

**KOGANEI**

*Air Valve*

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**SOLENOID VALVES 600 SERIES**

**INSTRUCTION MANUAL** Ver.1.0

## Handling Instructions and Precautions

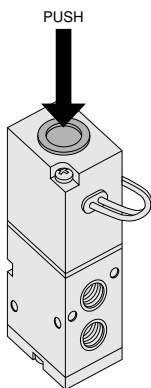


### Manual override

#### Non-locking type

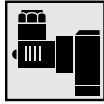
To operate the manual override, press it all the way down. For the single solenoid, the valve works the same as when in the energized state as long as the manual override is pushed down, and returns to the normal position upon release.

For the double solenoid, pressing the manual override on the 12(S1) side switches the 12(S1) to enter the energized position, and the unit remains in that state even after the manual override is released. To return it to the normal position, operate the manual override on the 14(S2) side. This is the same for the solenoid 14(S2).



※ Illustration shows the 200 series.

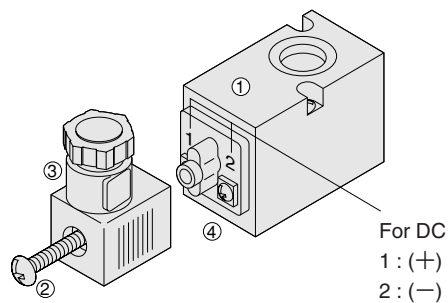
**Caution:** In the pilot type valve, the manual override cannot switch the main valve without air supplied from the 1(P) port.



### Terminal type connector

#### Wiring instructions

- Remove the terminal cover mounting screw ②, pull out and lift off the terminal cover ③ from the solenoid body ①.
- Insert the cable from the wiring port on the terminal cover ③, and connect the cable to the terminal ④ of the solenoid body ①.
- While pulling the cable, place the terminal cover ③ on the solenoid body ①, and use the terminal cover mounting screw ② to secure the terminal cover on the solenoid body ① in place.



# SOLENOID VALVES

## 600 SERIES

### Basic Models and Valve Functions

Basic model	600-4E1	600-4E2	603-4E2
Item	A600-4E1	A600-4E2	A603-4E2
Number of positions	2		3
Number of ports	5		
Valve function	Single solenoid	Double solenoid	Double solenoid

Remark: For optional specifications and order codes, see p.775~776.

### Specifications

Basic model		600-4E1	600-4E2	603-4E2
Item		A600-4E1	A600-4E2	A603-4E2
Media		Air		
Operation type		Internal pilot type		
Effective area [Cv]	mm <sup>2</sup>	60 {3.33}		
Port size <sup>Note</sup>		Rc1/2 or Rc3/8		
Lubrication		Not required		
Operating pressure range	Mpa{kgf/cm <sup>2</sup> } [psi.]	0.15~0.9 {1.5~9.2} [22~131]	0.2~0.9 {2.0~9.2} [29~131]	
Proof pressure	Mpa{kgf/cm <sup>2</sup> } [psi.]	1.35 {13.8} [196]		
Response time	DC24V	40/40 or below	25 or below	35 or below
ON/OFF	ms AC100V, AC200V	35/40 or below	25 or below	35 or below
Maximum operating frequency	Hz	2		1
Minimum time to energize for self holding	ms	—	50	
Operating temperature range (atmosphere and media)	°C [°F]	5~50 [41~122]		
Shock resistance	m/s <sup>2</sup> {G}	980.7{100.0}		
Mounting direction		Any		

Note: For details, see the port size.

### Solenoid Specifications

Item	Rated voltage	DC24V	AC100V	AC200V
Type		—	AC solenoid (Shading coil type)	
Operating voltage range	V	21.6~26.4 (24±10%)	90~130 (100 <sup>+30</sup> <sub>-10</sub> %)	180~260 (200 <sup>+30</sup> <sub>-10</sub> %)
Current (when rated voltage is applied)	Frequency Hz	—	50	60
	Starting mA(r.m.s)	—	106	94
	Energizing <sup>Note</sup> mA(r.m.s)	240 [252 (6.0W)]	55 [57]	44 [44]
Insulation resistance	MΩ	Over 10		
Wiring type		With terminal		
Lead wire color		Red	Yellow	White
Color of LED indicator		Red	Yellow	Green
Surge suppression		—	Solenoids with LED indicators employ a surge absorber	

Note: Figures in brackets [ ] are for solenoids with LED indicator.

### Manifold Connection Port Size

Manifold model	Port	Location of piping connection	Port size
LM□F	1(P), 3(R2), 5(R1)	Manifold	Rc3/4
	4(A), 2(B)	Valve	Rc1/2, Rc3/8
LM□A	1(P), 3(R2), 5(R1)	Manifold	Rc3/4
	4(A), 2(B)	Manifold	Rc1/2, Rc3/8

Solenoid Valve Mass

Basic model	Mass
600-4E1	900 [31.75]
600-4E2	1140 [40.21]
603-4E2	1400 [49.38]
A600-4E1	900 [31.75]
A600-4E2	1140 [40.21]
A603-4E2	1400 [49.38]
600-4A	700 [24.69]
600-4A2	780 [27.51]
A600-4A	700 [24.69]
A600-4A2	780 [27.51]

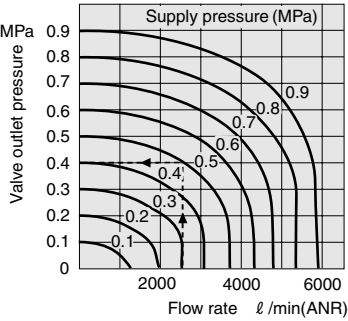
g [oz.]

Manifold Mass

Manifold model	Mass calculation of each unit (n=number of units)	Block-off plate
LM□F	$(330 \times n) + 640$ [(11.64 × n) + 22.57]	175 [6.17]
LM□A	$(330 \times n) + 640$ [(11.64 × n) + 22.57]	175 [6.17]

g [oz.]

Flow Rate

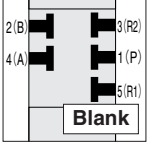


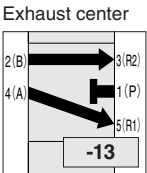




1MPa=145psi.    1 l /min.=0.0353ft.<sup>3</sup>/min.

How to read the graph

When the supply pressure is 0.5MPa [73psi.] and the flow rate is 2550 l/min [90.0ft.<sup>3</sup>/min.] (ANR), the valve outlet pressure becomes 0.4 MPa [58psi.].

# Solenoid Valve, Air-piloted Valve Order Codes

		3-position valve Valve function	Port size	Mounting base	Sub-base	Manual override
		Closed center 	Blank : Rc1/2 -03 : Rc3/8	Without mounting base 	Blank : Without sub-base -25 : With sub-base (port size Rc1/2) -03-25 : With sub-base (port size Rc3/8)	Non-locking type 
		Exhaust center 		With mounting base  For single solenoid only		Locking type 
		Basic model				Voltage
For F type manifold	Single solenoid	600-4E1		-21		AC100V AC200V DC24V
	2-position double solenoid	600-4E2	-03		-81	
	3-position double solenoid	603-4E2	-13			
For A type manifold	Single solenoid	A600-4E1			-25 -03-25	AC100V AC200V DC24V
	2-position double solenoid	A600-4E2			-81	
	3-position double solenoid	A603-4E2	-13			
Direct piping air-piloted valve (made to order)	Single pilot	600-4A		-21		
	Double pilot	600-4A2	-03			
Base piping air-piloted valve (made to order)	Single pilot	A600-4A			-25	
	Double pilot	A600-4A2				

## Options

Mounting base



- For direct piping
- Not available for double solenoid

Sub-base



- -25 (Port size Rc1/2)
- -03-25 (Port size Rc3/8)

Manual override



- Locking type

Manifold Order Codes

Port size

Blank : Rc1/2  
-03 : Rc3/8

3-position  
Valve function

Closed center  
  
Blank  
Exhaust center  
  
-13

Port size

Blank : Rc1/2  
-03 : Rc3/8

Manual override

Non-locking type  
  
Blank  
Locking type  
  
-81

Basic model

Voltage

Manifold for mounting 5-port valves	LM	2 . . . 10	F	stn. <input type="checkbox"/> . . . stn. <input type="checkbox"/>	-600-4E1	-03	-81	AC100V AC200V DC24V
					-600-4E2			
					-603-4E2			
	A	-03	stn. <input type="checkbox"/> . . . stn. <input type="checkbox"/>	-A600-4E1	-81	AC100V AC200V DC24V		
				-A600-4E2				
				-A603-4E2			-13	
Manifold for mounting 5-port valves (made to order)	LM	2 . . . 10	F	stn. <input type="checkbox"/> . . . stn. <input type="checkbox"/>	-600-4A	-03		
					-600-4A2			
					-A600-4A			
	A	-03	stn. <input type="checkbox"/> . . . stn. <input type="checkbox"/>	-A600-4A				
				-A600-4A2				

● 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.

Made to Order

Air-piloted valve  
600 series

- 5-port, 2-position
- Single pilot
- Double pilot

Grommet type  
with LED indicator

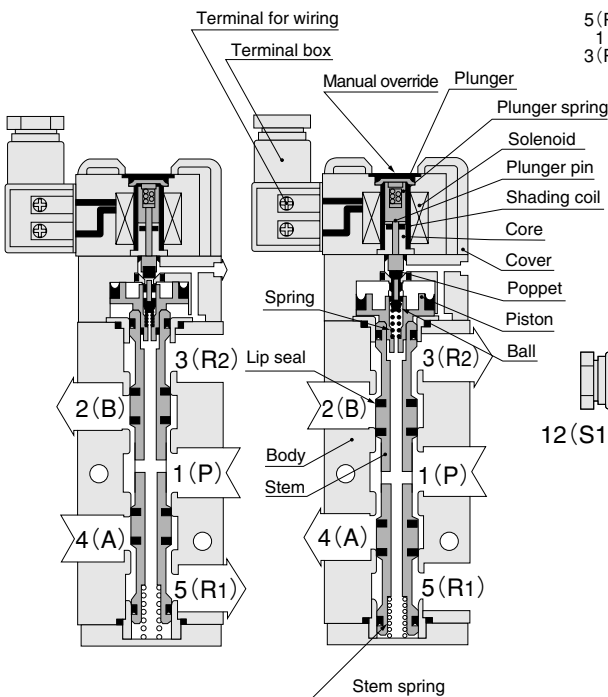
Operating Principles and Symbols

5-port, 2-position

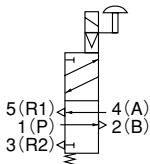
600-4E1

De-energized

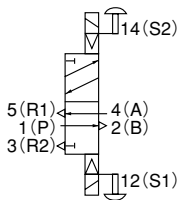
Energized



Single solenoid

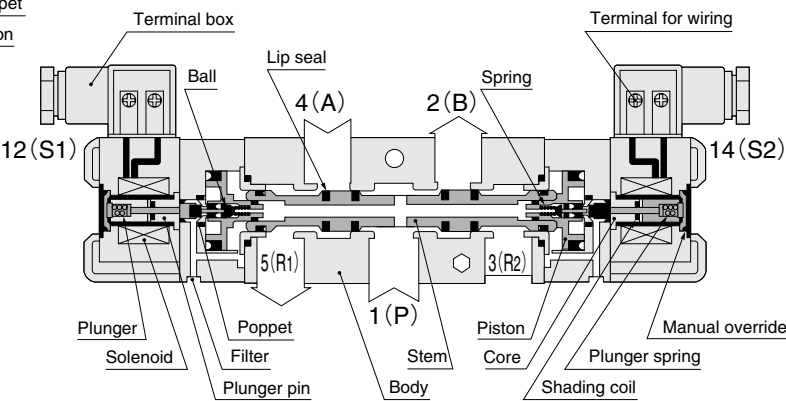


Double solenoid



600-4E2

(De-energized condition after energizing solenoid S1)



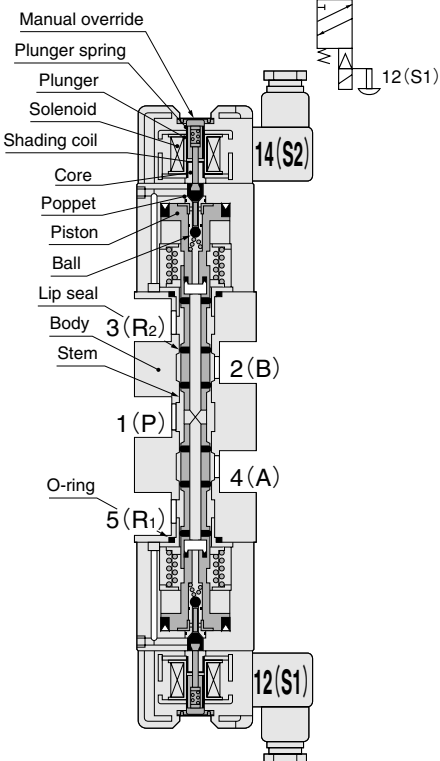
5-port, 3-position

Closed center

Exhaust center

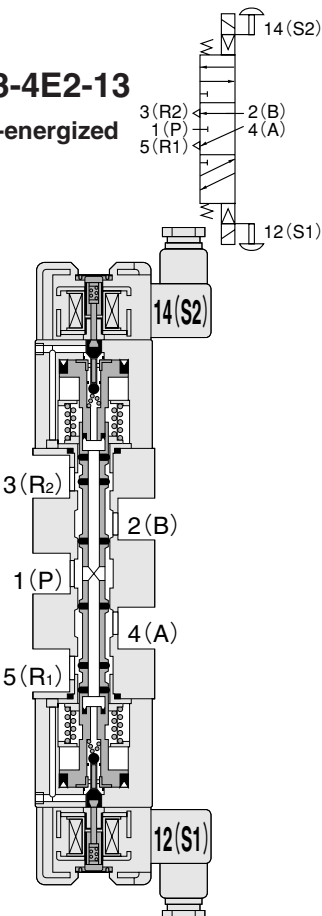
603-4E2

De-energized



603-4E2-13

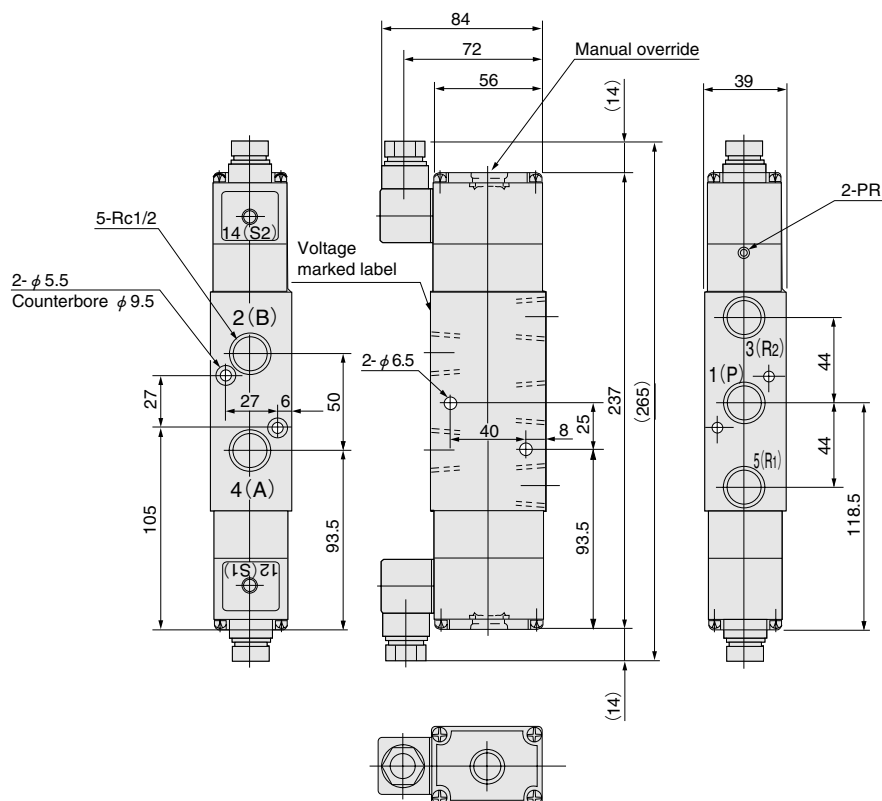
De-energized



Major Parts and Materials

Parts		Materials
Valve	Body	Aluminum alloy (anodized)
	Stem	
	Plunger	Stainless steel
	Plunger pin	
	Stem spring	
	Lip seal	Synthetic rubber
	Seal	
	O-ring	
Base		
Manifold	Body	Aluminum alloy (anodized)
	Block-off plate	Mild steel (zinc plated)
	Seal	Synthetic rubber

**600-4E1**

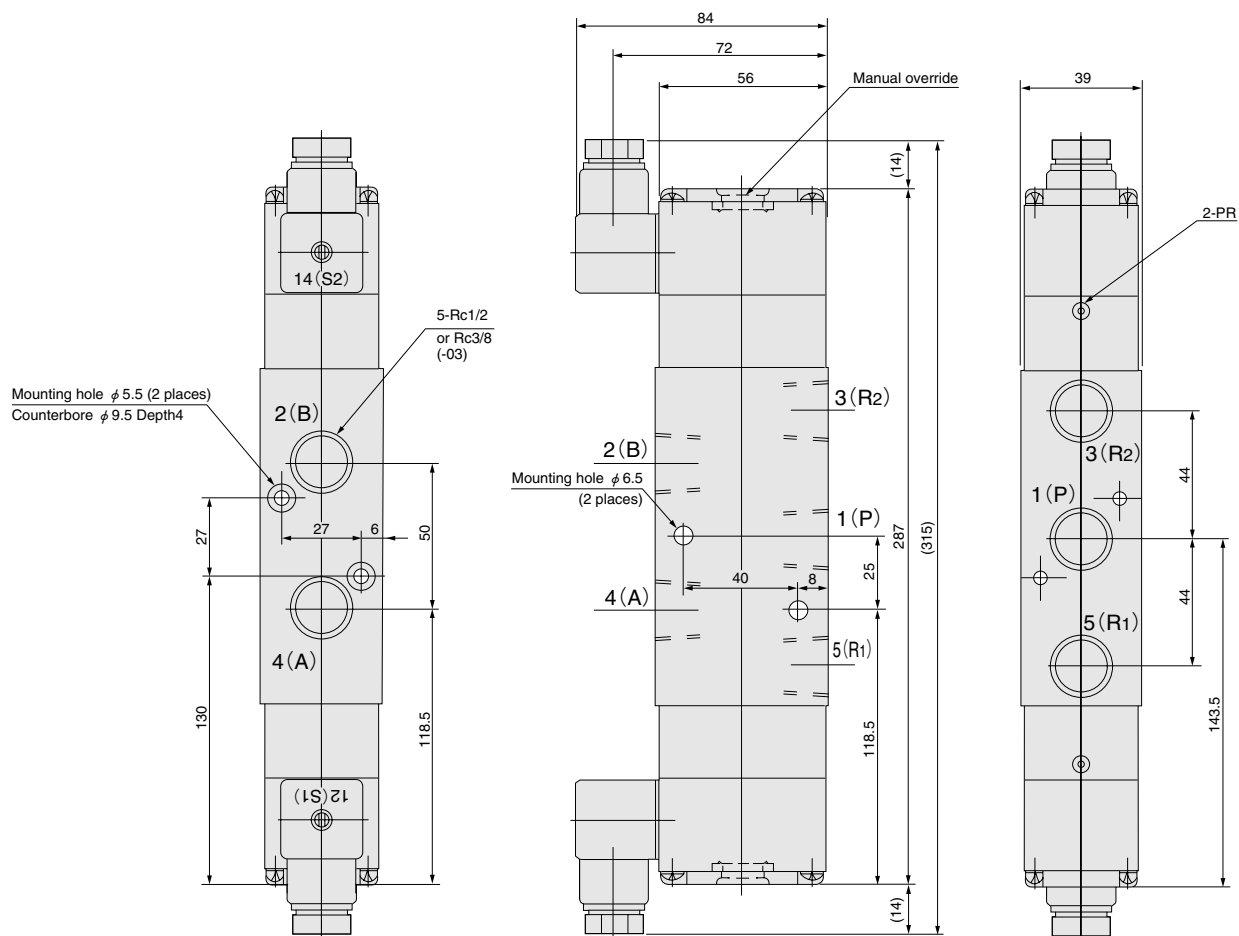




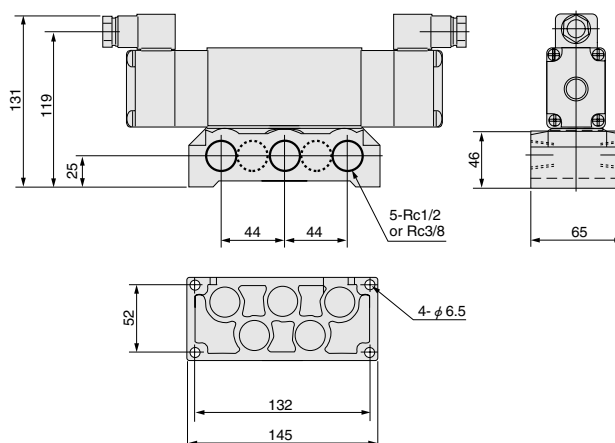
## Dimensions of Solenoid Valve (mm)

### 603-4E2 Closed center

### 603-4E2-13 Exhaust center



## Dimensions of mounting sub-base for all port piping

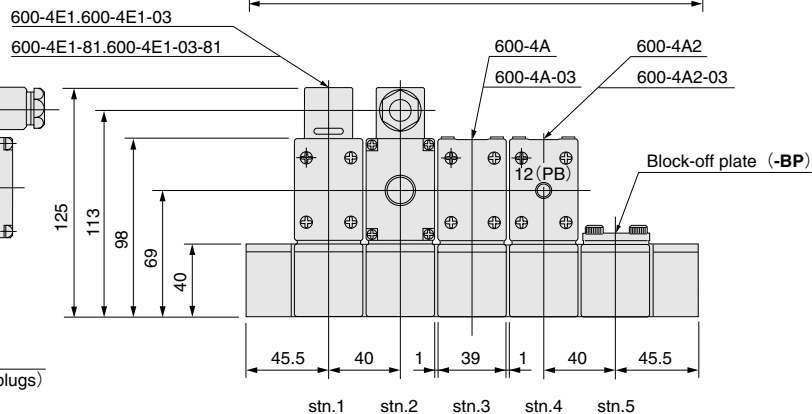
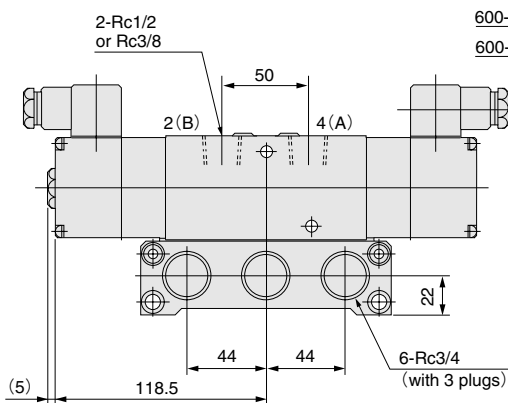
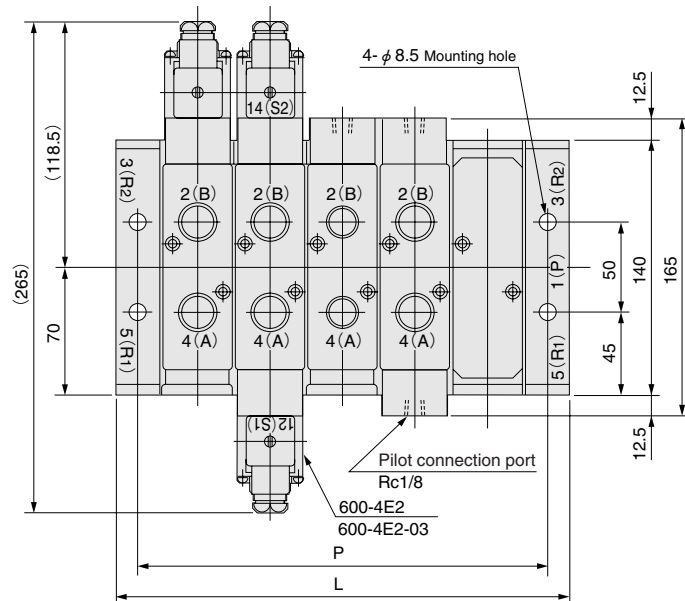


## Dimensions of Manifold (mm)

### F type

#### Unit dimensions

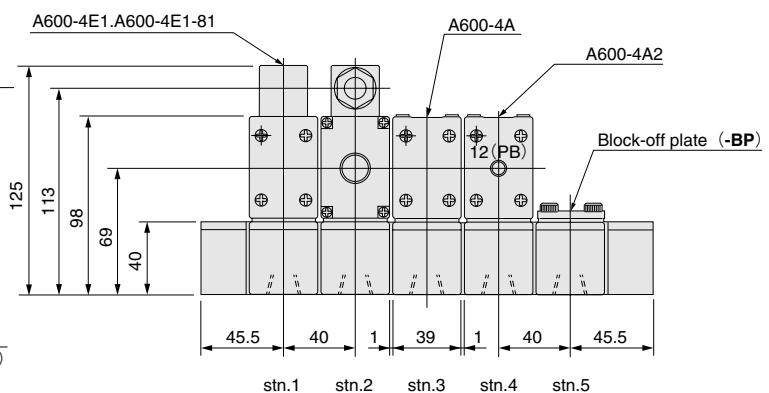
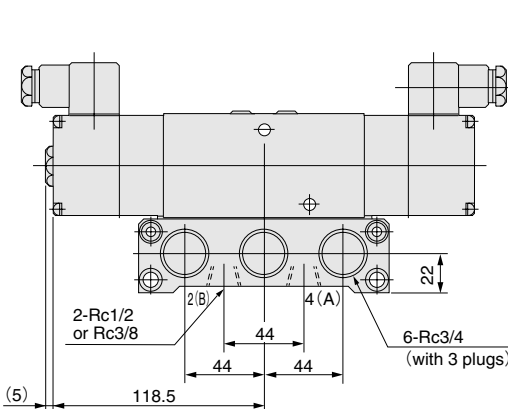
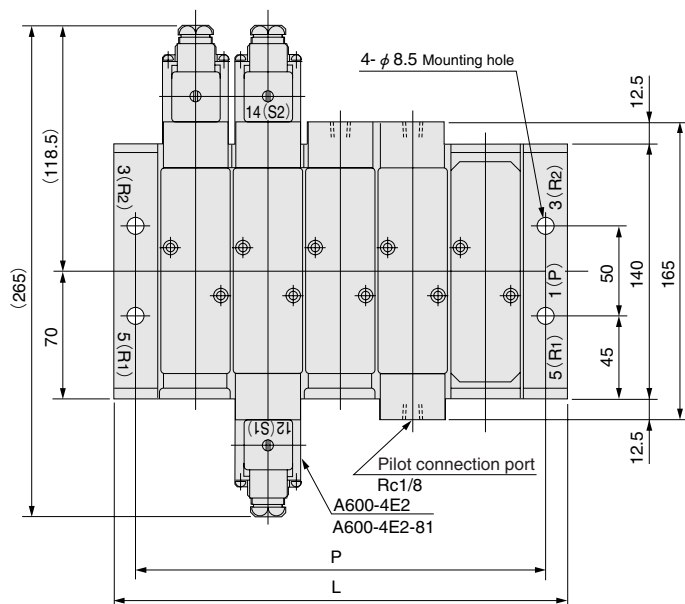
Code Number of units	P	L
LM2F	107	131
LM3F	147	171
LM4F	187	211
LM5F	227	251
LM6F	267	291
LM7F	307	331
LM8F	347	371
LM9F	387	411
LM10F	427	451



### A type

#### Unit dimensions

Code Number of units	P	L
LM2A	107	131
LM3A	147	171
LM4A	187	211
LM5A	227	251
LM6A	267	291
LM7A	307	331
LM8A	347	371
LM9A	387	411
LM10A	427	451



## Made to Order

### Air-piloted valve 600 series

- The optimum air-piloted valves for master valves or pilot valves for all-pneumatic control.



### Basic Models and Valve Functions

Item	Basic model	Direct piping, F type manifold	600-4A	600-4A2
		Sub-base piping, A type manifold	A600-4A	A600-4A2
Number of positions		2 positions		
Number of ports		5 ports		
Valve function		Single pilot		Double pilot

Remarks: For optional specifications and order codes, see p.775~776.

### Specifications

Item	Basic model	For direct piping, F type manifold		For sub-base piping, A type manifold	
		Single pilot	Double pilot	Single pilot	Double pilot
		600-4A	600-4A2	A600-4A	A600-4A2
Media		Air			
Effective area[Cv] <sup>Note 1</sup> mm <sup>2</sup>		60 [3.33]		60 [3.33]	
Port size <sup>Note 2</sup>	Main	Rc1/2 or Rc3/8			
	Pilot	Rc1/8			
Lubrication		Not required			
Operating pressure range MPa(kgf/cm <sup>2</sup> ) [psi.]	Main	0 ~ 0.9 [0 ~ 9.2] [0 ~ 131]			
	Pilot	See the table “Minimum Pilot Pressure”			
Proof pressure MPa(kgf/cm <sup>2</sup> )		1.35 [13.8] [196]			
Operating temperature range (atmosphere and media) °C [°F]		5 ~ 50 [41 ~ 122]			
Shock resistance m/s <sup>2</sup> (G)	Lateral direction	980.7{100.0}	980.7{100.0}	980.7{100.0}	
	Axial direction	980.7{100.0}	294.2{30.0} <sup>Note 3</sup>	980.7{100.0}	294.2{30.0} <sup>Note 3</sup>
Mounting direction		Any			

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

2. For details, see the port size.

3. Value when pilot is off.

When pilot is on, the value is 980.7{100.0}m/s<sup>2</sup> [G].

### Effective Area [Cv]

mm<sup>2</sup>

Basic model	Standard (single valve)
600-4A	60
600-4A2	[3.33]
A600-4A	60
A600-4A2	[3.33]

### Manifold Connection Port Size

Manifold model	Port	Location of piping connection	Port size
LM□F	1 (P), 3 (R2), 5 (R1)	Manifold	Rc3/4
	4 (A), 2 (B)	Valve	Rc1/2, Rc3/8
LM□A	1 (P), 3 (R2), 5 (R1)	Manifold	Rc3/4
	4 (A), 2 (B)	Manifold	Rc1/2, Rc3/8

### Air-piloted Valve Mass

g [oz.]

Basic model	Mass
600-4A	700 [24.69]
600-4A2	780 [27.51]
A600-4A	750 [26.46] (1570 [55.38])
A600-4A2	830 [29.28] (1650 [58.20])

Remark: Figures in parentheses ( ) are the mass with sub-base: -25.

### Manifold Mass

g [oz.]

Manifold model	Mass calculation of each unit (n=Number of units)	Block-off plate
LM□F	(330×n)+640 [(11.64×n)+22.57]	175 [6.17]
LM□A	(330×n)+640 [(11.64×n)+22.57]	175 [6.17]

### Minimum Pilot Pressure

MPa {kgf/cm<sup>2</sup>} [psi.]

Main pressure / Model	0.02 {0.2} [3]	0.1 {1.0} [15]	0.3 {3.1} [44]	0.5 {5.1} [73]	0.7 {7.1} [102]	0.9 {9.2} [131]
600-4A	0.12 {1.2} [17]	0.15 {1.5} [22]	0.2 {2.0} [29]	0.25 {2.5} [36]	0.33 {3.4} [48]	0.4 {4.1} [58]
600-4A2	0.1 {1.0} [15]		0.12 {1.2} [17]			0.15 {1.5} [22]

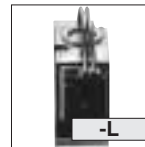
### Time Required for Switching

s

Model	Operation	Pilot line length ℓ m [ft.]				
		2 [6.6]	6 [19.7]	10 [32.8]	20 [65.6]	50 [164]
600-4A	ON	0.06	0.12	0.18	0.36	1.20
	OFF	0.09	0.20	0.30	0.62	2.40
600-4A2	ON					
	OFF	0.06	0.12	0.20	0.40	1.40

Measurement conditions: Air pressure (both main and pilot)=0.5MPa [73psi.]  
Tube inner diameter=4mm [0.16in.]

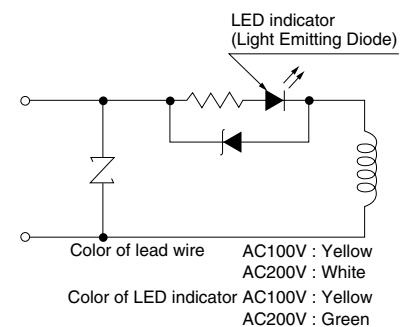
### LED indicator



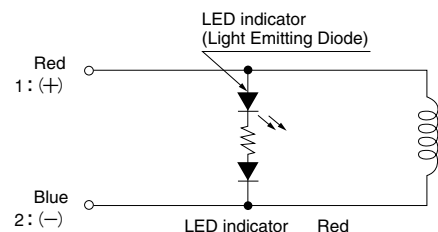
The LED indicator for confirmation of operation offers a clean monoblock look with a compact cover.

- When ordering, enter -L before the voltage specification.

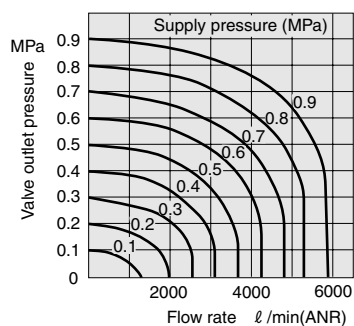
### AC100V AC200V



### DC24V



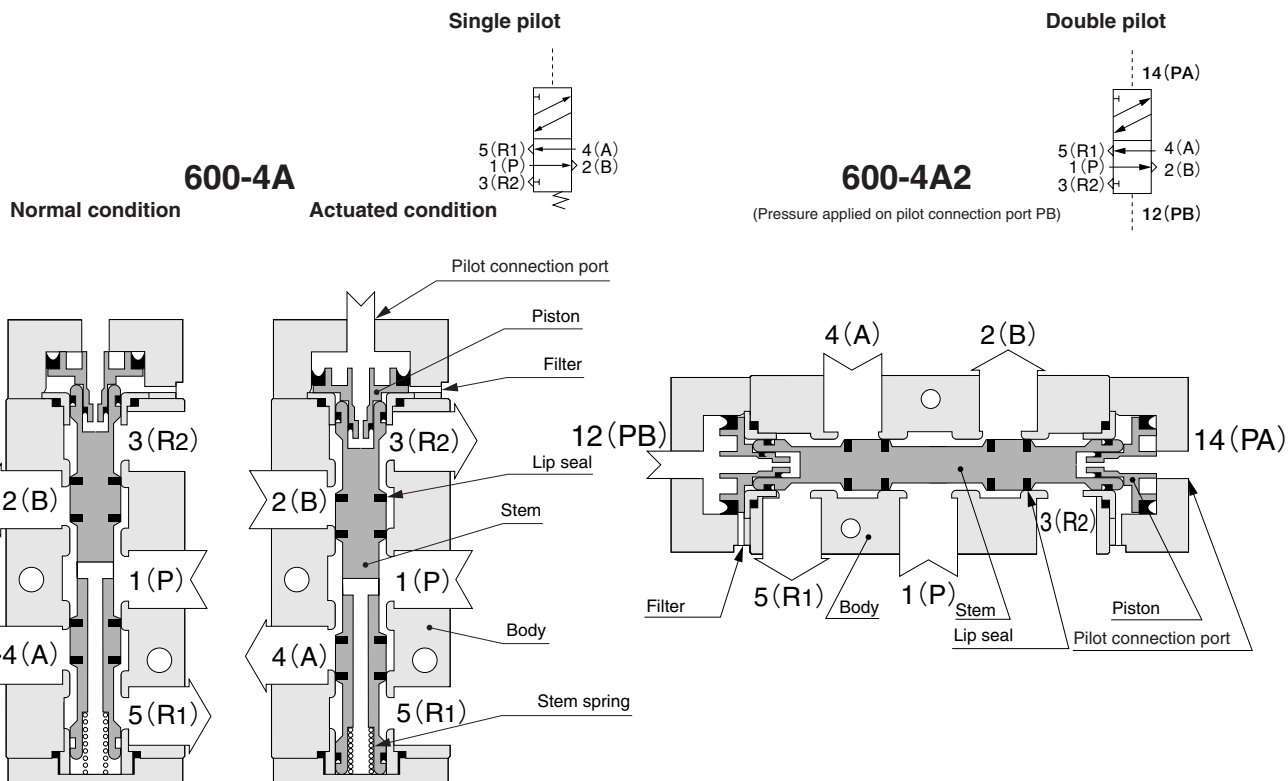
## Flow Rate



1MPa=145psi. 1 l/min.=0.0353ft<sup>3</sup>/min.

## Operating Principles and Symbols

### 5-port, 2-position

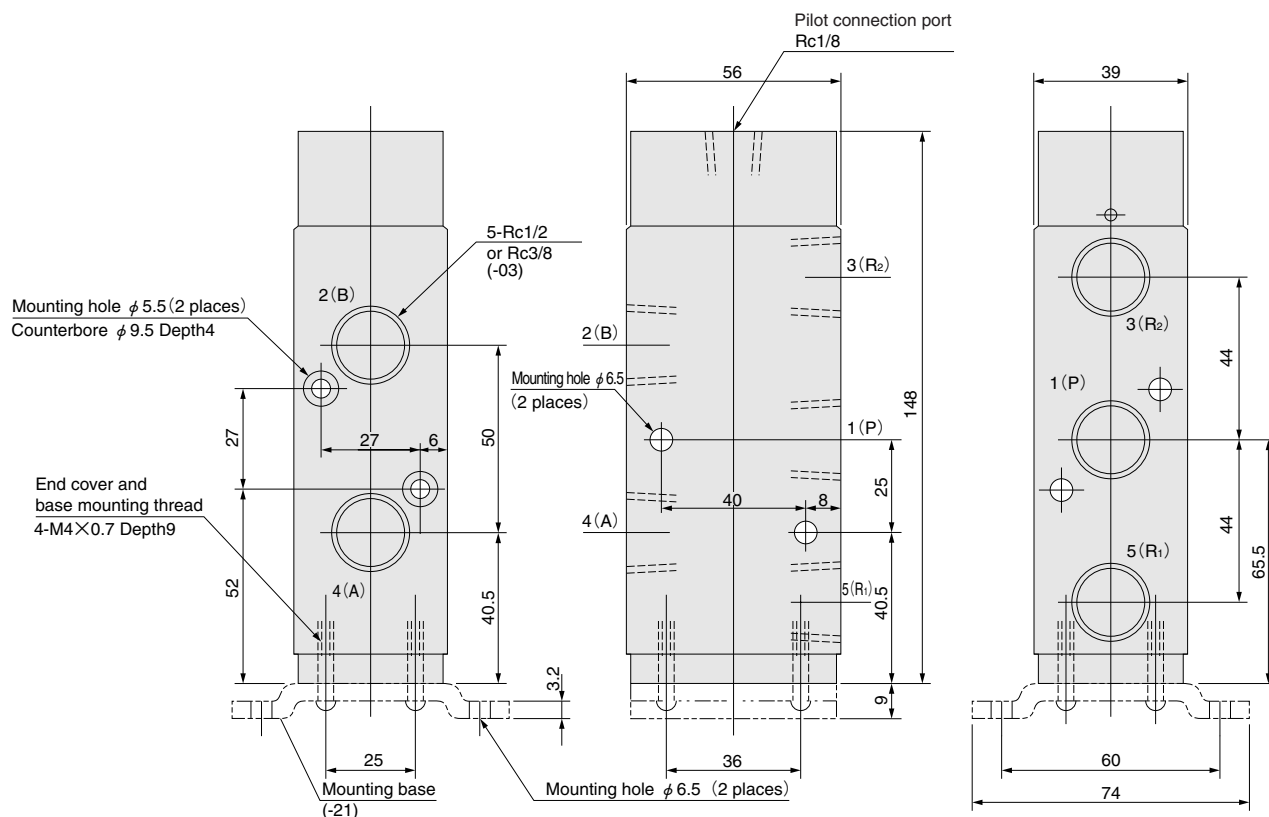


## Major Parts and Materials

Parts	Materials
Body	Aluminum alloy (anodized)
Stem	
Stem spring	Stainless steel
Lip seal	Synthetic rubber
Seal	
O-ring	
Base	Mild steel (zinc plated)

## Dimensions of Air-piloted Valve (mm)

### 600-4A



### 600-4A2

