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Discrete valve body piping
Pilot operated 3, 5-port pneumatic valve

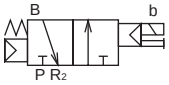
3KA1/4KA1/2/3/4 Series

● Cylinder bore size: ø20 to ø160

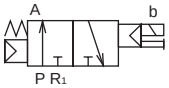
CE Refer to the Ending for details. RoHS CAD

JIS symbol

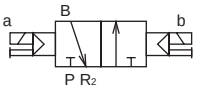
● 3-port valve
2-position NC single



● 3-port valve
2-position NO single



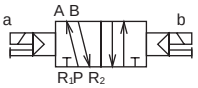
● 3-port valve
2-position double



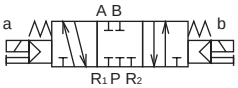
● 5-port valve
2-position single



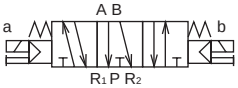
● 5-port valve
2-position double



● 5-port valve
3-position all ports closed



● 5-port valve
3-position A/B/R connection



● 5-port valve
3-position P/A/B connection



Common specifications

Item	Description
Valve and operation	Pilot operated soft spool valve
Working fluid	Compressed air
Max. working pressure MPa	0.70 (≈100 psi, 7 bar)
Min. working pressure MPa	Refer to Individual specifications listed below
Proof pressure MPa	1.05 (≈150 psi, 10.5 bar)
Ambient temperature °C	-5 (23°F) to 50 (122°F) (no freezing)
Fluid temperature °C	5 (41°F) to 50 (122°F)
Lubrication	Not required
Degree of protection	Dust-proof
Vibration resistance m/s^2	50 or less
Shock resistance m/s^2	300 or less
Atmosphere	Cannot be used in corrosive gas environment.

Electrical specifications

Item			3KA1, 4KA1/2	4KA3/4
Rated voltage	AC		100,200 (50 / 60 Hz)	
V	DC		24	
Voltage fluctuation range			±10%	
Starting current A	AC	100 V	0.056/0.044	0.046/0.042
	AC	200 V	0.028/0.022	0.023/0.021
Holding current A	AC	100 V	0.028/0.022	0.023/0.021
	AC	200 V	0.014/0.011	
	DC	24 V	0.075	
Power consumption W ( ): With indicator	AC	100 V	1.8 / 1.4 (1.8 / 1.5)	1.6 / 1.3 (1.8 / 1.5)
	AC	200 V	1.8 / 1.4 (1.8 / 1.5)	1.6 / 1.3 (1.8 / 1.5)
	DC	24 V	1.8 (2.0)	
Thermal class			B (molded coil)	
Temperature rise °C			43	30

Reference: 100 VAC 50/60 Hz can be used with a rated voltage of 110 VAC 60 Hz and 200 VAC 50/60 Hz can be used with 220 VAC 60 Hz.

Individual specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Item			3KA1	4KA1	4KA2	4KA3	4KA4
Min. working pressure MPa	2-position	Single	0.15	0.15	0.15	0.15	0.15
		Double			0.10	0.10	0.10
	3-position		-	0.20	0.20	0.20	0.20
Port size	P/A/B port		M5 Push-in fitting ø4, ø6	M5 Push-in fitting ø4, ø6	Rc1/8, G1/8, NPT1/8 Push-in fitting ø6, ø8	Rc1/4, G1/4, NPT1/4 Push-in fitting ø8, ø10	Rc3/8, G3/8, NPT3/8 Push-in fitting ø10, ø12
	R1/R2 port		M5	M5	Rc1/8, G1/8, NPT1/8	Rc1/4, G1/4, NPT1/4	Rc3/8, G3/8, NPT3/8

Performance/characteristics by model

Item		3KA1	4KA1	4KA2	4KA3	4KA4
Response time *1 ms	2-position	30 or less	30 or less	30 or less	30 or less	30 or less
	3-position	-	60 or less	60 or less	60 or less	60 or less

*1: The response time is the value at 0.5 MPa working pressure, with no lubrication, and with the power ON. It depends on the pressure and the lubricant quality.

Weight

Item			3KA1	4KA1	4KA2	4KA3	4KA4
Weight g	2-position	Single	70	70	115	214	325
		Double	110	110	155	315	435
	3-position		-	120	170	354	505

Flow characteristics

Model No.	Solenoid position		C[dm³/(s·bar)]	b
3KA1	2-position		0.65	0.37
4KA1	2-position		0.65	0.37
	3-position	All ports closed	0.60	0.32
		A/B/R connection	0.68	0.39
		P/A/B connection	0.61	0.36
4KA2	2-position		2.6	0.43
	3-position	All ports closed	2.3	0.43
		A/B/R connection	2.9	0.34
		P/A/B connection	2.3	0.42
4KA3	2-position		5.6	0.49
	3-position	All ports closed	4.1	0.60
		A/B/R connection	4.1	0.62
		P/A/B connection	4.2	0.68
4KA4	2-position		9.8	0.49
	3-position	All ports closed	8.2	0.54
		A/B/R connection	11	0.50
		P/A/B connection	8.4	0.54

*1: Effective cross-sectional area S and sonic conductance C are converted as S ≈ 5.0 × C.
*2: Flow characteristics are values when the port size is M5 (3KA1, 4KA1), Rc1/8 (4KA2), Rc1/4 (4KA3), or Rc3/8 (4KA4).

Ozone-proof specifications

(Ending Page 5)

** - Voltage - **P11**

Copper and PTFE free specifications

● Copper- and PTFE-based materials are not used in the flow path.

** - Voltage - **P6**

CE marking specifications

** - Voltage - **ST**

• Standard voltage of 24 VDC or less is CE marking-compatible even if the model No. is not indicated with "ST".

3KA1/4KA1 to 4 Series

Discrete valve; body piping

How to order

4KA2 1 0 - 06 - M1 B ○ - AC100V

● Single solenoid valve for manifold

4KA2 1 9 - 06 - M1 B ○ - AC100V

Ⓐ Model No. Ⓑ Solenoid position

Ⓒ Port size

Ⓓ Manual override

Ⓔ Electrical connections
* Refer to page 1263 for the circuit diagram with surge suppressor/lamp.

Ⓕ Other options

Ⓖ Voltage

* Gasket/mounting screw attached (*4)

	Code	Description	Ⓐ Model No. 3KA1	4KA1	4KA2	4KA3	4KA4
Ⓑ Solenoid position	**1**	2-position single		●	●	●	●
	2	2-position double	●	●	●	●	●
	3	3-position all ports closed		●	●	●	●
	4	3-position A/B/R connection		●	●	●	●
	5	3-position P/A/B connection		●	●	●	●
	1	2-position single normally closed	●				
	11	2-position single normally open	●				

	Port	P/A/B port	R1/R2 port (1) = M5 (2) = Rc1/8 (3) = Rc1/4 (4) = Rc3/8				
Ⓒ Port size	**M5**	M5	(1)	(1)			
	06	Rc1/8			(2)		
	08	Rc1/4				(3)	
	10	Rc3/8					(4)
	GS4	ø4 Push-in fitting	(1)	(1)			
	GS6	ø6 Push-in fitting	(1)	(1)	(2)		
	GS8	ø8 Push-in fitting			(2)	(3)	
	GS10	ø10 Push-in fitting				(3)	(4)
	GS12	ø12 Push-in fitting					(4)
	Port	P/A/B port	R1/R2 port (1) = M5 (5) = NPT1/8 (6) = NPT1/4 (7) = NPT3/8				
	06N	NPT1/8			(5)		
	08N	NPT1/4				(6)	
	10N	NPT3/8					(7)
	GS4N	ø4 Push-in fitting	(1)	(1)			
	GS6N	ø6 Push-in fitting	(1)	(1)	(5)		
	GS8N	ø8 Push-in fitting			(5)	(6)	
	GS10N	ø10 Push-in fitting				(6)	(7)
	GS12N	ø12 Push-in fitting					(7)
	Port	P/A/B port	R1/R2 port (1) = M5 (8) = G1/8 (9) = G1/4 (10) = G3/8				
	06G	G1/8			(8)		
	08G	G1/4				(9)	
	10G	G3/8					(10)
	GS4G	ø4 Push-in fitting	(1)	(1)			
	GS6G	ø6 Push-in fitting	(1)	(1)	(8)		
	GS8G	ø8 Push-in fitting			(8)	(9)	
	GS10G	ø10 Push-in fitting				(9)	(10)
	GS12G	ø12 Push-in fitting					(10)

Ⓓ	**Blank**	Non-locking manual override	●	●	●	●	●
	M1	Locking manual override	●	●	●	●	●
Ⓔ	Refer to the electrical connections list on the next page.						
Ⓕ	**Blank**	No option	●	●	●	●	●
	P	Mounting plate (compatible only with 2-position single)	●	●	●	●	●
	S	Surge suppressor attached (*2) (*3)	●	●	●	●	●
	-A	Coolant supported (packing: FKM)	●	●	●	●	●

Ⓖ Voltage	**AC100V**	100 VAC 50/60 Hz	Standard	●	●	●	●	●
	AC200V	200 VAC 50/60 Hz		●	●	●	●	●
	DC24V	24 VDC		●	●	●	●	●
	DC12V	12 VDC	Option	●	●	●	●	●
	AC110V	110 VAC 50/60 Hz		●	●	●	●	●
	AC220V	220 VAC 50/60 Hz		●	●	●	●	●

*** Other custom order products**						
AC24V	●	●	●	●	●	
AC115V	●	●	●	●	●	
AC120V	●	●	●	●	●	

[Table 1] Compact terminal box L/LS compatibility table

Code	Description			3KA1	4KA1	4KA2	4KA3	4KA4	Surge suppressor
L	Without lead wire	With indicator lamp	AC	●	●	●	●	●	
			DC				●	●	
		with surge suppressor/ indicator lamp	AC						
			DC	●	●	●			Integrated
LS	Without lead wire	with surge suppressor/ indicator lamp	AC	●	●	●	●	●	Integrated
			DC				●	●	Integrated

Precautions for model No. selection

*1 : The compact terminal boxes of 3KA1, 4KA1, and 4KA2 and the DC voltage models of L, and LS are equipped with a surge suppressor.

*2 : The surge suppressor for attachment is a suppression connector when the grommet lead wire is 24 VDC or less. (Refer to page 1262)

*3 : The surge suppressor can only be selected when the grommet lead wire or compact terminal box "B" has been selected for the electrical connections.

*4 : With regard to the printed model No., although the model No. when placing an order is "4KA□ □9", the model No. listed on the product name plate will be "4KA□ □0".

[Example of model No.]

4KA210-06-M1BP-AC100V

Ⓐ Model : 4KA2
Ⓑ Solenoid position : 2-position single
Ⓒ Port size : Rc1/8
Ⓓ Manual override : Locking manual override
Ⓔ Electrical connections : Compact terminal box/ without lead wire
Ⓕ Other options : With mounting plate
Ⓖ Voltage :100 VAC 50/60 Hz

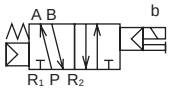
[Electrical connections list]

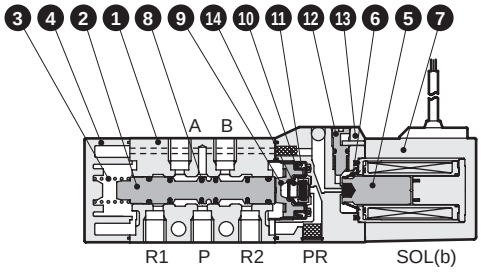
Ⓔ Electrical connections	Code	Description	Ⓐ Model No. 3KA1	4KA1	4KA2	4KA3	4KA4
	Grommet lead wire						
	Blank	Grommet lead wire (300 mm)	●	●	●	●	●
	Compact terminal box						
	B	Without lead wire	●	●	●	●	●
	L	Without lead wire	Refer to [Table 1] on the previous page for details (*1)				
	LS	Without lead wire, with surge suppressor/lamp					
	C-connector (lead wire lateral direction)						
	C	Lead wire length (300 mm)	●	●	●	●	●
	C00	Lead wire length (500 mm)	●	●	●	●	●
	C01	Lead wire length (1000 mm)	●	●	●	●	●
	C02	Lead wire length (2000 mm)	●	●	●	●	●
	C03	Lead wire length (3000 mm)	●	●	●	●	●
	C1	Without lead wire	●	●	●	●	●
	C2	Lead wire length (300 mm) with surge suppressor/lamp	●	●	●	●	●
	C20	Lead wire length (500 mm) with surge suppressor/lamp	●	●	●	●	●
	C21	Lead wire length (1000 mm) with surge suppressor/lamp	●	●	●	●	●
	C22	Lead wire length (2000 mm) with surge suppressor/lamp	●	●	●	●	●
	C23	Lead wire length (3000 mm) with surge suppressor/lamp	●	●	●	●	●
	C3	Without lead wire, with surge suppressor/lamp	●	●	●	●	●
	D-connector (lead wire upward direction)						
	D	Lead wire length (300 mm)	●	●	●	●	●
	D00	Lead wire length (500 mm)	●	●	●	●	●
	D01	Lead wire length (1000 mm)	●	●	●	●	●
	D02	Lead wire length (2000 mm)	●	●	●	●	●
	D03	Lead wire length (3000 mm)	●	●	●	●	●
	D1	Without lead wire	●	●	●	●	●
	D2	Lead wire length (300 mm) with surge suppressor/lamp	●	●	●	●	●
	D20	Lead wire length (500 mm) with surge suppressor/lamp	●	●	●	●	●
	D21	Lead wire length (1000 mm) with surge suppressor/lamp	●	●	●	●	●
	D22	Lead wire length (2000 mm) with surge suppressor/lamp	●	●	●	●	●
	D23	Lead wire length (3000 mm) with surge suppressor/lamp	●	●	●	●	●
	D3	Without lead wire, with surge suppressor/lamp	●	●	●	●	●

Internal structure and parts list

4KA110

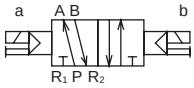
● 2-position single

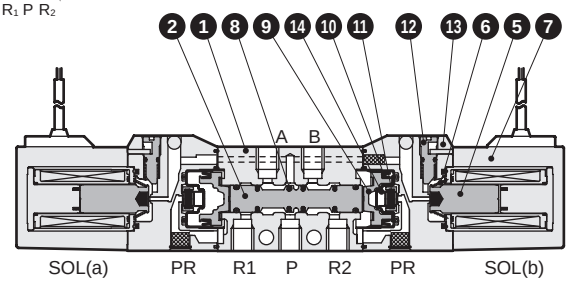




4KA120

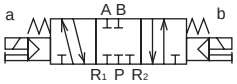
● 2-position double





4KA130

● 3-position all ports closed



4KA140

● 3-position A/B/R connection



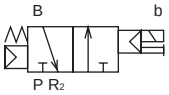
4KA150

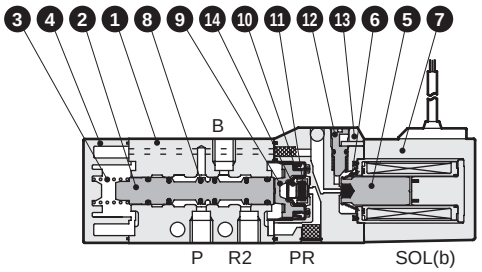
● 3-position P/A/B connection



3KA110-NC

● 2-position single / NC

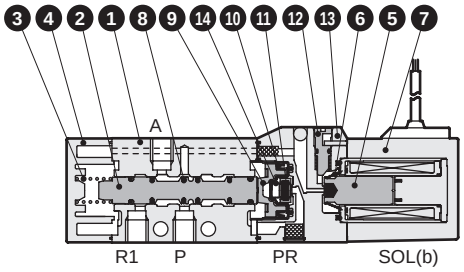


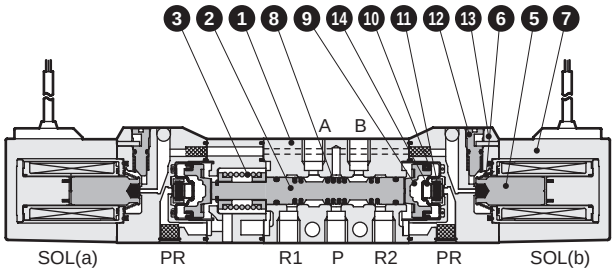


3KA1110-NO

● 2-position single / NO







Main parts list

No.	Part name	Material
1	Body	Aluminum alloy die-casting
2	Valving element (spool)	Aluminum
3	Valve spring	Stainless steel
4	Cap	Resin
5	Plunger	-
6	Plunger spring	-
7	Coil assembly	-
8	Spool packing	Nitrile rubber
9	Piston	Resin
10	Piston packing	Nitrile rubber
11	Valve seat	Nitrile rubber
12	Manual button	Resin
13	Pilot valve	Resin
14	Valve seat spring	Stainless steel

Repair parts list

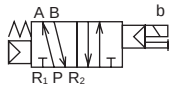
No./part name	2 8	9 10	5 6 7
Model No.	Spool assembly	Piston assembly	Coil assembly *
3KA110 / 3KA1110	4K9-110	4K9-151	4K1L- Ⓔ electrical connection option code - Blank for grommet lead wire COIL - Ⓖ Voltage
3KA120	4K9-118		
4KA110	4K9-110	4K9-151	
4KA120	4K9-118		
4KA130	4K9-111	4K9-152	
4KA140	4K9-112		
4KA150	4K9-113		

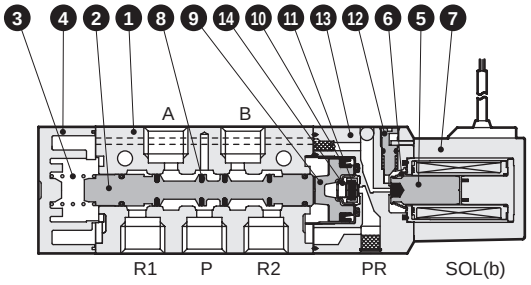
* The compact terminal box and connector of the coil assembly will come assembled and included with the options of the descriptions indicated with model No. selection.

Internal structure and parts list

4KA210

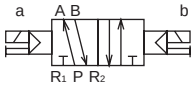
● 2-position single

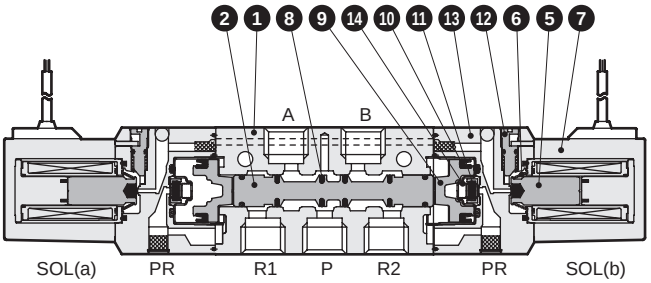




4KA220

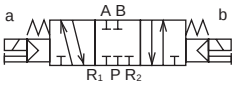
● 2-position double





4KA230

● 3-position all ports closed



4KA240

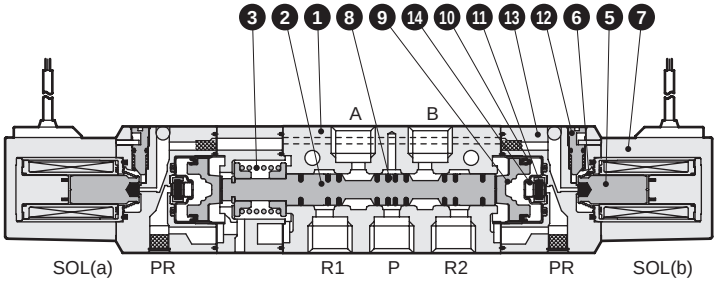
● 3-position A/B/R connection



4KA250

● 3-position P/A/B connection





Main parts list

No.	Part name	Material
1	Body	Aluminum alloy die-casting
2	Valving element (spool)	Aluminum
3	Valve spring	Stainless steel
4	Cap	Resin
5	Plunger	-
6	Plunger spring	-
7	Coil assembly	-
8	Spool packing	Nitrile rubber
9	Piston	Resin
10	Piston packing	Nitrile rubber
11	Valve seat	Nitrile rubber
12	Manual button	Resin
13	Pilot valve	Resin
14	Valve seat spring	Stainless steel

Repair parts list

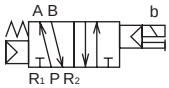
No./part name	2 8	9 10	5 6 7
Model No.	Spool assembly	Piston assembly	Coil assembly *
4KA210	4K9-150	4K9-153	4K1L- E electrical connection option code - Blank for grommet lead wire COIL - G Voltage
4KA220	4K9-126		
4KA230	4K9-127	4K9-154	
4KA240	4K9-128		
4KA250	4K9-129		

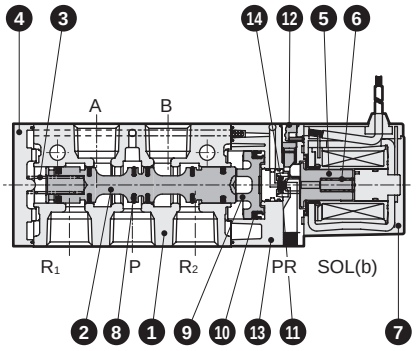
* The compact terminal box and connector of the coil assembly will come assembled and included with the options of the descriptions indicated with model No. selection.

Internal structure and parts list

4KA310

● 2-position single

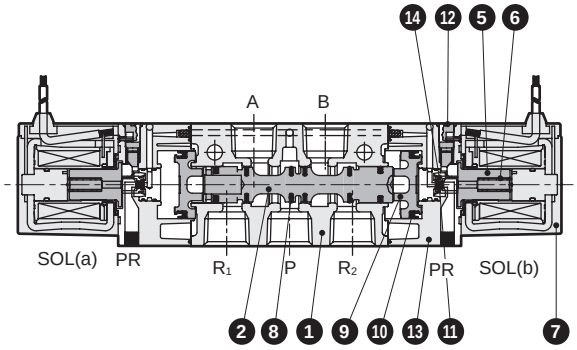




4KA320

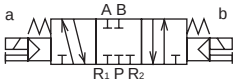
● 2-position double





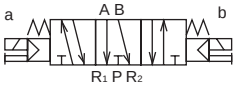
4KA330

● 3-position all ports closed



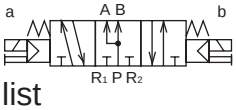
4KA340

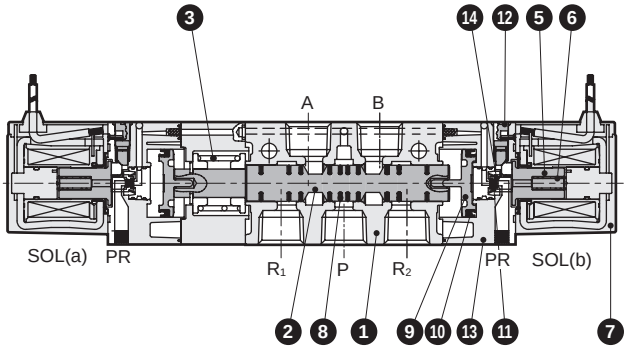
● 3-position A/B/R connection



4KA350

● 3-position P/A/B connection





Main parts list

No.	Part name	Material
1	Body	Aluminum alloy die-casting
2	Valving element (spool)	Aluminum
3	Valve spring	Stainless steel
4	Cap	Resin
5	Plunger	-
6	Plunger spring	-
7	Coil assembly	-
8	Spool packing	Nitrile rubber
9	Piston	Resin
10	Piston packing	Nitrile rubber
11	Valve seat	Nitrile rubber
12	Manual button	Resin
13	Pilot valve	Resin
14	Valve seat spring	Stainless steel

Repair parts list

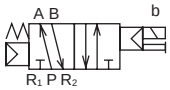
No./part name	2 8	9 10	5 6 7
Model No.	Spool assembly	Piston assembly	Coil assembly *
4KA310	4K9-133	4K9-137	4K3-(E) electrical connection option code- Blank for grommet lead wire COIL -(G) Voltage
4KA320			
4KA330	4K9-134	4K9-138	
4KA340	4K9-135		
4KA350	4K9-136		

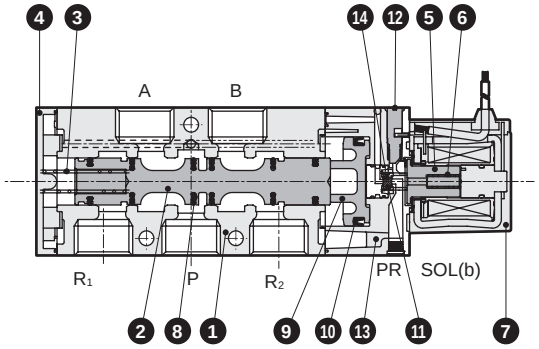
* The terminal box and connector of the coil assembly will come assembled and included with the options of the descriptions indicated with model No. selection.

Internal structure and parts list

4KA410

● 2-position single

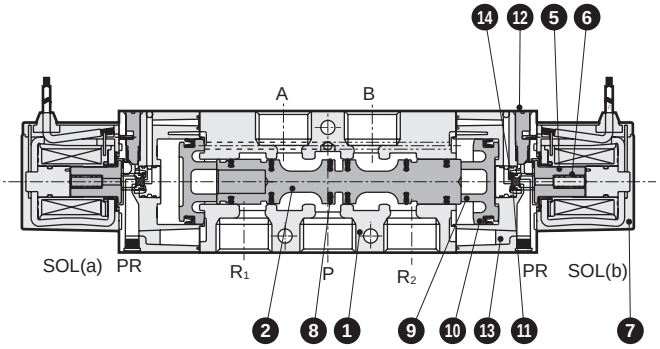




4KA420

● 2-position double





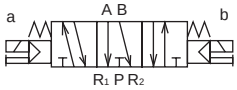
4KA430

● 3-position all ports closed



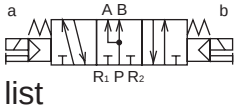
4KA440

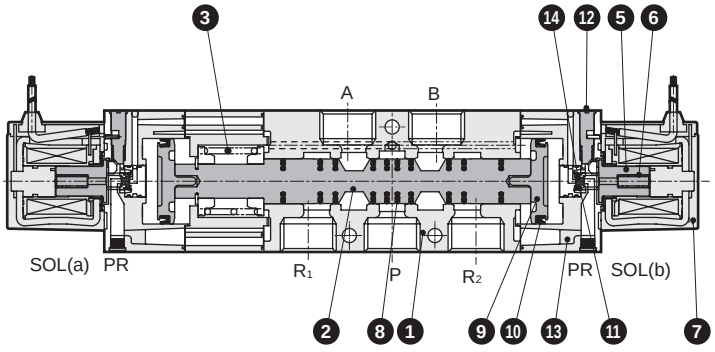
● 3-position A/B/R connection



4KA450

● 3-position P/A/B connection





Main parts list

No.	Part name	Material
1	Body	Aluminum alloy die-casting
2	Valving element (spool)	Aluminum
3	Valve spring	Stainless steel
4	Cap	Resin
5	Plunger	-
6	Plunger spring	-
7	Coil assembly	-
8	Spool packing	Nitrile rubber
9	Piston	Resin
10	Piston packing	Nitrile rubber
11	Valve seat	Nitrile rubber
12	Manual button	Resin
13	Pilot valve	Resin
14	Valve seat spring	Stainless steel

Repair parts list

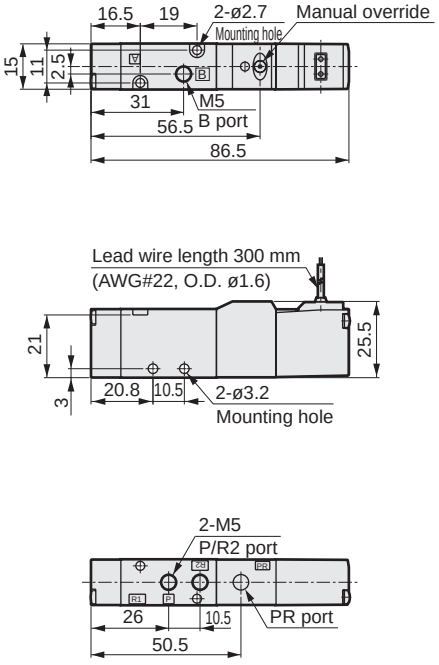
No./part name / Model No.	2 8 Spool assembly	9 10 Piston assembly	5 6 7 Coil assembly *
4KA410	4K9-140	4K9-144	4K3-Ⓔ electrical connection option code Blank for grommet lead wire COIL - Ⓖ Voltage
4KA420			
4KA430	4K9-141	4K9-145	
4KA440	4K9-142		
4KA450	4K9-143		

* The terminal box and connector of the coil assembly will come assembled and included with the options of the descriptions indicated with model No. selection.

Dimensions

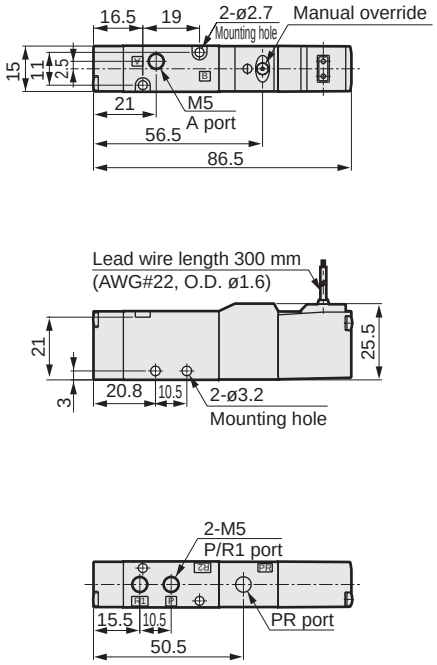
3KA110

● 2 position NC single: grommet lead wire



3KA1110

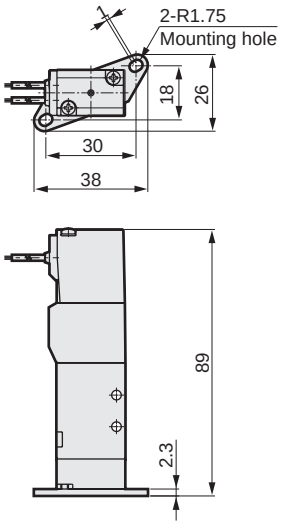
● 2 position NO single: grommet lead wire



● Mounting plate: (P [2-position single only])

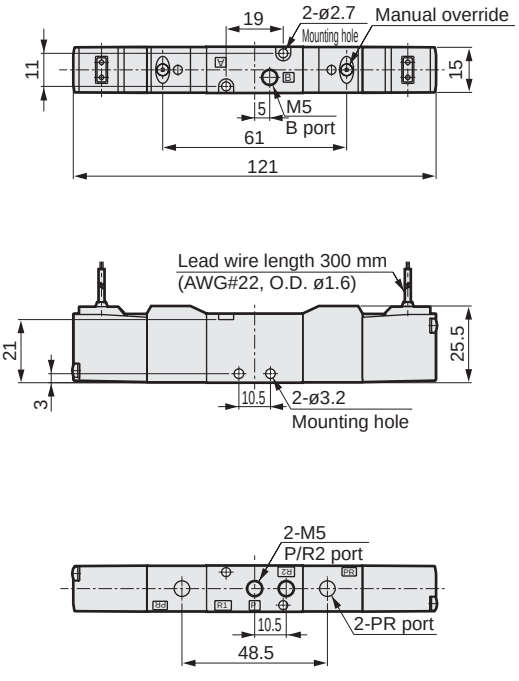
Material: Steel

Zinc chromate treatment



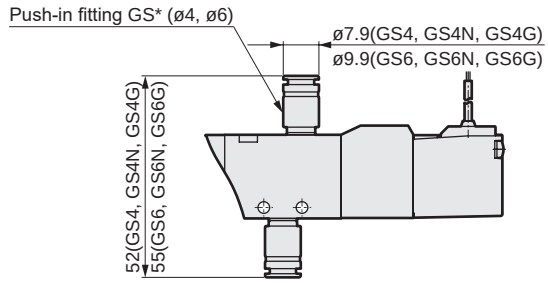
3KA120

● 2 position NC double: grommet lead wire



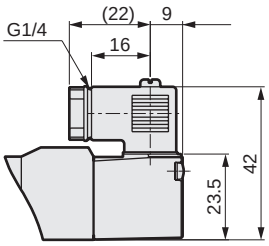
Dimensions

● ø4/ø6 push-in fitting: (GS4*/GS6*)

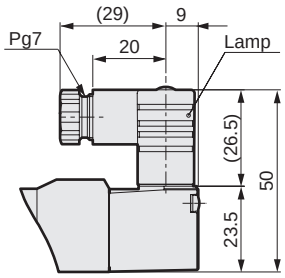


● Compact terminal box: (B [Without lamp]/L/LS [With lamp])

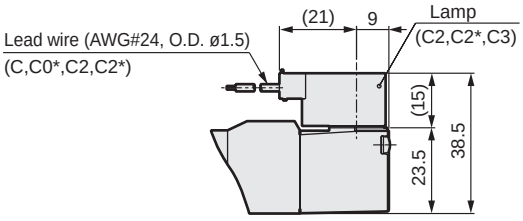
Without indicator lamp



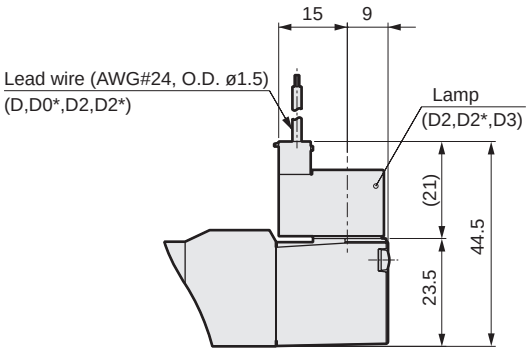
With indicator lamp



● C-connector: (C/C1/C0*/C2/C2*/C3)



● D-connector: (D/D1/D0*/D2/D2*/D3)

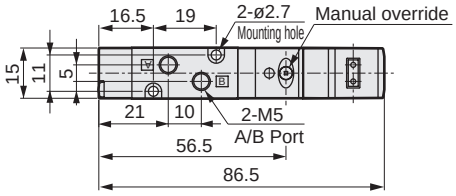


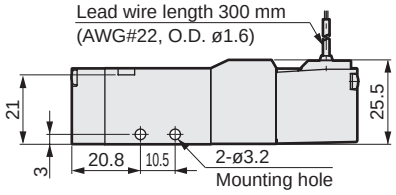
Dimensions

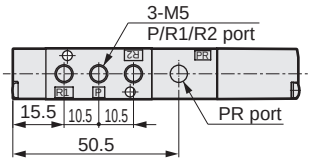
4KA110

CAD

● 2-position single: grommet lead wire



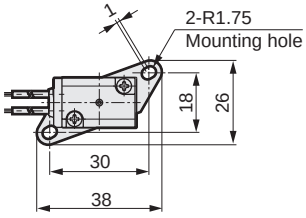


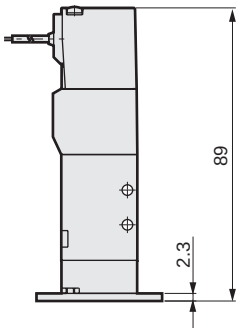


● Mounting plate: (P [2-position single only])

Material: Steel

Zinc chromate treatment

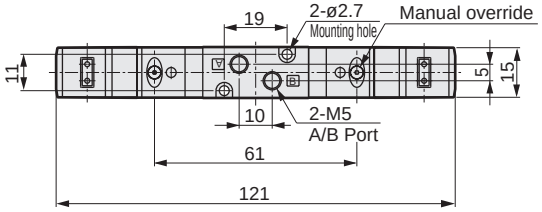


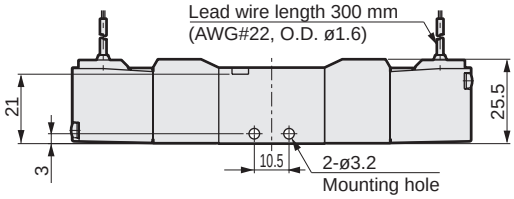


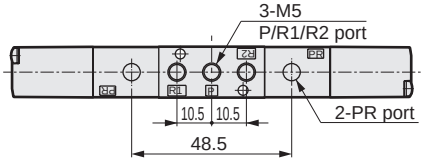
4KA120

CAD

● 2-position double: grommet lead wire



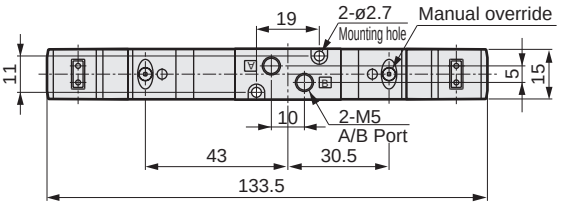


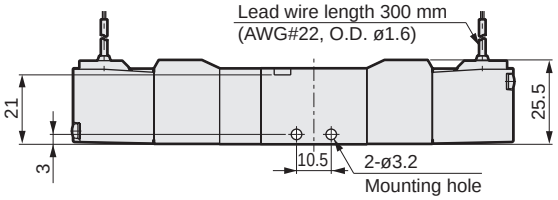


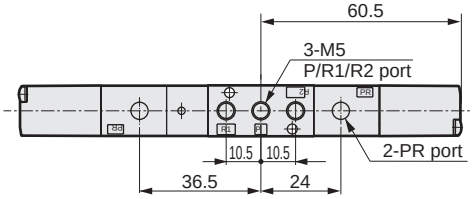
4KA1$^{3}_{5}$40

CAD

● 3-position: grommet lead wire

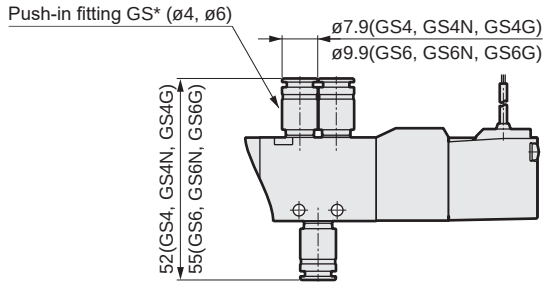






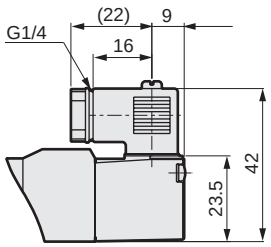
Dimensions

● ø4/ø6 push-in fitting: (GS4*/GS6*)

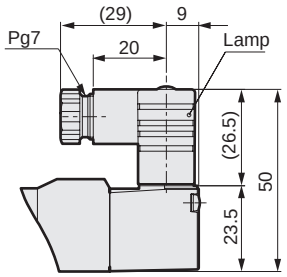


● Compact terminal box: (B [Without lamp]/L/LS [With lamp])

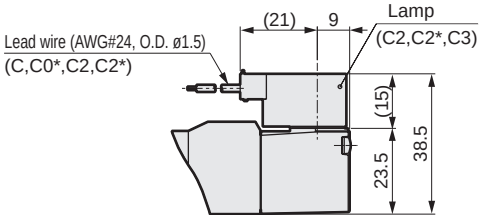
Without indicator lamp



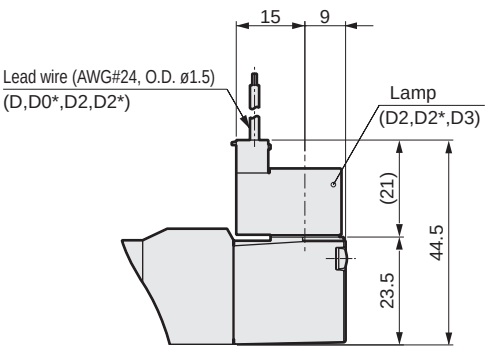
With indicator lamp



● C-connector: (C/C1/C0*/C2/C2*/C3)



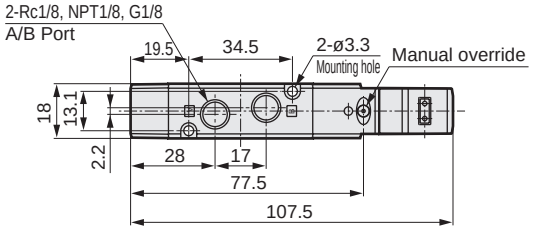
● D-connector: (D/D1/D0*/D2/D2*/D3)

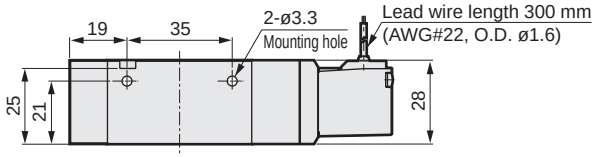


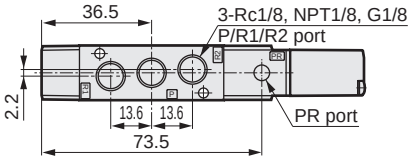
Dimensions

4KA210 CAD

● 2-position single: grommet lead wire



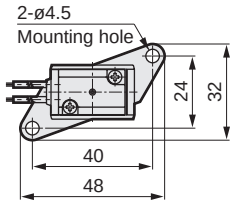


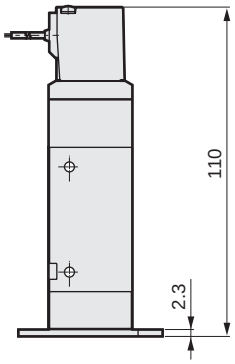


● Mounting plate: (P [2-position single only])

Material: Steel

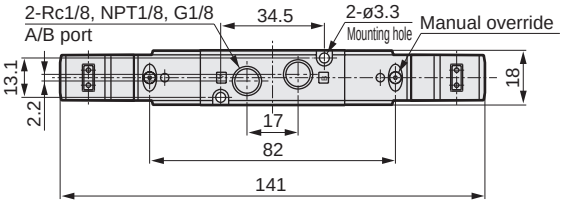
Zinc chromate treatment

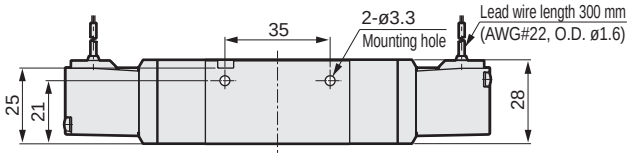


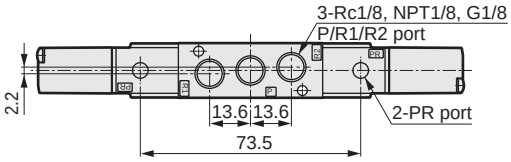


4KA220 CAD

● 2-position double: grommet lead wire

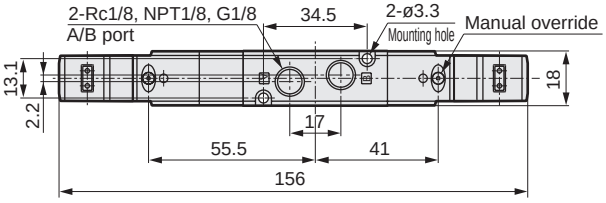


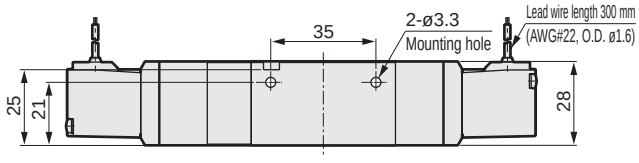


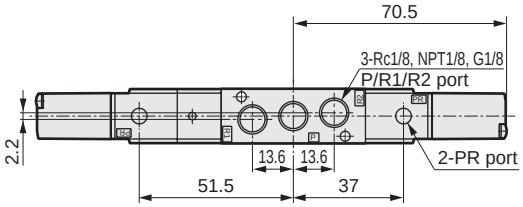


4KA2$^{3}_{5}$40 CAD

● 3-position: grommet lead wire

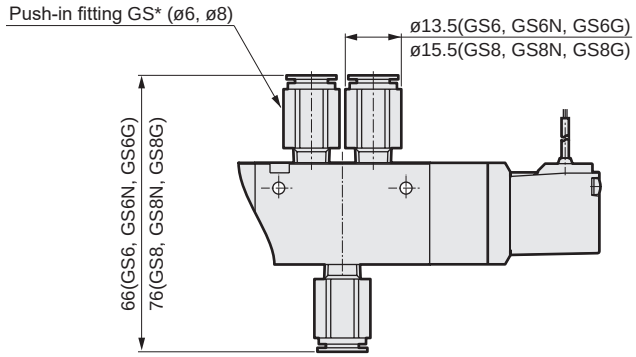






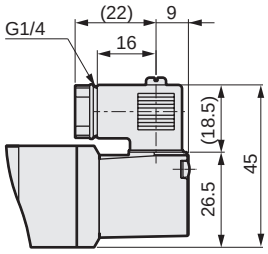
Dimensions

● ø6/ø8 push-in fitting: (GS6*/GS8*)

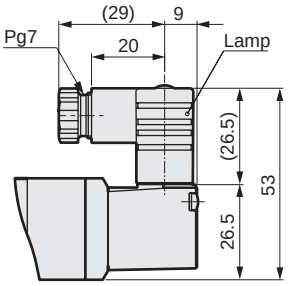


● Compact terminal box: (B [Without lamp]/L/LS [With lamp])

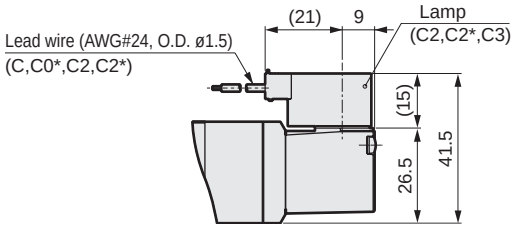
Without indicator lamp



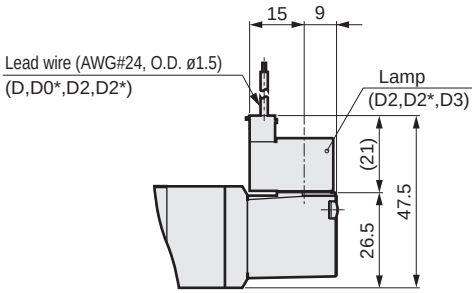
With indicator lamp



● C-connector: (C/C1/C0*/C2/C2*/C3)



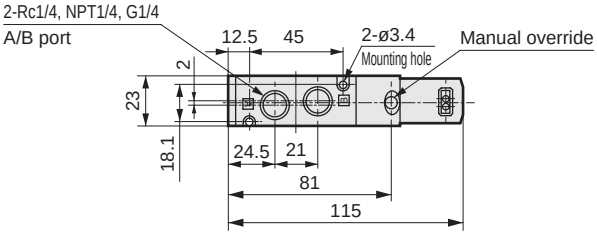
● D-connector: (D/D1/D0*/D2/D2*/D3)

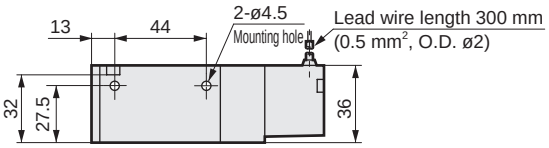


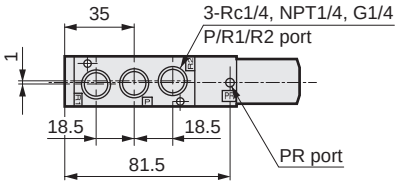
Dimensions

4KA310 CAD

● 2-position single: grommet lead wire



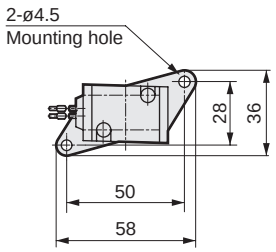


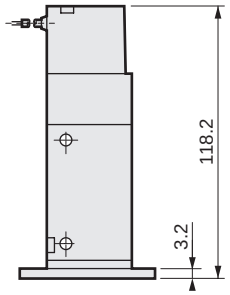


● Mounting plate: (P [2-position single only])

Material: Steel

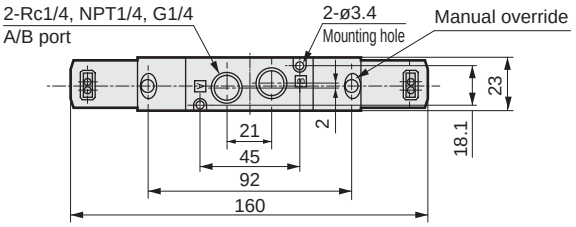
Zinc chromate treatment

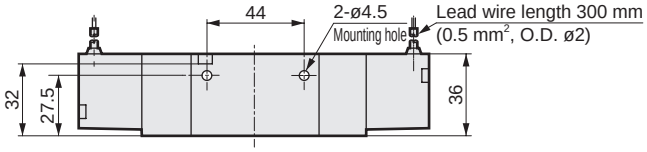


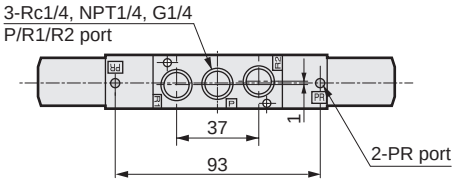


4KA320 CAD

● 2-position double: grommet lead wire

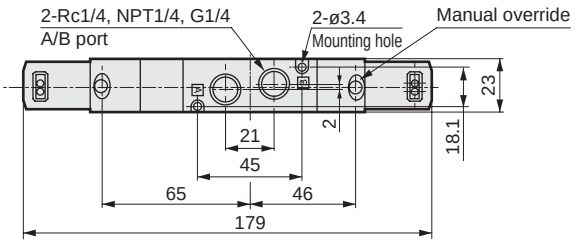


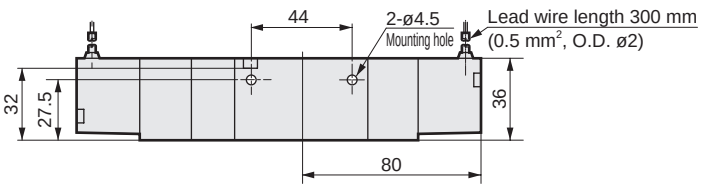


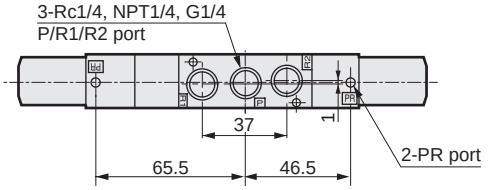


4KA3$^{3}_{4}$0$_{5}$ CAD

● 3-position: grommet lead wire

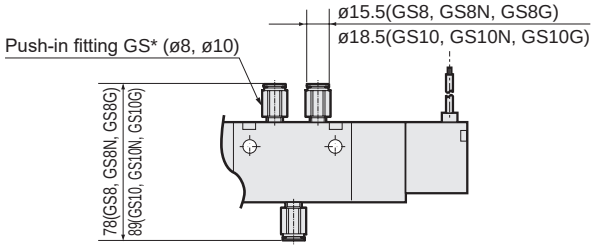




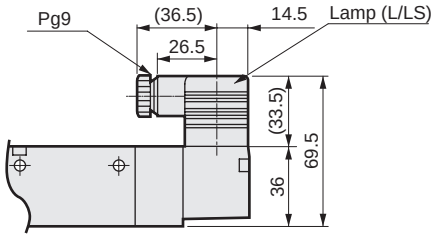


Dimensions

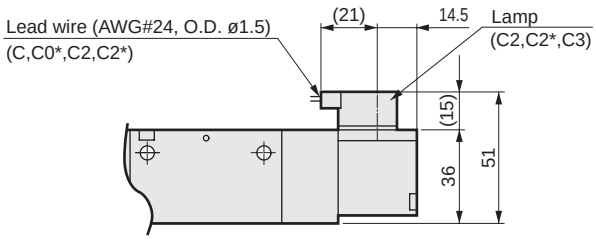
● ø8/ø10 push-in fitting: (GS8*/GS10*)



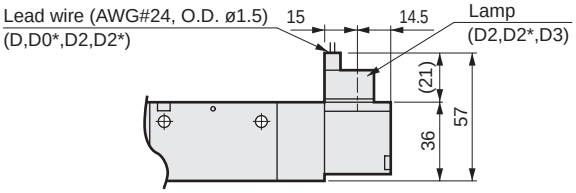
● Terminal box: (B/L/LS)



● C-connector: (C/C1/C0*/C2/C2*/C3)



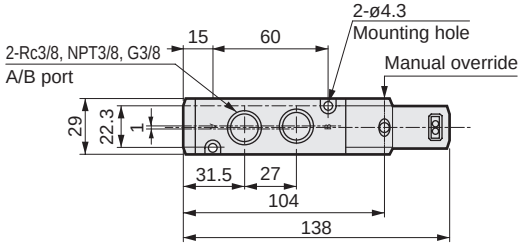
● D-connector: (D/D1/D0*/D2/D2*/D3)

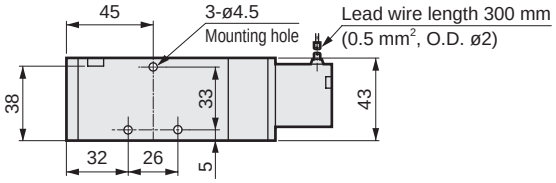


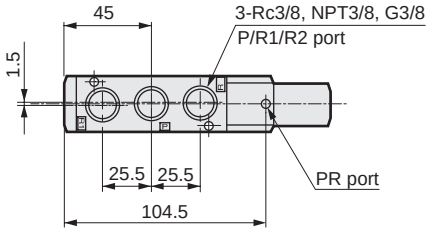
Dimensions

4KA410 CAD

● 2-position single: grommet lead wire



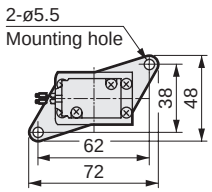


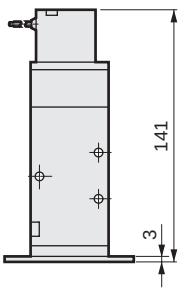


● Mounting plate: (P [2-position single only])

Material: Steel

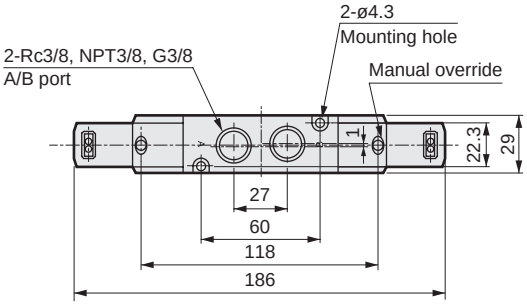
Zinc chromate treatment

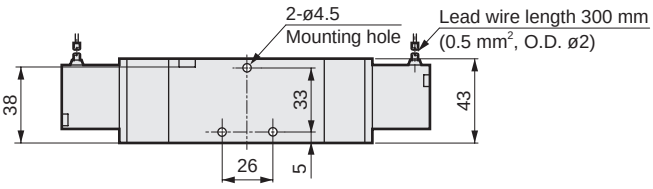


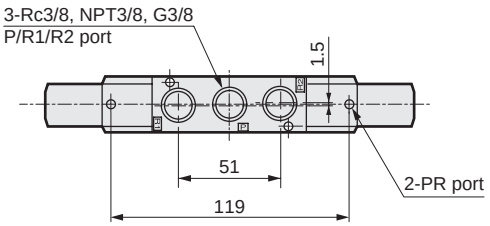


4KA420 CAD

● 2-position double: grommet lead wire

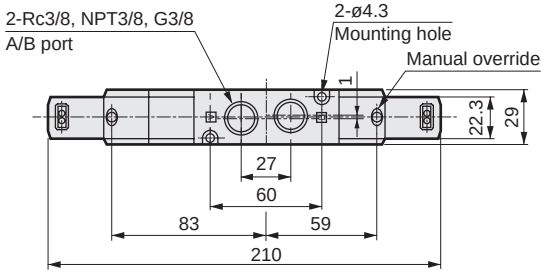


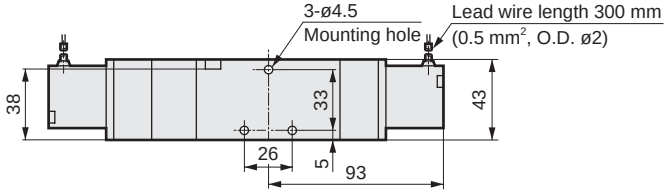


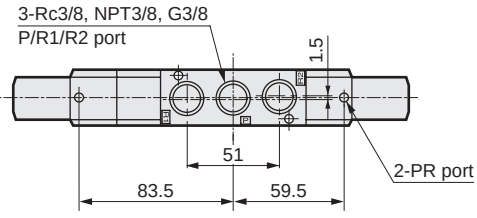


4KA4$^{3}_{5}$40 CAD

● 3-position: grommet lead wire

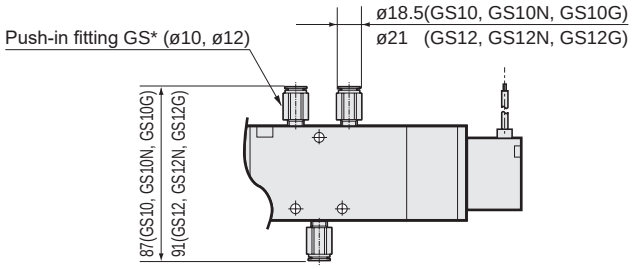




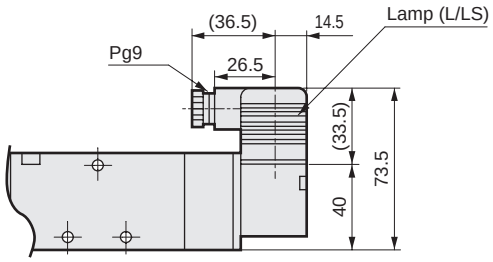


Dimensions

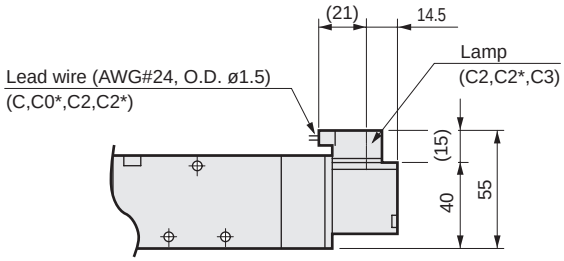
● With ø10/ø12 push-in fitting: (GS10*/GS12*)



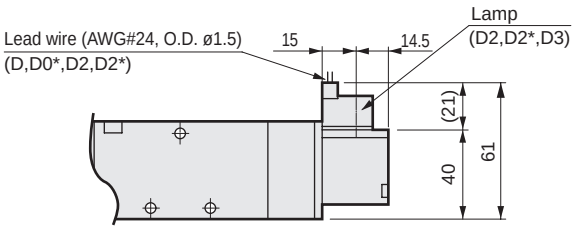
● Terminal box: (B/L/LS)



● C-connector: (C/C1/C0*/C2/C2*/C3)



● D-connector: (D/D1/D0*/D2/D2*/D3)





Discrete valve sub-plate piping
Pilot operated 5-port pneumatic valve

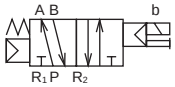
4KB1/2/3/4 Series

● Cylinder bore size: ø20 to ø160

CE Refer to the Ending for details. RoHS CAD

JIS symbol

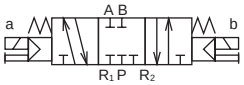
● 5-port valve
2-position single



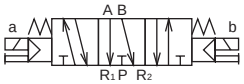
● 5-port valve
2-position double



● 5-port valve
3-position all ports closed



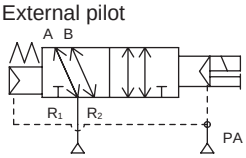
● 5-port valve
3-position A/B/R connection



● 5-port valve
3-position P/A/B connection



● External pilot



(2-position single)

Common specifications

Item	Description
Valve and operation	Pilot operated soft spool valve
Working fluid	Compressed air
Max. working press MPa	0.70 (≈100 psi, 7 bar)
Min. working press MPa	Refer to Individual specifications listed below
Proof pressure MPa	1.05 (≈150 psi, 10.5 bar)
Ambient temperature °C	-5 (23°F) to 50 (122°F) (no freezing)
Fluid temperature °C	5 (41°F) to 50 (122°F)
Lubrication	Not required
Degree of protection	Dust-proof
Vibration resistance m/s²	50 or less
Shock resistance m/s²	300 or less
Atmosphere	Cannot be used in corrosive gas environment.

*1: The working pressure when the external pilot (option code: K) has been selected is 0 to 0.7 MPa.
In addition, use the pilot with a pressure of 0.2 to 0.7 MPa.

Electrical specifications

Item			4KB1/2	4KB3/4
Rated voltage V	AC		100,200 (50 / 60 Hz)	
	DC		24	
Voltage fluctuation range			±10%	
Starting current A	AC	100 V	0.056/0.044	0.046/0.042
	AC	200 V	0.028/0.022	0.023/0.021
Holding current A	AC	100 V	0.028/0.022	0.023/0.021
	AC	200 V	0.014/0.011	
	DC	24 V	0.075	
Power consumption W ( ): With indicator	AC	100 V	1.8 / 1.4 (1.8 / 1.5)	1.6 / 1.3 (1.8 / 1.5)
	AC	200 V	1.8 / 1.4 (1.8 / 1.5)	1.6 / 1.3 (1.8 / 1.5)
	DC	24 V	1.8(2.0)	
Thermal class			B (molded coil)	
Temperature rise °C			43	30

Reference: 100 VAC 50/60 Hz can be used with a rated voltage of 110 VAC 60 Hz and 200 VAC 50/60 Hz can be used with 220 VAC 60 Hz.

Individual specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Item			4KB1	4KB2	4KB3	4KB4
Min. working pressure MPa	2-position	Single	0.15	0.15	0.15	0.15
		Double		0.10	0.10	0.10
	3-position		0.20	0.20	0.20	0.20
Port size	P/A/B port		Rc1/8 NPT1/8 G1/8	Rc1/8, Rc1/4 NPT1/8, NPT1/4 G1/8, G1/4	Rc1/4, Rc3/8 NPT1/4, NPT3/8 G1/4, G3/8	Rc3/8, Rc1/2 NPT3/8, NPT1/2 G3/8, G1/2
	R1/R2 port		Rc1/8 NPT1/8 G1/8	Rc1/8, Rc1/4 NPT1/8, NPT1/4 G1/8, G1/4	Rc1/4, Rc3/8 NPT1/4, NPT3/8 G1/4, G3/8	Rc3/8, Rc1/2 NPT3/8, NPT1/2 G3/8, G1/2

Performance/characteristics by model

Item		4KB1	4KB2	4KB3	4KB4
Response time *1 ms	2-position	30 or less	30 or less	30 or less	30 or less
	3-position	60 or less	60 or less	60 or less	60 or less

*1: The response time is the value at 0.5 MPa working pressure, with no lubrication, and with the power ON. It depends on the pressure and the lubricant quality.

Weight

Item			4KB1	4KB2	4KB3	4KB4
Weight g	2-position	Single	104	200	353	579
		Double	144	240	454	689
	3-position		154	255	493	759

Flow characteristics

Model No.	Solenoid position		C[dm³/(s·bar)]	b
4KB1	2-position		0.89	0.44
	3-position	All ports closed	0.63	0.50
		A/B/R connection	1.2	0.29
		P/A/B connection	0.75	0.39
4KB2	2-position		2.7	0.24
	3-position	All ports closed	2.4	0.29
		A/B/R connection	3.0	0.27
		P/A/B connection	2.4	0.34
4KB3	2-position		6.3	0.26
	3-position	All ports closed	5.6	0.27
		A/B/R connection	6.6	0.20
		P/A/B connection	5.9	0.27
4KB4	2-position		12	0.24
	3-position	All ports closed	11	0.27
		A/B/R connection	13	0.21
		P/A/B connection	10	0.22

*1: Effective cross-sectional area S and sonic conductance C are converted as S ≈ 5.0 × C.

Ozone-proof specifications

(Ending Page 5)

** - Voltage - **P11**

Copper and PTFE free specifications

● Copper- and PTFE-based materials are not used in the flow path.

** - Voltage - **P6**

CE marking specifications

** - Voltage - **ST**

• Standard voltage of 24 VDC or less is CE marking-compatible even if the model No. is not indicated with "ST".

4KB1 to 4 Series

Discrete valve; sub-plate piping

How to order

4KB2 1 0 - 06 - M1 B ( ) - AC100V

● Single solenoid valve for manifold

4KB1 1 9 - 00 - M1 B ( ) - AC100V * Gasket/mounting screw included

Ⓐ Model No.
Ⓑ Solenoid position
Ⓒ Port size
Ⓓ Manual override
Ⓔ Electrical connections
*Refer to page 1263 for the circuit diagram with surge suppressor/lamp.
Ⓕ Other options
Ⓖ Voltage

	Code	Description	Ⓐ Model No. 4KB1	4KB2	4KB3	4KB4
Ⓑ Solenoid position	1	2-position single	●	●	●	●
	2	2-position double	●	●	●	●
	3	3-position all ports closed	●	●	●	●
	4	3-position A/B/R connection	●	●	●	●
	5	3-position P/A/B connection	●	●	●	●
Ⓒ Port size	Port	Port P/A/B	Port R1/R2 (1) = Rc1/8 (2) = Rc1/4 (3) = Rc3/8 (4) = Rc1/2			
	06	Rc1/8	(1)	(2)		
	08	Rc1/4		(2)	(2)	
	10	Rc3/8			(3)	(3)
	15	Rc1/2				(4)
	Port	Port P/A/B	Port R1/R2 (5) = NPT1/8 (6) = NPT1/4 (7) = NPT3/8 (8) = NPT1/2			
	06N	NPT1/8	(5)	(6)		
	08N	NPT1/4		(6)	(6)	
	10N	NPT3/8			(7)	(7)
	15N	NPT1/2				(8)
	Port	Port P/A/B	Port R1/R2 (9) = G1/8 (10) = G1/4 (11) = G3/8 (12) = G1/2			
	06G	G1/8	(9)	(10)		
	08G	G1/4		(10)	(10)	
	10G	G3/8			(11)	(11)
	15G	G1/2				(12)
Ⓓ	Blank	Non-locking manual override	●	●	●	●
	M1	Locking manual override	●	●	●	●
Ⓔ		Refer to the electrical connections list on the next page.				
Ⓕ	Blank	No option	●	●	●	●
	K	External pilot (*2)	●	●	●	●
	S	Surge suppressor included (*3) (*4)	●	●	●	●
	-A	Coolant supported (packing: FKM)	●	●	●	●
Ⓖ Voltage	AC100V	100 VAC 50/60 Hz (Standard)	●	●	●	●
	AC200V	200 VAC 50/60 Hz (Standard)	●	●	●	●
	DC24V	24 VDC (Standard)	●	●	●	●
	DC12V	12 VDC (Option)	●	●	●	●
	AC110V	110 VAC 50/60 Hz (Option)	●	●	●	●
	AC220V	220 VAC 50/60 Hz (Option)	●	●	●	●
* Other made-to-order products						
	AC24V		●	●	●	●
	AC115V		●	●	●	●
	AC120V		●	●	●	●

[Table 1] Compact terminal box L/LS compatibility table

Code	Description			4KB1	4KB2	4KB3	4KB4	Surge suppressor
L	Without lead wire	With indicator lamp	AC	●	●	●	●	
			DC			●	●	
		With surge suppressor and indicator lamp	AC					
			DC	●	●			Integrated
LS	Without lead wire	With surge suppressor and indicator lamp	AC	●	●	●	●	Integrated
			DC			●	●	Integrated

⚠ Precautions for model No. selection

*1 : The DC voltage models of the compact terminal box "L" of 4KB1, 4KB2 are equipped with a surge suppressor.
*2 : Consult with CKD when using a vacuum with the external pilot (K).
*3: The surge suppressor for attachment is a suppression connector when the grommet lead wire is 24 VDC or less. (Refer to page 1262.)
*4 : The surge suppressor can only be selected when the grommet lead wire or compact terminal box "B" has been selected for the electrical connections.

[Example of model No.]

4KB210-06-M1BK-AC100V

Ⓐ Model : 4KB2
Ⓑ Solenoid position : 2-position single
Ⓒ Port size : Rc1/8
Ⓓ Manual override : Locking manual override
Ⓔ Electrical connections : Compact terminal box/ without lead wire
Ⓕ Other options : External pilot
Ⓖ Voltage : 100 VAC 50/60 Hz

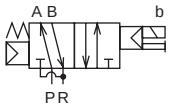
[Electrical connections list]

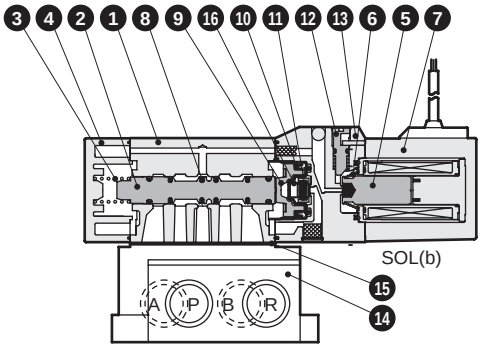
Ⓔ Electrical connections	Code	Description	Ⓐ Model No. 4KB1	4KB2	4KB3	4KB4
	Grommet lead wire					
	Blank	Grommet lead wire (300 mm)	●	●	●	●
	Compact terminal box					
	B	Without lead wire	●	●	●	●
	L	Without lead wire	Refer to [Table 1] on the previous page for details (*1)			
	LS	Without lead wire, with surge suppressor/lamp				
	C-connector (lead wire lateral direction)					
	C	Lead wire length (300 mm)	●	●	●	●
	C00	Lead wire length (500 mm)	●	●	●	●
	C01	Lead wire length (1000 mm)	●	●	●	●
	C02	Lead wire length (2000 mm)	●	●	●	●
	C03	Lead wire length (3000 mm)	●	●	●	●
	C1	Without lead wire	●	●	●	●
	C2	Lead wire length (300 mm) with surge suppressor/lamp	●	●	●	●
	C20	Lead wire length (500 mm) with surge suppressor/lamp	●	●	●	●
	C21	Lead wire length (1000 mm) with surge suppressor/lamp	●	●	●	●
	C22	Lead wire length (2000 mm) with surge suppressor/lamp	●	●	●	●
	C23	Lead wire length (3000 mm) with surge suppressor/lamp	●	●	●	●
	C3	Without lead wire, with surge suppressor/lamp	●	●	●	●
	D-connector (lead wire upward direction)					
	D	Lead wire length (300 mm)	●	●	●	●
	D00	Lead wire length (500 mm)	●	●	●	●
	D01	Lead wire length (1000 mm)	●	●	●	●
	D02	Lead wire length (2000 mm)	●	●	●	●
	D03	Lead wire length (3000 mm)	●	●	●	●
	D1	Without lead wire	●	●	●	●
	D2	Lead wire length (300 mm) with surge suppressor/lamp	●	●	●	●
	D20	Lead wire length (500 mm) with surge suppressor/lamp	●	●	●	●
	D21	Lead wire length (1000 mm) with surge suppressor/lamp	●	●	●	●
	D22	Lead wire length (2000 mm) with surge suppressor/lamp	●	●	●	●
	D23	Lead wire length (3000 mm) with surge suppressor/lamp	●	●	●	●
	D3	Without lead wire, with surge suppressor/lamp	●	●	●	●

Internal structure and parts list

4KB110

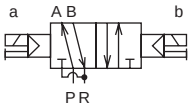
● 2-position single

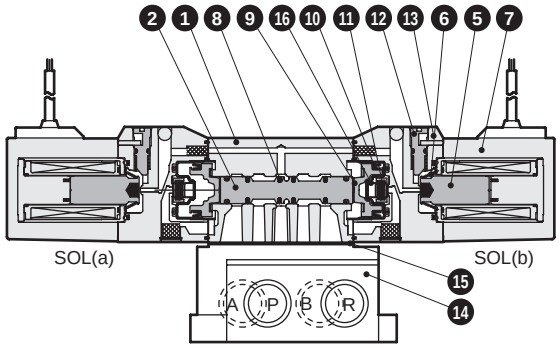




4KB120

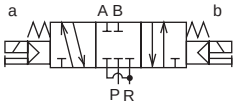
● 2-position double





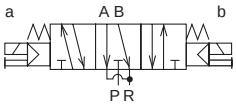
4KB130

● 3-position all ports closed



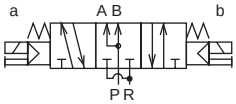
4KB140

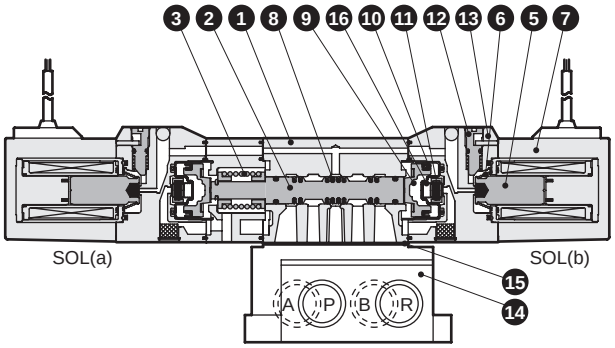
● 3-position A/B/R connection



4KB150

● 3-position P/A/B connection





Main parts list

No.	Part name		Material
1	Body		Aluminum alloy die-casting
2	Valving element (spool)		Aluminum
3	Valve spring		Stainless steel
4	Cap		Resin
5	Plunger		-
6	Plunger spring		-
7	Coil assembly		-
8	Spool packing		Nitrile rubber
9	Piston		Resin
10	Piston packing		Nitrile rubber
11	Valve seat		Nitrile rubber
12	Manual button		Resin
13	Pilot valve		Resin
14	Sub-plate		Aluminum alloy die-casting
15	Gasket	*2	Nitrile rubber
16	Valve seat spring		Stainless steel

Main parts list

No.	Component name	Model No.
14 15	Sub-plate kit	4KB110- Ⓑ Port size - Ⓕ Exterior Pilot -SUB-BASE-KIT

* Mounting screws are attached to the sub-plate kit.

Repair parts list

No./part name	2 8	9 10	5 6 7
Model No.	Spool assembly	Piston assembly	Coil assembly *
4KB110	4K9-110	4K9-151	4K1L- Ⓔ electrical connection option code - Blank for grommet lead wire
4KB120	4K9-118		
4KB130	4K9-111	4K9-152	
4KB140	4K9-112		COIL - Ⓖ Voltage
4KB150	4K9-113		

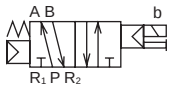
*1: The compact terminal box and connector of the coil assembly will come assembled and attached with the options of the descriptions indicated with model No. selection.

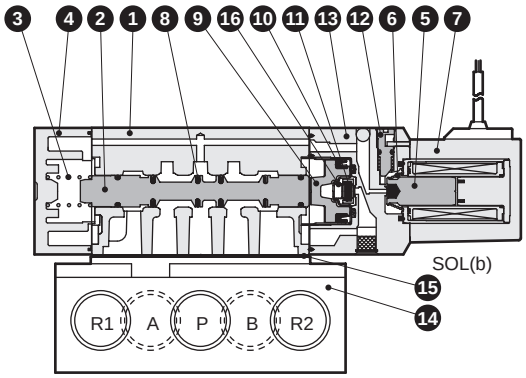
*2: Take care, as gasket ⑮ mounting has an orientation.

Internal structure and parts list

4KB210

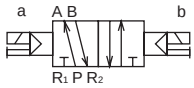
● 2-position single

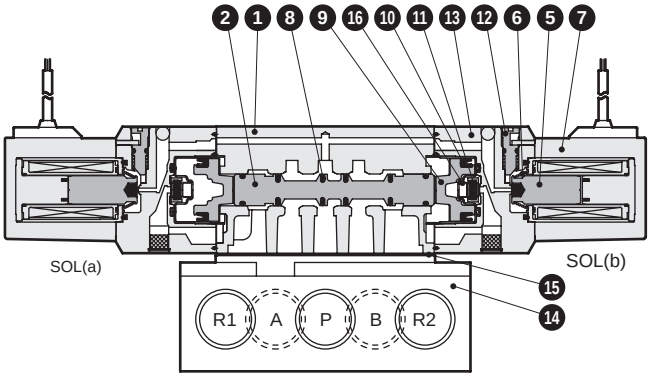




4KB220

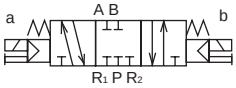
● 2-position double





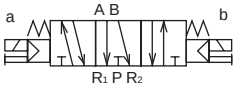
4KB230

● 3-position all ports closed



4KB240

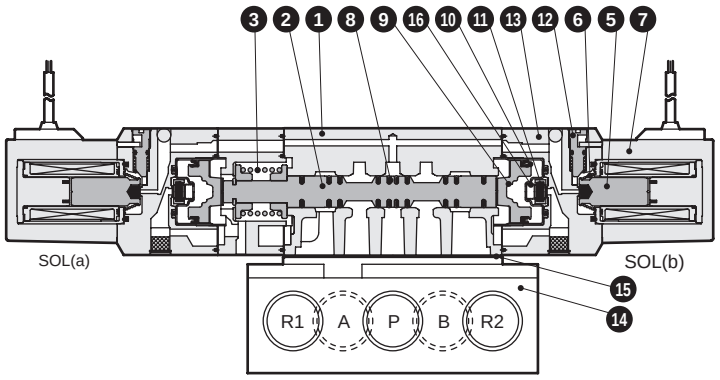
● 3-position A/B/R connection



4KB250

● 3-position P/A/B connection





Main parts list

No.	Part name	Material
1	Body	Aluminum alloy die-casting
2	Valving element (spool)	Aluminum
3	Valve spring	Stainless steel
4	Cap	Resin
5	Plunger	-
6	Plunger spring	-
7	Coil assembly	-
8	Spool packing	Nitrile rubber
9	Piston	Resin
10	Piston packing	Nitrile rubber
11	Valve seat	Nitrile rubber
12	Manual button	Resin
13	Pilot valve	Resin
14	Sub-plate	Aluminum alloy die-casting
15	Gasket	Nitrile rubber
16	Valve seat spring	Stainless steel

Main parts list

No.	Component name	Model No.
14 15	Sub-plate kit	4KB210- (B) Port size - (F) Exterior Pilot -SUB-BASE-KIT

* Mounting screws are attached to the sub-plate kit.

Repair parts list

No./part name	2 8	9 10	5 6 7
Model No.	Spool assembly	Piston assembly	Coil assembly *
4KB210	4K9-150	4K9-153	4K1L- (E) electrical connection option code - Blank for grommet lead wire
4KB220	4K9-126		
4KB230	4K9-127	4K9-154	
4KB240	4K9-128		COIL - (G) Voltage
4KB250	4K9-129		

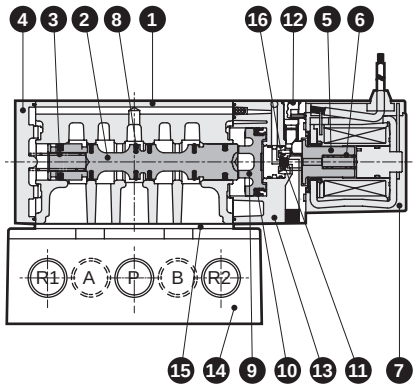
*1: The compact terminal box and connector of the coil assembly will come assembled and attached with the options of the descriptions indicated with model No. selection.

Internal structure and parts list

4KB310

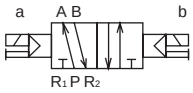
● 2-position single

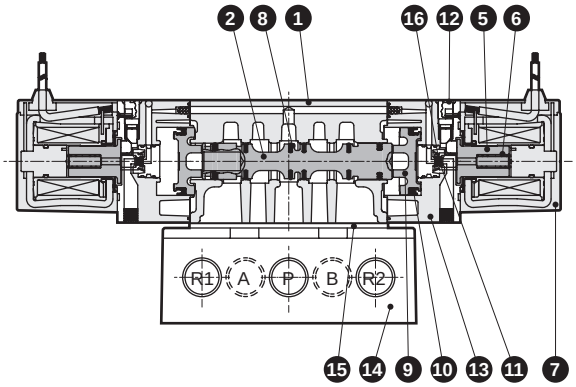




4KB320

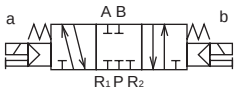
● 2-position double





4KB330

● 3-position all ports closed



4KB340

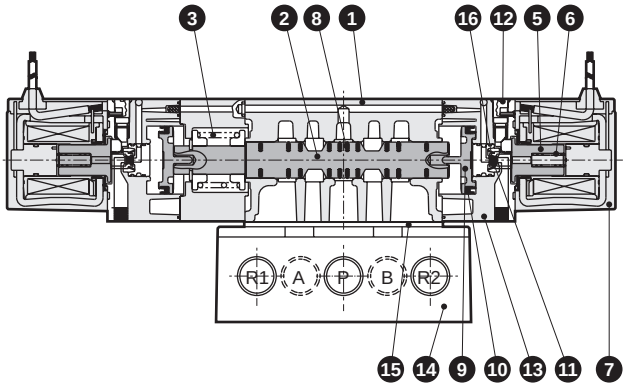
● 3-position A/B/R connection



4KB350

● 3-position P/A/B connection





Main parts list

No.	Part name	Material
1	Body	Aluminum alloy die-casting
2	Valving element (spool)	Aluminum
3	Valve spring	Stainless steel
4	Cap	Resin
5	Plunger	-
6	Plunger spring	-
7	Coil assembly	-
8	Spool packing	Nitrile rubber
9	Piston	Resin
10	Piston packing	Nitrile rubber
11	Valve seat	Nitrile rubber
12	Manual button	Resin
13	Pilot valve	Resin
14	Sub-plate	Aluminum alloy die-casting
15	Gasket *2	Nitrile rubber
16	Valve seat spring	Stainless steel

Main parts list

No.	Component name	Model No.
14 15	Sub-plate kit	4KB310- (B) Port size - (F) External pilot -SUB-BASE-KIT

* Mounting screws are attached to the sub-plate kit.

Repair parts list

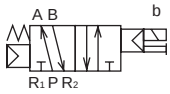
No./part name	2 8	9 10	5 6 7
Model No.	Spool assembly	Piston assembly	Coil assembly *1
4KB310	4K9-133	4K9-137	4K3- (E) electrical connection option code - Blank for grommet lead wire COIL - (G) Voltage
4KB320			
4KB330	4K9-134	4K9-138	
4KB340	4K9-135		
4KB350	4K9-136		

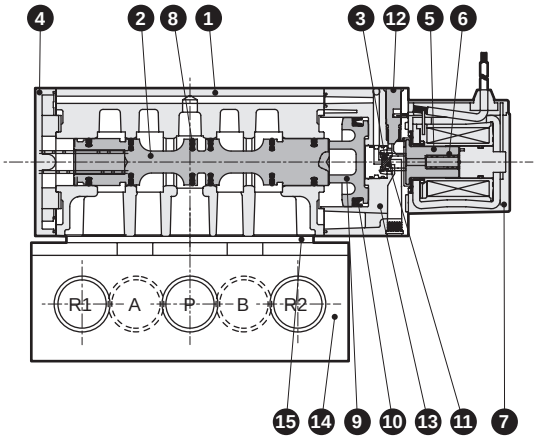
* 1: The terminal box and connector of the coil assembly will come assembled and included with the options of the descriptions indicated with model No. selection.
* 2: Take care, as gasket (15) mounting has an orientation.

Internal structure and parts list

4KB410

● 2-position single

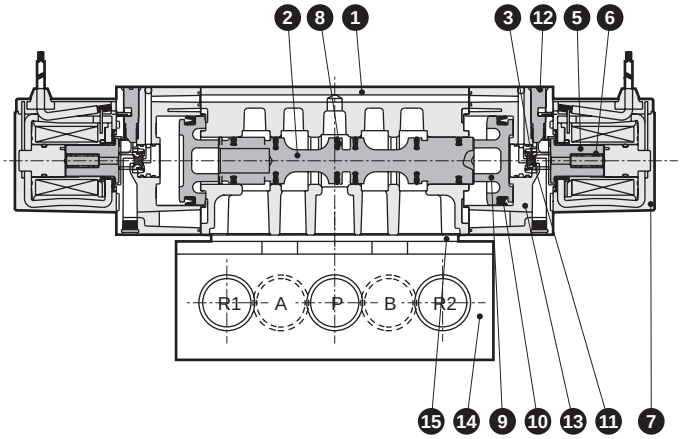




4KB420

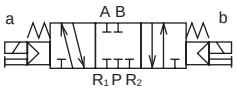
● 2-position double





4KB430

● 3-position all ports closed



4KB440

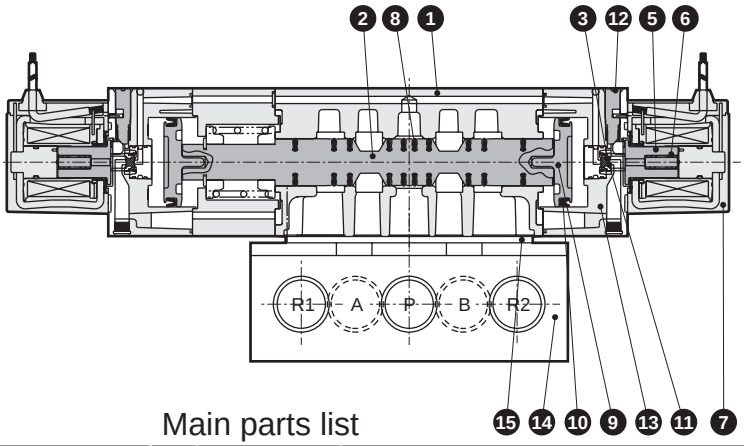
● 3-position A/B/R connection



4KB450

● 3-position P/A/B connection





Main parts list

No.	Part name	Material
1	Body	Aluminum alloy die-casting
2	Valving element (spool)	Aluminum
3	Valve spring	Stainless steel
4	Cap	Resin
5	Plunger	-
6	Plunger spring	-
7	Coil assembly	-
8	Spool packing	Nitrile rubber
9	Piston	Resin
10	Piston packing	Nitrile rubber
11	Valve seat	Nitrile rubber
12	Manual button	Resin
13	Pilot valve	Resin
14	Sub-plate	Aluminum alloy die-casting
15	Gasket	Nitrile rubber
16	Valve seat spring	Stainless steel

Main parts list

No.	Component name	Model No.
14 15	Sub-plate kit	4KB410- Ⓑ Port size - Ⓕ External pilot -SUB-BASE-KIT

* Mounting screws are attached to the sub-plate kit.

Repair parts list

No./part name	2 8	9 10	5 6 7
Model No.	Spool assembly	Piston assembly	Coil assembly *
4KB410	4K9-140	4K9-144	4K3- Ⓔ electrical connection option code - (Blank for grommet lead wire)
4KB420			
4KB430	4K9-141	4K9-145	COIL - Ⓖ Voltage
4KB440	4K9-142		
4KB450	4K9-143		

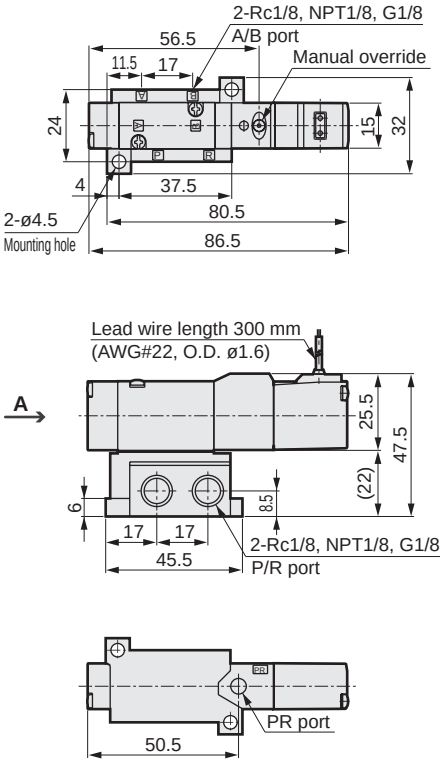
* 1: The plunger assembly is attached with the coil assembly. As there are limitations with the combinations of coils and plungers, do not replace these.
* 2: The terminal box and connector of the coil assembly will come assembled and included with the options of the descriptions indicated with model No. selection.
* 3: When combining a coil assembly into a valve, contact CKD for precautions regarding the work.

4GA/B
M4GA/B
MN4GA/B
4GA/B (master)
4GB With sensor
4GD/E
M4GD/E
MN4GD/E
4GA4/B4
MN3E MN4E
W4GA/B2
W4GB4
MN3S0 MN4S0
4SA/B0
4KA/B
4KA/B (master)
4F
4F (master)
PV5G GMF
PV5 GMF
PV5S-0
3Q
MV3QR
3MA/B0
3PA/B
P/M/B
NP/NAP NVP
4G*0EJ
4F*0EX
4F*0E
HMV HSV
2QV 3QV
SKH
Silencer
TotAirSys (Total Air)
TotAirSys (Gamma)
Ending

Dimensions

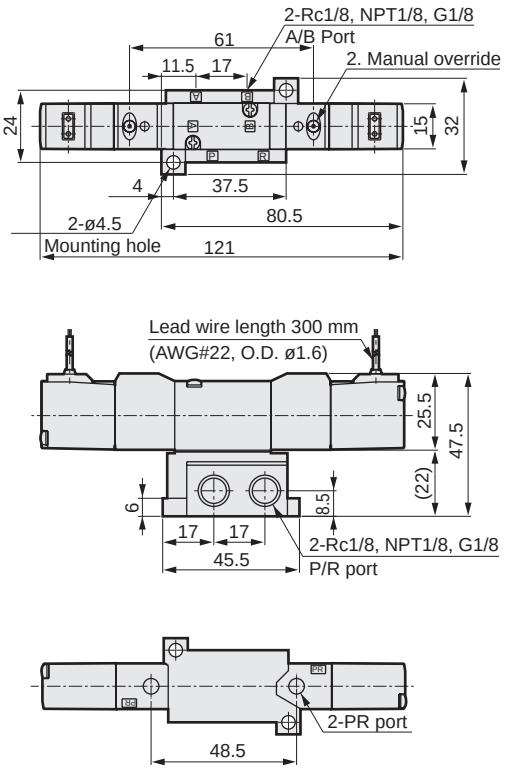
4KB110

● 2-position single: grommet lead wire



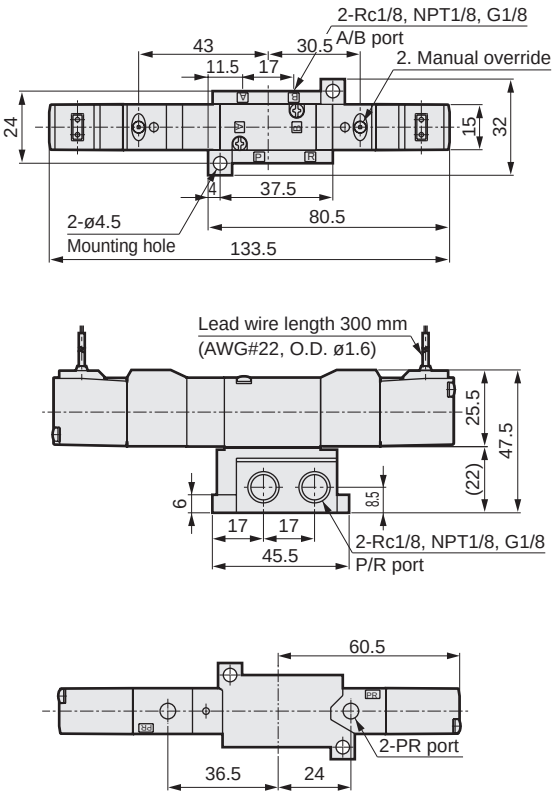
4KB120

● 2-position double: grommet lead wire



4KB1 3 4 5 0

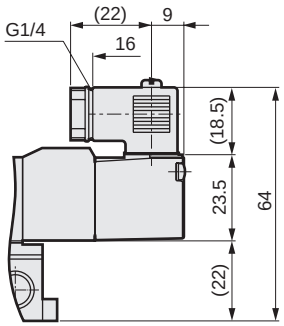
● 3-position: grommet lead wire



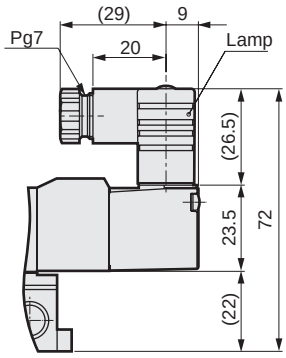
Dimensions

● Compact terminal box: (B [Without lamp]/L/LS [With lamp])

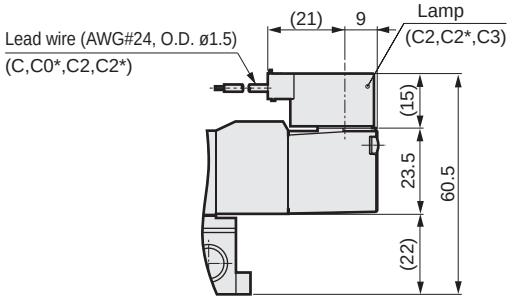
Without indicator lamp



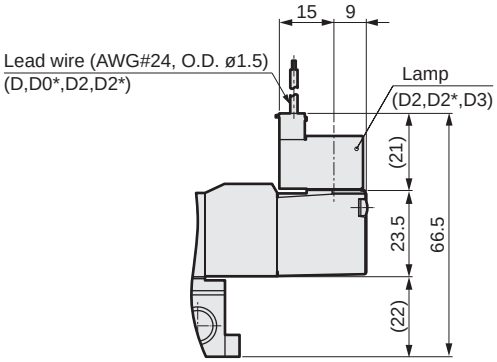
With indicator lamp



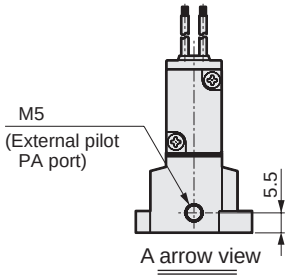
● C-connector: (C/C1/C0*/C2/C2*/C3)



● D-connector: (D/D1/D0*/D2/D2*/D3)



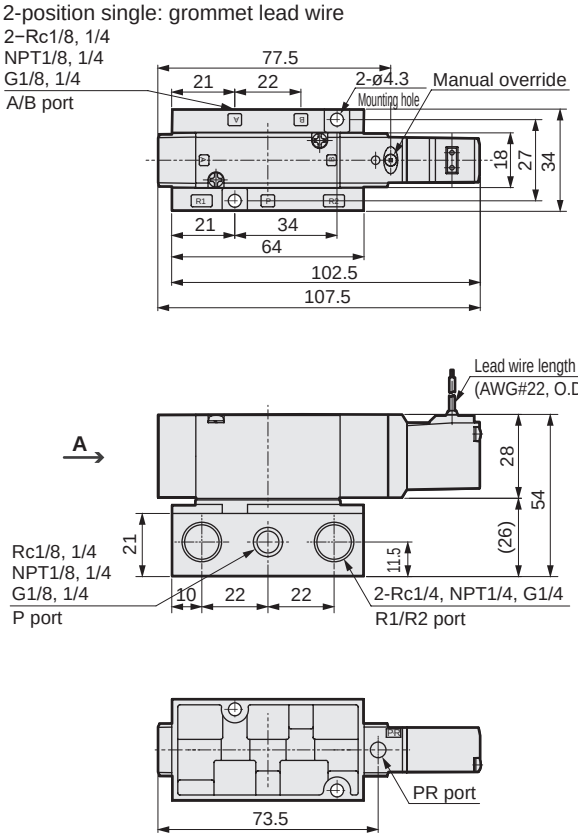
● External pilot: (K)



Dimensions CAD

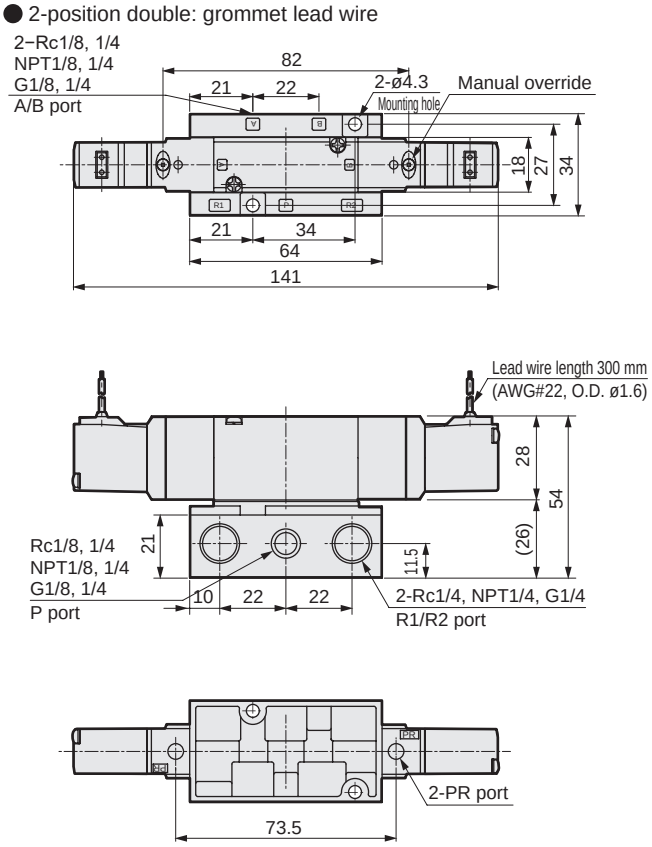
4KB210

● 2-position single: grommet lead wire



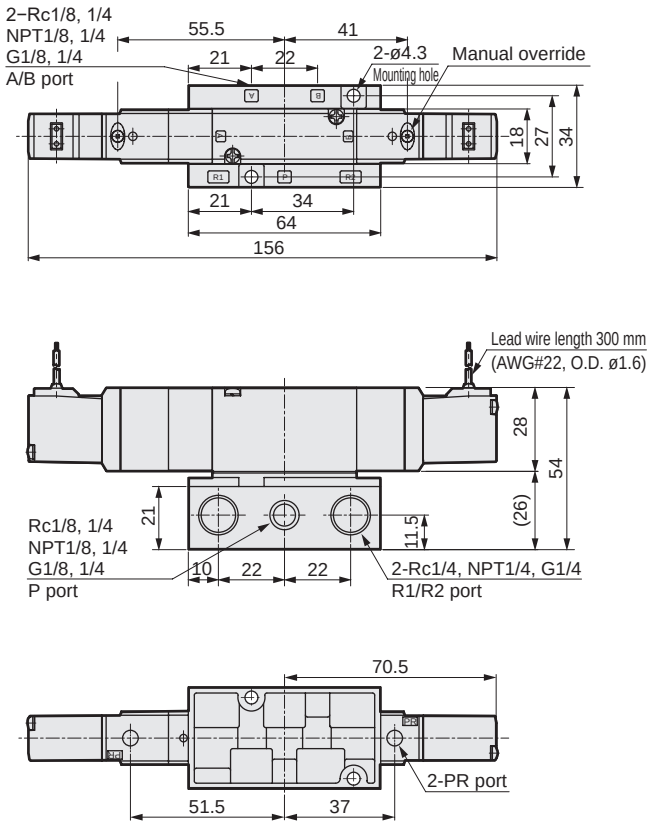
4KB220

● 2-position double: grommet lead wire



4KB2 $^{3}_{4}$0 $_{5}$

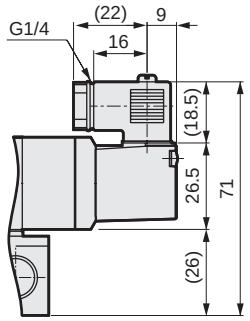
● 3-position: grommet lead wire



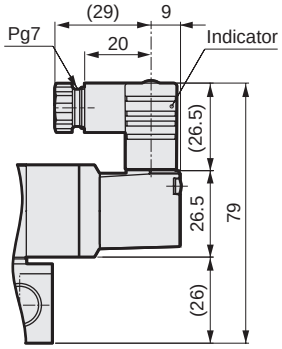
Dimensions

● Compact terminal box: (B [Without lamp]/L/LS [With lamp])

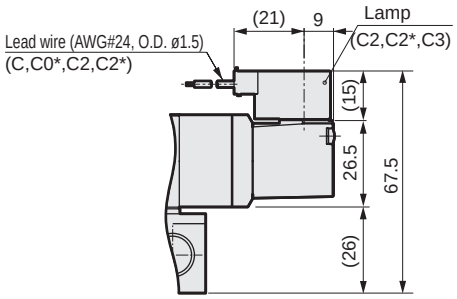
Without indicator lamp



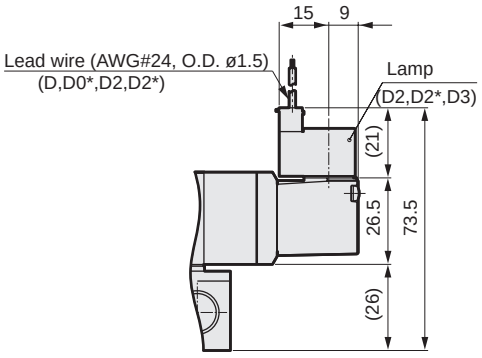
With indicator lamp



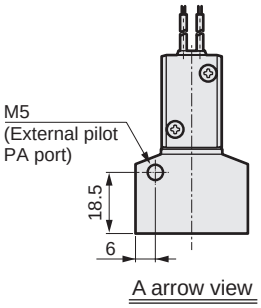
● C-connector: (C/C1/C0*/C2/C2*/C3)



● D-connector: (D/D1/D0*/D2/D2*/D3)



● External pilot: (K)

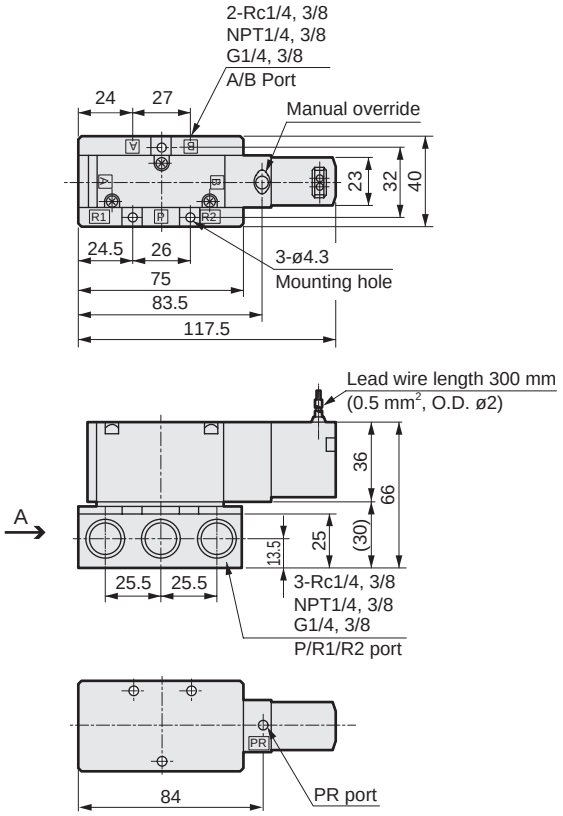


4GA/B
M4GA/B
MN4GA/B
4GA/B (master)
4GB With sensor
4GD/E
M4GD/E
MN4GD/E
4GA4/B4
MN3E MN4E
W4GA/B2
W4GB4
MN3S0 MN4S0
4SA/B0
4KA/B
4KA/B (master)
4F
4F (master)
PV5G GMF
PV5 GMF
PV5S-0
3Q
MV3QR
3MA/B0
3PA/B
P/M/B
NP/NAP NVP
4G*0EJ
4F*0EX
4F*0E
HMV HSV
2QV 3QV
SKH
Silencer
TotAirSys (Total Air)
TotAirSys (Gamma)
Ending

Dimensions CAD

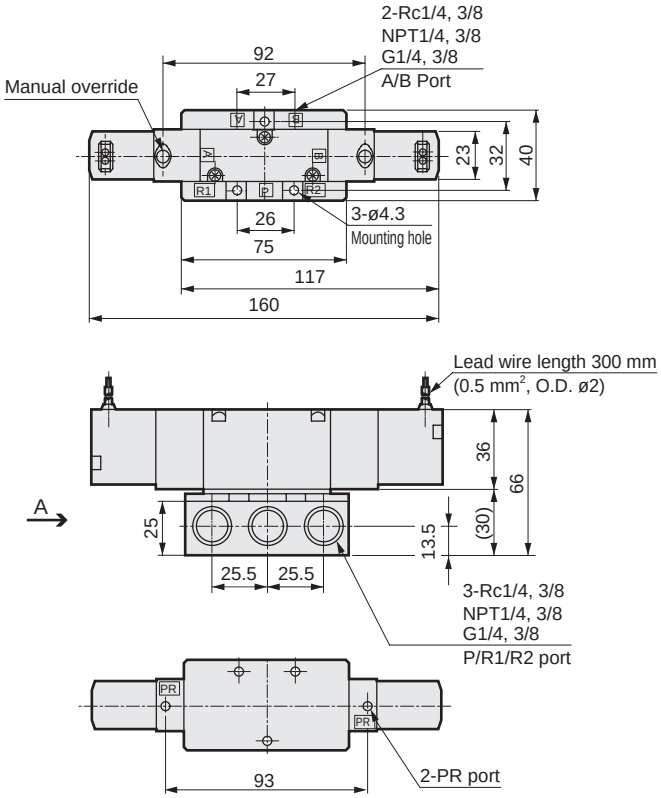
4KB310

● 2-position single: grommet lead wire



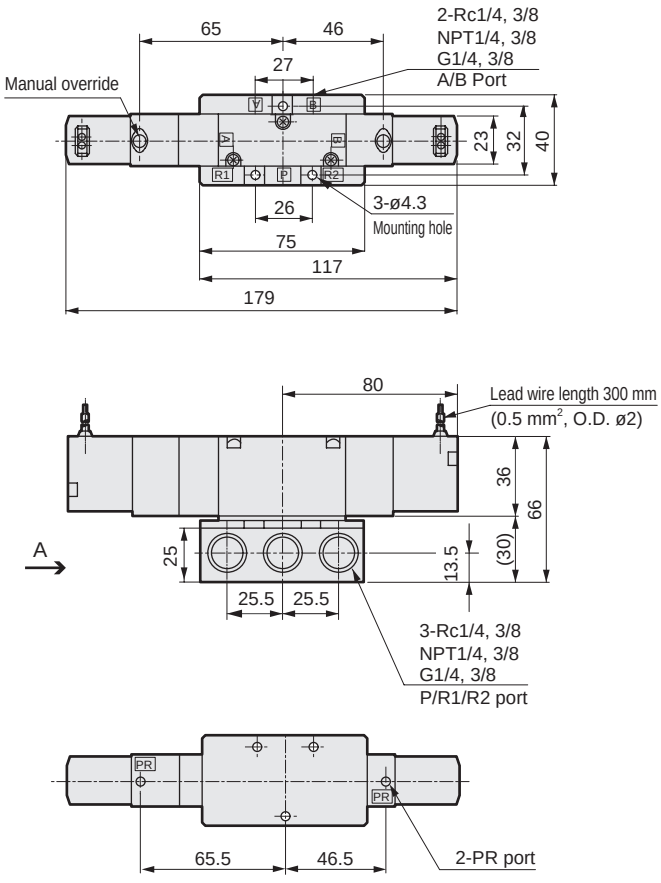
4KB320

● 2-position double: grommet lead wire



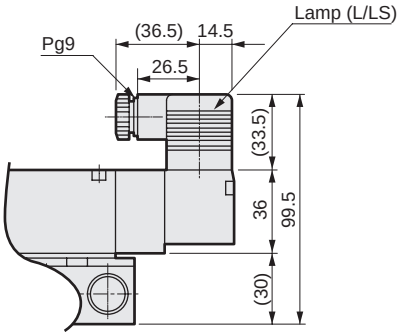
4KB3 3 4 0 5

● 3-position: grommet lead wire

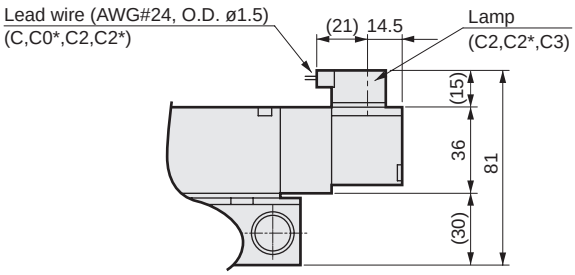


Dimensions

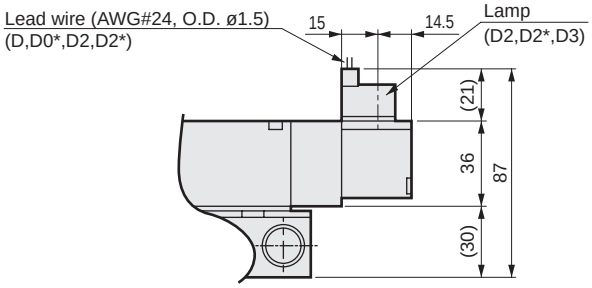
● Terminal box: (B/L/LS)



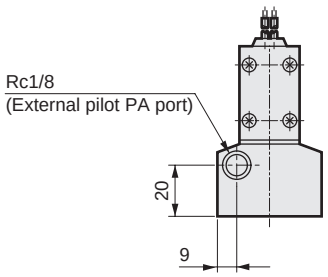
● C-connector: (C/C1/C0*/C2/C2*/C3)



● D-connector: (D/D1/D0*/D2/D2*/D3)



● External pilot: (K)

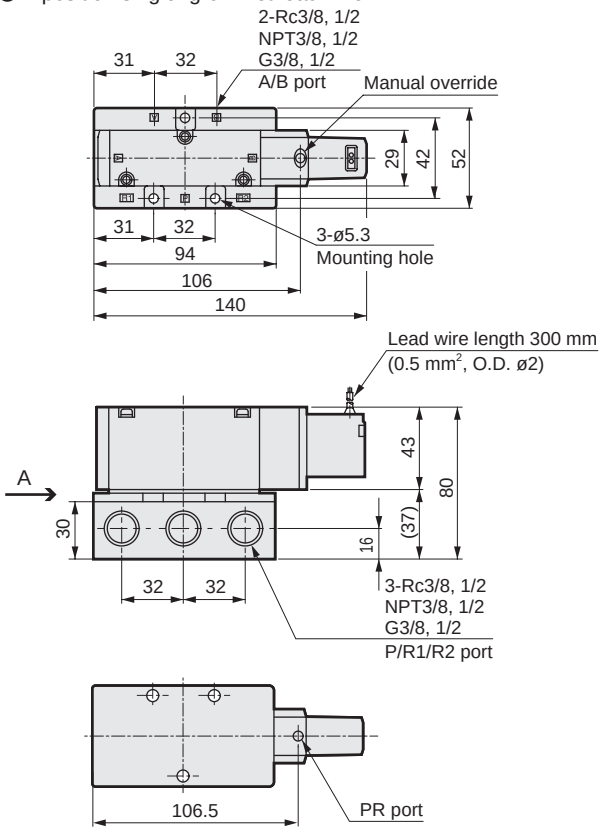


A arrow view

Dimensions

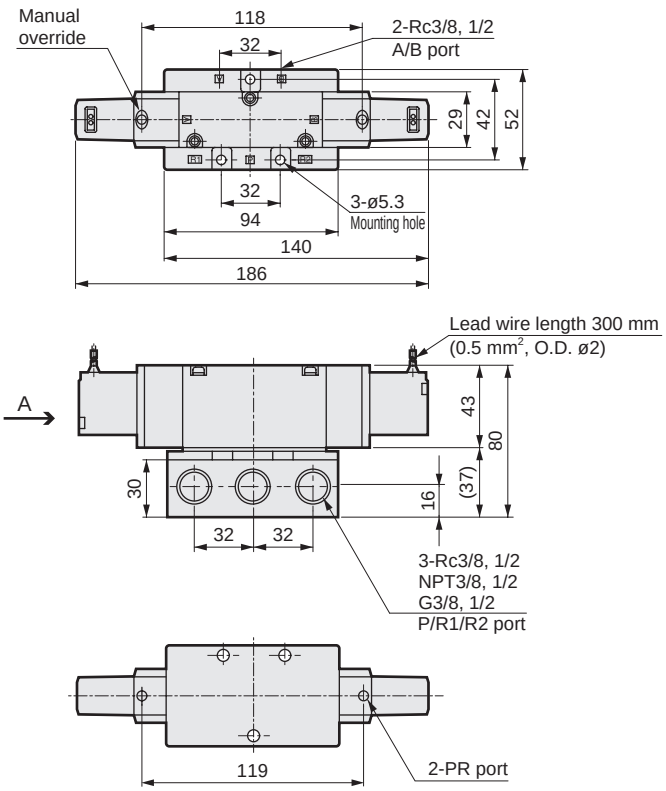
4KB410

● 2-position single: grommet lead wire



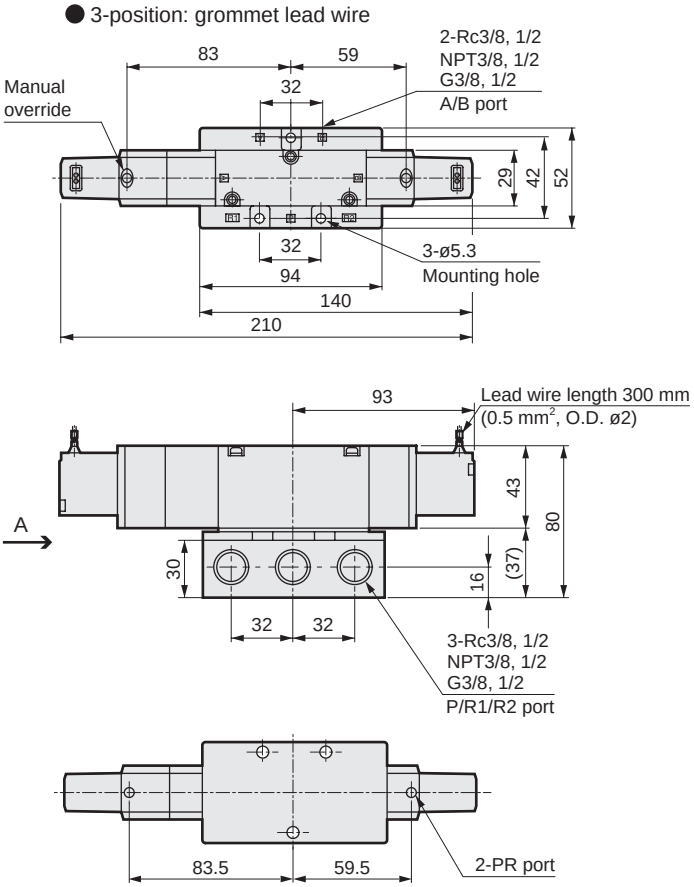
4KB420

● 2-position double: grommet lead wire



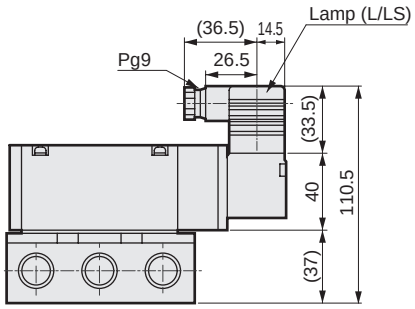
4KB4$^{3}_{5}$40

● 3-position: grommet lead wire

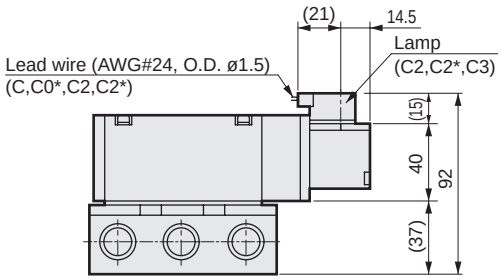


Dimensions

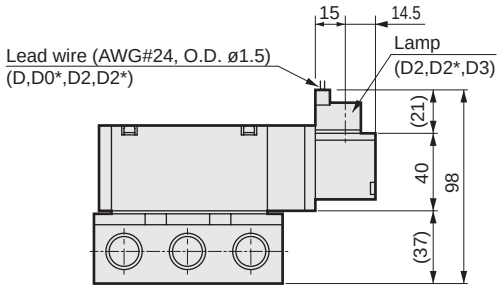
● Terminal box: (B/L/LS)



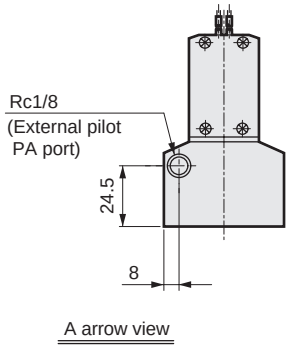
● C-connector: (C/C1/C0*/C2/C2*/C3)



● D-connector: (D/D1/D0*/D2/D2*/D3)



● External pilot: (K)



A arrow view

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