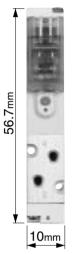
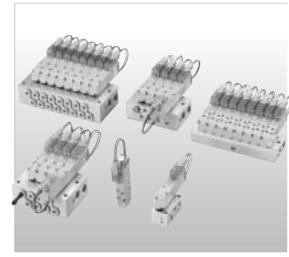
Small, easy-to-use, simple construction valves! Suitable for various needs and offering high-performance control, while achieving still lower power consumption and quicker response!

New Standard Valve SOLENOID VALVES EA, EB SERIES

SOLENOID VALVES EA series

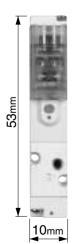
(2, 3, 5-port pilot type solenoid valves)

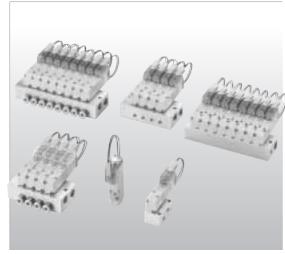




SOLENOID VALVES EB series

(2, 3-port pilot type solenoid valves)





Provides reliable performance for all situations in which solenoid valves are required, in the manufacturing lines, in machinery, or in equipment.

A NEW standard in compact valves!

● Space Saving—Thin and compact size

Valve width: 10mm [0.394in.]
Valve length: 56.7mm [2.232in.] (EA series)

53mm [2.087in.] (EB series) (for standard type)

● Flow — Efficient flow rate

Sonic conductance C: $0.26 dm^3/(s \cdot bar)$ (Effective area: $1.3 mm^2$ [Cv: 0.07]) Optimum for pilot-operated valves, and for operating up to $\phi 25$ [0.984in.] bore size cylinders.

● Response—Fast response time

Response time: When ON, 6ms or below When OFF, 7ms or below (in the case of quick response type single solenoids)

● Power—Lower power consumption
Standard type: 0.55W, Low current type: 0.15W

• Reliability—Improved reliability

New solenoid and stem construction resulting from years of our valve technology experience have boosted operating life, response, and other basic performance features.

● Environmental Protection—Improved performance

Grommet type valves offer moisture proof specifications.

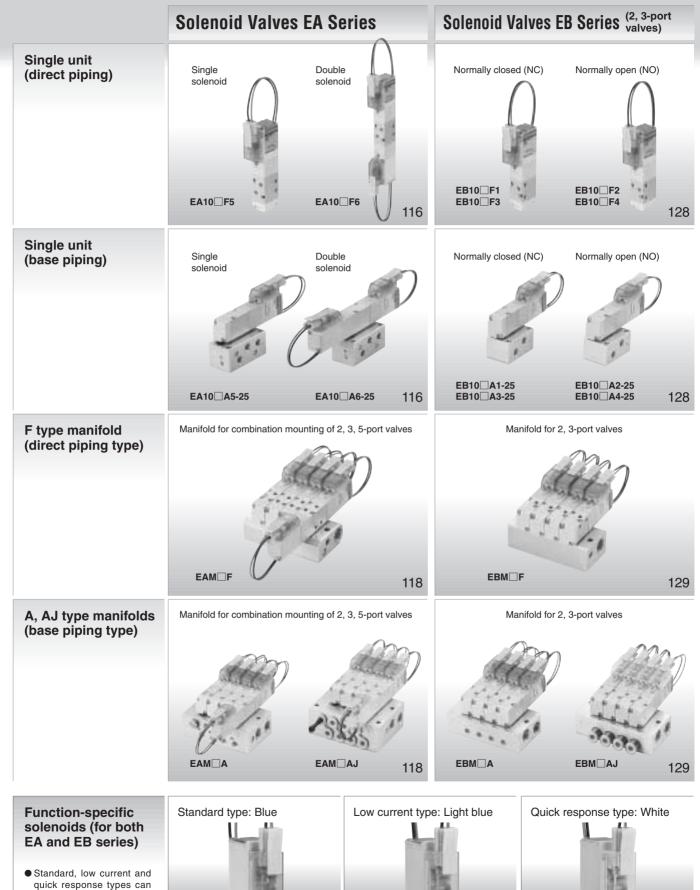


—Product Variety—

be identified by the color of

their housings.

Providing a wide product range





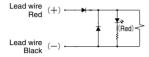
Solenoid

Internal circuit

●DC12V, DC24V

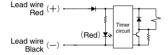
(Standard type)

Solenoid with LED indicator and surge suppression



●DC24V

(Low current, quick response types)
Solenoid with LED indicator and surge suppression



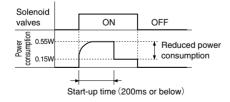
Cautions: 1. Do not apply megger between the pins.

- 2. Leakage current inside the circuit could result in failure of the solenoid valve to return to the rest position or other erratic operation. Always use it at less than the allowable leakage current shown in the solenoid specifications on p.109 and 121. If circuit conditions, etc. cause the leakage current to exceed the maximum allowable leakage current, consult us.
- For the double solenoid configuration, avoid energizing both solenoids simultaneously.
- **4.** The standard housing type is colored blue, while the low current type is light blue, and the quick response type is white.
- 5. The low current and quick response types will not activate when the power supply voltage is raised too slowly. Always apply the appropriate voltage.

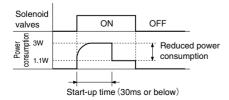
Operating principles of low current and quick response types

The low current and quick response types use a timer circuit, as shown above, that achieves power savings by switching to the holding operations mode after a certain period of time and operates at about 1/3 of the starting power consumption.

● Power waveform for low current type



Power waveform for quick response type



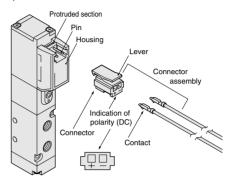


Plug connector

Attaching and removing plug connector

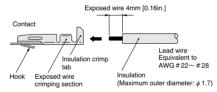
Use fingers to insert the connector into the pin, push it in until the lever claw latches onto the protruded section of the connector housing, and complete the connection.

To remove the connector, squeeze the lever along with the connector, lift the lever claw up from the protruded section of the connector housing, and pull it out.



Crimping of connecting lead wire and contact

To crimp lead wires into contacts, strip off 4mm [0.16in.] of the insulation from the end of the lead wire, insert it into the contact, and crimp it. Be sure at this time to avoid catching the insulation on the exposed wire crimping section.



Cautions: 1. Do not pull hard on the lead wire.

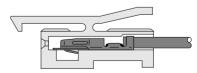
Always use a dedicated tool for crimping of connecting lead wire and contact.

Contact: Model 702062-2M Manufactured by Sumiko Tech, Inc. Crimping tool: Model F1-702062 Manufactured by Sumiko Tech, Inc.

Attaching and removing contact and connector

Insert the contact with lead wire into a plug connector \square hole until the contact hook latches on and is secured to the plug connector. Confirm that the lead wire cannot be easily pulled out.

To remove it, insert a tool with a fine tip (such as a small screwdriver) into the rectangular hole on the side of the plug connector to push up on the hook, and then pull out the lead wire.



Cautions: 1. Do not pull hard on the lead wire. It could result in defective contacts, breaking wires, etc.

If the pin is bent, use a small screwdriver, etc. to gently straighten out the pin, and then complete the connection to the plug connector.



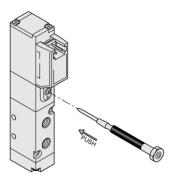
Manual override

Non-locking type

To operate the manual override, press it all the way down.

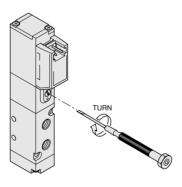
For the single solenoid, the valve works the same as when in the energized state as long as the manual override is pushed down, and returns to the rest position upon release.

For the double solenoid, pressing the manual override on the 14 (SA) side switches the 14 (SA) to the energized state, and the unit remains in that state even after the manual override is released. To return it to the rest position, operate the manual override on the 12 (SB) side. This is the same for the solenoid 12 (SB).



Locking type

To lock the manual override, use a small screwdriver to push down on the manual override all the way down and turn it clockwise 45 degrees. When locked, turning the manual override 45 degrees in the counterclockwise direction returns it to its original position, and releases the lock. (Excluding the quick response type)



Cautions: 1. The EA, EB series valves are pilot type solenoid valves. As a result, the manual override cannot switch the main valve without air supplied from the 1(P) port.

- Always release the lock of the locking type manual override before commencing normal operation.
- Do not attempt to operate the manual override with a pin or other object having an extremely fine tip. It could result in damage to the manual override.



Manifold

Mounting valves on manifold

When mounting valves on manifold, the recommended tightening torque for the valve mounting screw is 14.7N·cm {1.5kgf·cm} [1.3lbf·in.].

Tube

1. Attaching and removing tubes

For tube connection, insert an appropriate size tube until it makes contact with the tube stopper, and lightly pull it to check the connection

For tube removal, push the tube against the tube stopper, then push the release ring and at the same time pull the tube out.

2. Either a nylon or urethane tube can be used.

Use tubes with an outer diameter tolerance within ± 0.1 mm [0.004in.] of the nominal diameter, and ensure the ovalness (difference between the large diameter and small diameter) is 0.2mm [0.008in.] or less.

(Using a Koganei tube is recommended.)

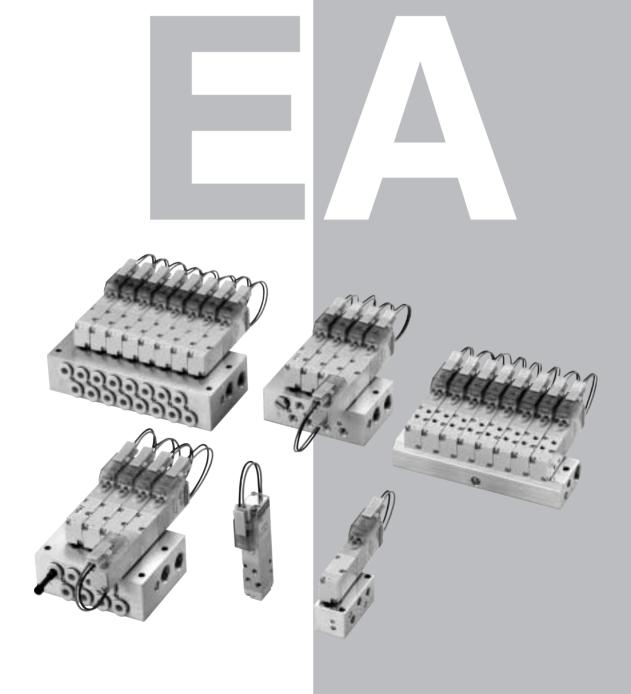
Cautions: 1. Do not use extra-soft tubes since their pull-out strength is significantly reduced.

- Only use tubes without scratches on their outer surfaces. If a scratch occurs during repeated use, cut off the scratched section
- 3. Do not bend the tube excessively near the fittings. The minimum bending radius is as shown in the table below.
- 4. When attaching or removing tubes, always stop the air supply. In addition, always confirm that air has been completely exhausted from the manifold.

mm [in.]

		[]		
Tube size	Minimum bending radius			
Tube Size	Nylon tube	Urethane tube		
φ3		7 [0.28]		
φ4	20 [0.79]	10 [0.39]		
φ6	30 [1.18]	15 [0.59]		
φ8	50 [1.97]	20 [0.79]		

Solenoid Valves EA Series



EA SERIES SPECIFICATIONS

Specifications

Basic Models and Functions

Basic model	For direct piping, F type manifold	EA10 ☐ F1 Note EA10 ☐ F2 Note EA10 ☐ F3 Note EA10 ☐ F4 Note	EA10□F5	EA10□F6
Item	For base piping, A, AJ type manifolds	EA10 ☐ A1 ^{Note} EA10 ☐ A2 ^{Note} EA10 ☐ A3 ^{Note} EA10 ☐ A4 ^{Note}	EA10□A5	EA10□A6
Number of position	าร		2 positions	
Number of ports	umber of ports 2, 3 ports		5 ports	
Valve function		Single solenoid NC, NO	Single solenoid	Double solenoid

Remark: For the optional specifications and order codes, see p.113

Note: Valves with valve specifications F1, F2, F3, F4, A1, A2, A3, and A4 are for mounting on manifolds only, and cannot be used as single valve units.

Specifications

		or direct piping, type manifold	EA10	EA10□F5	EA10□F6			
Item	A	or base piping, , AJ type nanifolds	EA10 □ A1 EA10 □ A2 EA10 □ A3 EA10 □ A4	EA10□A5	EA10□A6			
Media				Air				
Operation typ	ре			Internal pilot type				
Flow rate charac-	Sonic cor	nductance C dm3/(s · bar)	Base piping (A, AJ type): 0.26					
teristicsNote 1	Effectiv	e area S (Cv) mm²	Direct piping (F type): 1.3 (0.07)					
Port size ^{Note 2}	2		M3×0.5					
Lubrication			Not required					
Operating pres	sure rang	e MPa {kgf/cm²} [psi.]	0.2~0.7 {2~7.1} [29~102]					
Proof pressu	re	MPa{kgf/cm²} [psi.]	1.05 {10.7} [152]					
Response tin	noNote 3	Standard type	10/20	12 or below				
ON/OFF	ms	Low current type (L)	10/50 or below		12 or below			
ON/OI I		Quick response type (S)	6/7 or below		6 or below			
Maximum		Standard type		5				
operating	Hz	Low current type (L)	2					
frequency Quick response type (S)		Quick response type (S)	10					
Minimum time to energize for self holding Note 4 ms		for self holding ^{Note 4} ms	— 50					
Operating temperature range (atmosphere and media) °C [°F]		nosphere and media) °C [°F]	5~50 [41~122]					
Shock resista	ance	m/s² {G}	1373.0 {140} (Axial	1373.0 {140} (Axial direction 294.2 {30}) 1373.0 {140} (Axial direction 147.1 {15})				
Mounting dire	ection			Any				
				-	-			

- Notes: 1. For details, see the flow rate characteristics on p.110.

 - 2. For details, see the port size on p.110.
 3. Values when air pressure is 0.5MPa [73psi.].
 - 4. For double solenoid valves.

Solenoid Specifications

Item	F	Rated voltage	DC12V (Standard type)	DC24V (Standard type)	DC24V (Low current type)	DC24V (Quick response type)	
Opera	ting voltage range	V	10.8~13.2	21.6~26.4	21.6~26.4	21.6~26.4	
-	9	•	(12±10%)	(24±10%)	(24±10%)	(24±10%)	
Standard	Current (when rated voltage is a	pplied) mA (r.m.s)	46	23	_	_	
type	Power consumption	W	0.55	0.55	_	_	
type	Current (when rated	Starting mA	_	_	23	125	
	voltage is applied)	Holding mA	_	_	6.3	46	
Low current type Quick response	Power consumption	Starting W	_	_	0.55	3	
r curi	rower consumption	Holding W	_	_	0.15	1.1	
Pow	Start-up time (standa	rd time) ms	_	_	200 or below	30 or below	
Allowa	Allowable leakage current mA		2	2 1 0.5		4	
Insulation resistance MΩ			Over 100 (value at DC500V megger)				
Color	of LED indicator		Red				
Surge	suppression (as stand	ard)	Flywheel diode				

Specification	Port	2(B), 4(A)	1(P)	3, 5(R)	PR
Cinala unit	Direct piping	M3×0.5	M3×0.5	M3×0.5	
Single unit	Base piping (with sub-base)	M5×0.8	M5×0.8	M5×0.8	M5×0.8
	F type	M3×0.5	M5×0.8	Rc1/8	
Manifold	A type	M5×0.8	Rc1/8	Rc1/8	Callasted at 2 E (D) next
	AJ type	Quick fitting for φ4	Rc1/8	Rc1/8	Collected at 3, 5 (R) port

Flow Rate Characteristics

The test method for flow rate characteristics conforms to JIS B 8390:2000 (test method for pneumatic equipment — equipment for compressible fluids — flow rate characteristics).

When used as a single unit

Basic model		Flow path Sonic conductance C dm³/(s·bar) Critical pressure ratio b		Critical pressure ratio b	Effective area S (Cv)	
		1 (P) →4 (A)	_	_		
Direct piping	EA10□F5 EA10□F6	1 (P) →2 (B)	_	_	1.30 (0.072)	0.75 (0.042) (with fittings)
		4 (A) →5 (R1)	_	_	1.30 (0.072)	
		2 (B) →3 (R2)	_	_		
		1 (P) →4 (A)	0.26	0.17	1.30(0.	072) ^{Note3}
Base piping (with sub-base)	EA10□A5	1 (P) →2 (B)	0.22	0.00	1.10(0.	061) ^{Note3}
	EA10□A6	4 (A) →5 (R1)	0.26	0.17	1.30(0.	072) ^{Note3}
		2 (B) →3 (R2)	0.26	0.12	1.30(0.0	072) ^{Note3}

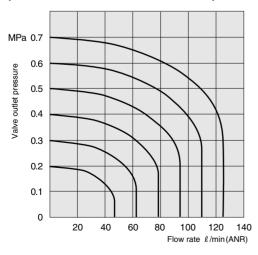
When mounted on a manifold

Basic model		Flow path Sonic conductance C dm³/(s·bar) Critical pressure ratio b		Effective area S (Cv) mm²		
	EA10 F1	1 (P) →4 (A)	_	_		
F type manifold EA (direct piping type) EA EA	EA10□F2 EA10□F3	1 (P) →2 (B)	_	_	1.30 (0.072)	Note2 0.80 (0.044)
	EA10□F4 EA10□F5 EA10□F6	4 (A) →5 (R1)	_	_	1.50 (0.072)	(with fittings)
		2 (B) →3 (R2)	_	_		
	EA10 A1	1 (P) →4 (A)	0.26	0.12	1.30(0.0)72) ^{Note3}
A, AJ type manifolds (base piping type)	EA10□A2 EA10□A3	1 (P) →2 (B)	0.26	0.18	1.30(0.0	072) ^{Note3}
	EA10□A4 EA10□A5	4 (A) →5 (R1)	0.25	0.26	1.25 (0.0	069) ^{Note3}
	EA10 A6	2 (B) →3 (R2)	0.26	0.20	1.30(0.0)72) ^{Note3}

Notes: 1. Quick fitting TS3-M3Ms have been mounted on connection ports 1(P), 2(B), and 4(A).

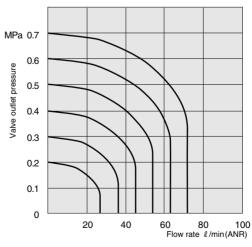
- 2. Quick fitting TS3-M3Ms have been mounted on connection ports 2(B), and 4(A).
- 3. Figures in effective area S are calculated based on sonic conductance C (S= $5.0\times$ C).

Base piping type (Effective area S = 1.3mm² (Cv: 0.072))



- $\bullet\mbox{Graphs}$ use flow rate calculations based on the discharge method.
- •Use the flow rate as a guide.

Direct piping type with fittings (Effective area S = 0.75mm² (Cv: 0.042))



1MPa = 145psi., 1 \(\ell \) /min = 0.0353ft3/min.

Single Valve Unit Mass

g [oz.]

Danie was del	Mana	Additional mass		
Basic model	Mass	-21(with bottom mounting base)	-25 (with sub-base)	
EA10□F1	23 [0.81]			
EA10□F2	23 [0.81]			
EA10□F3	23 [0.81]	_	_	
EA10□F4	23 [0.81]		_	
EA10□F5	23 [0.81]	4 [0.14]		
EA10□F6	38 [1.34]	_		
EA10 A1	23 [0.81]			
EA10□A2	23 [0.81]	_	_	
EA10□A3	23 [0.81]	_	_	
EA10 A4	23 [0.81]			
EA10□A5	23 [0.81]		00 [0 01]	
EA10□A6	38 [1.34]	_	23 [0.81]	

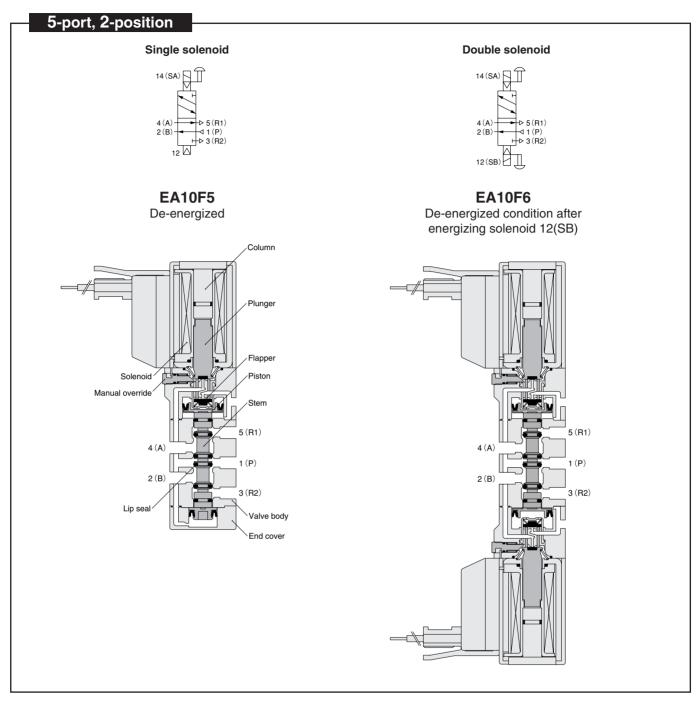
Manifold Mass

g [oz.]

Basic model	Mass calculation of each unit (n=number of units)	Block-off plate	
EAM□F	$(9\times n)+15$ [(0.32×n)+0.53]	3 [0.11]	
EAM□A	$(18\times n)+38$ $[(0.63\times n)+1.34]$	4 [0.14]	
EAM□AJ	$(27.5\times n)+50 [(0.97\times n)+1.76]$	4 [0.14]	

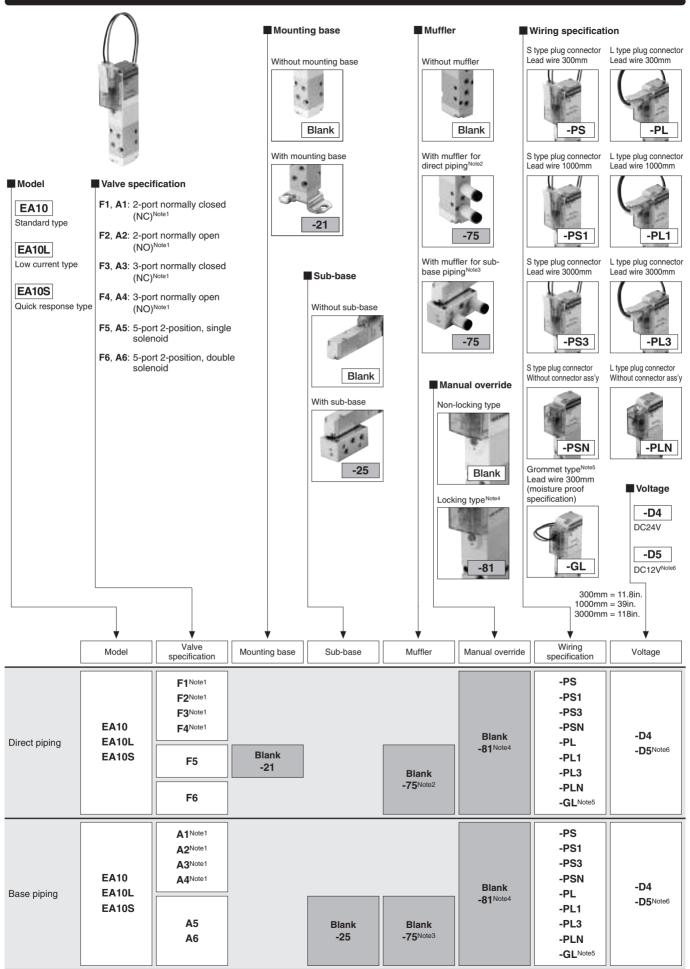
Calculation example: EAM8AJ stn.1~8 EA10A5-PS-D4

 $(27.5\times8)+50+(23\times8) = 454g$ [16.01oz.]



Major Parts and Materials

	Parts	Materials	
	Body	Aluminum alloy	
	Stem	(anodized)	
	Lip seal	O wath atia walah au	
Valve	Flapper	Synthetic rubber	
	Mounting base	Mild steel (zinc plated)	
	Sub-base	Aluminum alloy (anodized)	
	Plunger	Magnetic stainless	
	Column	steel	
	End cover	Plastic	
Manifold	Body	Aluminum alloy (anodized)	
	Block-off plate	Mild steel (nickel plated)	
	Seal	Synthetic rubber	

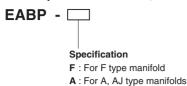


- Notes: 1. Valves with valve specifications F1, F2, F3, F4, A1, A2, A3, and A4 are for mounting on manifolds only, and cannot be used as single valve units.
 - 2. The muffler thread for direct piping is $M3\times0.5$ and the muffler cannot be used for sub-base piping.
 - When ordering the sub-base piping with muffler, always enter both -25 (sub-base) and -75 (muffler).
 The muffler thread for sub-base piping is M5×0.8 and the muffler cannot be used for direct piping.
- 4. The locking-type manual override is not available in the quick response type EA10S.
- The grommet type is not available in the low current type EA10L and quick response type EA10S.
- The DC12V specification is not available in the low current type EA10L and quick response type EA10S.

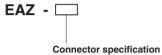
- Notes: 1. The valve mounting location is from the left side of the manifold.
 - The locking-type manual override is not available in the quick response type EA10S.
 - 3. The grommet type is not available in the low current type EA10L and quick response type EA10S.
 - 4. The DC12V specification is not available in the low current type EA10L and quick response type EA10S.

SOLENOID VALVES EA, EB SERIES

Block-off plate (block-off plate, gasket, and 2 mounting screws)



Connector-related



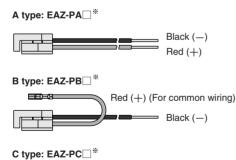
P : Connector, lead wire length 300mm [11.8in.]
 P1 : Connector, lead wire length 1000mm [39in.]
 P3 : Connector, lead wire length 3000mm [118in.]
 PN : Connector, without lead wire (contacts included)

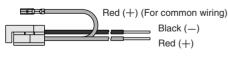
Common connector assembly



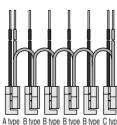
PA : Positive common A type, connector, lead wire length 300mm [11.8in.]
PA1 : Positive common A type, connector, lead wire length 1000mm [39in.]
PA3 : Positive common A type, connector, lead wire length 3000mm [118in.]
PB : Positive common B type, connector, lead wire length 300mm [11.8in.]
PB1 : Positive common B type, connector, lead wire length 1000mm [39in.]
PB3 : Positive common B type, connector, lead wire length 3000mm [118in.]
PC : Positive common C type, connector, lead wire length 300mm [11.8in.]
PC1 : Positive common C type, connector, lead wire length 1000mm [39in.]
PC3 : Positive common C type, connector, lead wire length 3000mm [118in.]

CPN : Positive common, connector, without lead wire (short bar and contacts included)



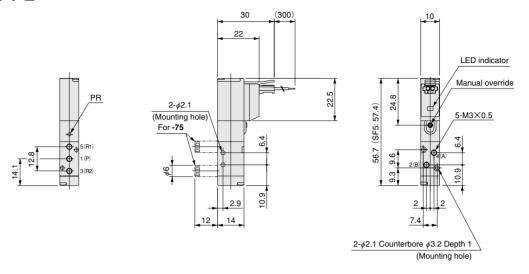


Application example



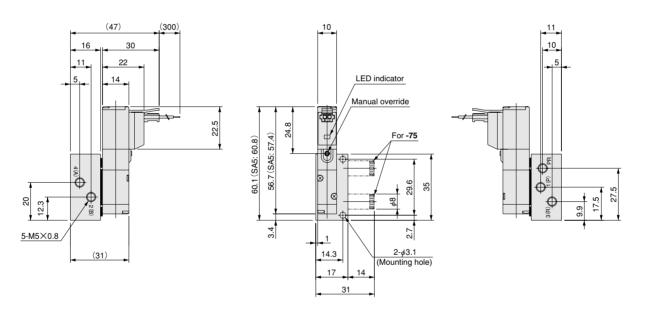
5-port, single solenoid

EA10 F5-PL

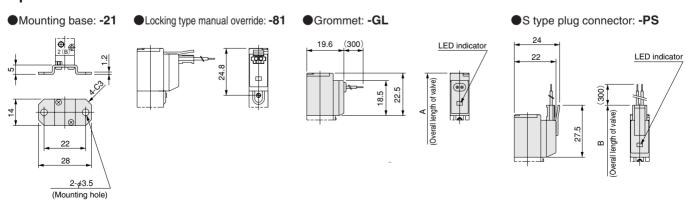


5-port, single solenoid (with sub-base)

EA10 A5-25-PL



Options

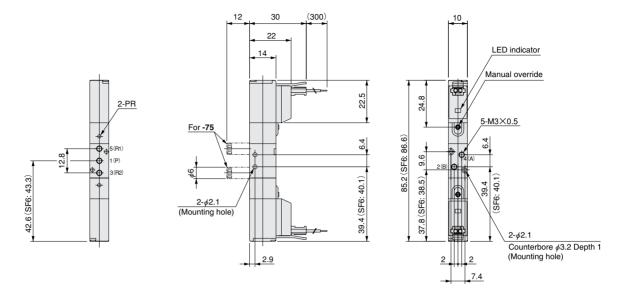


				111111
Model	Code	Α	В	Remark
EA10F1~EA10F5, EA10A1~EA10A5		56.7	61.7	
EA10LF1~EA10LF5, EA10LA1~EA10LA5		_	61.7	Overall length to the end of the valve
EA10SF1~EA10SF5, EA10SA1~EA10SA5		_	62.4	

mm

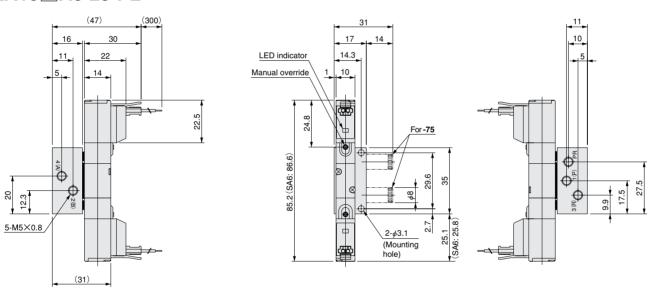
5-port, double solenoid

EA10 F6-PL

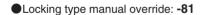


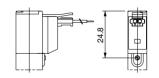
5-port, double solenoid (with sub-base)

EA10 A6-25-PL

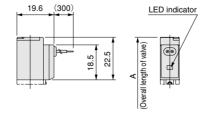


Options

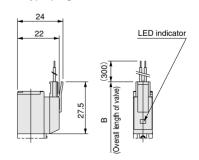




●Grommet: -GL



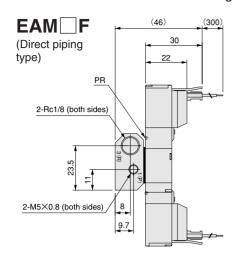
S type plug connector: -PS

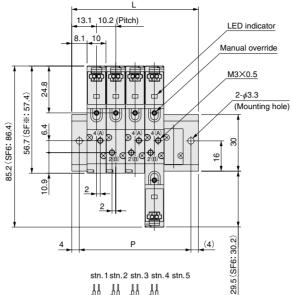


m	n

Model Code	А	В	Remark	
EA10F6, EA10A6	85.2	95.2		
EA10LF6, EA10LA6	_	95.2	Overall length to the end of the solenoid on the opposite side	
EA10SF6, EA10SA6	_	96.6		

Manifold for combination mounting of 2, 3, 5-port valves





Jnit dimensions					
Number of units	L	Р			
2	36.4	28.4			
3	46.6	38.6			
4	56.8	48.8			
5	67.0	59.0			
6	77.2	69.2			
7	87.4	79.4			
8	97.6	89.6			
9	107.8	99.8			
10	118.0	110.0			
11	128.2	120.2			
12	138.4	130.4			
13	148.6	140.6			
14	158.8	150.8			
15	169.0	161.0			
16	179.2	171.2			
17	189.4	181.4			
18	199.6	191.6			

209.8

220.0

201.8

212.0

(Installation example)

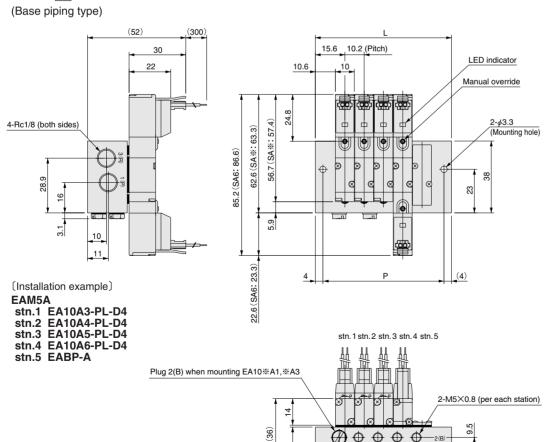
EAM5F

stn.1 EA10F3-PL-D4 stn.2 EA10F4-PL-D4

stn.3 EA10F5-PL-D4

stn.4 EA10F6-PL-D4 stn.5 EABP-F

EAM A



 $\Phi \oplus \Phi \Phi$

Plug 4(A) when mounting EA10%A2, %A4

(30)

Unit dimensions

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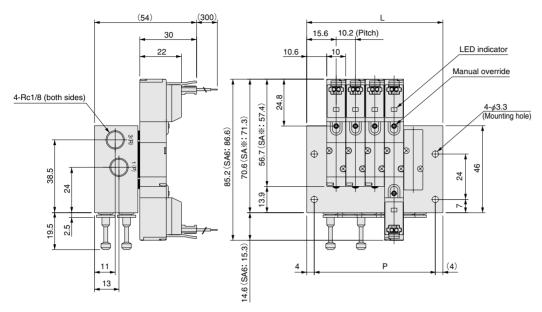
20

Number of units	L	Р
2	41.4	33.4
3	51.6	43.6
4	61.8	53.8
5	72.0	64.0
6	82.2	74.2
7	92.4	84.4
8	102.6	94.6
9	112.8	104.8
10	123.0	115.0
11	133.2	125.2
12	143.4	135.4
13	153.6	145.6
14	163.8	155.8
15	174.0	166.0
16	184.2	176.2
17	194.4	186.4
18	204.6	196.6
19	214.8	206.8
20	225.0	217.0

Manifold for combination mounting of 2, 3, 5-port valves

EAM AJ

(Base piping type with quick fittings)



Unit dimensions

Number of units	L	Р
2	41.4	33.4
3	51.6	43.6
4	61.8	53.8
5	72.0	64.0
6	82.2	74.2
7	92.4	84.4
8	102.6	94.6
9	112.8	104.8
10	123.0	115.0
11	133.2	125.2
12	143.4	135.4
13	153.6	145.6
14	163.8	155.8
15	174.0	166.0
16	184.2	176.2
17	194.4	186.4
18	204.6	196.6
19	214.8	206.8
20	225.0	217.0

