Direct acting 2-port solenoid valve for dry air, single unit
Special purpose

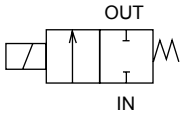
FGB Series

- NC (open when energized)
- Port size: Rc1/8 to Rc1/2

CE Refer to the Ending for details. RoHS CAD

JIS symbol

- NC (open when energized)



Common specifications

Item	FGB
Working fluid	Dry air, inert gas, low vacuum [1.33 x 10^2 Pa (abs)]
Working pressure differential MPa	0 (≈0 psi, 0 bar) to 1.4 (≈200 psi, 14 bar) (refer to the max. working pressure differential in the individual specifications)
Proof pressure (water pressure) MPa	2.1 (≈300 psi, 21 bar) (1.5 (≈220 psi, 15 bar) for FGB11/21)
Fluid temperature °C	-10 (14°F) to 40 (104°F) (no freezing)
Ambient temperature°C	-20 (-4°F) to 40 (104°F)
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
Mounting orientation	Unrestricted
Degree of protection	IP65 or equivalent (*1)

*1: The T type terminal box is IP61 or equivalent.

Individual specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Item / Model No.		Port size	Orifice size (mm)	Flow characteristics C[dm^3/(s·bar)]	Flow characteristics b	Max. working pressure differential MPa AC	Max. working pressure differential MPa DC	Max. working pressure MPa	Rated voltage	Power consumption (W) AC	Power consumption (W) DC	Weight (kg)
NC (open when energized)												
FGB21-6	-1	Rc1/8	1.5	0.28	0.52	1.0	1.0	1.0 (≈150 psi, 10 bar)	100 VAC 50/60 Hz 200 VAC 50/60 Hz 24 VDC 12 VDC	4.6	4	0.13
	-2		2	0.55	0.59	0.6	0.6					
FGB31-$^{6}_{8}$	-2	Rc1/8 Rc1/4	2	0.55	0.56	1.4	1.4	1.4 (≈200 psi, 14 bar)		6.2	6.5	0.22
	-3		3	1.2	0.56	0.6	0.6					
	-6		5	3.1	0.50	0.15	0.15					
FGB41-$^{8}_{10}$	-3	Rc1/4 Rc3/8	3	1.2	0.56	1.2	1.2			8.7	8	0.39
	-5		4	2.1	0.54	0.5	0.5					
	-7		7	5.7	0.48	0.1	0.1					
FGB51-10	-5	Rc3/8	4	2.1	0.54	1.0	1.2			10.7	11.5	0.62
	-6		5	3.1	0.50	0.5	0.6					
FGB51-$^{10}_{15}$	-7	Rc3/8	7	5.7	0.48	0.2	0.25					
	-8	Rc1/2	10	5.5	0.41	0.08	0.1					

*1 : The voltage fluctuation range must be within ±10% of the rated voltage.
*2 : The leakage current must be less than or equal to the values shown below.
*3 : Effective cross-sectional area S and sonic conductance C are converted as S ≈ 5.0 x C.
*4 : When using at low vacuum, vacuum the OUT port side.

Leakage current	Voltage / Model No.	100 VAC	200 VAC	24 VDC	12 VDC
	FGB**-	2 mA or less	1 mA or less	1 mA or less	2 mA or less

How to order

F G B 2 1 - 6 - 1 - 1 2CR A B - 1

- F G: Working fluid (Dry air)
- B: No. of ports (2-port valve)
- 2: Ⓐ Series size
- 1: Ⓑ Actuation
- 6: Ⓒ Port size
- 1: Ⓓ Orifice size *1
- 1: Ⓔ Body/sealant combination
- 2CR: Ⓕ Coil option *2 *3
- A: Ⓖ Manual override
- B: Ⓗ Other options
- 1: Ⓘ Voltage *4

Code	Description	Model No. FGB21	FGB31	FGB41	FGB51
Ⓐ Series size					
2	22 mm	●			
3	28 mm		●		
4	34 mm			●	
5	40 mm				●
Ⓑ Actuation					
1	NC (open when energized)	●	●	●	●
Ⓒ Port size					
6	Rc1/8	●	●		
8	Rc1/4		●	●	
10	Rc3/8			●	●
15	Rc1/2				●
Ⓓ Orifice size					
1	ø1.5	●			
2	ø2	●	●		
3	ø3		●	●	
5	ø4			●	●
6	ø5		●		●
7	ø7			●	●
8	ø10				●
Ⓔ Body/sealant combination					
	Body / **Seal**				
1	Aluminum / NBR	●	●	●	●
Ⓕ Coil option					
For AC					
2CR	Std. Grommet lead wire with full-wave rectifier	●	●	●	●
3TR	Option T type term box, full-wave rectifier (G1/2)		●	●	●
3RR	Option T type terminal box with lamp/ full-wave rectifier (G1/2)		●	●	●
For DC					
2C	Grommet lead wire	●	●	●	●
2CS	Grommet lead wire with surge suppressor	●	●	●	●
3T	With T type terminal box (G1/2)		●	●	●
3RS	T type terminal box with lamp surge suppressor (G1/2)		●	●	●
Ⓖ Manual override					
Blank	Std. None	●	●	●	●
A	Option Manual locking	●	●	●	●
N	Option Manual non-locking		●	●	●
Ⓗ Other options					
Blank	Std. None	●	●	●	●
B	Option Mounting plate	●	●	●	●
Ⓘ Voltage					
1	100 VAC 50/60 Hz	●	●	●	●
2	200 VAC 50/60 Hz	●	●	●	●
3	24 VDC	●	●	●	●
4	12 VDC	●	●	●	●
Specify the desired voltage if it is not listed above.					

Select from the combinations indicated with ● in the table above.

[Example of model No.]

FGB21-6-1-12CRAB-1

Model : FGB

- Ⓐ Series size : 22 mm
- Ⓑ Actuation : NC (open when energized)
- Ⓒ Port size : Rc1/8
- Ⓓ Orifice size : ø1.5
- Ⓔ Body/sealant combination : Body - aluminum, sealant - NBR
- Ⓕ Coil option : Grommet lead wire with full-wave rectifier
- Ⓖ Manual override : Manual locking
- Ⓗ Other options : Mounting plate
- Ⓘ Voltage : 100 VAC 50/60 Hz

⚠ Precautions for model No. selection

*1 : For FGB51 with orifice of ø4 mm (Item Ⓓ 5) and ø5 mm (Item Ⓓ 6), available port size is Rc3/8 (Item Ⓒ 10) only.

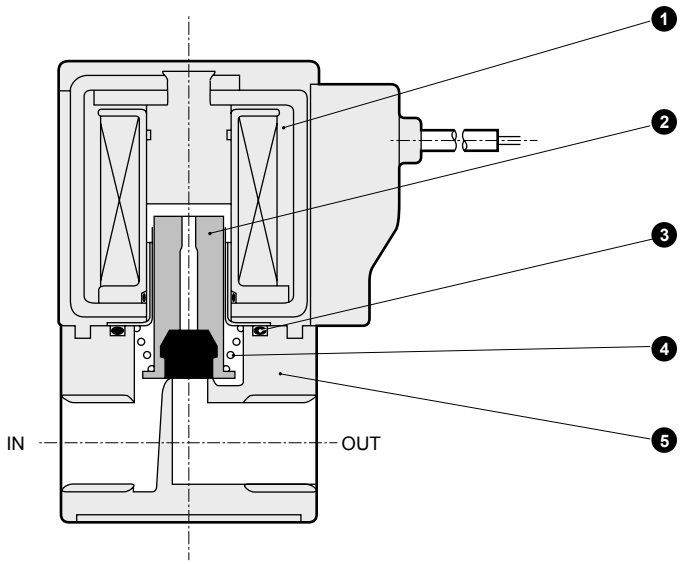
*2 : Full-wave rectifier and surge suppressor are built into the coil for Item Ⓕ 2CR, 2CS and in the terminal box for 3TR, 3RR, 3RS.

*3 : Surge suppressor is included as standard in the models with full-wave rectifier.

*4 : Other voltages may not be available. Contact CKD for details.

Internal structure and parts list

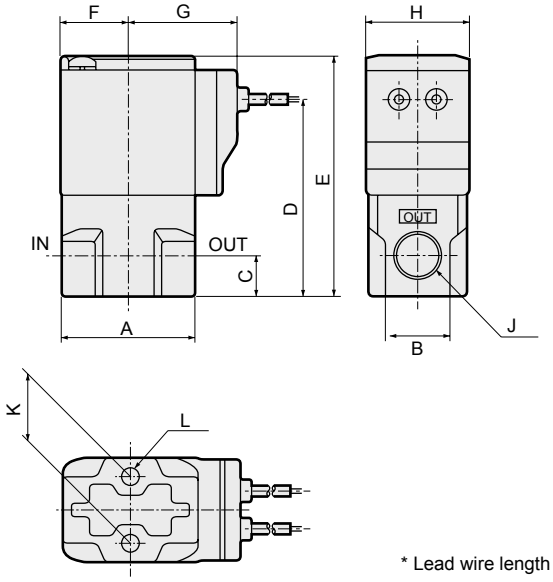
● FGB Series



No.	Part name	Material	
1	Coil assembly	-	-
2	Plunger assembly	SUS, NBR	Stainless steel, nitrile rubber
3	O-ring	NBR	Nitrile rubber
4	Spring	SUS	Stainless steel
5	Body	ADC	Aluminum die-casting

Dimensions CAD

● Grommet lead wire with full-wave rectifier
FGB*1-*-*-*2CR



* Lead wire length 300 mm

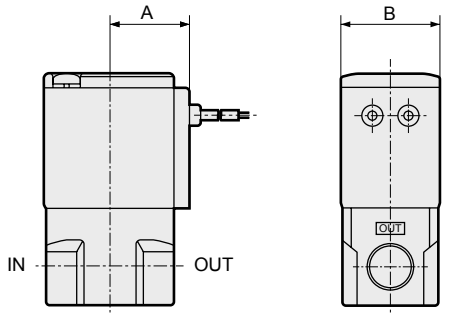
When using lead wire with DC voltage, use the grommet lead wire (2C) or grommet lead wire with surge suppressor (2CS).

Model No.	A	B	C	D	E	F	G	H	J	K	L
FGB21	32	16	8	43	54	15.5	26.5	22	Rc1/8	15	M4 depth 6
FGB31	36	18	11	53.5	65.5	18.5	29.5	28	Rc1/8, Rc1/4	18	M5 depth 6
FGB41	40	25	12	62	76	22.5	34	34	Rc1/4, Rc3/8	18	M5 depth 7
FGB51	50	30	15	74.5	90.5	26	37.5	40	Rc3/8, Rc1/2	20	M5 depth 8

Optional dimensions

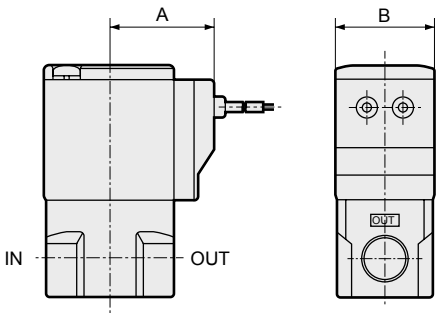
(Refer to the dimensions of grommet lead wire with full-wave rectifier on page 76 for common dimensions.)

● Grommet lead wire
FGB*1-*-*-*2C



Model No.	A	B
FGB21	19.5	22
FGB31	22.5	28
FGB41	26	34
FGB51	29.5	40

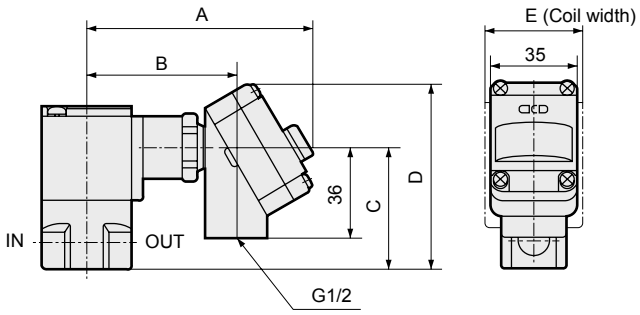
● Grommet lead wire with surge suppressor
FGB*1-*-*-*2CS



Model No.	A	B
FGB21	26.5	22
FGB31	29.5	28
FGB41	34	34
FGB51	37.5	40

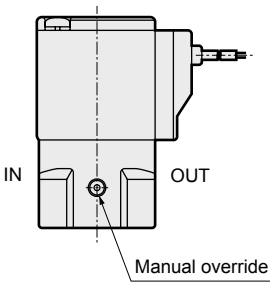
● T type terminal box (with lamp/surge suppressor) (G1/2)
FGB*1-*-*-* 3T 3RS

● T type terminal box with full-wave rectifier (with lamp) (G1/2)
FGB*1-*-*-* 3TR 3RR



Model No.	A	B	C	D	E
FGB31	92	60.5	48.5	74.5	28
FGB41	96	64.5	57.5	83.5	34
FGB51	99.5	68	71.5	97.5	40

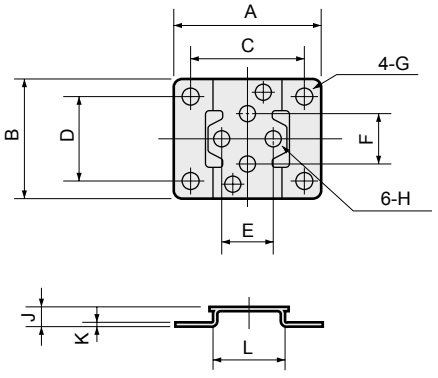
● Manual override locking/non-locking
FGB*1-*-*-** A N



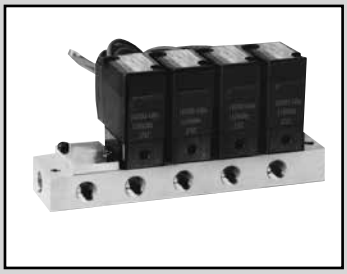
Note : Non-locking is available only for sizes 3, 4, 5.

● Mounting plate
FGB*1-*-*-***B

Material : Steel
Zinc plated



Model No.	A	B	C	D	E	F	G	H	J	K	L
FGB21	40	34	30	25	15	15	ø5	ø4.5	6	1.2	20
FGB31	52	42	40	30	18	18	ø6	ø5.5	7	1.6	25
FGB41	56	48	44	36	18	18	ø6	ø5.5	7	1.6	30
FGB51	62	50	50	38	20	20	ø6	ø5.5	7	1.6	36



Direct acting 2-port solenoid valve for dry air, manifold
Special purpose

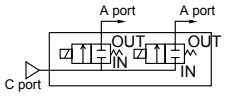
GFGB Series

- NC (open when energized)
- Port size: Rc1/8, Rc1/4, Rc3/8

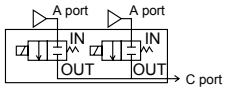
CE Refer to the Ending for details. RoHS CAD

JIS symbol

- NC (open when energized)/ common supply (port C pressurization)



- NC (open when energized)/ individual supply (port A pressurization)



Common specifications

Item	GFGB
Working fluid	Dry air, inert gas, low vacuum [1.33 x 10^2 Pa (abs)]
Working pressure differential MPa	0 (≈0 psi, 0 bar) to 1.4 (≈200 psi, 14 bar) (refer to the max. working pressure differential in the individual specifications)
Proof pressure (water pressure) MPa	2.1 (≈300 psi, 21 bar) (1.5 (≈220 psi, 15 bar) for GFGB2)
Fluid temperature °C	-10 (14°F) to 40 (104°F) (no freezing)
Ambient temperature °C	-20 (-4°F) to 40 (104°F)
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
Mounting orientation	Unrestricted
Degree of protection	IP65 or equivalent (*1)

*1 : The T type terminal box is IP61 or equivalent.

Individual specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Item / Model No.	Port size A port (Individual)	Port size C port (Common)	Orifice size (mm)	Flow characteristics C[dm^3/(s·bar)]	Flow characteristics b	Max. working pressure differential MPa AC	Max. working pressure differential MPa DC	Max. working pressure MPa	Rated voltage	Power consumption (W) AC	Power consumption (W) DC
GFGB 21 25 - 1	Rc1/8	Rc1/8	1.5	0.31	0.49	1.0	1.0	1.0 (≈150 psi, 10 bar)	100 VAC 50/60 Hz 200 VAC 50/60 Hz 24 VDC 12 VDC	4.6	4
GFGB 21 25 - 2	Rc1/8	Rc1/8	2	0.53	0.38	0.6	0.6				
GFGB 31 35 - 2	Rc1/4	Rc3/8	2	0.55	0.48	1.4	1.4	1.4 (≈200 psi, 14 bar)		6.2	6.5
GFGB 31 35 - 3	Rc1/4	Rc3/8	3	1.2	0.39	0.6	0.6				
GFGB 31 35 - 6	Rc1/4	Rc3/8	5	2.1	0.27	0.15	0.15				
GFGB 41 45 - 3	Rc1/4	Rc3/8	3	1.2	0.39	1.2	1.2			8.7	8
GFGB 41 45 - 5	Rc1/4	Rc3/8	4	2.1	0.34	0.5	0.5				
GFGB 41 45 - 7	Rc1/4	Rc3/8	7	3.5	0.21	0.1	0.1				
GFGB 51 55 - 5	Rc1/4	Rc3/8	4	2.1	0.34	1.0	1.2			10.7	11.5
GFGB 51 55 - 6	Rc1/4	Rc3/8	5	3.0	0.22	0.5	0.6				
GFGB 51 55 - 7	Rc1/4	Rc3/8	7	4.4	0.18	0.2	0.25				

*1 : The voltage fluctuation range must be within ±10% of the rated voltage.
*2 : The leakage current must be less than or equal to the values shown below.
*3 : Effective cross-sectional area S and sonic conductance C are converted as S ≈ 5.0 x C.
*4 : When using at low vacuum, vacuum the OUT port side.

Leakage current: Voltage / Model No.	100 VAC	200 VAC	24 VDC	12 VDC
GFGB	2 mA or less	1 mA or less	1 mA or less	2 mA or less

Weight

Model No.	Actuator weight (kg)	Masking weight (kg)	Sub-plate weight (kg) (n: manifold station No.)	Formula for product weight
GFGB21 GFGB25	0.11	0.012	0.017+0.025×n	(Product weight (kg)) = 0.11 x (Actuator quantity) + 0.012 x (Masking quantity) + 0.017 + 0.025 x (Manifold station No.)
GFGB31 GFGB35	0.18	0.026	0.038+0.056×n	(Product weight (kg)) = 0.18 x (Actuator quantity) + 0.026 x (Masking quantity) + 0.038 + 0.056 x (Manifold station No.)
GFGB41 GFGB45	0.32	0.032	0.044+0.076×n	(Product weight (kg)) = 0.32 x (Actuator quantity) + 0.032 x (Masking quantity) + 0.044 + 0.076 x (Manifold station No.)
GFGB51 GFGB55	0.52	0.045	0.053+0.11×n	(Product weight (kg)) = 0.52 x (Actuator quantity) + 0.045 x (Masking quantity) + 0.053 + 0.11 x (Manifold station No.)

How to order

● Manifold

GFGB31-2-7-12CN-3

● Manifold with masking plate

GFGB25-1-X-12CRN-2-52

No. of ports (2-port valve)

Working fluid (Dry air)

Ⓐ Series size

Ⓑ Circuit configuration

Ⓒ Orifice size

Ⓓ Manifold station No. *1 *2

Ⓔ Body/sealant combination

Ⓕ Coil option *3 *4

Ⓖ Manual override

Ⓗ Voltage *5

Ⓘ No. of solenoid valves *6

Ⓙ Masking plate quantity

Code	Description	Model No. GFGB21/25	GFGB31/35	GFGB41/45	GFGB51/55
Ⓐ Series size					
2	22 mm	●			
3	28 mm		●		
4	34 mm			●	
5	40 mm				●
Ⓑ Circuit configuration					
1	NC (open when energized)/common supply	●	●	●	●
5	NC (open when energized)/individual supply	●	●	●	●
Ⓒ Orifice size					
1	ø1.5	●			
2	ø2	●	●		
3	ø3		●	●	
5	ø4			●	●
6	ø5		●		●
7	ø7			●	●
Ⓓ Manifold station No.					
2 to 10	2 stations to 10 stations	●	●	●	●
0	Actuator only	●	●	●	●
X	With masking plate	●	●	●	●
Ⓔ Body/sealant combination					
	Body / **Seal**				
1	PPS / NBR	●	●	●	●
Ⓕ Coil option					
For AC					
2CR	Std. Grommet lead wire With full-wave rectifier	●	●	●	●
3TR	Option T type term box, full-wave rectifier (G1/2)			●	●
3RR	Option T type terminal box with lamp/ full-wave rectifier (G1/2)			●	●
For DC					
2C	Grommet lead wire	●	●	●	●
2CS	Grommet lead wire with surge suppressor	●	●	●	●
3T	With T type terminal box (G1/2)			●	●
3RS	T type terminal box with lamp surge suppressor (G1/2)			●	●
Ⓖ Manual override					
Blank	Std. None	●	●	●	●
N	Option Manual non-locking	●	●	●	●
Ⓗ Voltage					
1	100 VAC 50/60 Hz	●	●	●	●
2	200 VAC 50/60 Hz	●	●	●	●
3	24 VDC	●	●	●	●
4	12 VDC	●	●	●	●
Specify the desired voltage if it is not listed above.					
Ⓘ No. of solenoid valves					
Blank	No masking plate	●	●	●	●
1 to 9	1 solenoid valve to 9 solenoid valves	●	●	●	●
Ⓙ Masking plate quantity					
Blank	No masking plate	●	●	●	●
1 to 9	1 masking plate to 9 masking plates	●	●	●	●

Select from the combinations indicated with ● in the table above.

[Example of model No.]

GFGB31-2-7-12CN-3

Model : GFGB

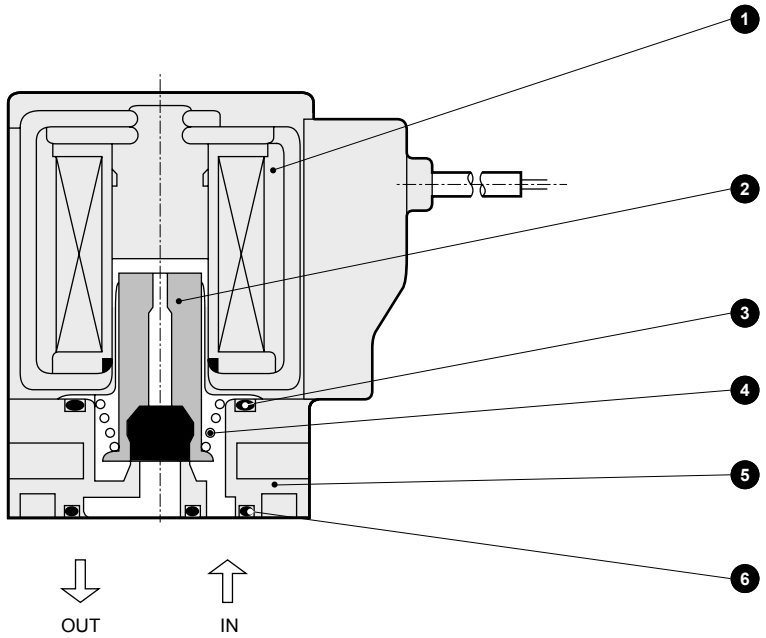
Ⓐ Series size : 28 mm
Ⓑ Circuit configuration : NC (open when energized)/ common supply
Ⓒ Orifice size : ø2
Ⓓ Manifold station No. : 7 stations
Ⓔ Body/sealant combination : Body - PPS, sealant - NBR
Ⓕ Coil option : Grommet lead wire
Ⓖ Manual override : Manual non-locking
Ⓗ Voltage : 24 VDC
Ⓘ Ⓙ : No masking plate

⚠ Precautions for model No. selection

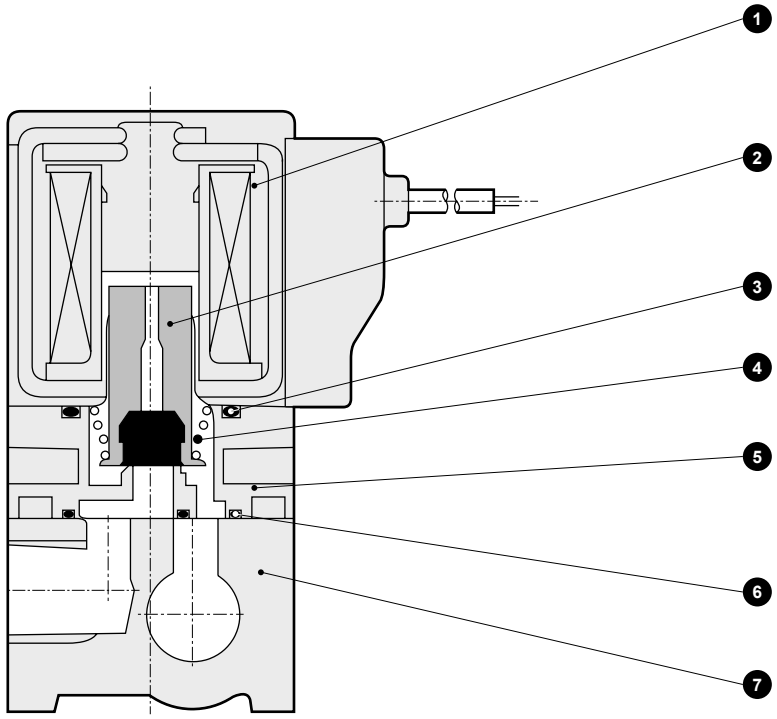
*1 : Select a desired manifold station No. from 2 to 10.
*2 : For the type with masking plate, designate Item Ⓓ as X, then designate the quantities of Ⓘ solenoid valves and Ⓙ masking plates.
*3 : Full-wave rectifier and surge suppressor are built into the coil for Item Ⓕ 2CR/2CS and in the terminal box for 3TR/3RR/3RS.
*4 : Surge suppressor is included as standard in the models with full-wave rectifier.
*5 : Other voltages may not be available. Contact CKD for details.
*6 : Solenoid valves are arranged from the right side with the sub-plate (individual) port A facing front.
*7 : Orders for only the masking plate and sub-plate are also available. Contact CKD for details.

Internal structure and parts list

● GFGB actuator



● GFGB manifold

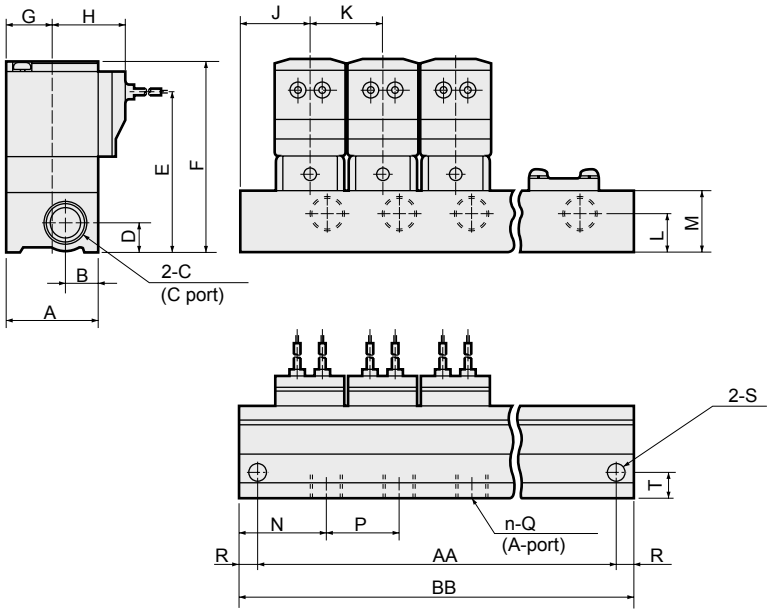


No.	Part name	Material		No.	Part name	Material	
1	Coil assembly	-	-	5	Body	PPS	Polyphenylene sulfide
2	Plunger assembly	SUS, NBR	Stainless steel, nitrile rubber	6	Gasket	NBR	Nitrile rubber
3	O-ring	NBR	Nitrile rubber	7	Sub-plate	A6063	Aluminum
4	Spring	SUS	Stainless steel				

* 4 body mounting screws and 2 O-rings are attached to the actuator only.

Dimensions: Manifold

● Grommet lead wire with full-wave rectifier
GFGB**-*-*-12CR



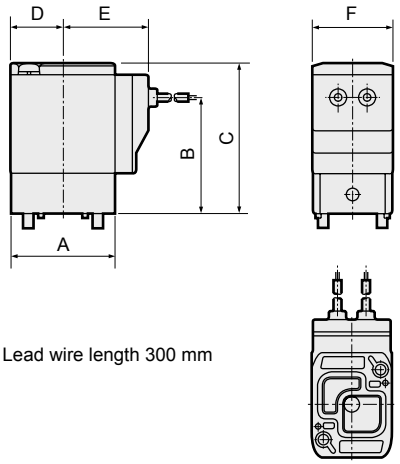
Lead wire length 300 mm

Model No.	Station No. / Code	2	3	4	5	6	7	8	9	10
GFGB2	AA	58	84	110	136	162	188	214	240	266
	BB	68	94	120	146	172	198	224	250	276
GFGB3	AA	74	106	138	170	202	234	266	298	330
	BB	88	120	152	184	216	248	280	312	344
GFGB4	AA	86	124	162	200	238	276	314	352	390
	BB	100	138	176	214	252	290	328	366	404
GFGB5	AA	100	146	192	238	284	330	376	422	468
	BB	114	160	206	252	298	344	390	436	482

Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
GFGB2	30	12	Rc1/8	8	49	60	15.5	26.5	21	26	8	16	25	26	Rc1/8	5	ø4.5	9
GFGB3	36	13	Rc3/8	12	64	76	18.5	29.5	28	32	15	24	34.5	32	Rc1/4	7	ø6.5	10
GFGB4	43	18	Rc3/8	12	71	85	22.5	34	31	38	15	24	31	38	Rc1/4	7	ø6.5	11.5
GFGB5	50	20	Rc3/8	12	79	95	26	37.5	34	46	12	24	34	46	Rc1/4	7	ø6.5	14

Dimensions: Actuator

● Grommet lead wire with full-wave rectifier
GFGB**-*-0-12CR



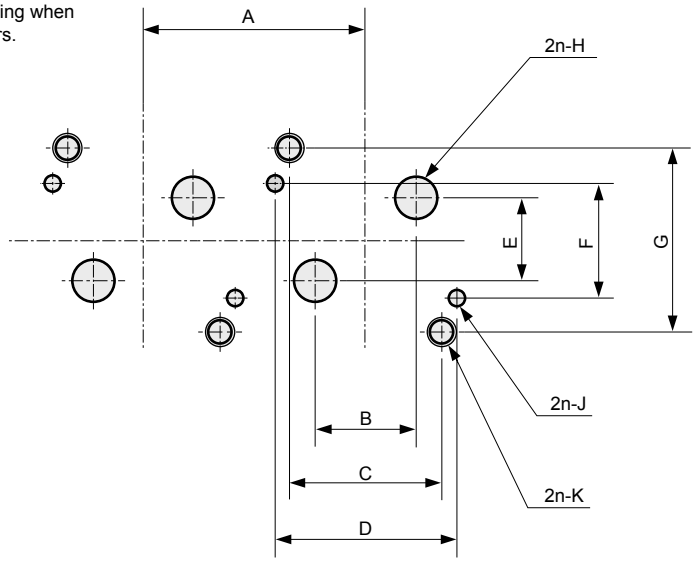
Lead wire length 300 mm

Model No.	A	B	C	D	E	F
GFGB2	30	33	44	15.5	26.5	22
GFGB3	36	40	52	18.5	29.5	28
GFGB4	43	47	61	22.5	34	34
GFGB5	50	55	71	26	37.5	40

Actuator installation dimensions

● GFGB2*/3*

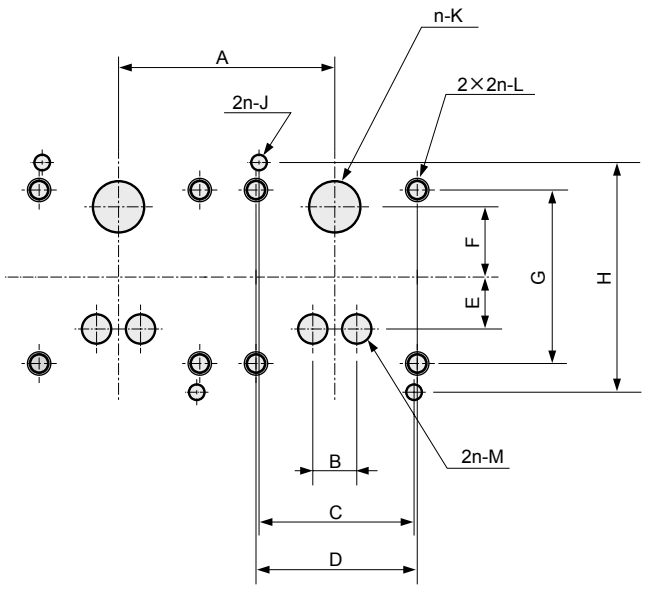
Machining drawing when using 2 actuators.



Model No.	A	B	C	D	E	F	G	H	J	K
GFGB2	26 or more	8±0.15	15.5±0.1	18.4±0.1	10±0.15	12.4±0.1	19.4±0.1	ø3.5	ø1.6$^{+0.1}_{0}$depth 2.5±0.5	M3 effective thread depth 6 or more
GFGB3	32 or more	13±0.15	20±0.1	23.6±0.1	11.4±0.15	15±0.1	24.2±0.1	ø5.5	ø2.1$^{+0.1}_{0}$depth 2.5±0.5	M4 effective thread depth 6 or more

● GFGB4*5*

Machining drawing when using 2 actuators.

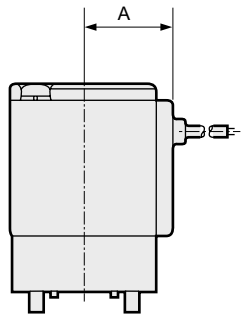


Model No.	A	B	C	D	E	F	G	H	J	K	L	M
GFGB4	38 or more	6±0.2	25±0.1	26±0.1	8.5±0.2	11±0.2	28±0.1	37±0.1	ø2.6$^{+0.1}_{0}$depth 2.5±0.5	ø8	M4 effective thread depth 9 or more	ø5
GFGB5	46 or more	8±0.2	30±0.1	30±0.1	11.5±0.2	14.5±0.2	33±0.1	43±0.1	ø2.6$^{+0.1}_{0}$depth 2.5±0.5	ø11	M5 effective thread depth 8 or more	ø7

Optional dimensions

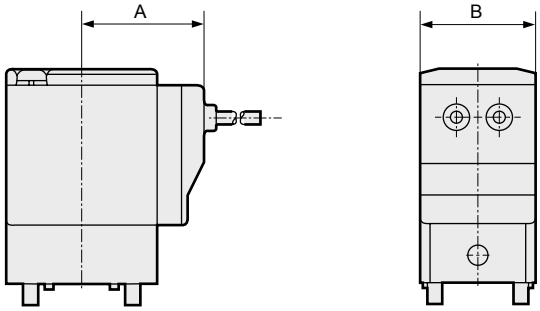
(Refer to the dimensions of grommet lead wire actuator with full-wave rectifier on page 81 for common dimensions.)

● Grommet lead wire
GFGB**-*-*-1 2C



Model No.	A	B
GFGB2	19.5	22
GFGB3	22.5	28
GFGB4	26	34
GFGB5	29.5	40

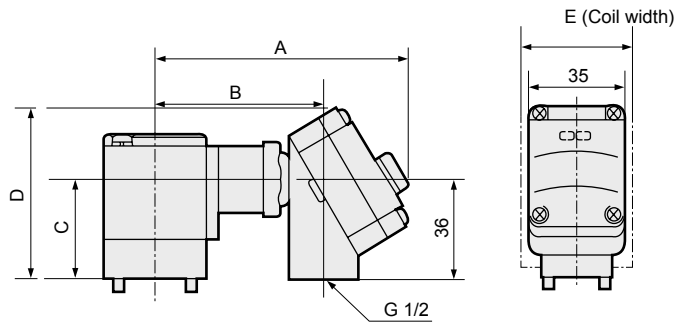
● Grommet lead wire with surge suppressor
GFGB**-*-*-1 2CS



Model No.	A	B
GFGB2	26.5	22
GFGB3	29.5	28
GFGB4	34	34
GFGB5	37.5	40

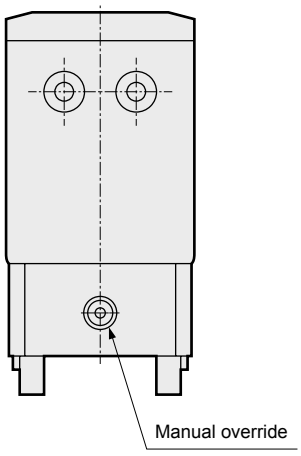
● T type terminal box (with lamp/surge suppressor) (G1/2)
GFGB**-*-*-1 3T 3RS

● T type terminal box with full-wave rectifier (with lamp) (G1/2)
GFGB**-*-*-1 3TR 3RR



Model No.	A	B	C	D	E
GFGB4	96	64.5	42.5	68.5	34
GFGB5	99.5	68	52	78	40

● Manual override (non-locking)
GFGB**-*-*-1*N



Position of manual override
· Common supply: Opposite side to port A
· Individual supply: Port A side

Direct acting 3-port solenoid valve for dry air, single unit
Special purpose

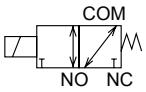
FGG Series

- Universal, NC pressurization
- Port size: Rc1/8, Rc1/4, Rc3/8

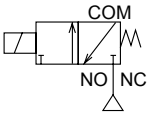
CE Refer to the Ending for details. RoHS CAD

JIS symbol

● Universal



● NC pressurization



Common specifications

Item	FGG
Working fluid	Dry air, inert gas, low vacuum [1.33 x 10^2 Pa (abs)]
Working pressure differential MPa	0 (≈0 psi, 0 bar) to 1.4 (≈200 psi, 14 bar) (refer to the max. working pressure differential in the individual specifications)
Proof pressure (water pressure) MPa	2.1 (≈300 psi, 21 bar) (1.5 (≈220 psi, 15 bar) for FGG2)
Fluid temperature °C	-10 (14°F) to 40 (104°F) (no freezing)
Ambient temperature °C	-20 (-4°F) to 40 (104°F)
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
Mounting orientation	Unrestricted
Degree of protection	IP65 or equivalent (*1)

*1 : The T type terminal box is IP61 or equivalent.

Individual specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Item / Model No.		Port size	Orifice size (mm)	Flow characteristics C[dm^3/(s·bar)]	Flow characteristics b	Max. working pressure differential MPa	Max. working pressure MPa	Rated voltage	Power consumption (W) AC	Power consumption (W) DC	Weight (kg)
● Universal											
FGG21- 6	- Z	Rc1/8	1	0.13	0.58	0.7	1.0 (≈150 psi, 10 bar)	100 VAC 50/60 Hz 200 VAC 50/60 Hz 24 VDC 12 VDC	4.6	4	0.15
	- 1		2	0.52	0.54	0.15					
FGG31- 6 8	- 0	Rc1/8 Rc1/4	1.5	0.32	0.58	0.7	1.4 (≈200 psi, 14 bar)		6.2	6.5	0.25
	- 1		2	0.55	0.48	0.4					
	- 4		3	1.2	0.57	0.2					
FGG41- 8 10	- 1	Rc1/4 Rc3/8	2	0.55	0.48	0.7			8.7	8	0.45
	- 4		3	1.2	0.57	0.3					
	- 8		4	2.1	0.48	0.15					
FGG51- 8 10	- 1	Rc1/4 Rc3/8	2	0.55	0.48	1.2(0.6)			10.7	11.5	0.65
	- 4		3	1.2	0.57	0.6(0.3)					
	- 8		4	2.1	0.48	0.3(0.15)					
● NC pressurization											
FGG33- 6 8	- 0	Rc1/8 Rc1/4	1.5	0.32	0.58	1.0	1.4	100 VAC 50/60 Hz 200 VAC 50/60 Hz 24 VDC 12 VDC	6.2	6.5	0.25
	- 1		2	0.55	0.48	0.7					
	- 4		3	1.2	0.57	0.3					
FGG43- 8 10	- 1	Rc1/4 Rc3/8	2	0.55	0.48	1.2			8.7	8	0.45
	- 4		3	1.2	0.57	0.6					
	- 8		4	2.1	0.48	0.3					

*1 : The voltage fluctuation range must be within ±10% of the rated voltage.
*2 : For FGG51, the max. working pressure differential when NO pressurized is shown in ( ).
*3 : The leakage current must be less than or equal to the values shown below.
*4 : Effective cross-sectional area S and sonic conductance C are converted as S ≈ 5.0 x C.
*5 : When using NC pressurization at low vacuum, vacuum the NO port side.

Leakage current	Voltage / Model No.	100 VAC	200 VAC	24 VDC	12 VDC
	FGG**	2 mA or less	1 mA or less	1 mA or less	2 mA or less

How to order

F G G 2 1 - 6 - Z - 1 2CR A B - 1

- No. of ports (3-port valve)
- Working fluid (Dry air)
- Ⓐ Series size
- Ⓑ Actuation
- Ⓒ Port size
- Ⓓ Orifice size
- Ⓔ Body/sealant combination
- Ⓕ Coil option *1 *2
- Ⓖ Manual override
- Ⓗ Other options
- Ⓘ Voltage *3

Code	Description	FGG21	FGG31/33	FGG41/43	FGG51
Ⓐ Series size					
2	22 mm	●			
3	28 mm		●		
4	34 mm			●	
5	40 mm				●
Ⓑ Actuation					
1	Universal	●	●	●	●
3	NC pressurization		●	●	
Ⓒ Port size					
6	Rc1/8	●	●		
8	Rc1/4		●	●	●
10	Rc3/8			●	●
Ⓓ Orifice size					
Z	ø1	●			
0	ø1.5		●		
1	ø2	●	●	●	●
4	ø3		●	●	●
8	ø4			●	●
Ⓔ Body/sealant combination					
	Body / **Seal**				
1	Aluminum / NBR	●	●	●	●
Ⓕ Coil option					
For AC					
2CR	Std. Grommet lead wire with full-wave rectifier	●	●	●	●
3TR	Option T type term box, full-wave rectifier (G1/2)		●	●	●
3RR	Option T type term box, lamp/full-wave rectifier (G1/2)		●	●	●
For DC					
2C	Option Grommet lead wire	●	●	●	●
2CS	Option Grommet lead wire with surge suppressor	●	●	●	●
3T	Option With T type terminal box (G1/2)		●	●	●
3RS	Option T type term box, lamp/anti-surge (G1/2)		●	●	●
Ⓖ Manual override					
Blank	Std. None	●	●	●	●
A	Option Manual locking	●	●	●	●
N	Option Manual non-locking		●	●	●
Ⓗ Other options					
Blank	Std. None	●	●	●	●
B	Option Mounting plate	●	●	●	●
Ⓘ Voltage					
1	100 VAC 50/60 Hz	●	●	●	●
2	200 VAC 50/60 Hz	●	●	●	●
3	24 VDC	●	●	●	●
4	12 VDC	●	●	●	●
Specify the desired voltage if it is not listed above.					

Select from the combinations indicated with ● in the table above.

[Example of model No.]

FGG21-6-Z-12CRAB-1

Model: FGG

- Ⓐ Series size : 22 mm
- Ⓑ Actuation : Universal
- Ⓒ Port size : Rc1/8
- Ⓓ Orifice size : ø1
- Ⓔ Body/sealant combination : Body - aluminum, sealant - NBR
- Ⓕ Coil option : Grommet lead wire with full-wave rectifier
- Ⓖ Manual override : Manual locking
- Ⓗ Other options : Mounting plate
- Ⓘ Voltage : 100 VAC 50/60 Hz

⚠ Precautions for model No. selection

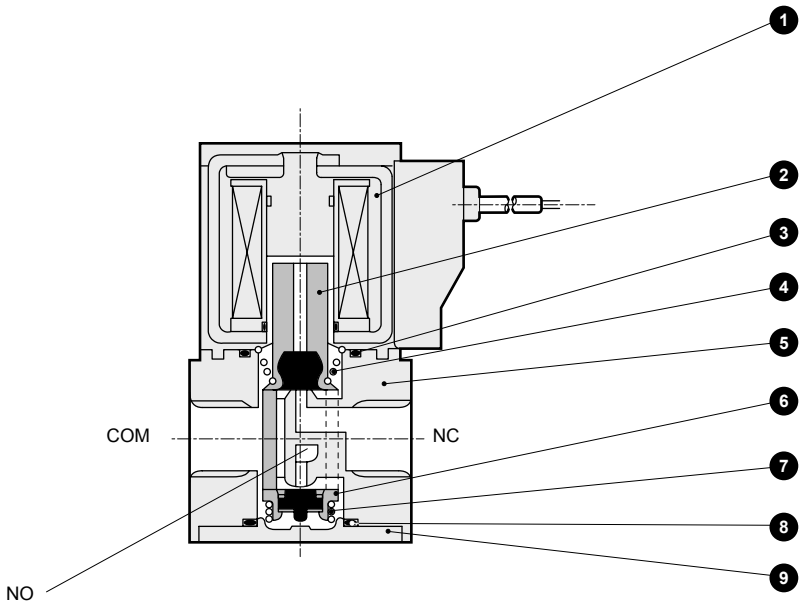
*1 : Full-wave rectifier and surge suppressor are built into the coil for Item Ⓕ 2CR, 2CS and in the terminal box for 3TR, 3RR, 3RS.

*2 : Surge suppressor is included as standard in the models with full-wave rectifier.

*3 : Other voltages may not be available. Contact CKD for details.

Internal structure and parts list

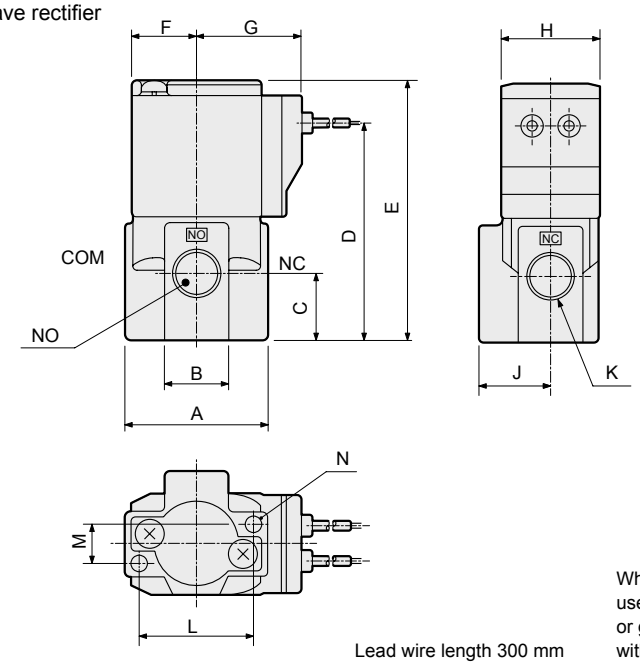
● FGG*1/*3 Series



No.	Part name	Material		No.	Part name	Material	
1	Coil assembly	-	-	6	Valving element guide assembly	PPS, SUS, NBR	Polyphenylene sulfide, stainless steel, nitrile rubber
2	Plunger assembly	SUS, NBR	Stainless steel, nitrile rubber	7	Spring	SUS	Stainless steel
3	O-ring	NBR	Nitrile rubber	8	O-ring	NBR	Nitrile rubber
4	Spring	SUS	Stainless steel	9	Cover	ADC	Aluminum die-casting
5	Body	ADC	Aluminum die-casting				

Dimensions CAD

● Grommet lead wire with full-wave rectifier
FGG**-*-*-12CR



Lead wire length 300 mm

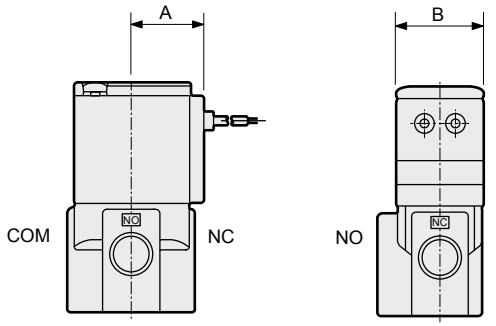
When using lead wire with DC voltage, use the grommet lead wire (2C) or grommet lead wire with surge suppressor (2CS).

Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N
FGG2	32	16	16.5	51	62	15.5	26.5	22	16	Rc1/8	25	8	M4 depth 6
FGG3	40	18	18.5	60.5	72.5	18.5	29.5	28	20	Rc1/8 Rc1/4	32	11	M5 depth 8
FGG4	45	25	25	74.5	88.5	22.5	34	34	21	Rc1/4 Rc3/8	35	15	M5 depth 8
FGG5	50	25	25	81	97	26	37.5	40	21	Rc1/4 Rc3/8	35	15	M5 depth 8

Optional dimensions

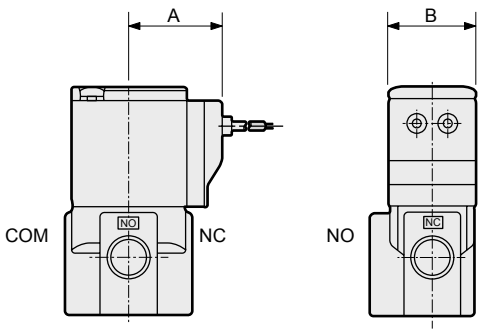
(Refer to the dimensions of grommet lead wire with full-wave rectifier on page 86 for common dimensions.)

● Grommet lead wire
FGG**-*-*-1 2C



Model No.	A	B
FGG2	19.5	22
FGG3	22.5	28
FGG4	26	34
FGG5	29.5	40

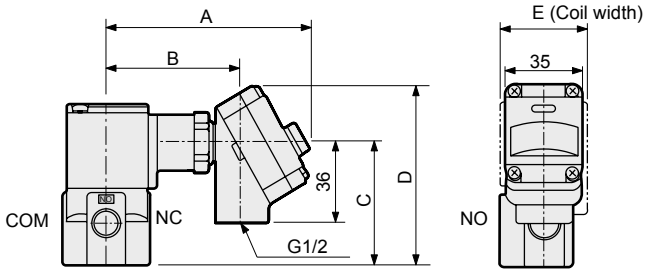
● Grommet lead wire with surge suppressor
FGG**-*-*-1 2CS



Model No.	A	B
FGG2	26.5	22
FGG3	29.5	28
FGG4	34	34
FGG5	37.5	40

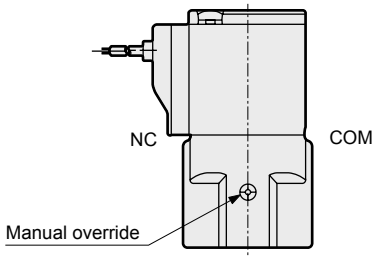
● T type terminal box (with lamp/surge suppressor) (G1/2)
FGG**-*-*-1 3T 3RS

● T type terminal box with full-wave rectifier (with lamp) (G1/2)
FGG**-*-*-1 3TR 3RR



Model No.	A	B	C	D	E
FGG3	92	60.5	55.5	81.5	28
FGG4	96	64.5	70	96	34
FGG5	99.5	68	78	104	40

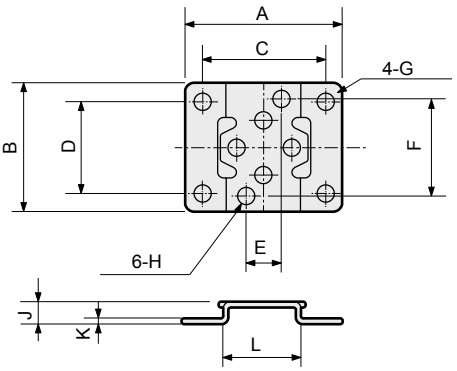
● Manual override (locking/non-locking)
FGG**-*-*-1* A N



Note : Non-locking is available only for sizes 3, 4, 5.

● Mounting plate
FGG**-*-*-1** B

Material : Steel
Zinc plated



Model No.	A	B	C	D	E	F	G	H	J	K	L
FGG2	40	34	30	25	8	25	ø5	ø4.5	6	1.2	20
FGG3	52	42	40	30	11	32	ø6	ø5.5	7	1.6	25
FGG4	56	48	44	36	15	35	ø6	ø5.5	7	1.6	30
FGG5	62	50	50	38	15	35	ø6	ø5.5	7	1.6	36

Direct acting 3-port solenoid valve for dry air, manifold
Special purpose

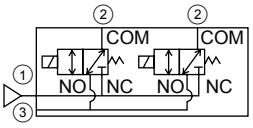
GFGG Series

- Universal
- Port size: Rc1/8, Rc1/4

CE Refer to the Ending for details. RoHS CAD

JIS symbol

- Common supply/common exhaust



Common specifications

Item	GFGG
Working fluid	Dry air, inert gas, low vacuum [1.33 x 10^2 Pa (abs)]
Working pressure differential MPa	0 (≈0 psi, 0 bar) to 1.2 (≈170 psi, 12 bar) (refer to the max. working pressure differential in the individual specifications)
Proof pressure (water pressure) MPa	1.8 (≈260 psi, 18 bar) (1.5 (≈220 psi, 15 bar) for GFGG $\frac{2}{3}$)
Fluid temperature °C	-10 (14°F) to 40 (104°F) (no freezing)
Ambient temperature °C	-20 (-4°F) to 40 (104°F)
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
Mounting orientation	Unrestricted
Degree of protection	IP65 or equivalent (*1)

*1 : The T type terminal box is IP61 or equivalent.

Individual specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Item / Model No.	Port size 2-port (Individual)	Port size 1, 3-port (Common)	Orifice size (mm)	Flow characteristics C[dm^3/(s·bar)]	Flow characteristics b	Max. working pressure differential MPa	Max. working pressure MPa	Rated voltage	Power consumption (W) AC	Power consumption (W) DC
Universal										
GFGG21 -Z	Rc1/8	Rc1/8	1	0.12	0.44	0.7	1.0 (≈150 psi, 10 bar)	100 VAC 50/60 Hz 200 VAC 50/60 Hz 24 VDC 12 VDC	4.6	4
GFGG21 -1			2	0.42	0.19	0.15				
GFGG31 -0	Rc1/4	Rc1/4	1.5	0.28	0.46	0.7			6.2	6.5
GFGG31 -1			2	0.49	0.36	0.4				
GFGG31 -4			3	0.90	0.20	0.2				
GFGG41 -1	Rc1/4	Rc1/4	2	0.50	0.31	0.7	1.2 (≈170 psi, 12 bar)		8.7	8
GFGG41 -4			3	1.1	0.20	0.3				
GFGG41 -8			4	1.6	0.14	0.15				
GFGG51 -1	Rc1/4	Rc1/4	2	0.50	0.31	1.2(0.6)			10.7	11.5
GFGG51 -4			3	1.1	0.20	0.6(0.3)				
GFGG51 -8			4	1.6	0.14	0.3(0.15)				

*1 : The voltage fluctuation range must be within ±10% of the rated voltage.
*2 : For GFGG51, the max. working pressure differential when NO pressurized is shown in ( ).
*3 : The leakage current must be less than or equal to the values shown below.
*4 : Effective cross-sectional area S and sonic conductance C are converted as S ≈ 5.0 x C.

Leakage current: Voltage / Model No.	100 VAC	200 VAC	24 VDC	12 VDC
GFGG	2 mA or less	1 mA or less	1 mA or less	2 mA or less

Weight

Model No.	Actuator weight (kg)	Masking weight (kg)	Sub-plate weight (kg) (n: manifold station No.)	Formula for product weight
GFGG21	0.12	0.012	0.027+0.043×n	(Product weight (kg)) = 0.12 x (Actuator quantity) + 0.012 x (Masking quantity) + 0.027 + 0.043 x (Manifold station No.)
GFGG31	0.2	0.026	0.06+0.08×n	(Product weight (kg)) = 0.2 x (Actuator quantity) + 0.026 x (Masking quantity) + 0.06 + 0.080 x (Manifold station No.)
GFGG41	0.36	0.034	0.067+0.11×n	(Product weight (kg)) = 0.36 x (Actuator quantity) + 0.034 x (Masking quantity) + 0.067 + 0.11 x (Manifold station No.)
GFGG51	0.55	0.048	0.08+0.150×n	(Product weight (kg)) = 0.55 x (Actuator quantity) + 0.048 x (Masking quantity) + 0.08 + 0.15 x (Manifold station No.)

How to order

● Manifold

GFGG21-Z-5-12CN-3

● Manifold with masking plate

GFGG31-1-X-13TN-2-41

Working fluid (Dry air)

No. of ports (3-port valve)

Ⓐ Series size

Ⓑ Circuit configuration

Ⓒ Orifice size

Ⓓ Manifold station No. *1 *2

Ⓔ Body/sealant combination

Ⓕ Coil option *3 *4

Ⓖ Manual override

Ⓗ Voltage *5

Ⓘ No. of solenoid valves *6

Ⓙ Masking plate quantity

Code	Description	GFGG21	GFGG31	GFGG41	GFGG51
Ⓐ Series size					
2	22 mm	●			
3	28 mm		●		
4	34 mm			●	
5	40 mm				●
Ⓑ Circuit configuration					
1	Common supply/common exhaust	●	●	●	●
Ⓒ Orifice size					
Z	ø1	●			
0	ø1.5		●		
1	ø2	●	●	●	●
4	ø3		●	●	●
8	ø4			●	●
Ⓓ Manifold station No.					
2 to 10	2 stations to 10 stations	●	●	●	●
0	Actuator only	●	●	●	●
X	With masking plate	●	●	●	●
Ⓔ Body/sealant combination					
	Body / Seal				
1	PPS / NBR	●	●	●	●
Ⓕ Coil option					
For AC					
2CR	Std. Grommet lead wire with full-wave rectifier	●	●	●	●
3TR	Option T type term box, full-wave rectifier (G1/2)			●	●
3RR	Option T type terminal with lamp/ full-wave rectifier (G1/2)			●	●
For DC					
2C	Option Grommet lead wire	●	●	●	●
2CS	Option Grommet lead wire with surge suppressor	●	●	●	●
3T	Option With T type terminal box (G1/2)			●	●
3RS	Option T type terminal with lamp/ surge suppressor (G1/2)			●	●
Ⓖ Manual override					
Blank	Std. None	●	●	●	●
N	Option Manual non-locking	●	●	●	●
Ⓗ Voltage					
1	100 VAC 50/60 Hz	●	●	●	●
2	200 VAC 50/60 Hz	●	●	●	●
3	24 VDC	●	●	●	●
4	12 VDC	●	●	●	●
Specify the desired voltage if it is not listed above.					
Ⓘ No. of solenoid valves					
Blank	No masking plate	●	●	●	●
1 to 9	1 solenoid valve to 9 solenoid valves	●	●	●	●
Ⓙ Masking plate quantity					
Blank	No masking plate	●	●	●	●
1 to 9	1 masking plate to 9 masking plates	●	●	●	●

Select from the combinations indicated with ● in the table above.

[Example of model No.]

GFGG21-Z-5-12CN-3

Model : GFGG

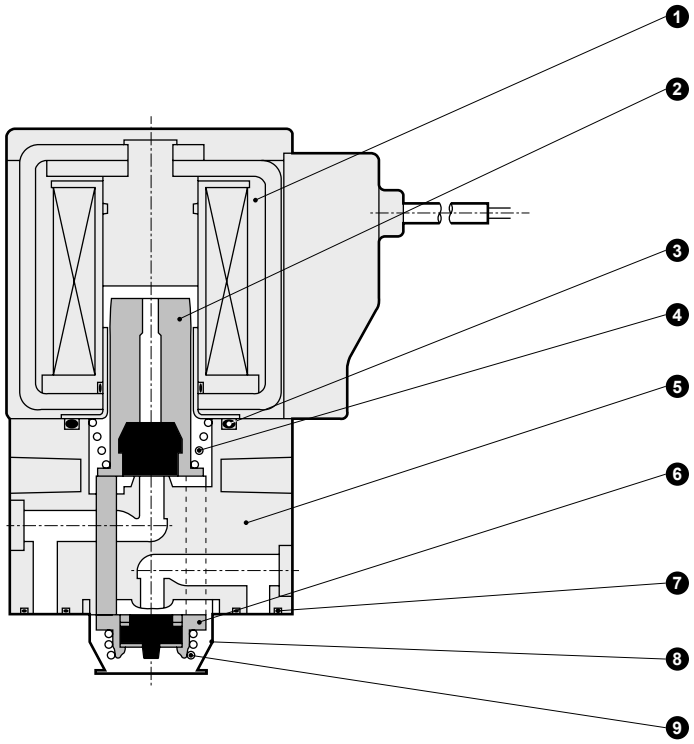
Ⓐ Series size : 22 mm
Ⓑ Circuit configuration : Common supply/common exhaust
Ⓒ Orifice size : ø1
Ⓓ Manifold station No. : 5 stations
Ⓔ Body/sealant combination : Body - PPS, sealant - NBR
Ⓕ Coil option : Grommet lead wire
Ⓖ Manual override : Manual non-locking
Ⓗ Voltage : 100 VAC 50/60 Hz
Ⓘ Ⓙ : No masking plate

⚠ Precautions for model No. selection

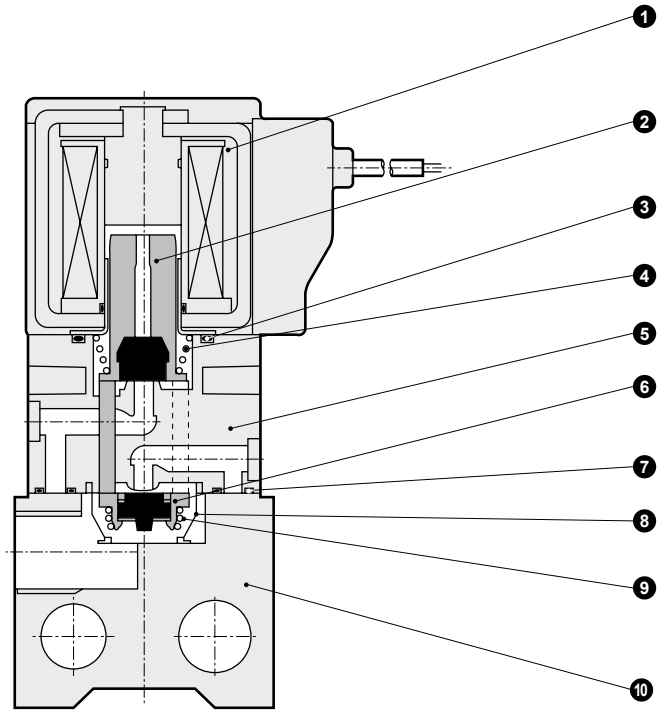
*1 : Select a desired manifold station No. from 2 to 10.
*2 : For the type with masking plate, designate Item Ⓓ as X, then designate the quantities Ⓘ of solenoid valves and Ⓙ masking plates.
*3 : Full-wave rectifier and surge suppressor are built into the coil for Item Ⓕ 2CR, 2CS and in the terminal box for 3TR, 3RR, 3RS.
*4 : Surge suppressor is included as standard in the models with full-wave rectifier.
*5 : Other voltages may not be available. Contact CKD for details.
*6 : Solenoid valves are arranged from the right side with the sub-plate (individual) port A facing front.
*7 : Orders for only the masking plate and sub-plate are also available. Contact CKD for details.

Internal structure and parts list

● GFGG actuator



● GFGG manifold

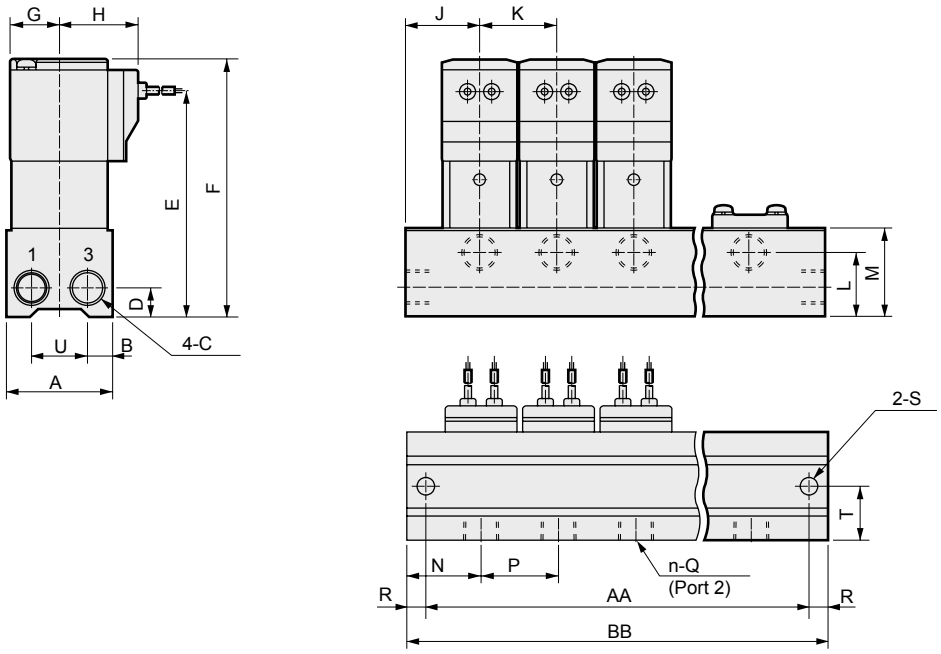


No.	Part name	Material		No.	Part name	Material	
1	Coil assembly	-	-	6	Valving element guide assembly	PPS, SUS, NBR	Polyphenylene sulfide, stainless steel, nitrile rubber
2	Plunger assembly	SUS, NBR	Stainless steel, nitrile rubber	7	Gasket	NBR	Nitrile rubber
3	O-ring	NBR	Nitrile rubber	8	Holder	SUS	Stainless steel
4	Spring	SUS	Stainless steel	9	Spring	SUS	Stainless steel
5	Body	PPS	Polyphenylene sulfide	10	Sub-plate	A6063	Aluminum

* 4 body mounting screws and 2 O-rings are attached to the actuator only.

Dimensions: Manifold

● Grommet lead wire with full-wave rectifier
GFGG*1-*-*-12CR

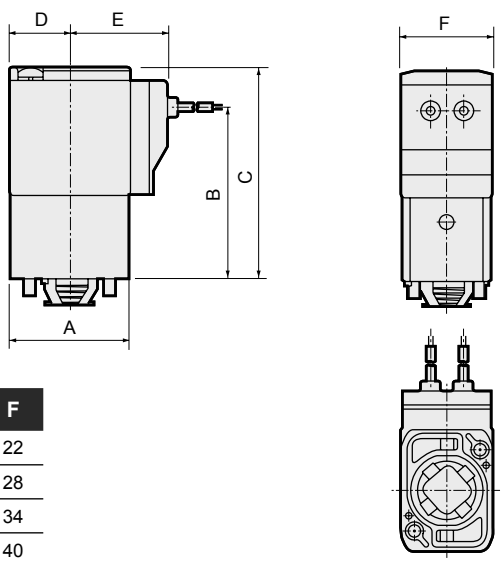


Model No.	Station No. / Code	2	3	4	5	6	7	8	9	10
GFGG2	AA	58	84	110	136	162	188	214	240	266
	BB	68	94	120	146	172	198	224	250	276
GFGG3	AA	74	106	138	170	202	234	266	298	330
	BB	88	120	152	184	216	248	280	312	344
GFGG4	AA	86	124	162	200	238	276	314	352	390
	BB	100	138	176	214	252	290	328	366	404
GFGG5	AA	100	146	192	238	284	330	376	422	468
	BB	114	160	206	252	298	344	390	436	482

Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U
GFGG2	30	6.5	Rc1/8	8	70	81	15.5	26.5	21	26	18	27	20	26	Rc1/8	5	ø4.5	15	17
GFGG3	40	9	Rc1/4	11	84	96	18.5	29.5	28	32	24	33	27.5	32	Rc1/4	7	ø6.5	20	22
GFGG4	43	9	Rc1/4	11	93.5	107.5	22.5	34	31	38	24	33	34.5	38	Rc1/4	7	ø6.5	21.5	25
GFGG5	50	10	Rc1/4	11	100	116	26	37.5	34	46	24	33	38.5	46	Rc1/4	7	ø6.5	25	30

Dimensions: Actuator

● Grommet lead wire with full-wave rectifier
GFGG*1-*-0-12CR



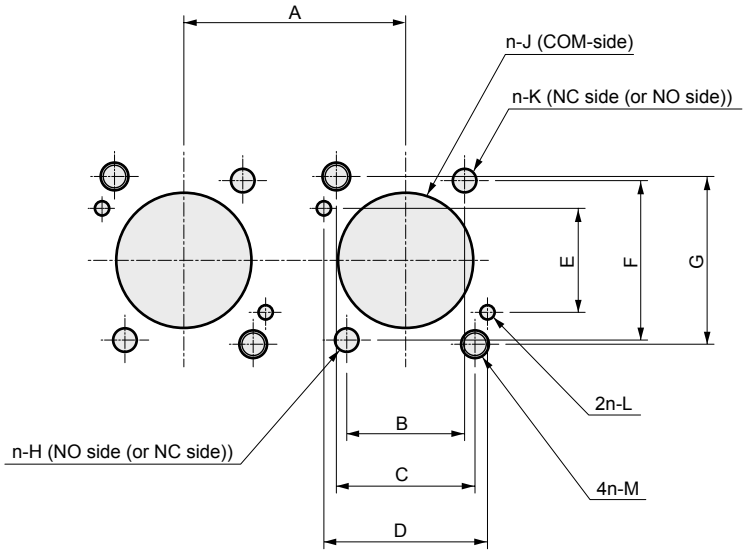
Model No.	A	B	C	D	E	F
GFGG2	30	43	54	15.5	26.5	22
GFGG3	36	51	63	18.5	29.5	28
GFGG4	43	60.5	74.5	22.5	34	34
GFGG5	50	67	83	26	37.5	40

Lead wire length 300 mm

Actuator installation dimensions

● GFGG2*/3*

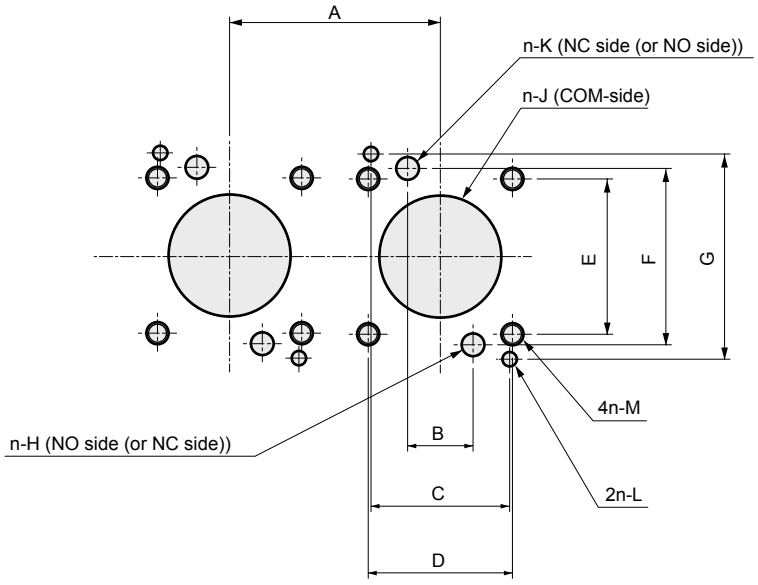
Machining drawing when using 2 actuators.



Model No.	A	B	C	D	E	F	G	H	J	K	L	M
GFGG2	26 or more	12±0.15	15.5±0.1	18.4±0.1	12.4±0.1	20±0.15	19.4±0.1	ø2.5 $^{+0.1}_{0}$	ø14.5 ±0.1 depth 6.7 $^{+0.2}_{0}$	ø2.5 $^{+0.1}_{0}$	ø1.6 $^{+0.1}_{0}$ depth 2.5±0.5	M3 effective depth 6
GFGG3	32 or more	17±0.15	20±0.1	23.6±0.1	15±0.1	24±0.15	24.2±0.1	ø3.4 $^{+0.1}_{0}$	ø19.5 ±0.1 depth 7.6 $^{+0.2}_{0}$	ø3.4 $^{+0.1}_{0}$	ø2.1 $^{+0.1}_{0}$ depth 2.5±0.5	M4 effective depth 6

● GFGG4*/5*

Machining drawing when using 2 actuators.

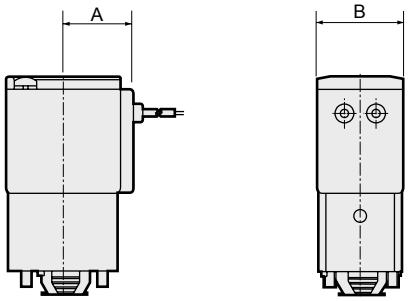


Model No.	A	B	C	D	E	F	G	H	J	K	L	M
GFGG4	38 or more	11.8±0.15	25±0.1	26±0.1	28±0.1	31.8±0.15	37±0.1	ø4.1 $^{+0.1}_{0}$	ø22 ±0.15 depth 11.2 $^{+0.2}_{0}$	ø4.1	ø2.6 $^{+0.1}_{0}$ depth 2.5±0.5	M4 effective depth 12
GFGG5	46 or more	11.8±0.15	30±0.1	30±0.1	33±0.1	31.8±0.15	43±0.1	ø4.1 $^{+0.1}_{0}$	ø22 ±0.15 depth 11.2 $^{+0.2}_{0}$	ø4.1	ø2.6 $^{+0.1}_{0}$ depth 2.5±0.5	M5 effective depth 8

Optional dimensions

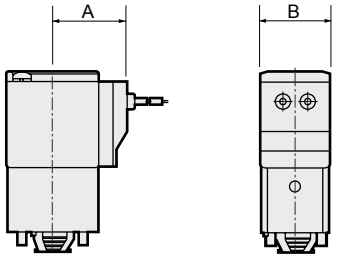
(Refer to the dimensions of grommet lead wire actuator with full-wave rectifier on page 91 for common dimensions.)

● Grommet lead wire
GFGG*1-*-*-1 2C



Model No.	A	B
GFGG2	19.5	22
GFGG3	22.5	28
GFGG4	26	34
GFGG5	29.5	40

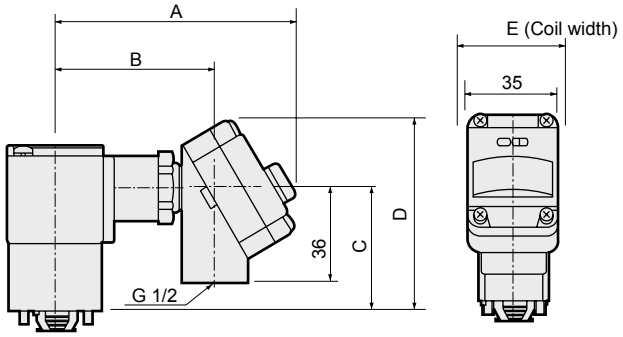
● Grommet lead wire with surge suppressor
GFGG*1-*-*-1 2CS



Model No.	A	B
GFGG2	26.5	22
GFGG3	29.5	28
GFGG4	34	34
GFGG5	37.5	40

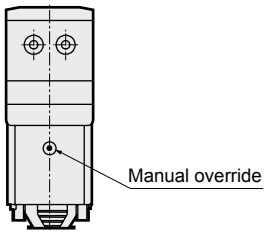
● T type terminal box (with lamp/surge suppressor) (G1/2)
GFGG*1-*-*-1 3T 3RS

● T type terminal box with full-wave rectifier (with lamp) (G1/2)
GFGG*1-*-*-1 3TR 3RR



Model No.	A	B	C	D	E
GFGG4	96	64.5	56	82	34
GFGG5	99.5	68	64	90	40

● Manual override (non-locking)
GFGG*1-*-*-** N



Position of manual override
: Opposite side to COM port