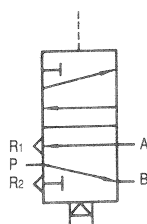


HUMPHREY H110 SERIES AIR PILOTED VALVES

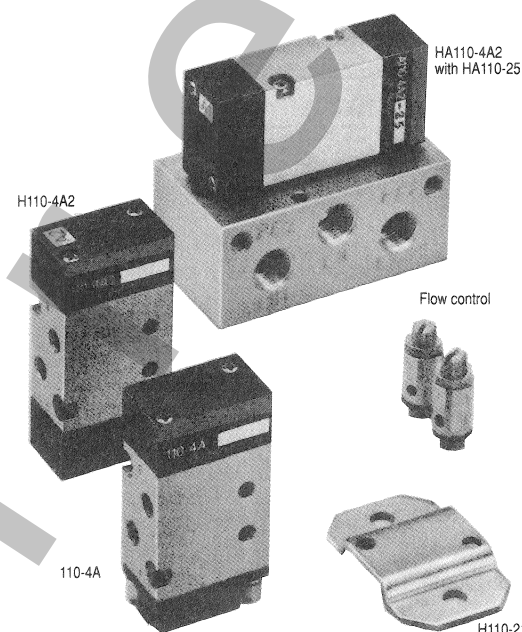
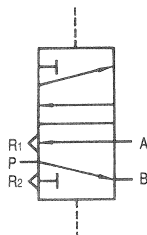
LIST OF SPECIFICATIONS

SYMBOLS

Single pilot
H110-4A



Double pilot
H110-4A2

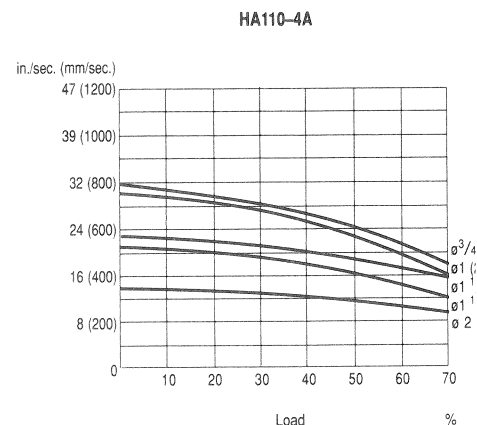
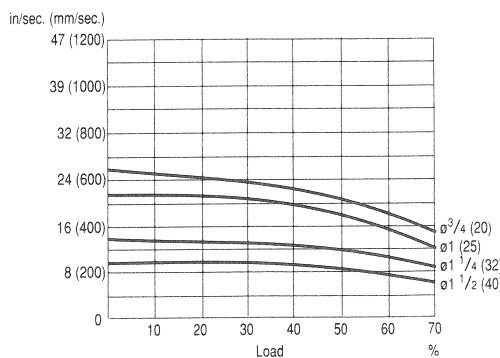
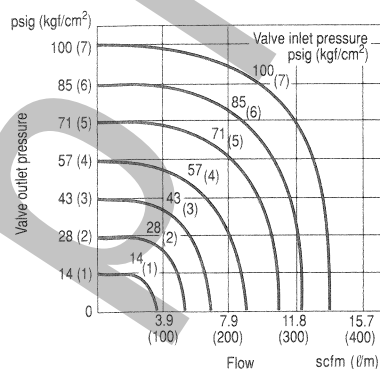


SPECIFICATIONS

Item		Basic model			
		In-line or F-type manifold		Subbase or A-type manifold	
		Single pilot	Double pilot	Single pilot	Double pilot
		H110-4A	H110-4A2	HA110-4A	HA110-4A2
Media		Air			
Type of operation		Indirect acting			
Number of positions/Number of ports		2 position, 4-way			
Flow – C _v		0.23			
Ports	Main	10-32 UNF		–	
	Pilot	10-32 UNF			
Lubrication		None required			
Pressure range – psig (kgf/cm ²)	Main	20 ~ 100 (1.5 ~ 7)	0 ~ 100 (0 ~ 7)	20 ~ 100 (1.5 ~ 7)	0 ~ 100 (0 ~ 7)
	Pilot	Refer to Min. Pressure chart			
Temperature range (atmosphere or media) – °F (°C)		40 ~ 140 (5 ~ 60)			
Impact resistance		140 (axle direction 30)			
Mounting direction		Any			
Maximum operation frequency – c/s		5			
Weight – oz. (gf)		1.4 (40)	1.4 (40)	1.6 (45)	1.8 (50)

Flow rate

Maximum operating speed



NOTE: When 71 psig supply pressure and 57 psig outlet pressure is measured at valve, expect 8 scfm.

HOW TO ORDER

VALVES

Model number	Description
H110-4A	In-line or F-type manifold mount, single air pilot, 5-port, 4-way, spring return
H110-4A2	In-line or F-type manifold mount, double air pilot, 5-port, 4-way detented
HA110-4A	Subbase or A-type manifold mount, single air pilot, 5-port, 4-way, spring return
HA110-4A2	Subbase or A-type manifold mount, double air pilot, 5-port, 4-way, detented

MANIFOLDS AND SUBBASE

Model number	Description
H110M□ F	Select 2 ~ 20 stations manifold, accepts H110-4A & H110-4A2 valves
H110M□ A	Select 2 ~ 20 stations manifold, accepts HA110-4A & HA110-4A2 valves
HA110-25	Single station subbase, accepts HA110-4A & HA110-4A2 valves

ACCESSORIES

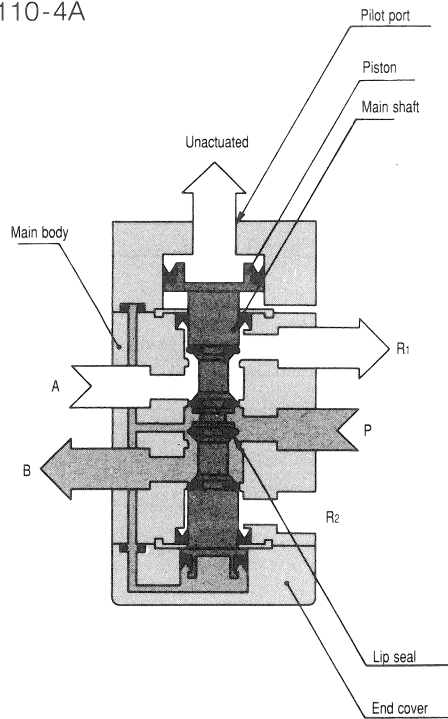
Model number	Description
H110-21	Mounting base for H110-4A only
HSCE-M5	10-32 UNF exhaust port flow control (for in-line valves)
HSCE-01	1/8 NPT exhaust port flow control (for H110-25 subbase)
H110M□ -BP	Block-off plates for manifolds. Select F-type or A-type (□)

PORTING DIAMETER

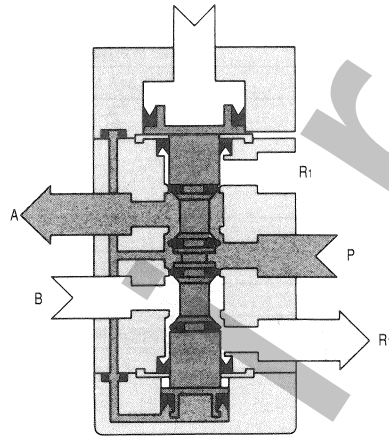
Specifications	Port	In-line porting F-type	Subbase porting A-type	Note
		H110-4A, H110-4A2	HA110-4A, HA110-4A2	
Female thread	P	10-32 UNF	—	Standard
	A, B			
	R			
Subbase	P	—	1/8 NPT	All port subbase
	A, B			
	R			
F-type manifold	P	1/8 NPT	—	IN•OUT manifold OUT valve
	A, B	10-32 UNF		
	R	1/8 NPT		
A-type manifold	P	—	1/8 NPT	All port manifold
	A, B		1/4 NPT	
	R			

OPERATING PRINCIPLE

H110-4A

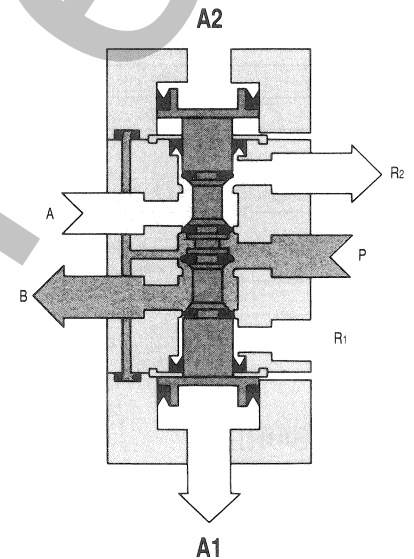


Actuated



H110-4A2

Piloted on A1 and released condition



MATERIALS OF MAIN PARTS

Parts	Materials
Body	Aluminum alloy (anodized)
Main seal shaft	Aluminum alloy (anodized)
Lip seal	Buna
Mounting base	Soft steel (zinc plated)
Subbase	Aluminum (anodized)

MINIMUM PILOT PRESSURE psig (kgf/cm²)

Model	Body pressure			
	21 (1.5)	43 (3)	71 (5)	100 (7)
H110-4A	21 (1.5)	36 (2.5)	50 (3.5)	64 (4.5)
H110-4A2	11 (0.8)	14 (1.0)	17 (1.2)	20 (1.4)

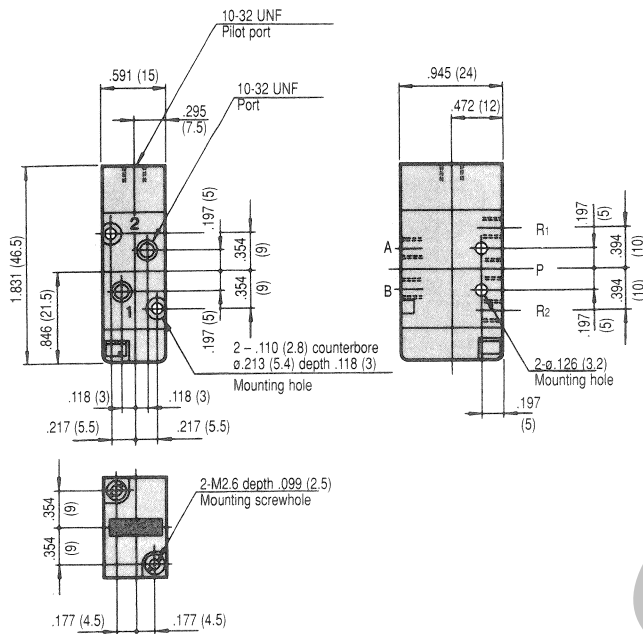
NECESSARY TIME FOR SWITCHING

sec.

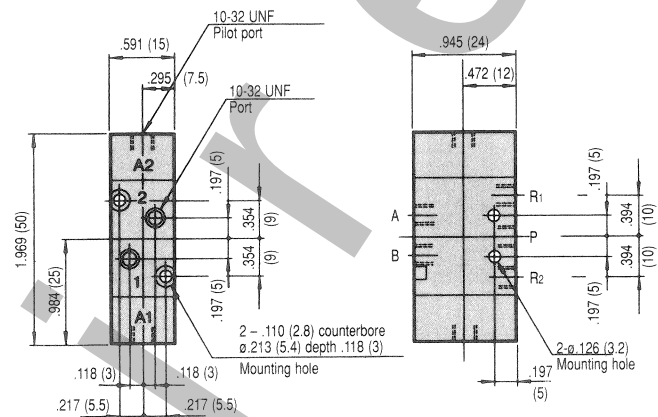
Model	Operation	Pilot line length – ft. (m)					
		6.6 (2)	19.7 (6)	32.8 (10)	65.6 (20)	164 (50)	328 (100)
H110-4A	ON	0.06	0.14	0.26	0.63	2.30	6.54
	OFF	0.12	0.33	0.67	1.65	6.30	19.50
H110-4A2	ON	0.07	0.16	0.29	0.70	2.66	7.40
	OFF						

NOTE: Using an H050-4E1 at 71 psig and 5/32" I.D. tubing.

H110-4A

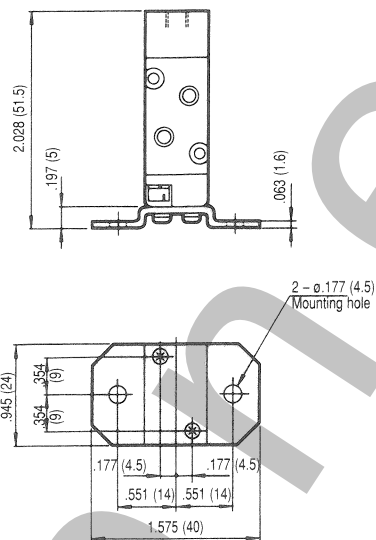


H110-4A2

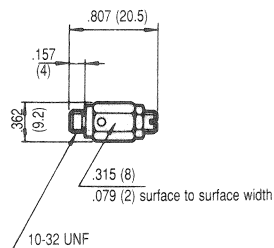


ADDITIONAL PARTS (sold separately)

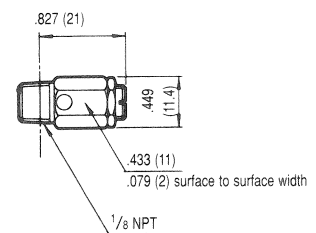
Mounting base
H110-21



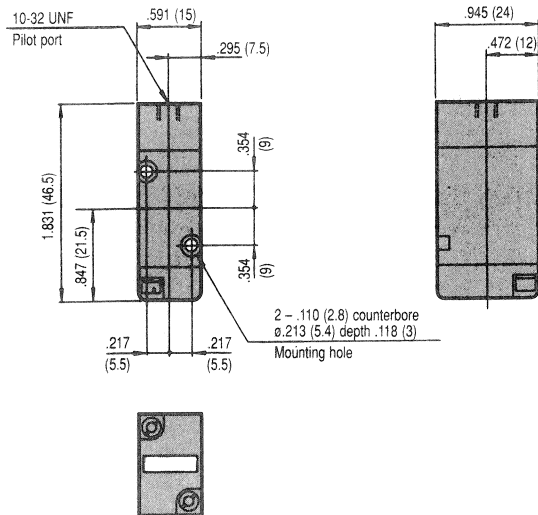
Flow control
HSCE-M5



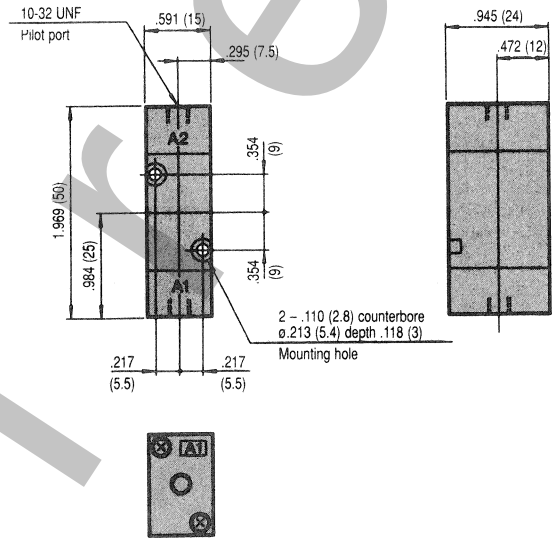
Flow control
HSCE-01



HA110-4A

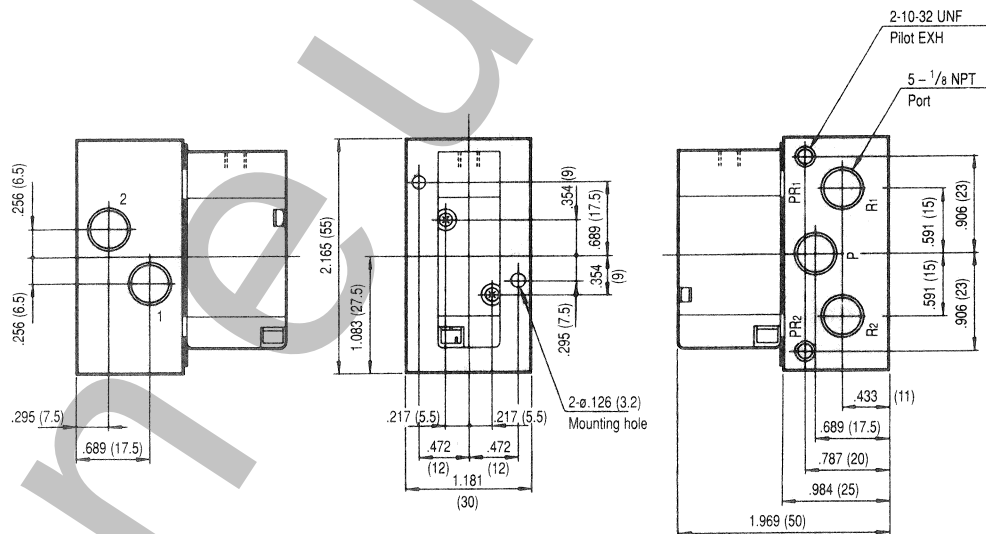


HA110-4A2

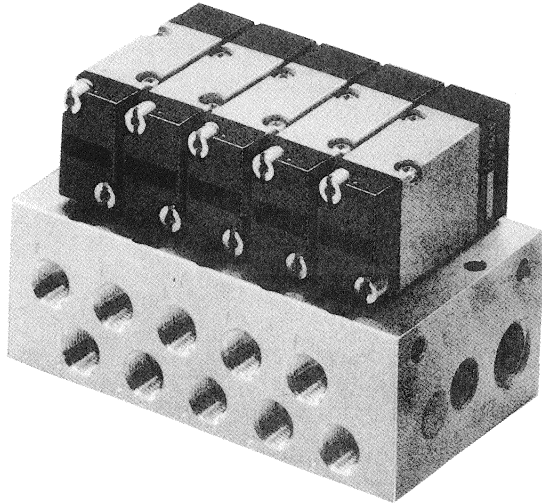


SINGLE SUBBASE (sold separately)

HA110-25 (with HA110-4A mounted)



H110 SERIES MANIFOLDS



MATERIALS OF MAIN PARTS

Part name	Material
Manifold body	Aluminum alloy (alumite)
Block-off plate	Soft steel (zinc plating)
Seal	Buna

SPECIFICATIONS AND PORT SIZES

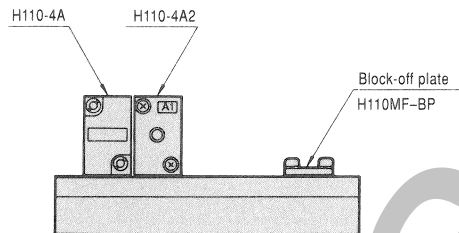
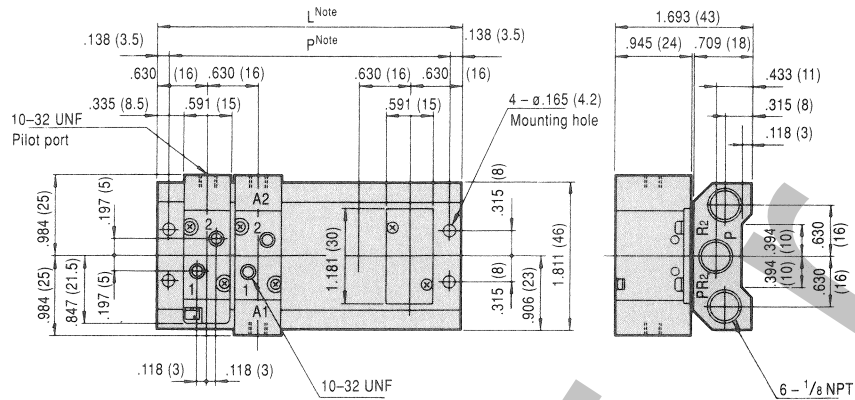
Manifold type	Location	Port	Port size
F type	IN•EXH manifold OUT valve	IN	1/8 NPT
		OUT	10-32 UNF
		EXH	1/8 NPT
A type	All ports IN manifold	IN	1/8 NPT
		OUT	1/8 NPT
		EXH	1/4 NPT

WEIGHT

oz. (gf)

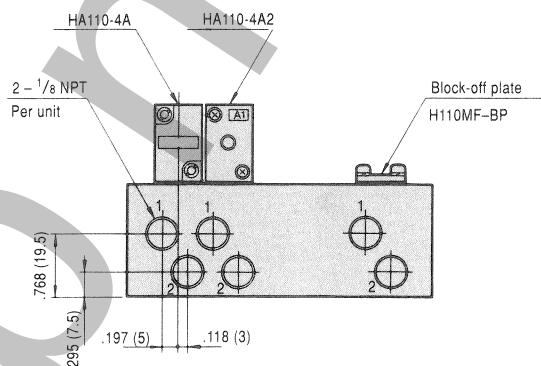
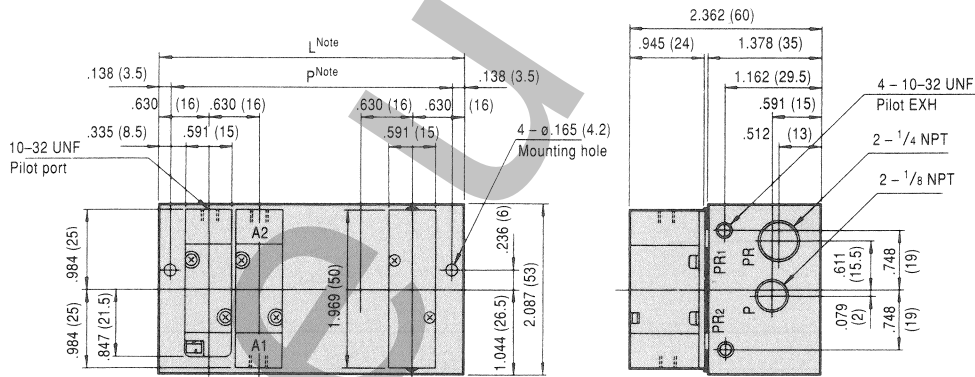
Manifold type	Calculation for each station (n = number of stations)	Mounting valve			
		H110-4A	H110-4A2	HA110-4A	HA110-4A2
F type	{0.7 (20) × n + 1.1 (30)}	1.4 (40)	1.6 (45)	–	–
A type	{2.1 (60) × n + 2.1 (60)}	–	–	1.6 (45)	1.8 (50)

H110M□F



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

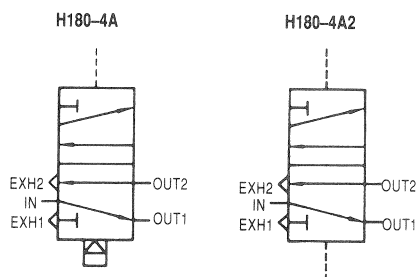


NOTE: L = 1.890 (48) and P = 1.614 (41) for a 2 station manifold. Add 0.630 (16) for each station over 2 [(example: for a 6 station manifold, add 2.520 (64), or L = 4.410 (112) and P = 4.134 (105)].

HUMPHREY H180 SERIES AIR PILOTED VALVES

LIST OF SPECIFICATIONS

SYMBOLS



H180-4A2

HA180-4A2 with H180-25

H180-4A

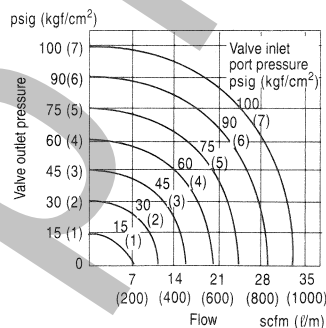
Flow control

H180-21

SPECIFICATIONS

Item		In-line – F type		Subbase – A type	
		Basic type			
		Single pilot	Double pilot	Single pilot	Double pilot
		H180-4A	H180-4A2	HA180-4A	HA180-4A2
Media		Air			
Operation		Indirect acting			
Position and port		2-position, 5 port			
Flow – C _v		0.57			
Ports	Main	1/8" NPT		1/4" NPT	
	Pilot	1/8" NPT			
Lubrication		Not required			
Operating pressure – psig (kgf/cm ²)	Main	20 ~ 100 (1.5 ~ 7)	0 ~ 100 (0 ~ 7)	20 ~ 100 (1.5 ~ 7)	0 ~ 100 (0 ~ 7)
	Pilot	Refer to Min. Pressure chart			
Operating temperature (environment or media) – °F (°C)		40 ~ 122 (5 ~ 50)			
Impact resistance – G		140 (30 on shaft)			
Installation direction		Free			
Speed – cycle/sec.		5			
Weight – oz. (gf)		2.5 (70)	2.8 (80)	2.8 (80)	3.2 (90)

Flow rate

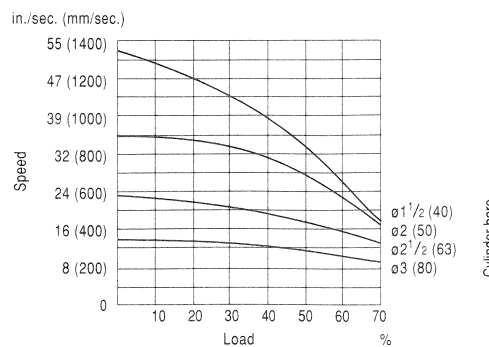


NOTE: When 71 psig supply pressure and 57 psig outlet pressure is measured at valve, expect 16 scfm.

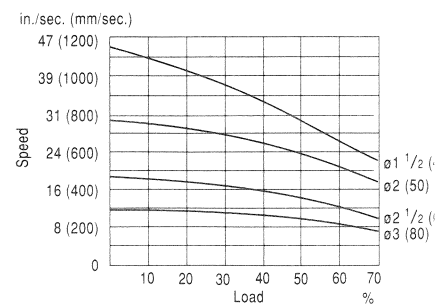
188

Maximum operating speed

H180-4A



HA180-4A



HOW TO ORDER

VALVES

Model number	Description
H180-4A	In-line or F-type manifold mount, single air pilot, 5-port, 4-way, spring return
H180-4A2	In-line or F-type manifold mount, double air pilot, 5-port, 4-way detented
HA180-4A	Subbase or A-type manifold mount, single air pilot, 5-port, 4-way, spring return
HA180-4A2	Subbase or A-type manifold mount, double air pilot, 5-port, 4-way, detented

MANIFOLDS AND SUBBASE

Model number	Description
H180M□ F	Select 2 ~ 20 station manifold, accepts H180-4A & H180-4A2 valves
H180M□ A	Select 2 ~ 20 station manifold, accepts HA180-4A & HA180-4A2 valves
HA180-25	Single station subbase, accepts HA180-4A & HA180-4A2 valves

ACCESSORIES

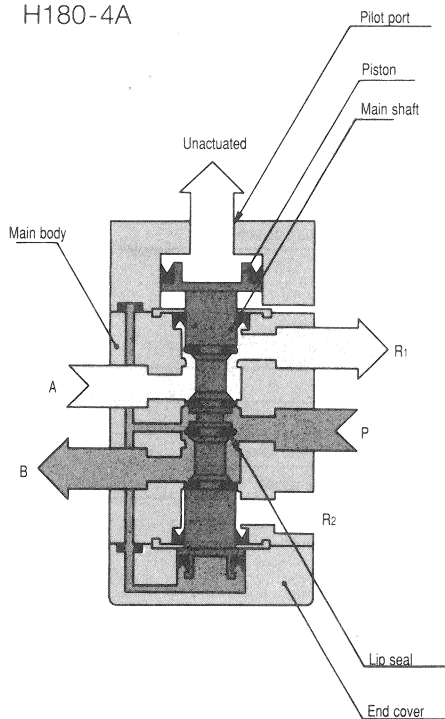
Model number	Description
H180-21	Mounting base for H180-4A only
HSCE-01	1/8 NPT exhaust port flow control (for in-line valves)
HSCE-02	1/4 NPT exhaust port flow control (for H180-25 subbase)
H180M□ -BP	Block-off plates for manifolds. Select F-type or A-type (□)
H180MA-52	Supply port regulator for A-type manifolds or subbase
H180MA-54	A or B port regulator for A-type manifolds or subbase

PORTING

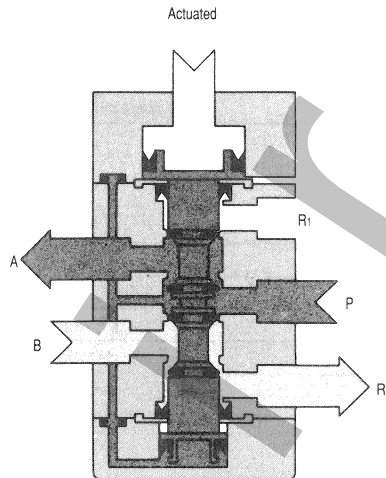
Specifications	Port	Basic type		Port location
		In-line porting F type	Subbase A type	
		H180-4A H180-4A2	HA180-4A HA180-4A2	
In-line	P	1/8" NPT	-	All ports in valve
	A			
	R			
Single Subbase	P	-	1/4" NPT	All ports in subbase
	A			
	R			
F type manifold	P	1/4" NPT	-	IN•EXH manifold OUT valve
	A	1/8" NPT		
	R	1/4" NPT		
A type manifold	P	-	1/4" NPT	All ports in manifold
	A		1/8" NPT	
	R		1/4" NPT	

OPERATING PRINCIPLE

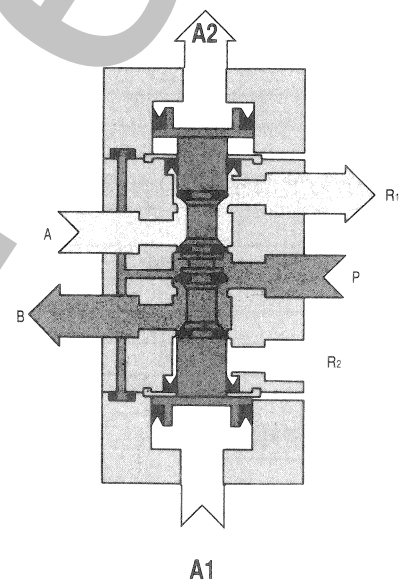
H180-4A



Actuated



H180-4A2



MAJOR PARTS AND MATERIALS

Parts	Materials
Body	Aluminum alloy (anodized)
Main seal shaft	Aluminum alloy (anodized)
Lip seal	Buna
Mounting base	Soft steel (zinc plated)
Subbase	Aluminum (anodized)

MINIMUM PILOT PRESSURE psig (kgf/cm²)

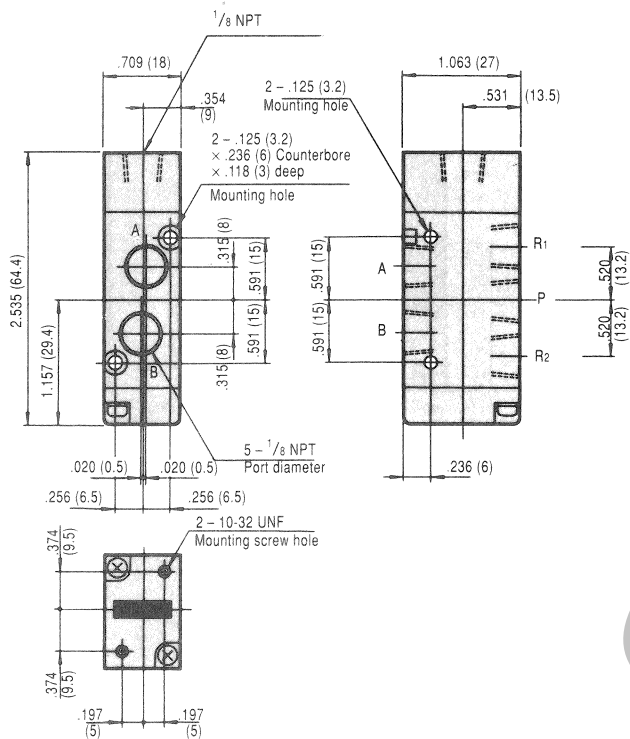
Model	Body pressure			
	21 (1.5)	43 (3)	71 (5)	100 (7)
H180-4A	21 (1.5)	36 (2.5)	50 (3.5)	64 (4.5)
H180-4A2	11 (0.8)	14 (1.0)	17 (1.2)	20 (1.4)

NECESSARY TIME FOR SWITCHING

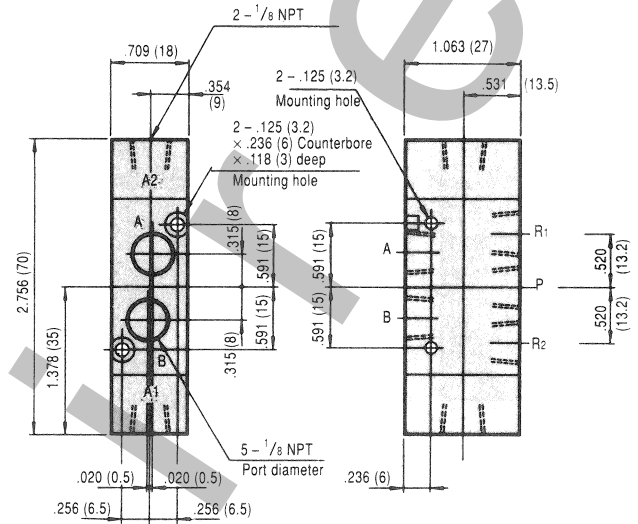
sec.

Model	Operation	Pilot line length – ft. (m)					
		6.6 (2)	19.7 (6)	32.8 (10)	65.6 (20)	164 (50)	328 (100)
H180-4A	ON	0.07	0.18	0.32	0.65	2.10	5.80
	OFF	0.15	0.42	0.72	1.50	4.32	12.20
H180-4A2	ON	0.09	0.23	0.40	0.83	2.73	7.00
	OFF						

H180-4A

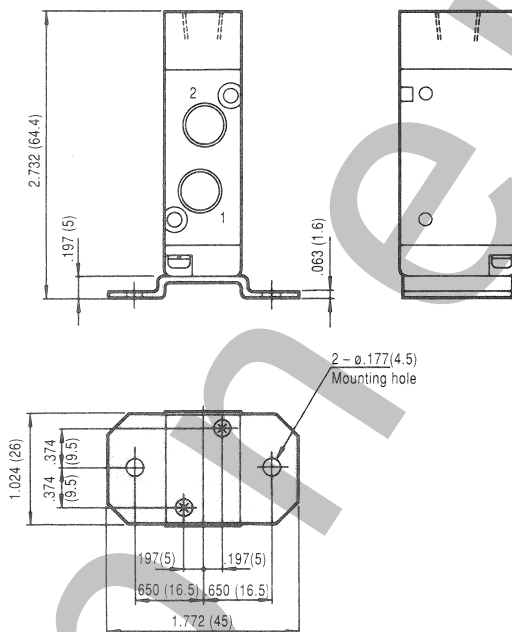


H180-4A2

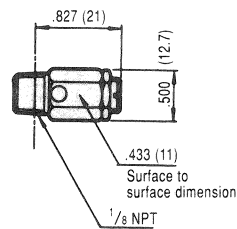


ADDITIONAL PARTS (sold separately)

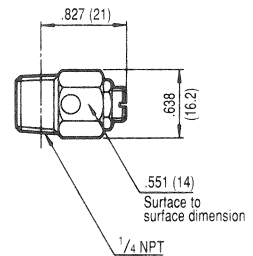
H180 -21: Mtg. base



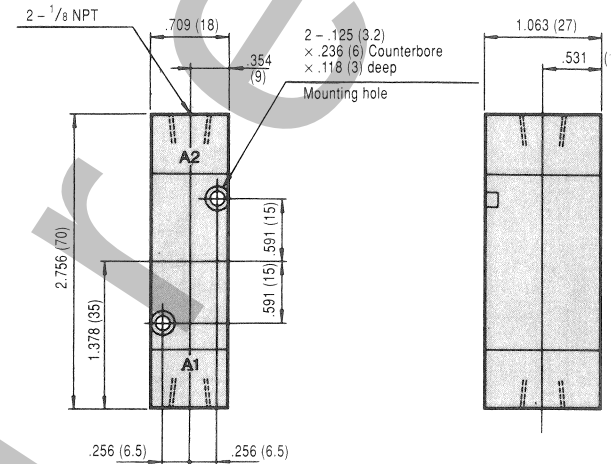
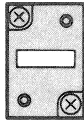
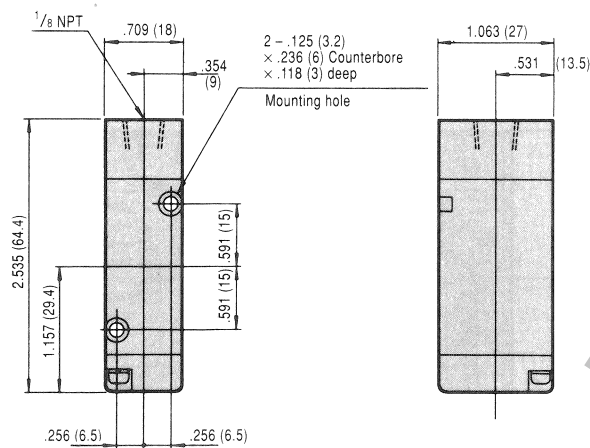
HSCE-01: flow control



HSCE-02: flow control

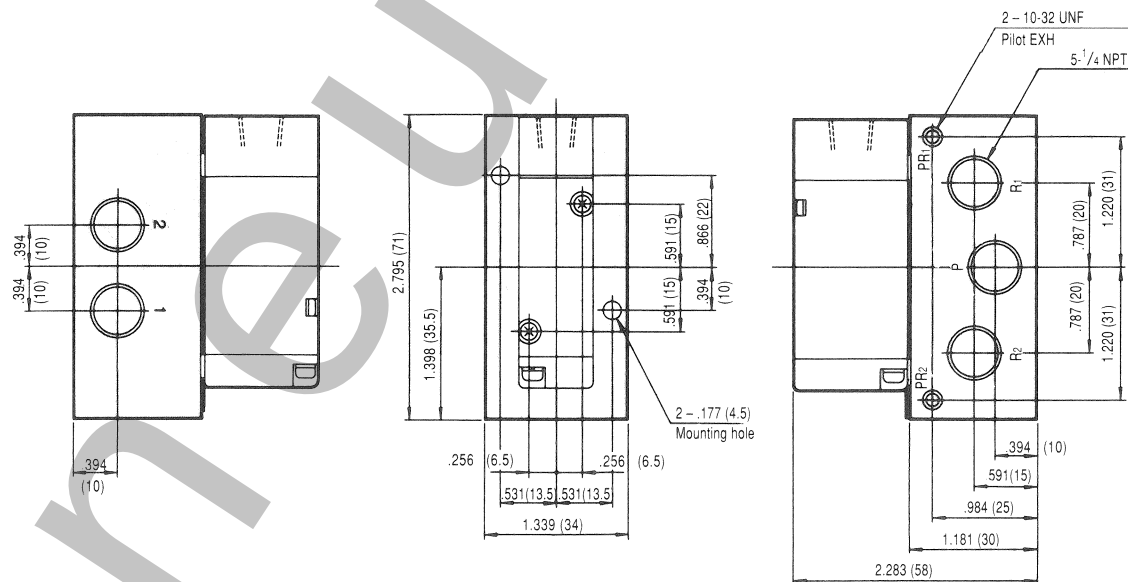


HA180-4A2

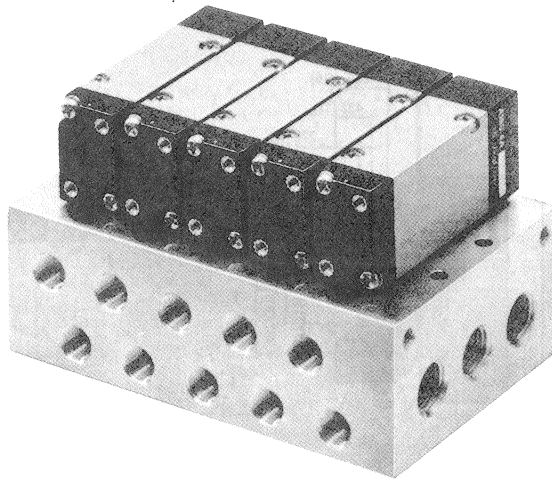


SINGLE SUBBASE (sold separately)

HA180 -25 (shown with HA180-4A mounted)



H180 SERIES AIR PILOTED MANIFOLD VALVE



MATERIALS OF MAIN PARTS

Part name	Material
Manifold body	Aluminum alloy (anodized)
Block-off plate	Soft steel (zinc plating)
Seal	Buna

SPECIFICATIONS AND PORT SIZES

Manifold type	Location	Port	Port size
F type	IN•EXH manifold OUT valve	IN	1/4 NPT
		OUT	1/8 NPT
		EXH	1/4 NPT
A type	All ports IN manifold	IN	1/4 NPT
		OUT	1/8 NPT
		EXH	1/4 NPT

WEIGHT

oz. (gf)

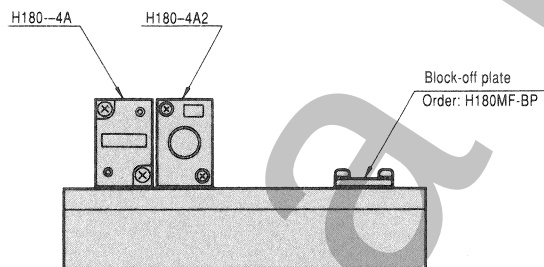
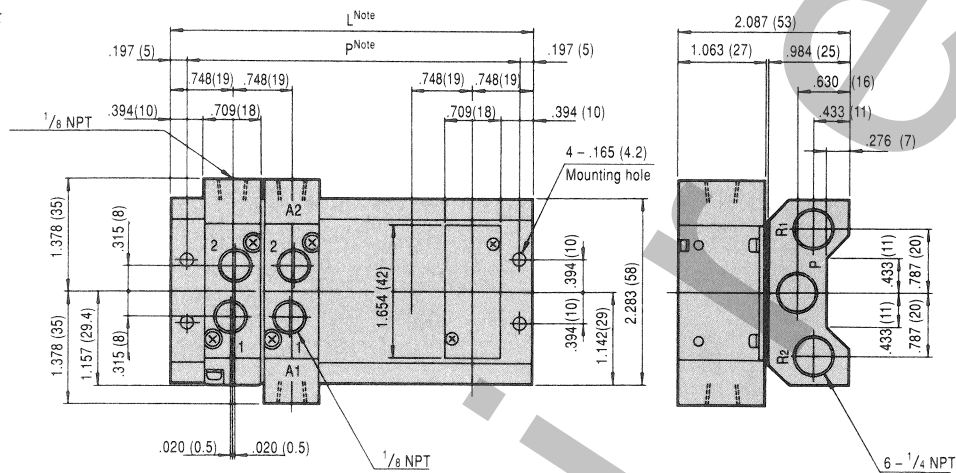
Manifold type	Calculation for each station (n = number of stations)	Mounting valve			
		H180-4A	H180-4A2	HA180-4A	HA180-4A2
F type	$\{1.5 (42) \times n\} + 1.4 (40)$	2.5 (70)	2.8 (80)	–	–
A type	$\{4.2 (120) \times n\} + 4.2 (120)$	–	–	2.8 (80)	3.2 (90)

MANIFOLD DIMENSION DIAGRAMS

in. (mm)

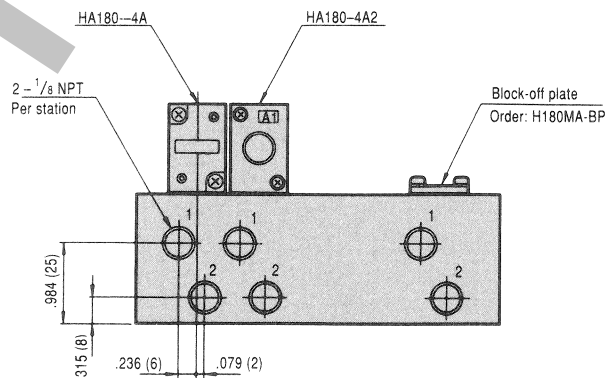
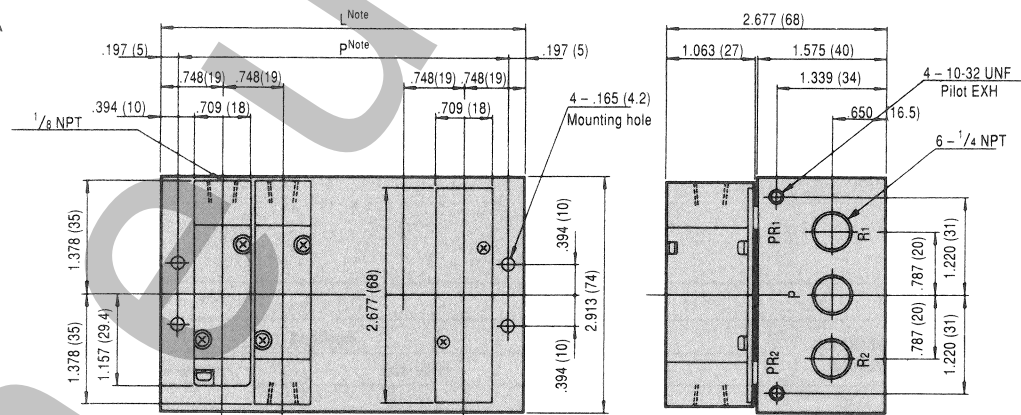
2-, 3-way

H180M□ F



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).

H180M□ A



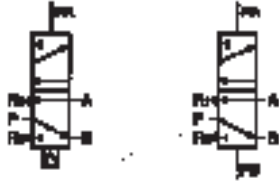
NOTE: L = 2.244 in. (57mm); P = 1.850 in. (47mm) for 2 station manifold. Add 0.748 in. (19mm) for each station over 2 (example: for 6 station manifold, model H180M6A, add 2.992 in. (76mm), or L = 5.236 (133), P = 4.842 (123).

HUMPHREY H240 SERIES AIR PILOTED VALVES

SYMBOLS

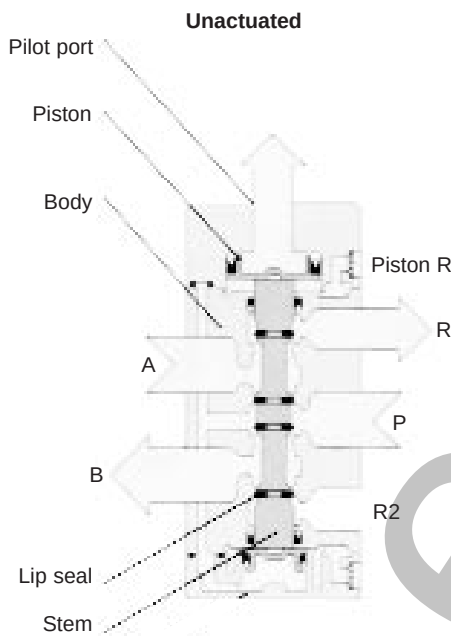
Single pilot
H240-4A

Double pilot
H240-4A2

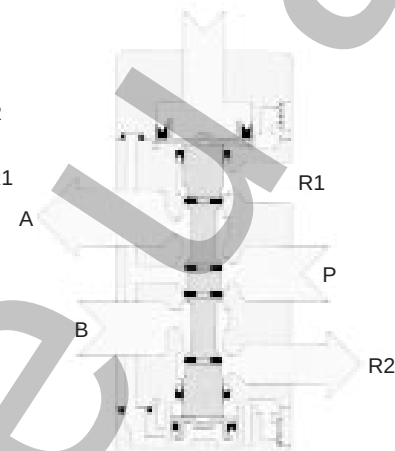


OPERATING PRINCIPLE

H240-4A

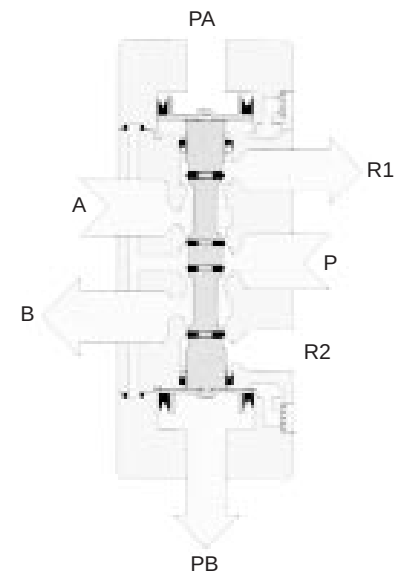


Actuated



H240-4A2

(Released condition after piloted to PB)



MAJOR PARTS AND MATERIALS

Parts	Materials
Body	Aluminum alloy (anodized)
Stem	Aluminum alloy (anodized)
Lip seal	Buna
Mounting base	Soft steel (zinc plated)
Subbase	Aluminum (anodized)
Piston Seal	NBR

LIST OF SPECIFICATIONS

Item		In line - F type		Subbase - A type	
		Basic type			
		Single pilot	Double pilot	Single pilot	Double pilot
		H240-4A	H240-4A2	HA240-4A	HA240-4A2
Media		Air			
Operation		Air-piloted			
Position and port		2-position, 5 port			
Flow - C _V		.88		.83	
Ports	Main	1/4 NPT		1/4 NPT	
	Pilot	1/8 NPT			
Lubrication		Not required			
Operating pressure- psig (kgf/cm ²)	Main	25~100 (1.7 ~ 7)			
	Pilot	Refer to Min. Pressure chart			
Operating temperature (environment or media) - °F (°C)		40~140 (5~50)			
Impact resistance - G		Lateral 140, Axial (93-Single pilot, 27-Double pilot)			
Installation direction		Any			
Max. speed - cycle/sec.		5			
Weight - oz. (gf)		3.5 (110)	4.3 (135)	3.5 (110)	4.3 (135)

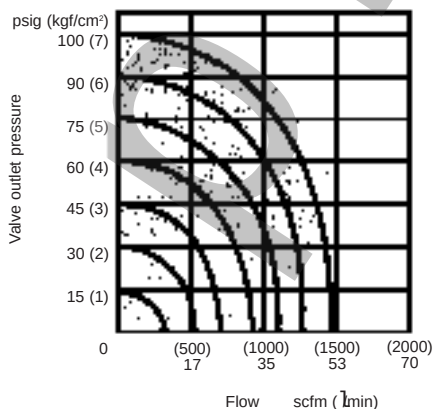
MINIMUM PILOT PRESSURE psig (kgf/cm^2)

Model	Body pressure			
	21 (1.5)	43 (3)	71 (5)	100 (7)
H(A)240-4A	21 (1.5)	31 (2.2)	45 (3.2)	60 (4.2)
H(A)240-4A2	8.5 (0.6)	11 (0.8)	14 (1.0)	17 (1.2)

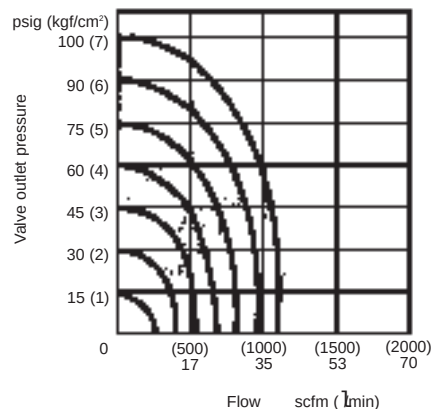
NECESSARY TIME FOR SWITCHING sec.

Model	Operation	Pilot line length-ft (m) [4 mm Tube ID, 72 PSI Pilot and media]					
		6.6 (2)	19.7 (6)	32.8 (10)	65.6 (20)	164 (50)	328 (100)
H(A)240-4A	ON	0.07	0.18	0.32	0.65	2.10	5.80
	OFF	0.15	0.42	0.72	1.50	4.32	12.20
H(A)240-4A2	ON	0.09	0.23	0.40	0.83	2.73	7.00
	OFF						

H240-4A FLOW RATE



HA240-4A FLOW RATE



HOW TO ORDER

VALVES

Model number	Description
H240-4A	In-line or F-type manifold mount, single air pilot, 5-port, 4-way, internal pilot return
H240-4A2	In-line or F-type manifold mount, double air pilot, 5-port, 4-way detented
HA240-4A	Subbase or A-type manifold mount, single air pilot, 5-port, 4-way, internal pilot return
HA240-4A2	Subbase or A-type manifold mount, double air pilot, 5-port, 4-way, detented

MANIFOLDS AND SUBBASE

Model number	Description
H240M□ F	Select 2 ~ 20 station manifold, accepts H240-4A & H240-4A2 valves
H240M□ A	Select 2 ~ 20 station manifold, accepts HA240-4A & HA240-4A2 valves
H240M□ B	Select 2 ~ 20 station manifold, accepts HA240-4A & HA240-4A2 valves; side and bottom ports
25-H240	Single station subbase, accepts HA240-4A & HA240-4A2 valves; side ports
27-H240	Select 2 ~ 20 station manifold, accepts HA240-4A & HA240-4A2 valves; side and bottom ports

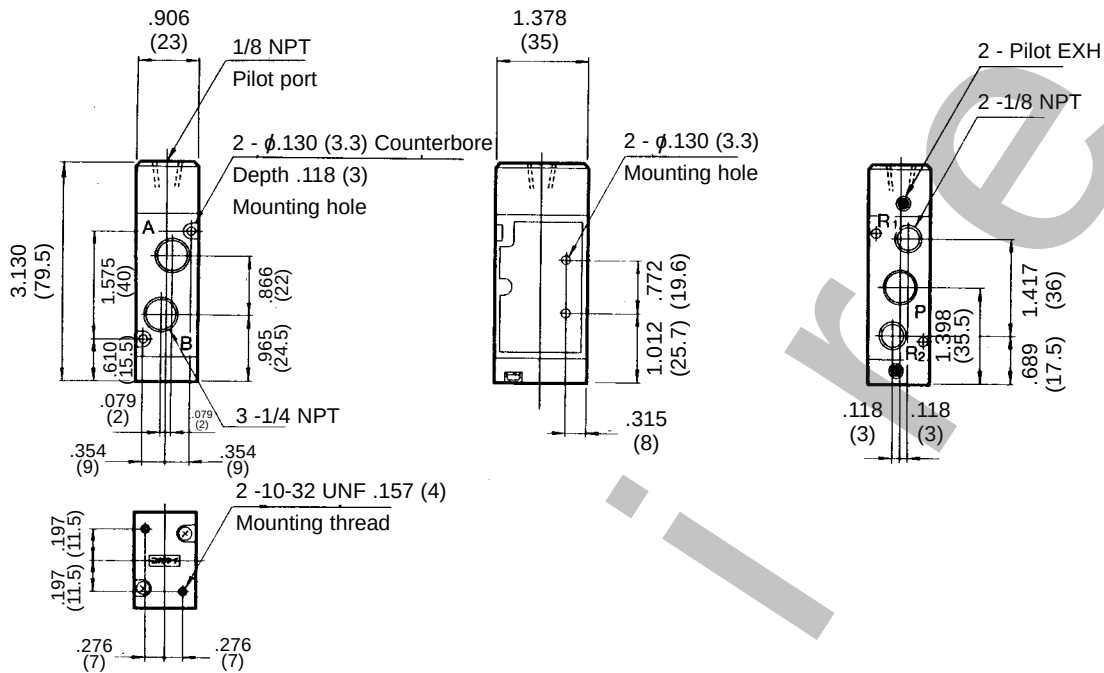
ACCESSORIES

Model number	Description
H240 - 21	Mounting base for H240-4A only
HSCE - 01	1/8 NPT exhaust port flow control (for in-line valves)
HSCE - 02	1/4 NPT exhaust port flow control (for H240-25 subbase)
H240M□ - BP	Block-off plates for manifolds. Select F-type or A-type (□)

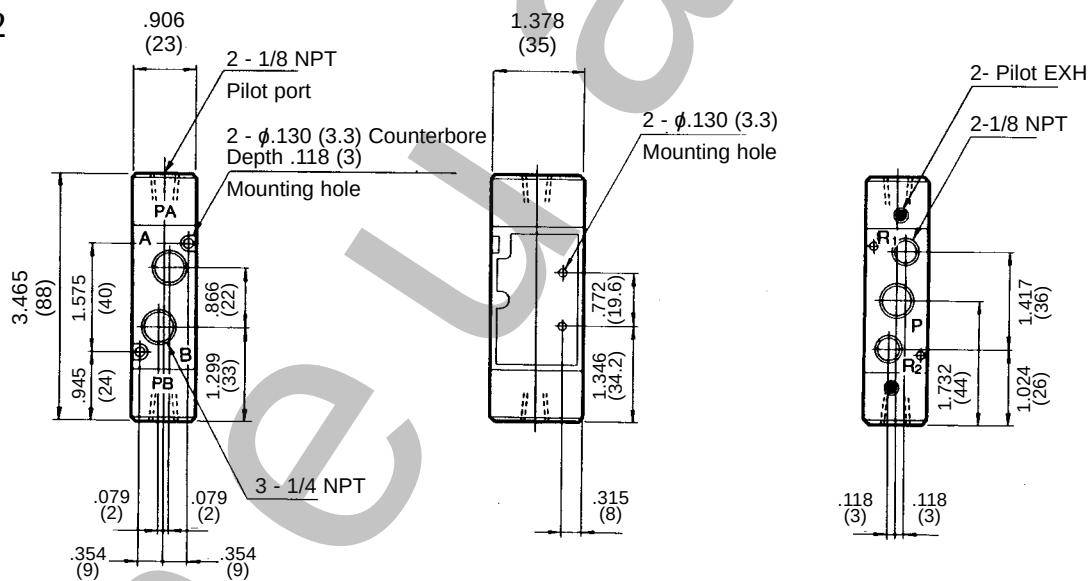
PORTING

Specifications	Port	Basic type		Port location
		In-line porting or F type	Subbase or A type	
		H240-4A H240-4A2	HA240-4A HA240-4A2	
In-line	P	1/4 NPT	—	All ports in valve
	A,B			
	R1,R2	1/8 NPT		
Single Subbase	P	—	1/4 NPT	All ports in subbase
	A,B			
	R1,R2			
	PR		1/8 NPT	
F-type manifold	P	1/4 NPT	—	P,R1,R2 manifold A,B valve
	A,B			
	R1,R2			
A-type manifold	P	—	1/4 NPT	All ports in manifold
	A,B			
	R1,R2			

H240-4A

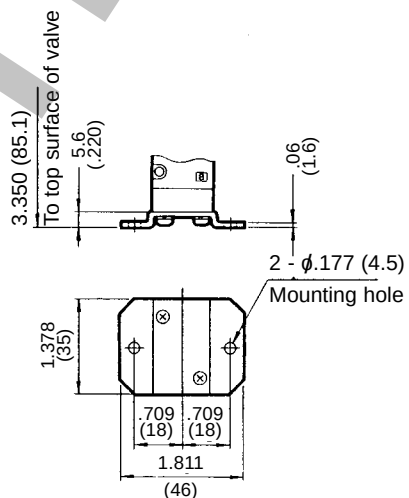


H240-4A2

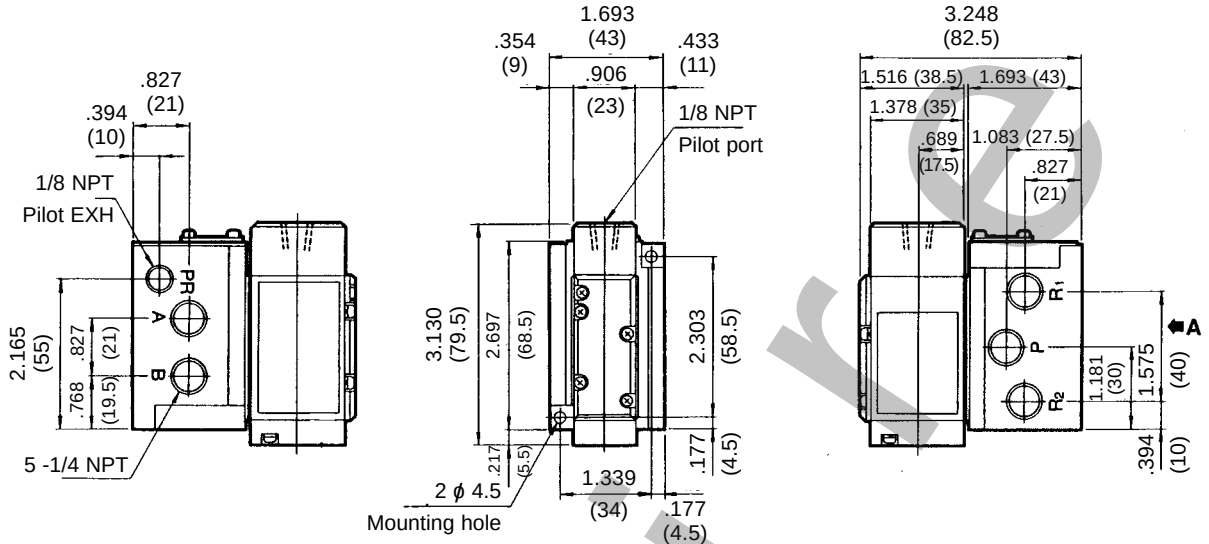


ACCESSORY

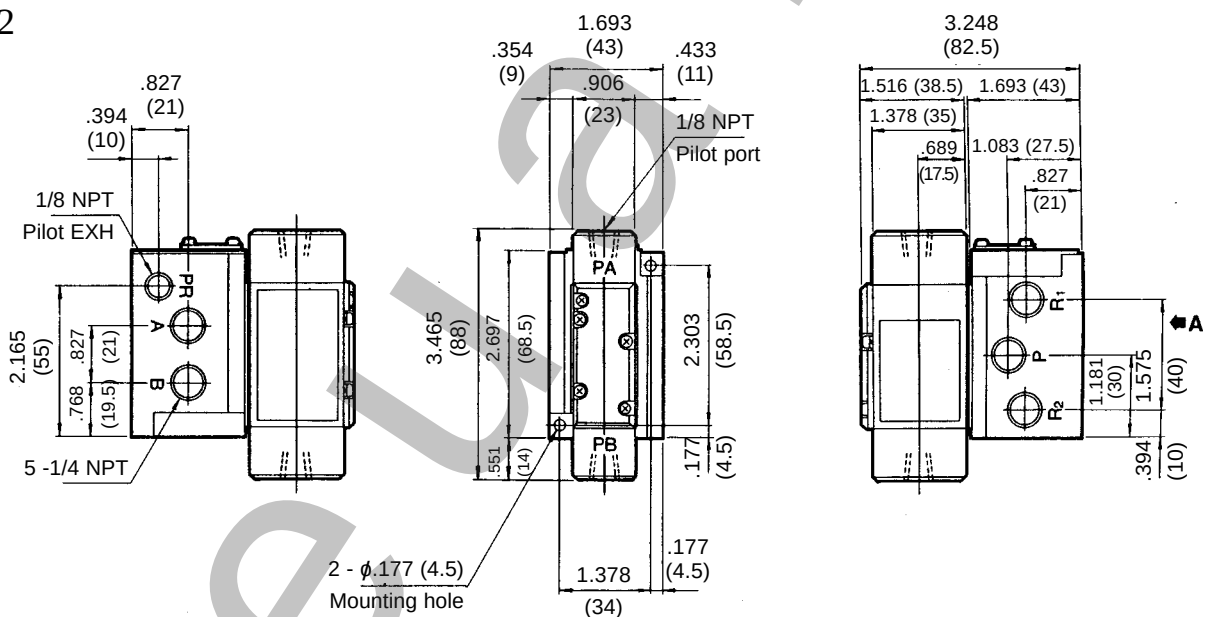
H240-21



HA240-4A
with
25-HA240
or
27-



HA240-4A2
with
25-HA240
or
27-HA240



Accessory

HSCE - 01: flow control

HSCE - 02: flow control

View from 27-HA240 (only):
Bottom port

