

Discontinue

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

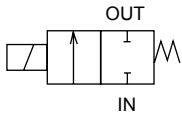


Refer to the Ending for details.



JIS symbol

- NC (open when energized)



Common specifications

| Item | FGB |
|---|---|
| Working fluid | Dry air, inert gas, low vacuum [1.33×10^2 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 $\text{cm}^3/\text{min}(\text{ANR})$ | 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 \approx 145.0 psi, 1 MPa = 10 bar

| Item | Port size | Orifice size (mm) | Flow characteristics | | Max. working pressure differential MPa | | Max. working pressure MPa | Rated voltage | Power consumption (W) | | Weight (kg) | |
|---------------------------------|-----------|-------------------|-----------------------------|------|--|------|---------------------------|-------------------------------------|-----------------------|------|-------------|------|
| | | | C[dm ³ /(s·bar)] | b | AC | DC | | | AC | DC | | |
| 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 | 4.6 | 4 | 0.13 |
| | -2 | | 2 | 0.55 | 0.59 | 0.6 | 0.6 | | | | | |
| FGB31- $\frac{6}{8}$ | -2 | Rc1/8 | 2 | 0.55 | 0.56 | 1.4 | 1.4 | 1.4 (≈ 200 psi, 14 bar) | 200 VAC 50/60 Hz | 6.2 | 6.5 | 0.22 |
| | -3 | Rc1/4 | 3 | 1.2 | 0.56 | 0.6 | 0.6 | | | | | |
| | -6 | | 5 | 3.1 | 0.50 | 0.15 | 0.15 | | | | | |
| FGB41- $\frac{8}{10}$ | -3 | Rc1/4 | 3 | 1.2 | 0.56 | 1.2 | 1.2 | 24 VDC 12 VDC | 8.7 | 8 | 0.39 | |
| | -5 | Rc3/8 | 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- $\frac{10}{15}$ | -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 $\pm 10\%$ of the rated voltage.

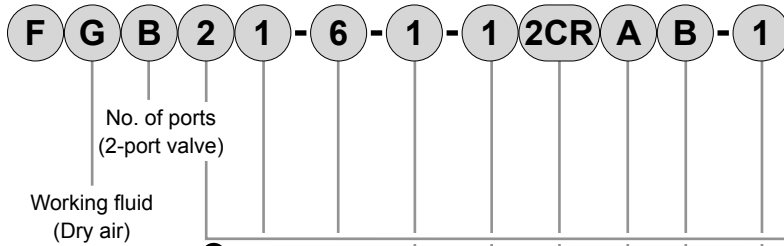
*2 : The leakage current must be less than or equal to the values shown below.

*3 : Effective cross-sectional area S and sonic conductance C are converted as $S \approx 5.0 \times C$.

*4 : When using at low vacuum, vacuum the OUT port side.

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

How to order



A Series size

B Actuation

C Port size

D Orifice size
*1

E Body/sealant combination

F Coil option
*2
*3

G Manual override

H Other options

I Voltage
*4

[Example of model No.]
FGB21-6-1-12CRAB-1

Model : FGB

- A** Series size : 22 mm
- B** Actuation : NC (open when energized)
- C** Port size : Rc1/8
- D** Orifice size : ϕ 1.5
- E** Body/sealant combination : Body - aluminum, sealant - NBR
- F** Coil option : Grommet lead wire with full-wave rectifier
- G** Manual override : Manual locking
- H** Other options : Mounting plate
- I** Voltage : 100 VAC 50/60 Hz

⚠ Precautions for model No. selection

- *1 : For FGB51 with orifice of ϕ 4 mm (Item **D** 5) and ϕ 5 mm (Item **D** 6), available port size is Rc3/8 (Item **C** 10) only.
- *2 : Full-wave rectifier and surge suppressor are built into the coil for Item **F** 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.

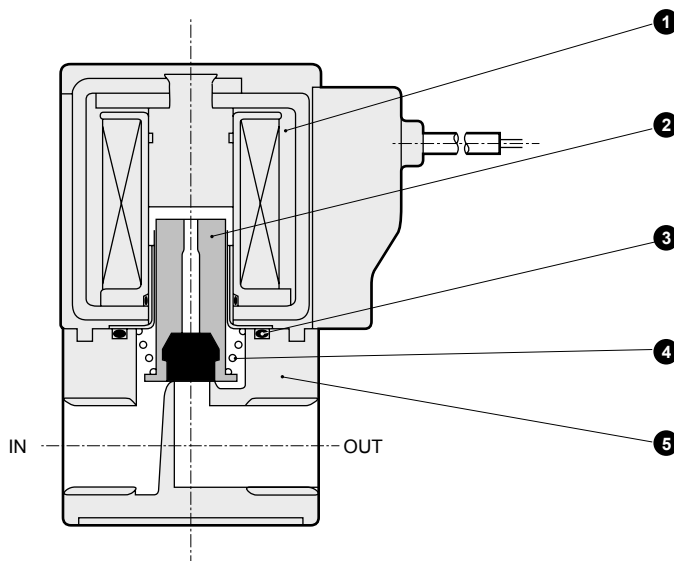
| | | Model No. | | | |
|--|--------------------------|--|-------|-------|-------|
| | | FGB21 | FGB31 | FGB41 | FGB51 |
| Code | Description | | | | |
| A Series size | | | | | |
| 2 | 22 mm | ● | | | |
| 3 | 28 mm | | ● | | |
| 4 | 34 mm | | | ● | |
| 5 | 40 mm | | | | ● |
| B Actuation | | | | | |
| 1 | NC (open when energized) | ● | ● | ● | ● |
| C Port size | | | | | |
| 6 | Rc1/8 | ● | ● | | |
| 8 | Rc1/4 | | ● | ● | |
| 10 | Rc3/8 | | | ● | ● |
| 15 | Rc1/2 | | | | ● |
| D Orifice size | | | | | |
| 1 | ϕ 1.5 | ● | | | |
| 2 | ϕ 2 | ● | ● | | |
| 3 | ϕ 3 | | ● | ● | |
| 5 | ϕ 4 | | | ● | ● |
| 6 | ϕ 5 | | ● | | ● |
| 7 | ϕ 7 | | | ● | ● |
| 8 | ϕ 10 | | | | ● |
| E Body/sealant combination | | | | | |
| | Body | Seal | | | |
| 1 | Aluminum | NBR | ● | ● | ● |
| F 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 | | T type terminal box with lamp/full-wave rectifier (G1/2) | | ● | ● |
| For DC | | | | | |
| 2C | Option | 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) | | ● | ● |
| G Manual override | | | | | |
| Blank | Std. | None | ● | ● | ● |
| A | Option | Manual locking | ● | ● | ● |
| N | | Manual non-locking | | ● | ● |
| H Other options | | | | | |
| Blank | Std. | None | ● | ● | ● |
| B | Option | Mounting plate | ● | ● | ● |
| I 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.

| |
|----------------|
| EXA |
| FWD |
| HNB/G |
| USB/G |
| FAB/G |
| FGB/G |
| FVB |
| FWB/G |
| FHB |
| FLB |
| AB |
| AG |
| AP/AD |
| APK/ADK |
| DryAir |
| EX-XPLNprf |
| XPLNprf |
| HVB/HVL |
| S ϕ B/NAB |
| LAD/NAD |
| Water-Rela |
| NP/NAP/NVP |
| SNP |
| CHB/G |
| MXB/G |
| Other valves |
| SWD/MWD |
| DustColl |
| CVE/CVSE |
| CCH/CPE/D |
| LifeSci |
| Gas-Combus |
| Auto-Water |
| Outdoor |
| SpecFld |
| Custom |
| Ending |

Internal structure and parts list

● FGB Series

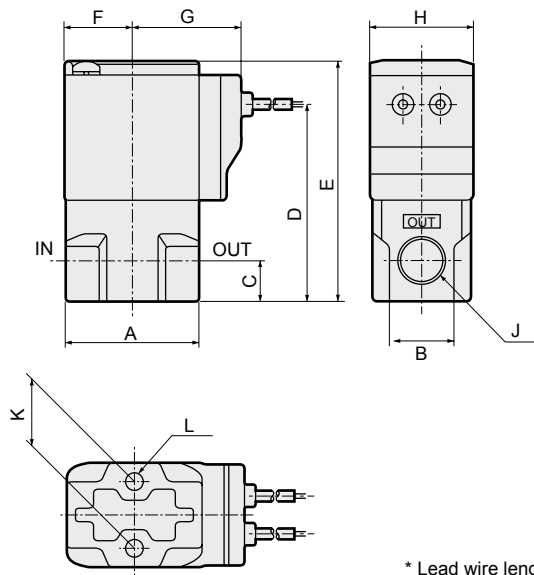


| No. | Part name | Material | |
|-----|------------------|----------|---------------------------------|
| 1 | Coil assembly | - | - |
| 2 | Plunger assembly | SUS, NBR | Stainless steel, nitrile rubber |
| 3 | O-ring | NBR | Nitrile rubber |
| 4 | Spring | SUS | Stainless steel |
| 5 | Body | ADC |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

Dimensions

● 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).

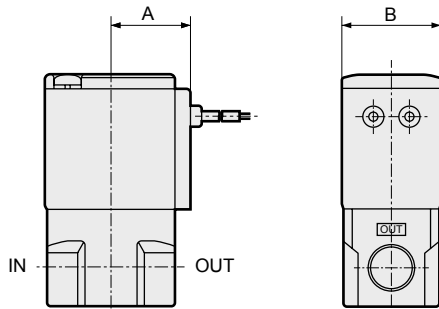
| Model No. | A | B | C | D | E | F | G | H | J | K | L |
|-----------|----|----|----|------|------|------|------|----|--------------|----|------------|
| FGB21 | 32 | 16 | 8 | 43 | 54 | 15.5 | 26.5 | 22 | Rc1/8 | 15 | M4 depth 6 |
| FGB31 | 36 | 18 | 11 | 53.5 | 65.5 | 18.5 | 29.5 | 28 | Rc1/8, Rc1/4 | 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



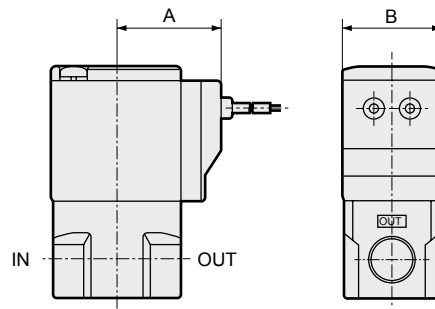
(Refer to the dimensions of grommet lead wire with full-wave rectifier on page 76 for common dimensions.)

- 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 |

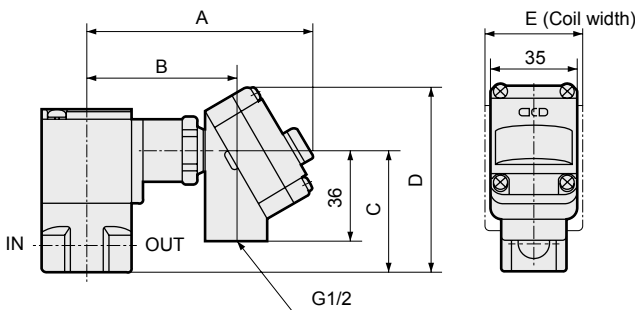
- Grommet lead wire with surge suppressor
FGB*1-*-*^{2CS}



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

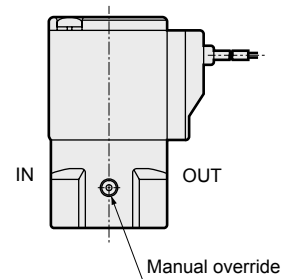
- T type terminal box (with lamp/surge suppressor) (G1/2)
FGB*1-*-*^{3T}
3RS

- 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 |

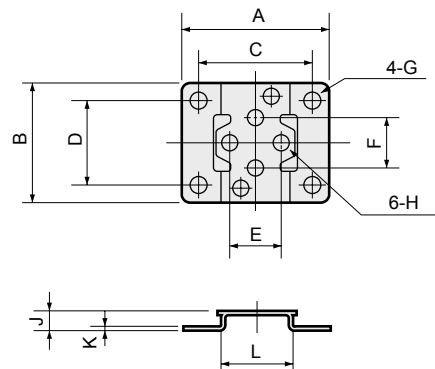
- Manual override locking/non-locking
FGB*1-*-*^A
N



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 |

- EXA
- FWD
- HNB/G
- USB/G
- FAB/G
- FGB/G**
- FVB
- FWB/G
- FHB
- FLB
- AB
- AG
- AP/AD
- APK/ADK
- DryAir
- EX-XPLNprf
- XPLNprf
- HVB/HVL
- S ϕ B/NAB
- LAD/NAD
- Water-Rela
- NP/NAP/NVP
- SNP
- CHB/G
- MXB/G
- Other valves
- SWD/MWD
- DustColl
- CVE/CVSE
- CCH/CPE/D
- LifeSci
- Gas-Combus
- Auto-Water
- Outdoor
- SpecFld
- Custom
- Ending

Discontinue

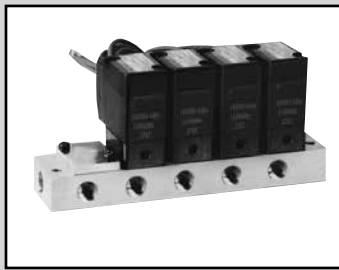
Direct acting 2-port solenoid valve for dry air, manifold
Special purpose

GFGB Series

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



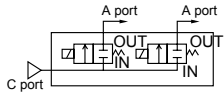
Refer to the Ending for details.



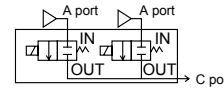
EXA
FWD
HNB/G
USB/G
FAB/G
FGB/G
FVB
FWB/G
FHB
FLB
AB
AG
AP/
AD
APK/
ADK
DryAir

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 [1.33×10^2 Pa (abs)] |
| Working pressure differential | 0 (≈ 0 psi, 0 bar) to 1.4 (≈ 200 psi, 14 bar) (refer to the max. working pressure differential in the individual specifications) |
| MPa | |
| 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 \approx 145.0 psi, 1 MPa = 10 bar

| Item | Port size | | Orifice size (mm) | Flow characteristics | | Max. working pressure differential MPa | | Max. working pressure MPa | Rated voltage | Power consumption (W) | | |
|---------------|-----------|---------------------|-------------------|----------------------|-----------------------------|--|------|---------------------------|--|-----------------------|------|------|
| | Model No. | A port (Individual) | | C port (Common) | C[dm ³ /(s·bar)] | b | AC | | | DC | AC | 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 | 4.6 | 4 |
| | -2 | | | 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) | 200 VAC 50/60 Hz | 6.2 | 6.5 |
| | -3 | | | 3 | 1.2 | 0.39 | 0.6 | 0.6 | | | | |
| | -6 | | | 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 | 1.4 (≈ 200 psi, 14 bar) | 24 VDC 12 VDC | 8.7 | 8 |
| | -5 | | | 4 | 2.1 | 0.34 | 0.5 | 0.5 | | | | |
| | -7 | | | 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 | 1.4 (≈ 200 psi, 14 bar) | 24 VDC 12 VDC | 10.7 | 11.5 |
| | -6 | | | 5 | 3.0 | 0.22 | 0.5 | 0.6 | | | | |
| | -7 | | | 7 | 4.4 | 0.18 | 0.2 | 0.25 | | | | |

*1 : The voltage fluctuation range must be within $\pm 10\%$ 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 $S \approx 5.0 \times C$.

*4 : When using at low vacuum, vacuum the OUT port side.

| Leakage current | Voltage | 100 VAC | 200 VAC | 24 VDC | 12 VDC |
|-----------------|-----------|--------------|--------------|--------------|--------------|
| GFGB | Model No. | 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 | $0.017+0.025 \times n$ | (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 | $0.038+0.056 \times n$ | (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 | $0.044+0.076 \times n$ | (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 | $0.053+0.11 \times n$ | (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

G F G B 3 1 - 2 - 7 - 1 2C N - 3

● Manifold with masking plate

G F G B 2 5 - 1 - X - 1 2CR N - 2 - 5 2

No. of ports
(2-port valve)
Working fluid
(Dry air)

A Series size

B Circuit configuration

C Orifice size

D Manifold station No.

*1
*2

E Body/sealant combination

F Coil option

*3
*4

G Manual override

H Voltage

*5

I No. of solenoid valves
*6

J Masking plate quantity

[Example of model No.]

GFGB31-2-7-12CN-3

Model : GFGB

- A** Series size : 28 mm
- B** Circuit configuration : NC (open when energized)/common supply
- C** Orifice size : $\phi 2$
- D** Manifold station No. : 7 stations
- E** Body/sealant combination : Body - PPS, sealant - NBR
- F** Coil option : Grommet lead wire
- G** Manual override : Manual non-locking
- H** Voltage : 24 VDC
- I** **J** : 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 **D** as X, then designate the quantities of **I** solenoid valves and **J** masking plates.
- *3 : Full-wave rectifier and surge suppressor are built into the coil for Item **F** 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.

Model No.

| GFGB21/25 | GFGB31/35 | GFGB41/45 | GFGB51/55 |
|-----------|-----------|-----------|-----------|
|-----------|-----------|-----------|-----------|

| Code | Description | GFGB21/25 | GFGB31/35 | GFGB41/45 | GFGB51/55 |
|----------------------|-------------|-----------|-----------|-----------|-----------|
| A Series size | | | | | |
| 2 | 22 mm | ● | | | |
| 3 | 28 mm | | ● | | |
| 4 | 34 mm | | | ● | |
| 5 | 40 mm | | | | ● |

| B Circuit configuration | | | | | |
|--------------------------------|--|---|---|---|---|
| 1 | NC (open when energized)/common supply | ● | ● | ● | ● |
| 5 | NC (open when energized)/individual supply | ● | ● | ● | ● |

| C Orifice size | | | | | |
|-----------------------|------------|---|---|---|---|
| 1 | $\phi 1.5$ | ● | | | |
| 2 | $\phi 2$ | ● | ● | | |
| 3 | $\phi 3$ | | ● | ● | |
| 5 | $\phi 4$ | | | ● | ● |
| 6 | $\phi 5$ | | ● | ● | ● |
| 7 | $\phi 7$ | | | ● | ● |

| D Manifold station No. | | | | | |
|-------------------------------|--------------------|---|---|---|---|
| 2 | 2 stations | | | | |
| to | to | | | | |
| 10 | 10 stations | ● | ● | ● | ● |
| 0 | Actuator only | ● | ● | ● | ● |
| X | With masking plate | ● | ● | ● | ● |

| E Body/sealant combination | | | | | |
|-----------------------------------|------|------|---|---|---|
| | Body | Seal | | | |
| 1 | PPS | NBR | ● | ● | ● |

| F 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 | Option | Grommet lead wire with surge suppressor | ● | ● | ● |
| 3T | Option | With T type terminal box (G1/2) | | | ● |
| 3RS | Option | T type terminal box with lamp surge suppressor (G1/2) | | | ● |

| G Manual override | | | | | |
|--------------------------|--------|--------------------|---|---|---|
| Blank | Std. | None | ● | ● | ● |
| N | Option | Manual non-locking | ● | ● | ● |

| H 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.

| I No. of solenoid valves | | | | | |
|---------------------------------|-------------------|--|---|---|---|
| Blank | No masking plate | | ● | ● | ● |
| 1 | 1 solenoid valve | | | | |
| to | to | | ● | ● | ● |
| 9 | 9 solenoid valves | | | | |

| J Masking plate quantity | | | | | |
|---------------------------------|------------------|--|---|---|---|
| Blank | No masking plate | | ● | ● | ● |
| 1 | 1 masking plate | | | | |
| to | to | | ● | ● | ● |
| 9 | 9 masking plates | | | | |

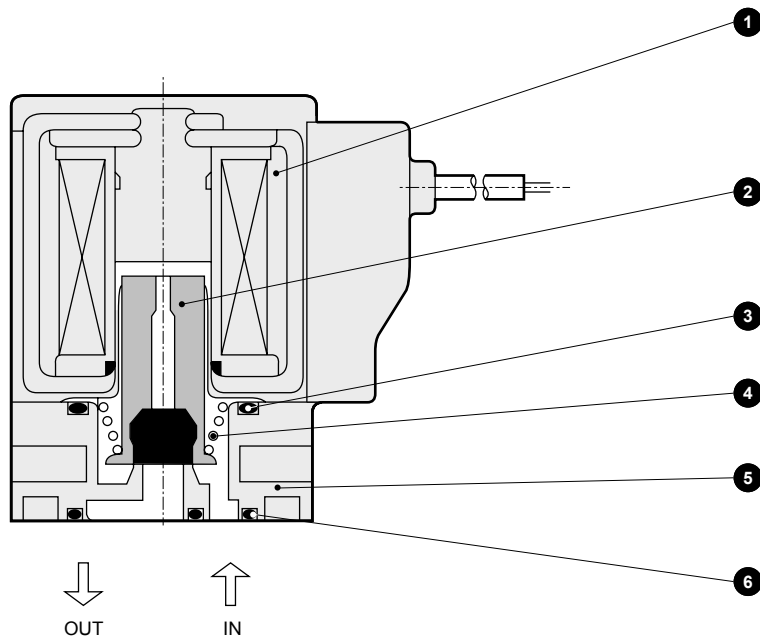
Select from the combinations indicated with ● in the table above.

EXA
FWD
HNB/G
USB/G
FAB/G
FGB/G
FVB
FWB/G
FHB
FLB
AB
AG
AP/
AD
APK/
ADK
DryAir
EX-
XPLNprf
XPLNprf
HVB/
HVL
S ♂ B/
NAB
LAD/
NAD
Water-
Rela
NP/NAP/
NVP
SNP
CHB/G
MXB/G
Other
valves
SWD/
MWD
DustColl
CVE/
CVSE
CCH/
CPE/D
LifeSci
Gas-
Combus
Auto-
Water
Outdoor
SpecFld
Custom
Ending

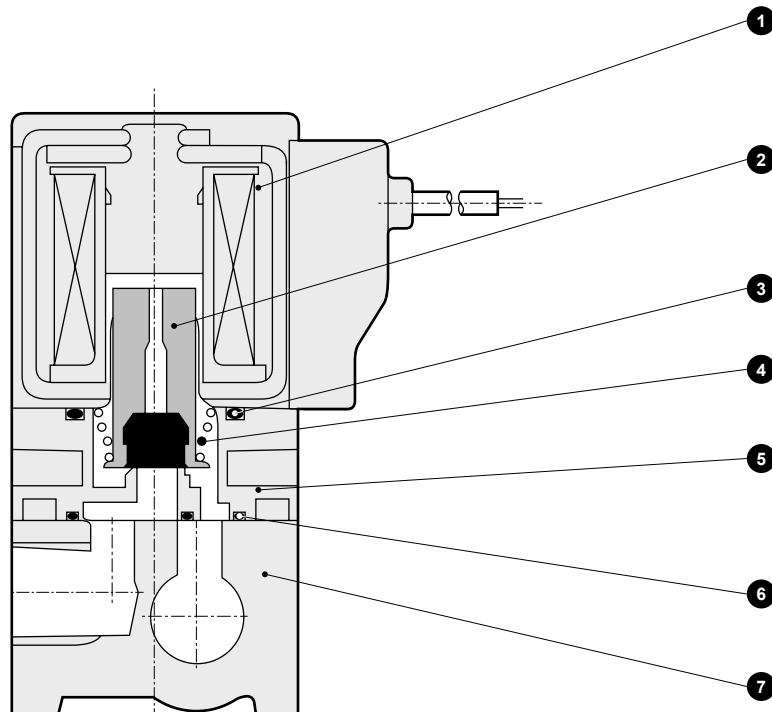
| |
|------------------------|
| EXA |
| FWD |
| HNB/G |
| USB/G |
| FAB/G |
| FGB/G |
| FVB |
| FWB/G |
| FHB |
| FLB |
| AB |
| AG |
| AP/ AD |
| APK/ ADK |
| DryAir |
| EX- XPLNprf |
| XPLNprf |
| HVB/ HVL |
| S \diamond B/ NAB |
| LAD/ NAD |
| Water- Rela |
| NP/NAP/ NVP |
| SNP |
| CHB/G |
| MXB/G |
| Other valves |
| SWD/ MWD |
| DustColl |
| CVE/ CVSE |
| CCH/ CPE/D |
| LifeSci |
| Gas- Combus |
| Auto- Water |
| Outdoor |
| SpecFld |
| Custom |
| Ending |

Internal structure and parts list

● GFGB actuator



● GFGB manifold



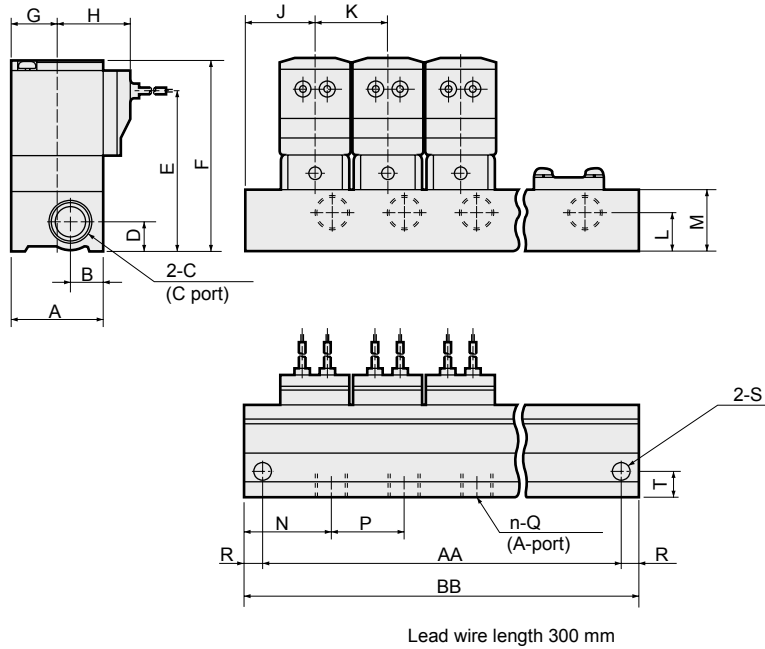
| No. | Part name | Material | No. | Part name | Material |
|-----|------------------|--|-----|-----------|---------------------------|
| 1 | Coil assembly | - | 5 | Body | PPS Polyphenylene sulfide |
| 2 | Plunger assembly | SUS, NBR Stainless steel, nitrile rubber | 6 | Gasket | NBR Nitrile rubber |
| 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

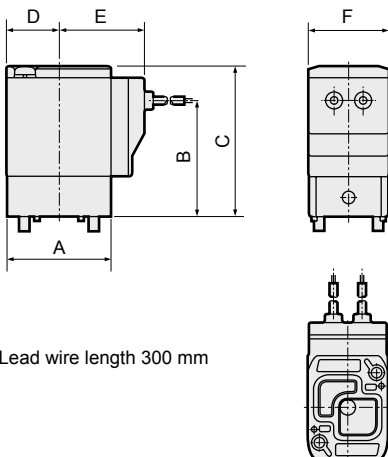


| Model No. | Station No. Code | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-----------|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| GFGB2 | AA | 58 | 84 | 110 | 136 | 162 | 188 | 214 | 240 | 266 |
| | BB | 68 | 94 | 120 | 146 | 172 | 198 | 224 | 250 | 276 |
| GFGB3 | AA | 74 | 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



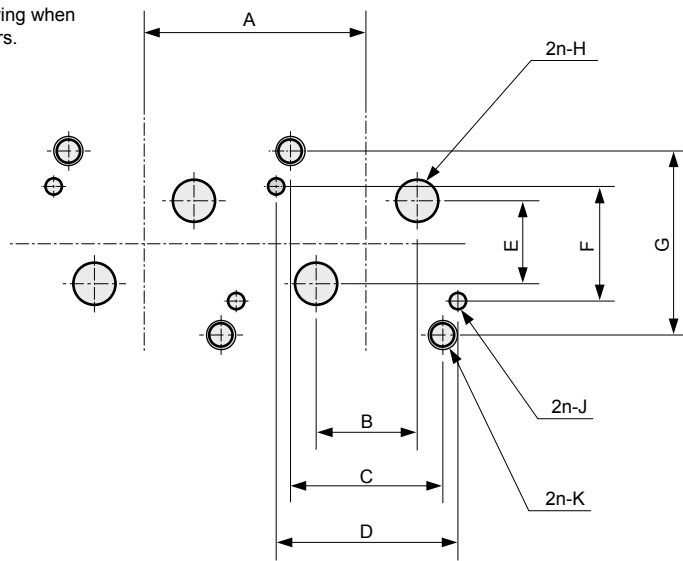
| Model No. | A | B | C | D | E | F |
|-----------|----|----|----|------|------|----|
| GFGB2 | 30 | 33 | 44 | 15.5 | 26.5 | 22 |
| GFGB3 | 36 | 40 | 52 | 18.5 | 29.5 | 28 |
| GFGB4 | 43 | 47 | 61 | 22.5 | 34 | 34 |
| GFGB5 | 50 | 55 | 71 | 26 | 37.5 | 40 |

| |
|--------------|
| EXA |
| FWD |
| HNB/G |
| USB/G |
| FAB/G |
| FGB/G |
| FVB |
| FWB/G |
| FHB |
| FLB |
| AB |
| AG |
| AP/AD |
| APK/ADK |
| DryAir |
| EX-XPLNprf |
| XPLNprf |
| HVB/HVL |
| SϕB/NAB |
| LAD/NAD |
| Water-Rela |
| NP/NAP/NVP |
| SNP |
| CHB/G |
| MXB/G |
| Other valves |
| SWD/MWD |
| DustColl |
| CVE/CVSE |
| CCH/CPE/D |
| LifeSci |
| Gas-Combus |
| Auto-Water |
| Outdoor |
| SpecFld |
| Custom |
| Ending |

Actuator installation dimensions

● GFGB2*/3*

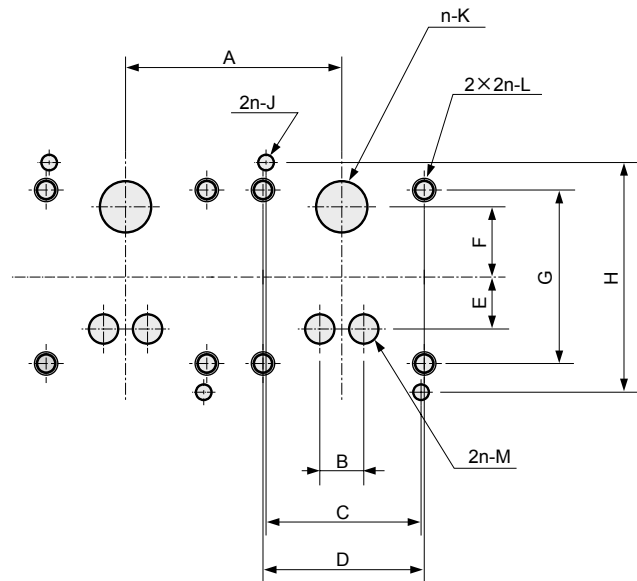
Machining drawing when using 2 actuators.



| 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 |

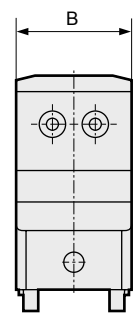
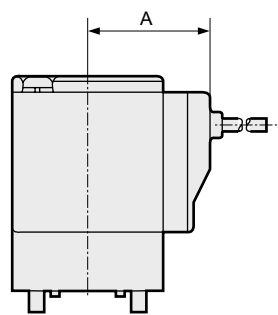
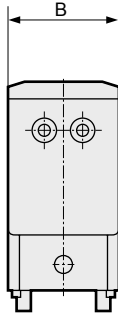
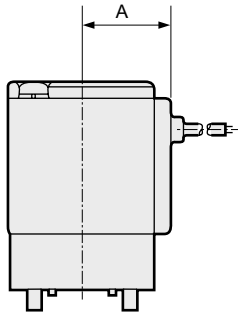
Optional dimensions



(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**

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



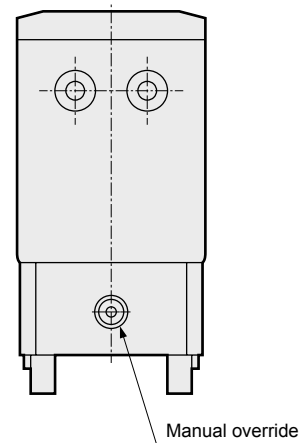
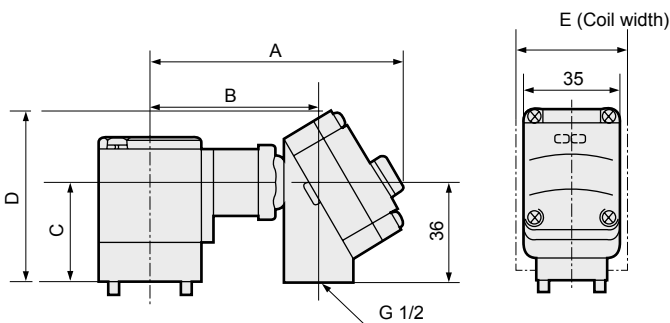
| Model No. | A | B |
|-----------|------|----|
| GFGB2 | 19.5 | 22 |
| GFGB3 | 22.5 | 28 |
| GFGB4 | 26 | 34 |
| GFGB5 | 29.5 | 40 |

| 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

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

- 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 |

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

| |
|----------------|
| EXA |
| FWD |
| HNB/G |
| USB/G |
| FAB/G |
| GFGB/G |
| FVB |
| FWB/G |
| FHB |
| FLB |
| AB |
| AG |
| AP/AD |
| APK/ADK |
| DryAir |
| EX-XPLNprf |
| XPLNprf |
| HVB/HVL |
| S ϕ B/NAB |
| LAD/NAD |
| Water-Rela |
| NP/NAP/NVP |
| SNP |
| CHB/G |
| MXB/G |
| Other valves |
| SWD/MWD |
| DustColl |
| CVE/CVSE |
| CCH/CPE/D |
| LifeSci |
| Gas-Combus |
| Auto-Water |
| Outdoor |
| SpecFld |
| Custom |
| Ending |

Discontinue

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



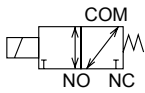
Refer to the Ending for details.



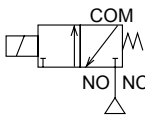
EXA
FWD
HNB/G
USB/G
FAB/G
FGB/G
FVB
FWB/G
FHB
FLB
AB
AG
AP/
AD
APK/
ADK
DryAir
EX-
XPLNprf
XPLNprf
HVB/
HVL
S ◇ B/
NAB
LAD/
NAD
Water-
Rela
NP/NAP/
NVP
SNP
CHB/G
MXB/G
Other
valves
SWD/
MWD
DustColl
CVE/
CVSE
CCH/
CPE/D
LifeSci
Gas-
Combus
Auto-
Water
Outdoor
SpecFld
Custom
Ending

JIS symbol

- Universal



- NC pressurization



Common specifications

| Item | FGG |
|---|---|
| Working fluid | Dry air, inert gas, low vacuum [1.33×10^2 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

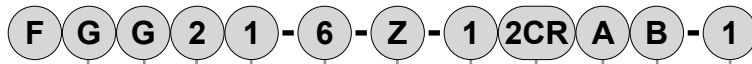
1 MPa \approx 145.0 psi, 1 MPa = 10 bar

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

- *1 : The voltage fluctuation range must be within $\pm 10\%$ 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 $S \approx 5.0 \times C$.
 *5 : When using NC pressurization at low vacuum, vacuum the NO port side.

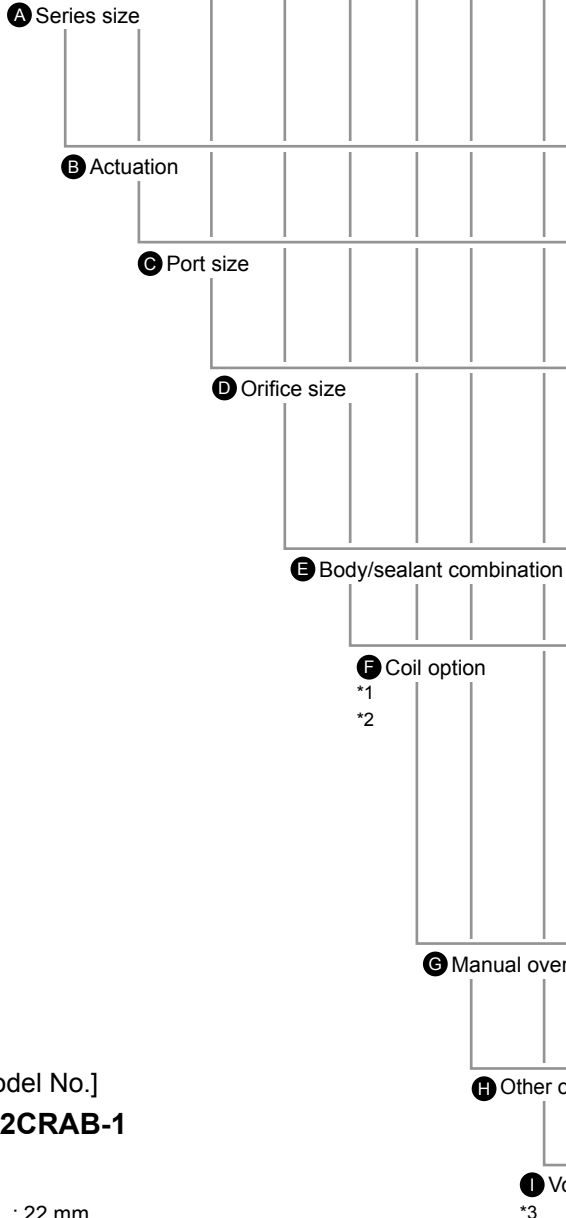
| Leakage current | Voltage | 100 VAC | 200 VAC | 24 VDC | 12 VDC |
|--------------------|-----------|--------------|--------------|--------------|--------------|
| | Model No. | | | | |
| | FGG** | 2 mA or less | 1 mA or less | 1 mA or less | 2 mA or less |

How to order



No. of ports
(3-port valve)

Working fluid
(Dry air)



[Example of model No.]

FGG21-6-Z-12CRAB-1

Model: FGG

- A** Series size : 22 mm
- B** Actuation : Universal
- C** Port size : Rc1/8
- D** Orifice size : $\phi 1$
- E** Body/sealant combination : Body - aluminum, sealant - NBR
- F** Coil option : Grommet lead wire with full-wave rectifier
- G** Manual override : Manual locking
- H** Other options : Mounting plate
- I** 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 **F** 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.

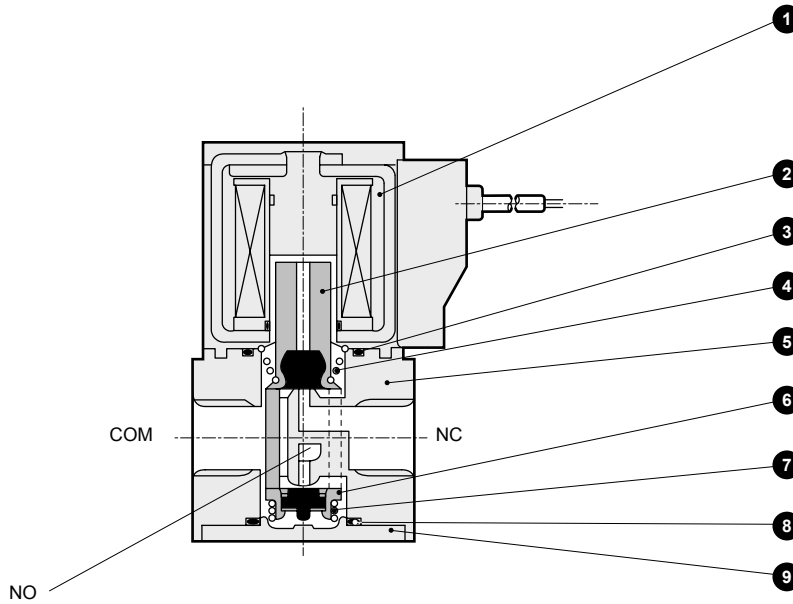
| Code | Description | Model No. | | | |
|--|-------------------|--|----------|----------|-------|
| | | FGG21 | FGG31/33 | FGG41/43 | FGG51 |
| A Series size | | | | | |
| 2 | 22 mm | ● | | | |
| 3 | 28 mm | | ● | | |
| 4 | 34 mm | | | ● | |
| 5 | 40 mm | | | | ● |
| B Actuation | | | | | |
| 1 | Universal | ● | ● | ● | ● |
| 3 | NC pressurization | | ● | ● | |
| C Port size | | | | | |
| 6 | Rc1/8 | ● | ● | | |
| 8 | Rc1/4 | | ● | ● | ● |
| 10 | Rc3/8 | | | ● | ● |
| D Orifice size | | | | | |
| Z | $\phi 1$ | ● | | | |
| 0 | $\phi 1.5$ | | ● | | |
| 1 | $\phi 2$ | ● | ● | ● | ● |
| 4 | $\phi 3$ | | ● | ● | ● |
| 8 | $\phi 4$ | | | ● | ● |
| E Body/sealant combination | | | | | |
| | Body | Seal | | | |
| 1 | Aluminum | NBR | ● | ● | ● |
| F 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) | | ● | ● |
| G Manual override | | | | | |
| Blank | Std. | None | ● | ● | ● |
| A | Option | Manual locking | ● | ● | ● |
| N | Option | Manual non-locking | | ● | ● |
| H Other options | | | | | |
| Blank | Std. | None | ● | ● | ● |
| B | Option | Mounting plate | ● | ● | ● |
| I 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.

| |
|----------------|
| EXA |
| FWD |
| HNB/G |
| USB/G |
| FAB/G |
| FGB/G |
| FVB |
| FWB/G |
| FHB |
| FLB |
| AB |
| AG |
| AP/AD |
| APK/ADK |
| DryAir |
| EX-XPLNprf |
| XPLNprf |
| HVB/HVL |
| S ϕ B/NAB |
| LAD/NAD |
| Water-Rela |
| NP/NAP/NVP |
| SNP |
| CHB/G |
| MXB/G |
| Other valves |
| SWD/MWD |
| DustColl |
| CVE/CVSE |
| CCH/CPE/D |
| LifeSci |
| Gas-Combus |
| Auto-Water |
| Outdoor |
| SpecFld |
| Custom |
| Ending |

EXA Internal structure and parts list

FWD ● FGG*1/*3 Series

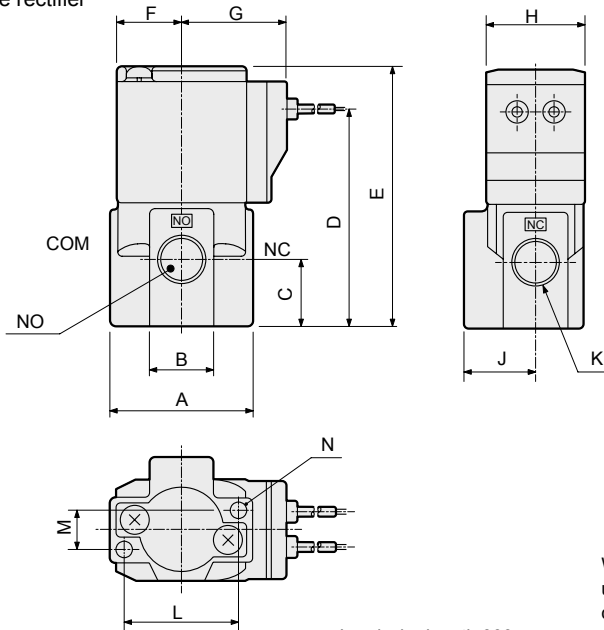


| No. | Part name | Material | No. | Part name | Material |
|-----|------------------|--|-----|--------------------------------|--|
| 1 | Coil assembly | - | 6 | Valving element guide assembly | PPS, SUS, NBR Polyphenylene sulfide, stainless steel, nitrile rubber |
| 2 | Plunger assembly | SUS, NBR Stainless 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



● 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).

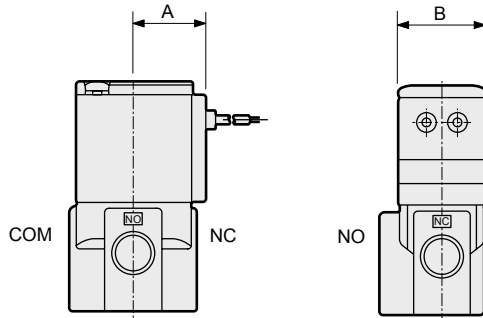
| Model No. | A | B | C | D | E | F | G | H | J | K | L | M | N |
|-----------|----|----|------|------|------|------|------|----|----|-------------|----|----|------------|
| FGG2 | 32 | 16 | 16.5 | 51 | 62 | 15.5 | 26.5 | 22 | 16 | Rc1/8 | 25 | 8 | M4 depth 6 |
| FGG3 | 40 | 18 | 18.5 | 60.5 | 72.5 | 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



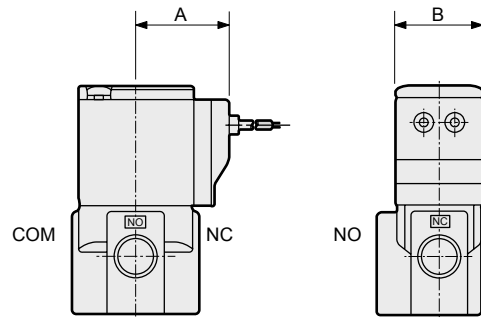
(Refer to the dimensions of grommet lead wire with full-wave rectifier on page 86 for common dimensions.)

- 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 |

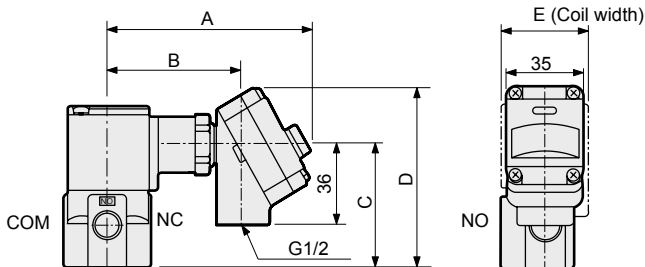
- Grommet lead wire with surge suppressor
FGG**-**-1 [2CS]



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

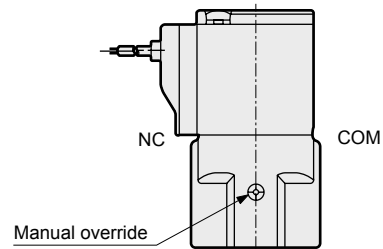
- T type terminal box (with lamp/surge suppressor) (G1/2)
FGG**-**-1 [3T
3RS]

- 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 |

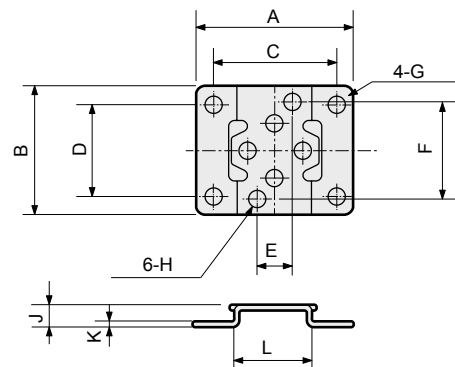
- Manual override (locking/non-locking)
FGG**-**-1* [A
N]



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 |

- EXA
- FWD
- HNB/G
- USB/G
- FAB/G
- FGG/G
- FVB
- FWB/G
- FHB
- FLB
- AB
- AG
- AP/
AD
- APK/
ADK
- DryAir
- EX-
XPLNprf
- XPLNprf
- HVB/
HVL
- S ⚡ B/
NAB
- LAD/
NAD
- Water-
Rela
- NP/NAP/
NVP
- SNP
- CHB/G
- MXB/G
- Other valves
- SWD/
MWD
- DustColl
- CVE/
CVSE
- CCH/
CPE/D
- LifeSci
- Gas-
Combus
- Auto-
Water
- Outdoor
- SpecFld
- Custom
- Ending

Discontinue

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

GFGG Series

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



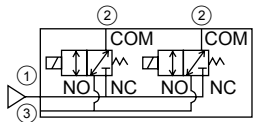
Refer to the Ending for details.



- EXA
- FWD
- HNB/G
- USB/G
- FAB/G
- FGB/G
- FVB
- FWB/G
- FHB
- FLB
- AB
- AG
- AP/AD
- APK/ADK
- DryAir
- EX-XPLNprf
- XPLNprf
- HVB/HVL
- S ⚡ B/NAB
- LAD/NAD
- Water-Rela
- NP/NAP/NVP
- SNP
- CHB/G
- MXB/G
- Other valves
- SWD/MWD
- DustColl
- CVE/CVSE
- CCH/CPE/D
- LifeSci
- Gas-Combus
- Auto-Water
- Outdoor
- SpecFld
- Custom
- Ending

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 | Port size | | Orifice size (mm) | Flow characteristics | | Max. working pressure differential MPa | Max. working pressure MPa | Rated voltage | Power consumption (W) | | | |
|------------------|-----------|---------------------|-------------------|----------------------|-----------------------------|--|---------------------------|---------------------------|-----------------------|-----------|-----|------|
| | Model No. | 2-port (Individual) | | 1, 3-port (Common) | C[dm ³ /(s·bar)] | | | | b | AC | 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 | 4.6 | 4 | |
| | -1 | | | 2 | 0.42 | 0.19 | | | | 0.15 | | |
| GFGG31 | -0 | Rc1/4 | Rc1/4 | 1.5 | 0.28 | 0.46 | 0.7 | 200 VAC 50/60 Hz | 6.2 | 6.5 | | |
| | -1 | | | 2 | 0.49 | 0.36 | | | | | 0.4 | |
| | -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) | 24 VDC 12 VDC | 8.7 | 8 | |
| | -4 | | | 3 | 1.1 | 0.20 | | | | | | 0.3 |
| | -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 | | | |
| | -4 | | | 3 | 1.1 | 0.20 | | | | 0.6(0.3) | | |
| | -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

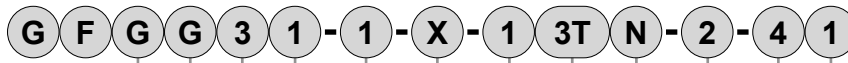
| Model No. | Actuator weight (kg) | Masking weight (kg) | Sub-plate weight (kg) (n: manifold station No.) | Formula for product weight |
|-----------|----------------------|---------------------|---|--|
| GFGG21 | 0.12 | 0.012 | 0.027+0.043×n | (Product weight (kg)) = 0.12 x (Actuator quantity) + 0.012 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



● Manifold with masking plate



No. of ports
(3-port valve)

Working fluid
(Dry air)

A Series size

B Circuit configuration

C Orifice size

D Manifold station No.

*1

*2

E Body/sealant combination

F Coil option

*3

*4

G Manual override

H Voltage

*5

I No. of solenoid valves

*6

J Masking plate quantity

[Example of model No.]

GFGG21-Z-5-12CN-3

Model : GFGG

- A** Series size : 22 mm
- B** Circuit configuration : Common supply/common exhaust
- C** Orifice size : $\phi 1$
- D** Manifold station No. : 5 stations
- E** Body/sealant combination : Body - PPS, sealant - NBR
- F** Coil option : Grommet lead wire
- G** Manual override : Manual non-locking
- H** Voltage : 100 VAC 50/60 Hz
- I** **J** : 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 **D** as X, then designate the quantities **I** of solenoid valves and **J** masking plates.
- *3 : Full-wave rectifier and surge suppressor are built into the coil for Item **F** 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.

| | | Model No. | | | |
|--|---------------------------------------|--|--------|--------|--------|
| | | GFGG21 | GFGG31 | GFGG41 | GFGG51 |
| Code | Description | | | | |
| A Series size | | | | | |
| 2 | 22 mm | ● | | | |
| 3 | 28 mm | | ● | | |
| 4 | 34 mm | | | ● | |
| 5 | 40 mm | | | | ● |
| B Circuit configuration | | | | | |
| 1 | Common supply/common exhaust | ● | ● | ● | ● |
| C Orifice size | | | | | |
| Z | $\phi 1$ | ● | | | |
| 0 | $\phi 1.5$ | | ● | | |
| 1 | $\phi 2$ | ● | ● | ● | ● |
| 4 | $\phi 3$ | | ● | ● | ● |
| 8 | $\phi 4$ | | | ● | ● |
| D Manifold station No. | | | | | |
| 2 to 10 | 2 stations to 10 stations | ● | ● | ● | ● |
| 0 | Actuator only | ● | ● | ● | ● |
| X | With masking plate | ● | ● | ● | ● |
| E Body/sealant combination | | | | | |
| | Body | Seal | | | |
| 1 | PPS | NBR | ● | ● | ● |
| F 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) | | | ● |
| G Manual override | | | | | |
| Blank | Std. | None | ● | ● | ● |
| N | Option | Manual non-locking | ● | ● | ● |
| H 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. | | | | | |
| I No. of solenoid valves | | | | | |
| Blank | No masking plate | ● | ● | ● | ● |
| 1 to 9 | 1 solenoid valve to 9 solenoid valves | ● | ● | ● | ● |
| J Masking plate quantity | | | | | |
| Blank | No masking plate | ● | ● | ● | ● |
| 1 to 9 | 1 masking plate to 9 masking plates | ● | ● | ● | ● |

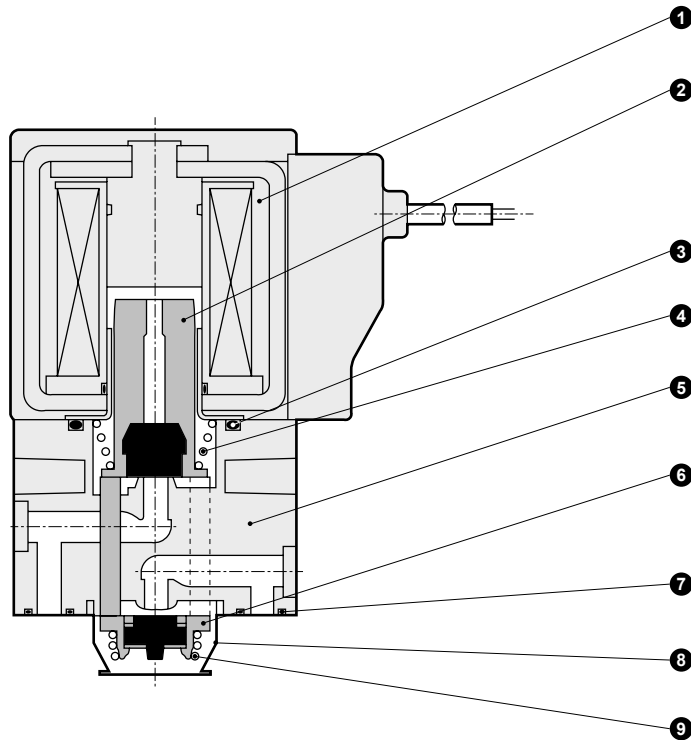
Select from the combinations indicated with ● in the table above.

- EXA
- FWD
- HNB/G
- USB/G
- FAB/G
- FGB/G
- FVB
- FWB/G
- FHB
- FLB
- AB
- AG
- AP/AD
- APK/ADK
- DryAir
- EX-XPLNprf
- XPLNprf
- HVB/HVL
- S ϕ B/NAB
- LAD/NAD
- Water-Rela
- NP/NAP/NVP
- SNP
- CHB/G
- MXB/G
- Other valves
- SWD/MWD
- DustColl
- CVE/CVSE
- CCH/CPE/D
- LifeSci
- Gas-Combus
- Auto-Water
- Outdoor
- SpecFld
- Custom
- Ending

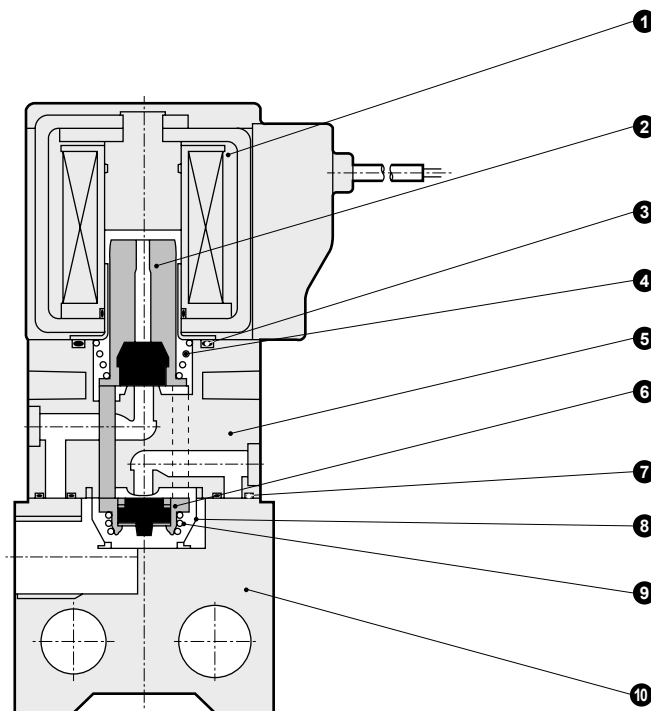
Internal structure and parts list

- EXA
- FWD
- HNB/G
- USB/G
- FAB/G
- FGB/G**
- FVB
- FWB/G
- FHB
- FLB
- AB
- AG
- AP/
AD
- APK/
ADK
- DryAir
- EX-
XPLNprf
- XPLNprf
- HVB/
HVL
- S \diamond B/
NAB
- LAD/
NAD
- Water-
Rela
- NP/NAP/
NVP
- SNP
- CHB/G
- MXB/G
- Other
valves
- SWD/
MWD
- DustColl
- CVE/
CVSE
- CCH/
CPE/D
- LifeSci
- Gas-
Combus
- Auto-
Water
- Outdoor
- SpecFld
- Custom
- Ending

● GFGG actuator



● GFGG manifold



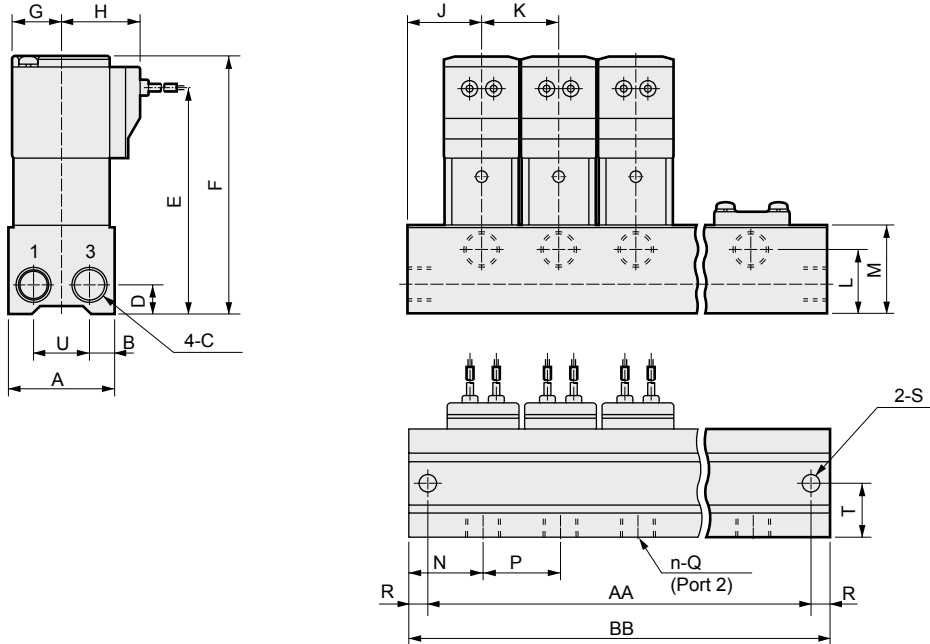
| No. | Part name | Material | No. | Part name | Material |
|-----|------------------|---|-----|--------------------------------|---|
| 1 | Coil assembly | - | 6 | Valving element guide assembly | PPS, SUS, NBR Polyphenylene sulfide, stainless steel, nitrile rubber |
| 2 | Plunger assembly | SUS, NBR 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



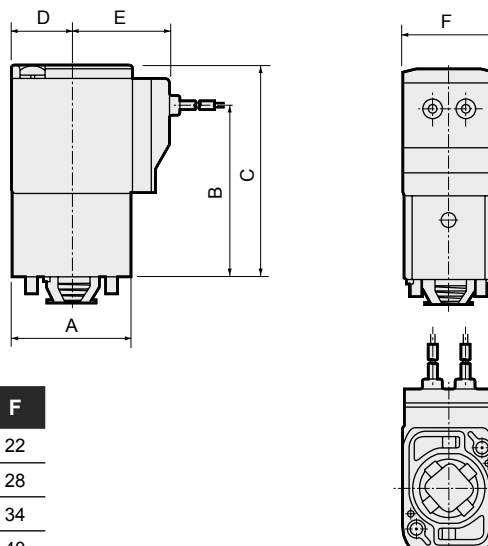
| Model No. | Station Code No. | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-----------|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | AA | 58 | 84 | 110 | 136 | 162 | 188 | 214 | 240 |
| GFGG2 | BB | 68 | 94 | 120 | 146 | 172 | 198 | 224 | 250 | 276 |
| GFGG3 | AA | 74 | 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 |

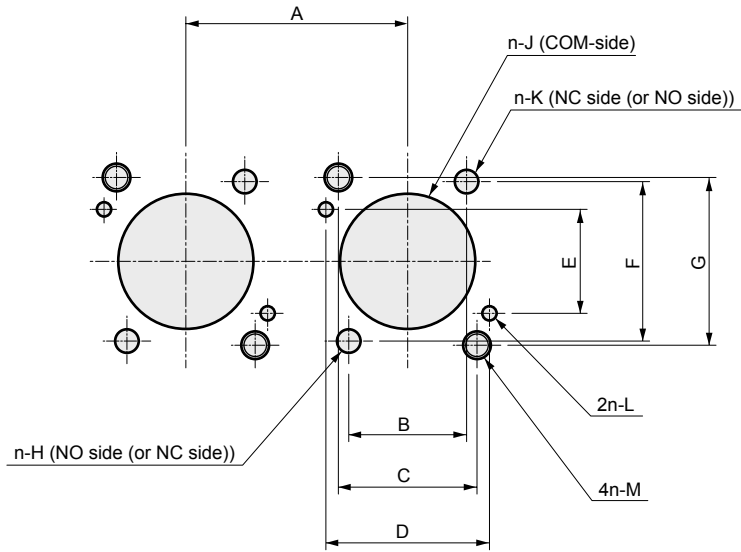
Lead wire length 300 mm

| |
|----------------|
| EXA |
| FWD |
| HNB/G |
| USB/G |
| FAB/G |
| FGB/G |
| FVB |
| FWB/G |
| FHB |
| FLB |
| AB |
| AG |
| AP/AD |
| APK/ADK |
| DryAir |
| EX-XPLNprf |
| XPLNprf |
| HVB/HVL |
| S ϕ B/NAB |
| LAD/NAD |
| Water-Rela |
| NP/NAP/NVP |
| SNP |
| CHB/G |
| MXB/G |
| Other valves |
| SWD/MWD |
| DustColl |
| CVE/CVSE |
| CCH/CPE/D |
| LifeSci |
| Gas-Combust |
| Auto-Water |
| Outdoor |
| SpecFld |
| Custom |
| Ending |

Actuator installation dimensions

● GFGG2*/3*

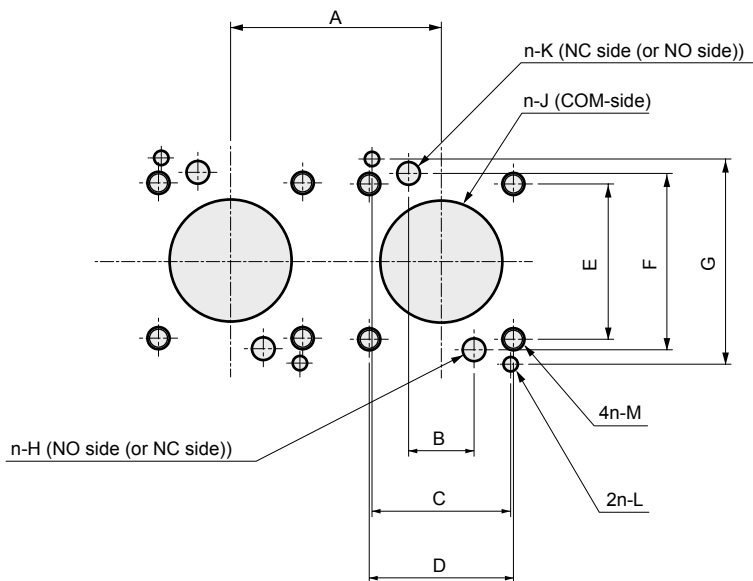
Machining drawing when using 2 actuators.



| 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.

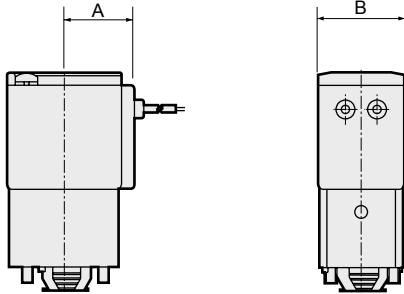


| Model No. | A | B | C | D | E | F | G | H | J | K | L | M |
|-----------|------------|-----------|--------|--------|--------|-----------|--------|-----------------------------------|---|------|---|-----------------------|
| GFGG4 | 38 or more | 11.8±0.15 | 25±0.1 | 26±0.1 | 28±0.1 | 31.8±0.15 | 37±0.1 | 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

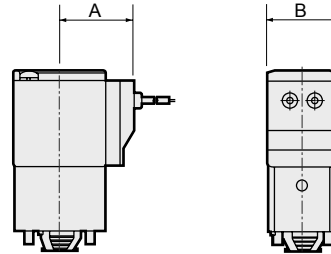
(Refer to the dimensions of grommet lead wire actuator with full-wave rectifier on page 91 for common dimensions.)

- Grommet lead wire
GFGG*1-**-1 2C



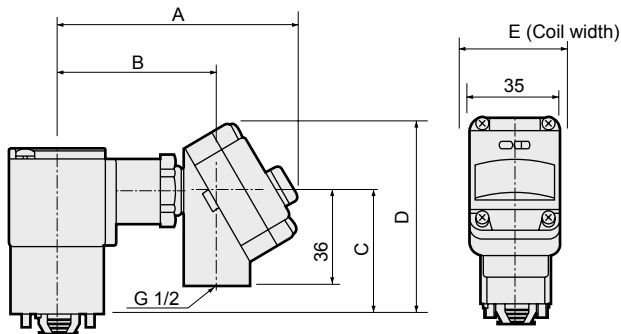
| Model No. | A | B |
|-----------|------|----|
| GFGG2 | 19.5 | 22 |
| GFGG3 | 22.5 | 28 |
| GFGG4 | 26 | 34 |
| GFGG5 | 29.5 | 40 |

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



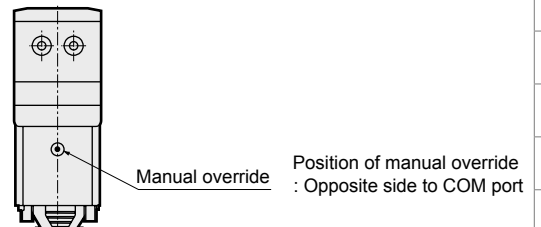
| Model No. | A | B |
|-----------|------|----|
| GFGG2 | 26.5 | 22 |
| GFGG3 | 29.5 | 28 |
| GFGG4 | 34 | 34 |
| GFGG5 | 37.5 | 40 |

- 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



| |
|----------------|
| EXA |
| FWD |
| HNB/G |
| USB/G |
| FAB/G |
| FGB/G |
| FVB |
| FWB/G |
| FHB |
| FLB |
| AB |
| AG |
| AP/ AD |
| APK/ ADK |
| DryAir |
| EX- XPLNprf |
| XPLNprf |
| HVB/ HVL |
| S ⚡ B/ NAB |
| LAD/ NAD |
| Water- Rela |
| NP/NAP/ NVP |
| SNP |
| CHB/G |
| MXB/G |
| Other valves |
| SWD/ MWD |
| DustColl |
| CVE/ CVSE |
| CCH/ CPE/D |
| LifeSci |
| Gas- Combus |
| Auto- Water |
| Outdoor |
| SpecFld |
| Custom |
| Ending |