

Made to Order

NPT THREADED SPECIFICATIONS

Air-piloted valves 110 series

- The ideal air valve for master valves or pilot valves for total pneumatic control.



Effective Area

mm² (Cv)

Specifications	Basic model	For direct piping, F type manifold	For sub-base, A, AJ type manifolds
		H110-4A, H110-4A2	HA110-4A, HA110-4A2
Single valve		4.2 [0.23]	4.0 [0.22]

Specifications

		For direct piping, F type manifold		For sub-base, A, AJ type manifolds	
		Single pilot	Double pilot	Single pilot	Double pilot
Item	Basic model	H110-4A	H110-4A2	HA110-4A	HA110-4A2
Media		Air			
Operation type		Air-piloted type			
Number of positions and ports		2 positions, 5 ports			
Effective area (Cv) mm ²		4.2 (0.23) ^{Note 1}			
Port size	Main	10-32 UNF ^{Note 2}		— ^{Note 2}	
	Pilot	10-32 UNF			
Lubrication		Not required			
Operating pressure range MPa (kgf/cm ²) [psi.]	Main	0.15~0.7 {1.5~7.1} [22~102]	0~0.7 {0~7.1} [0~102]	0.15~0.7 {1.5~7.1} [22~102]	0~0.7 {0~7.1} [0~102]
	Pilot	See the table "Minimum Pilot Pressure"			
Proof pressure MPa (kgf/cm ²) [psi.]		1.05 {10.7} [152]			
Operating temperature range (atmosphere and media) °C [°F]		5~60 [41~140]			
Shock resistance m/s ² [G]		1373.0 {140.0} (Axial direction 294.2 {30.0})			
Mounting direction		Any			
Maximum operating frequency Hz		5			
Mass g [oz.]		40 [1.41]	45 [1.59]	45 [1.59] (140 [4.94]) ^{Note 3}	50 [1.76] (145 [5.11]) ^{Note 3}

Notes: 1. For details, see the effective area.

2. For details, see the port size.

3. Figures in parentheses () are the mass with sub-plate: -25.

Port Size

Specifications	Basic model Port	For direct piping, F type manifold	For sub-base, A type manifolds	Remarks
		H110-4A H110-4A2	HA110-4A HA110-4A2	
Female thread	1 (P)	10-32 UNF	—	Standard
	4 (A), 2 (B) 3 (R2), 5 (R1)			
Sub-base -25	1 (P)	—	NPT1/8	● All ports sub-base piping
	4 (A), 2 (B) 3 (R2), 5 (R1)			
F type manifold	1 (P)	NPT1/8	—	● 1(P), 3(R2), 5(R1) manifold, 4(A), 2(B) valve piping
	4 (A), 2 (B) 3 (R2), 5 (R1)	10-32 UNF NPT1/8		
A type manifold	1 (P)	—	NPT1/8	● All ports manifold piping
	4 (A), 2 (B) 3, 5 (R)		NPT1/4	

Manifold Specifications and Port Size

Manifold model	Specifications	Port	Port size
F type	P, R manifold piping A, B valve piping	1 (P)	NPT1/8
		4 (A), 2 (B)	10-32 UNF
		3 (R2), 5 (R1)	NPT1/8
A type	All ports manifold piping	1 (P)	NPT1/8
		4 (A), 2 (B)	NPT1/8
		3, 5 (R)	NPT1/4

Manifold Mass

g [oz.]

Manifold model	Mass calculation of each unit (n=number of units)	Mounting valve			
		H110-4A	H110-4A2	HA110-4A	HA110-4A2
F type	(20×n)+30 [(0.71×n)+1.06]	40 [1.41]	45 [1.59]	—	—
A type	(60×n)+60 [(2.12×n)+2.12]	—	—	45 [1.59]	50 [1.76]

Calculation example: The mass of H110M 10F stn.1~5 H110-4A, stn.6~10 H110-4A2 becomes (20×10)+30+(40×5)+(45×5)=655g [23.10 oz.]

Minimum Pilot Pressure

MPa (kgf/cm²) [psi.]

Main pressure	0.15 {1.5} [22]	0.3 {3.0} [44]	0.5 {5.1} [73]	0.7 {7.1} [102]
Model				
H110-4A	0.15 {1.5} [22]	0.25 {2.5} [36]	0.34 {3.5} [49]	0.45 {4.5} [65]
H110-4A2	0.08 {0.8} [12]	0.10 {1.0} [15]	0.12 {1.2} [17]	0.14 {1.4} [20]

Required Time for Switching

s

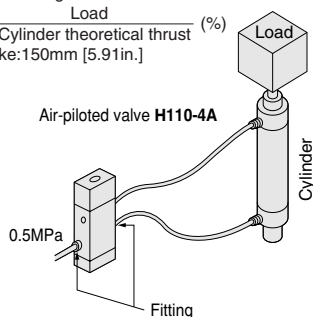
Model	Operation	Pilot line length L m [ft.]						Measurement circuit	Measurement conditions
		2 [6.6]	6 [19.7]	10 [32.8]	20 [65.6]	50 [163.9]	100 [327.8]		
H110-4A	ON	0.06	0.14	0.26	0.63	2.30	6.54		<ul style="list-style-type: none"> ● Pilot valve=050-4E1 (effective area 1.2mm² [Cv: 0.067]) ● Tube inner diameter = 4mm [0.16in.] ● Air pressure (both main and pilot)=0.5MPa [73psi.]
	OFF	0.12	0.33	0.67	1.65	6.30	19.50		
HA110-4A2	ON	0.07	0.16	0.29	0.70	2.66	7.40		<ul style="list-style-type: none"> ● Pilot valve=050-4E1 (effective area 1.2mm² [Cv: 0.067]) ● Tube inner diameter = 4mm [0.16in.] ● Air pressure (both main and pilot)=0.5MPa [73psi.]
	OFF								

Cylinder Operating Speed and Flow Rate

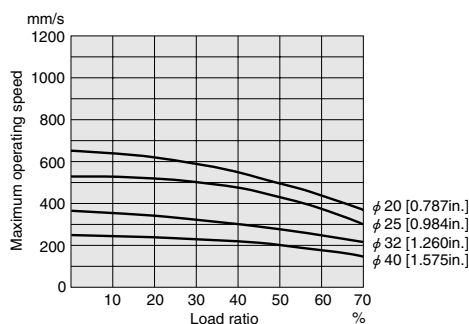
H110-4A

● Measurement conditions

- Air pressure : 0.5MPa {5.1kgf/cm²} [73psi.]
- Piping inner diameter and length: ϕ 25 [0.10in.]×1000mm [39in.]
- Fitting : Quick fitting 4mm
- Load ratio = $\frac{\text{Load}}{\text{Cylinder theoretical thrust}}$ (%)
- Cylinder stroke: 150mm [5.91in.]



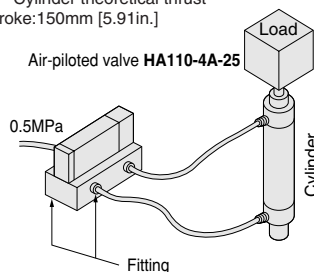
Maximum operating speed



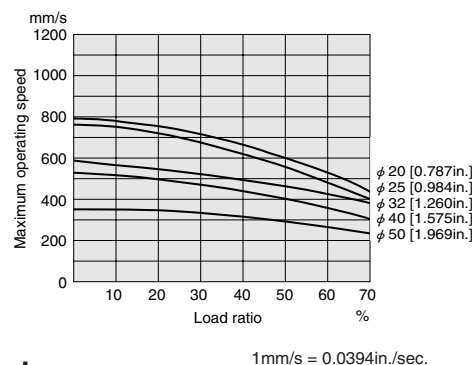
HA110-4A-25

● Measurement conditions

- Air pressure : 0.5MPa {5.1kgf/cm²} [73psi.]
- Piping inner diameter and length: ϕ 4 [0.16in.]×1000mm [39in.]
- Fitting : Quick fitting 6mm
- Load ratio = $\frac{\text{Load}}{\text{Cylinder theoretical thrust}}$ (%)
- Cylinder stroke: 150mm [5.91in.]

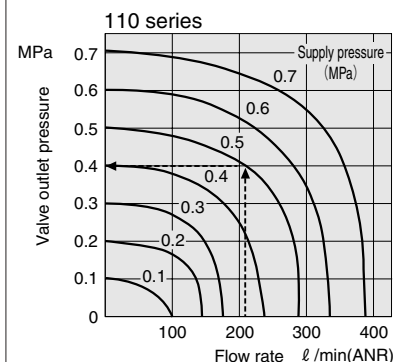


Maximum operating speed



1mm/s = 0.0394in./sec.

Flow rate



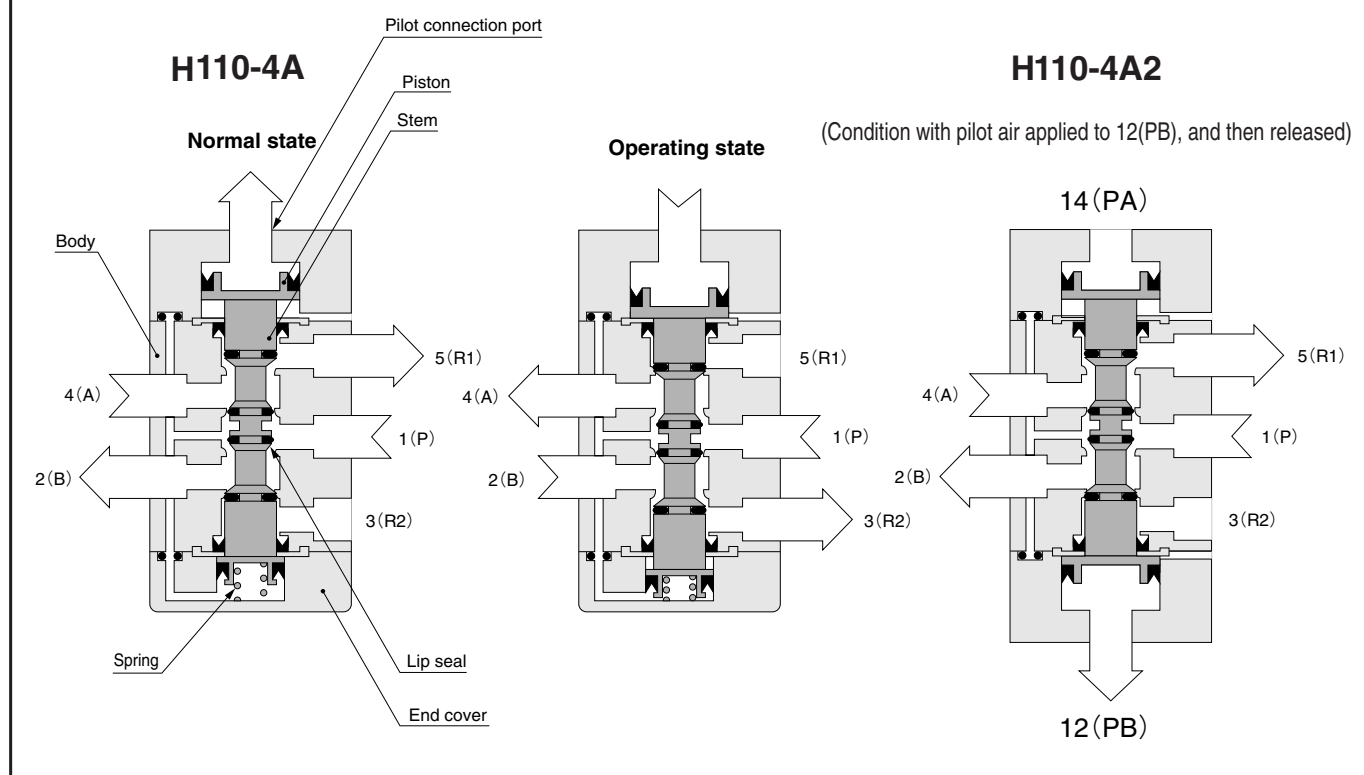
1MPa = 145psi., 1 l/min = 0.0353 ft³/min.

How to read the graph

When the supply pressure is 0.5MPa [73psi.] and the flow rate is 210 l/min [7.41ft³/min.] (ANR), the valve outlet pressure becomes 0.4 MPa [58psi.].

Operating Principles and Major Parts

5-port, 2-position




Major Parts and Materials

Parts	Materials
Body	Aluminum alloy
Stem	(anodized)
Lip seal	Synthetic rubber
Mounting base	Mild steel (zinc plated)
Sub-base	Aluminum alloy (anodized)

110 Series Air-piloted Valve Order Codes

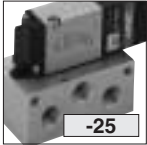
Sub-base

Without sub-base



Blank

With sub-base





-25

Basic model

Direct piping air-piloted valve (made to order)	5-port single pilot	H110-4A	
	5-port double pilot	H110-4A2	
Sub-base piping air-piloted valve (made to order)	5-port single pilot	HA110-4A	-25
	5-port double pilot	HA110-4A2	

Additional Parts (To be ordered separately)

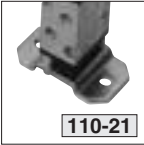
Speed controller



SCE-M5 SCE-01

● For direct piping ● For sub-base piping


Mounting base



110-21

● For direct piping ● For 2-, 3-port and 5-port single solenoids

Block-off plate



● ☐ M ☐ -BP

111 — For 111M
110 — For 110M

F — For F type manifold
FE — For FE type manifold
A — For A type, AJ type manifolds

110 Series Manifold Order Codes

Manifold model Number of units			Station	Basic model
Manifold for mounting 5-port valve (made to order)	H110M	2 ⋮ 20	F	stn. <input type="checkbox"/> -H110-4A
				stn. <input type="checkbox"/> -H110-4A2
		A	stn. <input type="checkbox"/> -HA110-4A	
			stn. <input type="checkbox"/> -HA110-4A2	

● Valve mounting location from the left-hand side when facing the 4(A), 2(B) ports.

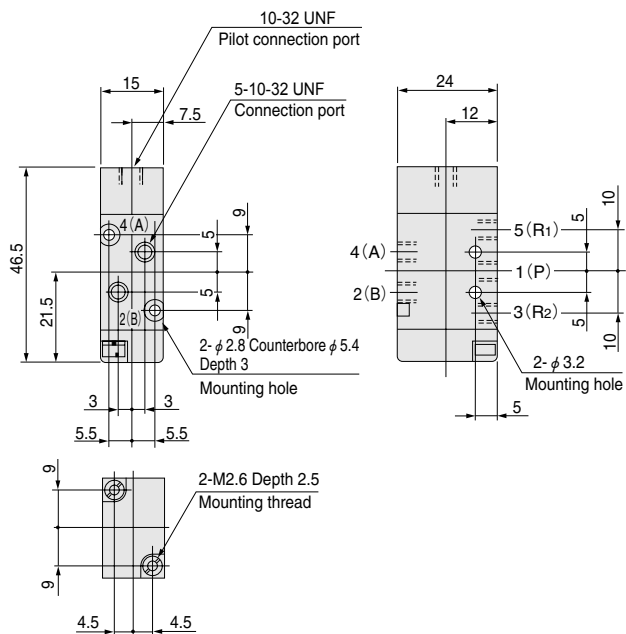
● Specify the valve model for each station.

● Enter -BP when closing a station with a block-off plate without mounting a valve.

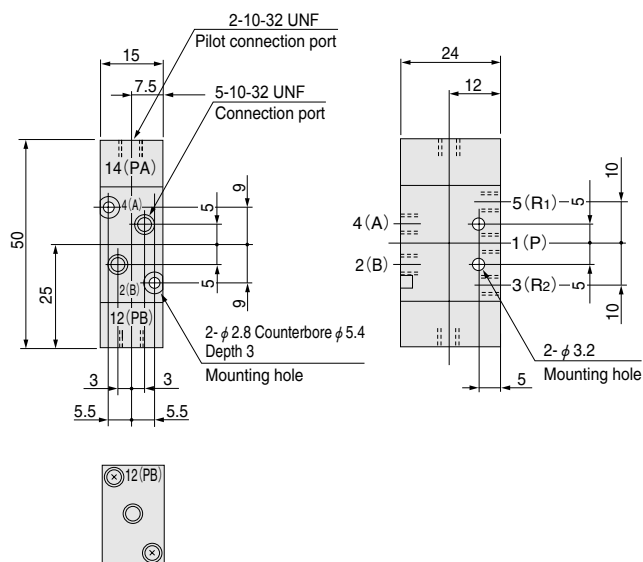
Notes : 1. Since the PR port on the port fitting type valves is located on the opposite side from the manifold, pilot air is exhausted directly from the valve. For that reason, collective exhaust is not possible and the port fitting type valves cannot be used for the manifold.

Dimensions of Air-piloted 5-port, 2-position Valve (mm)

H110-4A

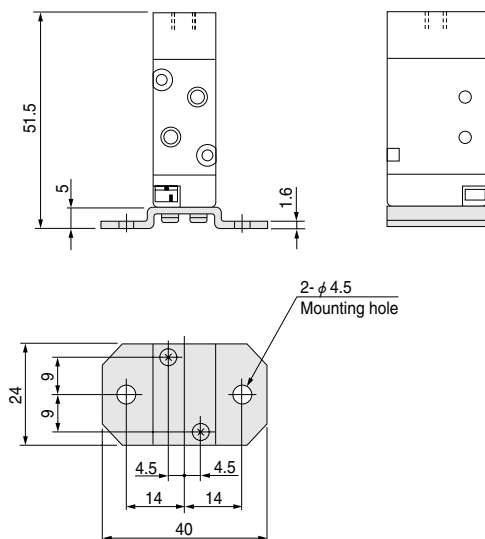


H110-4A2

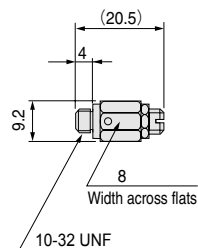


Options

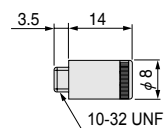
● Mounting base : -21



● Speed controller : -70

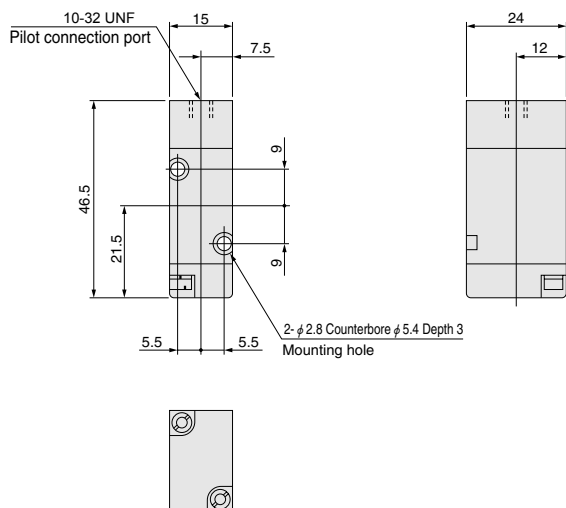


● Muffler : -75

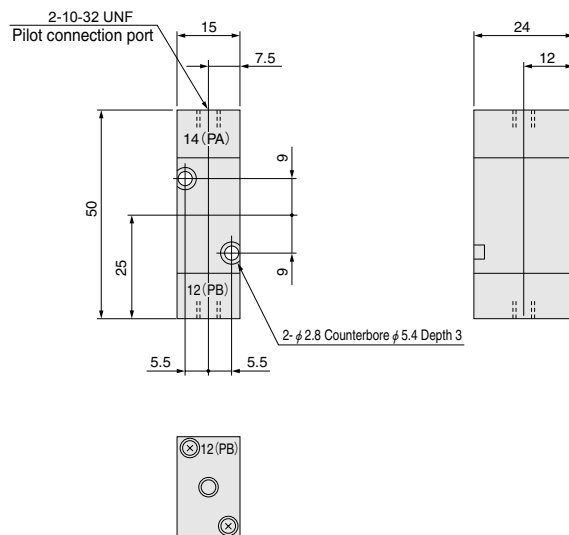


Dimensions of Air-piloted 5-port, 2-position Valve (mm)

HA110-4A

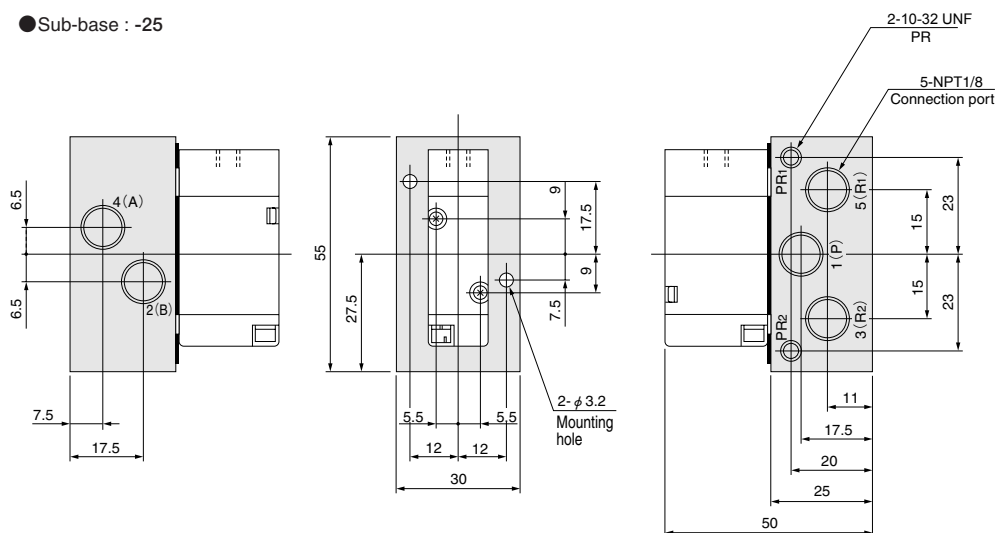


HA110-4A2

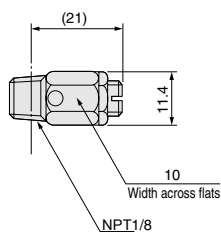


Options

● Sub-base : -25



● Speed controller : -70



Handling Instructions and Precautions

Mounting base 110-21

When installing a mounting base to the valve, always use the provided screws. The recommended tightening torque for the screws is 49N•cm {5kgf•cm} [4.3in•lbf].

Mounting valves on manifold

When mounting valves on manifold, apply the recommended tightening torque of 39.2N•cm {4kgf•cm} [3.5in•lbf] for the valve mounting screws.