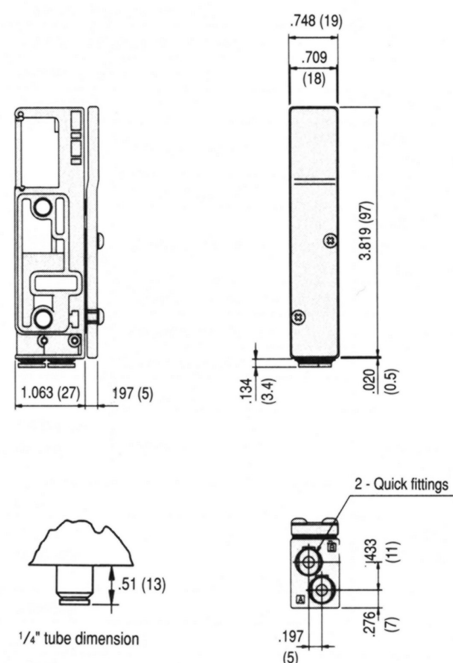
Drawing shows delivery ports with $\frac{5}{32}$ -inch quick fittings (Option -J4S). For dimensions of delivery ports with $\frac{1}{4}$ -inch quick fittings (Option -J1S), use inset in lower left corner.



$\frac{1}{4}$ " tube dimension

HFMW180-BP, HFMY180-BP

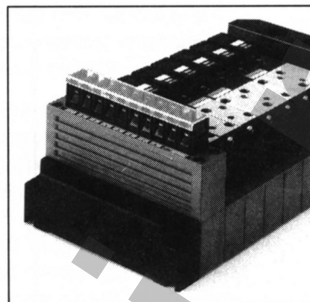
Drawing shows delivery ports with $\frac{5}{32}$ -inch quick fittings (Option -J4S). For dimensions of delivery ports with $\frac{1}{4}$ -inch quick fittings (Option -J1S), use inset in lower left corner.



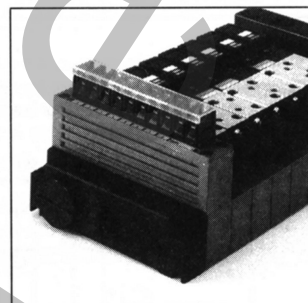
$\frac{1}{4}$ " tube dimension

FM-SOLID MANIFOLD – HX88M SERIES

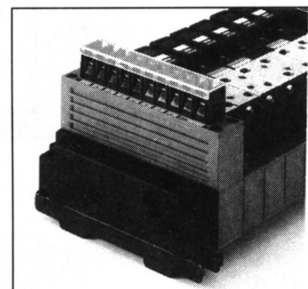
END BLOCKS



HX88M



HX88M-ED



HX88M-DN

FEATURES

- End Blocks secure finished assembly and provide for mounting.
- Two types available: End Block Mounting Type and End Block Mounting and Piping Type (option -ED).
- Optional DIN Rail mount (option -DN) available for each type.

MODULE WEIGHT

Model	Weight – oz. (gf)
HX88M	4.9 (140)
HX88M-ED	5.1 (145)
HX88M-DN	9.9 (280)

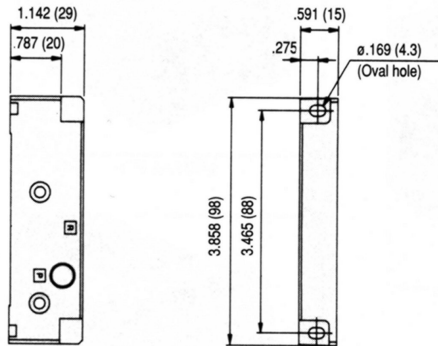
END BLOCK DIMENSION DIAGRAMS

in. (mm)

END BLOCK MODULE

HX88M

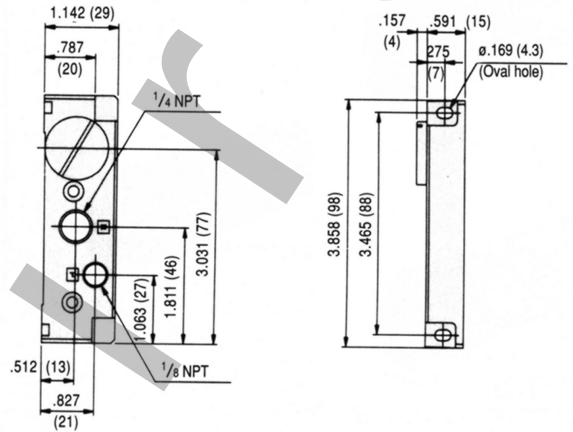
The drawing indicates left side of end block. For right side of end block dimensions, mounting hole locations and piping locations are mirror image of left side.



END BLOCK PIPING TYPE WITH EXHAUST

HX88M-ED

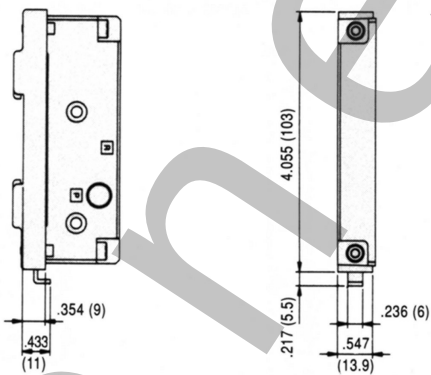
The drawing indicates left side of end block. For right side of end block dimensions, mounting hole locations and piping locations are mirror image of left side.



DIN RAIL MOUNT

HX88M-DN, HX88M-ED-DN

The drawing indicates left side of end block. For right side of end block dimensions, mounting hole locations and piping locations are mirror image of left side.



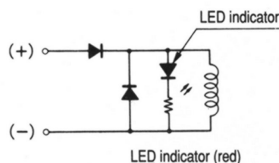
HANDLING INSTRUCTIONS AND GENERAL CAUTIONS

SOLENOIDS

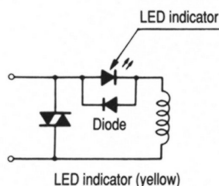
INTERNAL CIRCUIT

STANDARD SOLENOID

12VDC, 24VDC

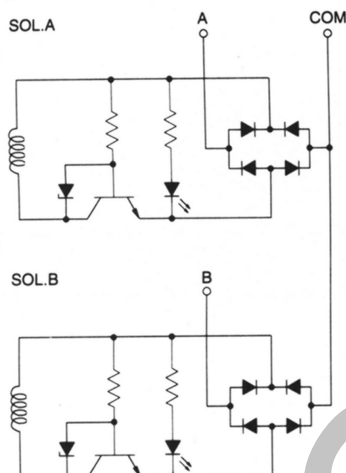


120VAC



TANDEM DOUBLE SOLENOID

24VDC



WIRING TERMINALS INFORMATION

Use of AMP #327717 spade tongue terminals, or equivalent, is recommended for all screw terminals.

Cautions:

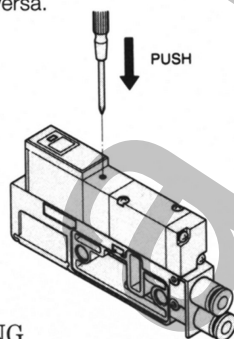
1. Do not install megger between lead wires.
2. 12 and 24 VDC solenoids will not short-out even with wrong polarity. However, solenoids with surge suppression will not operate.
3. Do not energize both solenoids of double solenoid valves simultaneously. Valves may assume neutral position.
4. If circuit leakage is experienced, the valve may not turn off. Ensure that current leakage is below the maximum allowable leak rate.
5. Tandem solenoid valves (24VDC only) do not have polarity, therefore, they can use either positive common or negative common.

MANUAL OVERRIDE

NON-LOCKING

Single solenoid – Actuate valve by fully depressing manual override with small tool. Valve remains actuated until manual override is released. Upon release, valve spring returns valve to normal position.

Double solenoid – Fully depress manual override S1 with a small tool to deliver pressure to outlet port 2 (port 1 exhausts). Valve remains in this position until depressing manual override S2, which diverts pressure to outlet port 1 (port 2 exhausts). Note: If the solenoid nearest override S1 was last energized, only override S2 will be operable and vice versa.

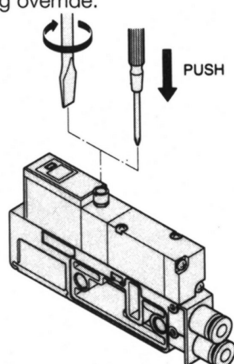


LOCKING

Use a small tool to push in, and turn manual override more than 45° to activate. Override turns in either direction.

Spring force will return override to normal position when override is turned past the locking position.

If override is not turned to activate, it may be operated like a non-locking override by depressing override.



Cautions:

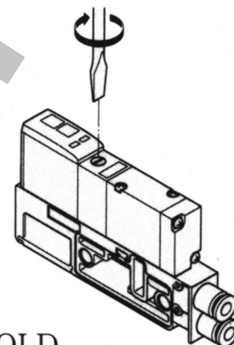
1. Since HFM series valves are piloted type solenoid valves, manual override will not activate unless air is supplied to the manifold.
2. Take care to release locking override before resuming normal operation.
3. Do not use a tool with a needle sharp tip. It may damage the button.

LOCKING (Tandem Solenoid Valve)

Use a small tool to push in, and turn manual override from center position to A position.

Solenoid A side will become activated and locked.

At Solenoid B side, turn manual override counterclockwise to B position. Solenoid B will become activated and locked.



MANIFOLD

BLOCK-OFF PLATE

Use block-off plate to close a station not in use.

Solenoid valve	Order code
HFMW110 series	HF1W110-BP
HFMW180 series	HF1W180-BP
HFMY110 series	HF1Y110-BP
HFMY180 series	HF1Y180-BP

NOTE: Two Block-off plates are required for HFMW-type double solenoids.