



Direct acting 2-port solenoid valve

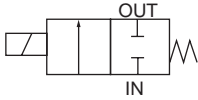
FFB Series

- NC, NO
- Port size: Rc, G, NPT 1/8 to 1/2

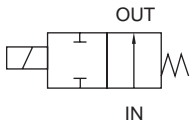


JIS symbol

- FFB-*1:NC (Open when energized)



- FFB-*2:NO (Closed when energized)



Common specifications

Item	FFB
Working fluid	Compressed air/water/oil (50mm ² /s or less)/medium vacuum (*2, *3)/dry air
Max. working pressure MPa	1.4 (refer to working pressure in individual specifications.)
Proof pressure (water pressure) MPa	2.1 (NC), 1.5 (NO)
Fluid temperature °C	-10 to 60 (no freezing)
Ambient temperature °C	-10 to 60 (DC), -10 to 55 (AC)
Thermal class	Class 130 (B)
Atmosphere	Place free of corrosive gas and explosive gas
Valve structure	Direct acting poppet structure
Valve seat leakage cm ³ /min (ANR)	0.2 or less (air)
Valve seat leakage *1 Pa·m ³ /sHe	1.33 x 10 ⁻⁶ or less
Mounting orientation	Unrestricted
Degree of protection	IP65

*1: Amount of leakage in medium vacuum. (FFB Series NC only)

*2: When using at medium vacuum, vacuum the OUT port side.

*3: When using with medium vacuum, select the material option "G""M".

Electrical specifications

Item	FFB-2							FFB-3						
	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz
Rated voltage V	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz
Voltage fluctuation range	±10%							±10%						
Power consumption W	3.5	3.5	-	-	-	-	-	4.5	4.5	-	-	-	-	-
Apparent power VA	-	-	5.1	5.7	6.0	5.3	5.7	-	-	6.2	6.1	6.2	6.2	6.5

Item	FFB-4							FFB-5						
	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz
Rated voltage V	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz
Voltage fluctuation range	±10%							±10%						
Power consumption W	7	7	-	-	-	-	-	10.5	10.5	-	-	-	-	-
Apparent power VA	-	-	8.6	10	9.6	9.5	9.4	-	-	13	13	14	14	13

The leakage current must be less than or equal to the values shown below.

Voltage	AC					DC	
	100V	110V	200V	220V	230V	12V	24V
Leakage current	2 mA or less		1 mA or less			5 mA or less	

Individual specifications

Item Model No.	Port size Rc/G/NPT	Orifice size (mm)	Working pressure (MPa) *1	Working pressure Pa (abs) *2, *3	Flow Rate Characteristics			Weight (kg) *4
					C[dm ³ /(s·bar)]	b	Cv	
NC (Normally Closed)								
FFB-21 06 * S	1/8	1.5	0 to 1.0	1.3×10^{-2} to 1×10^6	0.31	0.42	0.085	0.21
		2	0 to 0.6	1.3×10^{-2} to 0.6×10^6	0.53	0.34	0.13	
FFB-31 06 08 * 2	1/8 1/4	2	0 to 1.4	1.3×10^{-2} to 1.4×10^6	0.56	0.50	0.15	0.36
		3	0 to 0.6	1.3×10^{-2} to 0.6×10^6	1.2	0.45	0.31	
		5	0 to 0.2	1.3×10^{-2} to 0.2×10^6	2.9	0.43	0.63	
FFB-41 08 10 * 4	1/4 3/8	4	0 to 1.0	1.3×10^{-2} to 1×10^6	1.4	0.52	0.43	0.55
		7	0 to 0.15	1.3×10^{-2} to 0.15×10^6	4.2	0.43	1.15	
FFB-51 08 10 15 * 5	1/4 3/8 1/2	5	0 to 0.8	1.3×10^{-2} to 0.8×10^6	2.7	0.45	0.72	0.85
		7	0 to 0.3	1.3×10^{-2} to 0.3×10^6	4.7	0.38	1.2	
		X	0 to 0.1	1.3×10^{-2} to 0.1×10^6	6.9	0.41	2.0	
NO (closed when energized)								
FFB-32 06 08 * 2	1/8 1/4	2	0 to 0.9		0.53	0.46	0.13	0.46
		3	0 to 0.5		0.77	0.54	0.19	
		5	0 to 0.15		1.4	0.56	0.37	
FFB-42 08 10 * 3	1/4 3/8	3	0 to 0.8		1.2	0.45	0.31	0.71
		4	0 to 0.4		1.8	0.38	0.56	
		7	0 to 0.12		3.5	0.36	0.95	
FFB-52 08 10 * 4	1/4 3/8	4	0 to 0.8		1.8	0.38	0.56	0.9
		5	0 to 0.5		2.8	0.31	0.72	
		7	0 to 0.25		3.5	0.36	0.95	

*1: Can be used with low vacuum [1.33×10^2 Pa (abs)], but valve seat leakage is 0.2 cm³/min (ANR) or less. (Valve seat leakage at positive pressure) When used in a low vacuum, the lower limit of operating pressure is 1.33×10^2 Pa (abs), so the upper limit is 0.1 MPa lower.

*2: Working pressure at medium vacuum.

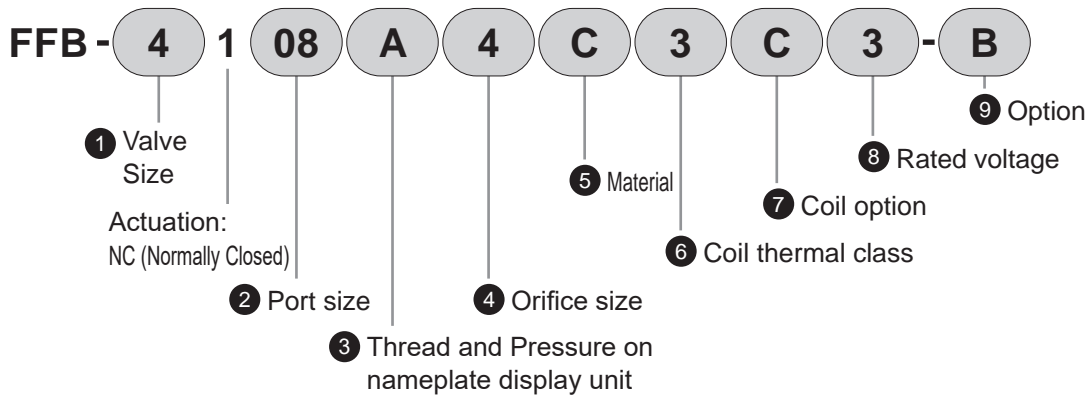
*3: When using at medium vacuum, vacuum the OUT port side.

*4: Brass body DC lead wire weight.

Discrete FFB
 Manifold FFBM
 Discrete FFG
 Manifold FFGM
 Working fluid check list
 Flow rate formula
 Safety caution

How to order

● NC (Normally Closed)



1 Valve size		Valve size			
		2	3	4	5
2	Width 24 mm	●			
3	Width 30 mm		●		
4	Width 35 mm			●	
5	Width 40 mm				●

2 Port size		Valve size			
		2	3	4	5
06	1/8	●	●		
08	1/4		●	●	●
10	3/8			●	●
15	1/2				●

3 Thread and pressure unit indicated on nameplate		
	Thread	Pressure display unit
A	Rc thread	MPa
B	G thread	bar
C	NPT thread	psi *1
D	G thread	MPa *2
E	NPT thread	MPa *2

4 Orifice size		Valve size			
		2	3	4	5
S	ø1.5	●			
2	ø2	●	●		
3	ø3		●		
4	ø4			●	
5	ø5		●		●*1
7	ø7			●	●
X	ø10				●*2

*1: In compliance with the Measurement Act, the psi display cannot be used in Japan.
*2: "D", "E" is a selection to display the pressure display unit as MPa even with G threads and NPT threads mainly in Japan.

*1: 2 Not available when port size is "15".
*2: 2 Not available for port size 08.

5 Material

	Body	Seal	Treatment	Working fluid
A	Aluminum	NBR		Compressed air / dry air
C	Brass	NBR	-	Compressed air / Dry air / Water / Oil / Low vacuum *1
D		FKM		Compressed air / Dry air / Water / Oil / Low vacuum *1
G	Stainless steel	FKM	Vacuum inspection	Compressed air / Dry air / Medium vacuum *2
H		NBR	-	Compressed air / Dry air / Water / Oil / Low vacuum *1
J	Stainless steel	FKM		Compressed air / Dry air / Water / Oil / Low vacuum *1
M		FKM	Vacuum inspection	Compressed air / Dry air / Medium vacuum *2
N	Brass	NBR		Compressed air / Dry air / Water / Oil / Low vacuum *1
P		FKM		Compressed air / Dry air / Water / Oil / Low vacuum *1
Q	Stainless steel	EPDM	Oil-prohibited	Water
S		NBR		Compressed air / Dry air / Water / Oil / Low vacuum *1
T	Stainless steel	FKM		Compressed air / Dry air / Water / Oil / Low vacuum *1
U		EPDM		Water

*1: Although it can be used with low vacuum [1.33×10^2 Pa (abs)], valve seat leakage is 0.2 cm³/min (ANR) or less. (Valve seat leakage at positive pressure) When used in a low vacuum, the lower limit of operating pressure is 1.33×10^2 Pa (abs), so the upper limit is 0.1 MPa lower.
*2: 4 Not available when the orifice size is "X".

6 Coil thermal class

3	Class 130 (B)
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7 Coil option		1 Valve size				Voltage	
		2	3	4	5	DC	AC
A	Lead wire (300 mm)	●	●	●	●	●	●
B	With DIN terminal box (G1/2)	*1	●	●	●	●	●
C	With DIN terminal box (Pg11)	●*2	●	●	●	●	●
D	DIN terminal box with lamp (Pg11)	●*2	●	●	●	*3	●
E	Conduit (G1/2)	●	●	●	●	●	●
F	Conduit (CTC19)	●	●	●	●	●	●
G	HP terminal box (G1/2)	●	●	●	●	●	●
H	HP terminal box with lamp (G1/2)	●	●	●	●	●	●*5
J	Lead wire (300 mm)	●	●	●	●	●*4	*6
K	With DIN terminal box (Pg11)	●*2	●	●	●	●	
L	DIN terminal box with lamp (Pg11)	●*2	●	●	●	●	
M	Conduit (G1/2)	●	●	●	●	●	
P	Conduit (CTC19)	●	●	●	●	●	
Q	HP terminal box (G1/2)	●	●	●	●	●	
R	HP terminal box with lamp (G1/2)	●	●	●	●	●	
S	DIN coil without terminal box	●	●	●	●	●*7	●*6

- *1: Coil option "B" cannot be selected when the valve size of 1 is "2".
- *2: When the valve size of 1 is "2", the DIN terminal box thread size is as in Pg9.
- *3: Use "L" DIN terminal box with lamp/surge suppressor
- *4: The surge suppressor of the DC voltage coil option "J" is included with product.
- *5: When the coil option is "H", the rated voltage "K" (230 VAC) cannot be selected.
- *6: All AC voltages are equipped with a full-wave rectifier circuit. For this reason, a surge suppressor is not available.
- *7: Surge suppressor is not available. Use the terminal box with surge suppressor.

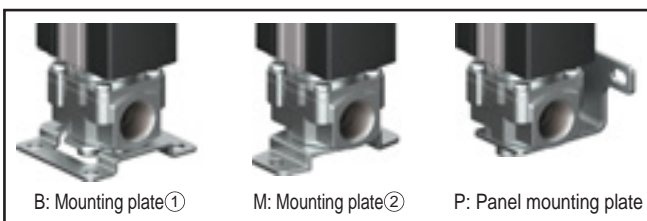
8 Rated voltage

1	100 VAC 50/60 Hz
2	200 VAC 50/60 Hz
3	24 VDC
4	12 VDC
5	110 VAC 50/60 Hz
6	220 VAC 50/60 Hz
K	230 VAC 50/60 Hz

9 Option *1

Blank	None
B	Mounting plate ① *2
M	Mounting plate ② *3, *4
P	Panel mounting plate

- *1: Mounting plate and panel mounting plate are included with the product. Refer to the precautions on page 56 for tightening torque.
- *2: Mounting plate ① is compatible with our product FAB, FGB, FVB, FWB, FLB Series.
- *3: Not available when the valve size of 1 is "2".
- *4: Mounting plate ② is compatible with our product AB Series.



How to order mounting plate

With body mounting screw

	Mounting plate code: B	Mounting plate code: M	Mounting plate code: P
FFB-21	FFB-21-B-MOUNT-PLATE-KIT	No setting	FFB-21-P-MOUNT-PLATE-KIT
FFB-31	FFB-31-B-MOUNT-PLATE-KIT	FFB-31-M-MOUNT-PLATE-KIT	FFB-31-P-MOUNT-PLATE-KIT
FFB-41	FFB-41-B-MOUNT-PLATE-KIT	FFB-31-M-MOUNT-PLATE-KIT	FFB-31-P-MOUNT-PLATE-KIT
FFB-51	FFB-51-B-MOUNT-PLATE-KIT (Aluminum body) FFB-41-B-MOUNT-PLATE-KIT (brass, stainless steel body)	FFB-51-M-MOUNT-PLATE-KIT	FFB-51-P-MOUNT-PLATE-KIT

Coil option code

A(DC) J		Grommet lead wire 300 mm Grommet lead wire 300 mm/ With surge suppressor
A(AC)		Grommet lead wire 300 mm
B C K		DIN terminal box DIN terminal box with surge suppressor
D L		DIN terminal box with lamp DIN terminal box / lamp, With surge suppressor
G Q		HP terminal box HP terminal box with surge suppressor
H R		HP terminal box with lamp HP terminal box / lamp, With surge suppressor
E F M P		Conduit (G1/2) Conduit (CTC19) Conduit (G1/2) with surge suppressor Conduit (CTC19) with surge suppressor
S		DIN coil without terminal box

Discrete FFB

Manifold FFBM

Discrete FFG

Manifold FFGM

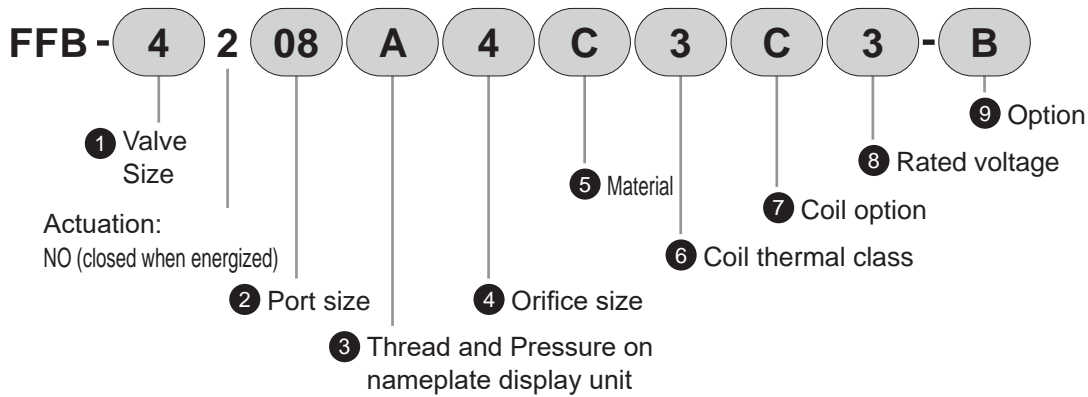
Working fluid
check list

Flow rate formula

Safety caution

How to order

● NO (closed when energized)



1 Valve size		Valve size		
		3	4	5
3	Width 30 mm	●		
4	Width 35 mm		●	
5	Width 40 mm			●

2 Port size		Valve size		
		3	4	5
06	1/8	●		
08	1/4	●	●	●
10	3/8		●	●

3 Thread and pressure unit indicated on nameplate	Thread		Pressure display unit
	A	Rc thread	MPa
B	G thread	bar	
C	NPT thread	psi *1	
D	G thread	MPa *2	
E	NPT thread	MPa *2	

4 Orifice size		Valve size		
		3	4	5
2	ø2	●		
3	ø3	●	●	
4	ø4		●	●
5	ø5	●		●
7	ø7		●	●

*1: In compliance with the Measurement Act, the psi display cannot be used in Japan.

*2: "D", "E" is a selection to display the pressure display unit as MPa even with G threads and NPT threads mainly in Japan.

5 Material

	Body	Seal	Treatment	Working fluid
A	Aluminum	NBR	-	Compressed air / dry air
C	Brass	NBR		Compressed air / Dry air / Water / Oil / Low vacuum *1
D		FKM		Compressed air / Dry air / Water / Oil / Low vacuum *1
H	Stainless steel	NBR		Compressed air / Dry air / Water / Oil / Low vacuum *1
J		FKM	Compressed air / Dry air / Water / Oil / Low vacuum *1	
N	Brass	NBR	Oil-prohibited	Compressed air / Dry air / Water / Oil / Low vacuum *1
P		FKM		Compressed air / Dry air / Water / Oil / Low vacuum *1
Q	Stainless steel	EPDM		Water
S		NBR		Compressed air / Dry air / Water / Oil / Low vacuum *1
T		FKM		Compressed air / Dry air / Water / Oil / Low vacuum *1
U		EPDM		Water

*1: Low vacuum [1.33×10^2 Pa (abs)] can be used, but valve seat leakage is 0.2 cm³/min (ANR) or less. (Valve seat leakage at positive pressure) When used in a low vacuum, the lower limit of operating pressure is 1.33×10^2 Pa (abs), so the upper limit is 0.1 MPa lower.

6 Coil thermal class

3	Class 130 (B)
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		① Valve size			Voltage		
		3	4	5	DC	AC	
7 Coil option	A	Lead wire (300 mm)	●	●	●	●	●
	B	With DIN terminal box (G1/2)	●	●	●	●	●
	C	With DIN terminal box (Pg11)	●	●	●	●	●
	D	DIN terminal box with lamp (Pg11)	●	●	●	●	●
	E	Conduit (G1/2)	●	●	●	●	●
	F	Conduit (CTC19)	●	●	●	●	●
	G	HP terminal box (G1/2)	●	●	●	●	●
	H	HP terminal box with lamp (G1/2)	●	●	●	●	●*3
	J	Lead wire (300 mm)	●	●	●	●*2	*4
	K	With DIN terminal box (Pg11)	●	●	●	●	
	L	DIN terminal box with lamp (Pg11)	●	●	●	●	
	M	Conduit (G1/2)	●	●	●	●	
	P	Conduit (CTC19)	●	●	●	●	
	Q	HP terminal box (G1/2)	●	●	●	●	
	R	HP terminal box with lamp (G1/2)	●	●	●	●	
	S	DIN coil without terminal box	●	●	●	●*5	

- *1: Use "L" DIN terminal box with lamp/surge suppressor
- *2: The surge suppressor of the DC voltage coil option "J" is included with product.
- *3: When the coil option is "H", the rated voltage "K" (230 VAC) cannot be selected.
- *4: All AC voltages are equipped with a full-wave rectifier circuit. For this reason, a surge suppressor is not available.
- *5: Surge suppressor is not available. Use the terminal box with surge suppressor.

8 Rated voltage

1	100 VAC 50/60 Hz
2	200 VAC 50/60 Hz
3	24 VDC
4	12 VDC
5	110 VAC 50/60 Hz
6	220 VAC 50/60 Hz
K	230 VAC 50/60 Hz

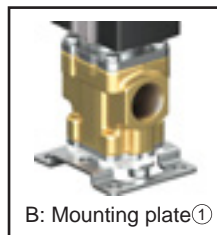
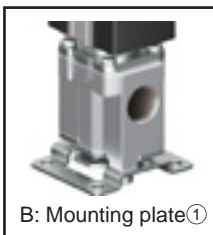
9 Option *1

Blank	No
B	Mounting plate①

- *1: Mounting plate is included with the product. Refer to the precautions on page 56 for tightening torque.
- *2: Mounting plate ① is compatible with our product FAB and FWB Series.

Aluminum body

Brass / stainless steel body



Coil option code

A(DC) J		Grommet lead wire 300 mm Grommet lead wire 300 mm/ With surge suppressor
A(AC)		Grommet lead wire 300 mm
B C K		DIN terminal box DIN terminal box with surge suppressor
D L		DIN terminal box with lamp DIN terminal box / lamp, With surge suppressor
G Q		HP terminal box HP terminal box with surge suppressor
H R		HP terminal box with lamp HP terminal box / lamp, With surge suppressor
E F M P		Conduit (G1/2) Conduit (CTC19) Conduit (G1/2) with surge suppressor Conduit (CTC19) with surge suppressor
S		DIN coil without terminal box

How to order mounting plate

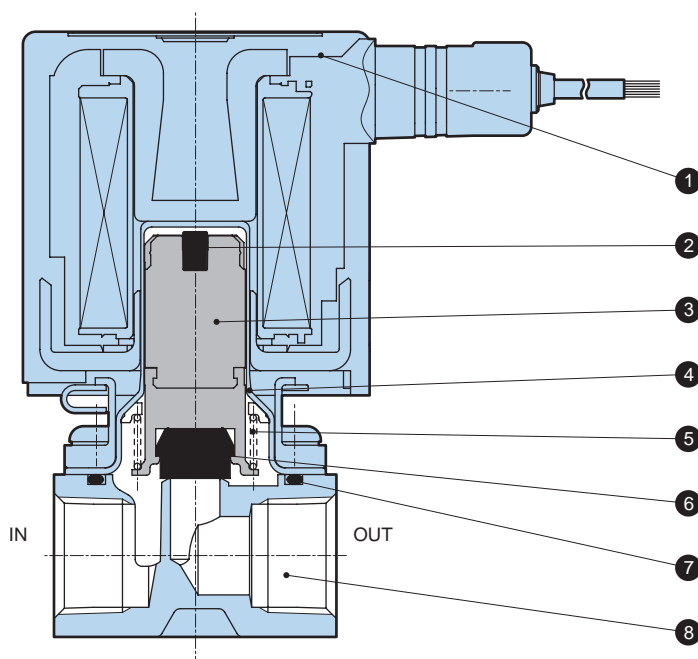
With body mounting screw

	Mounting plate code: B	
	Aluminum body	Brass, stainless steel body
FFB-32	FFB-31-B-MOUNT-PLATE-KIT	FFG-31-B-MOUNT-PLATE-KIT
FFB-42	FFB-41-B-MOUNT-PLATE-KIT	FFG-41-B-MOUNT-PLATE-KIT
FFB-52	FFB-51-B-MOUNT-PLATE-KIT	

Discrete FFB
 Manifold FFBM
 Direct acting 2-port valve
 Discrete FFG
 Manifold FFGM
 Direct acting 3-port valve
 Working fluid check list
 Flow rate formula
 Safety caution

Internal structure / Material

● FFB-*1 Series: NC



Direct acting 2-port valve

Discrete FFB

Manifold FFBM

Direct acting 3-port valve

Discrete FFG

Manifold FFGM

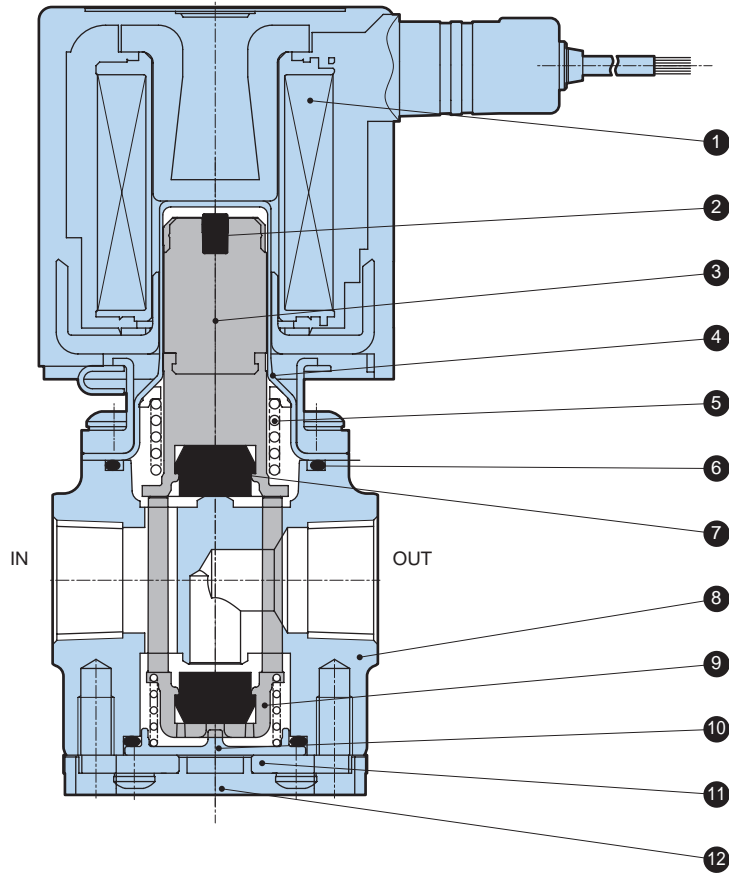
Working fluid check list

Flow rate formula

Safety caution

Part No.	Name	Material	
1	Coil assembly	-	
2	Noise dampening rubber	HNBR (FKM,EPDM)	Hydrogenated nitrile rubber (fluoro rubber, ethylene propylene rubber)
3	Plunger	SUS,PPS	Stainless steel, polyphenylene sulfide
4	Flare pipe assembly	SUS,PPS	Stainless steel, polyphenylene sulfide
5	Plunger spring	SUS304	Stainless steel
6	Seal	NBR(FKM,EPDM)	Nitrile rubber (fluoro rubber, ethylene propylene rubber)
7	O-ring	NBR(FKM,EPDM)	Nitrile rubber (fluoro rubber, ethylene propylene rubber)
8	Body	Brass (ADC, SCS13)	Brass (aluminum die-casting, stainless steel)

● FFB-*2 Series: NO (Normally open)



Part No.	Name	Material	
1	Coil assembly	-	
2	Noise dampening rubber	HNBR (FKM,EPDM)	Hydrogenated nitrile rubber (fluoro rubber, ethylene propylene rubber)
3	Plunger	SUS,PPS	Stainless steel, polyphenylene sulfide
4	Flare pipe assembly	SUS,PPS	Stainless steel, polyphenylene sulfide
5	Plunger spring	SUS304	Stainless steel
6	O-ring	NBR(FKM,EPDM)	Nitrile rubber (fluoro rubber, ethylene propylene rubber)
7	Seal	NBR(FKM,EPDM)	Nitrile rubber (fluoro rubber, ethylene propylene rubber)
8	Body	Brass (ADC, SCS13)	Brass (aluminum die-casting, stainless steel)
9	Valving element guide	PPS	Polyphenylene sulfide
10	NO cover	PPS	Polyphenylene sulfide
11	Covers A, B *1	SUS304	Stainless steel
12	Cover A lid *2	POM	Polyacetal

*1: Body material is brass, stainless steel for cover A, aluminum for cover B

*2: Only for brass and stainless steel body

Discrete FFB
Manifold FFBM
Direct acting 2-port valve

Discrete FFG
Manifold FFGM
Direct acting 3-port valve

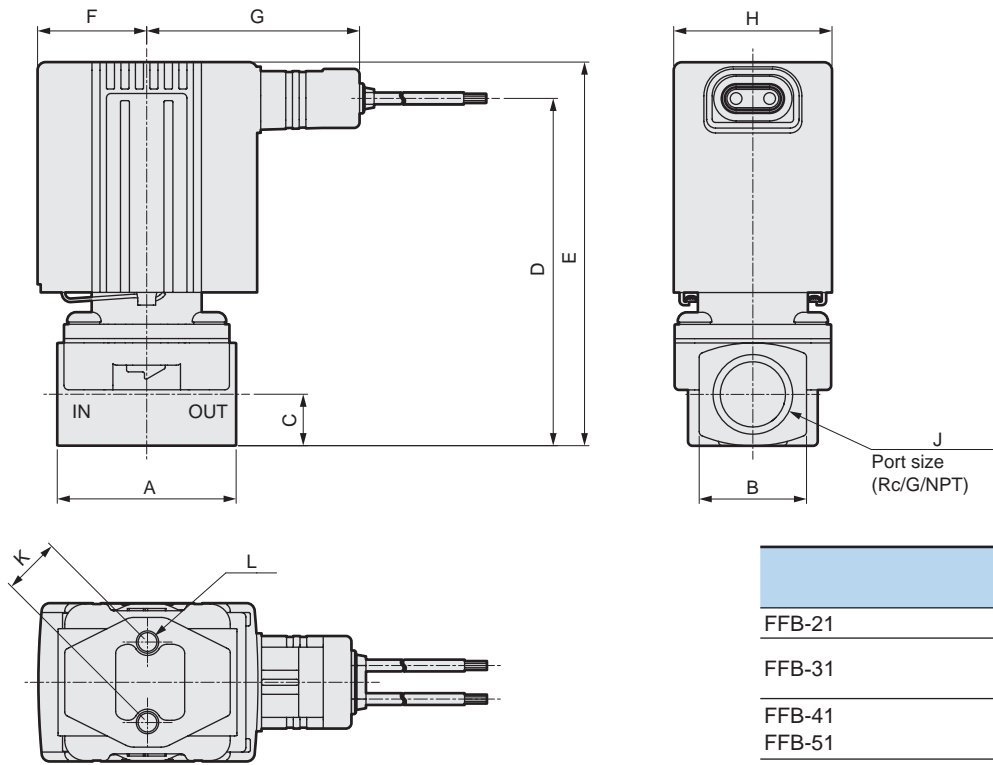
Working fluid
check list

Flow rate formula

Safety caution

Dimensions FFB-*1 Series: NC

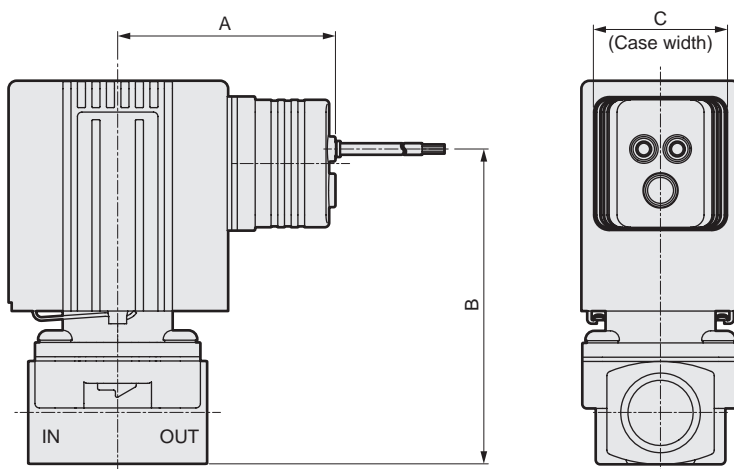
● Lead wire / DC voltage Coil option code: A / J



	Port size	Thread depth
FFB-21	G1/8	7.4
FFB-31	G1/8	8.5
	G1/4	10.5
FFB-41	G1/4	12.5
FFB-51	G3/8	11.4
FFB-5110*X (ø10)	G3/8	12.5
FFB-5115	G1/2	15

	A	B	C	D	E	F	G	H	J	K	L
FFB-21	32	17	7.5	54.5	62.5	18.5	42	24	1/8	15	M4 depth 6
FFB-31	36	19	9.5	66.5	74	22	45	30	1/8, 1/4	18	M5 depth 6
FFB-41	40	24	11.5	77.5	86	24.5	47.5	35	1/4, 3/8	18	M5 depth 8
FFB-51	40	24	11.5	86.5	95	27.5	50	40	1/4, 3/8	18	M5 depth 8
FFB-5110*X (ø10)	50	27	13.5	94.5	102.5	27.5	50	40	3/8, 1/2	18	M5 depth 8
FFB-5115(15A)											

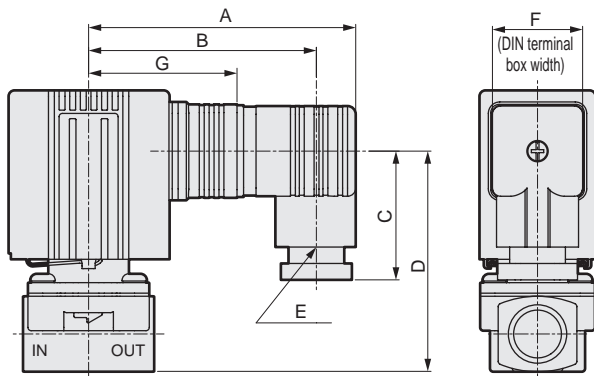
● Lead wire / AC voltage Coil option code: A / J



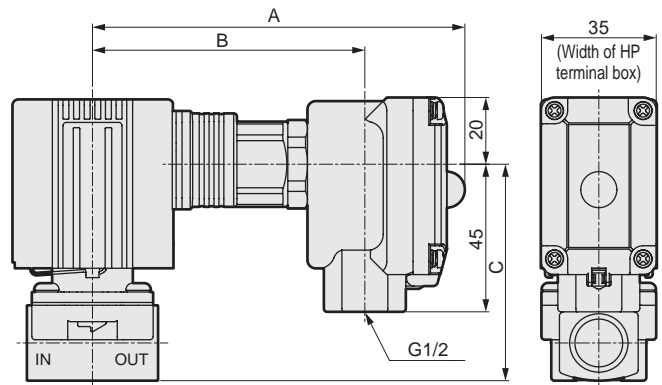
	A	B	C
FFB-21	43	50.5	24
FFB-31	46	59.5	30
FFB-41	48.5	70.5	30
FFB-51	51	79.5	30
FFB-5110*X (ø10)	51	87.5	30
FFB-5115(15A)			

Option Dimensions FFB-*1 Series: NC

- With DIN terminal box Coil option code: B/C/D/K/L/S
- DIN coil without terminal box



- With HP terminal box Coil option code: G/H/Q/R

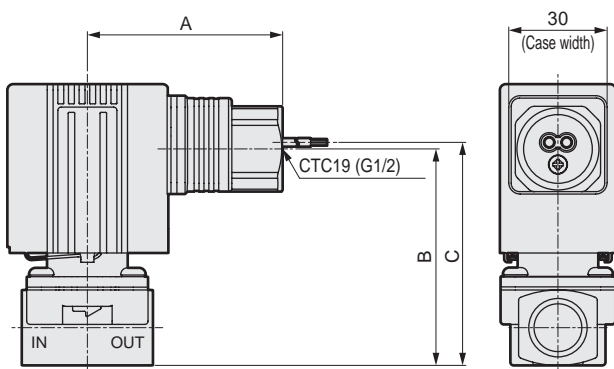


Dimensions shown in () are for G1/2.

	A	B	C	D	E	F	G
FFB-21	73	64	36	47.5	Pg9	21	39
FFB-31	78.5	66.5 (65)	39.5 (41.5)	56	Pg11 (G1/2)	27.5	42
FFB-41	81	69 (67.5)	39.5 (41.5)	67.5	Pg11 (G1/2)	27.5	44.5
FFB-51	83.5	71.5 (70)	39.5 (41.5)	76.5	Pg11 (G1/2)	27.5	47
FFB-5110*X (ø10)	83.5	71.5 (70)	39.5 (41.5)	84	Pg11 (G1/2)	27.5	47

	A	B	C
FFB-21			
FFB-31	113	82	55
FFB-41	115	85	66
FFB-51	118	87	75
FFB-5110*X (ø10)	118	87	83
FFB-5115(15A)			

- Conduit Coil option code: E/F/M/P

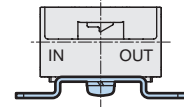
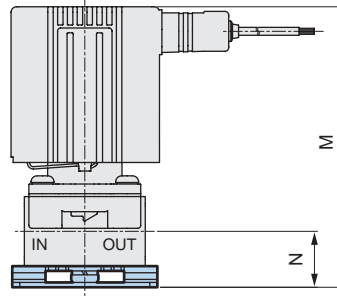
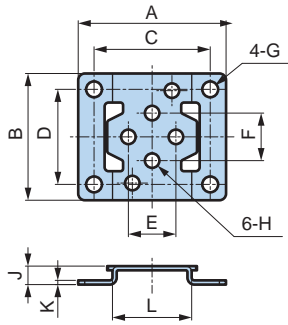


	A	B	C
FFB-21			
FFB-31	56.5	55	57
FFB-41	59	66	68
FFB-51	61.5	75	77
FFB-5110*X (ø10)	61.5	83	85
FFB-5115(15A)			

Discrete FFB
 Manifold FFBM
 Discrete FFG
 Manifold FFGM
 Working fluid check list
 Flow rate formula
 Safety caution

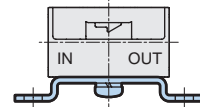
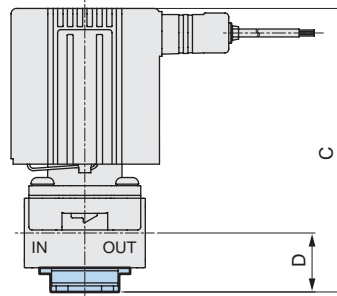
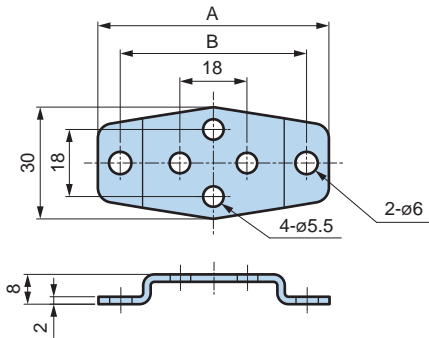
Option Dimensions FFB-*1 Series: NC

● Mounting plate① Option code: B



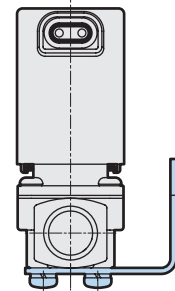
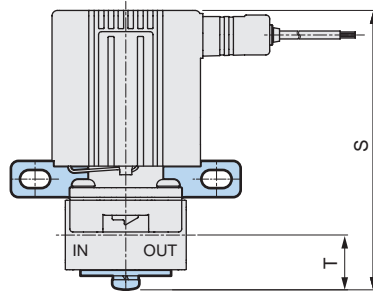
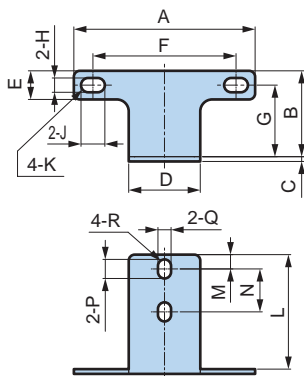
	A	B	C	D	E	F	G	H	J	K	L	M	N
FFB-21	40	34	30	25	15	15	ø5	ø4.5	6	1.2	20	68.5	13.5
FFB-31	52	42	40	30	18	18	ø6	ø5.5	7	1.6	25	81	16.5
FFB-41	56	48	44	36	18	18	ø6	ø5.5	7	1.6	30	93	18.5
FFB-51 Aluminum body	62	50	50	38	18	18	ø6	ø5.5	7	1.6	36	102	18.5
FFB-5110*X (ø10) Aluminum body												109.5	20.5
FFB-5115 (15A) Aluminum body												102	18.5
FFB-51 brass / SUS body	56	48	44	36	18	18	ø6	ø5.5	7	1.6	30	102	18.5
FFB-5110*X (ø10) brass / SUS body												109.5	20.5
FFB-5115 (15A) brass / SUS body												109.5	20.5

● Mounting plate② Option code: M



	A	B	C	D
FFB-31	62	50	82	17.5
FFB-41	62	50	94	19.5
FFB-51	70	58	103	19.5
FFB-5110*X (ø10)			110.5	21.5
FFB-5115(15A)			110.5	21.5

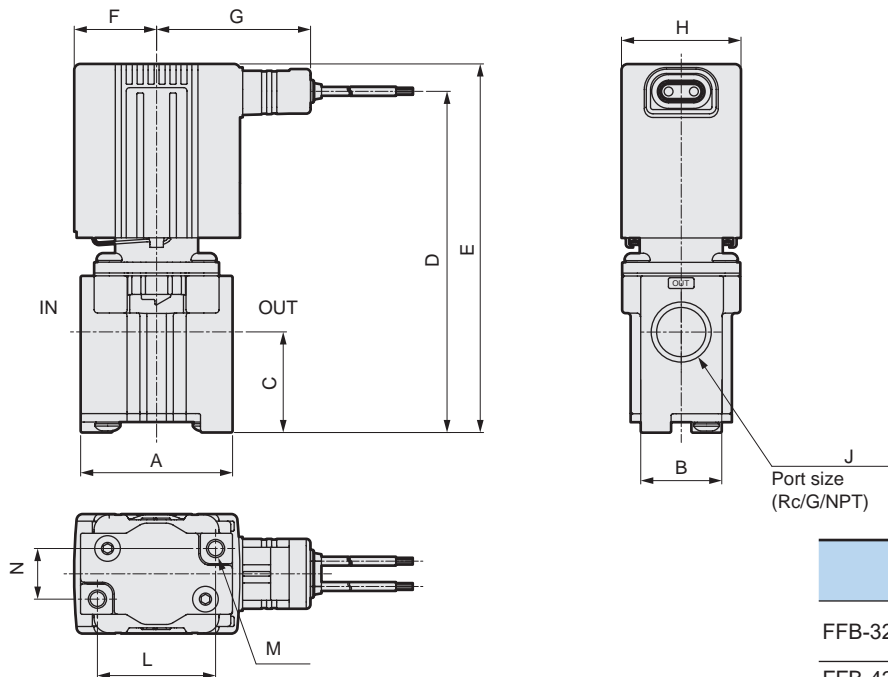
● Panel mounting plate Option code: P



	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
FFB-21	57	25	1.6	25	10	45	20	5	8	R 2.5	35.4	4.5	15	6	4.5	R2.25	67.5	12.5
FFB-31	66	31	2	30	12	50	25	6	10	R 3	43	6	18	8	5.5	R2.75	80.5	16
FFB-41	66	31	2	30	12	50	25	6	10	R 3	43	6	18	8	5.5	R2.75	92.5	18
FFB-51	76	36	2	30	12	60	30	6	10	R 3	48	6	18	8	5.5	R2.75	101.5	18
FFB-5110*X (ø10)																	109	20
FFB-5115(15A)																	109	20

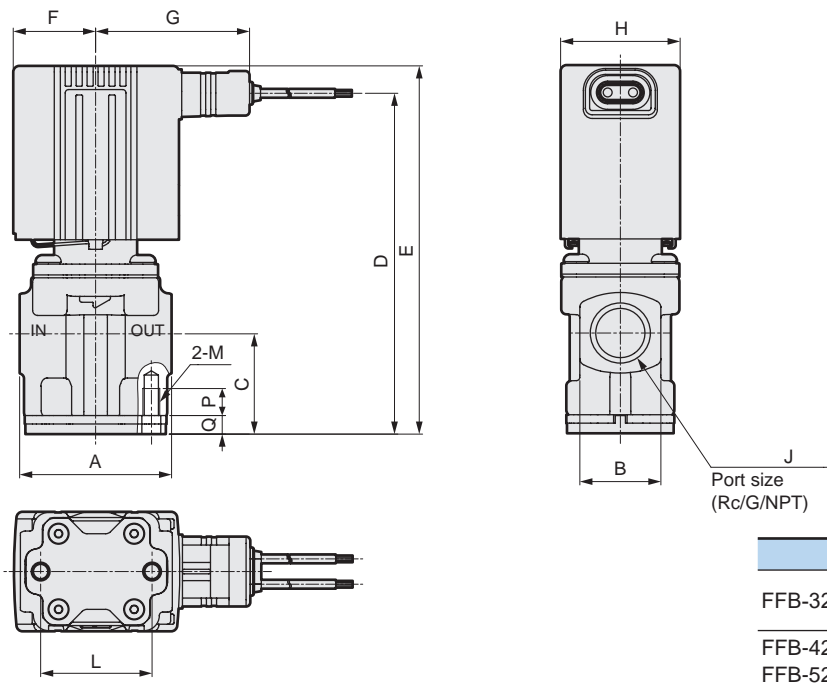
Dimensions FFB-*2 Series: NO (Normally open)

● Lead wire / DC voltage (aluminum body) Coil option code: A / J



	Port size	Thread depth
FFB-32	G1/8	8.5
	G1/4	12.5
FFB-42	G1/4	12.5
FFB-52	G3/8	12.5

● Lead wire / DC voltage (brass body / stainless steel body) Coil option code: A / J



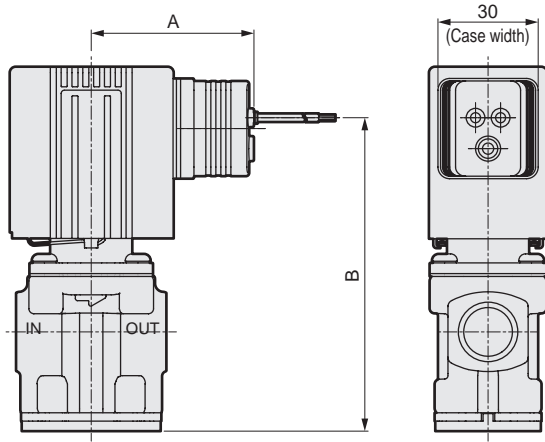
	Port size	Thread depth
FFB-32	G1/8	8.5
	G1/4	12.5
FFB-42	G1/4	12.5
FFB-52	G3/8	12.5

		A	B	C	D	E	F	G	H	J	L	M	N	P	Q
FFB-32	Aluminum body	40	19	26.5	86.5	94	22	45	30	1/8	32	M5 depth 8	11		
	Brass / SUS body			26	86	93.5				1/4		29		M5	6
FFB-42	Aluminum body	45	24	30	101	109	24.5	47.5	35	1/4	35	M5 depth 8	15		
	Brass / SUS body									3/8		33		M5	8
FFB-52	Aluminum body	45	24	30	110	118	27.5	50	40	1/4	35	M5 depth 8	15		
	Brass / SUS body									3/8		33		M5	8

Discrete FFB
 Manifold FFBM
 Discrete FFG
 Manifold FFGM
 Direct acting 2-port valve
 Direct acting 3-port valve
 Working fluid check list
 Flow rate formula
 Safety caution

Dimensions FFB-*2 Series: NO (Normally open)

● Lead wire / AC voltage Coil option code: A / J

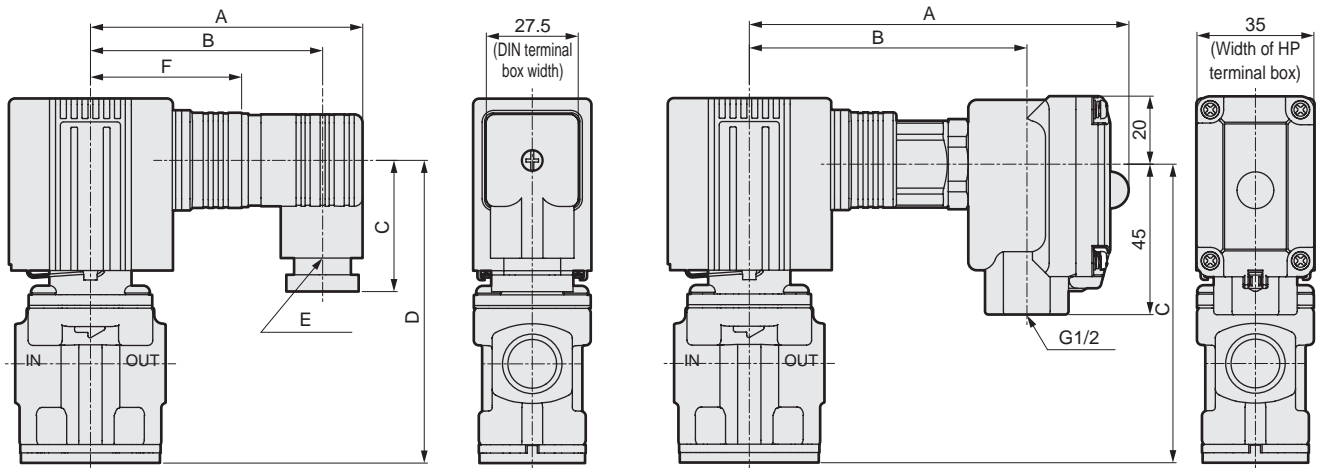


		A	B
FFB-32	Aluminum body	46	79
	Brass / SUS body		78.5
FFB-42	Aluminum body	48.5	94
	Brass / SUS body		
FFB-52	Aluminum body	51	103
	Brass / SUS body		

Option Dimensions FFB-*2 Series: NO (Normally open)

● With DIN terminal box Coil option code: B/C/D/K/L/S
 ● DIN coil without terminal box

● With HP terminal box Coil option code: G/H/Q/R



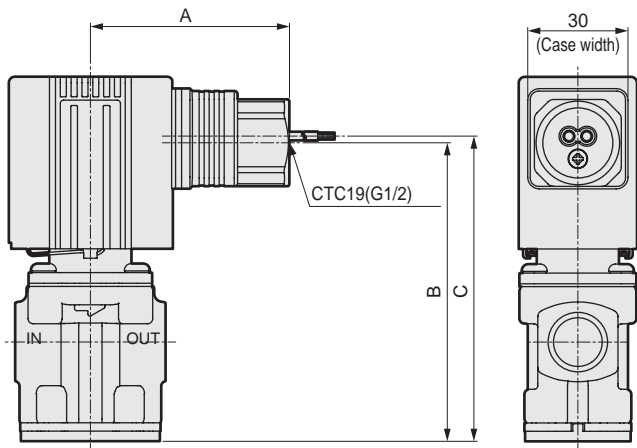
Dimensions shown in () are for G1/2.

		A	B	C	D	E	F
FFB-32	Aluminum body	78.5	66.5	39.5	76	Pg11	42
	Brass / SUS body		(65)	(41.5)	75.5	(G1/2)	
FFB-42	Aluminum body	81	69	39.5	90.5	Pg11	44.5
	Brass / SUS body		(67.5)	(41.5)		(G1/2)	
FFB-52	Aluminum body	83.5	71.5	39.5	99.5	Pg11	47
	Brass / SUS body		(70)	(41.5)		(G1/2)	

		A	B	C
FFB-32	Aluminum body	113	82	74.5
	Brass / SUS body			74
FFB-42	Aluminum body	115	85	89.5
	Brass / SUS body			
FFB-52	Aluminum body	118	87	98.5
	Brass / SUS body			

Option Dimensions FFB-*2 Series: NO (Normally open)

● Conduit Coil option code: E/F/M/P

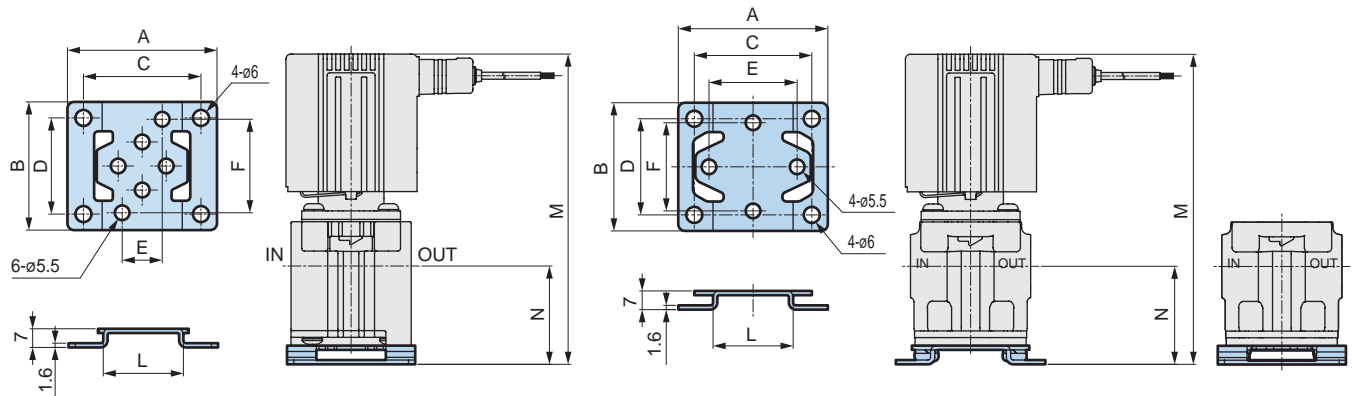


		A	B	C
FFB-32	Aluminum body	56.5	74.5	76.5
	Brass / SUS body		74	76
FFB-42	Aluminum body	59	89.5	91.5
	Brass / SUS body			
FFB-52	Aluminum body	61.5	98.5	100.5
	Brass / SUS body			

● Mounting plate① Option code: B

Aluminum body

Brass / SUS body



		A	B	C	D	E	F	L	M	N
FFB-32	Aluminum body	52	42	40	30	11	32	25	101	33.5
	Brass / SUS body					29	29	26	100.5	33
FFB-42	Aluminum body	56	48	44	36	15	35	30	116	37
	Brass / SUS body					33	33			
FFB-52	Aluminum body	62	50	50	38	15	35	36	125	37
	Brass / SUS body									

Discrete FFB

Manifold FFBM

Discrete FFG

Manifold FFGM

Working fluid
check list

Flow rate formula

Safety caution



Direct acting 2-port solenoid valve, manifold

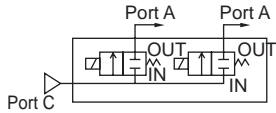
FFBM Series

- NC (Normally Closed)
- Port size: Rc, G, NPT 1/8 / 1/4

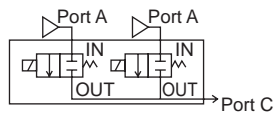


JIS symbol

- FFBM-*1
(Common supply/port C pressurization)



- FFBM-*5
(Individual supply/port A pressurization)



Common specifications

Item	FFBM
Working fluid	Compressed air/water/oil (50mm ² /s or less)/medium vacuum (*2)/dry air
Max. working pressure MPa	1.4 (refer to working pressure in individual specifications.)
Proof pressure (water pressure) MPa	2.1(NC)
Fluid temperature °C	-10 to 40 (no freezing)
Ambient temperature °C	-10 to 40
Thermal class	Class 130 (B)
Atmosphere	Place free of corrosive gas and explosive gas
Valve structure	Direct acting poppet structure
Valve seat leakage cm ³ /min (ANR)	0.2 or less (air)
Valve seat leakage *1 Pa·m ³ /sHe	1.33 x 10 ⁻⁶ or less
Mounting orientation	Unrestricted
Degree of protection	IP65

*1: Amount of leakage in medium vacuum.

*2: When using at medium vacuum, vacuum the OUT port side.

Electrical specifications

Item	FFBM-2							FFBM-3						
	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz
Rated voltage V	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz
Voltage fluctuation range	±10%							±10%						
Power consumption W	3.5	3.5	-	-	-	-	-	4.5	4.5	-	-	-	-	-
Apparent power VA	-	-	5.1	5.7	6.0	5.3	5.7	-	-	6.2	6.1	6.2	6.2	6.5
Item	FFBM-4							FFBM-5						
	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz
Rated voltage V	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz
Voltage fluctuation range	±10%							±10%						
Power consumption W	7	7	-	-	-	-	-	10.5	10.5	-	-	-	-	-
Apparent power VA	-	-	8.6	10	9.6	9.5	9.4	-	-	13	13	14	14	13

The leakage current must be less than or equal to the values shown below.

Voltage	AC					DC	
	100V	110V	200V	220V	230V	12V	24V
Leakage current	2 mA or less		1 mA or less			5 mA or less	

Individual specifications

Item	Port size Rc/G/NPT		Orifice size (mm)	Working pressure (MPa) *1	Working pressure Pa (abs) *2	Flow Rate Characteristics		
	Port A	Port C				C[dm ³ /(s·bar)]	b	Cv
NC (Normally Closed)								
FFBM-2 ¹ / ₅ 06 * S	1/8	1/4 (1/8) *3	1.5	0 to 1.0	1.3 x 10 ⁻² to 1 x 10 ⁶	0.30	0.48	0.085
			2	0 to 0.6	1.3 x 10 ⁻² to 0.6 x 10 ⁶	0.52	0.39	0.12
FFBM-3 ¹ / ₅ 08 * 2	1/4	3/8	2	0 to 1.4	1.3 x 10 ⁻² to 1.4 x 10 ⁶	0.55	0.42	0.12
			3	0 to 0.6	1.3 x 10 ⁻² to 0.6 x 10 ⁶	1.1	0.25	0.23
			5	0 to 0.2	1.3 x 10 ⁻² to 0.2 x 10 ⁶	1.8	0.11	0.45
FFBM-4 ¹ / ₅ 08 * 4	1/4	3/8	4	0 to 1.0	1.3 x 10 ⁻² to 1 x 10 ⁶	1.7	0.11	0.42
			7	0 to 0.15	1.3 x 10 ⁻² to 0.15 x 10 ⁶	3.3	0.11	0.73
FFBM-5 ¹ / ₅ 08 * 5	1/4	3/8	5	0 to 0.8	1.3 x 10 ⁻² to 0.8 x 10 ⁶	2.3	0.10	0.55
			7	0 to 0.3	1.3 x 10 ⁻² to 0.3 x 10 ⁶	3.3	0.11	0.73

*1: Although it can be used with low vacuum [1.33×10² Pa (abs)], valve seat leakage is 0.2 cm³/min (ANR) or less. (Valve seat leakage at positive pressure)
When used in a low vacuum, the lower limit of operating pressure is 1.33 x 10² Pa (abs), so the upper limit is 0.1 MPa lower.

*2: Working pressure at medium vacuum.

*3: 1/8 for aluminum material body

Weight

● Body material: Aluminum

Model No.	Actuator only	Weight (kg)								
		2 stations	3 stations	4 stations	5 stations	6 stations	7 stations	8 stations	9 stations	10 stations
FFBM-2	0.16	0.4	0.6	0.7	0.9	1.1	1.3	1.5	1.7	1.8
FFBM-3	0.27	0.7	1.0	1.3	1.7	2.0	2.3	2.6	3.0	3.3
FFBM-4	0.41	1.0	1.5	2.0	2.5	3.0	3.5	3.9	4.4	4.9
FFBM-5	0.60	1.4	2.1	2.8	3.5	4.2	4.9	5.6	6.3	7.0

*2: Weight of aluminum sub-plate 24 VDC lead wire type.

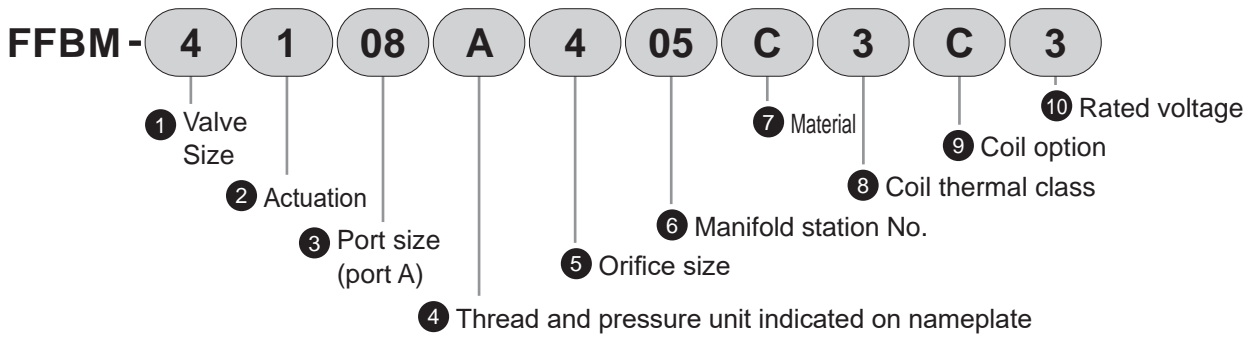
● Body material: brass / stainless steel

Model No.	Actuator only	Weight (kg)								
		2 stations	3 stations	4 stations	5 stations	6 stations	7 stations	8 stations	9 stations	10 stations
FFBM-2	0.2	0.9	1.3	1.8	2.0	2.5	2.9	3.3	3.8	4.0
FFBM-3	0.35	1.4	2.0	2.9	3.2	4.1	4.7	5.3	6.2	6.5
FFBM-4	0.5	2.0	2.8	4.0	4.5	5.7	6.5	7.4	8.6	9.1
FFBM-5	0.7	2.5	3.5	5.0	5.7	7.1	8.2	9.3	10.7	11.5

*3: Weight of brass sub-plate 24 VDC lead wire type.

Discrete FFB
 Manifold FFBM
 Discrete FFG
 Manifold FFGM
 Working fluid check list
 Flow rate formula
 Safety caution

How to order



① Valve size

		Valve size			
		2	3	4	5
2	Width 24 mm	●			
3	Width 30 mm		●		
4	Width 35 mm			●	
5	Width 40 mm				●

② Actuation

1	NC (open when energized) common supply
5	NC (open when energized) individual supply

③ Port size (port A)

		Valve size			
		2	3	4	5
06	1/8	●			
08	1/4		●	●	●
00	Actuator only	●	●	●	●

④ Thread and pressure unit indicated on nameplate

	Thread	Pressure display unit
A	Rc thread	MPa
B	G thread	bar
C	NPT thread	psi *2
D	G thread	MPa *3
E	NPT thread	MPa *3

*1: ● For "00" actuator only, there is no thread. Therefore, select "A" (MPa), "B" (bar), "C" (psi) for the pressure display unit.

*2: In compliance with the Measurement Act, the psi display cannot be used in Japan.

*3: "D", "E" is a selection to display the pressure display unit as MPa even with G threads and NPT threads mainly in Japan.

⑤ Orifice size

		Valve size			
		2	3	4	5
S	ø1.5	●			
2	ø2	●	●		
3	ø3		●		
4	ø4			●	
5	ø5		●		●
7	ø7			●	●

⑥ Manifold station No.

02	2 stations
to	to
09	9 stations
10	10 stations
00	Actuator only

⑦ Material

	Body and sub-plate	Seal	Treatment	Working fluid
A	Aluminum	NBR	-	Compressed air / dry air
C	Brass	NBR		Compressed air / Dry air / Water / Oil / Low vacuum *1
D		FKM	Compressed air / Dry air / Water / Oil / Low vacuum *1	
G	Stainless steel	FKM	Vacuum inspection	Compressed air / Dry air / Medium vacuum *2
H		NBR	-	Compressed air / Dry air / Water / Oil / Low vacuum *1
J	Brass	FKM	-	Compressed air / Dry air / Water / Oil / Low vacuum *1
M		FKM	Vacuum inspection	Compressed air / Dry air / Medium vacuum *2
N	Stainless steel	NBR	Oil-prohibited	Compressed air / Dry air / Water / Oil / Low vacuum *1
P		FKM		Compressed air / Dry air / Water / Oil / Low vacuum *1
Q	Brass	EPDM	Oil-prohibited	Water
S		NBR		Compressed air / Dry air / Water / Oil / Low vacuum *1
T	Stainless steel	FKM	Oil-prohibited	Compressed air / Dry air / Water / Oil / Low vacuum *1
U		EPDM		Water

*1: Although it can be used with low vacuum [1.33×10^2 Pa (abs)], valve seat leakage is 0.2 cm³/min (ANR) or less. (Valve seat leakage at positive pressure) When used in a low vacuum, the lower limit of operating pressure is 1.33×10^2 Pa (abs), so the upper limit is 0.1 MPa lower.

*2: ● cannot be selected when Actuation is "1".

8 Coil thermal class

3	Class 130 (B)
---	---------------

9 Coil option

		1 Valve size				Voltage	
		2	3	4	5	DC	AC
A	Lead wire (300 mm)	●	●	●	●	●	●
B	With DIN terminal box (G1/2)	*1	●	●	●	●	●
C	With DIN terminal box (Pg11)	●*2	●	●	●	●	●
D	DIN terminal box with lamp (Pg11)	●*2	●	●	●	*4	●
E	Conduit (G1/2)		●	●	●	●	●
F	Conduit (CTC19)		●	●	●	●	●
G	HP terminal box (G1/2)		●*3	●	●	●	●
H	HP terminal box with lamp (G1/2)		●*3	●	●	●	●*6
J	Lead wire (300 mm)	●	●	●	●	●*5	*7
K	With DIN terminal box (Pg11)	●*2	●	●	●	●	
L	DIN terminal box with lamp (Pg11)	●*2	●	●	●	●	
M	Conduit (G1/2)		●	●	●	●	
P	Conduit (CTC19)		●	●	●	●	
Q	HP terminal box (G1/2)		●*3	●	●	●	
R	HP terminal box with lamp (G1/2)		●*3	●	●	●	
S	DIN coil without terminal box	●	●	●	●	●*8	

*1: "B" coil option is not available when the valve size of 1 is "2".

*2: When the valve size of 1 is "2", the DIN terminal box thread size is Pg9.

*3: When the material of 7 is "A" aluminum body, the HP terminal box cannot be selected.

*4: Use "L" DIN terminal box with lamp/surge suppressor.

*5: The surge suppressor of the DC voltage coil option "J" is included.

*6: When the coil option is "H", the rated voltage "K" (230 VAC) cannot be selected.

*7: All AC voltages are equipped with a full-wave rectifier circuit. For this reason, a surge suppressor is not available.

*8: Surge suppressor is not available. Use the terminal box with surge suppressor.









10 Rated voltage

1	100 VAC 50/60 Hz
2	200 VAC 50/60 Hz
3	24 VDC
4	12 VDC
5	110 VAC 50/60 Hz
6	220 VAC 50/60 Hz
K	230 VAC 50/60 Hz

How to order

Masking plate orders are also available.
Refer to How to order on pages 21 and 25.

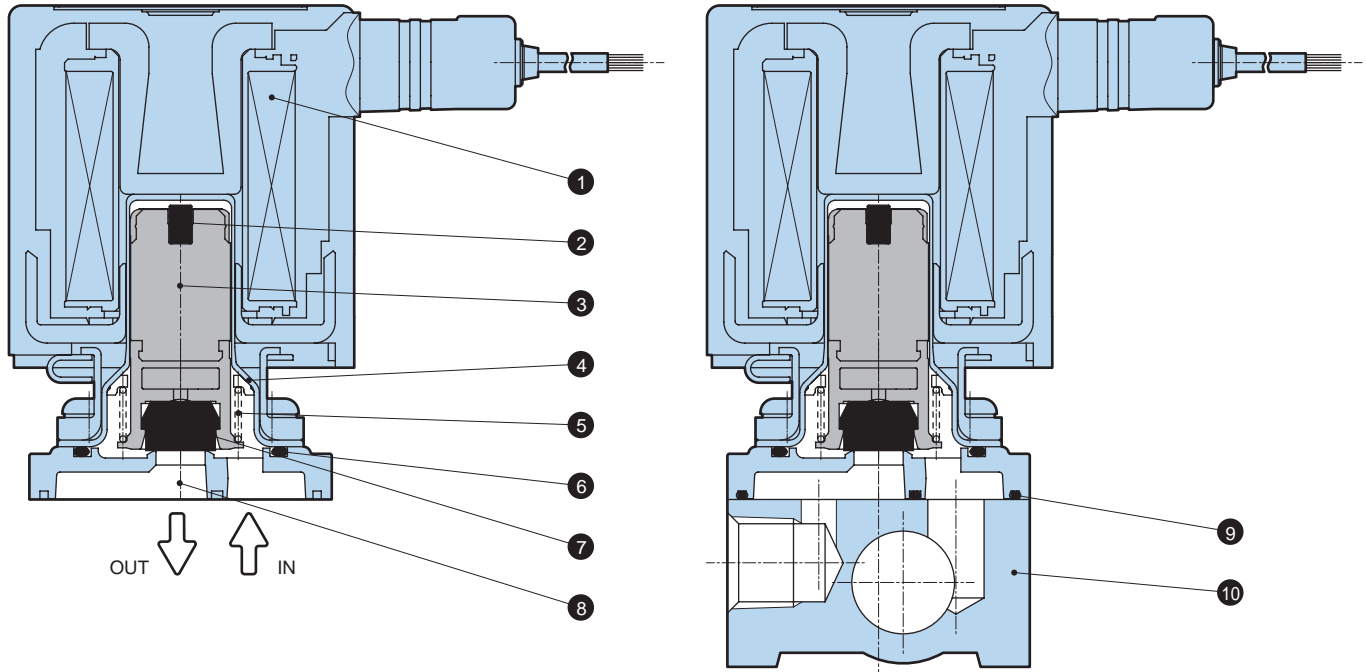
Coil option code

A(DC) J		Grommet lead wire 300 mm Grommet lead wire 300 mm/ With surge suppressor
A(AC)		Grommet lead wire 300 mm
B C K		DIN terminal box DIN terminal box with surge suppressor
D L		DIN terminal box with lamp DIN terminal box / lamp, With surge suppressor
G Q		HP terminal box HP terminal box with surge suppressor
H R		HP terminal box with lamp HP terminal box / lamp, With surge suppressor
E F M P		Conduit (G1/2) Conduit (CTC19) Conduit (G1/2) with surge suppressor Conduit (CTC19) with surge suppressor
S		DIN coil without terminal box

Internal structure / Material Aluminum body

● FFBM actuator

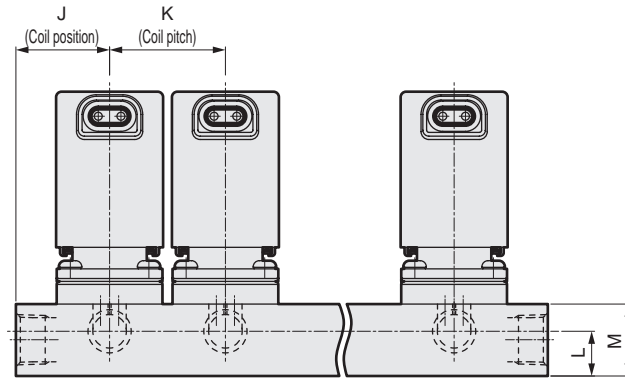
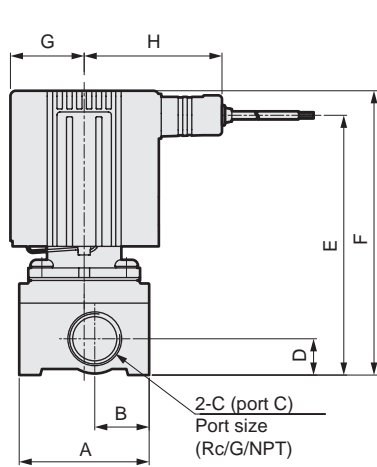
● FFBM manifold



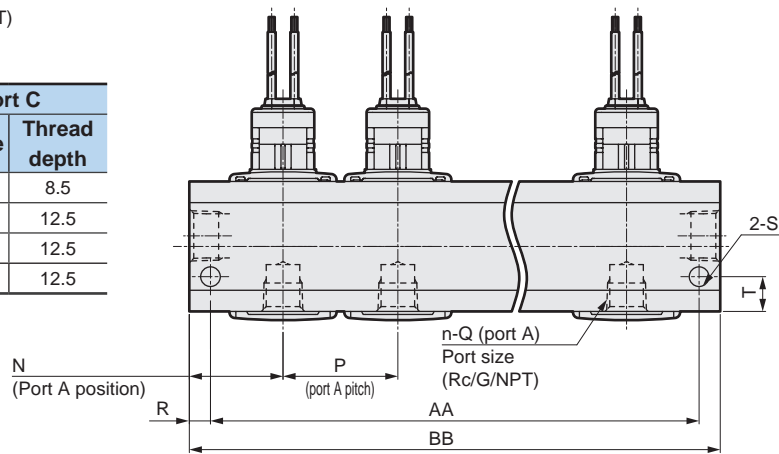
Part No.	Name	Material	
1	Coil assembly	-	
2	Noise dampening rubber	HNBR	Hydrogenated nitrile rubber
3	Plunger	SUS,PPS	Stainless steel, polyphenylene sulfide
4	Flare pipe assembly	SUS,PPS	Stainless steel, polyphenylene sulfide
5	Plunger spring	SUS304	Stainless steel
6	O-ring	NBR	Nitrile rubber
7	Seal	NBR	Nitrile rubber
8	Body	ADC	Aluminum die-casting
9	Gasket	NBR	Nitrile rubber
10	Sub-plate	A6063	Aluminum

Dimensions aluminum body

● Manifold lead wire / DC voltage Coil option code: A / J



	Port A		Port C	
	Port size	Thread depth	Port size	Thread depth
FFBM-2	G1/8	8.5	G1/8	8.5
FFBM-3	G1/4	11	G3/8	12.5
FFBM-4	G1/4	12.5	G3/8	12.5
FFBM-5	G1/4	12.5	G3/8	12.5



	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
FFBM-2	30	12	1/8	8	64.5	72.5	18.5	42	21	26	8	16	25	26	1/8	5	ø4.5	9
FFBM-3	36	13	3/8	12	79	87	22	45	28	32	15	24	34.5	32	1/4	7	ø6.5	10
FFBM-4	43	18	3/8	12	86	94	24.5	47.5	31	38	15	24	31	38	1/4	7	ø6.5	11.5
FFBM-5	43	18	3/8	12	95	103	27.5	50	34	46	15	24	34	46	1/4	7	ø6.5	11.5

	Station No. Code	2	3	4	5	6	7	8	9	10
		AA	58	84	110	136	162	188	214	240
FFBM-2	BB	68	94	120	146	172	198	224	250	276
FFBM-3	AA	74	106	138	170	202	234	266	298	330
	BB	88	120	152	184	216	248	280	312	344
FFBM-4	AA	86	124	162	200	238	276	314	352	390
	BB	100	138	176	214	252	290	328	366	404
FFBM-5	AA	100	146	192	238	284	330	376	422	468
	BB	114	160	206	252	298	344	390	436	482

Discrete FFB

Manifold FFBM

Direct acting 2-port valve

Discrete FFG

Manifold FFGM

Direct acting 3-port valve

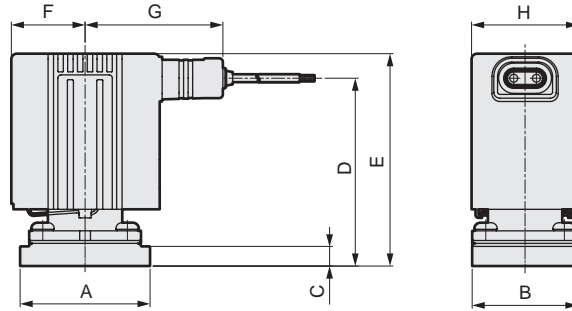
Working fluid check list

Flow rate formula

Safety caution

Dimensions aluminum body

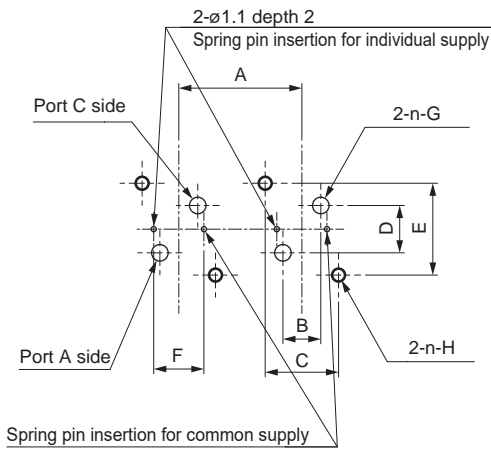
● Actuator lead wire / DC voltage Coil option code: A / J



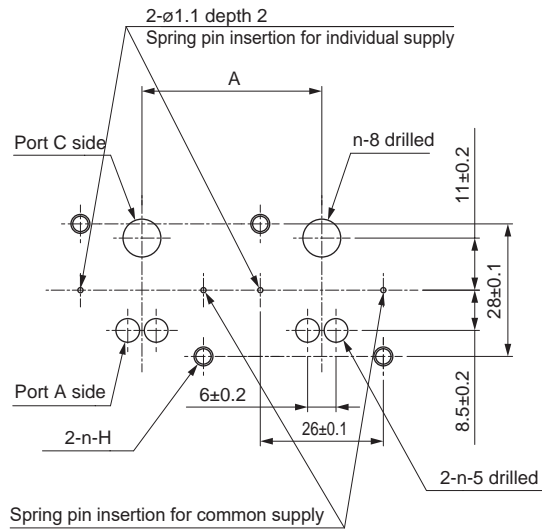
	A	B	C	D	E	F	G	H
FFBM-2	28	22.5	2.5	48.5	57	18.5	42	24
FFBM-3	32.5	29.5	2.5	55.5	63	22	45	30
FFBM-4	43	35	6.5	62	70.5	24.5	47.5	35
FFBM-5	43	35	6.5	71	79.5	27.5	50	40

● Actuator installation dimensions

FFBM-2*, 3*



FFBM-4*, 5*



Note: Machining drawing when using 2 actuators.

	A	B	C	D	E	F	G	H
FFBM-2	26 or more	8±0.15	15.5±0.1	10±0.15	19.4±0.1	10.6±0.1	ø3.5	M3 depth 6 or more
FFBM-3	32 or more	13±0.1	22.4±0.1	11.4±0.1	22.4±0.1	17±0.1	ø5.5	M3 depth 7 or more
FFBM-4	38 or more							M4 depth 7 or more
FFBM-5	46 or more							M4 depth 7 or more

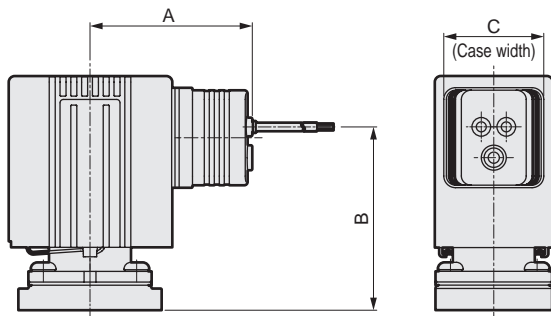
How to order discrete masking plate

O-ring, with mounting screw

	Aluminum body
FFBM-2	FFBM-21A-MP-KIT
FFBM-3	FFBM-31A-MP-KIT
FFBM-4	FFBM-41A-MP-KIT
FFBM-5	FFBM-41A-MP-KIT

Dimensions aluminum body

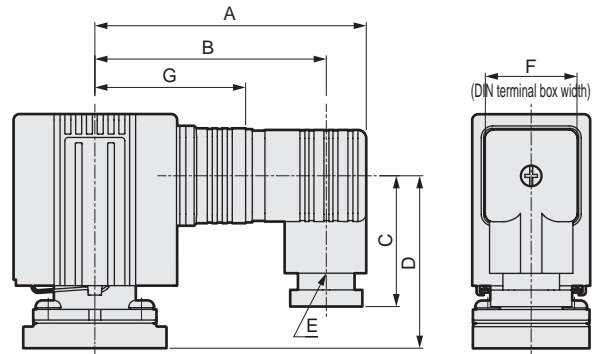
● Actuator lead wire / AC voltage Coil option code: A / J



	A	B	C
FFBM-2	43	45	24
FFBM-3	46	48.5	30
FFBM-4	48.5	55	30
FFBM-5	51	64	30

● With actuator DIN terminal box Coil option code: B/C/D/K/L/S

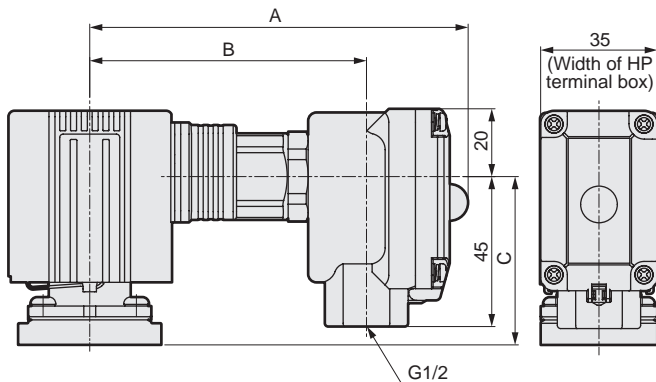
● Actuator DIN coil without terminal box



Dimensions shown in () are for G1/2.

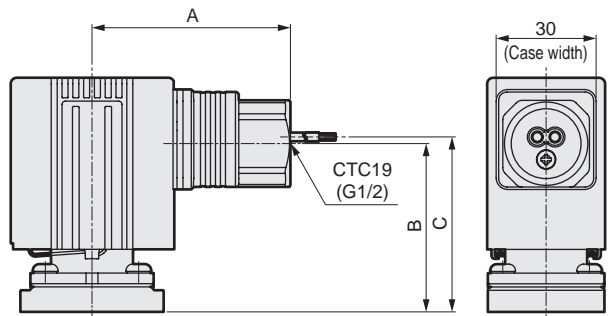
	A	B	C	D	E	F	G
FFBM-2	73	64	36	41.5	Pg9	21	39
FFBM-3	78.5	66.5 (65)	39.5 (41.5)	45	Pg11 (G1/2)	27.5	42
FFBM-4	81	69 (67.5)	39.5 (41.5)	52	Pg11 (G1/2)	27.5	44.5
FFBM-5	83.5	71.5 (70)	39.5 (41.5)	61	Pg11 (G1/2)	27.5	47

● With actuator HP terminal box Coil option code: G/H/Q/R



	A	B	C
FFBM-2			
FFBM-3	113	82	44
FFBM-4	115	85	50.5
FFBM-5	118	87	59.5

● Conduit Coil option code: E/F/M/P



	A	B	C
FFBM-2			
FFBM-3	56.5	44	46
FFBM-4	59	50.5	52.5
FFBM-5	61.5	59.5	61.5

Discrete FFB

Manifold FFBM

Discrete FFG

Manifold FFGM

Working fluid
check list

Flow rate formula

Safety caution

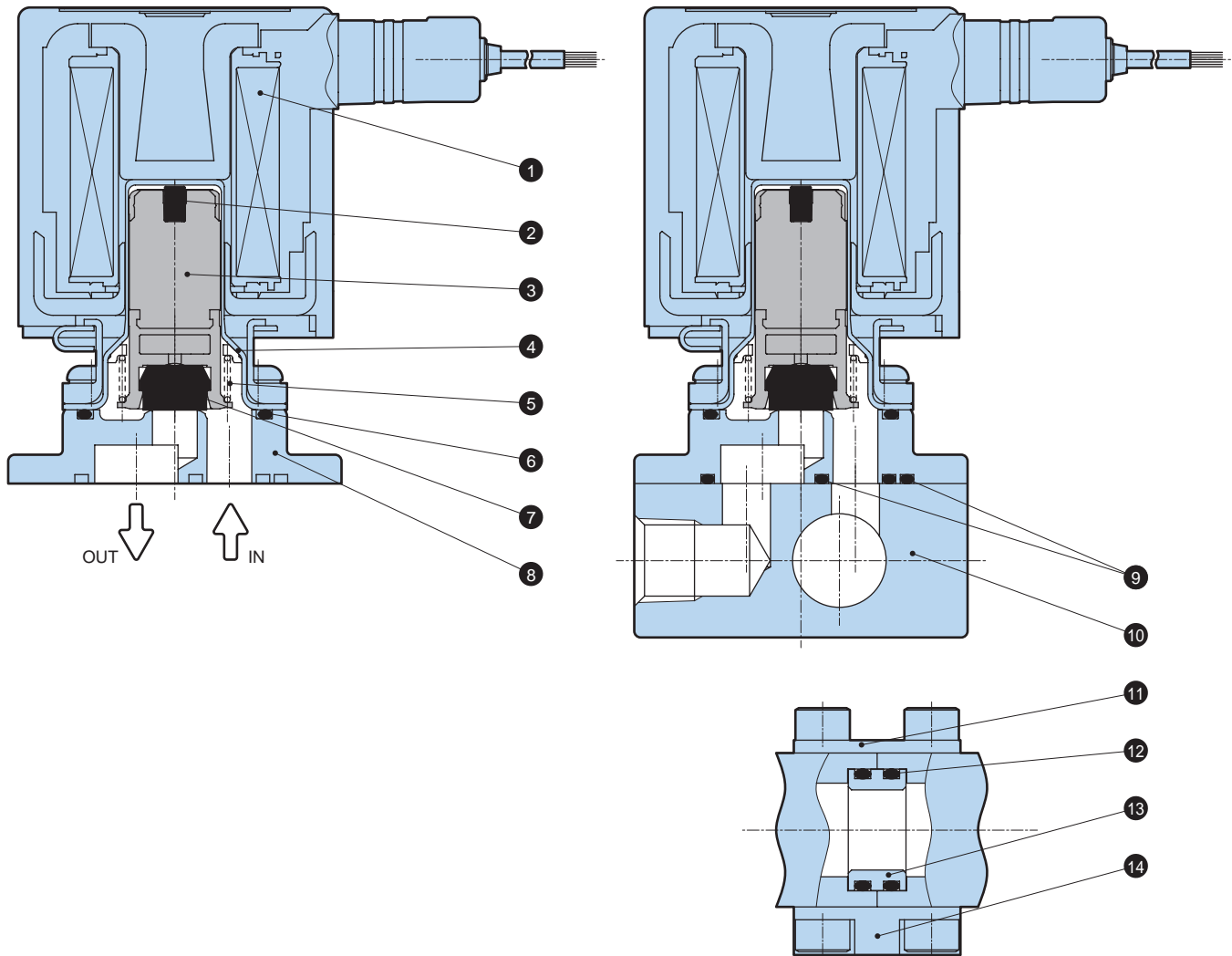
Direct acting 2-port valve

Direct acting 3-port valve

Internal structure / Material brass body / stainless steel body

● FFBM actuator

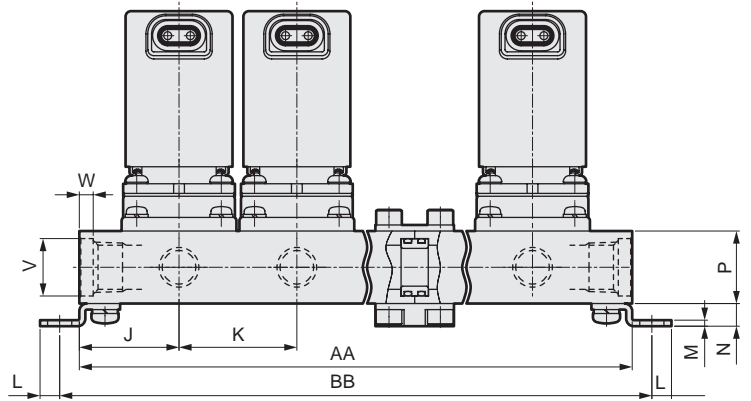
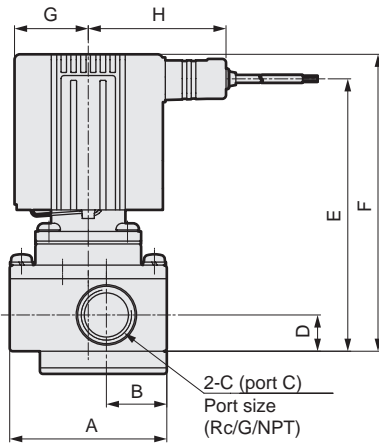
● FFBM manifold



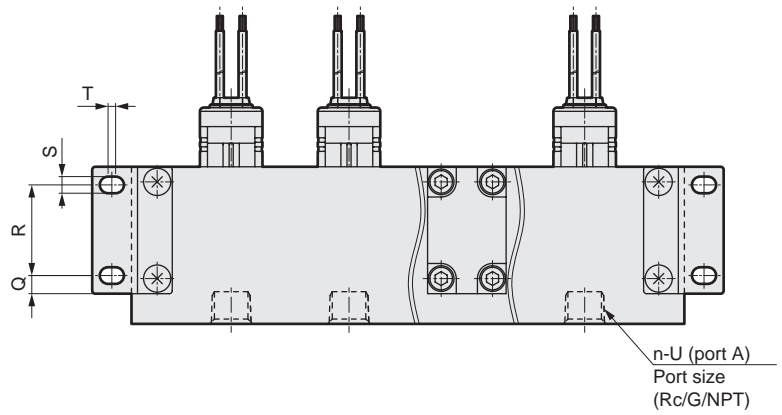
Part No.	Name	Material	
1	Coil assembly	-	
2	Noise dampening rubber	HNBR (FKM,EPDM)	Hydrogenated nitrile rubber (fluoro rubber, ethylene propylene rubber)
3	Plunger	SUS,PPS	Stainless steel, polyphenylene sulfide
4	Flare pipe assembly	SUS,PPS	Stainless steel, polyphenylene sulfide
5	Plunger spring	SUS304	Stainless steel
6	O-ring	NBR(FKM,EPDM)	Nitrile rubber (fluoro rubber, ethylene propylene rubber)
7	Seal	NBR(FKM,EPDM)	Nitrile rubber (fluoro rubber, ethylene propylene rubber)
8	Body	Brass (SCS13)	Brass (stainless steel)
9	O-ring	NBR(FKM,EPDM)	Nitrile rubber (fluoro rubber, ethylene propylene rubber)
10	Sub-plate	C3604(SUS304)	Brass (stainless steel) * same material as body
11	Connecting plate	SPCC	Steel
12	O-ring	NBR(FKM,EPDM)	Nitrile rubber (fluoro rubber, ethylene propylene rubber)
13	Connector	C3604(SUS)	Brass (stainless steel)
14	Connecting plate (bottom)	SS400	Steel

Dimensions brass body / stainless steel body

● Manifold lead wire / DC voltage Coil option code: A / J



	Port A		Port C	
	Port size	Thread depth	Port size	Thread depth
FFBM-2	G1/8	8.5	G1/4	12.5
FFBM-3	G1/4	12.5	G3/8	12.5
FFBM-4	G1/4	12.5	G3/8	12.5
FFBM-5	G1/4	12.5	G3/8	12.5



	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W
FFBM-2	38	14	1/4	11	71	79.5	18.5	42	26	28	6	1.6	6.5	21	5	22	4.5	2.5	1/8	ø17.3	4
FFBM-3	46	17.5	3/8	12	81	88.5	22	45	30	36	6	2	6.5	24	5	28	4.5	2.5	1/4	ø19	4.6
FFBM-4	52	20	3/8	12	90	98.5	24.5	47.5	33	39	6.5	2	7.5	24	6	30	5.5	2.5	1/4	ø19	4.6
FFBM-5	52	20	3/8	12	99	107.5	27.5	50	36	45	6.5	2	7.5	24	6	30	5.5	2.5	1/4	ø19	4.6

	Station No. Code	2	3	4	5	6	7	8	9	10
		FFBM-2	AA	81	109	162	165	218	246	274
	BB	93	121	174	177	230	258	286	339	342
FFBM-3	AA	97	133	194	205	266	302	338	399	410
	BB	109	145	206	217	278	314	350	411	422
FFBM-4	AA	106	145	212	223	290	329	368	435	446
	BB	119	158	225	236	303	342	381	448	459
FFBM-5	AA	118	163	236	253	326	371	416	489	506
	BB	131	176	249	266	339	384	429	502	519
Manifold configuration		2 stations x 1	3 stations x 1	2 stations x 2	5 stations x 1	3 stations x 2	5 stations + 2 stations	5 stations + 3 stations	3 stations x 3	5 stations x 2

Note: Manifold configuration combines 2-station, 3-station and 5-station units.

Discrete FFB

Manifold FFBM

Discrete FFG

Manifold FFGM

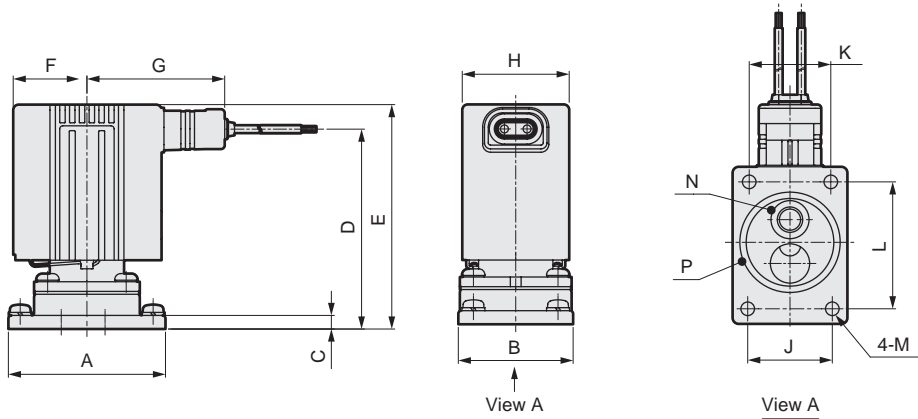
Working fluid check list

Flow rate formula

Safety caution

Dimensions brass body / stainless steel body

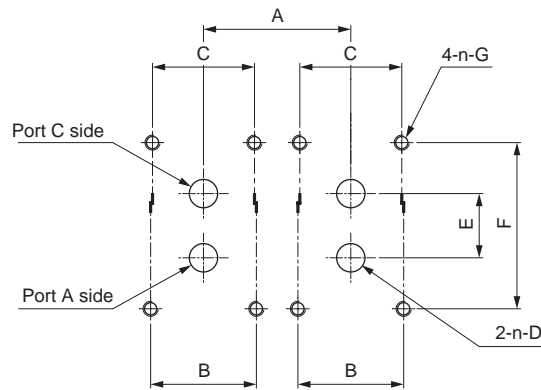
● Actuator lead wire / DC voltage Coil option code: A / J



	A	B	C	D	E	F	G	H	J	K	L	M	Applicable O-ring	
													N	P
FFBM-2	38	27	4.5	50	58.5	18.5	42	24	19(18)	18(19)	30	ø3.5	AS568-009	AS568-018
FFBM-3	46	34	4.5	57	64.5	22	45	30	24(23)	23(24)	38	ø4.5	AS568-011	AS568-022
FFBM-4	52	38	4.5	66	74.5	24.5	47.5	35	28(27)	27(28)	44	ø4.5	AS568-012	AS568-025
FFBM-5	52	38	4.5	75	83.5	27.5	50	40	28(27)	27(28)	44	ø4.5	AS568-012	AS568-025

Dimensions shown in () are for individual supply (FFBM-*5).

● Actuator installation dimensions



Note: Machining drawing when using 2 actuators.

	A	B	C	D	E	F	G
FFBM-2	28 or more	19±0.1	18±0.1	ø3.5	10.6±0.1	30±0.1	M3 depth 6 or more
FFBM-3	36 or more	24±0.1	23±0.1	ø5.5	13.8±0.1	38±0.1	M4 depth 6 or more
FFBM-4	39 or more	28±0.1	27±0.1	ø7.5	17±0.1	44±0.1	M4 depth 6 or more
FFBM-5	45 or more	28±0.1	27±0.1	ø7.5	17±0.1	44±0.1	M4 depth 6 or more

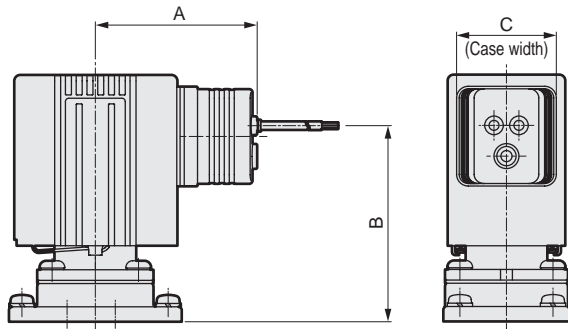
How to order discrete masking plate

O-ring, with mounting screw

Seal	Brass body			Stainless steel body		
	NBR	FKM	EPDM	NBR	FKM	EPDM
FFBM-2	FFBM-21C-MP-KIT	FFBM-21D-MP-KIT	FFBM-21Q-MP-KIT	FFBM-21H-MP-KIT	FFBM-21J-MP-KIT	FFBM-21U-MP-KIT
FFBM-3	FFBM-31C-MP-KIT	FFBM-31D-MP-KIT	FFBM-31Q-MP-KIT	FFBM-31H-MP-KIT	FFBM-31J-MP-KIT	FFBM-31U-MP-KIT
FFBM-4	FFBM-41C-MP-KIT	FFBM-41D-MP-KIT	FFBM-41Q-MP-KIT	FFBM-41H-MP-KIT	FFBM-41J-MP-KIT	FFBM-41U-MP-KIT
FFBM-5	FFBM-41C-MP-KIT	FFBM-41D-MP-KIT	FFBM-41Q-MP-KIT	FFBM-41H-MP-KIT	FFBM-41J-MP-KIT	FFBM-41U-MP-KIT

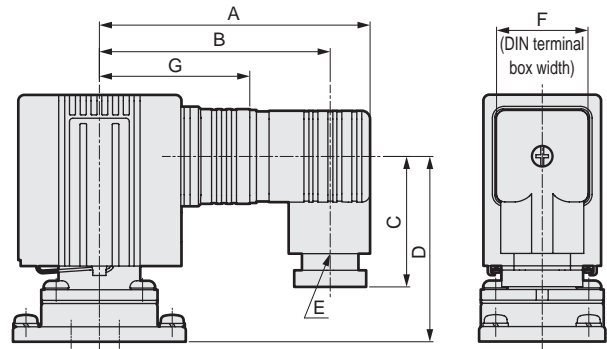
Dimensions brass body / stainless steel body

● Actuator lead wire / AC voltage Coil option code: A / J



	A	B	C
FFBM-2	43	46.5	24
FFBM-3	46	50	30
FFBM-4	48.5	59	30
FFBM-5	51	68	30

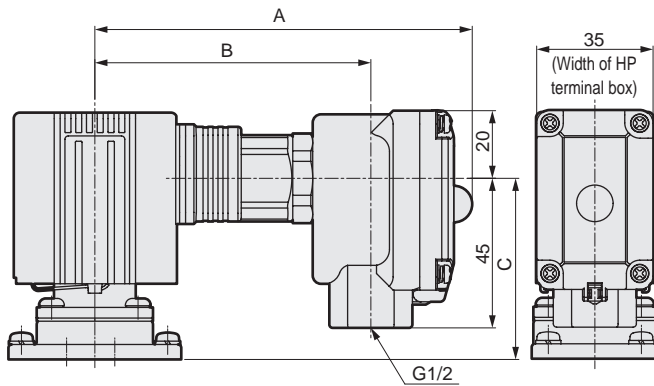
● With actuator DIN terminal box Coil option code: B/C/D/K/L/S
 ● Actuator DIN coil without terminal box



Dimensions shown in () are for G1/2.

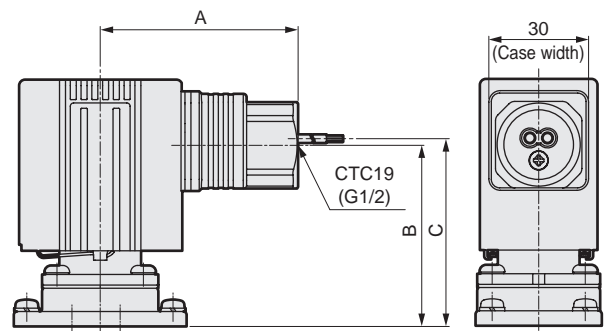
	A	B	C	D	E	F	G
FFBM-2	73	64	36	43	Pg9	21	39
FFBM-3	78.5	66.5 (65)	39.5 (41.5)	46.5	Pg11 (G1/2)	27.5	42
FFBM-4	81	69 (67.5)	39.5 (41.5)	56	Pg11 (G1/2)	27.5	44.5
FFBM-5	83.5	71.5 (70)	39.5 (41.5)	65	Pg11 (G1/2)	27.5	47

● With actuator HP terminal box Coil option code: G/H/Q/R



	A	B	C
FFBM-2			
FFBM-3	113	82	45.5
FFBM-4	115	85	54.5
FFBM-5	118	87	63.5

● Conduit Coil option code: E/F/M/P



	A	B	C
FFBM-2			
FFBM-3	56.5	45.5	47.5
FFBM-4	59	54.5	56.5
FFBM-5	61.5	63.5	65.5

Discrete FFB

Manifold FFBM

Direct acting 2-port valve

Discrete FFG

Manifold FFGM

Direct acting 3-port valve

Working fluid
check list

Flow rate formula

Safety caution



Direct acting 3-port solenoid valve

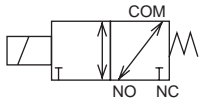
FFG Series

- Universal, NC pressurization
- Port size: Rc, G, NPT 1/8 to 3/8

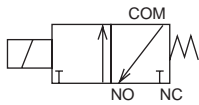


JIS symbol

- FFG-*1: Universal



- FFG-*3: NC pressurization



Common specifications

Item	FFG
Working fluid	Compressed air/water/oil (50mm ² /s or less)/dry air/low vacuum [1.33x10 ² Pa (abs)] *1
Max. working pressure MPa	1.2 (refer to working pressure in individual specifications.)
Proof pressure (water pressure) MPa	1.8
Fluid temperature °C	-10 to 60 (no freezing)
Ambient temperature °C	-10 to 60 (DC), -10 to 55 (AC)
Thermal class	Class 130 (B)
Atmosphere	Place free of corrosive gas and explosive gas
Valve structure	Direct acting poppet structure
Valve seat leakage (ANR) cm ³ /min	0.2 or less (air)
Mounting orientation	Unrestricted
Degree of protection	IP65

*1: When using at low vacuum, vacuum the NC/NO port side for the universal and the NO port for the NC pressurization.

Electrical specifications

Item	FFG-2							FFG-3						
	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz
Rated voltage V	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz
Voltage fluctuation range	±10%							±10%						
Power consumption W	3.5	3.5	-	-	-	-	-	4.5	4.5	-	-	-	-	-
Apparent power VA	-	-	5.1	5.7	6.0	5.3	5.7	-	-	6.2	6.1	6.2	6.2	6.5
Item	FFG-4							FFG-5						
	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz
Rated voltage V	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz
Voltage fluctuation range	±10%							±10%						
Power consumption W	7	7	-	-	-	-	-	10.5	10.5	-	-	-	-	-
Apparent power VA	-	-	8.6	10	9.6	9.5	9.4	-	-	13	13	14	14	13

The leakage current must be less than or equal to the values shown below.

Voltage	AC					DC	
	100V	110V	200V	220V	230V	12V	24V
Leakage current	2 mA or less		1 mA or less			5 mA or less	

Individual specifications

Item Model No.	Port size Rc/G/ NPT	Orifice size (mm)	Usage Pressure (MPa) *1/*2	Flow Rate Characteristics												Weight (kg) *3
				COM→NC			COM→NO			NC→COM			NO→COM			
				C[dm ³ /(s-bar)]	b	Cv	C[dm ³ /(s-bar)]	b	Cv	C[dm ³ /(s-bar)]	b	Cv	C[dm ³ /(s-bar)]	b	Cv	
Universal																
FFG-21 06 * 1	1/8	1	0 to 0.7	0.12	0.47	0.036	0.11	0.54	0.030	0.12	0.50	0.032	0.11	0.37	0.028	0.27
		2	0 to 0.15	0.53	0.49	0.13	0.35	0.64	0.10	0.48	0.27	0.10	0.32	0.24	0.085	
FFG-31 06 08 * S	1/8 1/4	1.5	0 to 0.7	0.30	0.49	0.080	0.30	0.48	0.080	0.27	0.46	0.080	0.27	0.42	0.075	0.48
		2	0 to 0.4	0.55	0.46	0.15	0.49	0.47	0.13	0.49	0.38	0.13	0.49	0.30	0.10	
		3	0 to 0.15	1.1	0.37	0.27	0.95	0.46	0.20	1.1	0.14	0.24	0.9	0.17	0.17	
FFG-41 08 10 * 2	1/4 3/8	2	0 to 0.7 (0.6)	0.55	0.49	0.16	0.55	0.49	0.15	0.49	0.44	0.14	0.49	0.45	0.13	0.74
		3	0 to 0.3	1.2	0.40	0.32	1.2	0.39	0.30	1.1	0.29	0.30	1.1	0.22	0.25	
		4	0 to 0.15	1.9	0.40	0.47	1.8	0.37	0.41	1.9	0.21	0.41	1.8	0.19	0.32	
FFG-51 08 10 * 2	1/4 3/8	2	0 to 1.2 (0.6)	0.55	0.49	0.16	0.55	0.49	0.15	0.49	0.44	0.14	0.49	0.45	0.13	0.93
		3	0 to 0.6 (0.3)	1.2	0.40	0.32	1.2	0.39	0.30	1.1	0.29	0.30	1.1	0.22	0.25	
		4	0 to 0.3 (0.15)	1.9	0.40	0.47	1.8	0.37	0.41	1.9	0.21	0.41	1.8	0.19	0.32	
NC pressurization																
FFG-33 06 08 * S	1/8 1/4	1.5	0 to 1.0				0.30	0.48	0.080	0.27	0.46	0.080				0.48
		2	0 to 0.7				0.49	0.47	0.13	0.49	0.38	0.13				
		3	0 to 0.3				0.95	0.46	0.20	1.1	0.14	0.24				
FFG-43 08 10 * 2	1/4 3/8	2	0 to 1.2				0.55	0.49	0.15	0.49	0.44	0.14				0.74
		3	0 to 0.6				1.2	0.39	0.30	1.1	0.29	0.30				
		4	0 to 0.3				1.8	0.37	0.41	1.9	0.21	0.41				

*1: () is for NO pressurization.

*2: When used in a low vacuum, the lower limit of operating pressure is 1.33×10^2 Pa (abs), so the upper limit is 0.1 MPa lower.

*3: Weight of brass body with DC lead wire.

Discrete FFB

Direct acting 2-port valve

Manifold FFBM

Discrete FFG

Direct acting 3-port valve

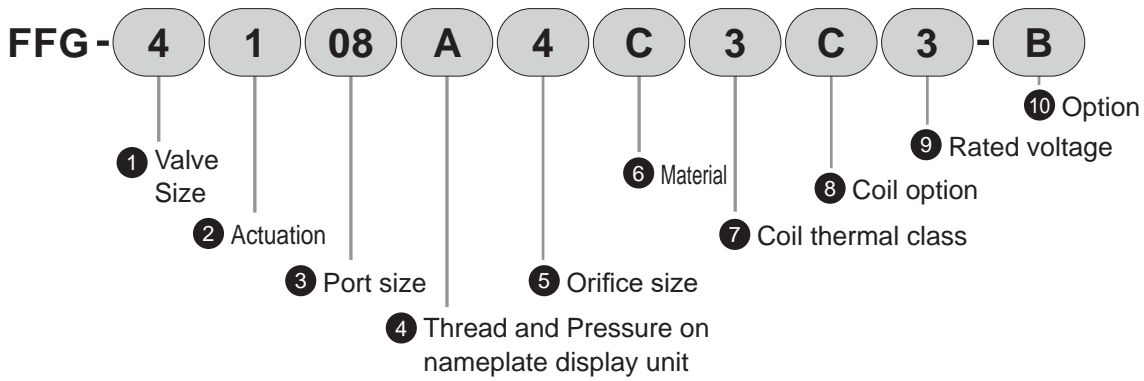
Manifold FFGM

Working fluid
check list

Flow rate formula

Safety caution

How to order



① Valve size		Valve size			
		2	3	4	5
2	Width 24 mm	●			
3	Width 30 mm		●		
4	Width 35 mm			●	
5	Width 40 mm				●

② Actuation		Valve size			
		2	3	4	5
1	Universal	●	●	●	●
3	NC pressurization		●	●	

③ Port size		Valve size			
		2	3	4	5
06	1/8	●	●		
08	1/4		●	●	●
10	3/8			●	●

	④ Thread and pressure unit indicated on nameplate	
	Thread	Pressure display unit
A	Rc thread	MPa
B	G thread	bar
C	NPT thread	psi *1
D	G thread	MPa *2
E	NPT thread	MPa *2

*1: In compliance with the Measurement Act, the psi display cannot be used in Japan.

*2: "D", "E" is a selection to display the pressure display unit as MPa even with G threads and NPT threads mainly in Japan.

⑤ Orifice size		Valve size			
		2	3	4	5
1	ø1	●			
S	ø1.5		●		
2	ø2	●	●	●	●
3	ø3		●	●	●
4	ø4			●	●

⑥ Material				
	Body	Seal	Treatment	Working fluid
A	Aluminum	NBR	-	Compressed air / dry air
C	Brass	NBR		Compressed air / Dry air / Water / Oil / Low vacuum *1
D		FKM	Compressed air / Dry air / Water / Oil / Low vacuum *1	
H	Stainless steel	NBR	-	Compressed air / Dry air / Water / Oil / Low vacuum *1
J		FKM		Compressed air / Dry air / Water / Oil / Low vacuum *1
N	Brass	NBR	Oil-prohibited	Compressed air / Dry air / Water / Oil / Low vacuum *1
P		FKM		Compressed air / Dry air / Water / Oil / Low vacuum *1
Q		EPDM		Water
S	Stainless steel	NBR		Compressed air / Dry air / Water / Oil / Low vacuum *1
T		FKM		Compressed air / Dry air / Water / Oil / Low vacuum *1
U		EPDM		Water

*1: Although it can be used with low vacuum [1.33×10^2 Pa (abs)], valve seat leakage is 0.2 cm³/min (ANR) or less. (Valve seat leakage at positive pressure) When used in a low vacuum, the lower limit of operating pressure is 1.33×10^2 Pa (abs), so the upper limit is 0.1 MPa lower.

7 Coil thermal class

3	Class 130 (B)
---	---------------

8 Coil option

		1 Valve size				Voltage	
		2	3	4	5	DC	AC
A	Lead wire (300 mm)	●	●	●	●	●	●
B	With DIN terminal box (G1/2)	*1	●	●	●	●	●
C	With DIN terminal box (Pg11)	●*2	●	●	●	●	●
D	DIN terminal box with lamp (Pg11)	●*2	●	●	●	*3	●
E	Conduit (G1/2)		●	●	●	●	●
F	Conduit (CTC19)		●	●	●	●	●
G	HP terminal box (G1/2)		●	●	●	●	●
H	HP terminal box with lamp (G1/2)		●	●	●	●	●*5
J	Lead wire (300 mm)	●	●	●	●	●*4	*6
K	With DIN terminal box (Pg11)	●*2	●	●	●	●	
L	DIN terminal box with lamp (Pg11)	●*2	●	●	●	●	
M	Conduit (G1/2)		●	●	●	●	
P	Conduit (CTC19)		●	●	●	●	
Q	HP terminal box (G1/2)		●	●	●	●	
R	HP terminal box with lamp (G1/2)		●	●	●	●	
S	DIN coil without terminal box	●	●	●	●	●*7	

*1: "B" coil option is not available when the valve size is "2".

*2: When the valve size is "2", the DIN terminal box thread size is as in Pg9.

*3: Use "L" DIN terminal box with lamp/surge suppressor

*4: The surge suppressor of the DC voltage coil option "J" is included with product.

*5: When the coil option is "H", the rated voltage "K" (230 VAC) cannot be selected.

*6: All AC voltages are equipped with a full-wave rectifier circuit. Significant surges generated in the coil by the action of this diode are almost eliminated. For this reason, a surge suppressor is not available.

*7: Surge suppressor is not available. Use the terminal box with surge suppressor.

9 Rated voltage

1	100 VAC 50/60 Hz
2	200 VAC 50/60 Hz
3	24 VDC
4	12 VDC
5	110 VAC 50/60 Hz
6	220 VAC 50/60 Hz
K	230 VAC 50/60 Hz

10 Option *1

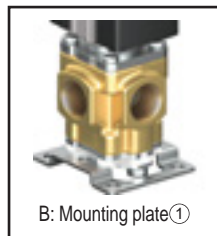
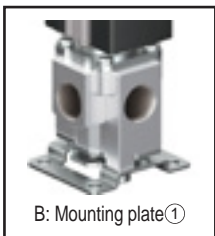
Blank	No
B	Mounting plate①

*1: Mounting plate is included with the product. Refer to the precautions on page 56 for tightening torque.

*2: The mounting plate ① is compatible with CKD product FAG, FGG, and FWG Series.

Aluminum body

Brass / Stainless steel body



How to order mounting plate

With body mounting screw

	Mounting plate code: B	
	Aluminum body	Brass, Stainless steel body
FFG-2	FFB-21-B-MOUNT-PLATE-KIT	FFG-21-B-MOUNT-PLATE-KIT
FFG-3	FFB-31-B-MOUNT-PLATE-KIT	FFG-31-B-MOUNT-PLATE-KIT
FFG-4	FFB-41-B-MOUNT-PLATE-KIT	FFG-41-B-MOUNT-PLATE-KIT
FFG-5	FFB-51-B-MOUNT-PLATE-KIT	

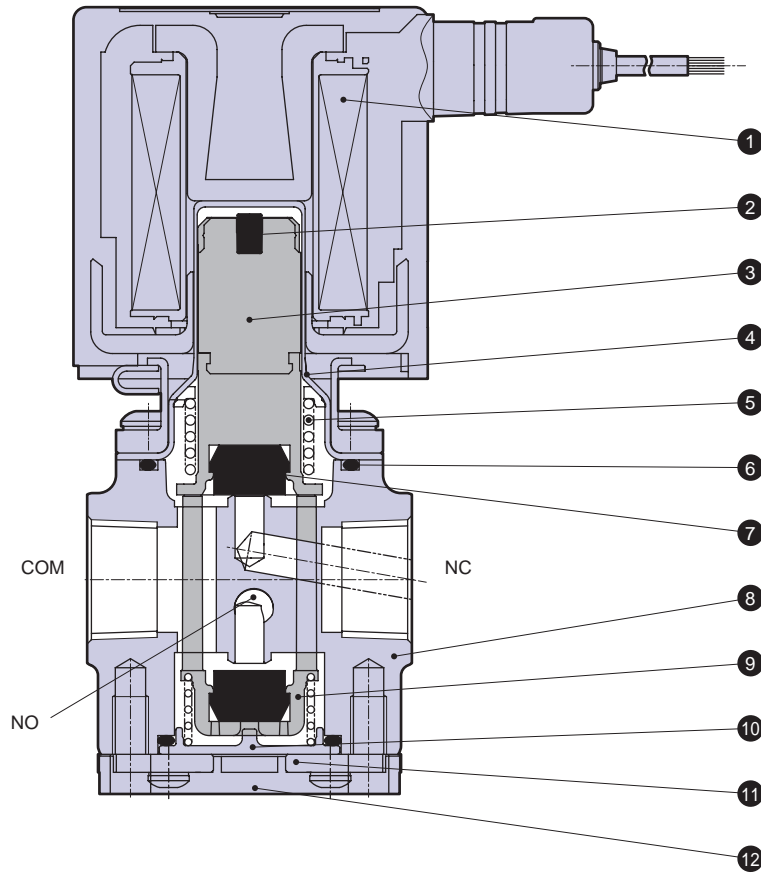
Coil option code

A(DC) J		Grommet lead wire 300 mm Grommet lead wire 300 mm/ With surge suppressor
A(AC)		Grommet lead wire 300 mm
B C K		DIN terminal box DIN terminal box with surge suppressor
D L		DIN terminal box with lamp DIN terminal box / lamp, With surge suppressor
G Q		HP terminal box HP terminal box with surge suppressor
H R		HP terminal box with lamp HP terminal box / lamp, With surge suppressor
E F M P		Conduit (G1/2) Conduit (CTC19) Conduit (G1/2) with surge suppressor Conduit (CTC19) with surge suppressor
S		DIN coil without terminal box

Discrete FFB
Manifold FFBM
Discrete FFG
Manifold FFGM
Working fluid check list
Flow rate formula
Safety caution

Internal structure / Material

Direct acting 2-port valve	Discrete FFB
	Manifold FFBM
Direct acting 3-port valve	Discrete FFG
	Manifold FFGM
Working fluid check list	
Flow rate formula	
Safety caution	



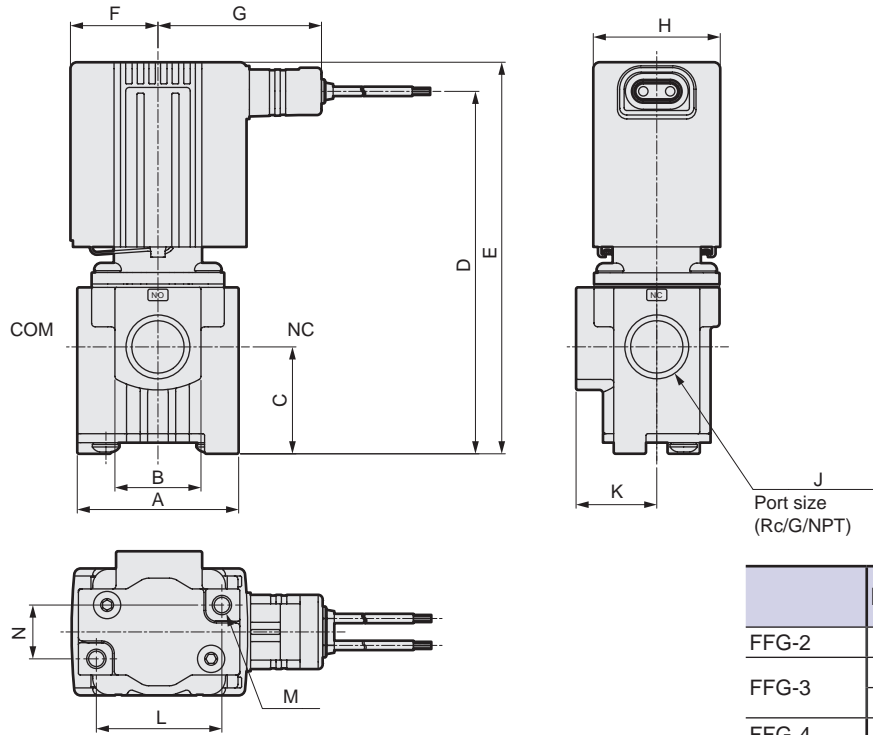
Part No.	Name	Material	
1	Coil assembly	-	
2	Noise dampening rubber	HNBR (FKM,EPDM)	Hydrogenated nitrile rubber (fluoro rubber, ethylene propylene rubber)
3	Plunger	SUS,PPS	Stainless steel, polyphenylene sulfide
4	Flare pipe assembly	SUS,PPS	Stainless steel, polyphenylene sulfide
5	Plunger spring	SUS304	Stainless steel
6	O-ring	NBR(FKM,EPDM)	Nitrile rubber (fluoro rubber, ethylene propylene rubber)
7	Seal	NBR(FKM,EPDM)	Nitrile rubber (fluoro rubber, ethylene propylene rubber)
8	Body	Brass (ADC, SCS13)	Brass (aluminum die-casting, stainless steel)
9	Valving element guide	PPS	Polyphenylene sulfide
10	NO cover	PPS	Polyphenylene sulfide
11	Covers A, B *1	SUS304	Stainless steel
12	Cover cover *2	POM	Polyacetal

*1: Body material is brass, stainless steel for cover A, aluminum for cover B

*2: Only for brass and stainless steel body

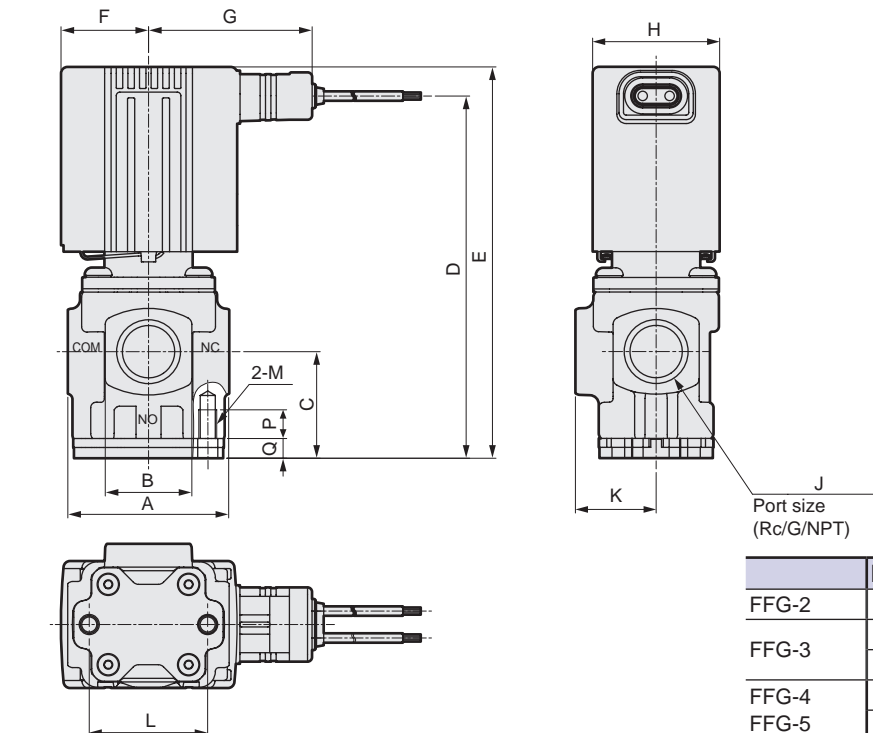
Dimensions

- Lead wire / DC voltage Coil option code: A / J
- Aluminum body



	Port size	Thread depth
FFG-2	G1/8	7.4
FFG-3	G1/8	8.5
	G1/4	10.5
FFG-4	G1/4	12.5
FFG-5	G3/8	11.4

Brass body / Stainless steel body

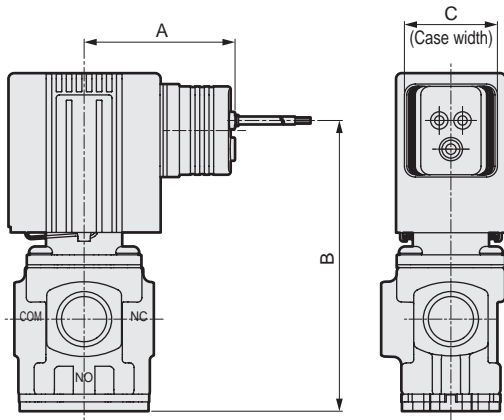


	Port size	Thread depth
FFG-2	G1/8	7.4
FFG-3	G1/8	8.5
	G1/4	10.5
FFG-4	G1/4	12.5
FFG-5	G3/8	11.4

	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
FFG-2	Aluminum body Brass / SUS body	32	17	21	69.5	78	18.5	42	24	1/8	16	25	M4 depth 6	8	
												23.8	M4	6	4.5
FFG-3	Aluminum body Brass / SUS body	40	19	26.5	86.5	94	22	45	30	1/8	20	32	M5 depth 8	11	
				26	86	93.5				1/4		29	M5	6	4.5
FFG-4	Aluminum body Brass / SUS body	45	24	30	101	109	24.5	47.5	35	1/4	22.5	35	M5 depth 8	15	
										3/8		33	M5	8	5.5
FFG-5	Aluminum body Brass / SUS body	45	24	30	110	118	27.5	50	40	1/4	22.5	35	M5 depth 8	15	
										3/8		33	M5	8	5.5

Dimensions

● Lead wire / AC voltage Coil option code: A

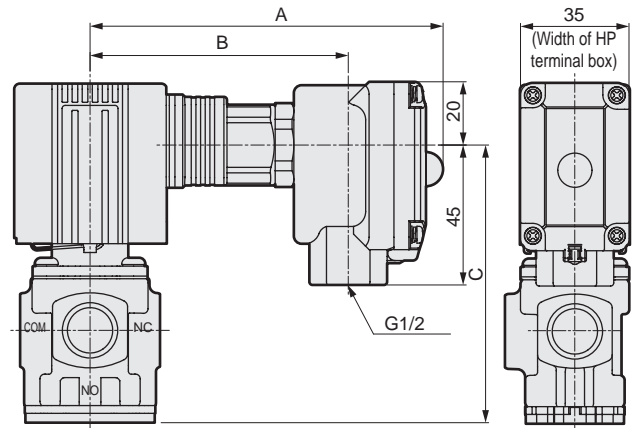
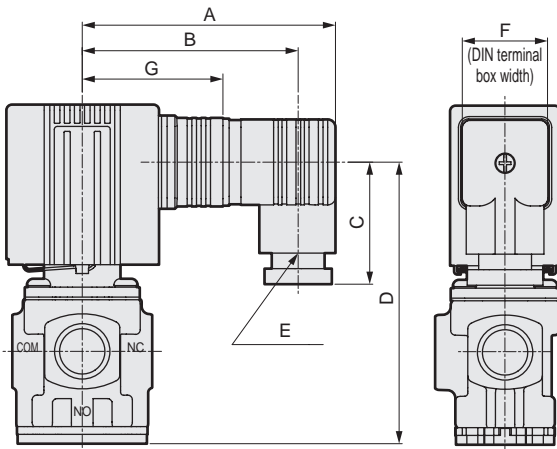


		A	B	C
FFG-2	Aluminum body	43	66	24
	Brass / SUS body			
FFG-3	Aluminum body	46	79	30
	Brass / SUS body		78.5	
FFG-4	Aluminum body	48.5	94	30
	Brass / SUS body			
FFG-5	Aluminum body	51	103	30
	Brass / SUS body			

Optional dimensions

● With DIN terminal box Coil option code: B/C/D/K/L/S
 ● DIN coil without terminal box

● With HP terminal box Coil option code: G/H/Q/R



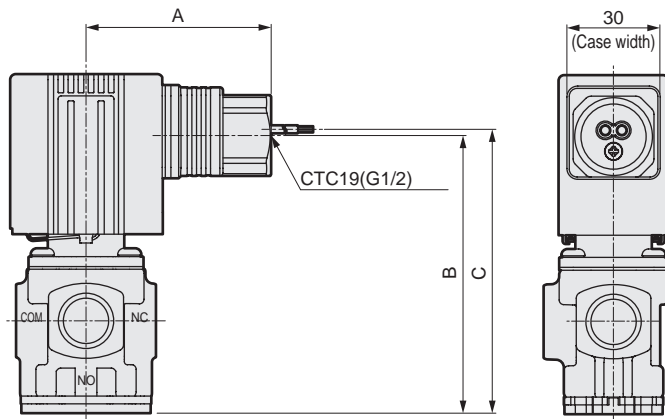
Dimensions shown in () are for G1/2.

		A	B	C	D	E	F	G
FFG-2	Aluminum body	73	64	36	62.5	Pg9	21	39
	Brass / SUS body							
FFG-3	Aluminum body	78.5	66.5	39.5	76	Pg11	27.5	42
	Brass / SUS body		(65.5)	(41.5)	75.5			
FFG-4	Aluminum body	81	69	39.5	90.5	Pg11	27.5	44.5
	Brass / SUS body		(67.5)	(41.5)				
FFG-5	Aluminum body	83.5	71.5	39.5	99.5	Pg11	27.5	47
	Brass / SUS body		(70)	(41.5)				

		A	B	C
FFG-2	Aluminum body			
	Brass / SUS body			
FFG-3	Aluminum body	113	82	74.5
	Brass / SUS body			74
FFG-4	Aluminum body	115	85	89.5
	Brass / SUS body			
FFG-5	Aluminum body	118	87	98.5
	Brass / SUS body			

Optional dimensions

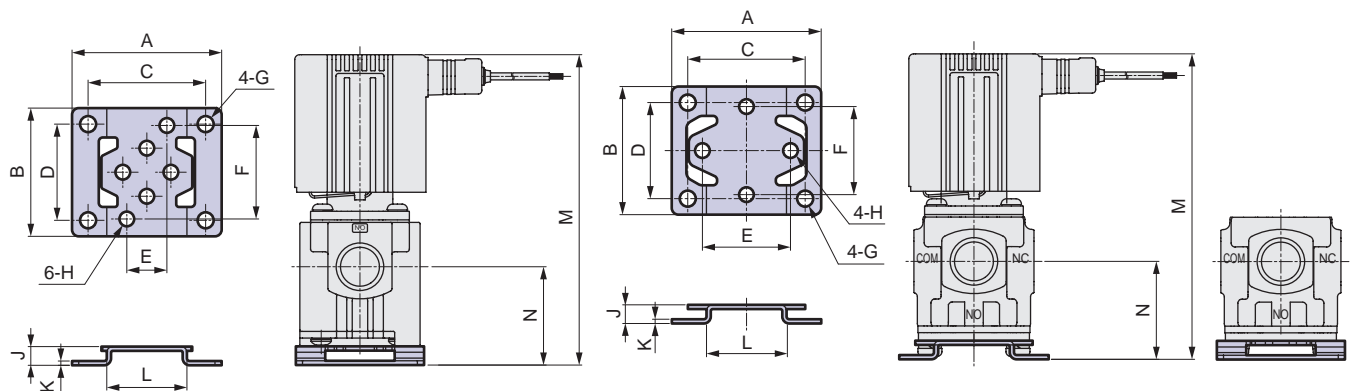
● Conduit Coil option code: E/F/M/P



		A	B	C
FFG-2	Aluminum body			
	Brass / SUS body			
FFG-3	Aluminum body	56.5	74.5	76.5
	Brass / SUS body		74	76
FFG-4	Aluminum body	59	89.5	91.5
	Brass / SUS body			
FFG-5	Aluminum body	61.5	98.5	100.5
	Brass / SUS body			

● Mounting plate① Option code: B
Aluminum body

Brass / Stainless steel body



		A	B	C	D	E	F	G	H	J	K	L	M	N
FFG-2	Aluminum body	40	34	30	25	8	25	ø5	ø4.5	6	1.2	20	84	27
	Brass / SUS body					23.8	23.8					19		
FFG-3	Aluminum body	52	42	40	30	11	32	ø6	ø5.5	7	1.6	25	101	33.5
	Brass / SUS body					29	29					26		
FFG-4	Aluminum body	56	48	44	36	15	35	ø6	ø5.5	7	1.6	30	116	37
	Brass / SUS body					33	33					30		
FFG-5	Aluminum body	62	50	50	38	15	35	ø6	ø5.5	7	1.6	36	125	37
	Brass / SUS body					56	48					44		

Discrete FFB

Manifold FFBM

Discrete FFG

Manifold FFGM

Working fluid check list

Flow rate formula

Safety caution

Direct acting 2-port valve

Direct acting 3-port valve



Direct acting 3-port solenoid valve, manifold

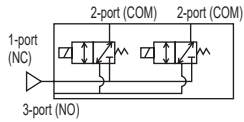
FFGM Series

- Universal
- Port size: Rc, G, NPT 1/8, 1/4



JIS symbol

● Common supply/common exhaust



Common specifications

Item	FFGM
Working fluid	Compressed air/water/oil (50mm ² /s or less)/dry air/low vacuum [1.33×10 ² Pa (abs)] *1
Max. working pressure MPa	1.2 (refer to working pressure in individual specifications.)
Proof pressure (water pressure) MPa	1.8
Fluid temperature °C	-10 to 40 (no freezing)
Ambient temperature °C	-10 to 40
Thermal class	Class 130 (B)
Atmosphere	Place free of corrosive gas and explosive gas
Valve structure	Direct acting poppet structure
Valve seat leakage cm ³ /min (ANR)	0.2 or less (air)
Mounting orientation	Unrestricted
Degree of protection	IP65

*1: When using at low vacuum, vacuum the NC/NO port side for the universal and the NO port for the NC pressurization.

Electrical specifications

Item	FFGM-3						
	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz
Rated voltage V	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz
Voltage fluctuation range	±10%						
Power consumption W	4.5	4.5	-	-	-	-	-
Apparent power VA	-	-	6.2	6.1	6.2	6.2	6.5

Item	FFGM-4							FFGM-5						
	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz
Rated voltage V	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	230 VAC 50/60Hz
Voltage fluctuation range	±10%							±10%						
Power consumption W	7	7	-	-	-	-	-	10.5	10.5	-	-	-	-	-
Apparent power VA	-	-	8.6	10	9.6	9.5	9.4	-	-	13	13	14	14	13

The leakage current must be less than or equal to the values shown below.

Voltage	AC					DC	
	100V	110V	200V	220V	230V	12V	24V
Leakage current	2 mA or less		1 mA or less			5 mA or less	

Individual specifications

Item	Port size		Orifice size (mm)	Usage Pressure (MPa) *1 *2	Flow Rate Characteristics											
	Rc/G/NPT				COM→NC			COM→NO			NC→COM			NO→COM		
	2-port	1-port 3-port			C[dm ³ /(s·bar)]	b	Cv	C[dm ³ /(s·bar)]	b	Cv	C[dm ³ /(s·bar)]	b	Cv	C[dm ³ /(s·bar)]	b	Cv
Universal																
FFGM-31 08 * S	1/4	1/4	1.5	0 to 0.7	0.31	0.41	0.089	0.31	0.26	0.079	0.28	0.33	0.070	0.27	0.32	0.073
2			2	0 to 0.4	0.54	0.42	0.15	0.52	0.10	0.12	0.49	0.19	0.12	0.48	0.25	0.12
3			3	0 to 0.15	0.92	0.26	0.22	0.85	0.090	0.19	0.86	0.11	0.20	0.88	0.15	0.20
FFGM-41 08 * 2	1/4	1/4	2	0 to 0.7(0.6)	0.56	0.46	0.16	0.56	0.29	0.15	0.52	0.32	0.14	0.50	0.31	0.12
3			3	0 to 0.3	1.2	0.40	0.33	1.1	0.060	0.26	1.1	0.16	0.27	1.1	0.17	0.26
4			4	0 to 0.15	1.8	0.27	0.42	1.3	0.15	0.36	1.6	0.090	0.36	1.5	0.13	0.37
FFGM-51 08 * 2	1/4	1/4	2	0 to 1.2(0.6)	0.56	0.46	0.16	0.56	0.29	0.15	0.52	0.32	0.14	0.50	0.31	0.12
3			3	0 to 0.6(0.3)	1.2	0.40	0.33	1.1	0.060	0.26	1.1	0.16	0.27	1.1	0.17	0.26
4			4	0 to 0.3(0.15)	1.8	0.27	0.42	1.3	0.15	0.36	1.6	0.09	0.36	1.5	0.13	0.37

*1:() is for NO pressurization.

*2: When used in a low vacuum, the lower limit of operating pressure is 1.33 x 10² Pa (abs), so the upper limit is 0.1 MPa lower.

Weight

●Body material: Aluminum

Model No.	Actuator only	Weight (kg)								
		2 stations	3 stations	4 stations	5 stations	6 stations	7 stations	8 stations	9 stations	10 stations
FFGM-3	0.34	1.0	1.5	2.0	2.5	2.9	3.4	3.9	4.4	4.8
FFGM-4	0.53	1.4	2.1	2.8	3.5	4.2	4.8	5.5	6.2	6.9
FFGM-5	0.72	1.8	2.7	3.6	4.6	5.5	6.4	7.3	8.2	9.1

*3: Weight of aluminum sub-plate 24 VDC lead wire.

●Body material: brass / stainless steel

Model No.	Actuator only	Weight (kg)			
		2 stations	3 stations	4 stations	5 stations
FFGM-3	0.49	2.2	3.1	4.1	5.0
FFGM-4	0.78	2.8	4.1	5.4	6.6
FFGM-5	0.97	3.3	4.8	6.4	7.9

*4: Weight of brass body, stainless steel sub-plate 24 VDC lead wire.

Discrete FFB

Direct acting 2-port valve

Manifold FFBM

Discrete FFG

Direct acting 3-port valve

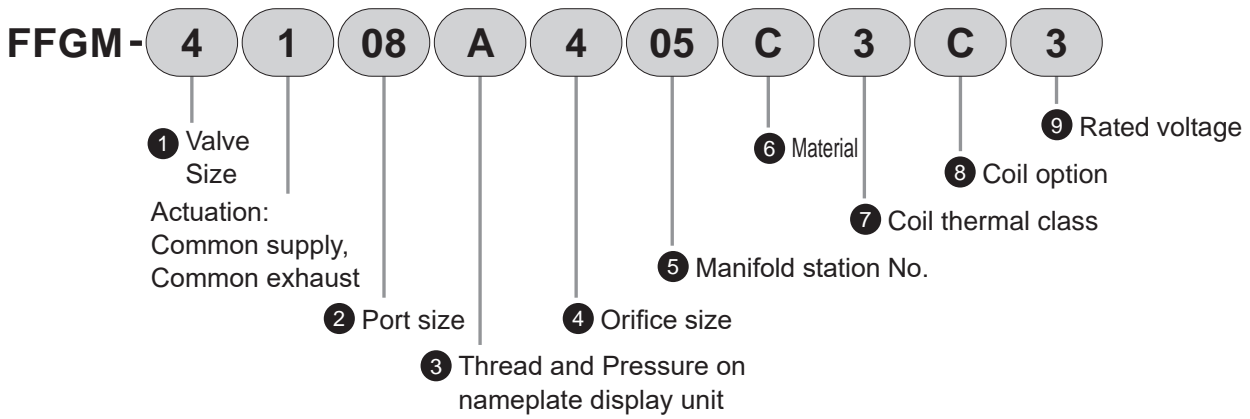
Manifold FFGM

Working fluid
check list

Flow rate formula

Safety caution

How to order



① Valve size

		Valve size		
		3	4	5
3	Width 30 mm	●		
4	Width 35 mm		●	
5	Width 40 mm			●

② Port size

		Valve size		
		3	4	5
08	1/4	●	●	●
00	Actuator only	●	●	●

③ Thread and pressure unit indicated on nameplate

	Thread	Pressure display unit
A	Rc thread	MPa
B	G thread	bar
C	NPT thread	psi *2
D	G thread	MPa *3
E	NPT thread	MPa *3

④ Orifice size

		Valve size		
		3	4	5
S	ø1.5	●		
2	ø2	●	●	●
3	ø3	●	●	●
4	ø4		●	●

*1: When port size of ② is "00" actuator only, there is no thread type. Therefore, select "A" (MPa), "B" (bar), "C" (psi) for the pressure display unit.

*2: In compliance with the Measurement Act, the psi display cannot be used in Japan.

*3: "D", "E" is a selection to display the pressure display unit as MPa even with G threads and NPT threads mainly in Japan.

⑤ Manifold station No.

02	2 stations
to	to
09	9 stations
10	10 stations
00	Actuator only

Note: For brass or stainless steel body, the manifold station No. is from 2 to 5 stations.

⑥ Material

	Body	Sub-plate	Seal	Treatment	Working fluid
A	Aluminum		NBR		Compressed air / dry air
C	Brass	Stainless steel	NBR	Oil-prohibited	Compressed air / Dry air / Water / Oil / Low vacuum*1
D			FKM		Compressed air / Dry air / Water / Oil / Low vacuum*1
H	NBR		Compressed air / Dry air / Water / Oil / Low vacuum*1		
J	FKM		Compressed air / Dry air / Water / Oil / Low vacuum*1		
N	NBR		Compressed air / Dry air / Water / Oil / Low vacuum*1		
P	Brass	FKM		Compressed air / Dry air / Water / Oil / Low vacuum*1	
S	Stainless steel	NBR		Compressed air / Dry air / Water / Oil / Low vacuum*1	
T		FKM		Compressed air / Dry air / Water / Oil / Low vacuum*1	

*1: Although it can be used with low vacuum [1.33×10^2 Pa (abs)], valve seat leakage is 0.2 cm³/min (ANR) or less. (Valve seat leakage at positive pressure) When used in a low vacuum, the lower limit of operating pressure is 1.33×10^2 Pa (abs), so the upper limit is 0.1 MPa lower.

7 Coil thermal class

3	Class 130 (B)
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8 Coil option

		1 Valve size			Voltage	
		3	4	5	DC	AC
A	Lead wire (300 mm)	●	●	●	●	●
B	With DIN terminal box (G1/2)	●	●	●	●	●
C	With DIN terminal box (Pg11)	●	●	●	●	●
D	DIN terminal box with lamp (Pg11)	●	●	●	*1	●
E	Conduit (G1/2)	●	●	●	●	●
F	Conduit (CTC19)	●	●	●	●	●
G	HP terminal box (G1/2)	●	●	●	●	●
H	HP terminal box with lamp (G1/2)	●	●	●	●	●*3
J	Lead wire (300 mm)	●	●	●	●*2	*4
K	With DIN terminal box (Pg11)	●	●	●	●	
L	DIN terminal box with lamp (Pg11)	●	●	●	●	
M	Conduit (G1/2)	●	●	●	●	
P	Conduit (CTC19)	●	●	●	●	
Q	HP terminal box (G1/2)	●	●	●	●	
R	HP terminal box with lamp (G1/2)	●	●	●	●	
S	DIN coil without terminal box	●	●	●	●*5	

*1: Use "L" DIN terminal box with lamp/surge suppressor

*2: The surge suppressor of the DC voltage coil option "J" is included with product.

*3: When the coil option is "H", the rated voltage "K" (230 VAC) cannot be selected.

*4: All AC voltages are equipped with a full-wave rectifier circuit. Significant surges generated in the coil by the action of this diode are almost eliminated. For this reason, a surge suppressor is not available.

*5: Surge suppressor is not available. Use the terminal box with surge suppressor.









9 Rated voltage

1	100 VAC 50/60 Hz
2	200 VAC 50/60 Hz
3	24 VDC
4	12 VDC
5	110 VAC 50/60 Hz
6	220 VAC 50/60 Hz
K	230 VAC 50/60 Hz

How to order

Masking plate orders are also available.
Refer to How to order on page 41.

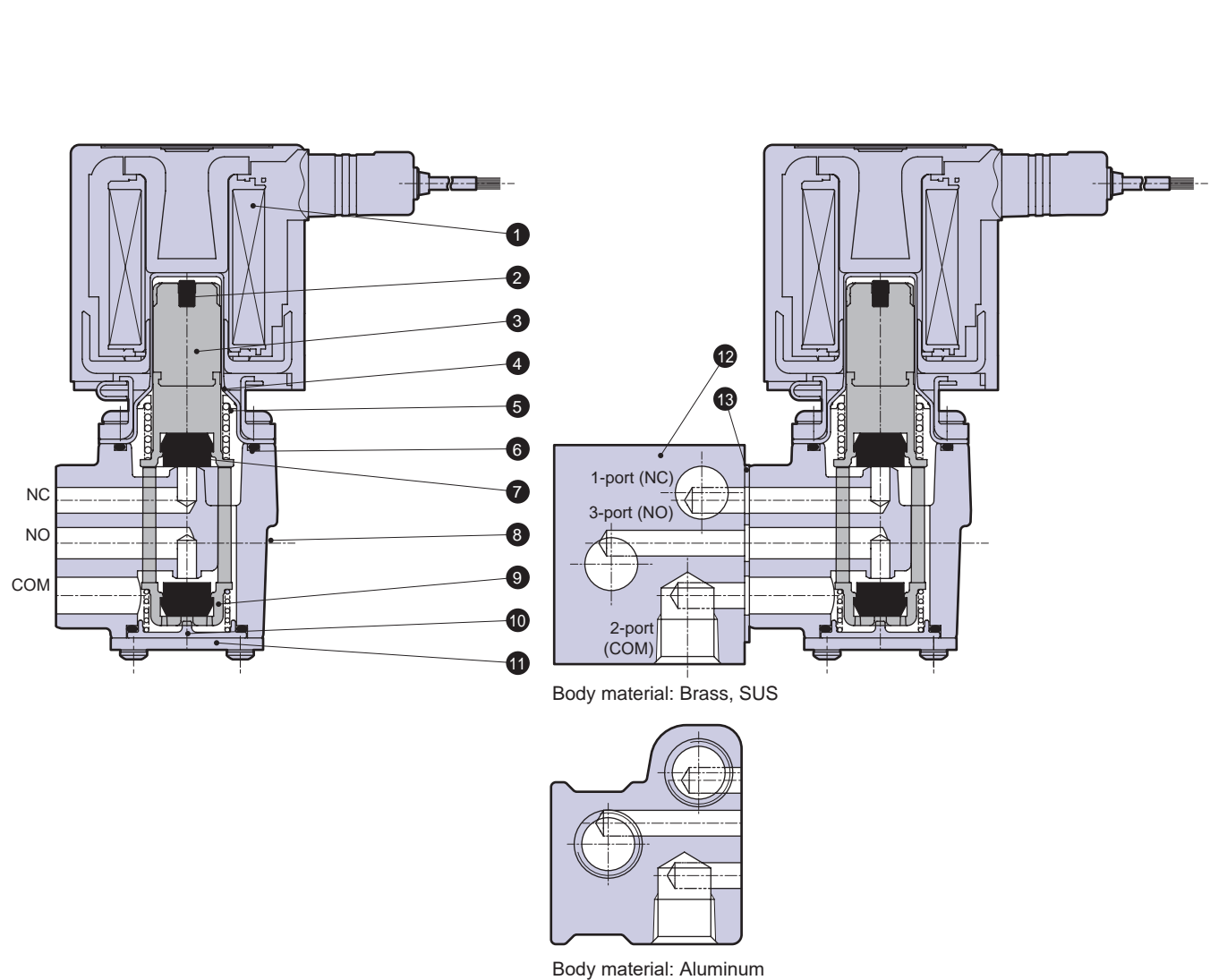
Coil option code

A(DC) J		Grommet lead wire 300 mm Grommet lead wire 300 mm/ With surge suppressor
A(AC)		Grommet lead wire 300 mm
B C K		DIN terminal box DIN terminal box with surge suppressor
D L		DIN terminal box with lamp DIN terminal box / lamp, With surge suppressor
G Q		HP terminal box HP terminal box with surge suppressor
H R		HP terminal box with lamp HP terminal box / lamp, With surge suppressor
E F M P		Conduit (G1/2) Conduit (CTC19) Conduit (G1/2) with surge suppressor Conduit (CTC19) with surge suppressor
S		DIN coil without terminal box

Internal structure / Material

● FFGM actuator

● FFGM manifold

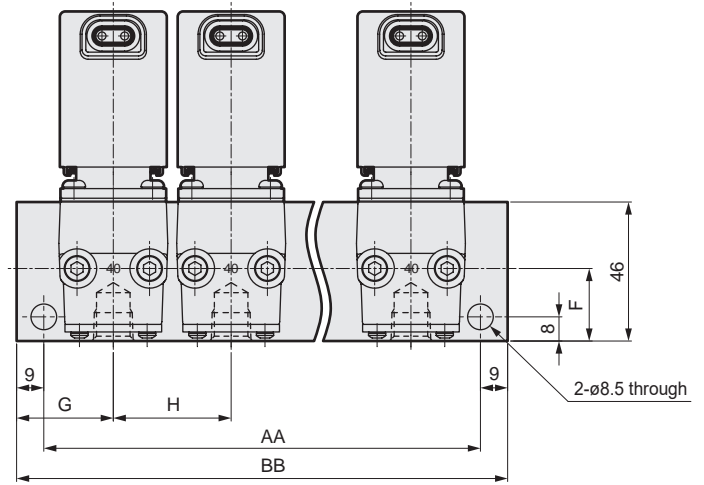
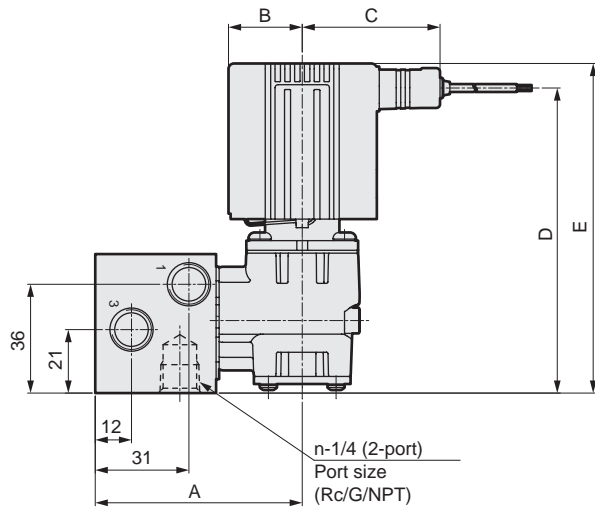


Part No.	Name	Material	
1	Coil assembly	-	
2	Noise dampening rubber	HNBR (FKM,EPDM)	Hydrogenated nitrile rubber (fluoro rubber, ethylene propylene rubber)
3	Plunger	SUS,PPS	Stainless steel, polyphenylene sulfide
4	Flare pipe assembly	SUS,PPS	Stainless steel, polyphenylene sulfide
5	Plunger spring	SUS304	Stainless steel
6	O-ring	NBR(FKM,EPDM)	Nitrile rubber (fluoro rubber, ethylene propylene rubber)
7	Seal	NBR(FKM,EPDM)	Nitrile rubber (fluoro rubber, ethylene propylene rubber)
8	Body	Brass (aluminum, SCS13)	Brass (aluminum, stainless steel)
9	Valving element guide	PPS	Polyphenylene sulfide
10	NO cover	PPS	Polyphenylene sulfide
11	Cover M	SUS304	Stainless steel
12	Sub-plate	SUS304 (aluminum)	Stainless steel (aluminum) *1
13	Gasket	NBR (FKM)	Nitrile rubber (fluoro rubber)

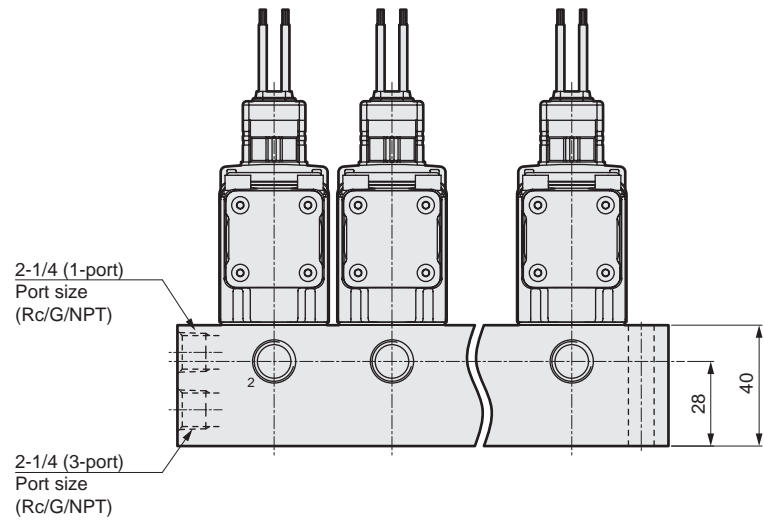
*1: Body material: For brass, the sub-plate material is stainless steel.

Dimensions

● Manifold lead wire / DC voltage Coil option code: A / J



	Port size	Thread depth
FFGM-3	G1/4	12.5
FFGM-4	G1/4	12.5
FFGM-5	G1/4	12.5



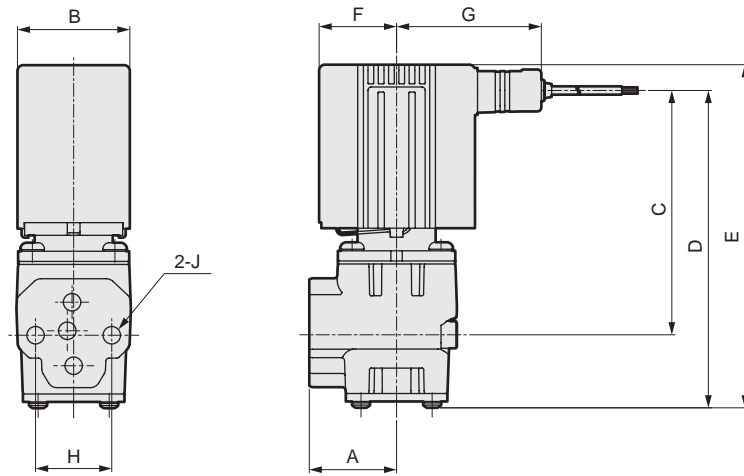
		A	B	C	D	E	F	G	H
FFGM-3	Aluminum body	63.5	22	45	88	95.5	25	32	36
	Brass / SUS body								36
FFGM-4	Aluminum body	68.5	24.5	47.5	101	109	24	32	38
	Brass / SUS body								39
FFGM-5	Aluminum body	68.5	27.5	50	110	118.5	24	32	46
	Brass / SUS body								45

		Station No. Code	2	3	4	5	6	7	8	9	10
FFGM-3	Aluminum body	AA	82	118	154	190	226	262	298	334	370
		BB	100	136	172	208	244	280	316	352	388
	Brass / SUS body	AA	82	118	154	190					
		BB	100	136	172	208					
FFGM-4	Aluminum body	AA	84	122	160	198	236	274	312	350	388
		BB	102	140	178	216	254	292	330	368	406
	Brass / SUS body	AA	85	124	163	202					
		BB	103	142	181	220					
FFGM-5	Aluminum body	AA	92	138	184	230	276	322	368	414	460
		BB	110	156	202	248	294	340	386	432	478
	Brass / SUS body	AA	91	136	181	226					
		BB	109	154	199	244					

Discrete FFB
Manifold FFBM
Discrete FFG
Manifold FFGM
Working fluid check list
Flow rate formula
Safety caution

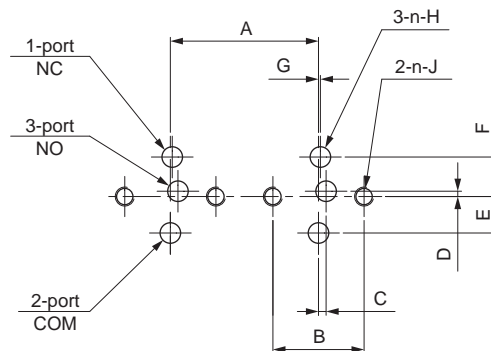
Dimensions

● Actuator lead wire / DC voltage Coil option code: A / J



	A	B	C	D	E	F	G	H	J
FFGM-3	23	30	63	85.5	93	22	45	20	ø4.5
FFGM-4	27.5	35	77	100	108	24.5	47.5	24	ø5.5
FFGM-5	27.5	40	86	109	117	27.5	50	24	ø5.5

● Actuator installation dimensions



Note: Machining drawing when using 2 actuators.

		A	B	C	D	E	F	G	H	J
FFGM-3	Aluminum body	36 or more	20±0.1	1.5±0.1	±0	9±0.2	7.5±0.2	0.5	ø4	M4 depth 10 or more
	Brass / SUS body	36 or more								
FFGM-4	Aluminum body	38 or more	24±0.1	2±0.1	1.4±0.1	9.6±0.2	10.4±0.2	0.5	ø5.4	M5 depth 10 or more
	Brass / SUS body	39 or more								
FFGM-5	Aluminum body	46 or more	24±0.1	2±0.1	1.4±0.1	9.6±0.2	10.4±0.2	0.5	ø5.4	M5 depth 10 or more
	Brass / SUS body	45 or more								

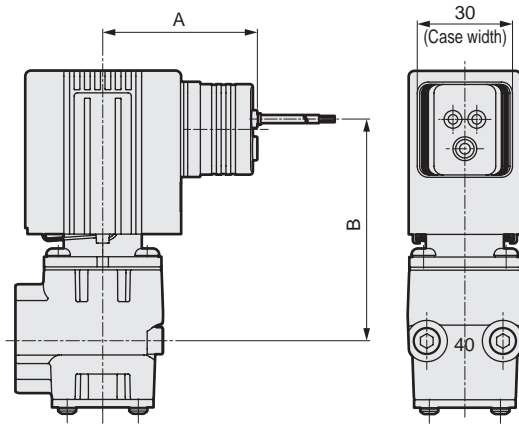
How to order discrete masking plate

With gasket and mounting screws

Seal	Aluminum body	Brass, stainless steel body	
	NBR	NBR	FKM
FFGM-3	FFGM-31A-MP-KIT	FFGM-31H-MP-KIT	FFGM-31J-MP-KIT
FFGM-4	FFGM-41A-MP-KIT	FFGM-41H-MP-KIT	FFGM-41J-MP-KIT
FFGM-5	FFGM-41A-MP-KIT	FFGM-41H-MP-KIT	FFGM-41J-MP-KIT

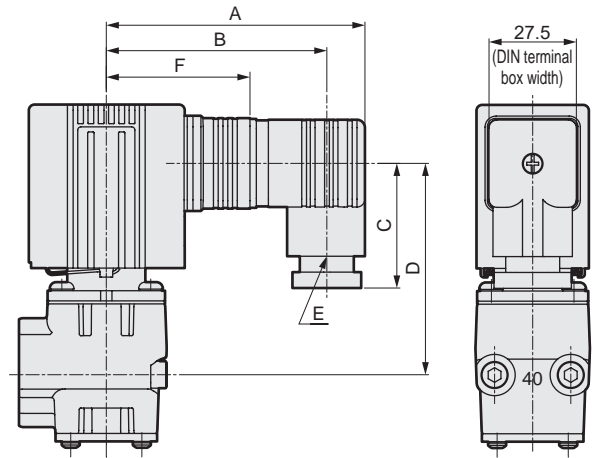
Dimensions

● Actuator lead wire / AC voltage Coil option code: A / J



	A	B
FFGM-3	46	55.5
FFGM-4	48.5	70
FFGM-5	51	79

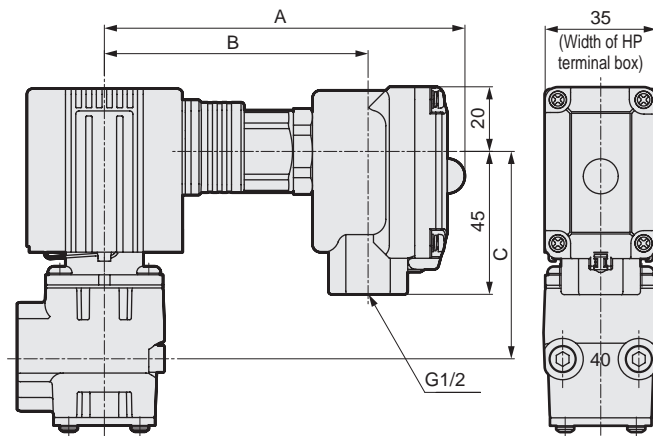
● With actuator DIN terminal box Coil option code: B/C/D/K/L/S
 ● Actuator DIN coil without terminal box



Dimensions shown in () are for G1/2.

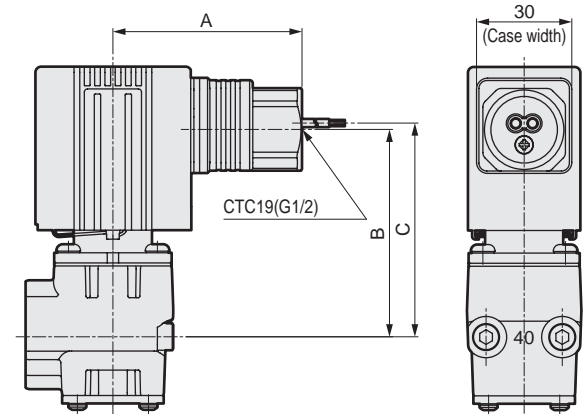
	A	B	C	D	E	F
FFGM-3	78.5	66.5 (65.5)	39.5 (41.5)	52.5	Pg11 (G1/2)	42
FFGM-4	81	69 (67.5)	39.5 (41.5)	66.5	Pg11 (G1/2)	44.5
FFGM-5	83.5	71.5 (70)	39.5 (41.5)	75.5	Pg11 (G1/2)	47

● With actuator HP terminal box Coil option code: G/H/Q/R



	A	B	C
FFGM-3	113	82	51
FFGM-4	115	85	65.5
FFGM-5	118	87	74.5

● Actuator conduit Coil option code: E/F/M/P



	A	B	C
FFGM-3	56.5	51	53
FFGM-4	59	65.5	67.5
FFGM-5	61.5	74.5	76.5

Discrete FFB

Manifold FFBM

Discrete FFG

Manifold FFGM

Working fluid
check list

Flow rate formula

Safety caution

Direct acting 2-port valve

Direct acting 3-port valve