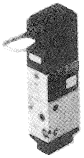



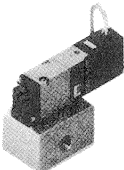
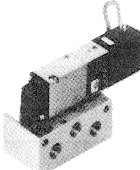
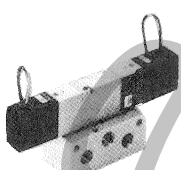
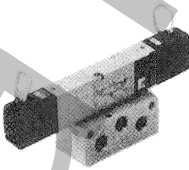
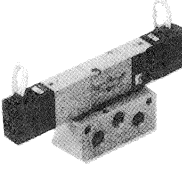
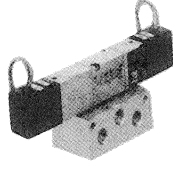


# H110 SERIES BASIC MODELS AND CONFIGURATIONS

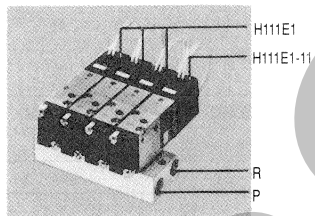
## SINGLE UNIT – IN-LINE AND SUBBASE MOUNTED

2-, 3-way	4-way				
	<b>In-line mounted</b>				
Normally closed (N/C) or normally open (N/O) Single solenoid only    H111E1 series	2 position Single or double solenoid    H110-4E1 (-4E2)	  H113-4E2	3 position    H113-4E2-13	  H113-4E2-14	
	<b>Subbase mounted<sup>Note</sup></b>				
Normally closed (N/C)    HA111E1	2 position    HA110-4E1	  HA110-4E2	  HA113-4E2	3 position    HA113-4E2-13	  HA113-4E2-14

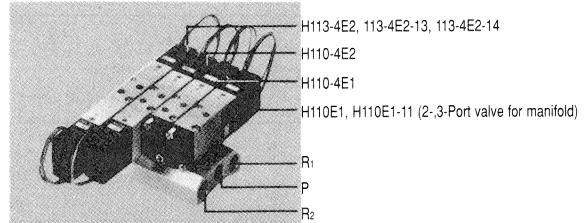
NOTE: Valves are mounted to HA111-25 and HA110-25 subbases. Subbases are not available for H110 (3-way) series.

## MULTIPLE UNITS – MANIFOLD MOUNTED

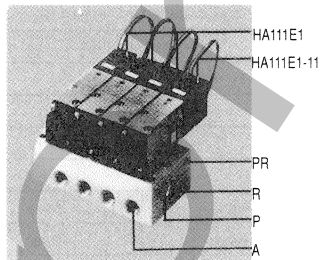
H111M□ F – use with H111 valves



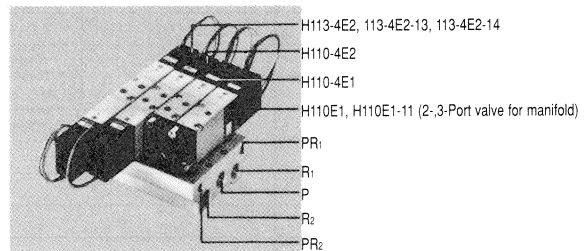
H110M□ F – use with H110, H110-4, H113-4 valves



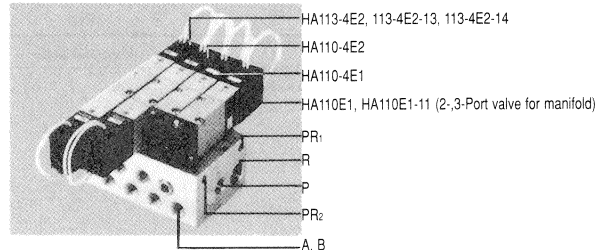
H111M□ A – use with HA111 valves



H110M□ FE – use with H110, H110-4, H113-4 valves



H110M□ A – use with HA110, HA110-4, HA113-4 valves



# LIST OF SPECIFICATIONS

## MODEL AND VALVE FUNCTIONS

Item	In-line and manifold type	Basic model		
		H111E1 H110E1	H110-4E1 H110-4E2	H113-4E2
	Manifold or subbase type only	HA111E1 HA110E1	HA110-4E1 HA110-4E2	HA113-4E2
Number of positions	2 position		3 position	
Number of ports	2- and 3-way		4-way	
Valve function	Normally closed (N/C standard) and normally open (N/O option)		Single and double solenoid	Double solenoid

NOTE: H110E1 and HA110E1 cannot be used as in-line valves. Use as manifold mount only.

## SPECIFICATIONS

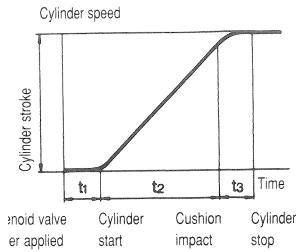
Item	In-line and manifold type	Basic model		
		H111E1 H110E1	H110-4E1 H110-4E2	H113-4E2
	Manifold or subbase type only	HA111E1 HA110E1	HA110-4E1 HA110-4E2	HA113-4E2
Media	Air			
Type of operation	Indirect acting			
Flow – C <sub>v</sub>	.23		.21	
Ports	10-32 UNF			
Lubrication	None required			
Pressure range psig (kgf/cm <sup>2</sup> )	20 ~ 100 (1.5 ~ 7)			
Response time – ms (ON/OFF)	12VDC, 24VDC	below 15/20	below 15/25	below 15/30
	120VAC, 240VAC	below 15/15	below 15/15	below 15/20
Maximum operation frequency – c/s	5			
Minimum time to energize (ms)	-		50 (E2 only)	-
Temperature range (atmosphere or media) – °F (°C)	40 ~ 122 (5 ~ 50)			
Impact resistance – G	140 (axle direction 30)			30
Mounting direction	Any			

## SOLENOID SPECIFICATIONS

Voltage		12VDC	24VDC	24VAC	120VAC	240VAC			
Model		Surge protector – flywheel diode		Shading system					
Voltage Range		10.8 ~ 13.2	21.6 ~ 26.4	21.6 ~ 26.4	90 ~ 132	180 ~ 264			
Current value (Rated voltage applied)	Frequency Hz	-	-	50	60	50	60		
	Starting power – mA	-	-	145	130	44	40	22	20
	Holding power – mA <sup>NOTE 1</sup>	130 (140)	65 (75)	85	70	32	26	16	13
Power consumption <sup>NOTE 1</sup>		1.6 (1.7)	1.6 (1.8)	-	-	-	-	-	-
Leak rate (maximum allowed) – mA		8	4	8	4	2			
Temperature rise (at rated voltage) – °F (°C)		below 77° (25°)				Less than 95° (35°)			
Insulation		Type B							
Insulation tolerance – MΩ		Over 100							
Lead wire: length	Standard	Grommet 12" (300mm)							
	Options	Plug connector							
Lead wire: color		Brown/Black	Red/Black	Black	Yellow	White			
LED indicator (option) color		Red		-	Yellow	Green			
Surge suppression		Flywheel diode				-			

NOTE 1: Number in ( ) indicates solenoid with LED indicator.

## CYLINDER SPEED



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.



### H110-4E1, H113-4E2

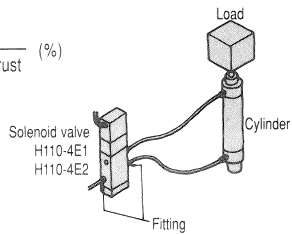
#### Measurement requirements

Air pressure: 71 psig (5 kgf/cm<sup>2</sup>)

1/4" I.D. tubing x 35" long

$$\text{Load ratio} = \frac{\text{Load}}{\text{Cylinder theoretical thrust}} (\%)$$

Cylinder stroke: 6 in.



### HA110-4E1, HA113-4E2

#### Measurement requirements

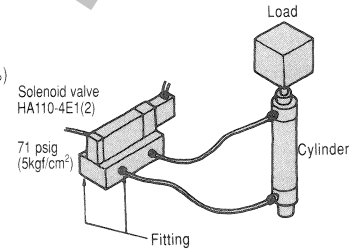
• Mounted to H110-25

• Air pressure: 71 psig (5 kgf/cm<sup>2</sup>)

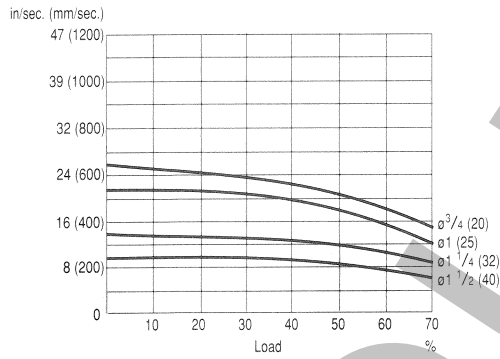
• 1/4" I.D. tubing x 35" long

$$\text{Load ratio} = \frac{\text{Load}}{\text{Cylinder theoretical thrust}} (\%)$$

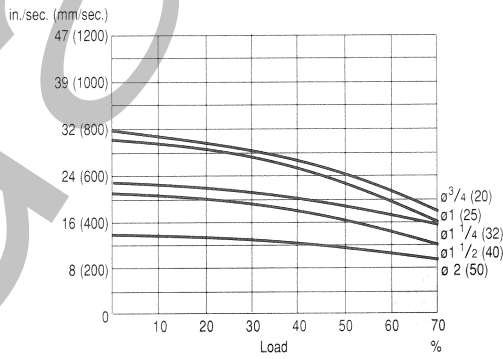
• Cylinder stroke: 6 in.



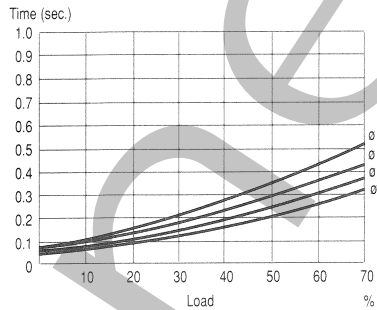
#### Maximum operating speed



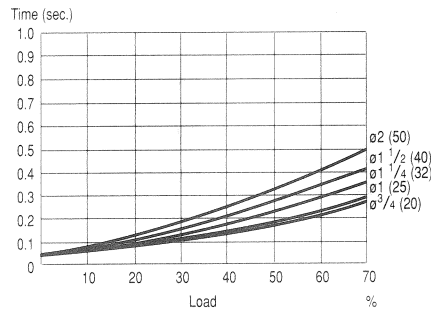
#### Maximum operating speed



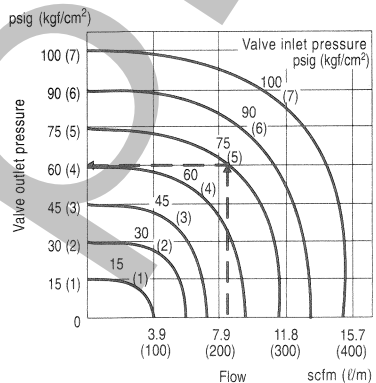
#### Delay time



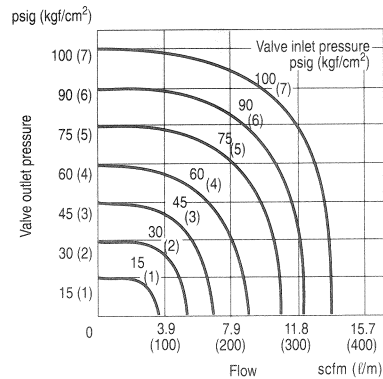
#### Delay time



#### Flow



#### Flow



# HOW TO ORDER

## VALVES

Description	Model	ORDERING CODE						Manual override	Electrical Connection	Voltage
		Function				Open center	Pressure center			
		2-way	Norm. Open	3 position						
				Open center	Pressure center					
In-line or F-type manifold	2 or 3 port	H111E1	-2	-11						
	5 port Single solenoid	H110-4E1								
	5 port Double solenoid	H110-4E2								
	5 port 3-position	H113-4E2			-13	-14				
Single subbase or A-type manifold	2 or 3 port	HA111E1	-2	-11						
	5 port Single solenoid	HA110-4E1								
	5 port Double solenoid	HA110-4E2								
	5 port 3-position	HA113-4E2			-13	-14				
Manifold mount only	H110M□F, FE 2 or 3 port	H110E1								
	H110M□A 2 or 3 port	HA110E1	-2	-11						

NOTE: 24VAC with lead wires and no LED only.

3-port options:

2-way (3-way std.)

Normally open (Normally closed-std.)

3-position options:  
Block center std.  
Order code: Blank

Exhaust center

Pressure center

Override  
Non-locking recessed std.

Locking

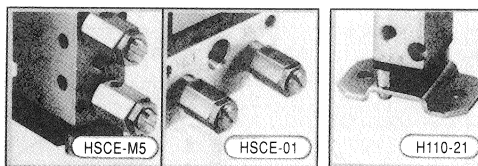
Electrical:  
Grommet with 12" lead wires std.  
Order code: Blank

Grommet with LED and surge protection

Plug-in with LED and surge protection <sup>NOTE</sup>

## ACCESSORIES

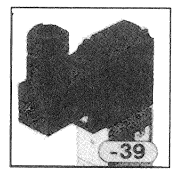
3 port valves are 3-way, normally closed standard.  
3 position 4-way valves have all ports blocked in the center position as standard.



10-32 UNF exhaust flow control.

1/8" NPT exhaust flow control.

Mtg. base: single solenoid only.



DIN-style plug-in (LED not available)

NOTE: Standard wire length is 12" (300mm). Specify -PSL-L3 for 108" (3000mm) lead wires.

# HOW TO ORDER

## MANIFOLDS AND SINGLE STATION SUBBASES

2- and 3-way valve manifolds

Model number	Description
H111M□F	Select 2 – 20 stations (□), accepts H111 series valves
H111M□A	Select 2 – 20 stations (□), accepts HA111 series valves

2-, 3- and 4-way valve manifolds

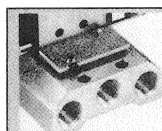
Model number	Description
H110M□F	Select 2 – 20 stations (□), accepts H110 series valves
H110M□FENOTE	Select 2 – 20 stations (□), accepts H110 series valves
H110M□A	Select 2 – 20 stations (□), accepts HA110 series valves

Single station subbases

Model number	Description
HA111-25	Subbase accepts HA111E1 3-way valves
HA110-25	Accepts HA110-4E1 (2) & HA113-4E2 4-way valves

OTE: FE has captured pilot exhaust.

## ACCESSORIES



Block-off plates:  
 H111MF-BP: for H111M□F  
 H111MA-BP: for H111M□A  
 H110MF-BP: for H110M□F  
 H110MA-BP: for H110M□FE & H110M□A

## PORT INFORMATION

### SINGLE VALVE PORT INFORMATION

Model	Port	Specifications	Port diameter
H111E1, (H110E1 <sup>NOTE 1</sup> )	Standard	Female thread	10-32 UNF
H110-4E1, H110-4E2, H113-4E2	Standard	Female thread	10-32 UNF
HA110-25 <sup>NOTE 2</sup> HA111-25	P	Female thread	1/8 NPT
	A, B		
	R	Female thread	10-32 UNF
	PR		

OTE 1: H110E1 is for manifold installation only. Cannot be used as stand alone valve.  
 OTE 2: Single station subbase for manifold mounted valves.

### MANIFOLD PIPING OUTLET DIAMETER

Manifold model	Port	Location	Port dimensions
H111M□F H110M□F	P	Manifold	1/8 NPT
	A, B	Valve	10-32
	R	Manifold	1/8 NPT
H110M□FE	P	Manifold	1/8 NPT
	A, B	Valve	10-32
	R	Manifold	1/8 NPT
	PR		10-32 UNF
H111M□A H110M□A	P	Manifold	1/8 NPT
	A, B		1/8 NPT
	R		1/4 NPT
	PR		10-32 UNF

## WEIGHT

### SOLENOID VALVE WEIGHT oz. (gf)

Basic model	Weight
H111E1	2.6 (75)
H110E1	2.8 (80)
H110-4E1	2.8 (80)
H110-4E2	4.6 (130)
H113-4E2	5.1 (145)
HA111E1	2.8 (80)
HA110E1	3.0 (85)
HA110-4E1	3.0 (85)
HA110-4E2	4.8 (135)
HA113-4E2	5.3 (150)
HA111-25	3.0 (85)
HA110-25	3.4 (95)

### MANIFOLD WEIGHT oz. (gf)

Manifold model	Weight calculation for each unit mounting (n = number)	Block-off plate
H111M□F	{0.5 (15) x n + 1.1 (30)}	0.18 (5)
H111M□A	{1.6 (45) x n + 1.6 (45)}	0.35 (10)
H110M□F	{0.7 (20) x n + 1.1 (30)}	0.21 (6)
H110M□FE	{1.4 (40) x n + 1.8 (50)}	0.39 (11)
H110M□A	{2.1 (60) x n + 2.1 (60)}	

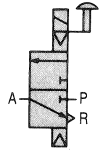
# OPERATING PRINCIPLE

## 3-WAY

H111E1

Unactuated

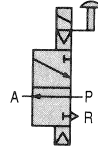
Normally closed (N/C)



H111E1-11

Unactuated

Normally open (N/O)

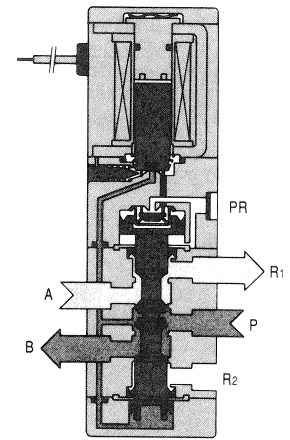
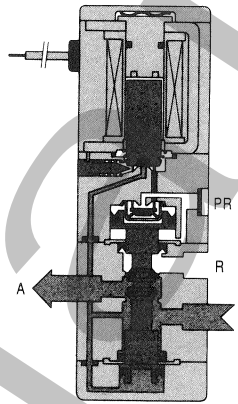
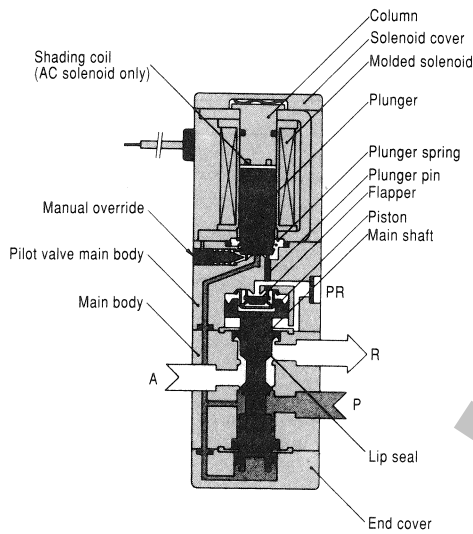
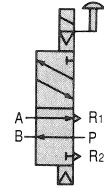


## 4-WAY, 2-POSITION

H110-4E1

Unactuated

Single solenoid



## MATERIALS OF MAIN PARTS

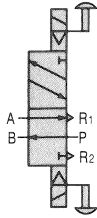
Item	Parts	Materials
Valve	Body	Aluminum (anodized)
	Stem	
	Lip seal	Buna
	Flapper	
	Mounting base	Soft steel (zinc plated)
	Subbase	Aluminum (anodized)
	Plunger	Electromagnetic stainless
Column		
Manifold	Body	Aluminum (anodized)
	Block-off plate	Steel (nickel plated)
	Seal	Buna

4-WAY,  
3-POSITION

H110-4E2

2 actuated

Double solenoid

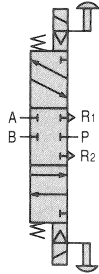


4-WAY,  
3-POSITION

H113-4E2

Unactuated

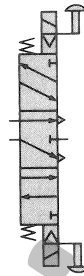
Closed center



H113-4E2-13

Unactuated

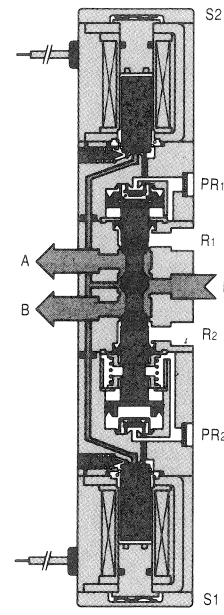
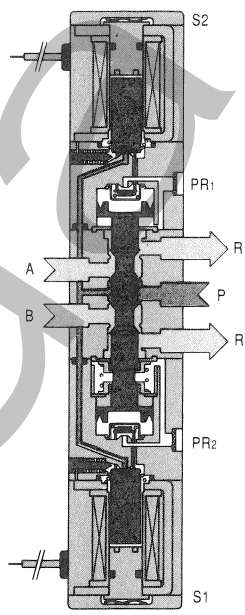
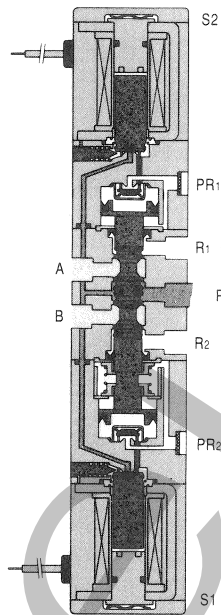
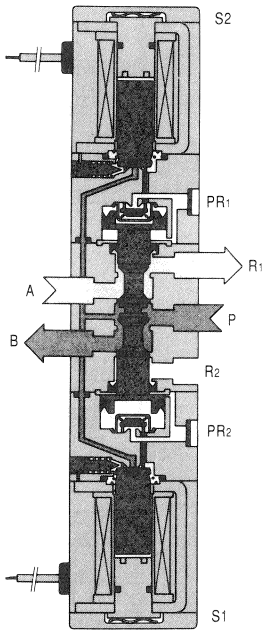
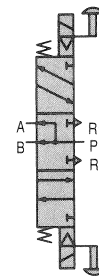
Open center



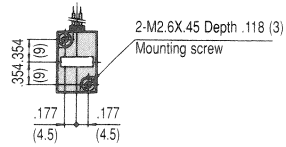
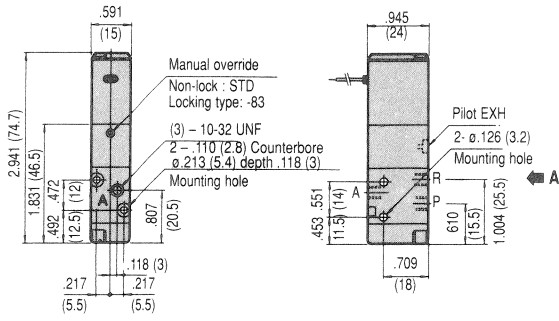
H113-4E2-14

Unactuated

Pressure center



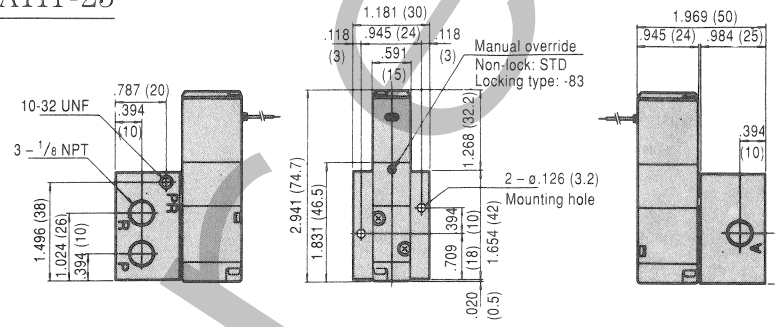
H111E1



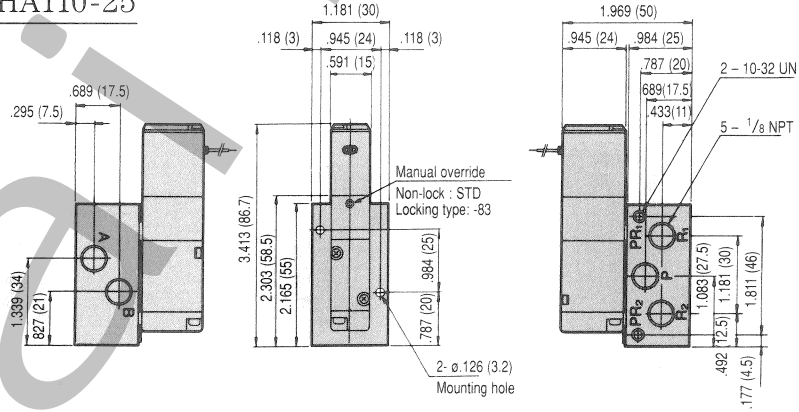
View from A



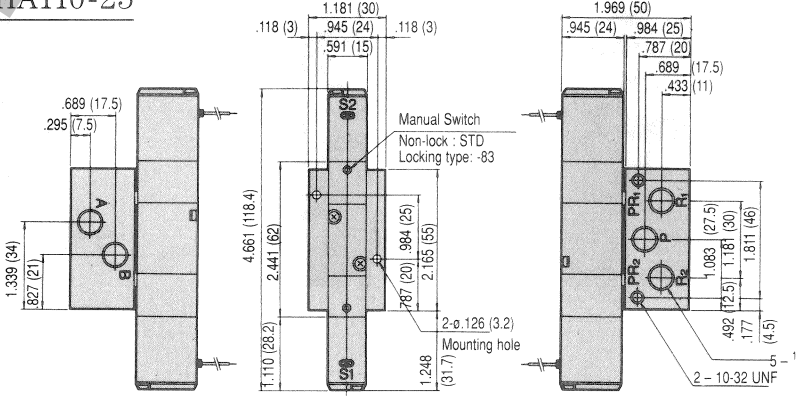
HA111E1 & HA111-25



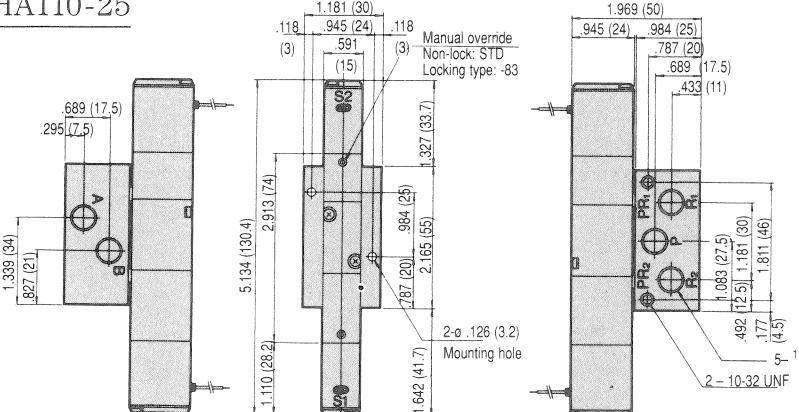
HA110-4E1 & HA110-25



HA110-4E2 & HA110-25

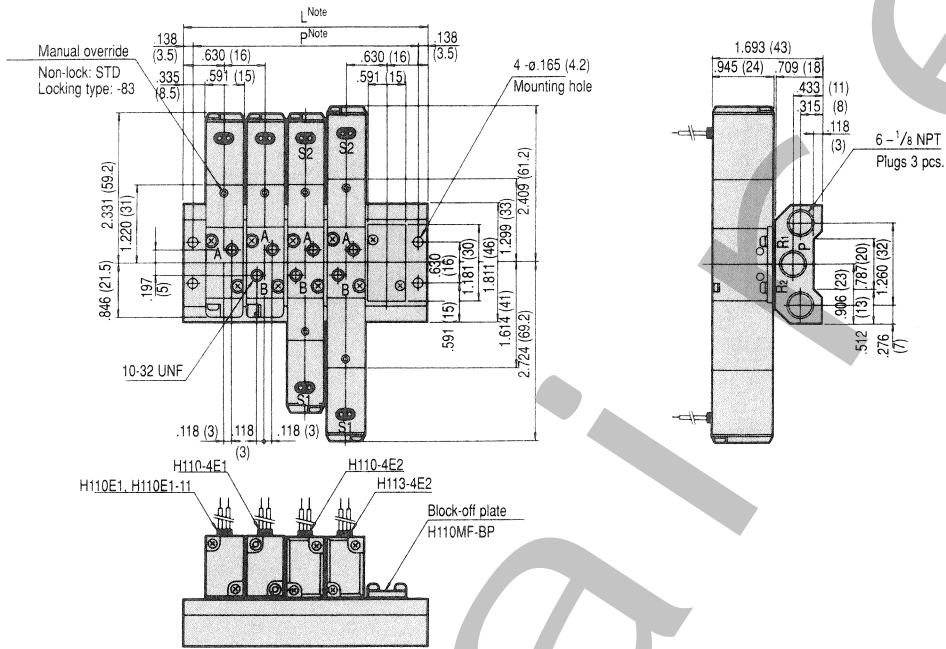


HA113-4E2 & HA110-25

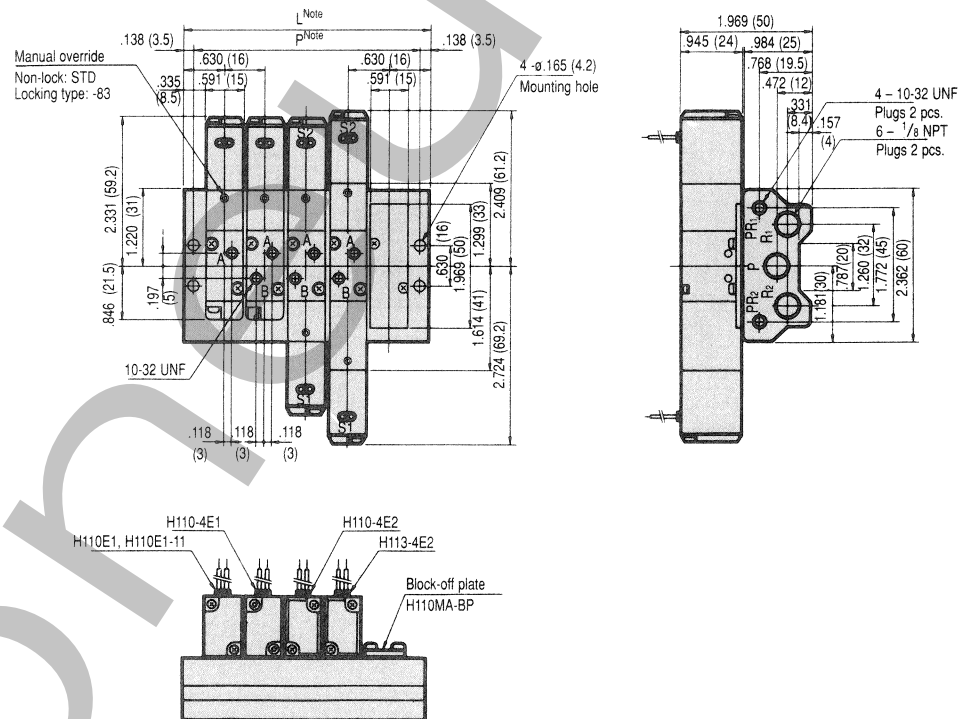




H110M□F

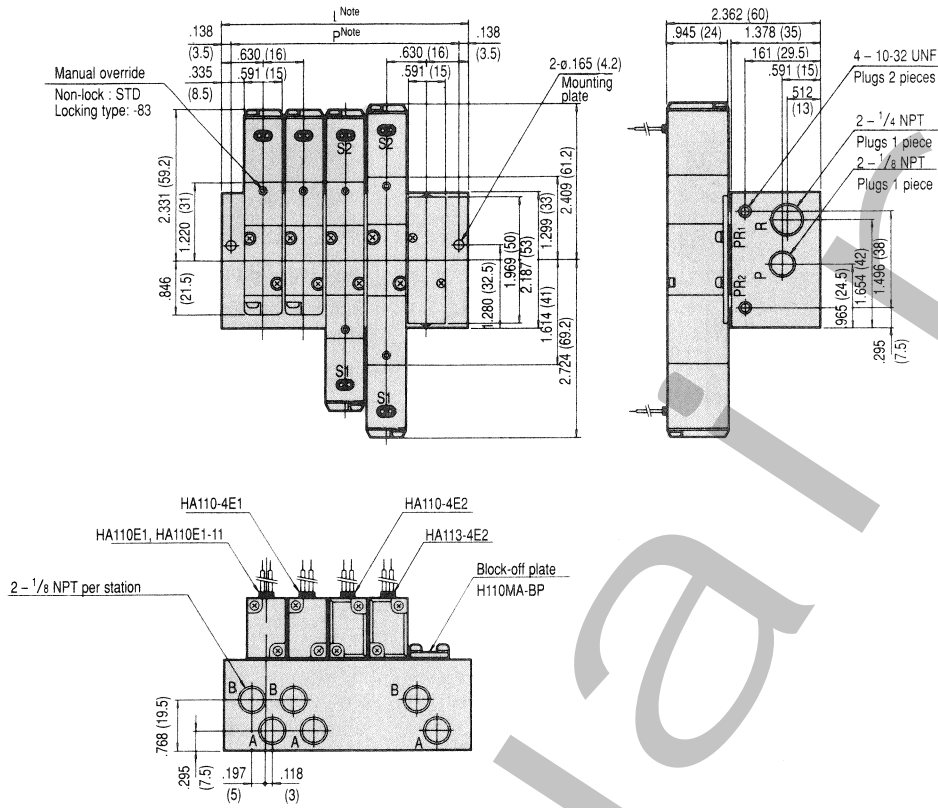


H110M□FE



NOTE: L = 1.890 (48) and P = 1.614 (41) for a 2 station manifold. Add 0.630 (16) for each station over 2 [(example: for a 6 station manifold, add 2.520 (64), or L = 4.410 (112) and P = 4.134 (105)].

H110M□A



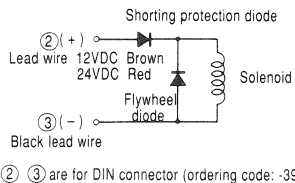
NOTE: L = 1.890 (48) and P = 1.614 (41) for a 2 station manifold. Add 0.630 (16) for each station over 2 [example: for a 6 station manifold, add 2.520 (64), or L = 4.410 (112) and P = 4.134 (105)].

# HANDLING CAUTIONS AND GENERAL ITEMS

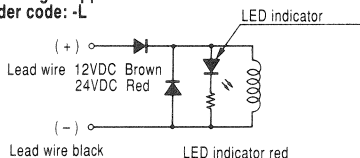
## SOLENOIDS

### INTERNAL CIRCUIT – DC

#### STD. Solenoid (Surge protection)

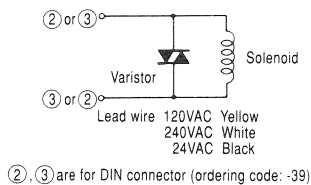


#### Solenoid with LED indicator with surge suppression Order code: -L

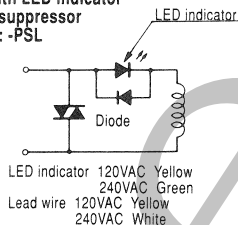


### INTERNAL CIRCUIT – AC

#### STD. Solenoid (Surge protection)



#### Solenoid with LED indicator with surge suppressor Order code: -PSL

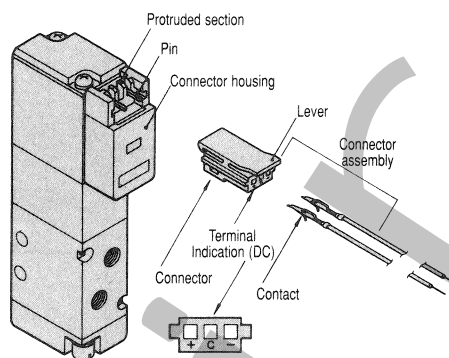


## CAUTIONS

- Shorting will not occur to the 24VDC solenoid even if the wrong polarity is applied. However, the solenoid valve with surge suppression will not operate. Also the indicator on the valve with the LED indicator will not light.
- If there is a current leakage in the circuit, improper operation, such as the valve not returning to the proper position, will occur. Make sure to operate the valve well within the limit of current leakage. If a leakage larger than the limit occurs, please consult factory.
- Double solenoid: Do not apply power to both solenoids simultaneously. The valves may be put into a neutral state.
- The AC solenoids contain diodes. Therefore, when a number of solenoid valves are connected together, make sure to connect the same color lead wires.

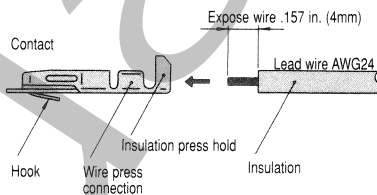
## PLUG CONNECTOR

To plug in, push connector until the lever clips into place. To take plug out, press lever and pull out.



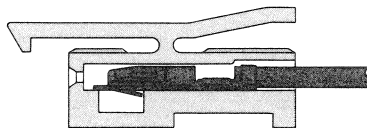
## LEAD WIRE AND CONTACT ASSEMBLY

Remove insulation from the lead wire and expose for 0.157" (4). Insert wire into contact and bend down press holds.



## CONTACT INSERTION AND DISASSEMBLY

Insert contact into square hole of connector until the hook engages. Pull lightly to assure the assembly. Push hook up with small screwdriver from side of connector to disassemble.



## CAUTIONS

- Do not pull lead wire too hard.
- Make sure pins on the connector housing are straight before inserting the connector.
- Use appropriate tool to attach contact on lead wires.

## DIN CONNECTOR

High performance in contamination and environmental protection. Lead wire self stripping system.



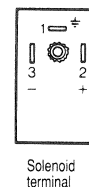
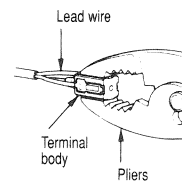
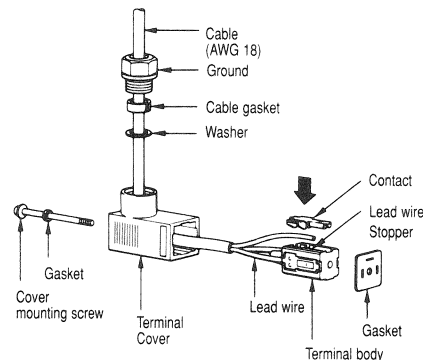
Indicate -39 option in valve order code.

Surge suppressors are equipped as standard feature.

LED indicator cannot be used.

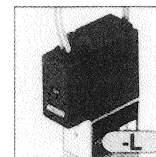
Solenoid w/DIN connector:

No need to strip lead wire. Insert lead wire into terminal body until seated with stopper and press down with pliers to ensure positive connection with the contact.



## LED INDICATOR

Confirm presence of current at coil of grommet type (12" lead wires) with LED.



Indicate -L in plug connector option.

Surge suppressors are equipped as standard feature.

## MANUAL OVERRIDE

### NON-LOCKING

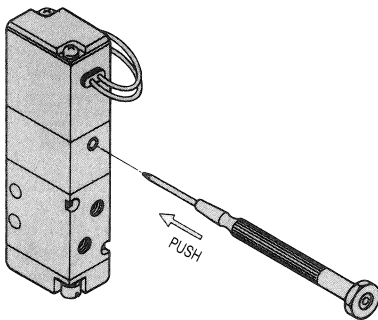
Actuate valve by fully depressing manual override with small tool. Valve remains actuated until manual override is released. Upon release, valve spring returns valve to normal position.

### LOCKING

Use a small tool to push in and turn manual override more than 45° to actuate. 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 actuate, it may be operated like a non-locking override merely by depressing.



Cautions:

- Since these valves are indirect acting, manual override will not actuate unless air is applied to IN port.
- Do not use a sharp instrument to operate the override as it may damage the button.
- Take care to release locking override before resuming normal operation.

## MANIFOLD

### PIPING

Ports P and R are located at both ends of the manifold. Piping direction can be determined according to mounting location. Ports at one end of the manifold are temporarily plugged during shipping. Remove plugs and reseal with sealing agent.

### BLOCK-OFF PLATE

Use Block-Off Plate to close stations when they are not in use. Order code is H111M□ -BP or H110M□ -BP).

Cautions:

1. For P port piping, make sure to select fitting sizes to fit the manifold connecting pipe dimensions. Actuators may not operate properly if there is insufficient flow and/or pressure due to improper piping.
2. When installing fittings or mufflers in R port, make sure that exhaust remains unrestricted. Restriction of exhaust may cause actuators to operate erratically. Consider using R ports at both ends of manifold to enhance exhaust.
3. When several manifold valves are to be operated simultaneously, connect supply air to both ends of manifold. Also exhaust through both ends of manifold. This ensures adequate supply and exhaust capacity.

## POINTS TO BE CONSIDERED

### INSTALLATION

1. Mount valves in any direction. However, mount valves perpendicular to significant shock or vibration.
2. Location near water, oil, or in excessively dusty conditions requires adequate solenoid housing protection to prevent solenoid actuator contamination. Also consider the installation of breather/muffler in exhaust ports to prevent foreign objects from entering valves.
3. Before installing fittings and tubing, blow all foreign material from them. If using a sealant, take extra care that sealant does not enter valve causing potential malfunction and/or leaks.
4. When valves are installed in tight enclosures, consider the possibility of heat build-up. Ensure adequate ventilation.
5. Valves with A or B ports open to atmosphere will not operate properly.

## AIR SOURCE

1. Use compressed air or inert gas in accordance with the pressure rating in the specifications.
2. Compressed air should be clean and uncontaminated. When in doubt, install an air filter with filtering capacity of 40 microns. Periodically remove and clean or replace filter element.
3. For optimum performance, use largest possible tubing size and minimum tubing length.

## LUBRICATION

No externally applied lubrication is required. However, when dry air is used (air that does not contain water or oil), use of a turbine oil (ISO VG32) or equivalent is recommended. Thin or low viscosity oils (spindle oil, machine oil, etc.) do not provide a good residual film of lubrication, thus should not be used.

## AIR QUALITY

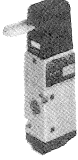

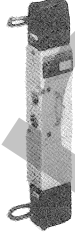


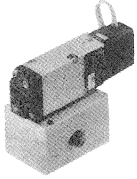
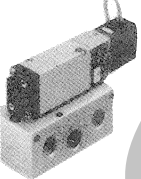
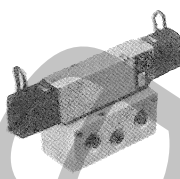
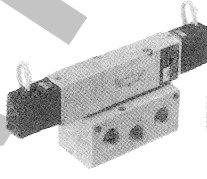
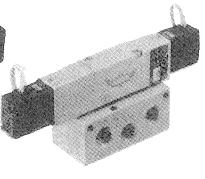
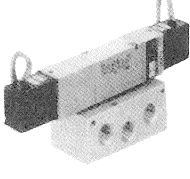
These valves cannot be used when media or ambient conditions contain organic solvents, phosphoric acid, ester type machine oil, sulfuric acid gas, or other acids.

## CAUTION

Compressed air is powerful and may be dangerous. Before attempting to remove a component from an air line or system, *always* disconnect the supply air and thoroughly exhaust the line or system. *Never* attempt to construct, operate or service anything using compressed air unless you have been properly trained to do so. Failure to heed the warning could result in **SERIOUS, EVEN FATAL, PERSONAL INJURY.**

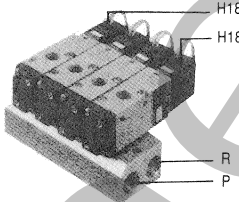
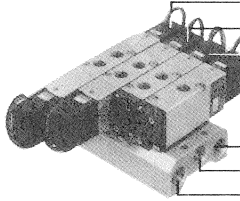
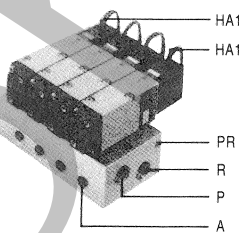
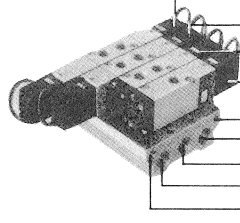
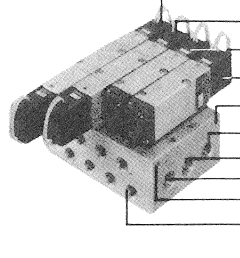
# H180 SERIES BASIC MODELS AND CONFIGURATIONS

## SINGLE UNIT – IN-LINE AND SUBBASE MOUNTED

2-, 3-way	4-way	
Normally closed (N/C) or normally open (N/O) Single solenoid only	<b>In-line mounted</b>	
 H181 series	2 position Single or double solenoid  H180 series	3 position  H183-4E2  H183-4E2-13  H183-4E2-14
Normally closed (N/C)	<b>Sub-base mounted<sup>NOTE</sup></b>	
 HA181E1	2 position  HA180-4E1  HA180-4E2	3 position  HA183-4E2  HA183-4E2-13  HA183-4E2-14

NOTE: Valves are mounted to HA181-25 or HA180-25 subbases. Subbases are not available for H180E1 (3-way) series.

## MULTIPLE UNITS – MANIFOLD MOUNTED

2-, 3-way	2-, 3- and 4-way
H181M□ F – use with H181 series 	H180M□ F – use with H180 and H183 series H183-4E2, H183-4E2-13, H183-4E2-14 H180-4E2 H180-4E1 H180E1 H180E1-11 (2 • 3 port valve for manifold) 
H181M□ A – use with HA181 series 	H180M□ FE – use with H180 and H183 series H183-4E2, H183-4E2-13, H183-4E2-14 H180-4E2 H180-4E1 H180E1 H180E1-11 (2 • 3 port valve for manifold) 
	H180M□ A – use with H180 and H183 series HA183-4E2, HA183-4E2-13, HA183-4E2-14 HA180-4E2 HA180-4E1 HA180E1 HA180E1-11 (2 • 3 port valve for manifold) 

# LIST OF SPECIFICATIONS

## MODEL AND VALVE FUNCTIONS

Item	In-line and manifold type	Basic model		
		H181E1 H180E1	H180-4E1 H180-4E2	H183-4E2
	Manifold or subbase type only	HA181E1 HA180E1	HA180-4E1 HA180-4E2	HA183-4E2
Number of positions	2 position		3 position	
Number of ports	2- and 3-way		4-way	
Valve function	Normally closed (N/C standard) and normally open (N/O option)		Single and double solenoid	Double solenoid

NOTE: H180E1 and HA180E1 cannot be used as in-line valves.

## SPECIFICATIONS

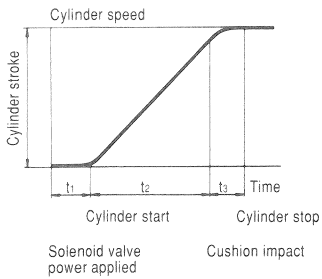
Item	In-line and manifold type	Basic model		
		H181E1 H180E1	H180-4E1 H180-4E2	H183-4E2
	Manifold or subbase type only	HA181E1 HA180E1	HA180-4E1 HA180-4E2	HA183-4E2
Media	Air			
Type of operation	Indirect acting			
Flow – C <sub>v</sub>	.57		.50	
Ports	1/8" NPT			
Lubrication	None required			
Pressure range psig (kgf/cm <sup>2</sup> )	20 ~ 100 (1.5 ~ 7)			
Response time – ms (ON/OFF)	12VDC, 24VDC	below 15/20	below 15/25	below 15/35
	120VAC, 240VAC, 24VAC	below 15/15	below 15/15	below 15/20
Maximum operation frequency – c/s	5			
Minimum time to energize (ms)	-		50 (E2 only)	-
Temperature range (atmosphere or media) – °F (°C)	40 ~ 122 (5 ~ 50)			
Impact resistance – G	140 (axial direction 30)			30
Mounting direction	Any			

## SOLENOID SPECIFICATIONS

Voltage		12VDC	24VDC	24VAC	120VAC	240VAC			
Model		Surge protector – flywheel diode			Shading system				
Voltage Range		10.8 ~ 13.2	21.6 ~ 26.4	21.6 ~ 26.4	90 ~ 132	180 ~ 264			
Current value (Rated voltage applied)	Frequency Hz	-	-	50	60	50	60		
	Starting power – mA	-	-	145	130	44	40	22	20
	Holding power – mA <sup>NOTE 1</sup>	130 (140)	65 (75)	85	70	32	26	16	13
Power consumption <sup>NOTE 1</sup>		1.6 (1.7)	1.6 (1.8)	-	-	-	-	-	-
Leak rate (maximum allowed) – mA		8	4	8	4	2			
Temperature rise (at rated voltage) – °F (°C)		below 77° (25°)			Less than 95° (35°)				
Insulation		Type B							
Insulation tolerance – MΩ		Over 100							
Lead wire: length	Standard	Grommet 12" (300mm)							
	Options	Plug connector							
Lead wire: color		Brown/Black	Red/Black	Black	Yellow	White			
LED indicator (option) color		Red			Yellow	Green			
Surge suppression		Flywheel diode			-				

NOTE 1: Number in ( ) indicates solenoid with LED indicator.

## CYLINDER SPEED



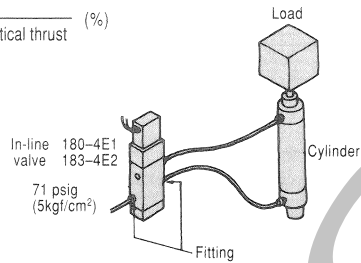
In order to obtain required time for cylinder to make one stroke, add cylinder's delay time  $t_1$  (delay time between activating valve and actual starting time of cylinder) to the time  $t_2$  at the maximum speed. If there is a cushion time, add the cushion time. General cushion time  $t_3$  is around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



### H180-4E1, H180-4E2

#### Measurement requirements

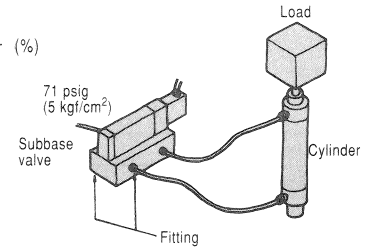
- Air pressure: 71 psig (5 kgf/cm<sup>2</sup>)
- Tubing: 1/4" (6.35) I.D. x 35" (890) long
- Load ratio =  $\frac{\text{Load}}{\text{Cylinder theoretical thrust}}$  (%)
- Cylinder stroke: 6 in.



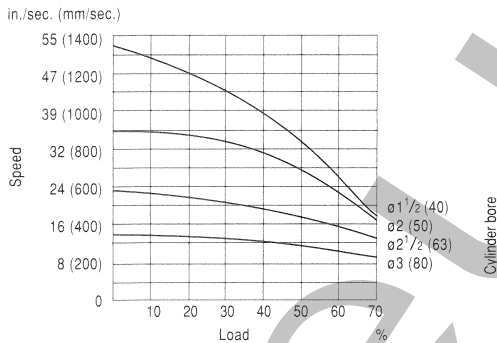
### HA180-4E1, HA183-4E2

#### Measurement requirements

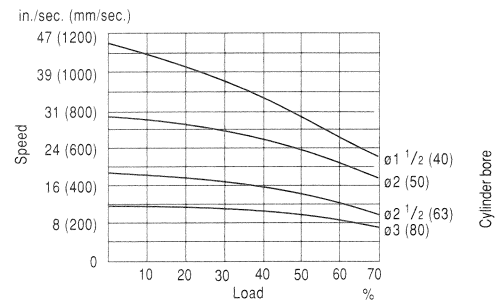
- Mounted on HA180-25 subbase.
- Air pressure: 71 psig (5 kgf/cm<sup>2</sup>)
- Tubing: 1/4" (6.35) I.D. x 35" (890) long
- Load ratio =  $\frac{\text{Load}}{\text{Cylinder theoretical thrust}}$  (%)
- Cylinder stroke: 6 in.



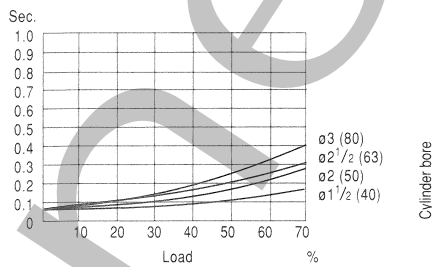
#### Maximum operating speed



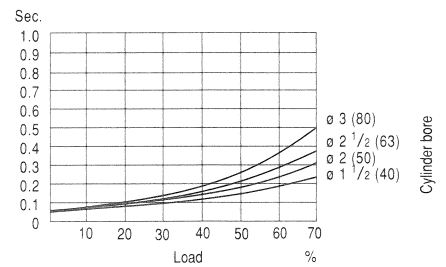
#### Maximum operating speed



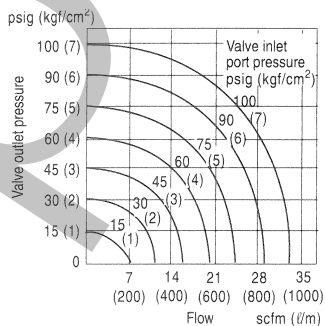
#### Delay time



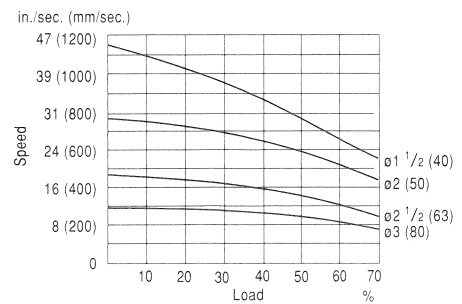
#### Delay time



#### Flow



#### Flow



# HOW TO ORDER

## VALVES

Description	Model	ORDERING CODE						Locking Manual Override	Electrical Connection	Voltage
		Function				Open center	Pressure center			
		2-way	Norm. Open	3 position						
In-line or F-type manifold	2 or 3 port	H181E1	-2	-11					12VDC 24VDC	
	5 port Single solenoid	H180-4E1						-83 -L -PSL <sup>Note</sup> -39		
	5 port Double solenoid	H180-4E2								
	5 port 3-position	H183-4E2			-13	-14				
Single subbase or A-type manifold	2 or 3 port	HA181E1	-2	-11					120VAC 240VAC 24VAC <sup>Note</sup>	
	5 port Single solenoid	HA180-4E1								
	5 port Double solenoid	HA180-4E2								
	5 port 3-position	HA183-4E2			-13	-14				
Manifold mount only	H180□F, FE 2 or 3 port	H180E1	-2	-11						
	H180□A 2 or 3 port	HA180E1								

NOTE: 24VAC with lead wires and no LED only.

12" lead wires are standard.

Non-locking recessed override is standard.

3-port options:

2-way (3-way std.)

Normally open (Normally closed-std.)

3-position options:  
Block center std.  
Order code: Blank

Exhaust center

Pressure center

Override

Locking (Non-locking recessed-std.)

Electrical:  
Grommet with 12" lead wires std.  
Order code: Blank

Grommet with LED and surge protection

Plug-in with LED and surge protection <sup>NOTE</sup>

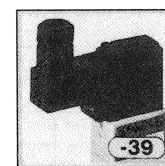
## ACCESSORIES

3 port valves are 3-way, normally closed standard.

3 position 4-way valves have all ports blocked in the center position as standard.



1/8" NPT exhaust flow control.    1/4" NPT exhaust flow control.    Mtg. base: single solenoid only.



DIN-style plug-in (LED not available)

NOTE: Standard wire length is 12" (300mm). Specify -PSL-L3 for 108" (3000mm) lead wires.



# HOW TO ORDER

## MANIFOLDS AND SINGLE STATION SUBBASES

### 2- and 3-way valve manifolds

Model number	Description
H181M□F	Select 2 – 20 stations (□), accepts H181 series valves <sup>NOTE 2</sup>
H181M□A	Select 2 – 20 stations (□), accepts HA181 series valves

### 2-, 3- and 4-way valve manifolds

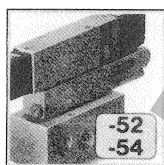
Model number	Description
H180M□F	Select 2 – 20 stations (□), accepts H180 series valves <sup>NOTE 2</sup>
H180M□FE <sup>NOTE 1</sup>	Select 2 – 20 stations (□), accepts H180 series valves <sup>NOTE 2</sup>
H180M□A	Select 2 – 20 stations (□), accepts HA180 series valves

### Single station subbases

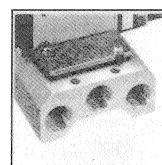
Model number	Description
HA181-25	Subbase accepts HA181E1 3-way valves
HA180-25	Accepts HA180-4E1 (2) & HA183-4E2 4-way valves

NOTE 1: FE has captured pilot exhaust. NOTE 2: Manifolds are shipped with gaskets and screws for valve mounting.

## ACCESSORIES



Manifold regulator:  
H180MA-52: Regulates supply (P-port) pressure.  
H180MA-54: Regulates A or B port pressure.



Block-off plates:  
H181MF-BP: for H181M□F  
H181MA-BP: for H181M□A  
H180MF-BP: for H180M□F  
H180MA-BP: for H180M□FE & H180M□A

## PORT INFORMATION

### SINGLE VALVE PORT INFORMATION

Model	Port	Specifications	Port diameter
H181E1, (H180E1 <sup>NOTE 1</sup> )	Standard	Female thread	1/8" NPT
H180-4E1, H180-4E2, H183-4E2	Standard	Female thread	1/8" NPT
HA181-25 <sup>NOTE 2</sup> , HA180-25	P	Female thread	1/4" NPT
	A, B		
	R	Female thread	10-32 UNF
	PR		

NOTE 1: H180E1 is for manifold installation only. Cannot be used as a stand alone valve.  
NOTE 2: Single station subbase for manifold mounted valves.

### MANIFOLD PORT INFORMATION

Manifold model	Port	Piping location	Port dimensions
H181M□F H180M□F	P	Manifold	1/4" NPT
	A, B	Valve	1/8" NPT
	R	Manifold	1/4" NPT
H180M□FE	P	Manifold	1/4" NPT
	A, B	Valve	1/8" NPT
	R	Manifold	1/4" NPT
	PR		10-32 UNF
H181M□A H180M□A	P	Manifold	1/4" NPT
	A, B		1/8" NPT
	R		1/4" NPT
	PR		10-32 UNF

## WEIGHT

### SOLENOID VALVE SUBBASE WEIGHT

oz. (gf)

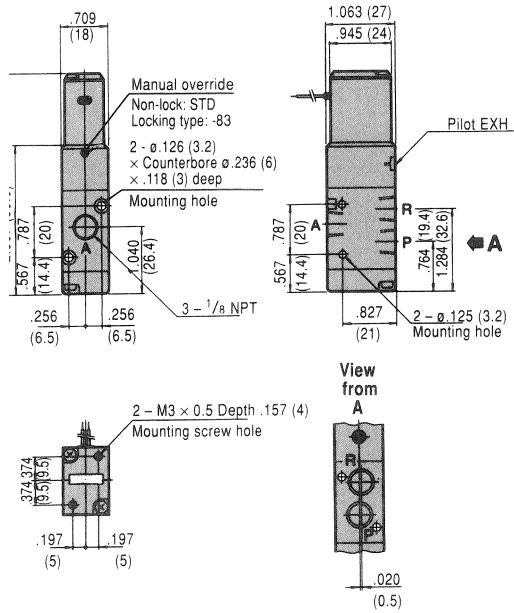
Basic model	Weight
H181E1	3.5 (100)
H180E1	3.9 (110)
H180-4E1	3.9 (110)
H180-4E2	5.6 (160)
H183-4E2	6.7 (190)
HA181E1	3.9 (110)
HA180E1	4.2 (120)
HA180-4E1	4.2 (120)
HA180-4E2	6.0 (170)
HA183-4E2	7.0 (200)
HA181-25	5.5 (155)
HA180-25	5.6 (160)

### MANIFOLD WEIGHT

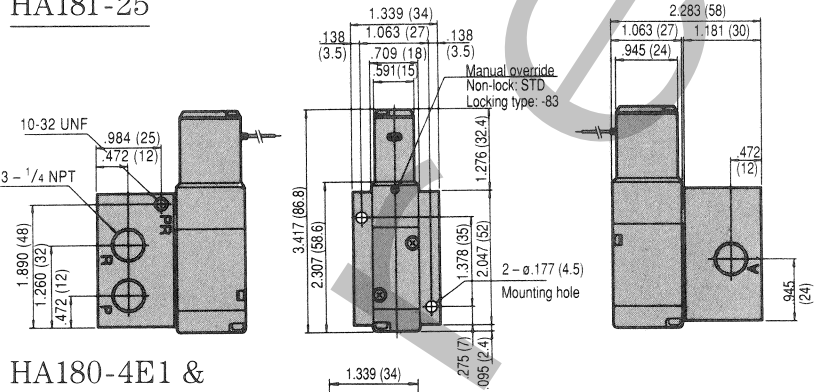
oz. (gf)

Manifold model	Weight (n = number of stations)	Block-off plate
H181M□F	{1.1 (32) x n} + 1.1 (30)	0.5 (14)
H181M□A	{2.5 (72) x n} + 2.5 (72)	0.8 (22)
H180M□F	{1.5 (42) x n} + 1.4 (40)	0.7 (19)
H180M□FE	{2.1 (60) x n} + 2.5 (70)	1.1 (30)
H180M□A	{4.2 (120) x n} + 4.2 (120)	

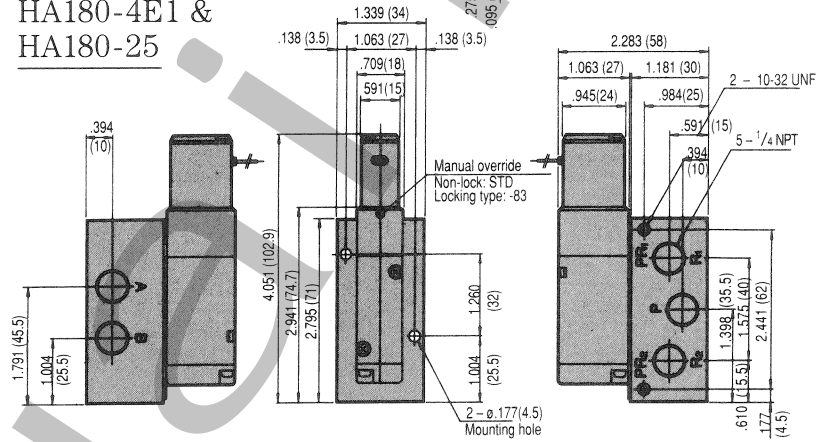
HA181E1



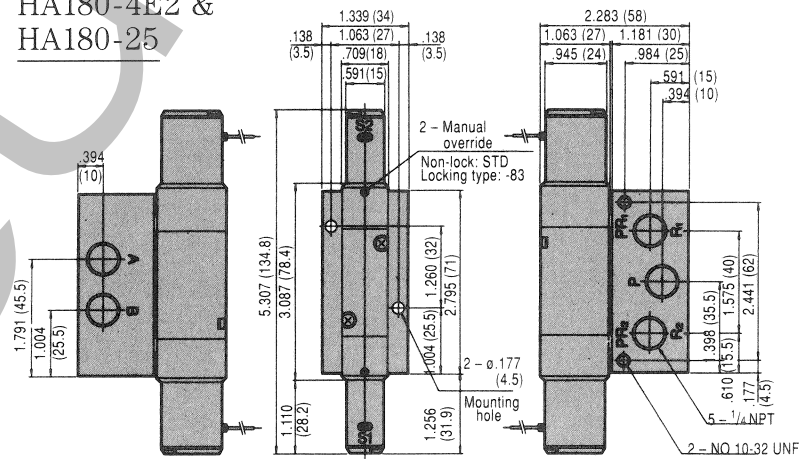
HA181E1 &  
HA181-25



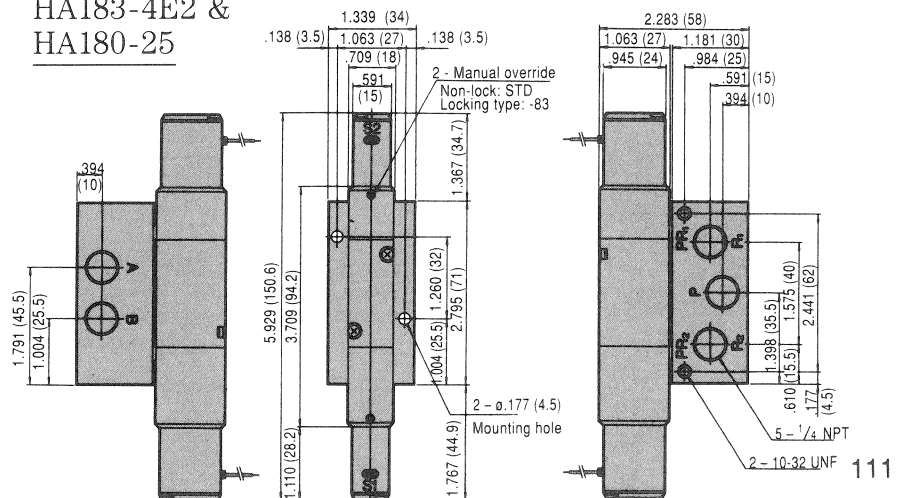
HA180-4E1 &  
HA180-25



HA180-4E2 &  
HA180-25

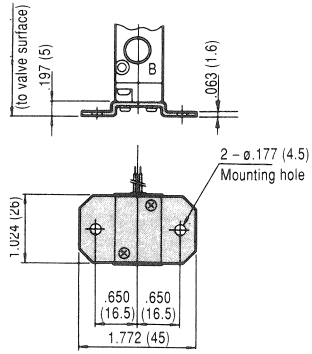


HA183-4E2 &  
HA180-25



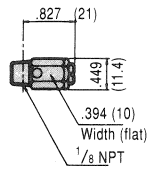
ADDITIONAL PARTS (sold separately)

Counting base: H180-21

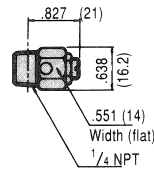


Flow control

In-line: HSCE-01 (bag of 10)

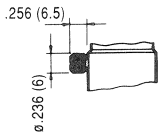


Subbase: HSCE-02 (bag of 10)

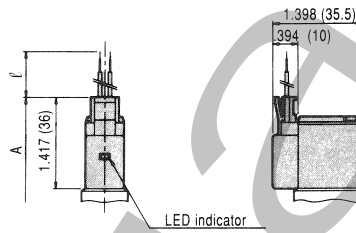


OPTIONS

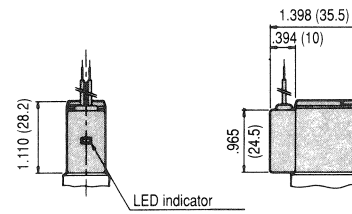
Locking manual override: (-83)



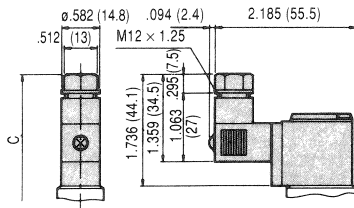
Straight connector solenoid: (-PSL)



Grommet w/LED: (-L)

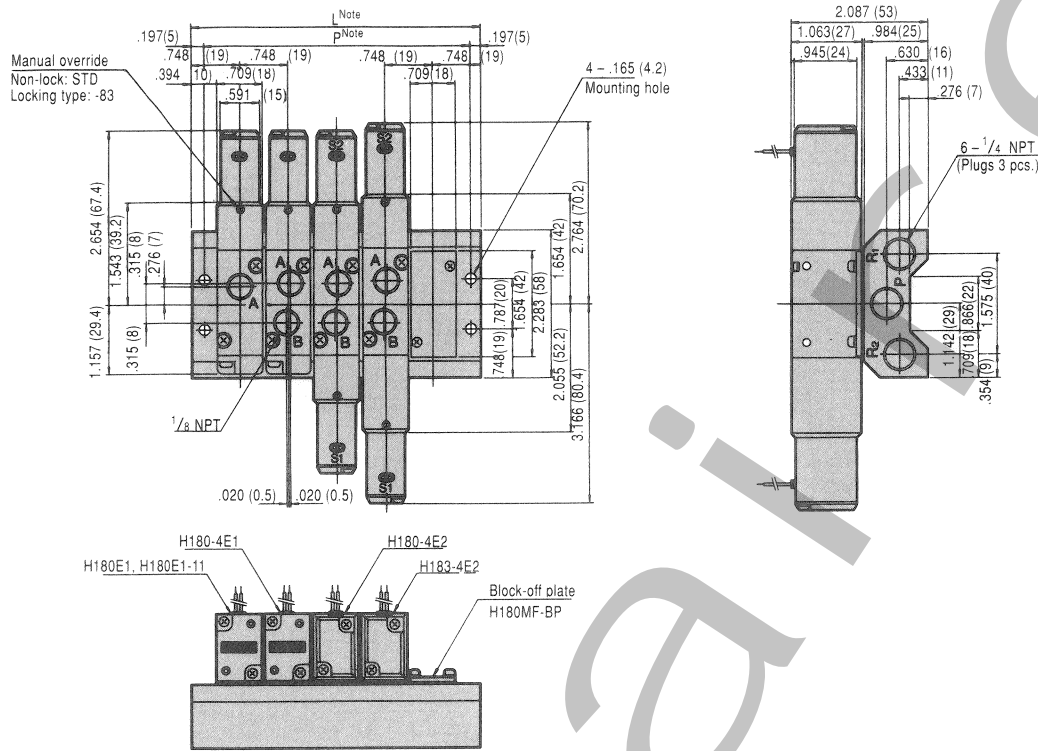


N connector solenoid: (-39)

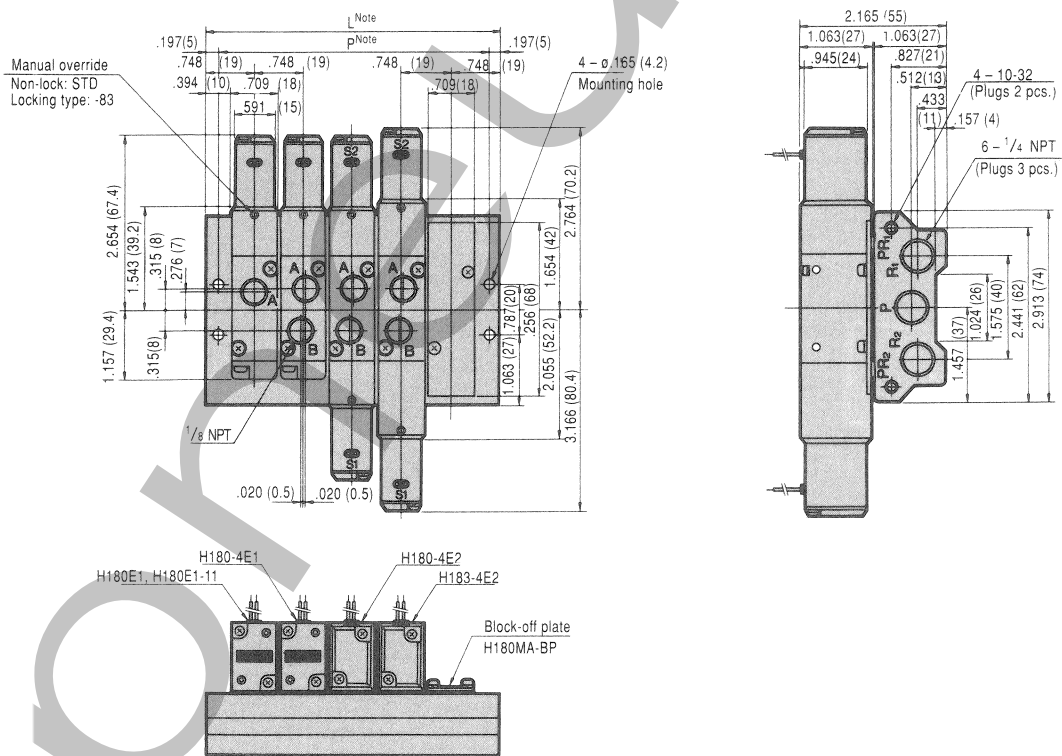


Type	Body length with connector - In. (mm)			Measurement
	A	B	C	
H181E1, HA181E1, on HA181-25	3.725 (94.6)	3.450 (87.6)	4.044 (102.7)	Length to valve end
H180-4E1	4.119 (104.6)	3.843 (97.6)	4.437 (112.7)	
HA180-4E1, on HA181-25	4.359 (110.7)	4.083 (103.7)	4.678 (118.8)	
HA180-4E2, on HA181-25	5.922 (150.4)	5.370 (136.4)	6.560 (166.6)	Length to opposite solenoid end
83-4E2, HA183-4E2, on HA180-25	6.544 (166.2)	5.993 (152.2)	7.182 (182.4)	

H180M□F

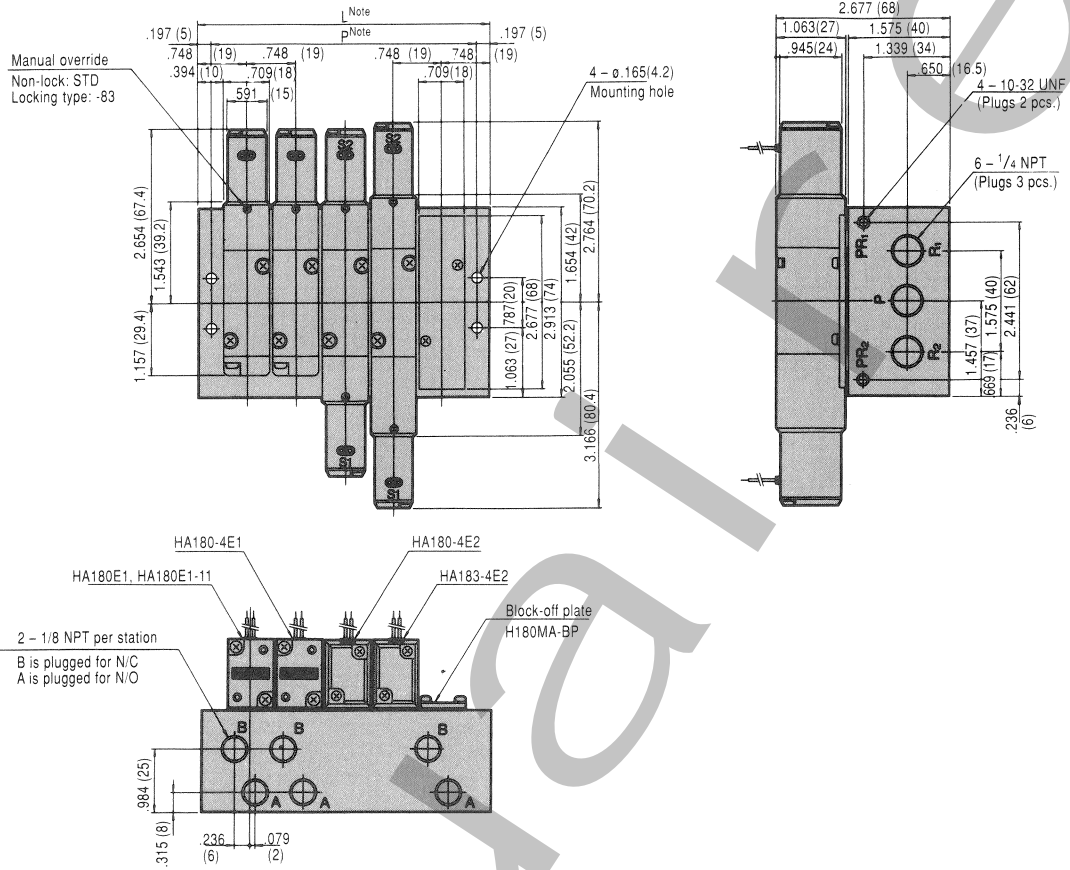


H180M□FE



DTE: L = 2.244 in. (57mm); P = 1.850 in. (47mm) for 2 station manifold. Add 0.748 in. (19mm) for each station over 2 example: for 6 station manifold, model H180M6F(E), add 2.992 in. (76mm), or L = 5.236 (133), P = 4.842 (123).]

H180M□A



NOTE: L = 2.244 in. (57mm); P = 1.850 in. (47mm) for 2 station manifold. Add 0.748 in. (19mm) for each station over 2 [example: for 6 station manifold, model H180M6A, add 2.992 in. (76mm), or L = 5.236 (133), P = 4.842 (123).]

## SUBBASE REGULATOR

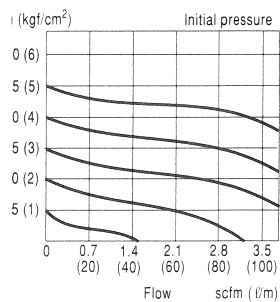


Order:  
H180MA-52: P-port regulator  
H180MA-54: A or B port regulator

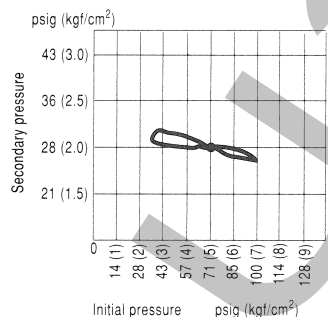
## SPECIFICATIONS

Item	Ordering code	
	H180MA-52	H180MA-54
Function	P-port pressure regulating type	A or B-port pressure regulating type
Media	Air	
Pressure range – kgf/cm <sup>2</sup>	(20 ~ 70) 1.5 ~ 5	
Maximum pressure – kgf/cm <sup>2</sup>	100 (7)	
Warranted max. pressure – kgf/cm <sup>2</sup>	150 (10.5)	
Operating temperature – °F (°C)	40 ~ 140 (5 ~ 60)	
Weight – oz. (gf)	2.8 (80)	

## FLOW CHARACTERISTICS

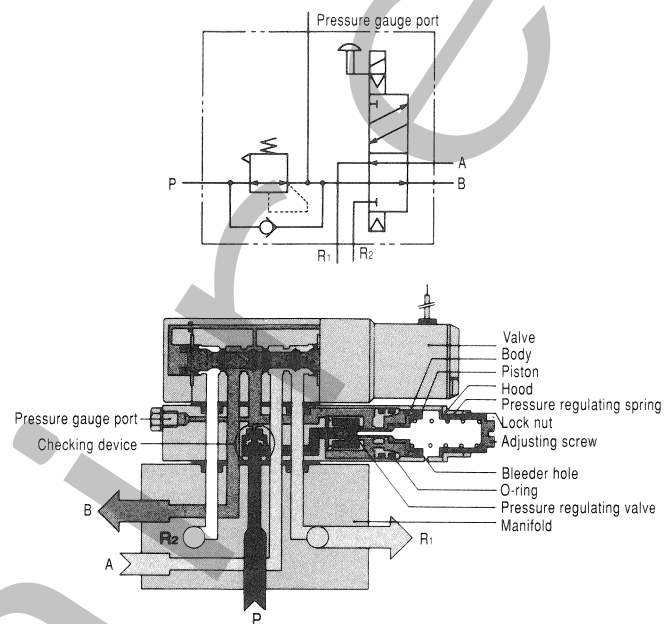


## PRESSURE CHARACTERISTICS

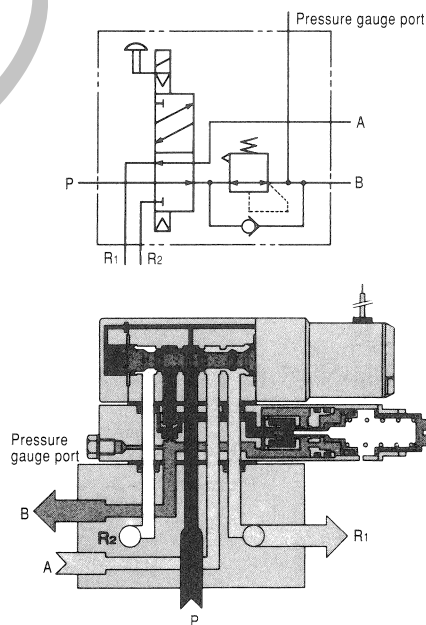


## DIMENSIONS

P-port pressure regulating type: H180MA-52



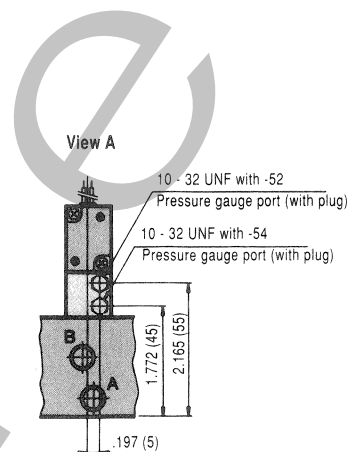
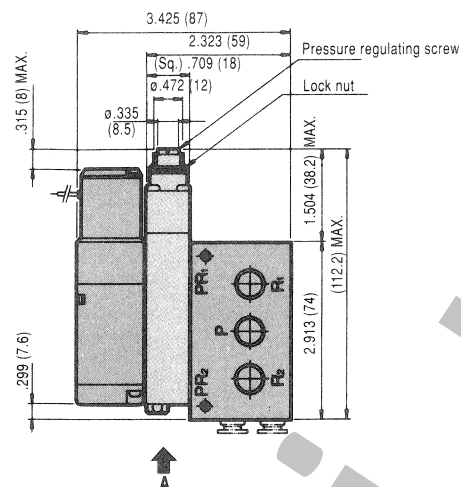
A or B-port pressure regulating type: H180MA-54



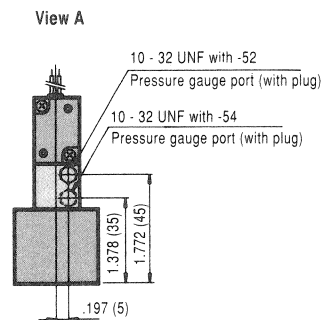
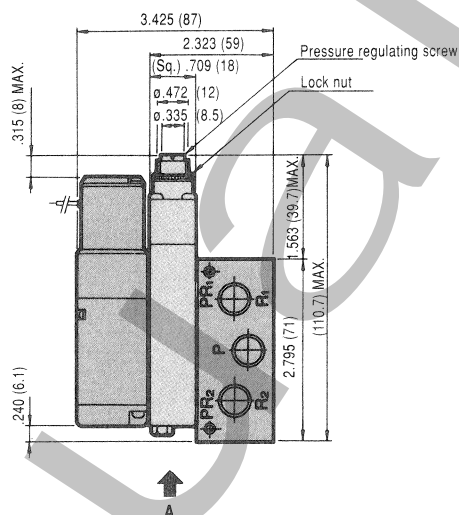
## MAJOR PARTS AND MATERIAL OF CONSTRUCTION

Name	Material
Main body	Aluminum (anodized)
Adjusting screw	Brass
Piston	Aluminum (anodized)
Spring	Stainless steel
Seal	Buna

H180M□A

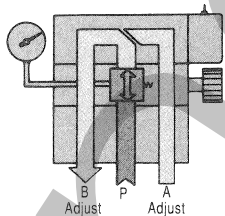


HA180E1 & HA180-25  
HA180-4E□ & HA180-25  
HA183-4E2 & HA180-25

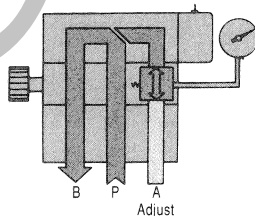


HANDLING HINTS AND PRECAUTIONS

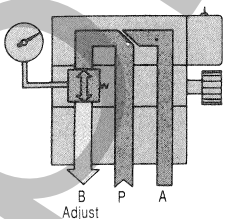
P-port pressure regulating type: -52  
Adjust A, B port to same pressure



B-port pressure regulating type: -54  
Adjust port A



B-port pressure regulating type: -54  
Adjust port B



INSTALLATION

1. Make sure to flush piping before installation. If foreign particles, such as shavings, sealing tapes or rust, enter the valves, they may cause valve to malfunction.
2. Mount subbase regulator between manifold base and valve. Typically, the pressure adjusting screw of subbase regulator is mounted toward the manifold base R<sub>1</sub>-port side. However, the pressure regulating screw of B-port type is mounted on the R<sub>2</sub>-port and can regulate A-port.

Cautions:

When mounting subbase regulator or changing pressure regulating ports, be sure to pay attention to direction of subbase regulator knob and valve coil position. See drawings above.

P-port pressure regulating type (-52): regulating screw to R<sub>1</sub> side, pressure gauge connecting port toward the valve side.

B-port pressure regulating type (-54): regulating screw during regulation at B-port is to R<sub>1</sub> side and during A-port regulation is to R<sub>2</sub> side. However, pressure gauge connecting port is toward manifold side.

PRESSURE ADJUSTMENT

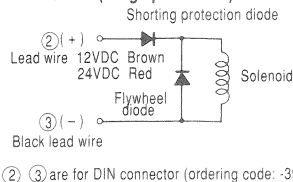
1. Always use pressure gauge to monitor the pressure.
2. Once desired pressure is set, tighten locknut.

# HANDLING CAUTIONS AND GENERAL ITEMS

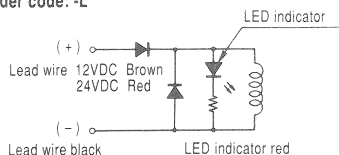
## SOLENOIDS

### INTERNAL CIRCUIT – DC

#### STD. Solenoid (Surge protection)

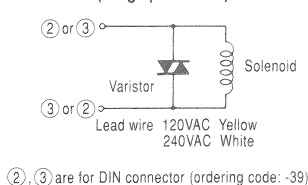


#### Solenoid with LED indicator and surge suppression Order code: -L

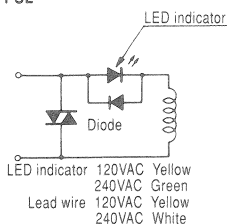


### INTERNAL CIRCUIT – AC

#### STD. Solenoid (Surge protection)



#### Solenoid with LED indicator with surge suppressor Order code: -PSL

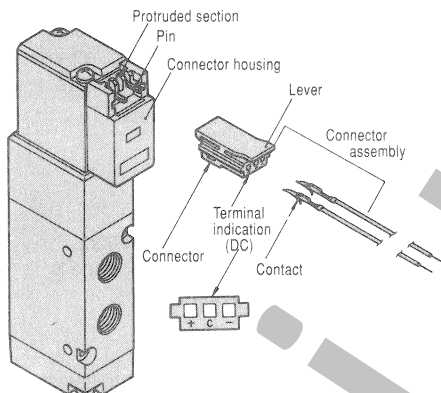


## CAUTIONS

- Shorting will not occur to the 24VDC solenoid even if the wrong polarity is applied. However, the solenoid valve with surge suppression will not operate. Also the indicator on the valve with the LED indicator will not light.
- If there is a current leakage in the circuit, improper operation, such as the valve not returning to the proper position, will occur. Make sure to operate the valve well within the limit of current leakage. If a leakage larger than the limit occurs, please consult factory.
- Double solenoid: Do not apply power to both solenoids simultaneously. The valves may be put into a neutral state.
- The AC solenoids contain diodes. Therefore, when a number of solenoid valves are connected together, make sure to connect the same color lead wires together also.

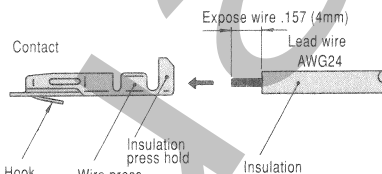
## PLUG CONNECTOR

To plug in, push connector until the lever clips into place. To take plug out, press lever and pull out.



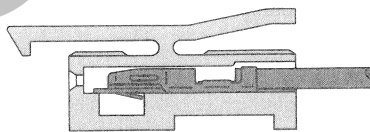
## LEAD WIRE AND CONTACT ASSEMBLY

Remove 0.157" (4) of insulation from the lead wire. Insert wire into contact and bend down press holds.



## CONTACT INSERTION AND DISASSEMBLY

Insert contact into square hole of connector until the hook engages. Pull lightly to assure the assembly. Push hook up with small screwdriver from side of connector to disassemble.



## CAUTIONS

- Do not pull lead wire too hard.
- Make sure pins on the connector housing are straight before inserting the connector.
- Use appropriate tool to attach contact on lead wires.

## DIN CONNECTOR

High performance in contamination and environmental protection. Lead wire self stripping system.



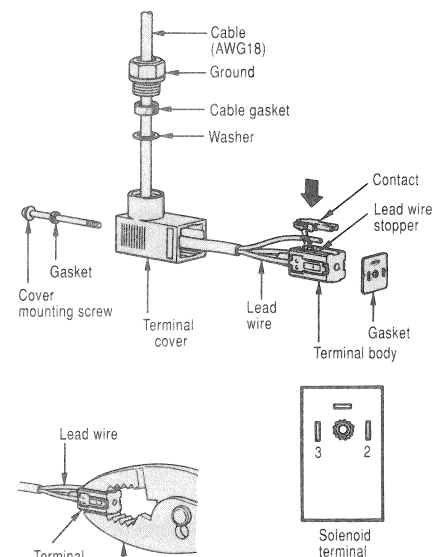
Indicate -39 option in valve order code.

Surge suppressors are equipped as standard feature.

LED indicator cannot be used.

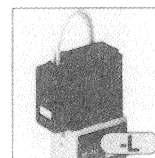
Solenoid w/DIN connector:

No need to strip lead wire. Insert lead wire into terminal body until seated with stopper and press down with pliers to ensure positive connection with the contact.



## LED INDICATOR

Confirm presence of current at coil of grommet type (12" lead wires) with LED.



Indicate -L in plug connector option of ordering code.

Surge suppressors are equipped as standard feature.



## MANUAL OVERRIDE

### NON-LOCKING

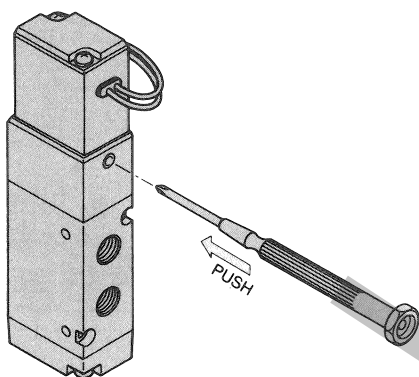
Actuate valve by fully depressing manual override with small tool. Valve remains actuated until manual override is released. Upon release, valve spring returns valve to normal position.

### LOCKING

Use a small tool to push in and turn manual override more than 45° to actuate. 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 actuate, it may be operated like a non-locking override merely by depressing.



#### Cautions:

1. Since these valves are indirect acting, manual override will not actuate unless air is supplied to IN port.
2. Do not use a sharp instrument to operate the override as it may damage the button.
3. Take care to release locking override before resuming normal operation.

## MANIFOLD

### PIPING

Ports P and R are located at both ends of the manifold. Piping direction can be determined according to mounting location. Ports at one end of the manifold are temporarily plugged during shipping. Remove plugs and reseal with sealing agent.

### BLOCK-OFF PLATE

Use Block-Off Plate to close stations when they are not in use. Order code is H181M□ -BP or H180M□ -BP).

#### Cautions:

1. For P port piping, make sure to select fitting sizes to fit the manifold connecting pipe dimensions. Actuators may not operate properly if there is insufficient flow and/or pressure due to improper piping.
2. When installing fittings or mufflers in R port, make sure that exhaust remains unrestricted. Restriction of exhaust may cause actuators to operate erratically. Consider using R ports at both ends of manifold to enhance exhaust.
3. When several manifold valves are to be operated simultaneously, connect supply air to both ends of manifold. Also exhaust through both ends of manifold. This ensures adequate supply and exhaust capacity.

## POINTS TO BE CONSIDERED

### INSTALLATION

1. Mount valves in any direction. However, mount valves perpendicular to significant shock or vibration.
2. Location near water, oil, or in excessively dusty conditions requires adequate solenoid housing protection to prevent solenoid actuator contamination. Also consider the installation of breather/muffler in exhaust ports to prevent foreign objects from entering valves.
3. Before installing fittings and tubing, blow all foreign material from them. If using a sealant, take extra care that sealant does not enter valve causing potential malfunction and/or leaks.
4. When valves are installed in tight enclosures, consider the possibility of heat build-up. Ensure adequate ventilation.
5. Valves with A or B ports open to atmosphere will not operate properly.

## AIR SOURCE

1. Use compressed air or inert gas in accordance with the pressure rating in the specifications.
2. Compressed air should be clean and uncontaminated. When in doubt, install an air filter with filtering capacity of 40 microns. Periodically remove and clean or replace filter element.
3. For optimum performance, use largest possible tubing size and minimum tubing length.

## LUBRICATION

No externally applied lubrication is required. However, when dry air is used (air that does not contain water or oil), use of a turbine SAE 20 oil (ISO VG32) or equivalent is recommended. Thin or low viscosity oils (spindle oil, machine oil, etc.) do not provide a good residual film of lubrication, thus should not be used.

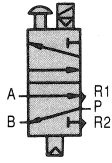
## AIR QUALITY

These valves cannot be used when media or ambient conditions contain organic solvents, phosphoric acid, ester type machine oil, sulfuric acid gas, or other acids.

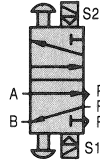
## CAUTION

Compressed air is powerful and may be dangerous. Before attempting to remove a component from an air line or system, *always* disconnect the supply air and thoroughly exhaust the line or system. *Never* attempt to construct, operate or service anything using compressed air unless you have been properly trained to do so. Failure to heed the warning could result in **SERIOUS, EVEN FATAL, PERSONAL INJURY.**

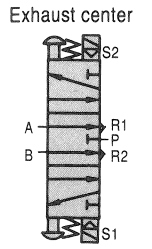
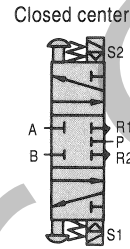
Single solenoid



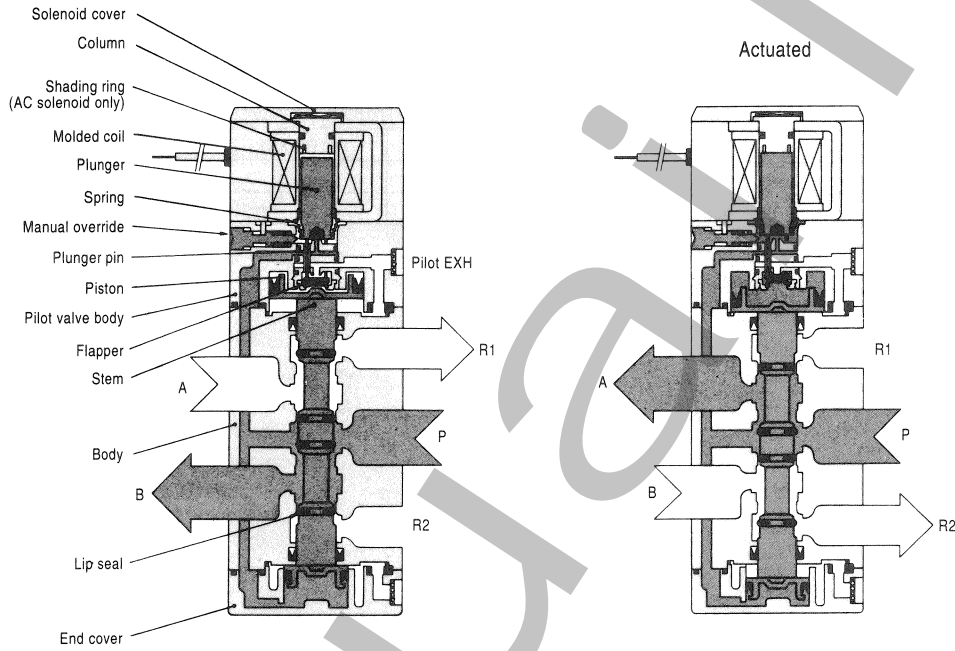
2-position double solenoid



3-position double solenoid



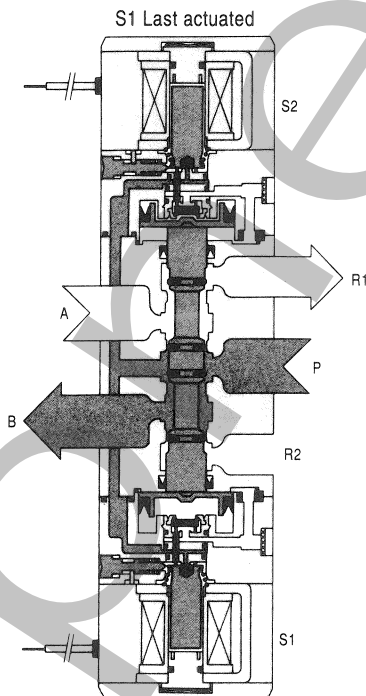
BASIC OPERATION AND NOMENCLATURE



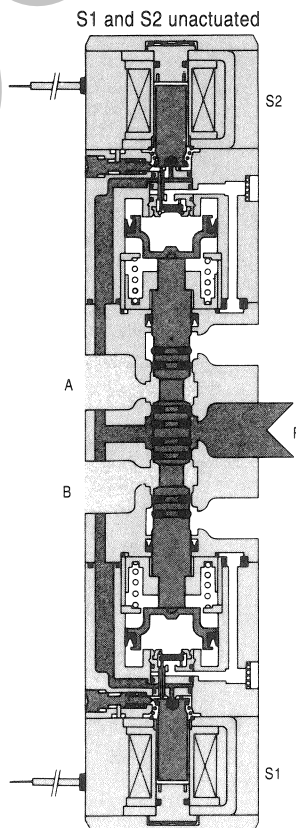
MATERIALS

Item	Material
Body	Diecast aluminum
Stem	Aluminum
Lip seal	Buna N
Flapper	Buna N
Mounting base	Mild steel (zinc plated)
Subbase	Diecast aluminum
Plunger	Electromagnetic stainless steel

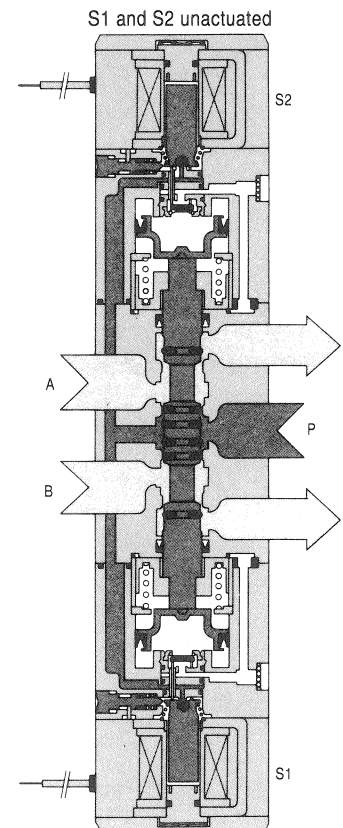
H240-4E2



H243-4E2



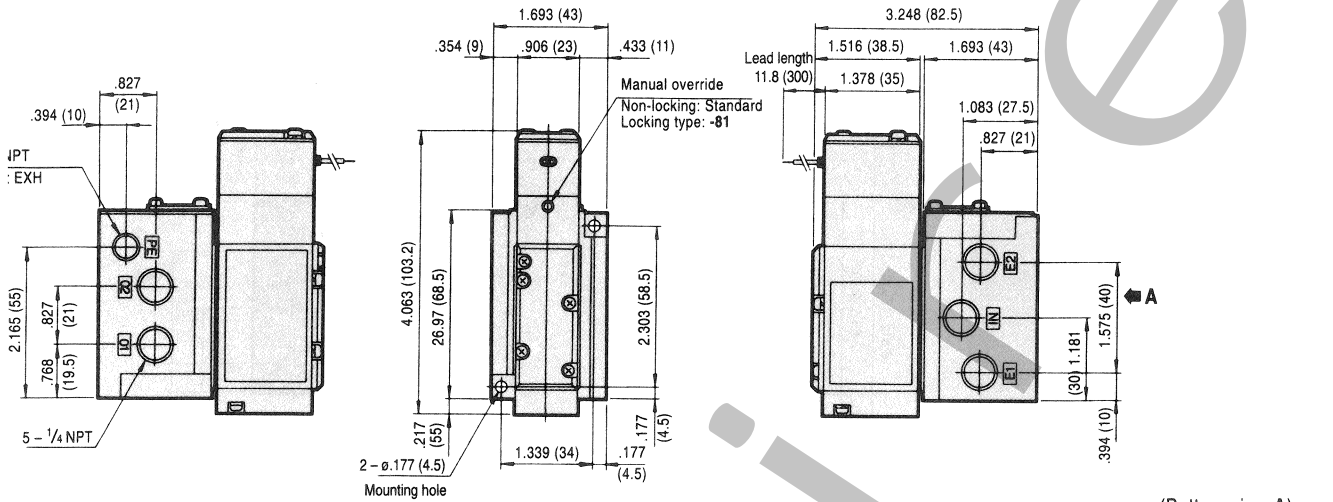
H243-4E2-13



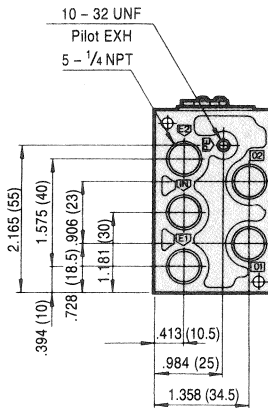
LENOID VALVE DIMENSION DIAGRAMS

in. (mm)

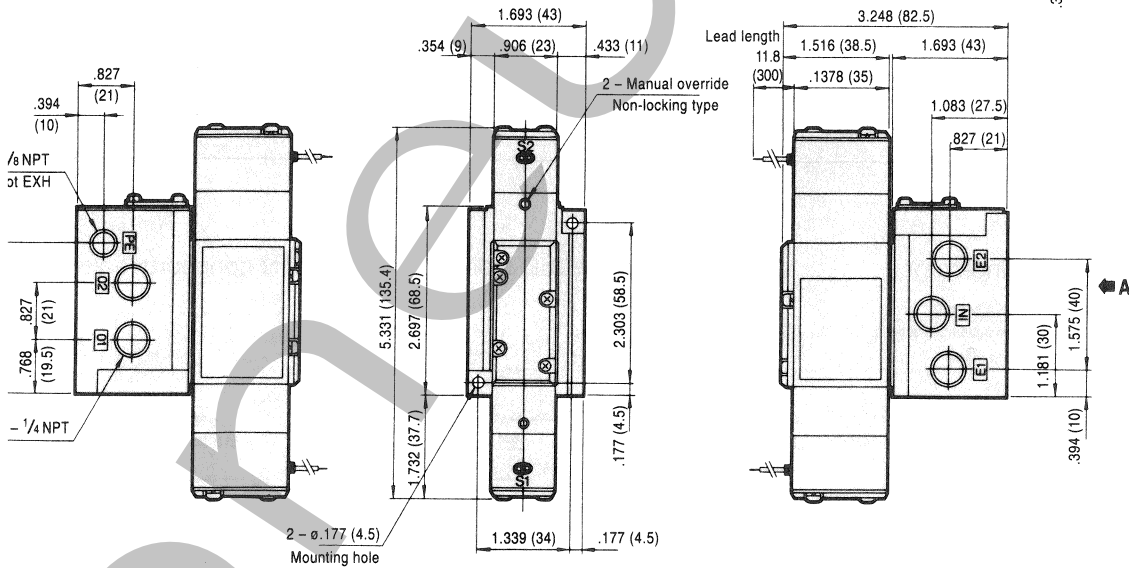
240-4E1-25  
240-4E1-27



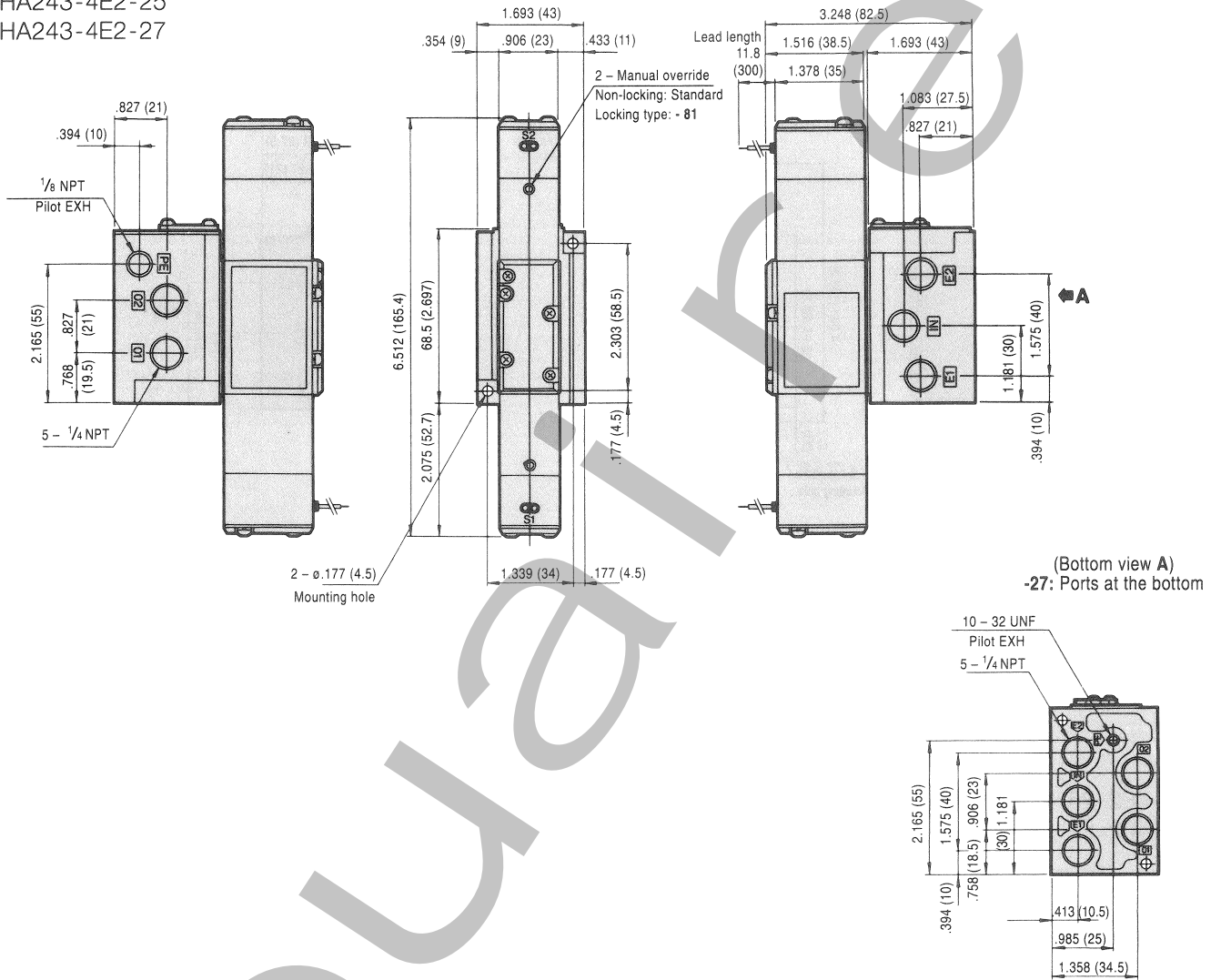
(Bottom view A)  
-27: Ports at the bottom



240-4E2-25  
240-4E2-27



HA243-4E2-25  
HA243-4E2-27

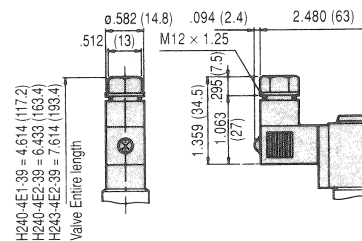
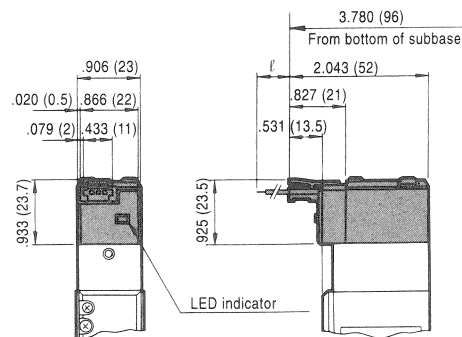
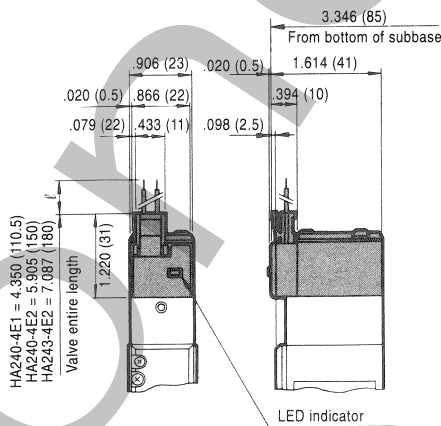


OPTIONS

Straight connector w/LED indicator

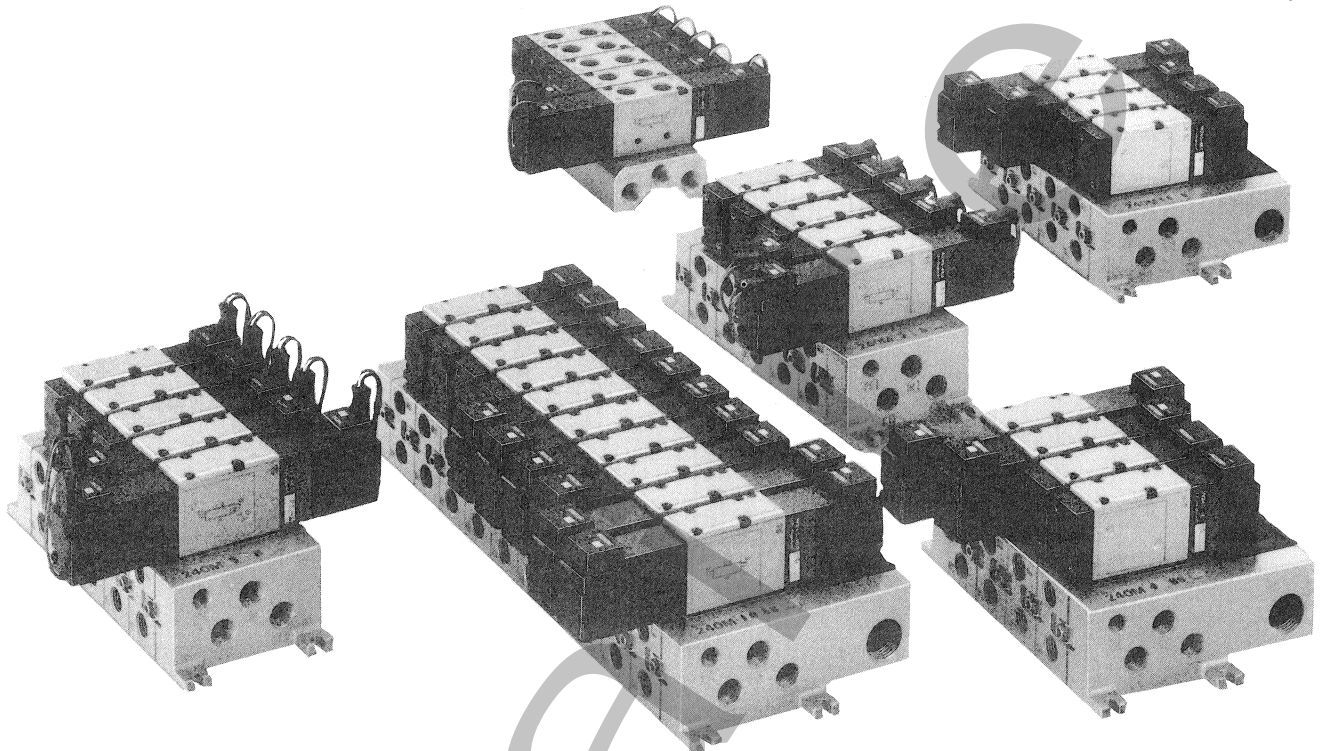
L-connector w/LED indicator

DIN connector solenoid: (-39)



Surge suppressor varistor: -ZR.  
Same dimensions as standard.

# H240 SERIES MANIFOLDS



## SPECIFICATIONS AND PIPE CONNECTION DIMENSIONS

Manifolds	Specifications	Port Dimensions NPT		Valves	Notes	
H240M□ F	IN, EXH manifold, OUT valve	P	1/4	H240-4E1 H240-4E2 H243-4E2	No pilot EXH piping	
		A, B				
		R1, R2				
H240M□ A	All ports in manifold	P	1/4	HA240-4E1 HA240-4E2 HA243-4E2		
		A, B				
		R1, R2				
		PE	1/8			
H240M□ AW	All ports in plug-in manifold	P	1/4	HW240-4E1 HW240-4E2 HW243-4E2		
		A, B				
		R1, R2				
		PE	1/8			
H240M□ B	All ports in manifold: choice of ports in side or bottom	end plate and side ports	P	1/4	HA240-4E1 HA240-4E2 HA243-4E2	P, A, B, R1, R2 ports can be at the side or bottom by using isolator (end plate only for pilot EXH, PE port).
			A, B			
			R1, R2			
		bottom ports	P	1/8		
			A, B			
			R1, R2			
H240M□ BW	All ports in plug-in manifold: choice of ports in side or bottom	end plate and side ports	P	1/4	HW240-4E1 HW240-4E2 HW243-4E2	P, A, B, R1, R2 ports can be at the side or bottom by using isolator (end plate only for pilot EXH, PE port).
			A, B			
			R1, R2			
		bottom ports	PE	1/8		
			P			
			A, B			
			R1, R2	1/8		

MATERIALS OF MAIN PARTS

Item	Material
Manifold body	Diecast aluminum
Block-off plate	Mild steel (nickel plated)
Seal	Buna N



WEIGHT

oz. (gf)

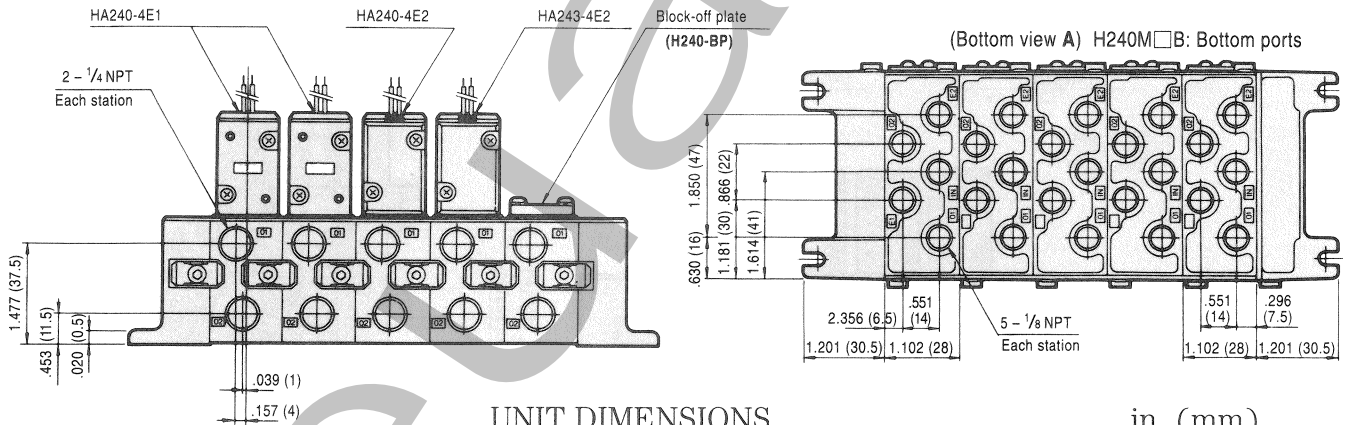
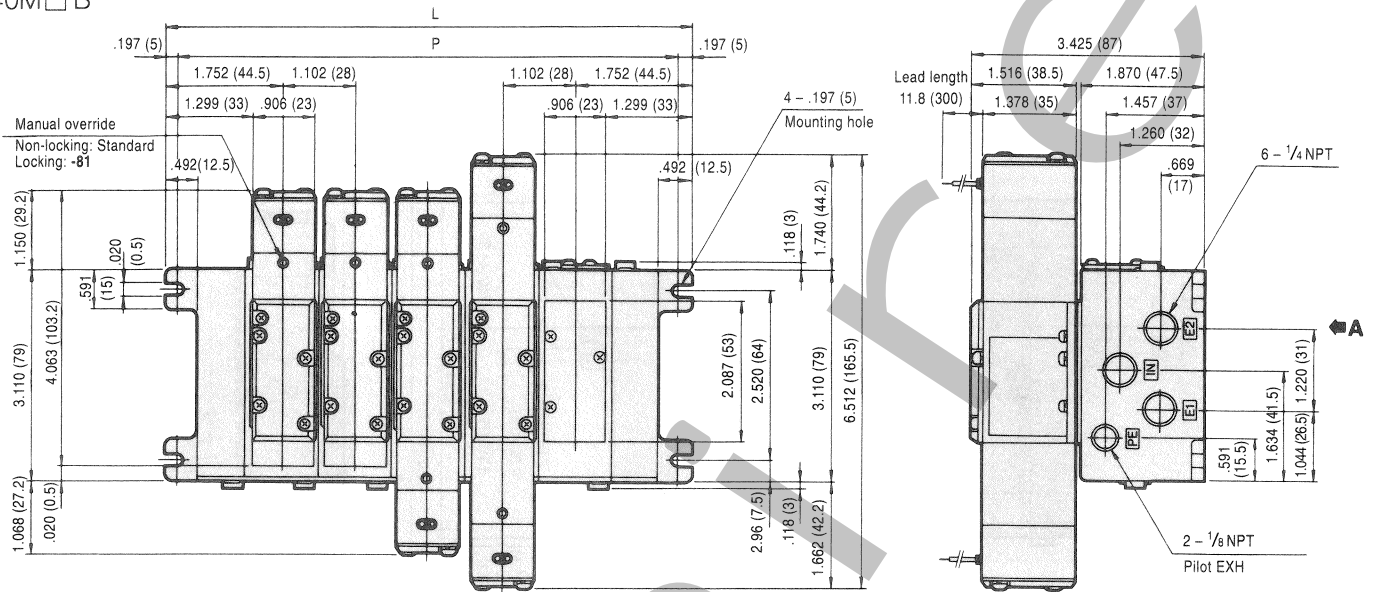
Manifolds	Calculation of each unit (N = stations)	Valves								Block-off plate	
		H240-4E1	H240-4E2	H243-4E2	HA240-4E1	HA240-4E2	HA243-4E2	HW240-4E1	HW240-4E2		HW243-4E2
H240M□ F	$2.4xn+2.4$ ( $69xn+69$ )	5.6 (160)	8.1 (230)	9.2 (260)	-	-	-	-	-	-	1.1 (30)
H240M□ A	$5.9xn+7.7$ ( $167xn+217$ )	-	-	-	5.6 (160)	8.1 (230)	9.2 (260)	-	-	-	
H240M□ AW	$7.1xn+9.5$ ( $199xn+270$ )	-	-	-	-	-	-	5.6 (160)	8.1 (230)	9.2 (260)	
H240M□ B	$5.9xn+7.7$ ( $167xn+217$ )	-	-	-	5.6 (160)	8.1 (230)	9.2 (260)	-	-	-	
H240M□ BW	$7.1xn+9.5$ ( $199xn+270$ )	-	-	-	-	-	-	5.6 (160)	8.1 (230)	9.2 (260)	

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MANIFOLD VALVE DIMENSION DIAGRAMS

in. (mm)

H240M□ A  
H240M□ B



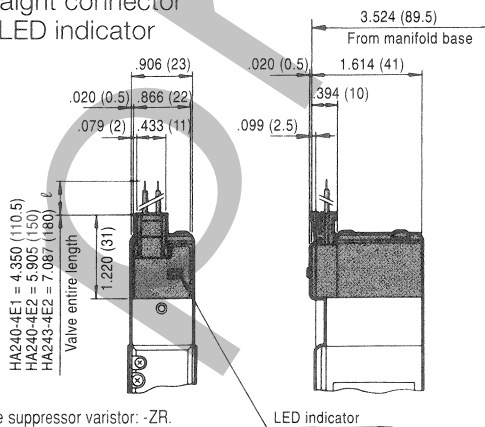
UNIT DIMENSIONS

in. (mm)

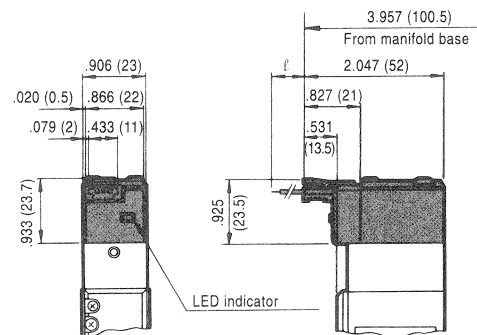
Model	L	P	Model	L	P
H240M2A, H240M2B	4.606 (117)	4.213 (107)	H240M7A, H240M7B	10.118 (257)	9.724 (247)
H240M3A, H240M3B	5.709 (145)	5.315 (135)	H240M8A, H240M8B	11.220 (285)	10.827 (275)
H240M4A, H240M4B	6.811 (173)	6.417 (163)	H240M9A, H240M9B	12.323 (313)	11.929 (303)
H240M5A, H240M5B	7.913 (201)	7.520 (191)	H240M10A, H240M10B	13.425 (341)	13.031 (331)
H240M6A, H240M6B	9.016 (229)	8.622 (219)			

OPTIONS

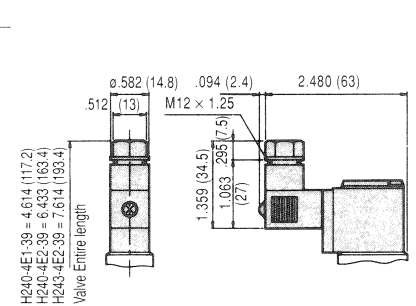
Straight connector  
w/LED indicator



L-connector w/LED indicator



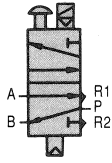
DIN connector solenoid: (-39)



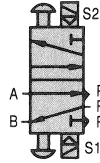
Pressure suppressor varistor: -ZR.  
All dimensions standard.

OPERATING PRINCIPLE, VALVE SYMBOLS, AND MATERIALS OF CONSTRUCTION

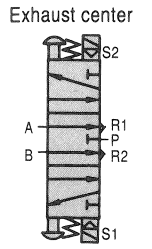
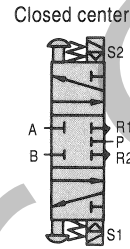
Single solenoid



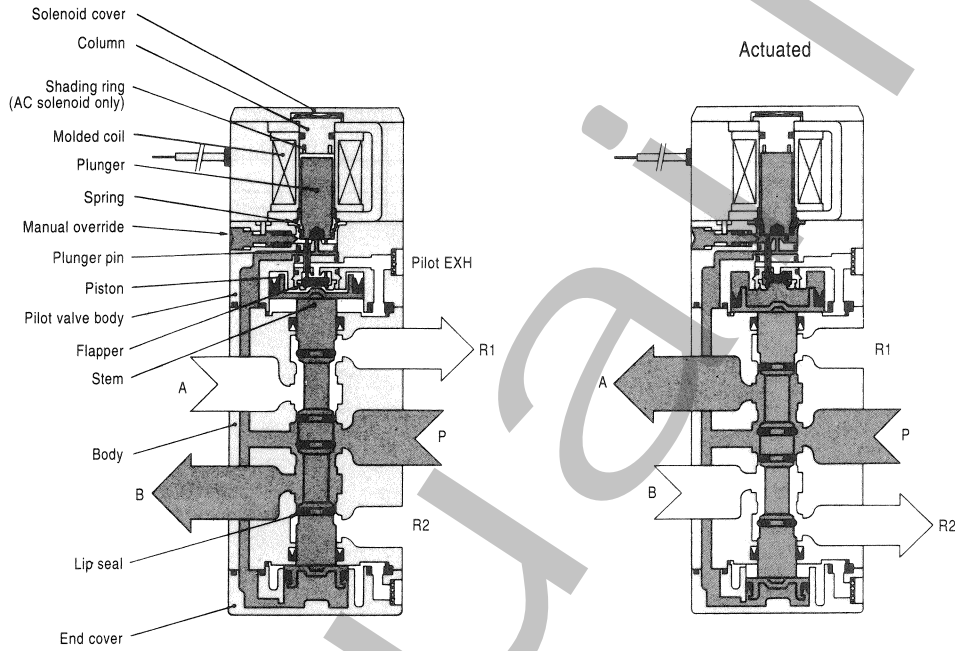
2-position double solenoid



3-position double solenoid



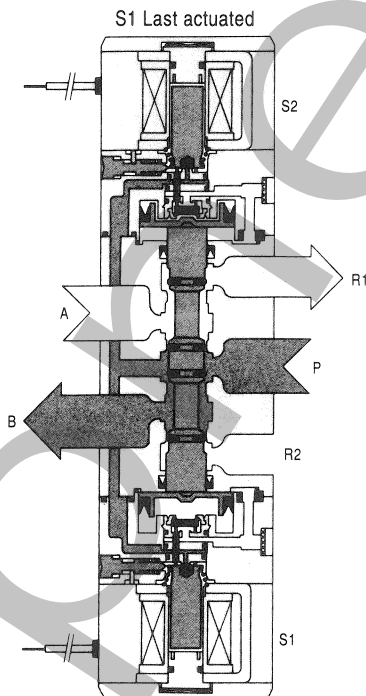
BASIC OPERATION AND NOMENCLATURE



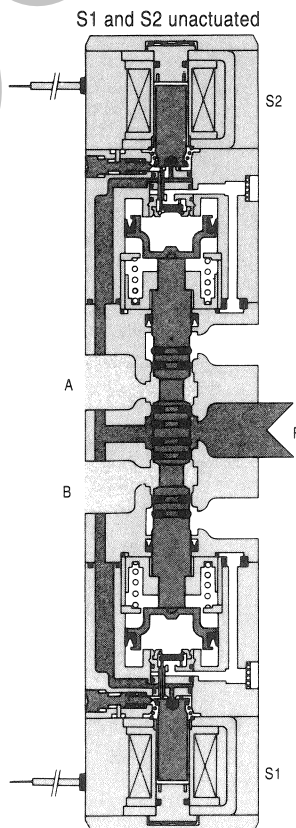
MATERIALS

Item	Material
Body	Diecast aluminum
Stem	Aluminum
Lip seal	Buna N
Flapper	Buna N
Mounting base	Mild steel (zinc plated)
Subbase	Diecast aluminum
Plunger	Electromagnetic stainless steel

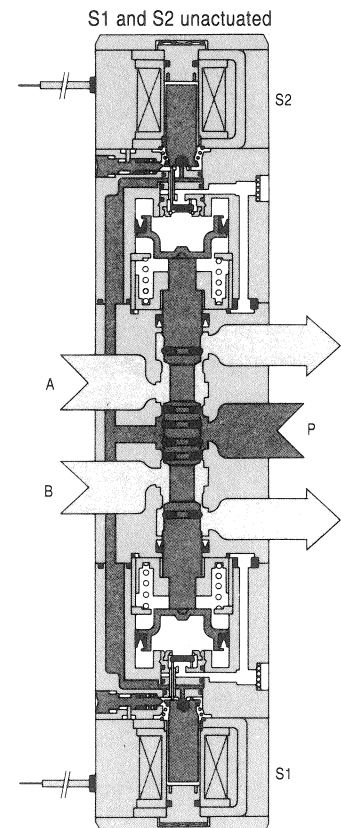
H240-4E2



H243-4E2



H243-4E2-13

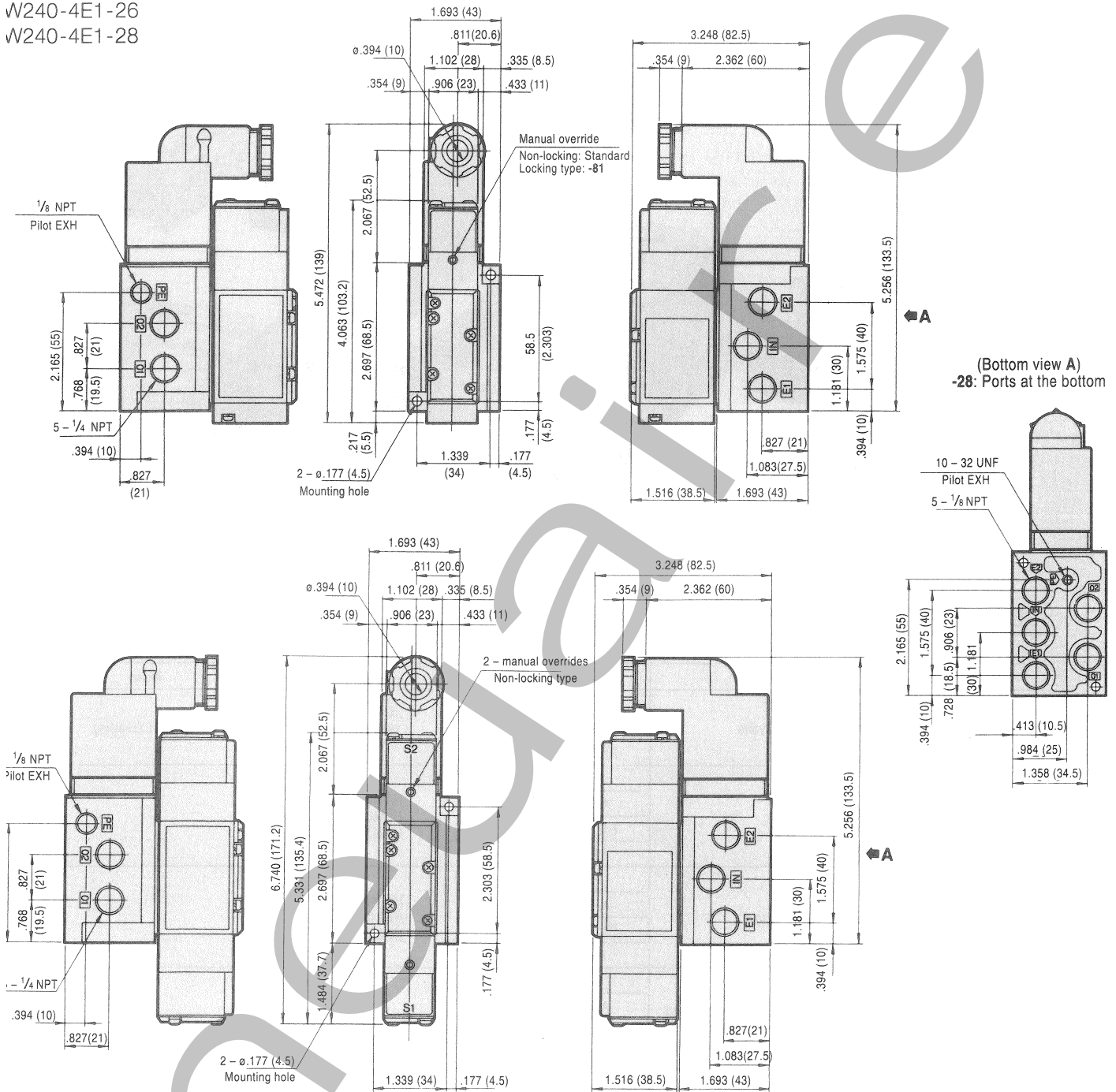




SOLENOID VALVE DIMENSION DIAGRAMS

in. (mm)

W240-4E1-26  
W240-4E1-28

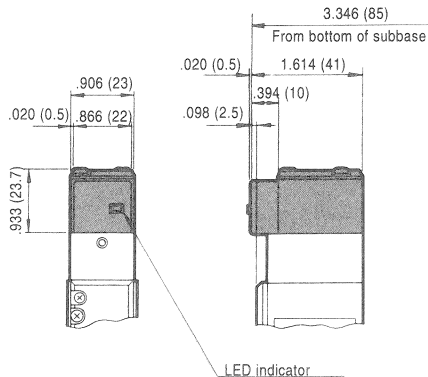
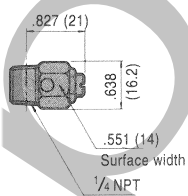


OPTIONS

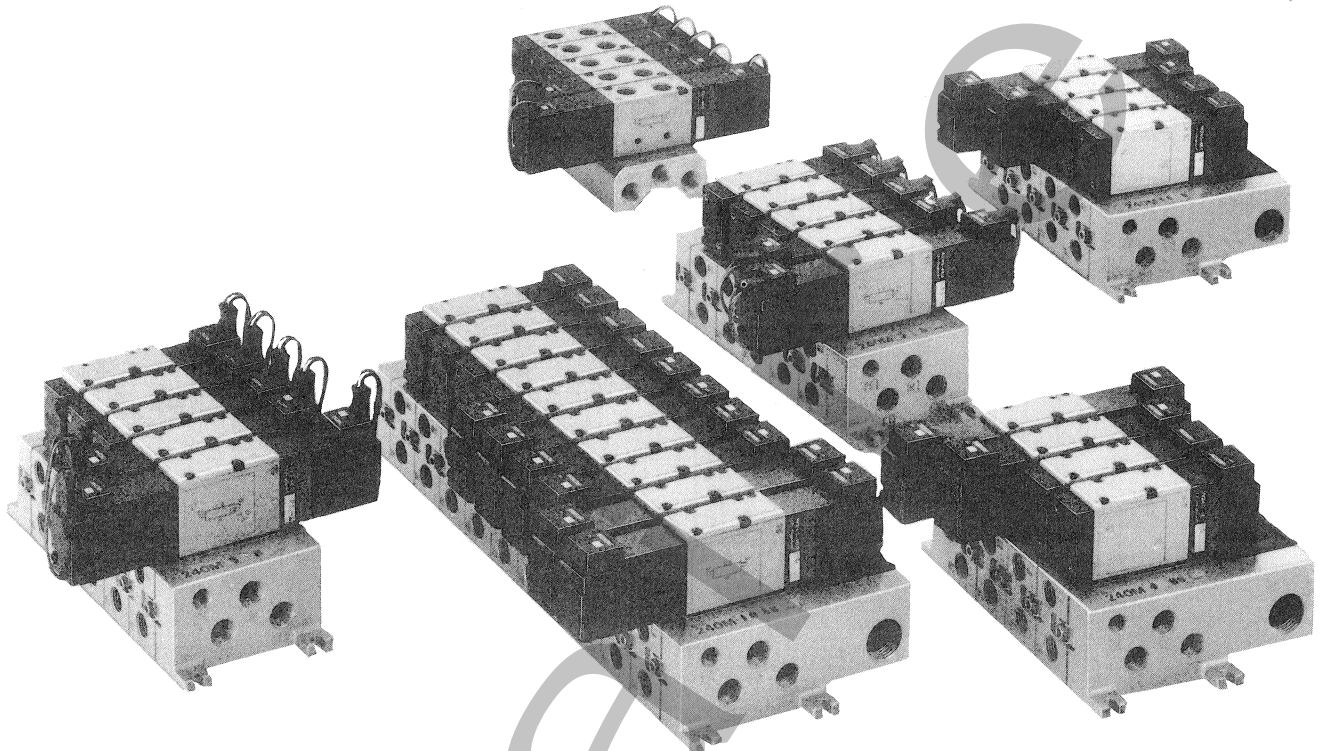
Speed controller: HSCE-02

Straight connector w/LED indicator

Surge suppressor varistor: -ZR.  
Same dimensions as standard.



# H240 SERIES MANIFOLDS



## SPECIFICATIONS AND PIPE CONNECTION DIMENSIONS

Manifolds	Specifications	Port Dimensions NPT		Valves	Notes	
H240M□ F	IN, EXH manifold, OUT valve	P	1/4	H240-4E1 H240-4E2 H243-4E2	No pilot EXH piping	
		A, B				
		R1, R2				
H240M□ A	All ports in manifold	P	1/4	HA240-4E1 HA240-4E2 HA243-4E2		
		A, B				
		R1, R2				
		PE	1/8			
H240M□ AW	All ports in plug-in manifold	P	1/4	HW240-4E1 HW240-4E2 HW243-4E2		
		A, B				
		R1, R2				
		PE	1/8			
H240M□ B	All ports in manifold: choice of ports in side or bottom	end plate and side ports	P	1/4	HA240-4E1 HA240-4E2 HA243-4E2	P, A, B, R1, R2 ports can be at the side or bottom by using isolator (end plate only for pilot EXH, PE port).
			A, B			
			R1, R2			
		bottom ports	P	1/8		
			A, B			
			R1, R2			
H240M□ BW	All ports in plug-in manifold: choice of ports in side or bottom	end plate and side ports	P	1/4	HW240-4E1 HW240-4E2 HW243-4E2	P, A, B, R1, R2 ports can be at the side or bottom by using isolator (end plate only for pilot EXH, PE port).
			A, B			
			R1, R2			
		bottom ports	PE	1/8		
			P			
			A, B			
			R1, R2	1/8		

MATERIALS OF MAIN PARTS

Item	Material
Manifold body	Diecast aluminum
Block-off plate	Mild steel (nickel plated)
Seal	Buna N



WEIGHT

oz. (gf)

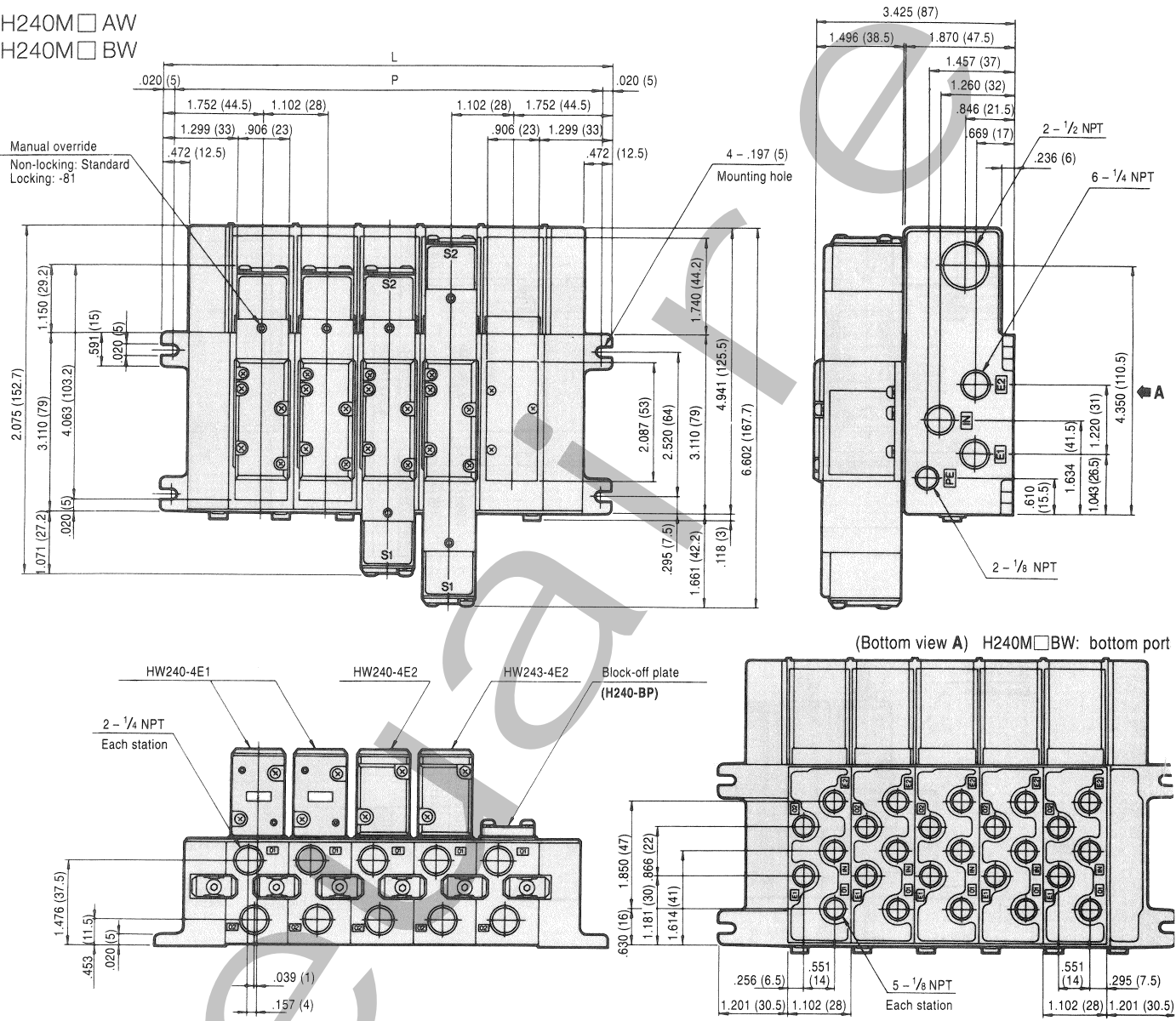
Manifolds	Calculation of each unit (N = stations)	Valves								Block-off plate	
		H240-4E1	H240-4E2	H243-4E2	HA240-4E1	HA240-4E2	HA243-4E2	HW240-4E1	HW240-4E2		HW243-4E2
H240M□ F	2.4xn+2.4 (69xn+69)	5.6 (160)	8.1 (230)	9.2 (260)	-	-	-	-	-	-	1.1 (30)
H240M□ A	5.9xn+7.7 (167xn+217)	-	-	-	5.6 (160)	8.1 (230)	9.2 (260)	-	-	-	
H240M□ AW	7.1xn+9.5 (199xn+270)	-	-	-	-	-	-	5.6 (160)	8.1 (230)	9.2 (260)	
H240M□ B	5.9xn+7.7 (167xn+217)	-	-	-	5.6 (160)	8.1 (230)	9.2 (260)	-	-	-	
H240M□ BW	7.1xn+9.5 (199xn+270)	-	-	-	-	-	-	5.6 (160)	8.1 (230)	9.2 (260)	

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MANIFOLD VALVE DIMENSION DIAGRAMS

in. (mm)

H240M□AW  
H240M□BW



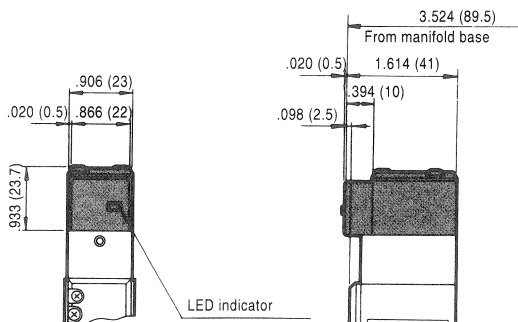
UNIT DIMENSIONS

in. (mm)

Model	L	P	Model	L	P
H240M2AW, H240M2BW	4.606 (117)	4.213 (107)	H240M7AW, H240M7BW	10.118 (257)	9.724 (247)
H240M3AW, H240M3BW	5.709 (145)	5.315 (135)	H240M8AW, H240M8BW	11.220 (285)	10.827 (275)
H240M4AW, H240M4BW	6.811 (173)	6.417 (163)	H240M9AW, H240M9BW	12.323 (313)	11.929 (303)
H240M5AW, H240M5BW	7.913 (201)	7.520 (191)	H240M10AW, H240M10BW	13.425 (341)	13.031 (331)
H240M6AW, H240M6BW	9.016 (229)	8.622 (219)			

OPTIONS

w/LED indicator: -L



Plug-in with surge suppressor varistor: -ZR.  
Same dimensions standard.