



Direct acting 2-port solenoid valve

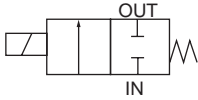
FFB Series

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

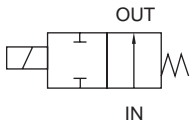


JIS symbol

- 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)/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 ^{cm³/min (ANR)}	0.2 or less (air)
Valve seat leakage *1Pa·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.

Electrical specifications

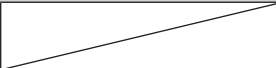
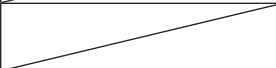
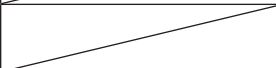
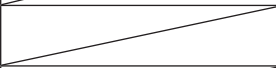
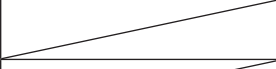
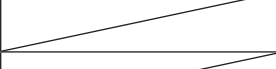
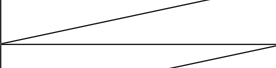

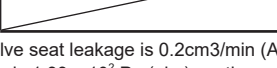
Item	FFB-2							FFB-3							
	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz			
Rated voltage	V														
Voltage fluctuation range		±10%							±10%						
Power consumption	W	3.5	3.5	-	-	-	-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

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

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

Voltage	AC				DC	
	100V	110V	200V	220V	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 characteristics			Weight (kg) *4
					C[dm ³ /(s·bar)]	b	Cv	
NC (open when energized)								
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: Although it can be used with low vacuum [1.33×10^2 Pa (abs)], valve seat leakage is 0.2cm³/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.

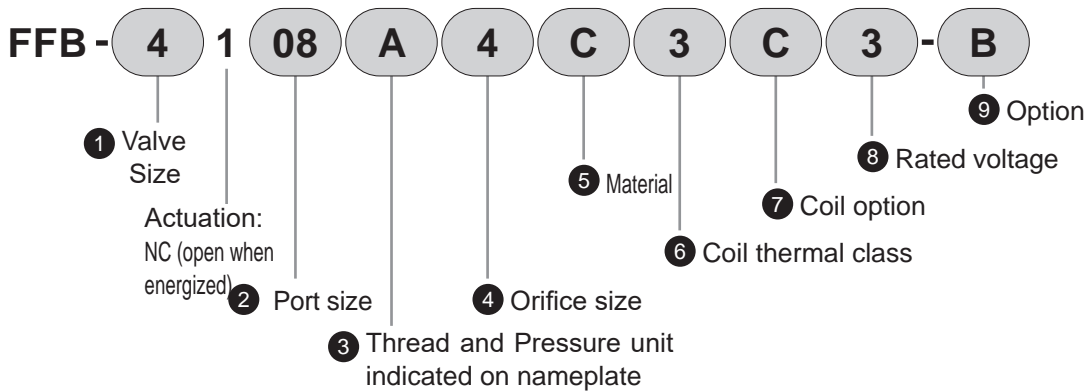
*3: When using at medium vacuum, vacuum the OUT port side.

*4: brass body DC lead wire weight.

Discrete FFB
 Manifold FFBM
 Discrete FFG
 Manifold FFGM
 Working fluid
 check list
 Flow rate formula
 Precautions for
 use

How to order

● NC (open when energized)



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 unit indicated
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" and "E" are selected mainly in Japan to indicate MPa as the pressure display unit even for G and NPT threads.

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: 2 Not available when port size is "15".

*2: 2 Not available for port size 08.

5 Material

	Body	Seal	Treatment	Remarks
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		FKM	Vacuum inspection	Compressed air/dry air/medium vacuum *2
H	Stainless steel	NBR	-	Compressed air/dry air/water/oil/low vacuum *1
J		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		EPDM	Oil-prohibited	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: Low vacuum [1.33×10^2 Pa (abs)] can be used, but valve seat leakage is $0.2\text{cm}^3/\text{min}$ (ANR) or less. (Valve seat leakage at positive pressure) When using at low vacuum, the lower limit of the working pressure is 1.33×10^2 Pa (abs), so the upper limit is 0.1MPa lower.

*2: 4 Not available when the orifice size is "X".

6 Coil thermal class

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

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	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)		●	●	●	●	●
J	Lead wire (300 mm)	●	●	●	●	●*4	*5
K	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)		●	●	●	●	

*1: 1 Coil option "B" cannot be selected when valve size is "2".

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

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

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

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

8 Rated voltage

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

9 Option *1

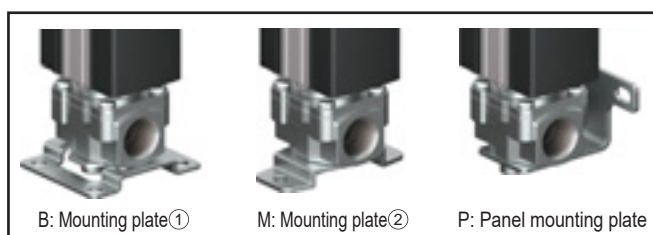
Blank	No
B	Mounting plate① *2
M	Mounting plate② *3, *4
P	Panel mounting plate

*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 or FWB Series.

*3: 1 Not available when valve size 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 with lamp/ surge suppressor
G Q		HP terminal box HP terminal box with surge suppressor
H R		HP terminal box with lamp HP terminal box with lamp/ surge suppressor
E F M P		Conduit (G1/2) Conduit (CTC19) Conduit (G1/2) with surge suppressor Conduit (CTC19) with surge suppressor

Discrete FFB

Manifold FFBM

Discrete FFG

Manifold FFGM

Working fluid
check list

Flow rate formula

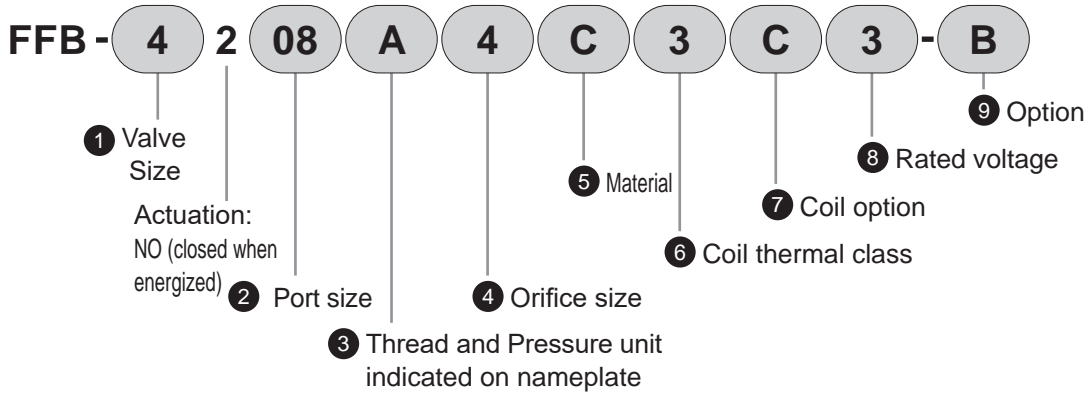
Precautions for
use

Direct acting 2-port valve

Direct acting 3-port valve

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 unit indicated
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" and "E" are selected mainly in Japan to indicate MPa as the pressure display unit even for G and NPT threads.

⑤ Material

	Body	Seal	Treatment	Remarks
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	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 0.2cm³/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)
---	---------------

		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	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)	●	●	●	●	●
J	Lead wire (300 mm)	●	●	●	●*2	*3
K	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)	●	●	●	●	

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

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

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

⑧ Rated voltage

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

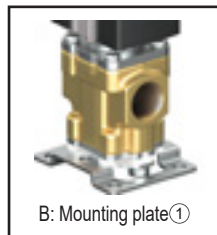
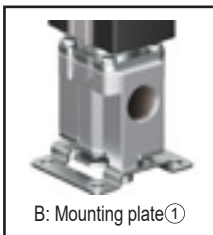
⑨ Option *1

Blank	No
B	Mounting plate①

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

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
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	

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 with 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 with lamp/ With surge suppressor
E F M P		Conduit (G1/2) Conduit (CTC19) Conduit (G1/2) with surge suppressor Conduit (CTC19) with surge suppressor

Discrete FFB

Manifold FFBM

Discrete FFG

Manifold FFGM

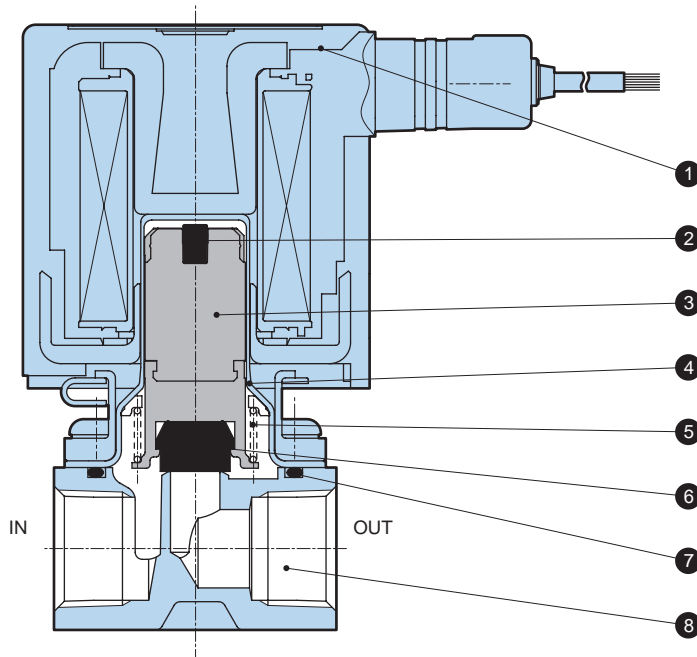
Working fluid
check list

Flow rate formula

Precautions for
use

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

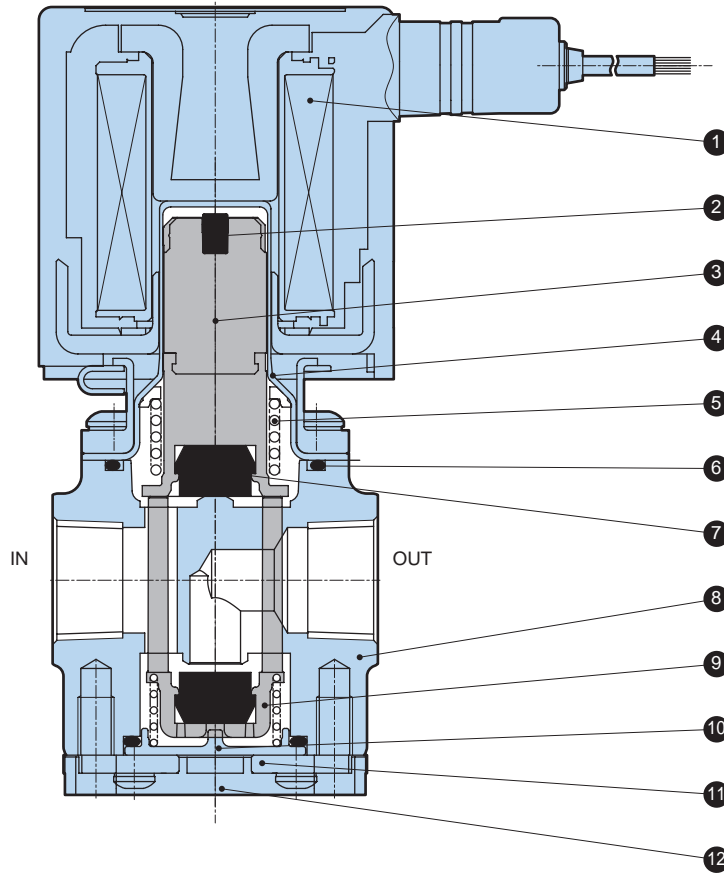
Working fluid
check list

Flow rate formula

Precautions for
use

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



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
		Precautions for use

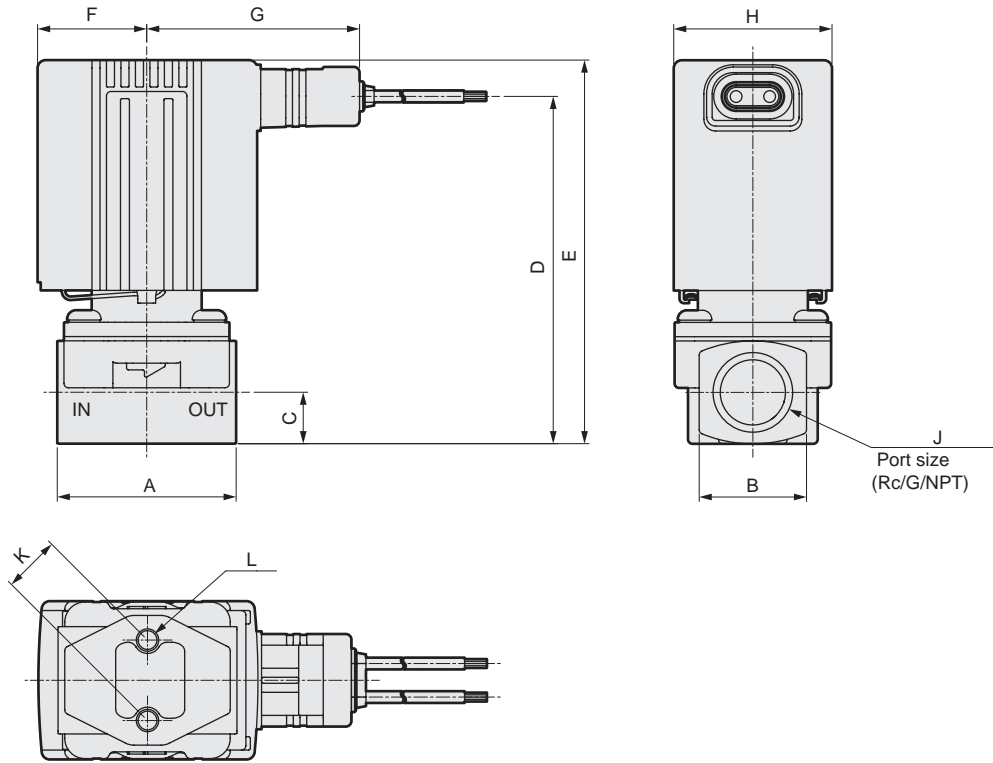
Part No.	Name	Material	
1	Coil assembly	-	
2	Noise dampening rubber	HNBR(FKM, EPDM)	Hydrogenated nitrile rubber (fluoro rubber, ethylene propylene rubber)
3	Plunger	SUS, PPS	Stainless steel, polyphenylene sulfide
4	Flare pipe assembly	SUS, PPS	Stainless steel, polyphenylene sulfide
5	Plunger spring	SUS304	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: brass body material, cover A for stainless steel, cover B for aluminum

*2: Only for brass and stainless steel body

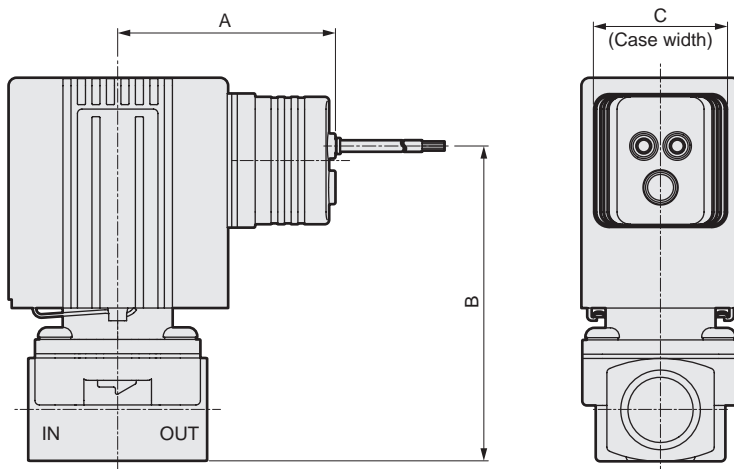
Dimensions FFB-*1 Series: NC

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



	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)											

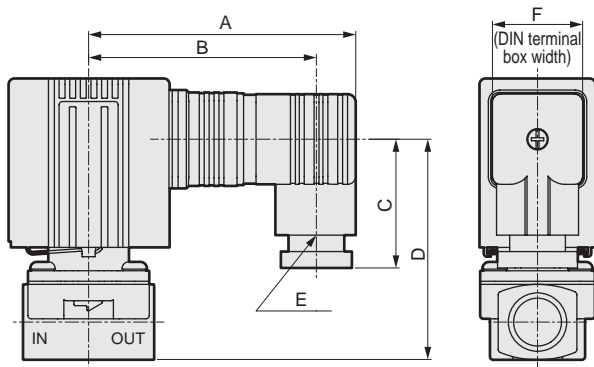
● Lead wire/AC voltage Coil option code: A/J



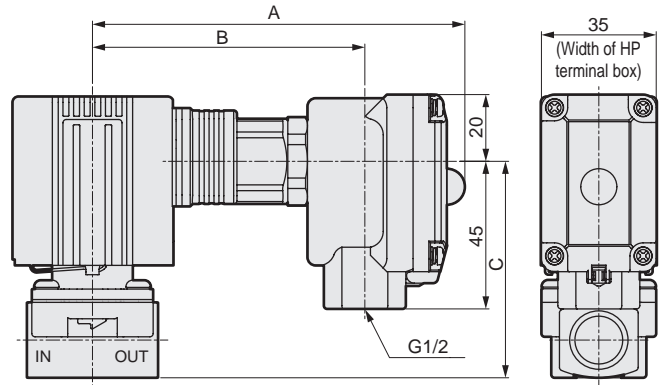
	A	B	C
FFB-21	43	50.5	24
FFB-31	46	59.5	30
FFB-41	48.5	70.5	30
FFB-51	51	79.5	30
FFB-5110*X (ø10)	51	87.5	30
FFB-5115(15A)			

Option Dimensions FFB-*1 Series: NC

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



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

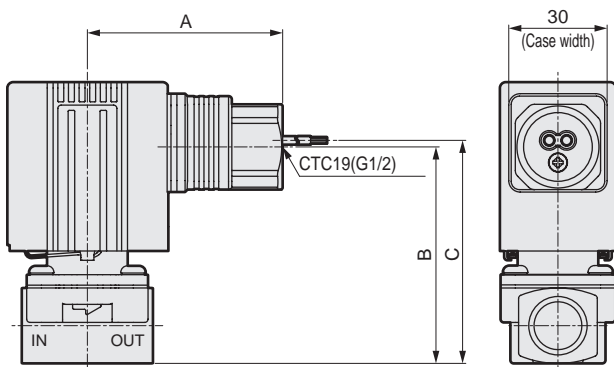


Dimensions shown in () are for G1/2.

	A	B	C	D	E	F
FFB-21	73	64	36	47.5	Pg9	21
FFB-31	78.5	66.5 (65)	39.5 (41.5)	56	Pg11 (G1/2)	27.5
FFB-41	81	69 (67.5)	39.5 (41.5)	67.5	Pg11 (G1/2)	27.5
FFB-51	83.5	71.5 (70)	39.5 (41.5)	76.5	Pg11 (G1/2)	27.5
FFB-5110*X (ø10)	83.5	71.5	39.5	84	Pg11	27.5
FFB-5115(15A)		(70)	(41.5)		(G1/2)	

	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

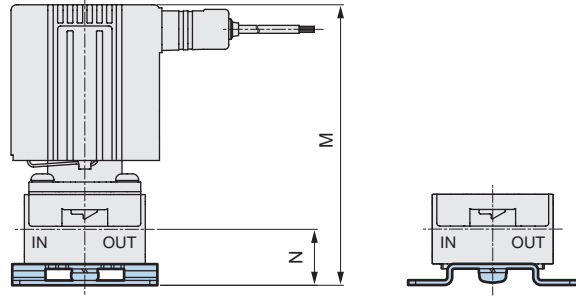
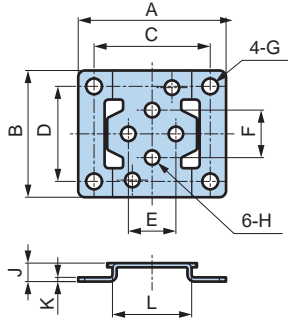


	A	B	C
FFB-21			
FFB-31	56.5	55	57
FFB-41	59	66	68
FFB-51	61.5	75	77
FFB-5110*X (ø10)	61.5	83	85
FFB-5115(15A)			

Discrete FFB
Manifold FFBM
Discrete FFG
Manifold FFGM
Working fluid check list
Flow rate formula
Precautions for use

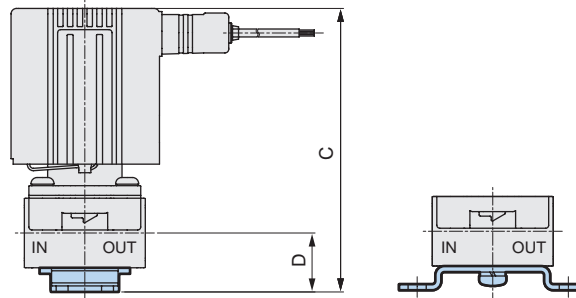
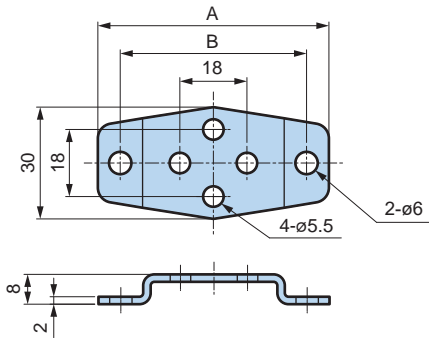
Option Dimensions FFB-*1 Series: NC

● Mounting plate① Option code: B



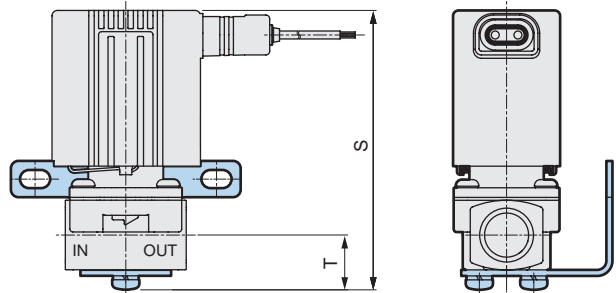
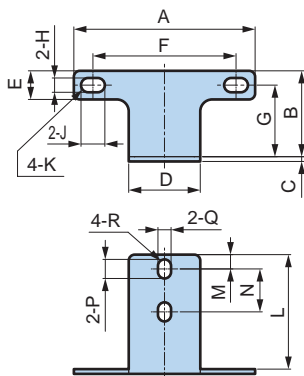
	A	B	C	D	E	F	G	H	J	K	L	M	N
FFB-21	40	34	30	25	15	15	ø5	ø4.5	6	1.2	20	68.5	13.5
FFB-31	52	42	40	30	18	18	ø6	ø5.5	7	1.6	25	81	16.5
FFB-41	56	48	44	36	18	18	ø6	ø5.5	7	1.6	30	93	18.5
FFB-51 Aluminum body	62	50	50	38	18	18	ø6	ø5.5	7	1.6	36	102	18.5
FFB-5110*X (ø10) Aluminum body												109.5	20.5
FFB-5115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

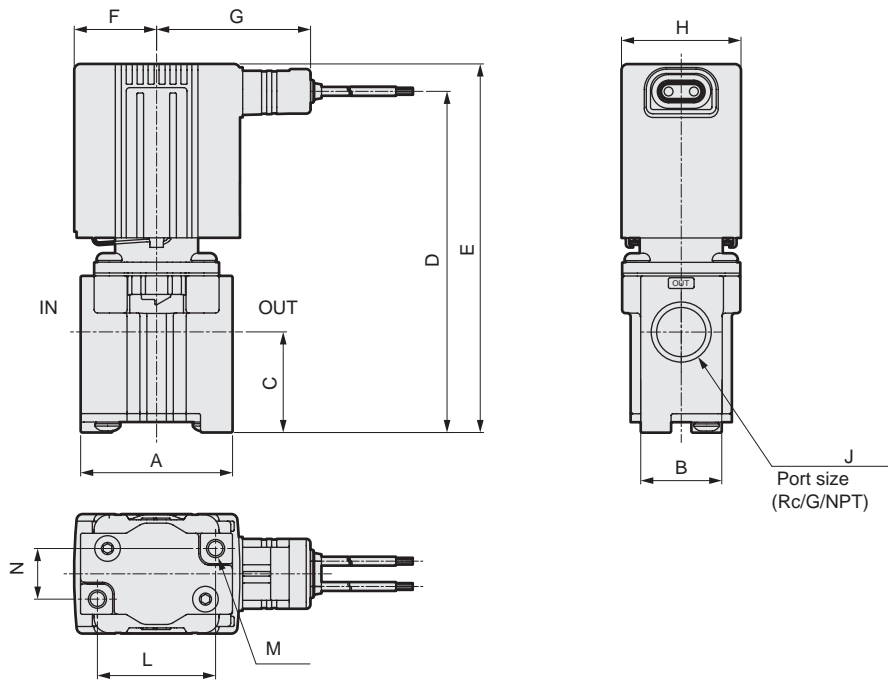
● Panel mounting plate Option code: P



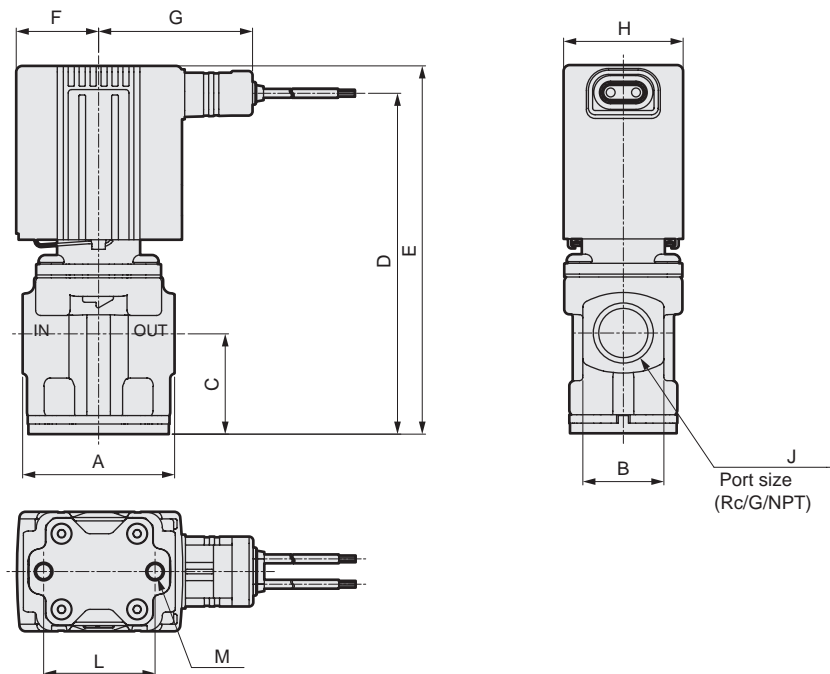
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
FFB-21	57	25	1.6	25	10	45	20	5	8	R 2.5	35.4	4.5	15	6	4.5	R 2.25	67.5	12.5
FFB-31	66	31	2	30	12	50	25	6	10	R 3	43	6	18	8	5.5	R 2.75	80.5	16
FFB-41	66	31	2	30	12	50	25	6	10	R 3	43	6	18	8	5.5	R 2.75	92.5	18
FFB-51	76	36	2	30	12	60	30	6	10	R 3	48	6	18	8	5.5	R 2.75	101.5	18
FFB-5110*X (ø10)																	109	20
FFB-5115(15A)																	109	20

Dimensions FFB-*2 Series: NO

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



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

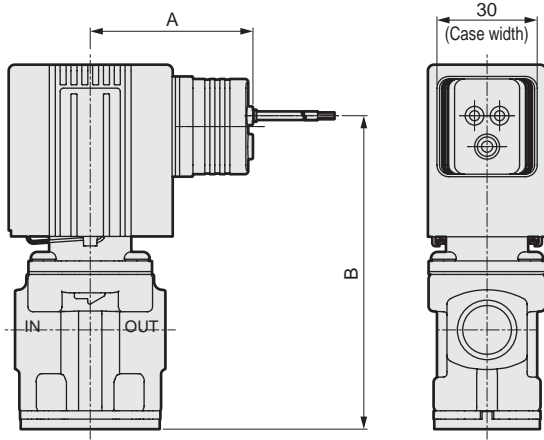


		A	B	C	D	E	F	G	H	J	L	M	N
FFB-32	Aluminum body	40	19	26.5	86.5	94	22	45	30	1/8	32	M5 depth 8	11
	Brass/SUS body			26	86	93.5				1/4		29	
FFB-42	Aluminum body	45	24	30	101	109	24.5	47.5	35	1/4	35	M5 depth 8	15
	Brass/SUS body										33		
FFB-52	Aluminum body	45	24	30	110	118	27.5	50	40	1/4	35	M5 depth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

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

Dimensions FFB-*2 Series: NO

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

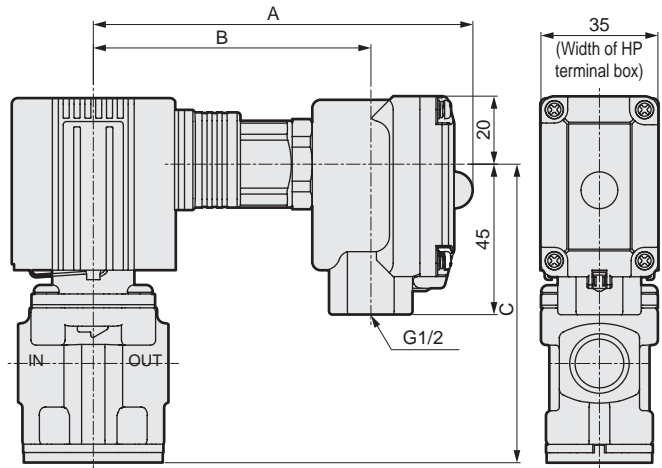
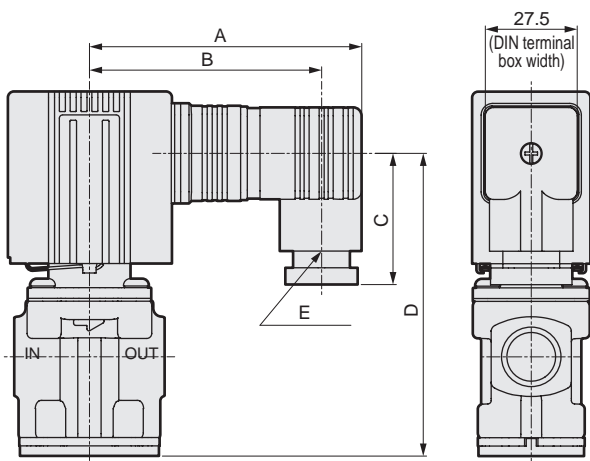


		A	B
FFB-32	Aluminum body	46	79
	Brass/SUS body		78.5
FFB-42	Aluminum body	48.5	94
	Brass/SUS body		
FFB-52	Aluminum body	51	103
	Brass/SUS body		

Option Dimensions FFB-*2 Series: NO

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

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



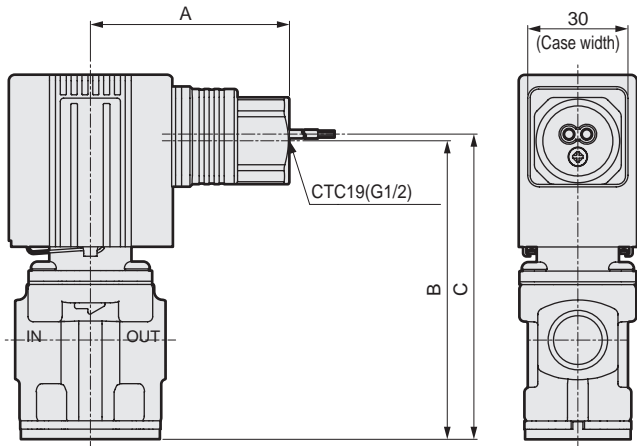
Dimensions shown in () are for G1/2.

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

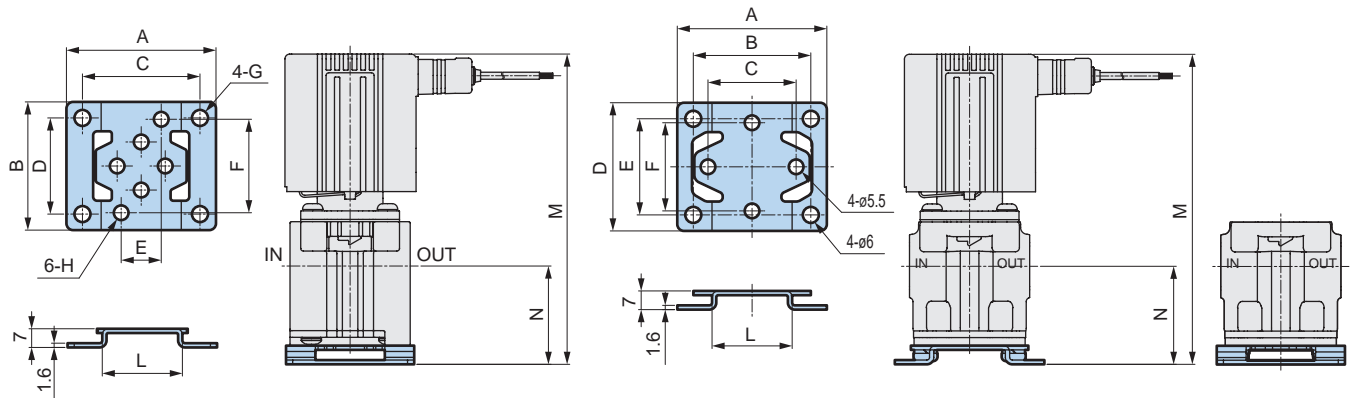
● Conduit Coil option code: E/F/M/P



		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			
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

Precautions for
use



Direct acting 2-port solenoid valve, manifold

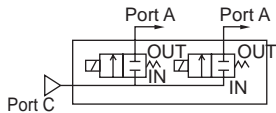
FFBM Series

- NC (open when energized)
- Port size: Rc, G, NPT 1/8, 1/4

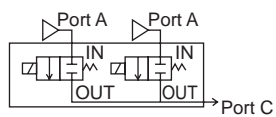


JIS symbol

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



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



Common specifications

Item	FFBM
Working fluid	Compressed air/water/oil (50 mm ² /sOr 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), 1.5 (NO)
Fluid temperature	°C -10 to 40 (no freezing)
Ambient temperature	°C -10 to 40
Thermal class	Class130 (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 *1PA·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	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz		
Rated voltage	V													
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	-	-	6.2	6.1	6.2	6.2	
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	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 VAC 50/60Hz		
Rated voltage	V													
Voltage fluctuation range		±10%							±10%					
Power consumption	W	7	7	-	-	-	-	10.5	10.5	-	-	-	-	
Apparent power	VA	-	-	8.6	10	9.6	9.5	-	-	13	13	14	14	

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

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

Individual specifications

Item	Port size Rc/G/NPT		Orifice size (mm)	Working pressure (MPa) *1	Working pressure Pa (abs) *2	Flow characteristics			
	Model No.	Port A				Port C	C[dm ³ /(s·bar)]	b	Cv
NC (open when energized)									
FFBM-2 ¹ ₅ 06 * S	—	1/8	1/4	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	1.2	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: Can be used with NC low vacuum [1.33×102Pa (abs)], but valve seat leakage is 0.2cm³/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.

Weight

● Body material: Aluminum

Model No.	Weight (kg)									
	Actuator only	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 with 24 VDC lead wire.

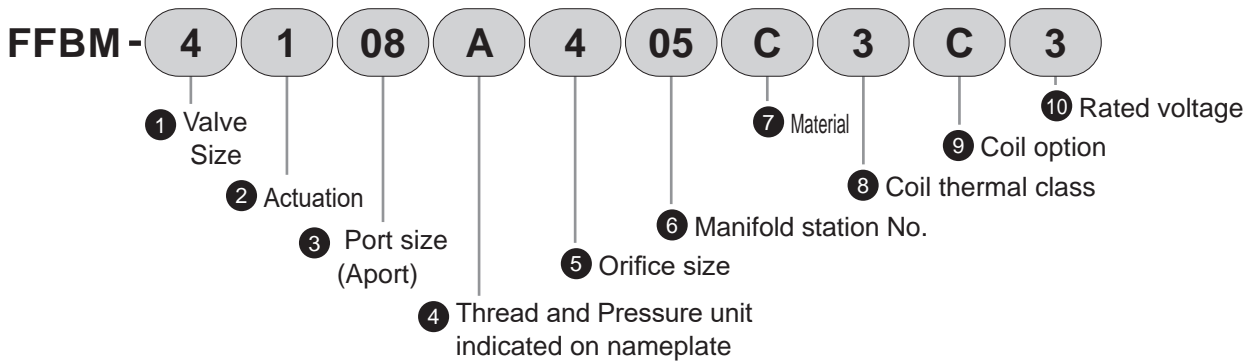
● Body material: brass/stainless steel

Model No.	Weight (kg)									
	Actuator only	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 aluminum sub-plate with 24 VDC lead wire.

Discrete FFB
 Manifold FFBM
 Discrete FFG
 Manifold FFGM
 Control fluid
 Checklist
 Flow rate formula
 Safety
 Precautions

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

*1: ③ 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" and "E" are selections primarily used in Japan to display the pressure display unit as MPa even with G threads and NPT threads.

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	Remarks
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			FKM	Vacuum inspection	Compressed air/dry air/medium vacuum *2
H	Stainless steel		NBR		Compressed air/dry air/water/oil/low vacuum *1
J			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			EPDM	Oil-prohibited	Water
S			NBR		Compressed air/dry air/water/oil/low vacuum *1
T			FKM		Compressed air/dry air/water/oil/low vacuum *1
U	Stainless steel		EPDM		Water

*1: Although it can be used with low vacuum [1.33×10^2 Pa (abs)], valve seat leakage is 0.2cm³/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: ② Cannot be selected when Actuation is "1".

8 Coil thermal class

3	Class130(B)
---	-------------

9 Coil option

		1 Valve size				Voltage	
		2	3	4	5	DC	AC
A	Lead wire (300mm)	●	●	●	●	●	●
B	DINWith terminal box(G1/2)	*1	●	●	●	●	●
C	DINWith terminal box(Pg11)	●*2	●	●	●	●	●
D	DINTerminal box with lamp(Pg11)	●*2	●	●	●	*4	●
E	Conduit(G1/2)		●	●	●	●	●
F	Conduit(CTC19)		●	●	●	●	●
G	HPWith terminal box(G1/2)		●*3	●	●	●	●
H	HPTerminal box with lamp(G1/2)		●*3	●	●	●	●
J	Lead wire (300mm)	●	●	●	●	●*5	*6
K	DINWith terminal box(Pg11)	●*2	●	●	●	●	
L	DINTerminal box with lamp(Pg11)	●*2	●	●	●	●	
M	Conduit(G1/2)		●	●	●	●	
P	Conduit(CTC19)		●	●	●	●	
Q	HPWith terminal box(G1/2)		●*3	●	●	●	
R	HPTerminal box with lamp(G1/2)		●*3	●	●	●	

*1: ① Coil option "B" cannot be selected when valve size is "2".

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

*3: ② When the material is "A" aluminum body, the HP terminal box cannot be selected.

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

*5: The surge suppressor for the DC voltage coil option "J" is supplied with the product.

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

10 Rated voltage








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

⚠ How to order

Masking plate orders are also available.

Refer to How to order on pages 21 and 25.

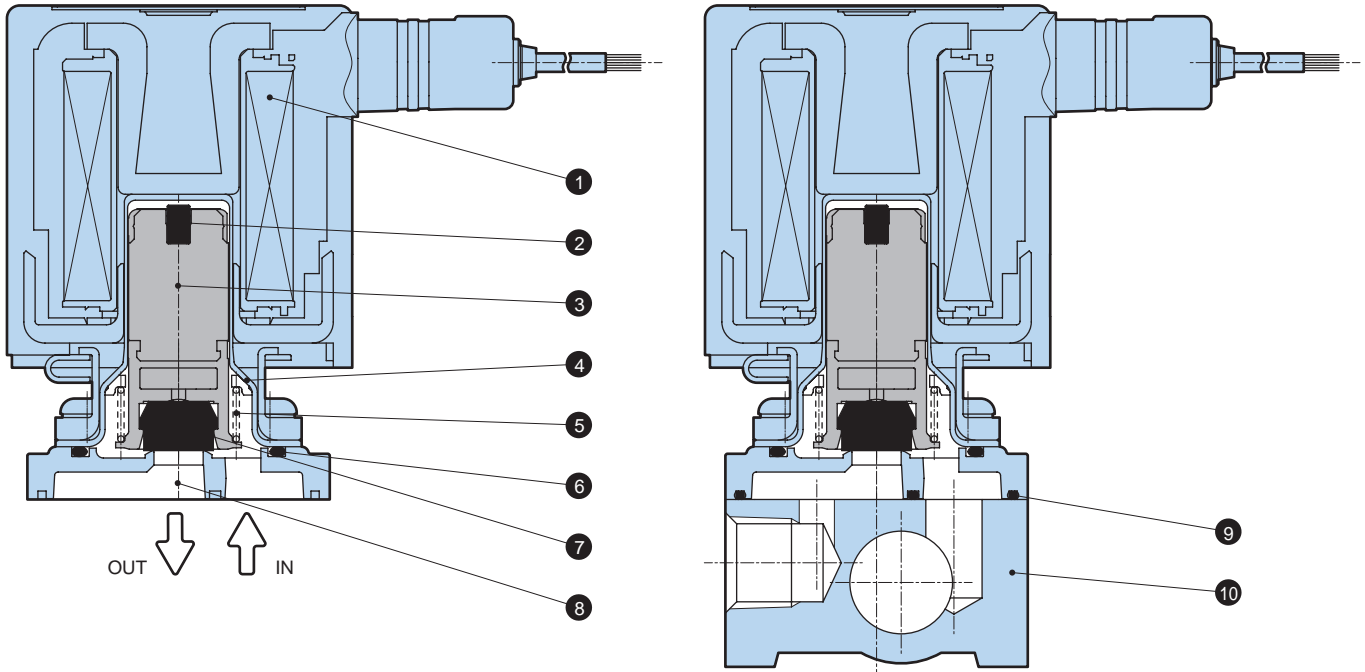
Coil option code

A(DC) J		Grommet lead wire300 mm Grommet lead wire300 mm With surge suppressor
A(AC)		Grommet lead wire300 mm
B C K		DINTerminal box DINTerminal box with surge suppressor
D L		DINTerminal box with lamp DINTerminal box with lamp/ With surge suppressor
G Q		HPTerminal box HPTerminal box with surge suppressor
H R		HPTerminal box with lamp HPTerminal box with lamp/ With surge suppressor
E F M P		Conduit(G1/2) Conduit(CTC19) Conduit(G1/2) with surge suppressor Conduit(CTC19) with surge suppressor

Internal structure/material Aluminum body

● FFBM Actuator

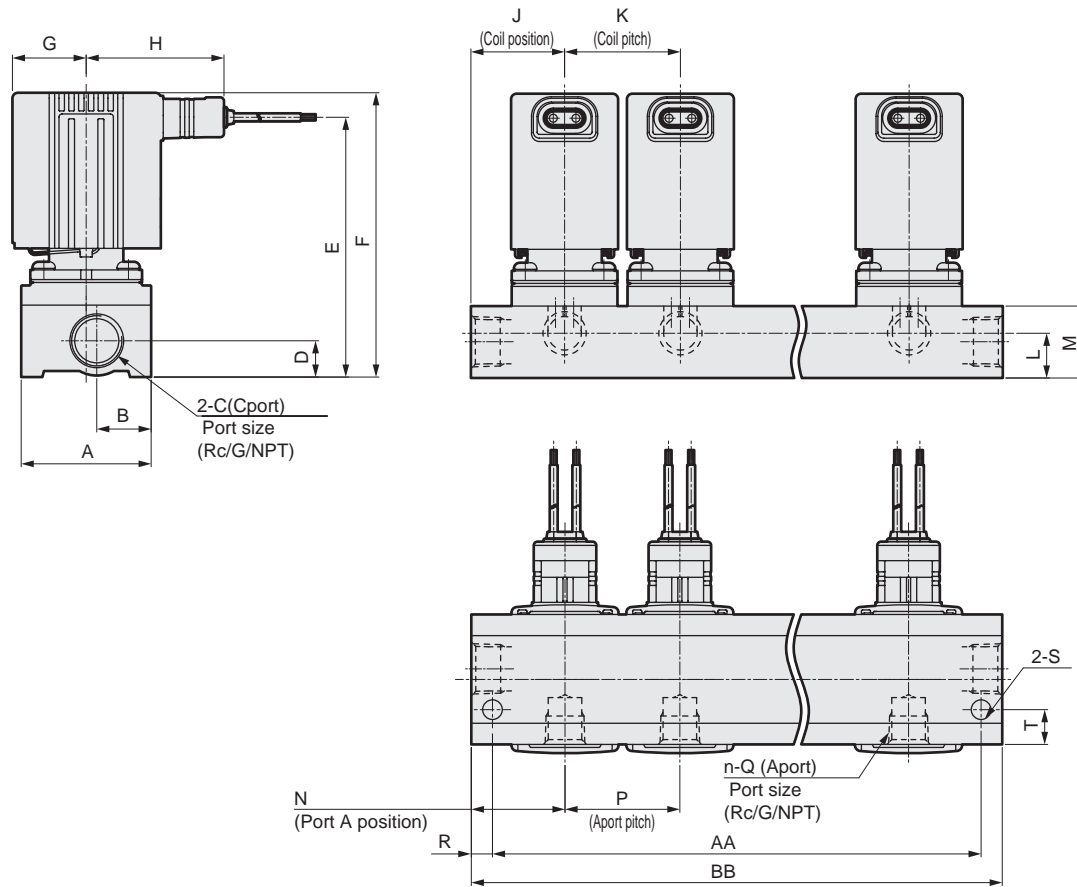
● FFBM Manifold



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	ORing	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



	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
		FFBM-2	AA	58	84	110	136	162	188	214
	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

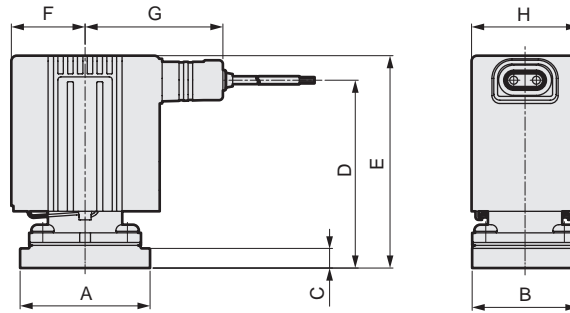
Control fluid
Checklist

Flow rate formula

Safety
Precautions

dimensions Aluminum body

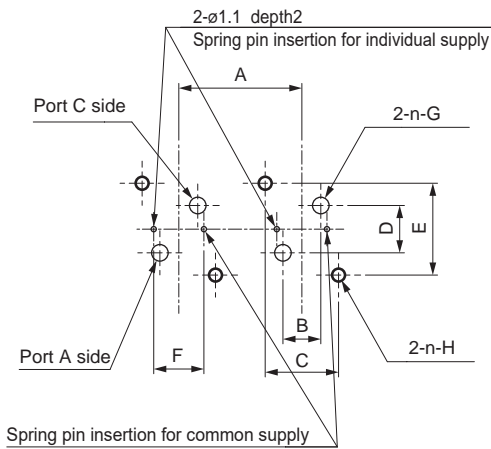
● Actuator Lead wire/DC Voltage Coil option code:A/J



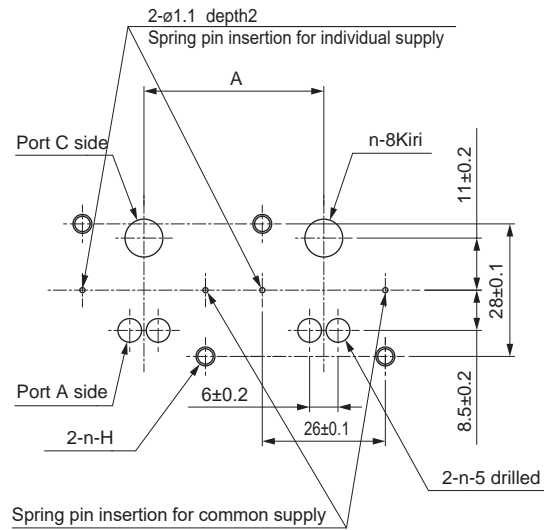
	A	B	C	D	E	F	G	H
FFBM-2	28	22.5	2.5	48.5	57	18.5	42	24
FFBM-3	32.5	29.5	2.5	55.5	63	22	45	30
FFBM-4	43	35	6.5	62	70.5	24.5	47.5	35
FFBM-5	43	35	6.5	71	79.5	27.5	50	40

● Actuator Mounting dimensions

FFBM-2*/3 *



FFBM-4*/5*



Note: Machining diagram 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

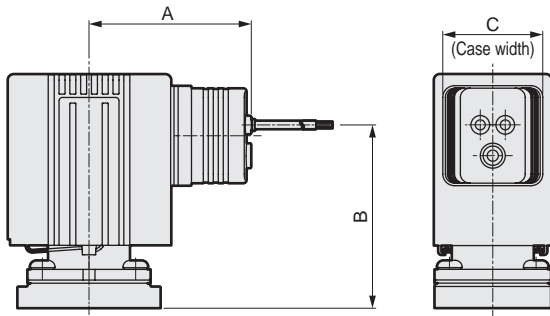
How to order discrete masking plate

OWith ring, 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

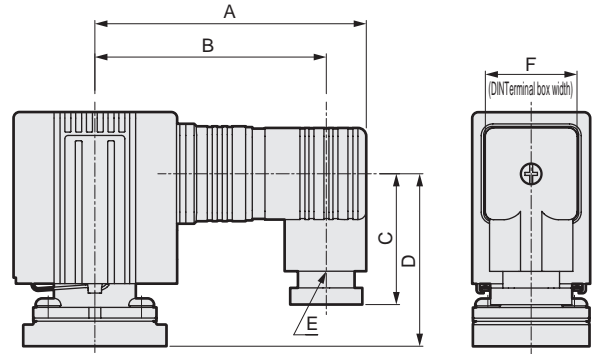
dimensions Aluminum body

● 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

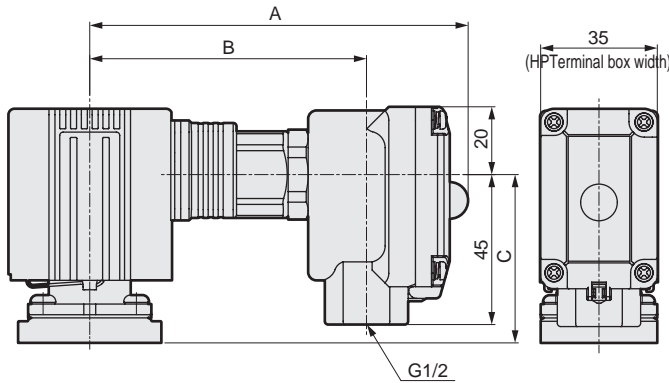
● With actuator DIN terminal box Coil option code: B/C/D/K/L



Dimensions shown in () are for G1/2.

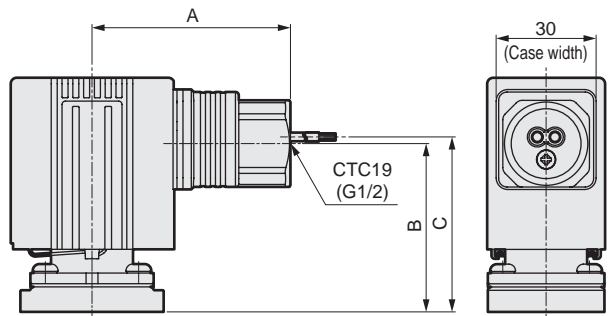
	A	B	C	D	E	F
FFBM-2	73	64	36	41.5	Pg9	21
FFBM-3	78.5	66.5 (65)	39.5 (41.5)	45	Pg11 (G1/2)	27.5
FFBM-4	81	69 (67.5)	39.5 (41.5)	52	Pg11 (G1/2)	27.5
FFBM-5	83.5	71.5 (70)	39.5 (41.5)	61	Pg11 (G1/2)	27.5

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



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

● Conduit Coil option code: E/F/M/P



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

Discrete FFB

Manifold FFBM

Discrete FFG

Manifold FFGM

Control fluid Checklist

Flow rate formula

Safety Precautions

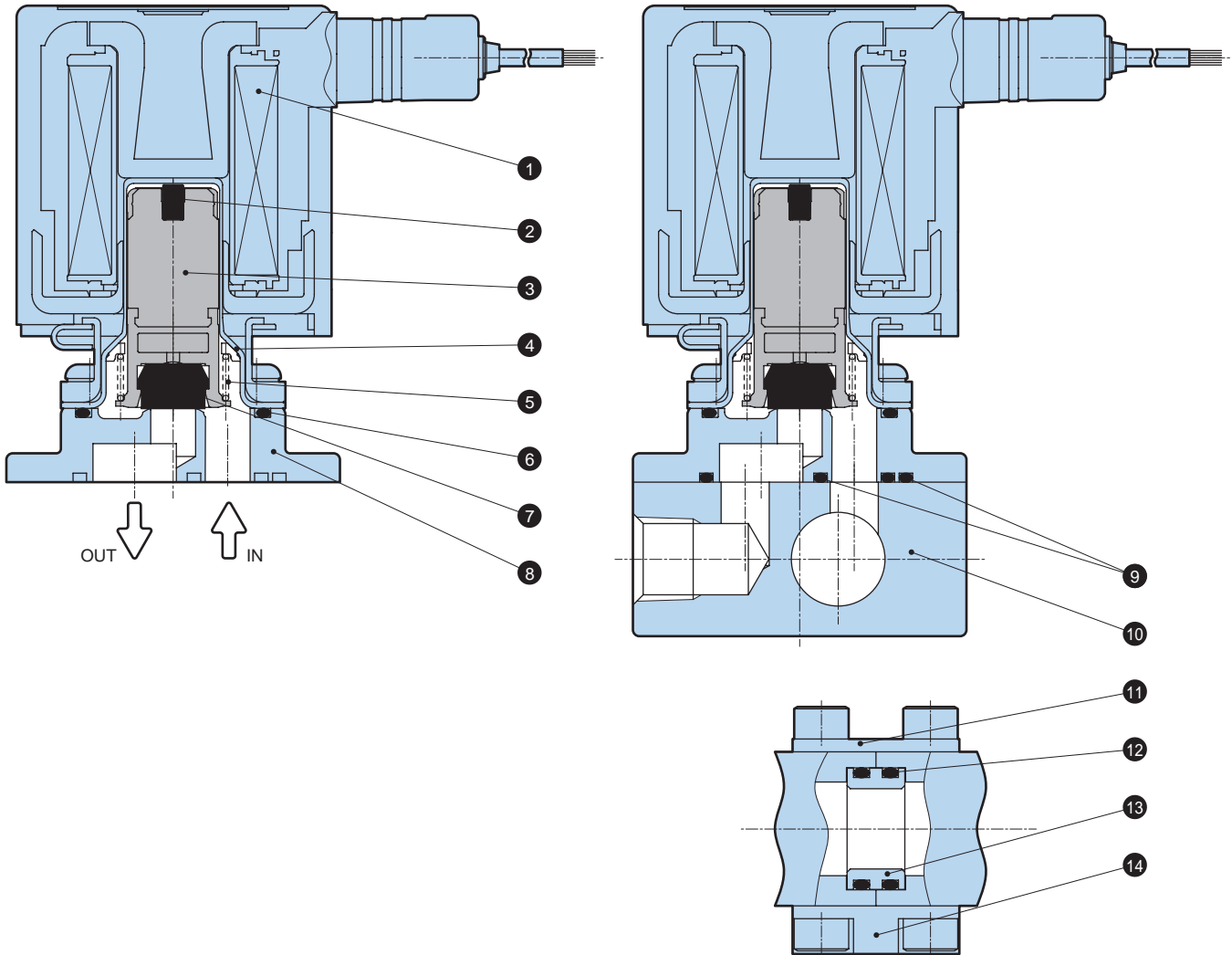
Direct acting 2-port valve

Direct acting 3-port valve

Internal structure/material Brass body/stainless steel body

● FFBM Actuator

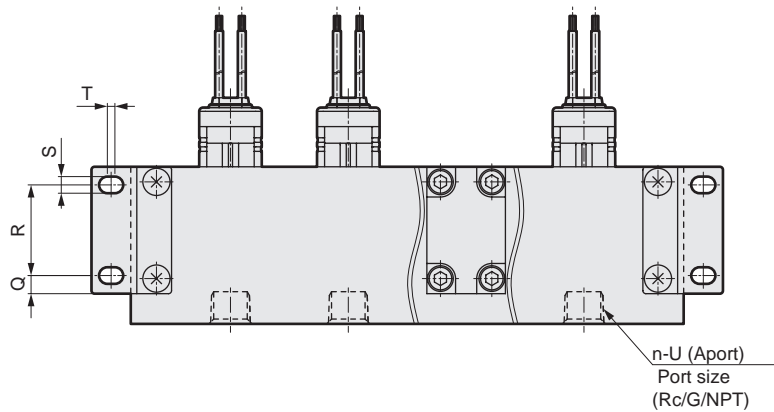
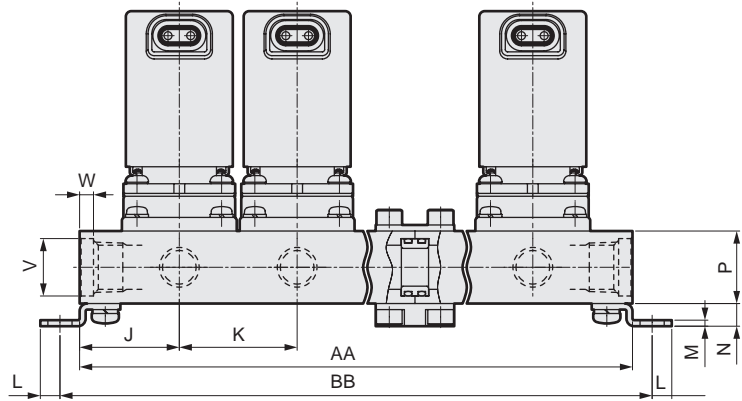
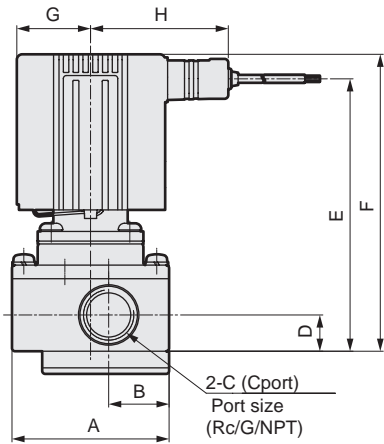
● FFBM Manifold



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	ORing	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	ORing	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	ORing	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



	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

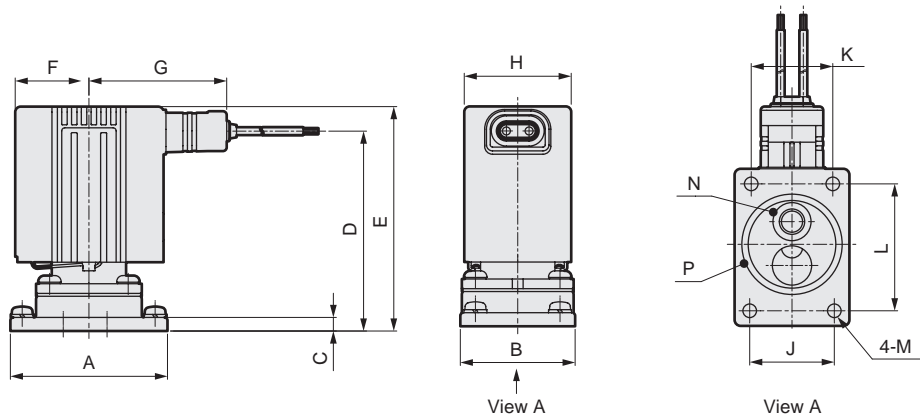
	Station No.	2	3	4	5	6	7	8	9	10
	Code									
FFBM-2	AA	81	109	162	165	218	246	274	327	330
	BB	93	121	174	177	230	258	286	339	342
FFBM-3	AA	97	133	194	205	266	302	338	399	410
	BB	109	145	206	217	278	314	350	411	422
FFBM-4	AA	106	145	212	223	290	329	368	435	446
	BB	119	158	225	236	303	342	381	448	459
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
Control fluid Checklist
Flow rate formula
Safety Precautions

dimensions Brass body/stainless steel body

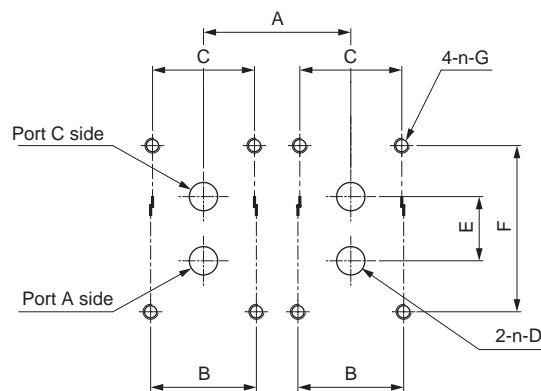
● Actuator Lead wire/DC Voltage Coil option code:A/J



	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 Mounting dimensions



Note: Machining diagram when using 2 actuators.

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

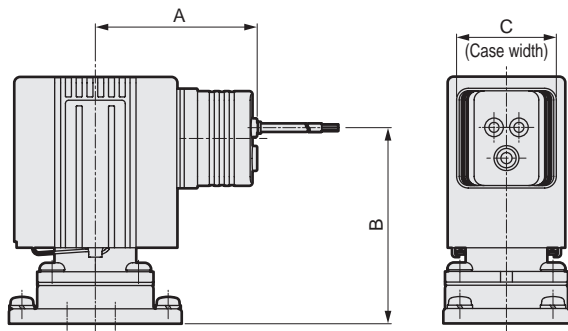
How to order discrete masking plate

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

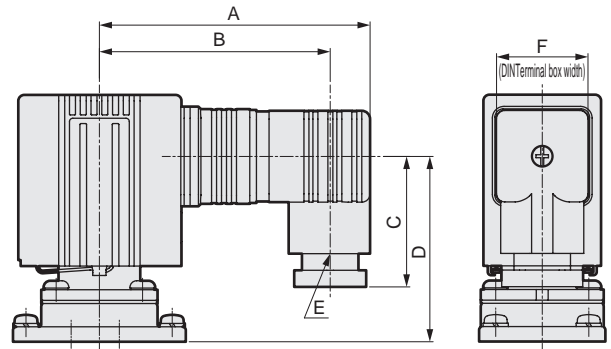
dimensions Brass body/stainless steel body

● 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

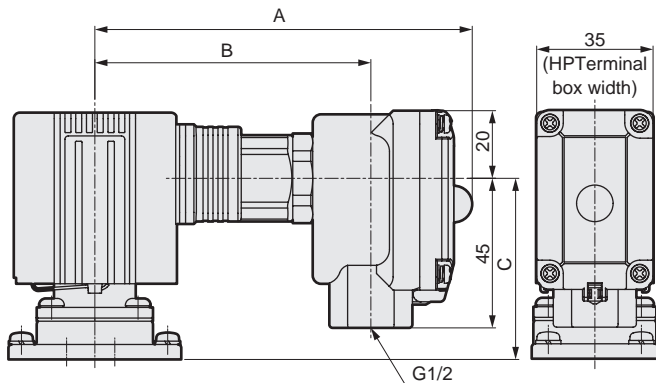
● With actuator DIN terminal box Coil option code: B/C/D/K/L



Dimensions shown in () are for G1/2.

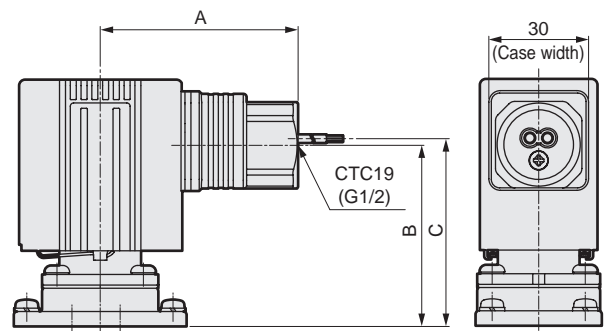
	A	B	C	D	E	F
FFBM-2	73	64	36	43	Pg9	21
FFBM-3	78.5	66.5 (65)	39.5 (41.5)	46.5	Pg11 (G1/2)	27.5
FFBM-4	81	69 (67.5)	39.5 (41.5)	56	Pg11 (G1/2)	27.5
FFBM-5	83.5	71.5 (70)	39.5 (41.5)	65	Pg11 (G1/2)	27.5

● 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

Discrete FFG

Manifold FFGM

Control fluid Checklist

Flow rate formula

Safety Precautions

Direct acting 2-port valve

Direct acting 3-port valve



Direct acting 3-port solenoid valve

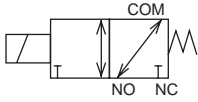
FFG Series

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

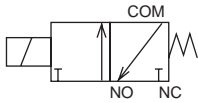


JIS symbol

- 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 [1.33 × 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 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)
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	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 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	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 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	-	-	6.2	6.1	6.2	6.2
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	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 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	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 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	-	-	13	13	14	14

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

Voltage	AC				DC	
	100V	110V	200V	220V	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 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				

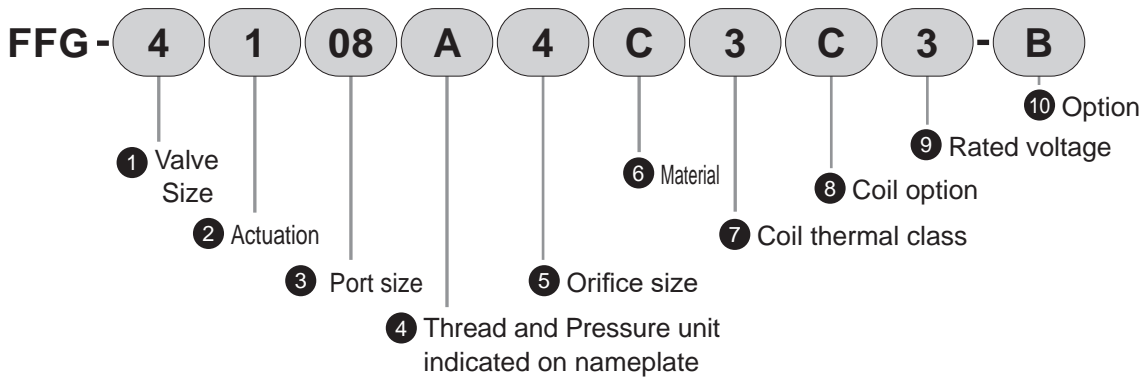
*1: Values in () are for NO pressurization.

*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
 Manifold FFBM
 Discrete FFG
 Manifold FFGM
 Control fluid
 Checklist
 Flow rate formula
 Safety
 Precautions

How to order



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

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

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

④ Thread and Pressure unit indicated on nameplate

	Thread	Pressure unit indicated
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" and "E" are selected mainly in Japan to indicate MPa as the pressure display unit even for G and NPT threads.

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

⑥ Material

	Body	Seal	Treatment	Remarks
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	Oil-prohibited	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 0.2cm³/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	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)		●	●	●	●	●
J	Lead wire (300 mm)	●	●	●	●	●*4	*5
K	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)		●	●	●	●	

- *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 Pg9.
- *3: "L" DIN terminal box with lamp/surge suppressor
- *4: The surge suppressor of the DC voltage coil option "J" is attached.
- *5: All AC voltages are equipped with a full-wave rectifier circuit. For this reason, a surge suppressor is not available.

9 Rated voltage

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

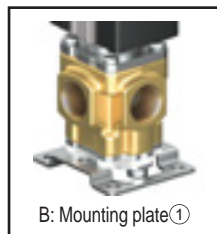
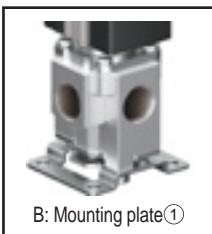
10 Option *1

Blank	No
B	Mounting plate①

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

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	

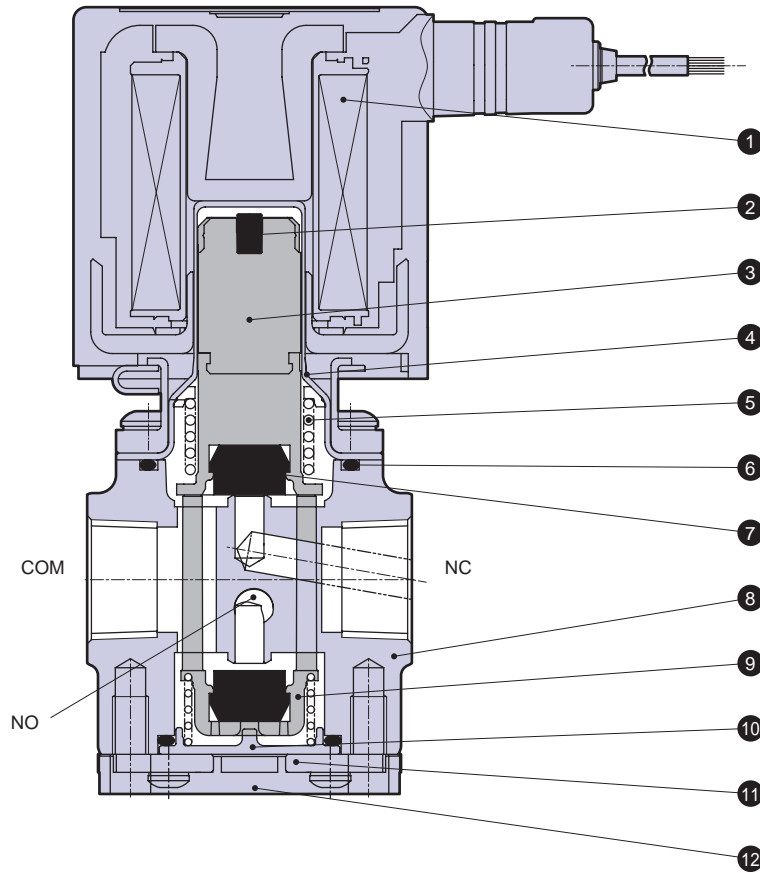
Coil option code

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 with 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 with lamp/ With surge suppressor
E F M P		Conduit (G1/2) Conduit (CTC19) Conduit (G1/2) with surge suppressor Conduit (CTC19) with surge suppressor

Discrete FFB
Manifold FFBM
Discrete FFG
Manifold FFGM
Control fluid Checklist
Flow rate formula
Safety Precautions

Internal structure/material

Direct acting 2-port valve	Discrete FFB
	Manifold FFBM
Direct acting 3-port valve	Discrete FFG
	Manifold FFGM
Control fluid Checklist	
Flow rate formula	
Safety Precautions	



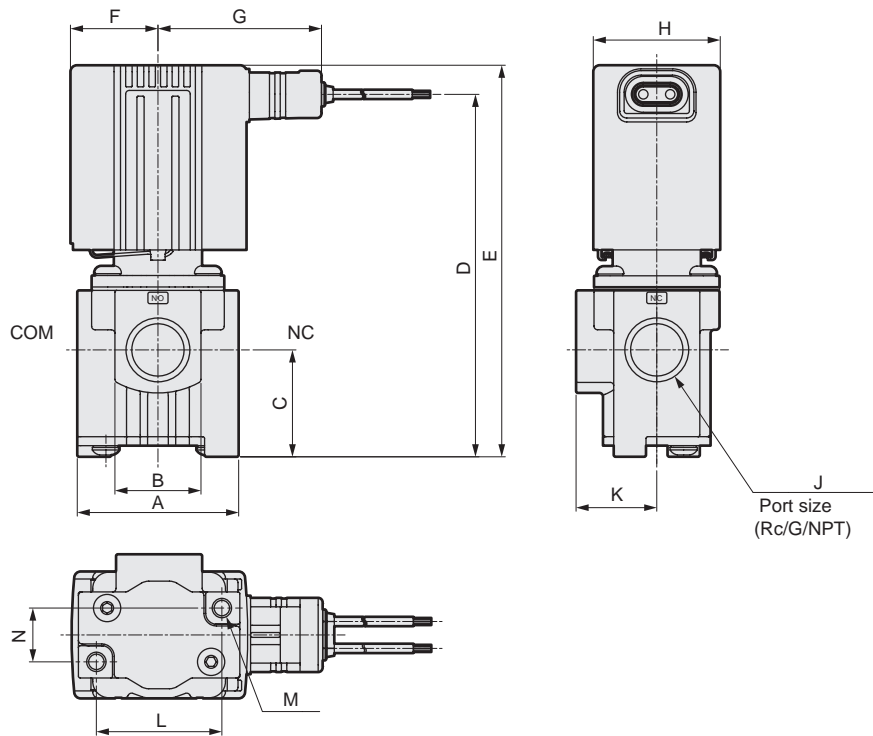
Part No.	Name	Material	
1	Coil assembly	-	
2	Noise dampening rubber	HNBR (FKM, EPDM)	Hydrogenated nitrile rubber (fluoro rubber, ethylene propylene rubber)
3	Plunger	SUS, PPS	Stainless steel, polyphenylene sulfide
4	Flare pipe assembly	SUS, PPS	Stainless steel, polyphenylene sulfide
5	Plunger spring	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 brass, for stainless steel cover A, for aluminum cover B

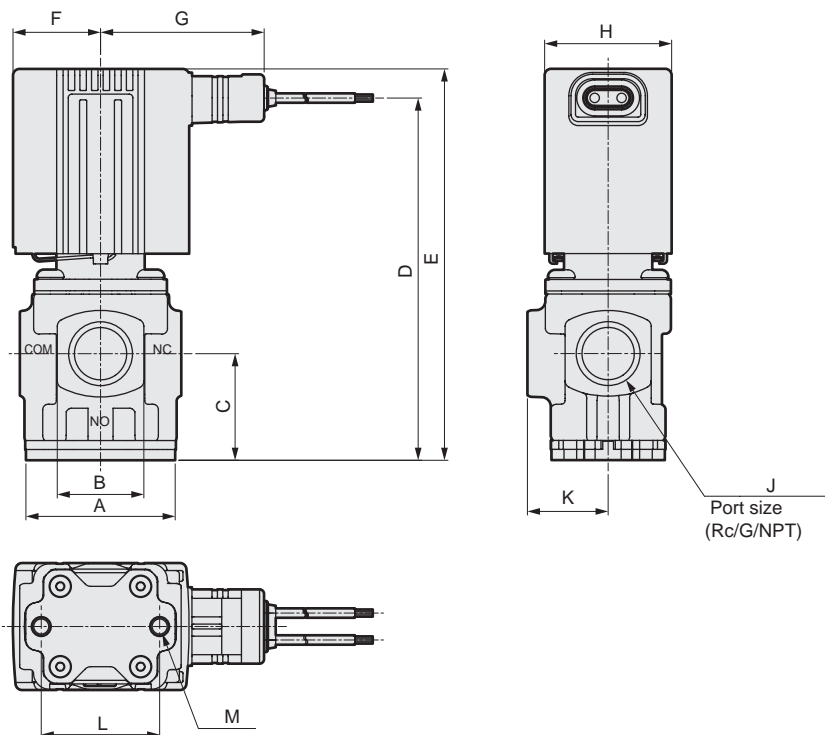
*2: Only for brass and stainless steel body

dimensions

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



Brass body/stainless steel body

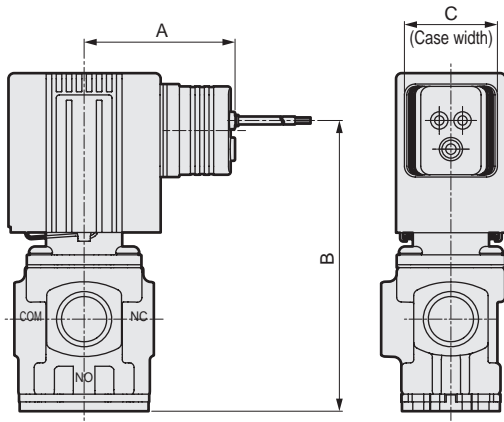


		A	B	C	D	E	F	G	H	J	K	L	M	N
FFG-2	Aluminum body	32	17	21	69.5	78	18.5	42	24	1/8	16	25	M4 depth	8
	Brass/SUS body											23.8	6	
FFG-3	Aluminum body	40	19	26.5	86.5	94	22	45	30	1/8	20	32	M5 depth	11
	Brass/SUS body			26								86	93.5	
FFG-4	Aluminum body	45	24	30	101	109	24.5	47.5	35	1/4	22.5	35	M5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

Discrete FFB	Direct acting 2-port valve
Manifold FFBM	
Discrete FFG	Direct acting 3-port valve
Manifold FFGM	
Control fluid Checklist	
Flow rate formula	
Safety Precautions	

dimensions

● Lead wire/AC voltage Coil option code: A

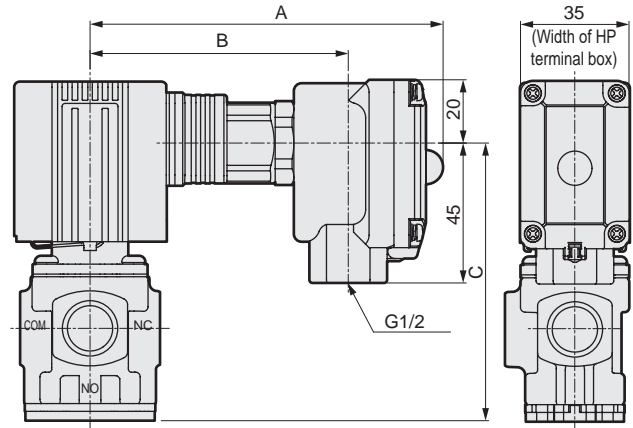
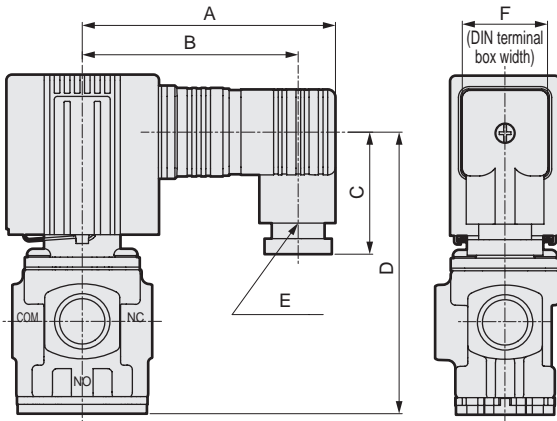


		A	B	C
FFG-2	Aluminum body	43	66	24
	Brass/SUS body			
FFG-3	Aluminum body	46	79	30
	Brass/SUS body		78.5	
FFG-4	Aluminum body	48.5	94	30
	Brass/SUS body			
FFG-5	Aluminum body	51	103	30
	Brass/SUS body			

Optional dimensions

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

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



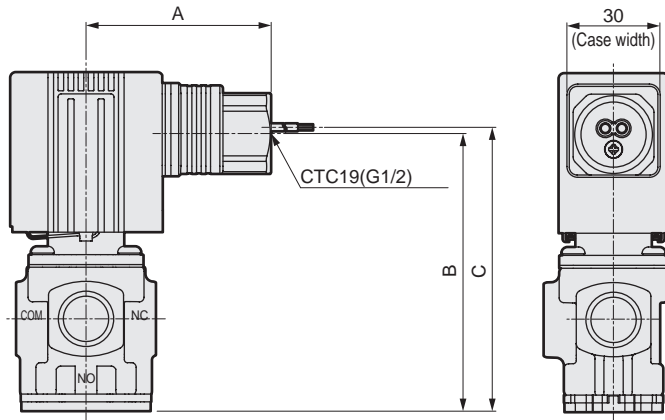
Dimensions shown in () are for G1/2.

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

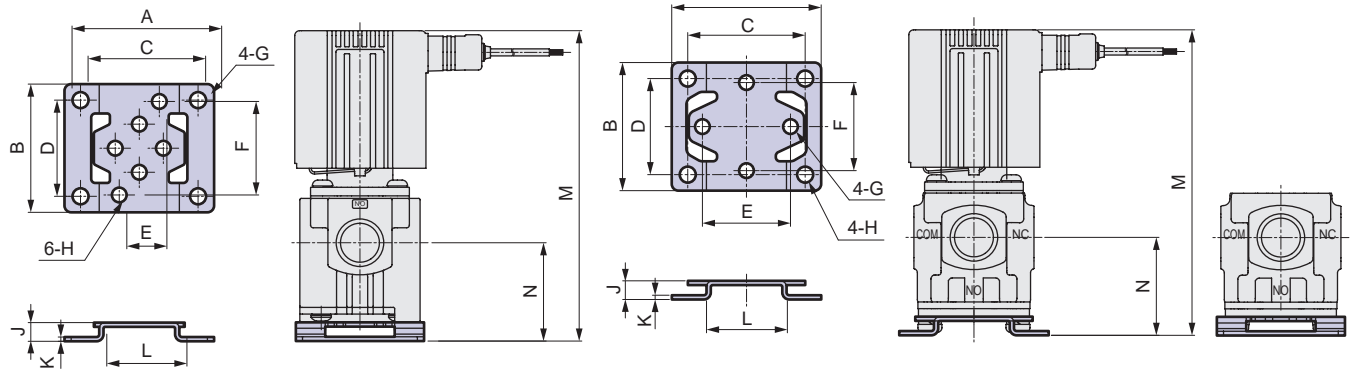
● Conduit Coil option code: E/F/M/P



		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

Control fluid Checklist

Flow rate formula

Safety Precautions

Direct acting 2-port valve

Direct acting 3-port valve

Direct acting 3-port solenoid valve, manifold

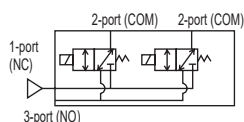
FFGM Series

- 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	
Rated voltage V	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 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	

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	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 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	24 DC	12 DC	100 VAC 50/60Hz	110 VAC 50/60Hz	200 VAC 50/60Hz	220 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	-	-	13	13	14	14

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

Voltage	AC				DC	
	100V	110V	200V	220V	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 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 using at low vacuum, the lower limit of the working pressure is 1.33×10^2 Pa (abs), so the upper limit is 0.1MPa 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.

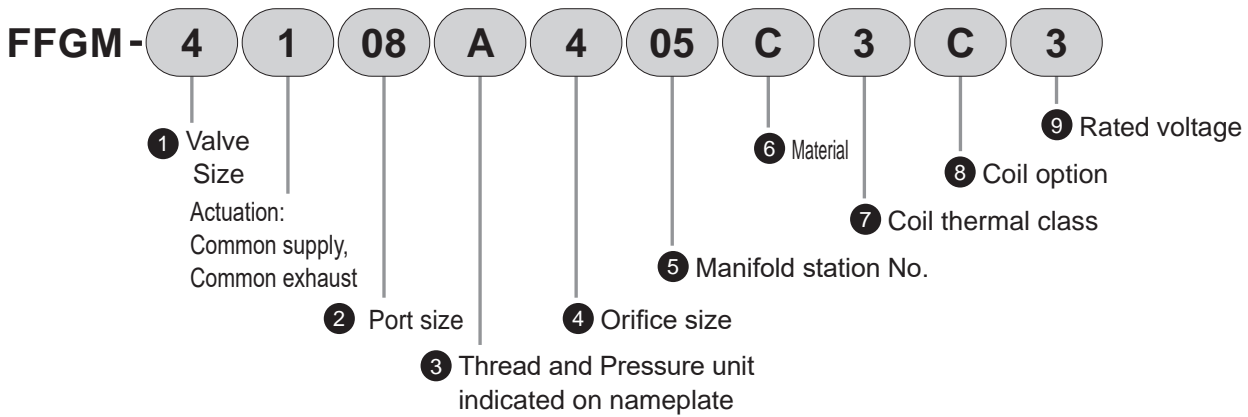
●Body material: brass/stainless steel

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
 Control fluid
 Checklist
 Flow rate formula
 Safety
 Precautions

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 unit indicated
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: 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" and "E" are selections primarily used in Japan to indicate the pressure display unit as MPa even with G and NPT threads.

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	Remarks
A	Aluminum		NBR		Compressed air/dry air
C	Brass	Stainless steel	NBR	-	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	Brass	NBR	Oil-prohibited	Compressed air/dry air/water/oil/low vacuum *1	
P		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 0.2cm³/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	
		3	4	5	DC	AC
A	Lead wire (300 mm)	●	●	●	●	●
B	With DIN terminal box (G1/2)	●	●	●	●	●
C	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)	●	●	●	●	●
J	Lead wire (300 mm)	●	●	●	●*2	*3
K	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)	●	●	●	●	
	Surge With absorber					

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

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

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








9 Rated voltage

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

How to order

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

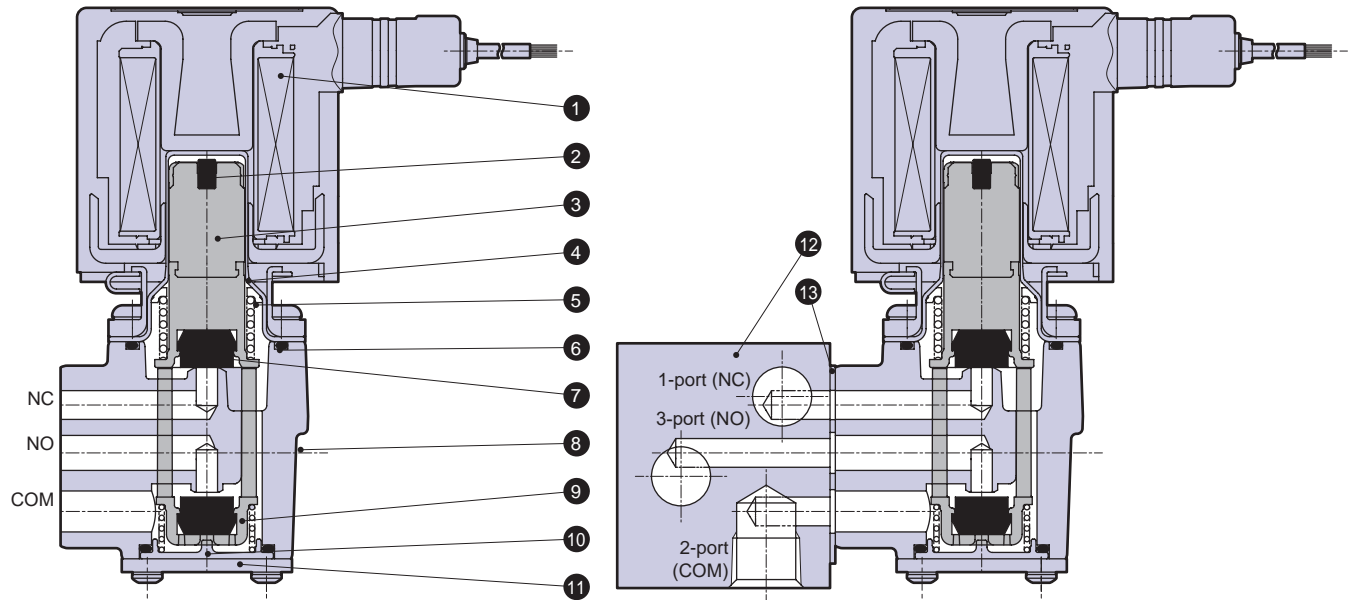
Coil option code

A(DC) J		Grommet lead wire 300 mm Grommet lead wire 300 mm With surge suppressor
A(AC)		Grommet lead wire 300 mm
BCK		DIN terminal box DIN terminal box with surge suppressor
DL		DIN terminal box with lamp DIN terminal box with lamp/ With surge suppressor
GQ		HP terminal box HP terminal box with surge suppressor
HR		HP terminal box with lamp HP terminal box with lamp/ With surge suppressor
EFMP		Conduit (G1/2) Conduit (CTC19) Conduit (G1/2) with surge suppressor Conduit (CTC19) with surge suppressor

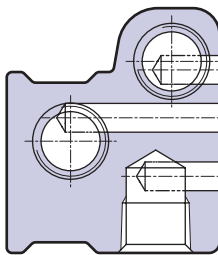
Internal structure/material

● FFGM actuator

● FFGM manifold



Body material: brass, SUS



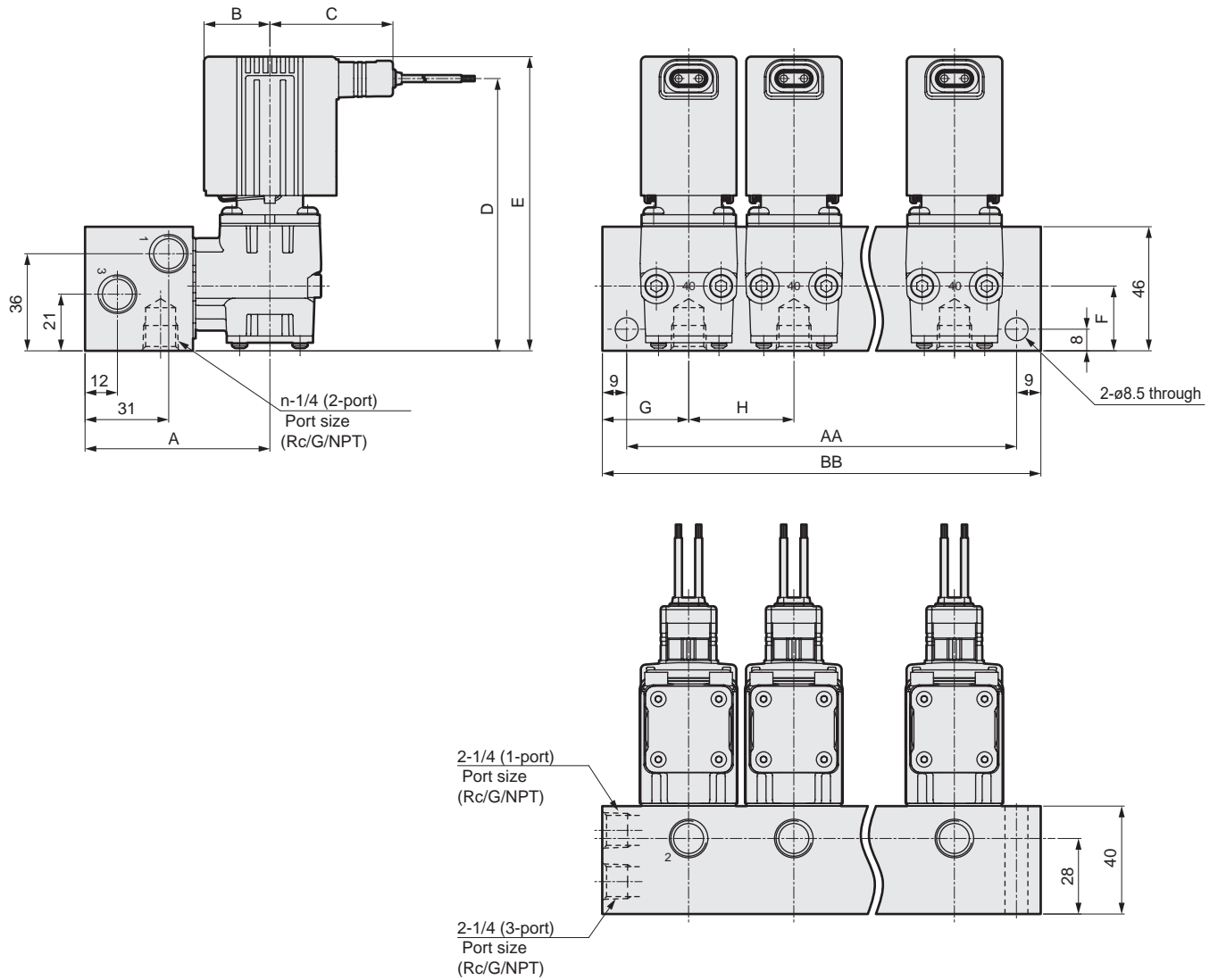
Body material: Aluminum

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



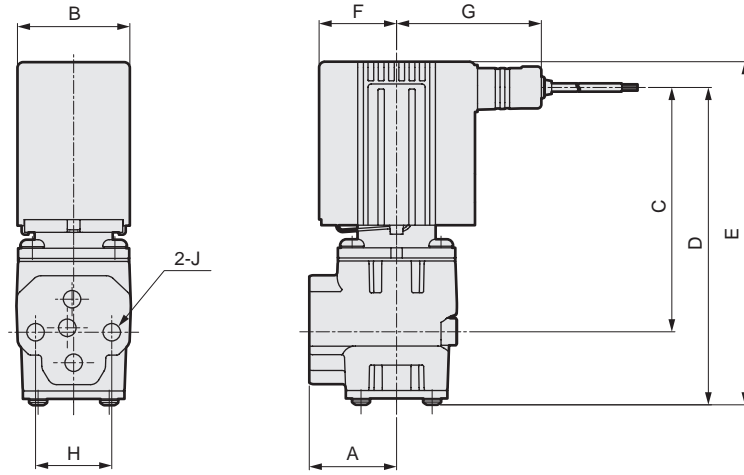
		A	B	C	D	E	F	G	H
FFGM-3	Aluminum body	63.5	22	45	88	95.5	25	32	36
	Brass/SUS body								36
FFGM-4	Aluminum body	68.5	24.5	47.5	101	109	24	32	38
	Brass/SUS body								39
FFGM-5	Aluminum body	68.5	27.5	50	110	118.5	24	32	46
	Brass/SUS body								45

		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
Control fluid
Checklist
Flow rate formula
Safety
Precautions

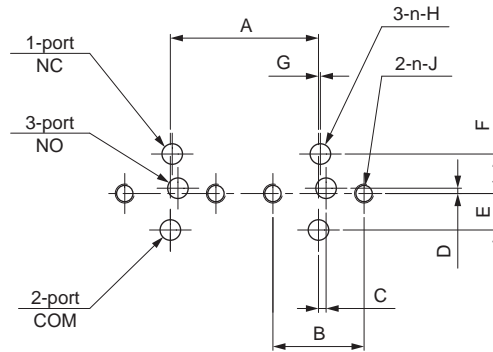
dimensions

● 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 6 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 6 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 6 or more
	Brass/SUS body	45 or more								

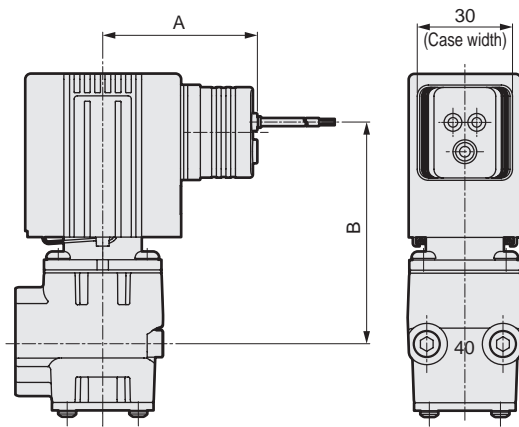
How to order discrete masking plate

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

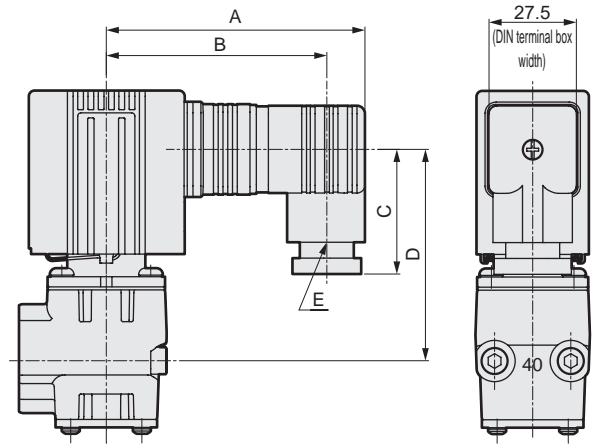
dimensions

● 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

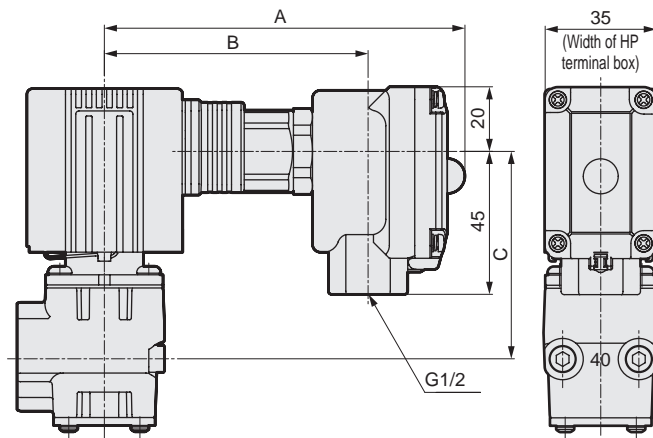
● With actuator DIN terminal box Coil option code: B/C/D/K/L



Dimensions shown in () are for G1/2.

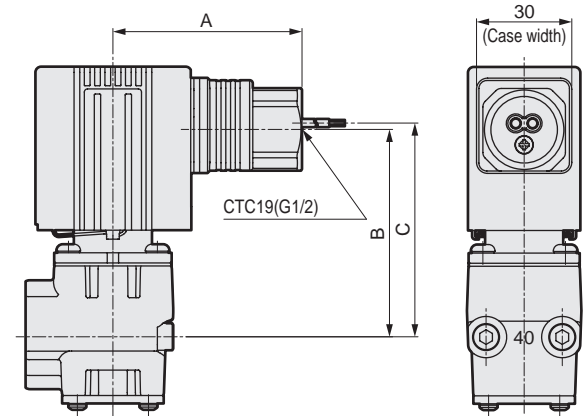
	A	B	C	D	E
FFGM-3	78.5	66.5 (65.5)	39.5 (41.5)	52.5	Pg11 (G1/2)
FFGM-4	81	69 (67.5)	39.5 (41.5)	66.5	Pg11 (G1/2)
FFGM-5	83.5	71.5 (70)	39.5 (41.5)	75.5	Pg11 (G1/2)

● 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

Direct acting 2-port valve

Manifold FFBM

Discrete FFG

Direct acting 3-port valve

Manifold FFGM

Control fluid
Checklist

Flow rate formula

Safety
Precautions