

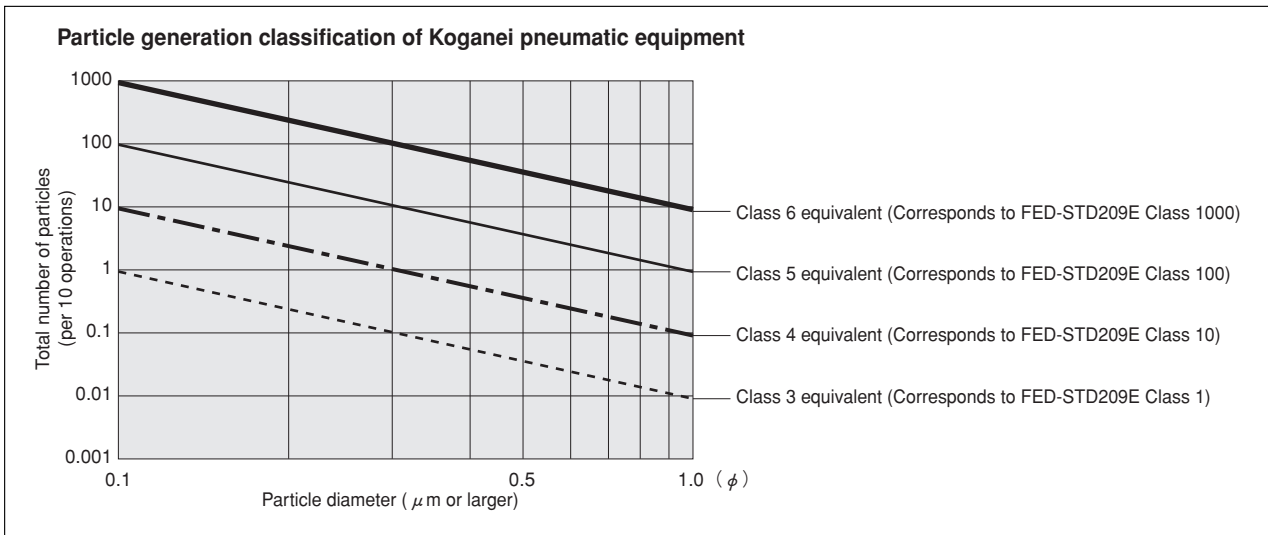


Koganei Clean System products provide complete support for the maintenance of a clean environment inside the cleanroom.

Koganei Clean System products meet the needs of the ultra-clean production environment. In everything from actuators and valves to air preparation and auxiliary equipment, anti-corrosion materials processing and other Koganei-developed design concepts serve to prevent particle contamination within the cleanroom. These perfectly designed mechanisms, which resolve even the slightest leaks to the outside during operations, have already won a high level of reliability.

Koganei Cleanliness

There is currently no standard in JIS or elsewhere for methods of evaluating cleanliness for pneumatic equipment in the cleanroom specifications. Therefore, to measure the effects of cleanroom contamination by pneumatic equipment, Koganei has decided to use “number of particles generated per 10 operations,” rather than particle density. Koganei has also developed classifications for application classes in cleanroom, based on JIS and other upper limit density tables, and on the company’s own experience.



- Remarks:
1. In the above table, product performance in terms of the number of particles generated per 10 operations is expressed as the upper limit of particles corresponding to the equivalent JIS or ISO class.
 2. In the above table, values in the JIS, ISO, and FED-STD upper limit density tables are calculated as upper density per liter.
 3. The classes shown are clean levels as classified in JIS and ISO.

From the above definitions, the Koganei clean level classes can be viewed as the level of average contamination per liter of surrounding air over a period of 10 operations in cleanroom. Air ventilation in cleanrooms is usually faster than 1 cycle per minute, and clean volumetric capacity is usually larger than 1 liter, which should provide a sufficient safety margin in practice.

Caution: The above conclusions are based on an ideal situation in which air ventilation is being implemented. For specific cases where air ventilation is not ensured, caution is needed since the clean classes cannot be maintained.

The clean system diagrams shown here are for Class 5 equivalent products. For Class 4 or Class 3 equivalent products, consult us.

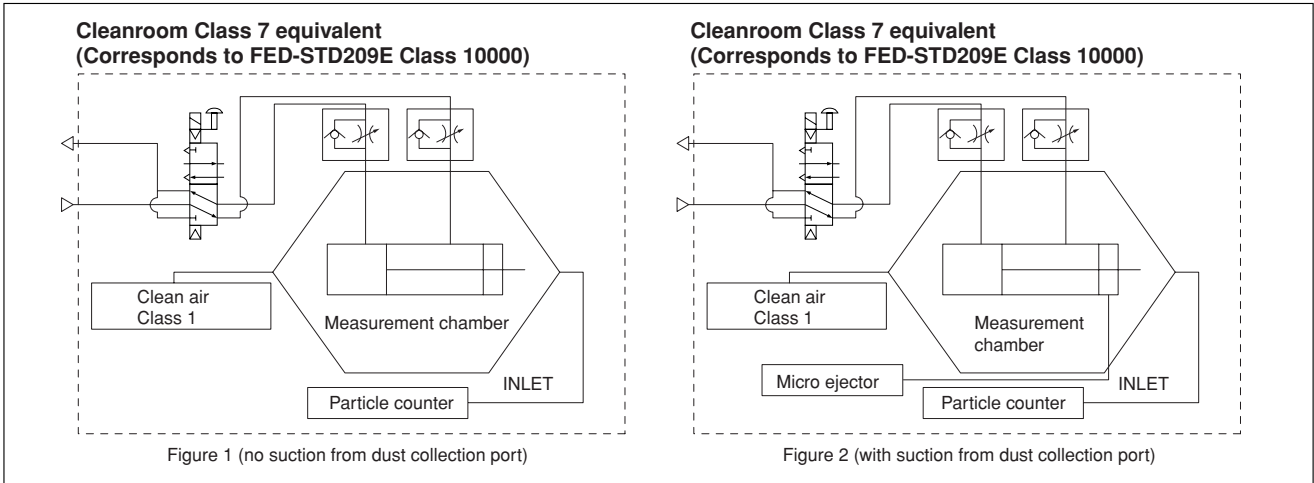
Evaluations of Cleanliness

Koganei has therefore specified its in-house measurement methods, to conduct evaluations on the cleanroom rating.

The number of particles of the Air Cylinder Cleanroom Specification is measured as shown in the method below.

1. Measurement conditions

1-1 Test circuit: Figure 1 (no suction), Figure 2 (with suction)



1-2 Operating conditions of tested cylinder

- Operating frequency: 1Hz
- Average speed: 500mm/s [20in./sec.]
- Applied pressure: 0.5MPa [73psi.]
- Suction condition: Microejector ME05, Primary side: 0.5MPa [73psi.] applied, Tube: $\phi 6$ [0.236in.]
- Mounting direction: Vertical
- Chamber volume: 8.3 ℓ [0.293ft.³]

2. Particle counter

- Manufacturer/model: RION/KM20
- Suction flow rate: 28.3 ℓ /min [1ft.³/min.]
- Particle diameter: 0.1 μm , 0.2 μm , 0.3 μm , 0.5 μm , 0.7 μm , 1.0 μm

3. Measurement method

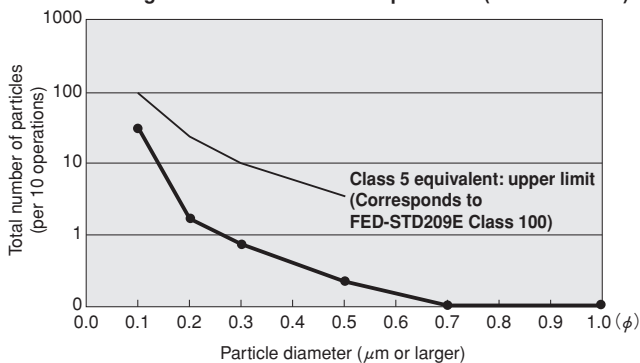
- 3-1 Confirmation of number of particles in the measurement system
Under the conditions in the above 1 and 2, using a particle counter to measure the sample for 9 minutes without operating the measurement sample, and confirmed the measured number of particle is 1 piece or less.
- 3-2 Measurement under operation
Under the conditions in the above 1 and 2, operating the measurement sample for 36 minutes, and measured the total values in the latter half of 18 minutes test.
- 3-3 Reconfirmation
Performed the measurement in 3-1 again, to reconfirm the number of particles in the measurement system.

4. Measurement results

● Cleanroom specification

Jig Cylinder (no suction from dust collection port)

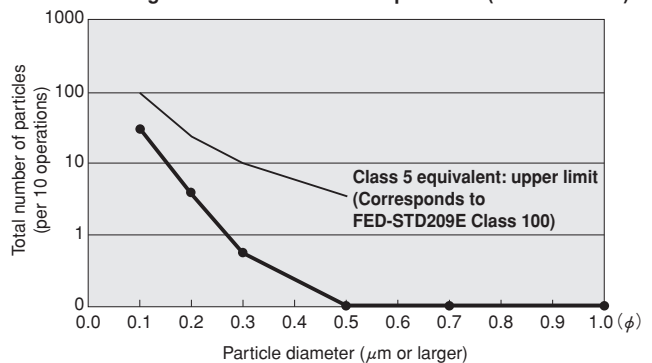
Particle generation over 1 million operations (CS-CDA16 \times 30)



● Cleanroom specification

Slim Cylinder (with suction from dust collection port)

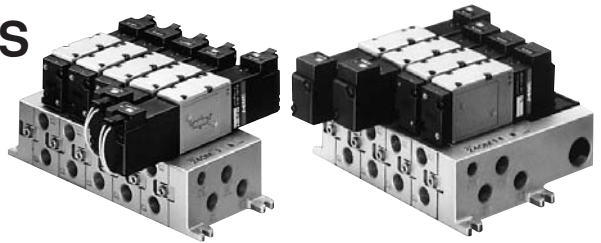
Particle generation over 1 million operations (CS-DA20 \times 100)



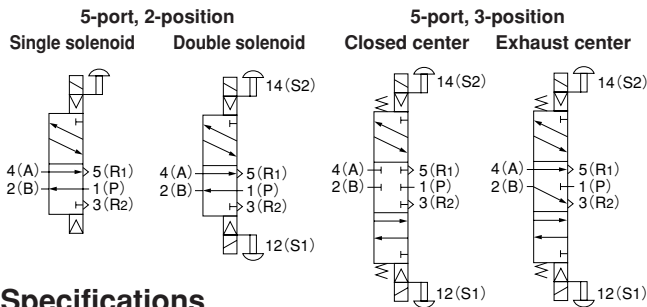
For “safety precautions” listed in the Clean System Product Drawings, see the materials below.

- For actuators, see “Safety Precautions” on p. 45 of the Actuators General Catalog .
- For valves, see “Safety Precautions” on p. 31 of the Valves General Catalog.
- For air treatment and auxiliary equipment, see “Safety Precautions” on p.31 of the General Catalog of Air Treatment, Auxiliary, Vacuum.

KOGANEI CLEAN SYSTEM SOLENOID VALVES 240 SERIES



Symbols



Specifications

Basic model	Solenoid specification	Single solenoid	Double solenoid	3-position double solenoid
	Item	For standard type sub-base For A type, B type manifolds	CS-A240-4E1	CS-A240-4E2
	For plug-in type sub-base For AW, BW type manifolds	CS-W240-4E1	CS-W240-4E2	CS-W243-4E2
Media	Air			
Operation type	Internal pilot type			
Number of positions, number of ports	2 positions, 5 ports		3 positions, 5 ports	
Valve function	—		Closed center (standard) or Exhaust center (optional)	
Effective area [Cv]	mm ²	11.3 [0.62]	11 [0.61]	
Port size	P, A, B, R : Rc 1/4, PR : Rc 1/8			
Lubrication	Not required			
Operating pressure range	MPa [psi.]	0.17~0.7 [25~102]		
Proof pressure	MPa [psi.]	1.05 [152]		
Operating temperature range (atmosphere and media)	°C [°F]	5~50 [41~122]		
Shock resistance	m/s ² {G}	Lateral direction	1373.0 {140.0}	
		Axial direction	451.1 {46.0}	264.8 {27.0}
Mounting direction	Any			
Maximum operating frequency	Hz	5		
Minimum time to energize	ms	—	0.05	—
Mass	g [oz.]	160 [5.64]	230 [8.11]	260 [9.17]
		(350 [12.35] ^{Note 1})	(420 [14.81] ^{Note 1})	(450 [15.87] ^{Note 1})
		400 [14.11] ^{Note 2}	470 [16.58] ^{Note 2}	500 [17.64] ^{Note 2}

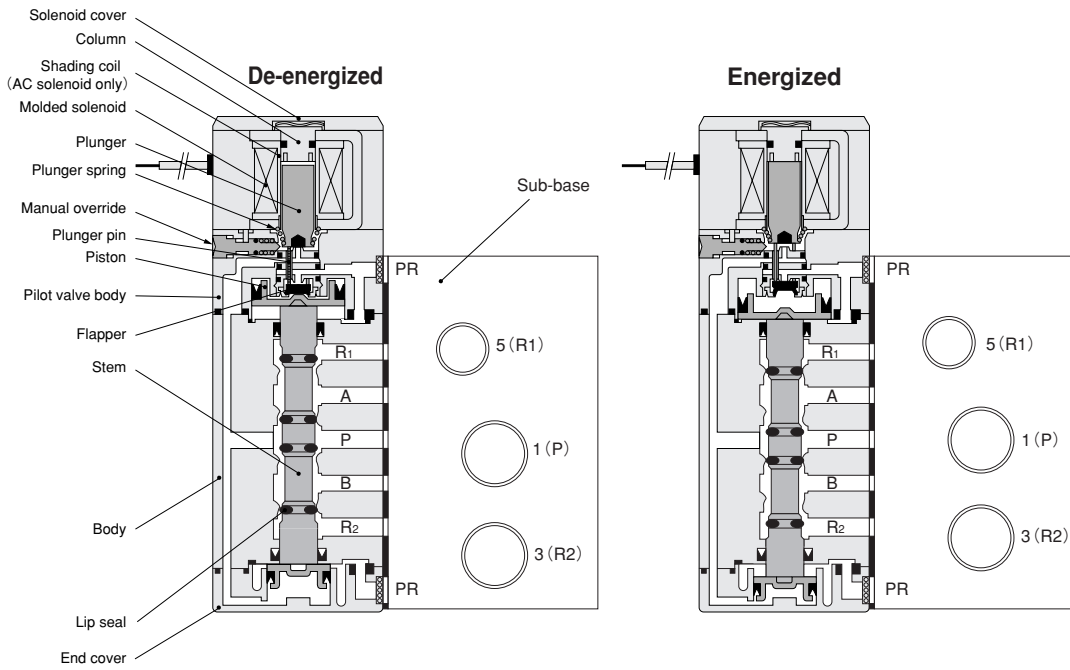
Notes: 1. Mass of CS-A24□-4E□ with sub-base.
2. Mass of CS-W24□-4E□ with sub-base.

Solenoid Specifications

Item	Rated voltage		AC100V		AC200V		DC24V	
	Type	Shading type						Flywheel diode incorporated for surge suppression
Operating voltage range	V	90~132 (100 ⁺³² ₋₁₀ %)		180~264 (200 ⁺³² ₋₁₀ %)		21.6~26.4 (24±10%)		
Current (when rated voltage is applied)	Frequency	Hz	50	60	50	60	—	
	Starting	mA (r.m.s.)	34	32	17	16	—	
	Energizing	mA (r.m.s.)	22	20	11	10	65(1.6W) [⁷⁵ (1.8W) with LED indicator]	
Allowable leakage current	mA	4		2		4		
Insulation resistance	MΩ	Over 100						
Wiring type	Standard type	Standard	Grommet type: 300mm [11.8in.]					
		Optional	Plug connector type Straight connector -PSL: 300mm [11.8in.]※ -PSNL: Without lead wire (connector, contacts included) L connector -PLL: 300mm [11.8in.]※ -PLNL: Without lead wire (connector, contacts included) ※-1L: 1000mm [39in.], -3L: 3000mm [118in.] also available as options.					
	Plug-in type	Terminal type (Sub-base comes with conduit cover, and manifold with terminal cover)						
Color of lead wire	Yellow	White	Red (+), Black (-)					
Color of LED indicator (optional)	Yellow	Green	Red					
Surge suppression	Built-in varistor (optional)		Flywheel diode (as standard)					

Inner Construction and Major Parts

CS-A240-4E1-25



Major Parts and Materials

Parts	Materials
Body	Aluminum alloy (anodized)
Stem	
Lip seal	Synthetic rubber (NBR)
Flapper	Aluminum alloy (anodized)
Sub-base	
Plunger	
Column	Magnetic stainless steel

Order Codes

CS - A240 - 4E1 - [] - [] - [] - [] - []									
Clean system 240 series valve basic model			Valve function		Sub-base				Manual override
			Closed center (standard)	Exhaust center	Without sub-base	Side piping standard type	Side piping plug-in type	Side and bottom piping standard type	Side and bottom piping plug-in type
<ul style="list-style-type: none"> ● For sub-base-mounted units (cannot be used for units without sub-base) ● For A type manifold 	CS - A240 - 4E1	5-port	—	—	Blank	- 25	—	- 27	—
	CS - A240 - 4E2	5-port	Blank	- 13					
	CS - A243 - 4E2	5-port							
<ul style="list-style-type: none"> ● For plug-in type sub-base-mounted single unit (cannot be used for units without plug-in sub-base) ● For W type manifold 	CS - W240 - 4E1	5-port	—	—	Blank	—	- 26	—	- 28
	CS - W240 - 4E2	5-port	Blank	- 13					
	CS - W243 - 4E2	5-port							

Note: Varistor for surge suppression is available for AC100V and AC200V only (flywheel diode for surge suppression is standard equipment for DC24V).
A varistor for surge suppression is built into AC100V and AC200V with LED indicator.

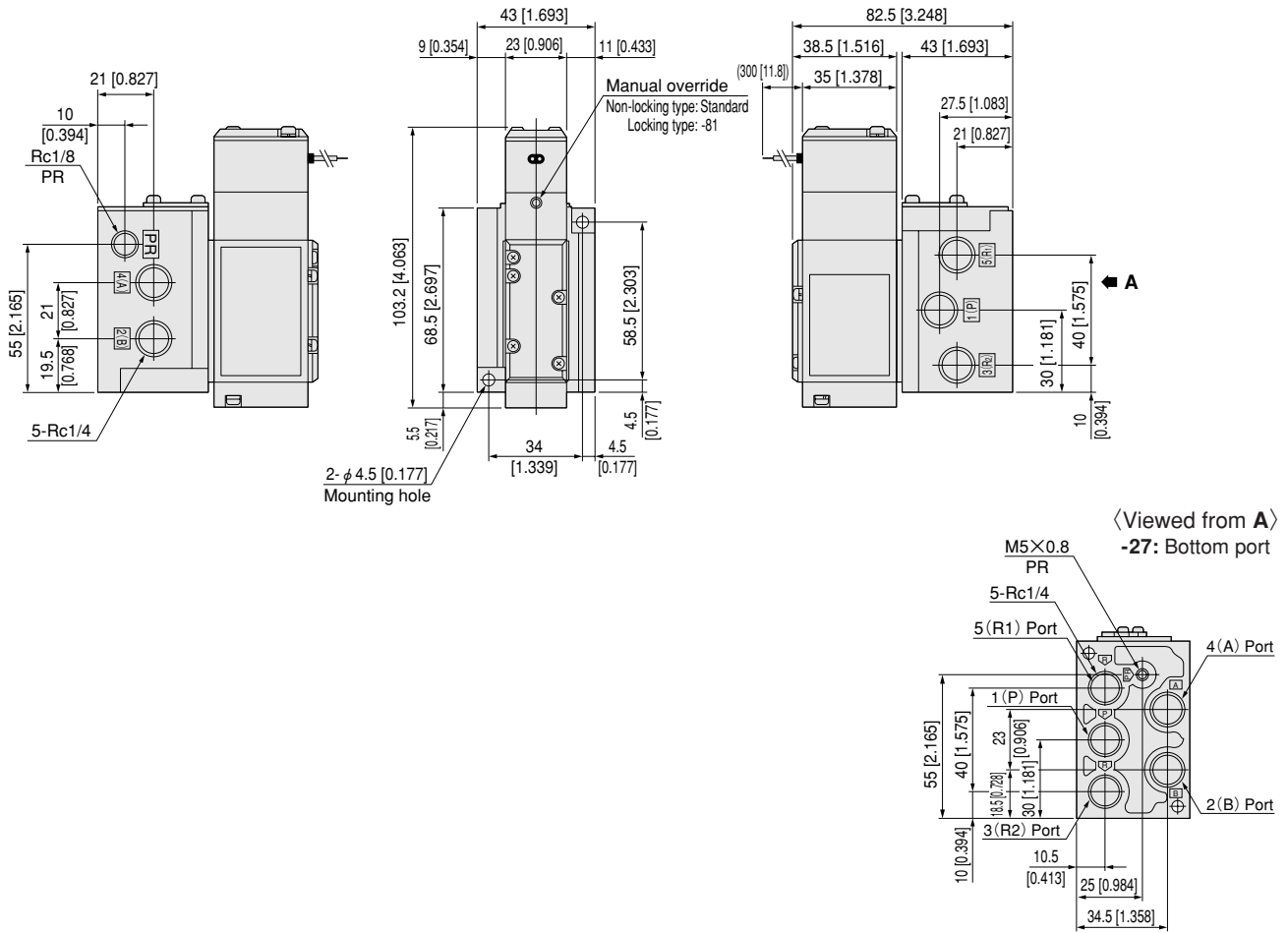
Manifold Order Codes

CS - 240M [] [] [] [] [] [] [] [] [] []					
Clean system 240 series manifold basic model	Number of units	Manifold model		Station	Clean system mounting valve type
	2 : 2 units 3 : 3 units ⋮ 10 : 10 units	A : A type ● All ports manifold B : B type ● Bottom ported all ports manifold AW : AW type ● Plug-in type all ports manifold BW : BW type ● Plug-in type and bottom ported all ports manifold		● Valve mounting position from left, as viewed from the front Stn.1 : First Stn.2 : Second ⋮ Stn.10 : 10th	● For details of valve models, see the order codes listed above. ● Enter CS-BP when closing a station with a block-off plate without mounting a valve.
CS-240M					

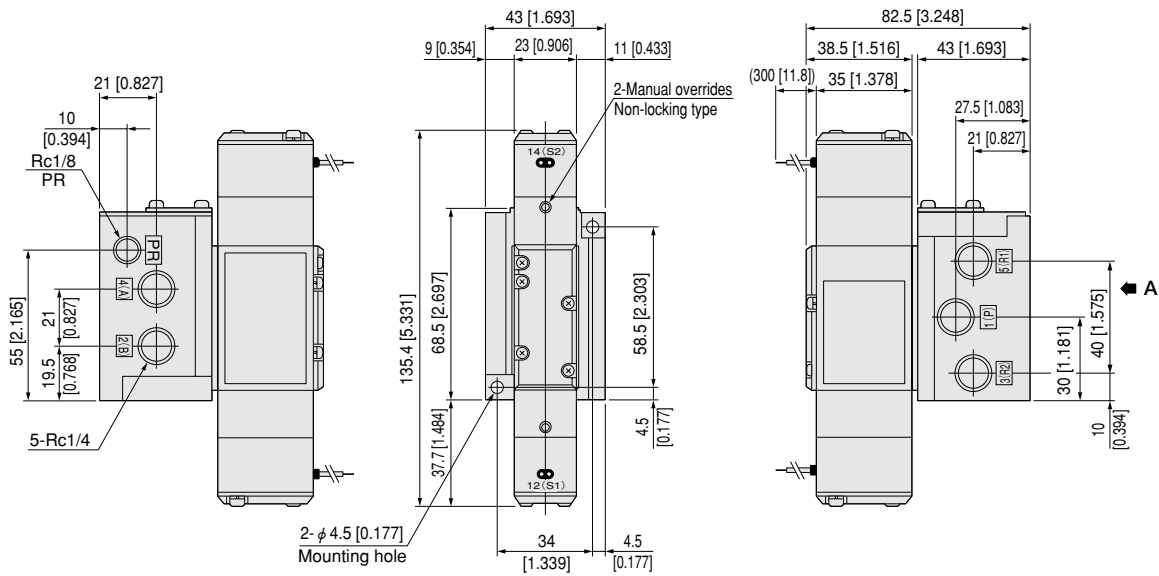
Solenoid options											Voltage
Locking type	Grommet type (standard)	Grommet with built-in varistor for surge suppression ^{Note}	DIN connector type	Straight connector with LED indicator		L connector with LED indicator		Plug-in type (standard)	Plug-in type with LED indicator	Plug-in type with built-in varistor for surge suppression type ^{Note}	
				With lead wire	Without lead wire	With lead wire	Without lead wire				
- 81	Blank	- ZR	- 39	- PSL	- PSNL	- PLL	- PLNL	—	—	—	DC24V AC100V AC200V
—											
- 81	—	—	—	—	—	—	—	Blank	- L	- ZR	
—											
- 81											
—											

Dimensions of Solenoid Valve mm [in.]

- CS-A240-4E1-25
- CS-A240-4E1-27

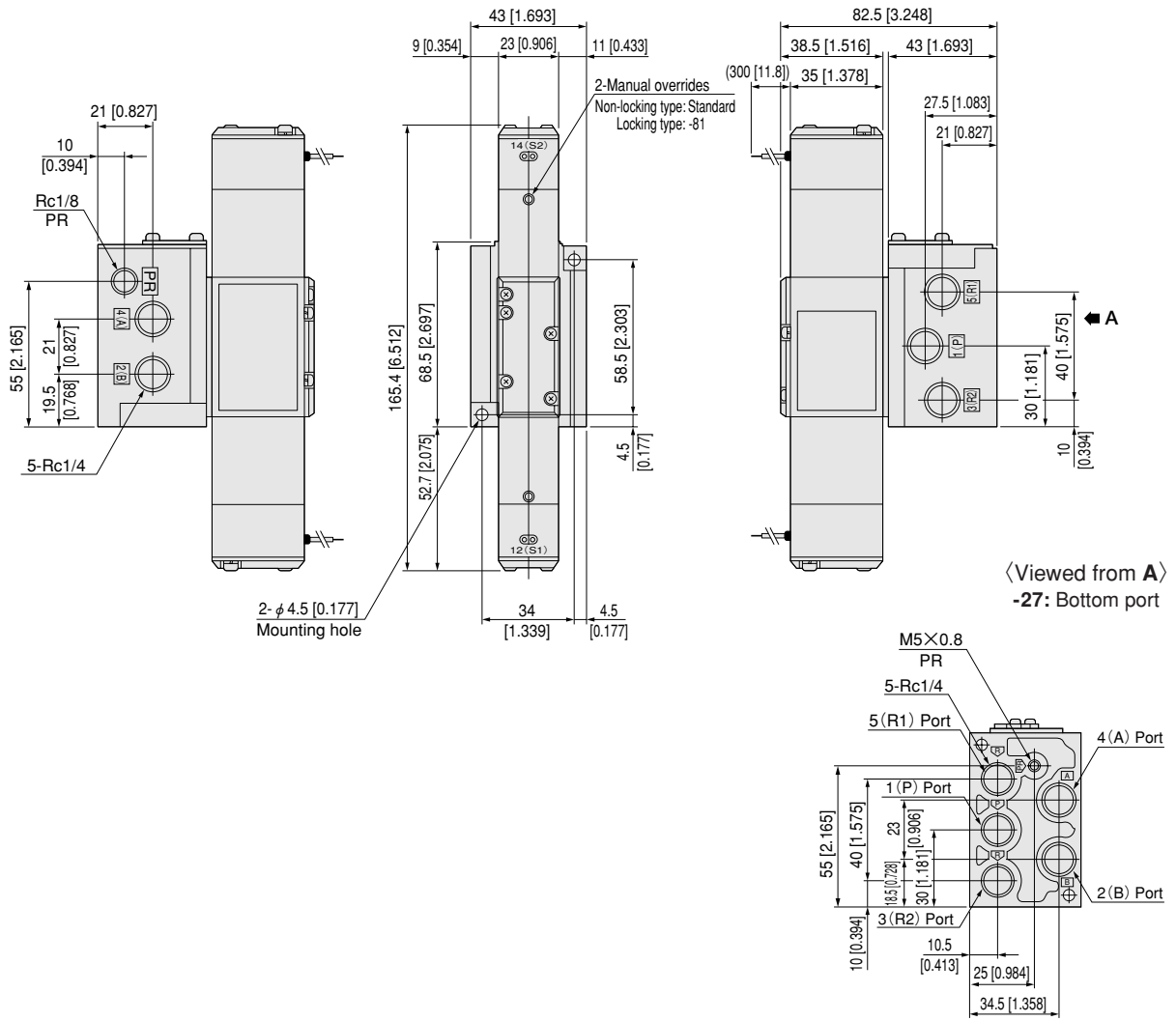


- CS-A240-4E2-25
- CS-A240-4E2-27



Dimensions of Solenoid Valve mm [in.]

- CS-A243-4E2-25
- CS-A243-4E2-27

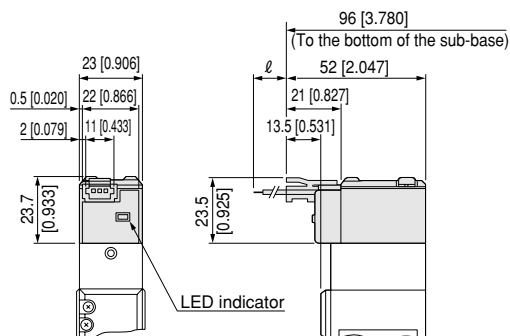
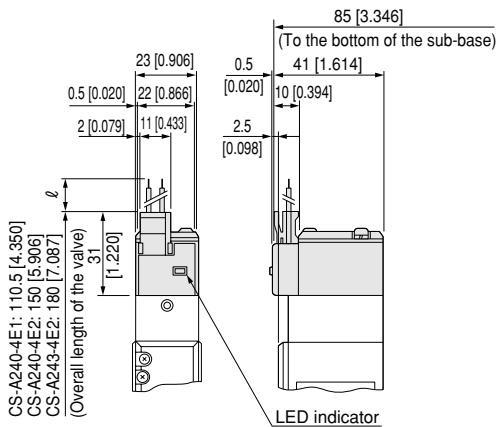


Options

- Straight connector with LED indicator: **-PS(N)-L**

- L connector with LED indicator: **-PL(N)-L**

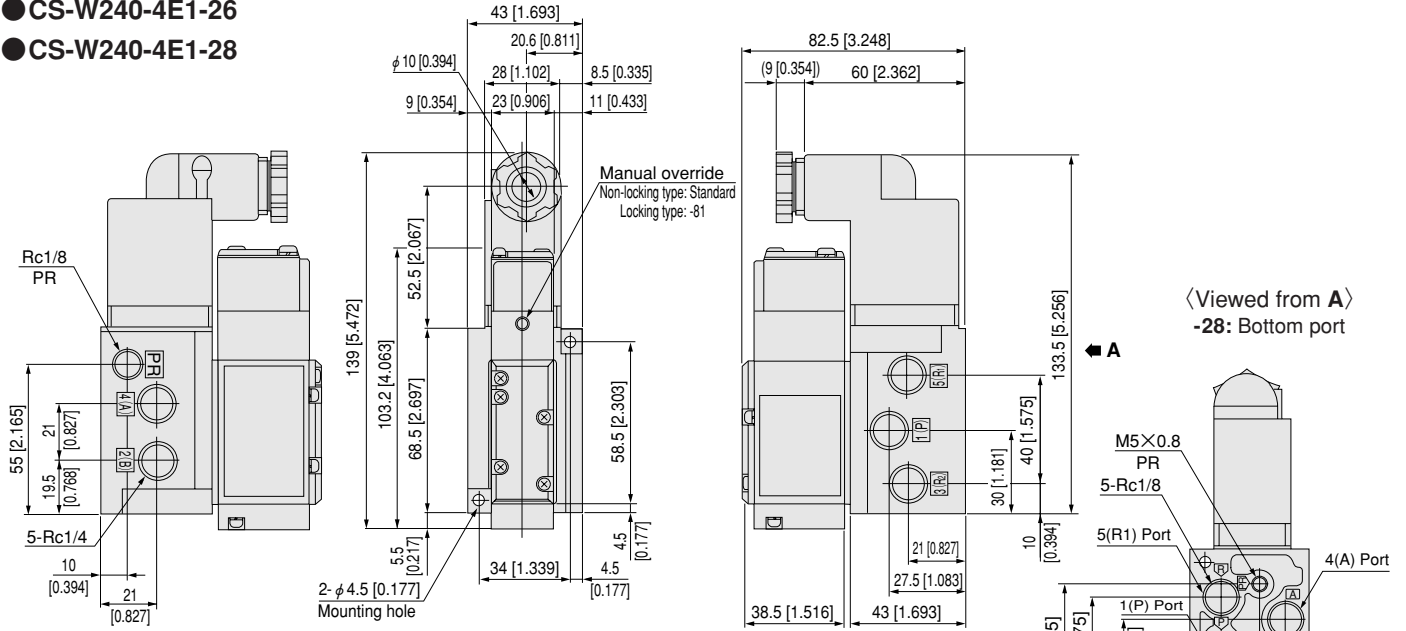
● Dimensions for the solenoid with built-in varistor for surge suppression are the same as for the standard product.



Dimensions of Solenoid Valve mm [in.]

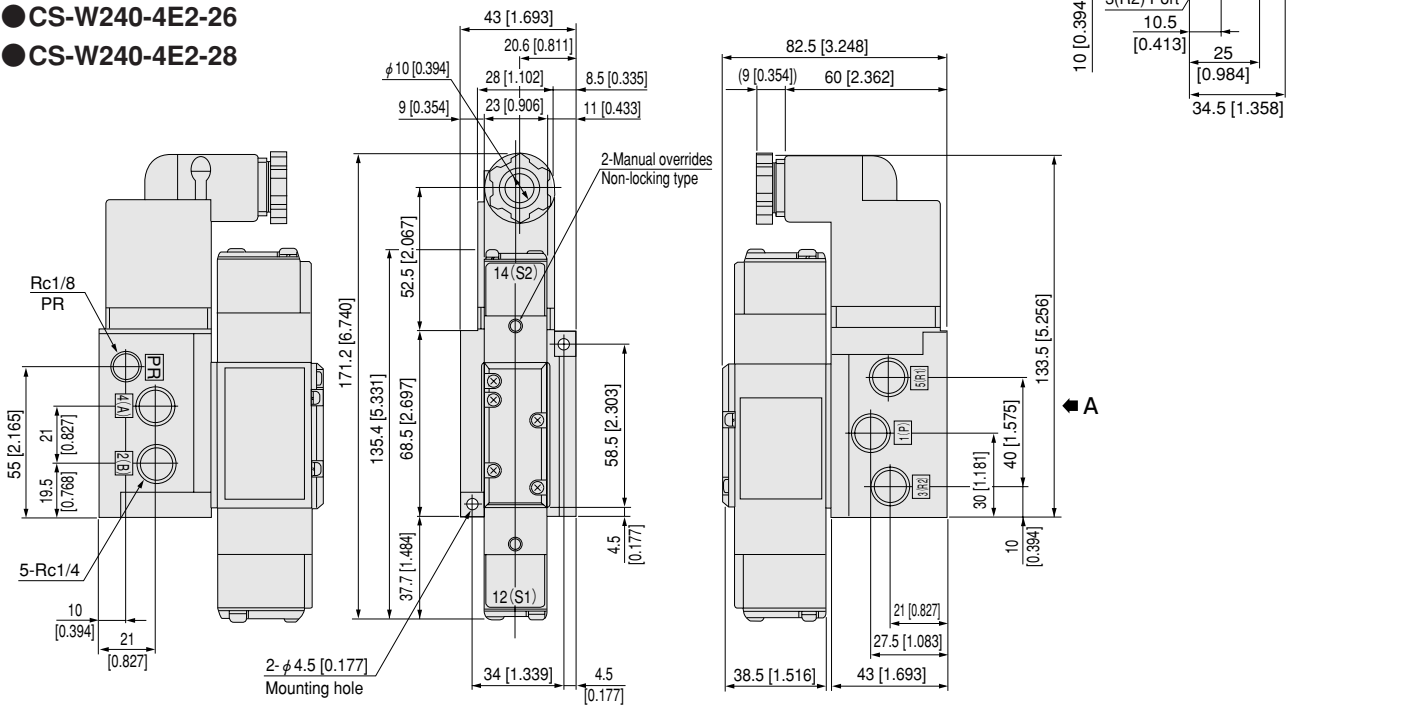
● CS-W240-4E1-26

● CS-W240-4E1-28



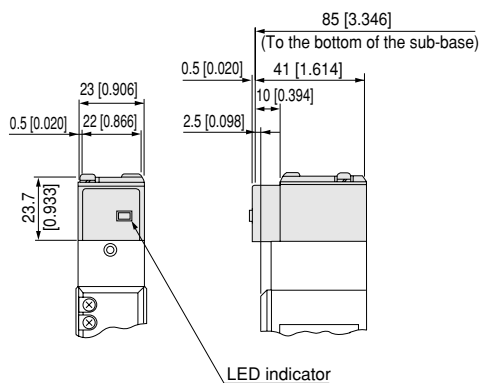
● CS-W240-4E2-26

● CS-W240-4E2-28



● Option

● With LED indicator: -L

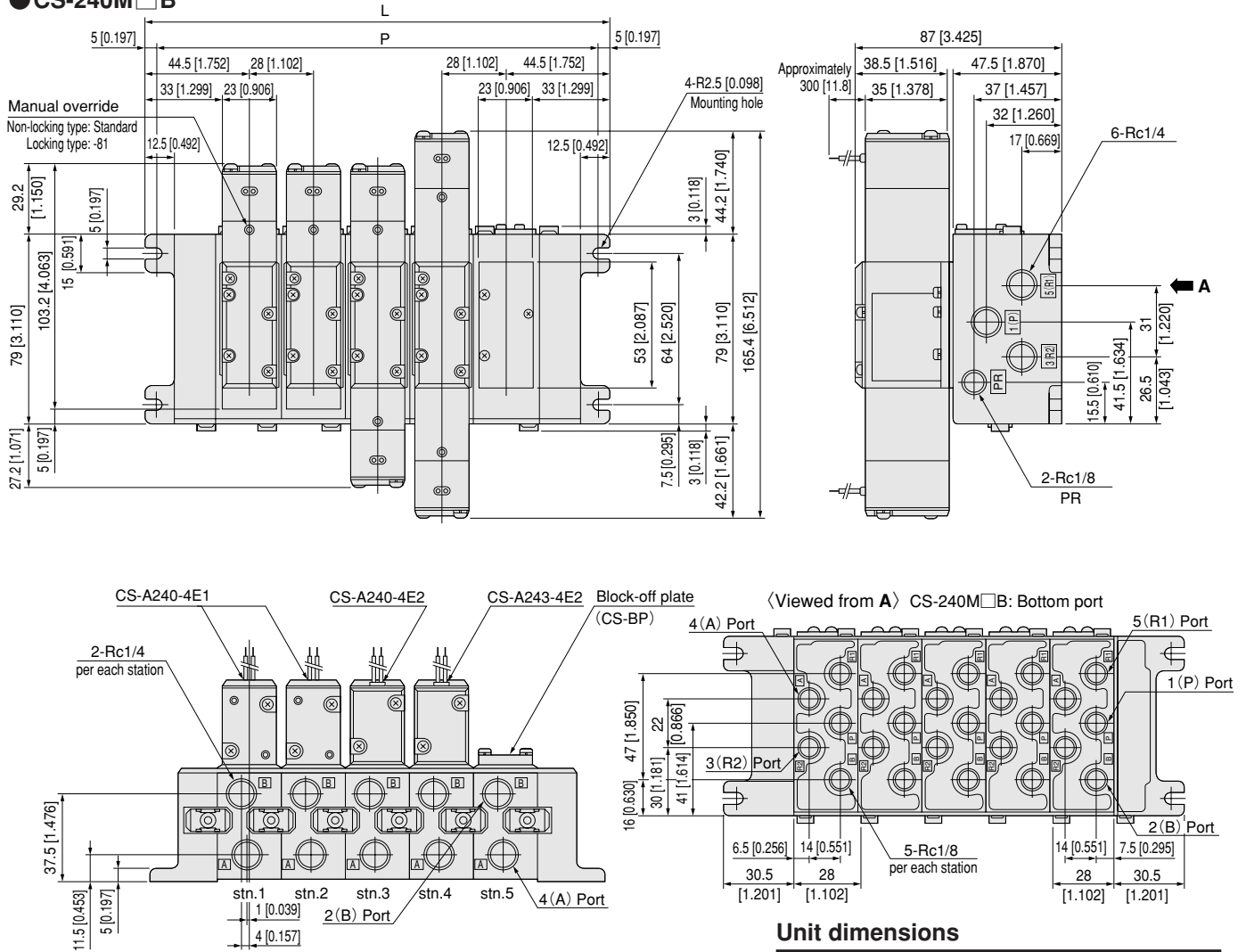


● Plug-in type with built-in varistor for surge suppression: -ZR Dimensions are the same as the standard product.

Dimensions of Manifold 5-Port mm [in.]

● CS-240M□A

● CS-240M□B



Unit dimensions

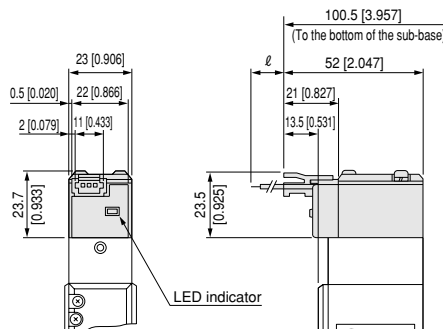
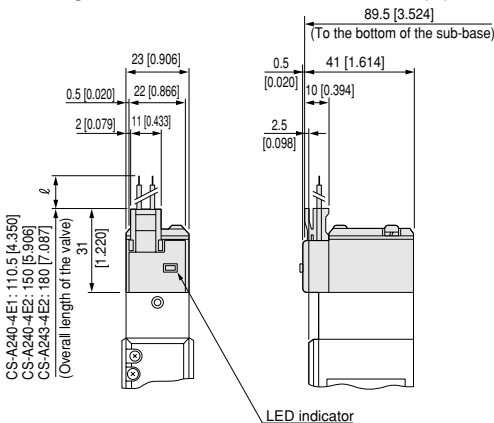
Model	P	L
CS-240M2A, CS-240M2B	107 [4.213]	117 [4.606]
CS-240M3A, CS-240M3B	135 [5.315]	145 [5.709]
CS-240M4A, CS-240M4B	163 [6.417]	173 [6.811]
CS-240M5A, CS-240M5B	191 [7.520]	201 [7.913]
CS-240M6A, CS-240M6B	219 [8.622]	229 [9.016]
CS-240M7A, CS-240M7B	247 [9.724]	257 [10.118]
CS-240M8A, CS-240M8B	275 [10.827]	285 [11.220]
CS-240M9A, CS-240M9B	303 [11.929]	313 [12.323]
CS-240M10A, CS-240M10B	331 [13.031]	341 [13.425]

Options

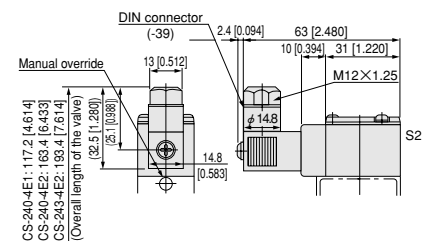
● Straight connector with LED indicator: -PS(N)-L

● L connector with LED indicator: -PL(N)-L

● With built-in varistor for surge suppression: -ZR
Dimensions are the same as the standard product.



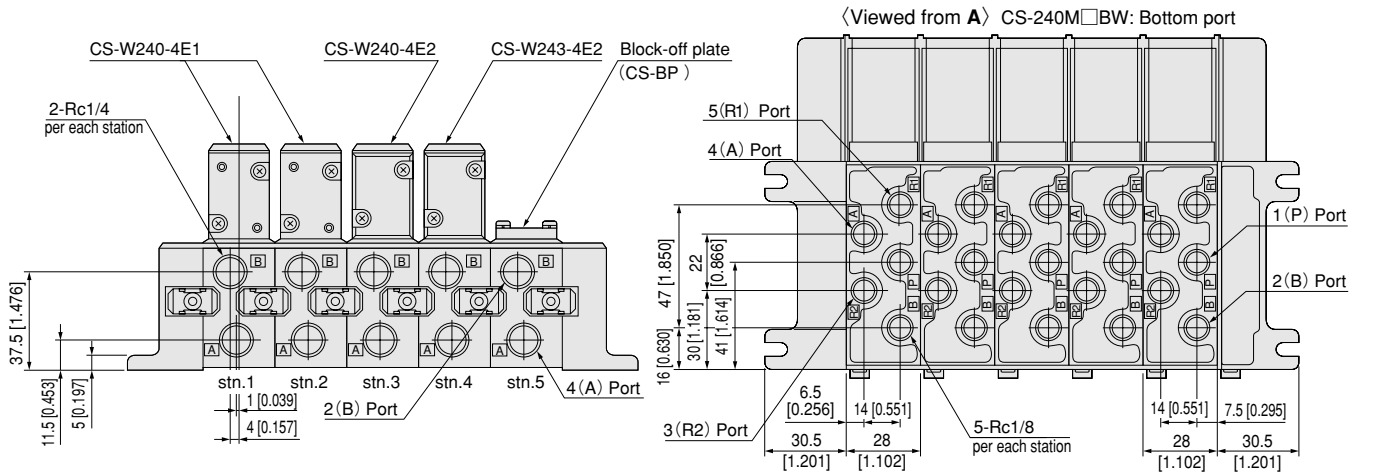
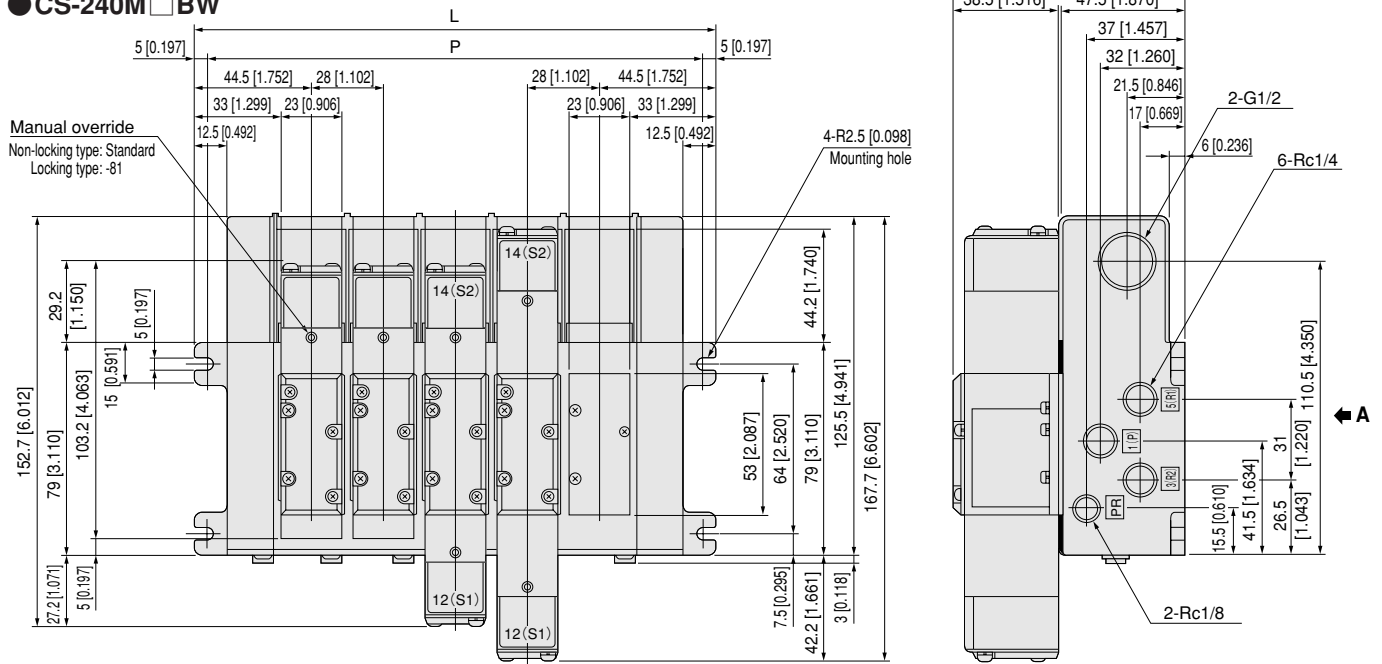
● DIN connector: -39



Dimensions of Manifold 5-Port mm [in.]

● CS-240M □ AW

● CS-240M □ BW

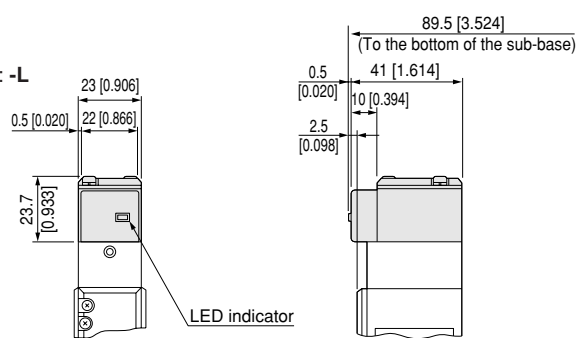


Unit dimensions

Model	P	L
CS-240M2AW, CS-240M2BW	107 [4.213]	117 [4.606]
CS-240M3AW, CS-240M3BW	135 [5.315]	145 [5.709]
CS-240M4AW, CS-240M4BW	163 [6.417]	173 [6.811]
CS-240M5AW, CS-240M5BW	191 [7.520]	201 [7.913]
CS-240M6AW, CS-240M6BW	219 [8.622]	229 [9.016]
CS-240M7AW, CS-240M7BW	247 [9.724]	257 [10.118]
CS-240M8AW, CS-240M8BW	275 [10.827]	285 [11.220]
CS-240M9AW, CS-240M9BW	303 [11.929]	313 [12.323]
CS-240M10AW, CS-240M10BW	331 [13.031]	341 [13.425]

Option

● With LED indicator: -L



● Plug-in type with built-in varistor for surge suppression: -ZR
Dimensions are the same as the standard product.