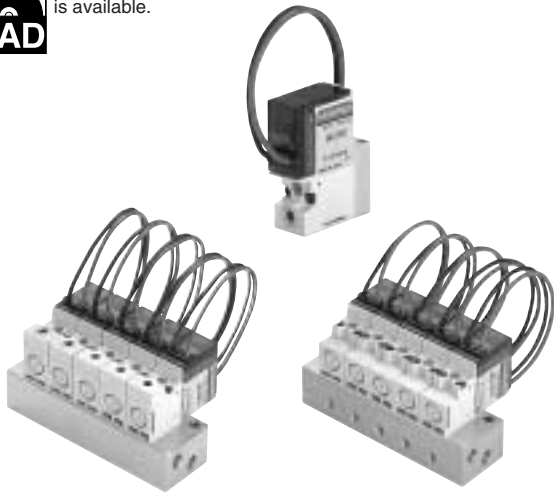




CAD drawing data catalog
is available.



KOGANEI

VALVES GENERAL CATALOG

SOLENOID VALVES G010 SERIES

SOLENOID VALVES G010 SERIES INDEX

| | |
|---------------------------------------|----|
| Features | 35 |
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| Manifold Order Codes | 46 |
| Operating Principles and Symbols | 47 |
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| Dimensions of Manifold | 51 |



Caution

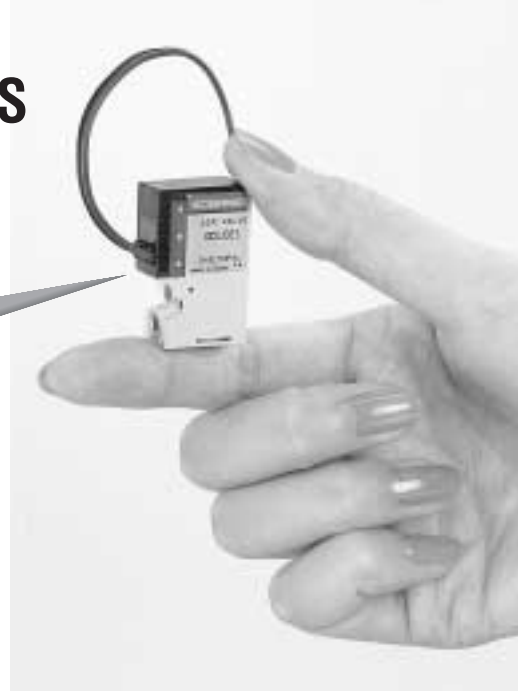
Before use, be sure to read the "Safety Precautions" on p. 31.

Powerful & Widely Varied

SOLENOID VALVES G010 SERIES

In response to diversified control requirements, our new line-up includes positive pressure normally open (NO) specifications, and vacuum specifications!

Now you can select the best possible control system for your production line machinery and equipment.



Total Height:
32~34mm
[1.26~1.34in.]

More compact than ever, in response to down-sizing requirements.

Note: Excluding the AC200V specification.

Wide voltage selection

STANDARD TYPE

Power consumption: 1.0W
Effective area: 0.2mm²
[Cv: 0.011]

Achieves power consumption of 0.5W

LOW CURRENT TYPE

Power consumption: 0.5W
Effective area: 0.1mm²
[Cv: 0.006]

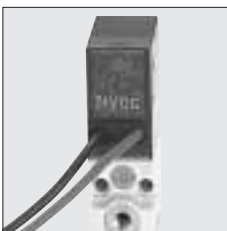
Meets large flow & quick response requirements

LARGE FLOW TYPE

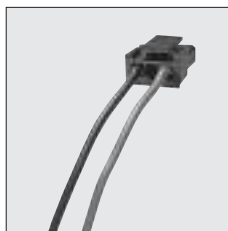
Power consumption: 3.2W^{Note}
Effective area: 0.45mm²
[Cv: 0.025]

Note: With power-saving circuit

| | | | | |
|----------------------------------|----------------------|------------|-------------|-------------|
| Positive pressure specifications | Normally closed (NC) | G010E1 | G010LE1 | G010HE1 |
| | Normally open (NO) | G010E1-11 | G010LE1-11 | G010HE1-11 |
| Vacuum specifications | Normally closed (NC) | GV010E1 | GV010LE1 | GV010HE1 |
| | Normally open (NO) | GV010E1-11 | GV010LE1-11 | GV010HE1-11 |







LED indicator is standard for the grommet type connector.

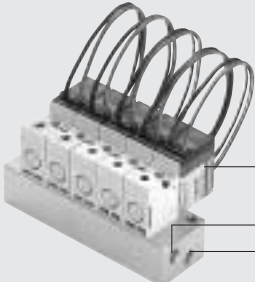
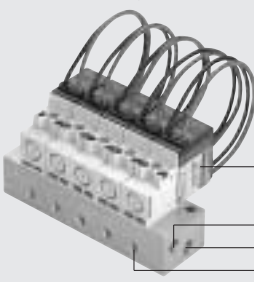
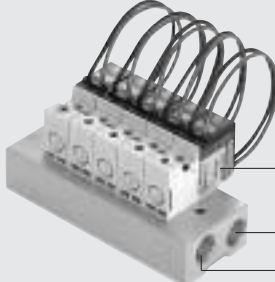
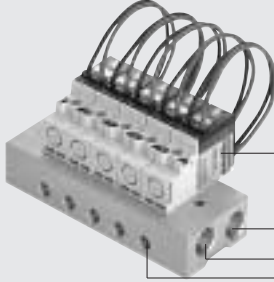


3-pin connector makes common wiring possible.



Locking type is standard for the manual override.

| Single unit | | | | | |
|----------------------------------|---|---|---|---|------------------------|
| Direct acting solenoid valve | | | | | |
| Outward view | Normally closed (NC) | | Normally open (NO) | | |
| | Direct piping | Sub-base piping | Direct piping | Sub-base piping | |
| |  |  |  |  | |
| Type | | | | | |
| Positive pressure specifications | G010E1 (Standard) | G010E1-21 | GA010E1-25 | G010E1-11-21 | GA010E1-11-25 |
| | G010LE1 (Low current) | G010LE1-21 | GA010LE1-25 | G010LE1-11-21 | GA010LE1-11-25 |
| | G010HE1 (Large flow) | G010HE1-21 | GA010HE1-25 | G010HE1-11-21 | GA010HE1-11-25 |
| Vacuum specifications | GV010E1 (Standard) | GV010E1-21 | GAV010E1-25 | GV010E1-11-21 | GAV010E1-11-25 |
| | GV010LE1 (Low current) | GV010LE1-21 | GAV010LE1-25 | GV010LE1-11-21 | GAV010LE1-11-25 |
| | GV010HE1 (Large flow) | GV010HE1-21 | GAV010HE1-25 | GV010HE1-11-21 | GAV010HE1-11-25 |

| Manifold | |
|-----------------------------------|---|
| G(V)010E1, G(V)010LE1, G(V)010HE1 | |
| 1 (P), 3 (R) port (M5×0.8) type | <p>G010M□F—F type (1(P), 3(R)) manifold</p>  <p>G010E1, G010LE1, G010HE1 GV010E1, GV010LE1, GV010HE1</p> <p>3(R) 1(P)</p> |
| | <p>G010M□A—A type (all ports) manifold</p>  <p>GA010E1, GA010LE1, GA010HE1 GAV010E1, GAV010LE1, GAV010HE1</p> <p>3(R) 1(P) 2(A)</p> |
| 1 (P), 3 (R) port (Rc1/8) type | <p>G010MH□F—F type (1(P), 3(R)) manifold</p>  <p>G010E1, G010LE1, G010HE1 GV010E1, GV010LE1, GV010HE1</p> <p>1(P) 3(R)</p> |
| | <p>G010MH□A—A type (all ports) manifold</p>  <p>GA010E1, GA010LE1, GA010HE1 GAV010E1, GAV010LE1, GAV010HE1</p> <p>1(P) 3(R) 2(A)</p> |

Handling Instructions and Precautions



Piping Precautions

Use the piping shown below for the manifold, as well.

2-, 3-port valves valve functions and connection port configurations

Positive pressure specifications

| | | De-energized | Energized |
|--------|----------------------|--------------|-----------|
| 2-port | Normally closed (NC) | | |
| | Normally open (NO) | | |
| 3-port | Normally closed (NC) | | |
| | Normally open (NO) | | |

Vacuum specifications

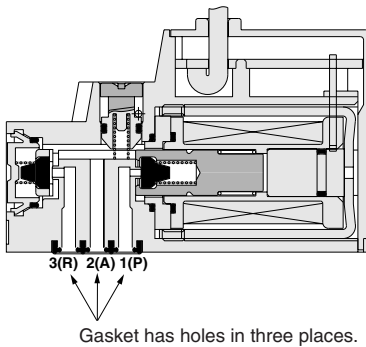
| | | De-energized | Energized |
|--------|----------------------|--------------|-----------|
| 2-port | Normally closed (NC) | | |
| | Normally open (NO) | | |
| 3-port | Normally closed (NC) | | |
| | Normally open (NO) | | |

Caution: Normally closed (NC) and normally open (NO) valves cannot be mounted together on the same manifold.

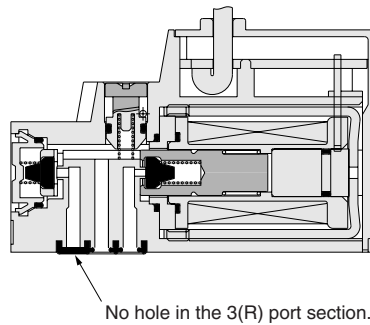
About the 2-, 3-port valves

The G010 series can be divided, by the types of gaskets used on the valves, into 3-port and 2-port valves. When replacing the valve, pay attention to the gasket shape and mounting direction.

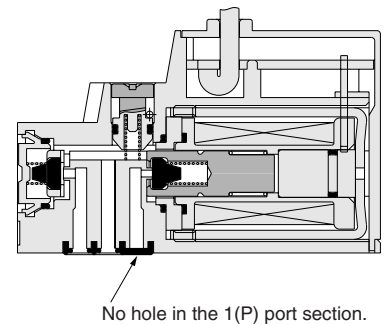
G□010□E1 (For 3-port)



G□010□E1-2 (For NC, 2-port)



G□010□E1-2-11 (For NO, 2-port)





Solenoid

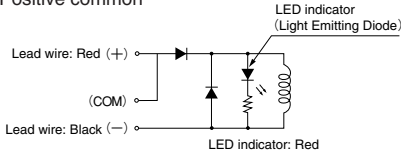
Internal circuit

< Standard type, low current type >

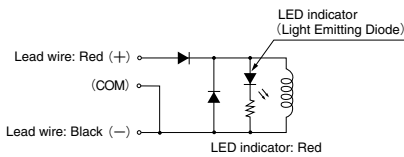
● DC5V, DC6V, DC12V, DC24V

Solenoid with LED indicator (Surge suppression)

● Positive common

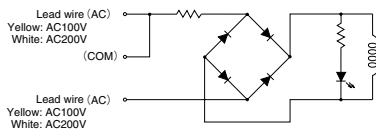


● Negative common (Made to order)



● AC100V, AC200V

Solenoid with LED indicator (Surge suppression)

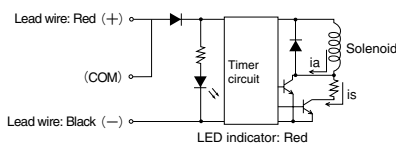


< Large flow type >

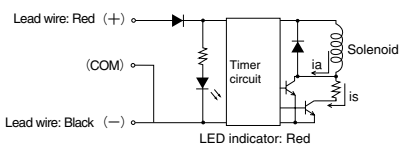
● DC12V, DC24V

Solenoid with LED indicator (Surge suppression)

● Positive common



● Negative common (Made to order)

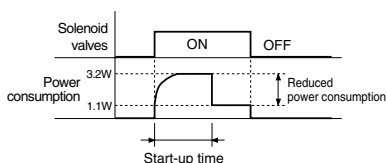


ia: Starting current
is: Steady-state current

Operating principles of large flow type

The large flow type uses a timer circuit, as shown above, that achieves power savings by switching to holding operations mode after a certain period of time to operate at about 1/3 of the starting power consumption.

● Power waveform



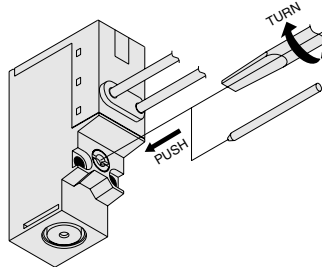
| | Start-up time (Standard time) |
|-------|-------------------------------|
| DC12V | 48ms |
| DC24V | 27ms |



Manual override

Locking type

To lock the manual override, use a small screwdriver to push down on the manual override all the way and turn it clockwise. When locked, turning the manual override in the counterclockwise direction releases a spring on the manual override, returns it to the original position, and releases the lock. When the manual override is not turned, this type acts just like the non-locking type, the valve is energized as long as the manual override is pushed down, and it returns to the rest position upon release.



- Cautions:**
1. Always release the lock of the locking type before commencing normal operation.
 2. Do not attempt to operate the manual override with a pin or other object having an extremely fine tip. It could damage the manual override button.

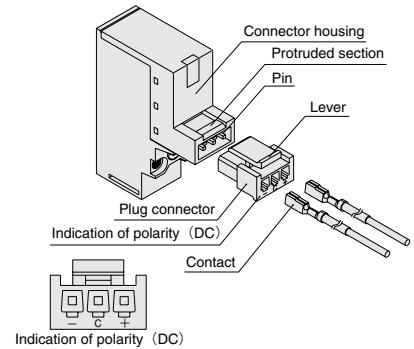
- Cautions:**
1. Do not apply megger between the lead wires.
 2. The DC solenoid will not short circuit even if the wrong polarity is applied, but the valve will not operate.
 3. Leakage current inside the circuit could result in failure of the solenoid valve to return, or in other erratic operation. Always use it within the range of the allowable leakage current. If circuit conditions, etc. cause the current leakage to exceed the maximum allowable leakage current, consult us.
 4. The large flow type will not operate if the supply voltage is increased slowly. Always apply the appropriate voltage.



Plug connector

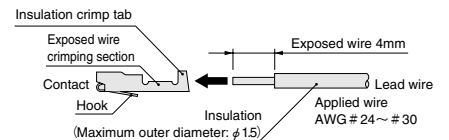
Attaching and removing plug connector

Use fingers to insert the connector into the pin, push it in until the lever claw latches onto the protruded section of the connector housing, and complete the connection. To remove the connector, squeeze the lever along with the connector, lift the lever claw up from the protruded section of the connector housing, and pull it out.



Crimping of connecting lead wire and contact

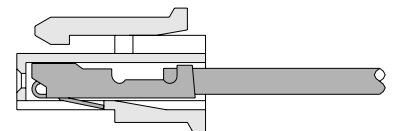
To crimp lead wires into contacts, strip off 4mm [0.16in.] of the insulation from the end of the lead wire, insert it into the contact, and crimp it. Be sure to avoid catching the insulation on the exposed wire crimping section.



Attaching and removing contact and connector

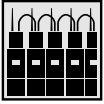
Insert the contact with lead wire into a plug connector hole until the contact hook latches on the connector and is secured to the plug connector. Confirm that the lead wire cannot be easily pulled out.

To remove it, insert a tool with a fine tip (such as a small screwdriver) into the rectangular hole on the side of the plug connector to push up on the hook, and then pull out the lead wire.



- Cautions:**
1. Do not pull hard on the lead wire. It could result in defective contacts, shorted lines, etc.
 2. If the pin is bent, use a small screwdriver, etc. to gently straighten out the pin, and then complete the connection to the plug connector.
 3. For crimping of connecting lead wire and contact, always use a dedicated crimping tool.
Contact: Model 706312-2MK
Manufactured by Sumiko Tech, Inc.
Crimping tool: Model F1
(for 706312-2MK)
Manufactured by Sumiko Tech, Inc.

Handling Instructions and Precautions

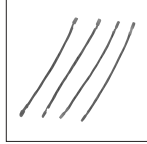


Lead wire for common wiring (only lead wire)

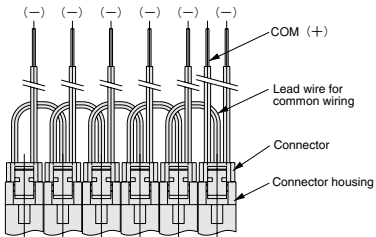
Using the lead wire for common wiring, provided as additional parts, saves wiring work.

Order code

G010-COM

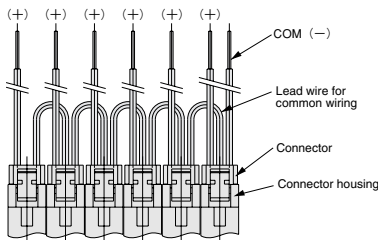


1. Wiring example of DC positive side and AC common terminal

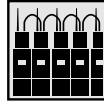


Shows polarity in DC case

2. Wiring example of DC negative side common terminal



- Cautions:**
1. The diagrams show the straight connector configuration.
 2. Since the COM terminal is connected to a crossover terminal inside the connector housing, the connector cannot be switched between a positive common and a negative common wiring by changing the connectors.



Common pre-wired lead wire assembly

Using the common pre-wired lead wire assembly, provided as additional parts, saves wiring work.

Order code

CR1652W —



Common specifications
Blank — Positive common
M — Negative common

Lead wire length
Blank — 300mm [11.8in.]
1 — 1000mm [39in.]
3 — 3000mm [118in.]

Outlet position of common wiring

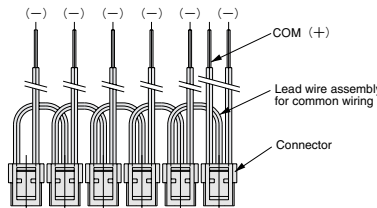
S — The type **PS** is **stn.1** side, the type **PL** is final **stn.** side.
E — The type **PS** is final **stn.** side, the type **PL** is **stn.1** side.

Number of wiring units

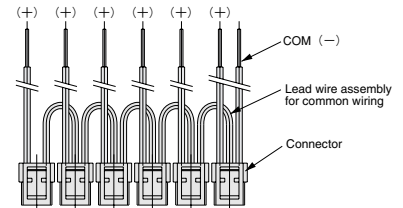
2 : 2 units
 }
20 : 20 units

Common pre-wired lead wire assembly

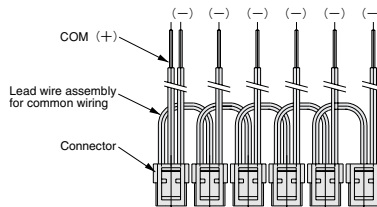
1. For CR1652W-6E□



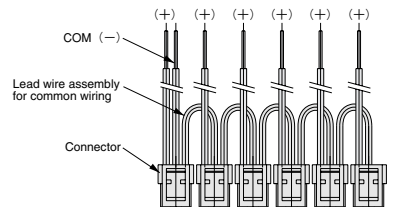
2. For CR1652W-6E□M



3. For CR1652W-6S□



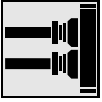
4. For CR1652W-6S□M



Caution: Since the COM terminal is connected to a crossover terminal inside the connector housing, the connector cannot be switched between a positive common and a negative common wiring by changing the connectors.

Number of valves which can be energized simultaneously with common wiring

| Voltage | Model | | |
|---------|-------|-----|-----|
| | G010 | | |
| | E1 | LE1 | HE1 |
| DC5,6V | 6 | 12 | — |
| DC12V | 12 | 20 | 4 |
| DC24V | 20 | 20 | 8 |
| AC100V | 20 | — | — |
| AC200V | 20 | — | — |



Fittings

Recommended fittings

G(V) 010 □ E1-21

| Fitting | | 2(A) port | 1(P), 3(R) port |
|---------------|-------------------|--|----------------------|
| Quick fitting | | TS4-M3M TS3-M3M TSH4-M3M TSH3-M3M TL4-M3M TL3-M3M | — |
| TAC fitting | For urethane tube | BF4BU-M3 BF3BU-M3 | BF4BU-M3 BF3BU-M3 |
| | For nylon tube | BF4-M3 | BF4-M3 |

GA(V) 010 □ E1-25

| Fitting | | 2(A) port | 1(P), 3(R) port |
|---------------|-------------------|--|--|
| Quick fitting | | TS4-M5M TSH4-M5M TL4-M5M TLL4-M5M | TS4-M5M TSH4-M5M TL4-M5M TLL4-M5M |
| TAC fitting | For urethane tube | BF4BU BF3BU | BF4BU BF3BU |
| | For nylon tube | BF4 | BF4 |

SOLENOID VALVES

G010 SERIES

Specifications

Basic Models and Functions

| Item | Basic model | For direct piping, F type manifold ^{Note1} | | | For A type manifold ^{Note2} | | |
|---------------------|-------------|--|--|---|---|--|---|
| | | G010E1(-11) GV010E1(-11) (standard) | G010LE1(-11) GV010LE1(-11) (low current) | G010HE1(-11) GV010HE1(-11) (large flow) | GA010E1(-11) GAV010E1(-11) (standard) | GA010LE1(-11) GAV010LE1(-11) (low current) | GA010HE1(-11) GAV010HE1(-11) (large flow) |
| Number of positions | | 2 positions | | | | | |
| Number of ports | | 2, 3 ports | | | | | |
| Valve function | | Normally closed (NC, standard) or normally open (NO, option) | | | | | |

Remark: For optional specifications and order code, see p. 45~46.

Notes: 1. When using the G010□E1, GV010□E1 as a single unit, select it with a mounting base.

2. When using the GA010□E1, GAV010□E1 as a single unit, select it with a sub-base.

Specifications (Positive Pressure)

| Item | Basic model | Direct piping, F type manifold | | | A type manifold | | |
|---|-------------|---|----------------------------|-------------------------|---|----------------------------|--------------------------|
| | | G010E1 (standard) | G010LE1 (low current) | G010HE1 (large flow) | GA010E1 (standard) | GA010LE1 (low current) | GA010HE1 (large flow) |
| Media | | Air | | | | | |
| Operation type | | Direct acting type | | | | | |
| Effective area [Cv] ^{Note 1} mm ² | 1 (P)→2 (A) | 0.2 [0.011] | 0.1 [0.006] | 0.45 [0.025] | 0.2 [0.011] | 0.1 [0.006] | 0.45 [0.025] |
| | 2 (A)→3 (R) | 0.3 [0.017] | 0.2 [0.011] | 0.6 [0.033] | 0.3 [0.017] | 0.2 [0.011] | 0.6 [0.033] |
| Port size ^{Note 2} | | M3×0.5 | | | M5×0.8 | | |
| Lubrication | | Not required | | | | | |
| Operating pressure range MPa {kgf/cm ² } [psi.] | | 0~0.7 {0~7.1} [0~102] | | | | | |
| Proof pressure MPa {kgf/cm ² } [psi.] | | 1.05 {10.7} [152] | | | | | |
| Response time ^{Note3} ON/OFF ms | | 4/8 | 5/10 | 3/6 | 4/8 | 5/10 | 3/6 |
| Maximum operating frequency Hz | | 5 | | | | | |
| Operating temp. range (atmosphere and media) °C [°F] ^{Note4} | | 5~50 [41~122] | | | | | |
| Shock resistance m/s ² [G] | | 1373.0 {140.0} (Axial direction 196.2 {20.0}) | | | | | |
| Rated voltage ^{Note 5} | | (DC5V,DC6V) DC12V,DC24V AC100V,(AC200V) | (DC5V,DC6V) DC12V,DC24V | (DC12V) DC24V | (DC5V,DC6V) DC12V,DC24V AC100V,(AC200V) | (DC5V,DC6V) DC12V,DC24V | (DC12V) DC24V |
| Mounting direction | | Any | | | | | |

| Item | Basic model | Direct piping, F type manifold | | | A type manifold | | |
|---|-------------|---|-----------------------------|----------------------------|---|------------------------------|-----------------------------|
| | | G010E1-11 (standard) | G010LE1-11 (low current) | G010HE1-11 (large flow) | GA010E1-11 (standard) | GA010LE1-11 (low current) | GA010HE1-11 (large flow) |
| Media | | Air | | | | | |
| Operation type | | Direct acting type | | | | | |
| Effective area [Cv] ^{Note 1} mm ² | 2 (A)→1 (P) | 0.3 [0.017] | 0.15 [0.008] | 0.55 [0.031] | 0.3 [0.017] | 0.15 [0.008] | 0.55 [0.031] |
| | 3 (R)→2 (A) | 0.2 [0.011] | 0.1 [0.006] | 0.45 [0.025] | 0.2 [0.011] | 0.1 [0.006] | 0.45 [0.025] |
| Port size ^{Note 2} | | M3×0.5 | | | M5×0.8 | | |
| Lubrication | | Not required | | | | | |
| Operating pressure range MPa {kgf/cm ² } [psi.] | | 0~0.7 {0~7.1} [0~102] | | 0~0.5 {0~5.1} [0~73] | 0~0.7 {0~7.1} [0~102] | | 0~0.5 {0~5.1} [0~73] |
| Proof pressure MPa {kgf/cm ² } [psi.] | | 1.05 {10.7} [152] | | | | | |
| Response time ^{Note 3} ON/OFF ms | | 4/8 | 5/10 | 3/6 | 4/8 | 5/10 | 3/6 |
| Maximum operating frequency Hz | | 5 | | | | | |
| Operating temp. range (atmosphere and media) °C [°F] ^{Note4} | | 5~50 [41~122] | | | | | |
| Shock resistance m/s ² [G] | | 1373.0 {140.0} (Axial direction 196.2 {20.0}) | | | | | |
| Rated voltage ^{Note 5} | | (DC5V,DC6V) DC12V,DC24V AC100V,(AC200V) | (DC5V,DC6V) DC12V,DC24V | (DC12V) DC24V | (DC5V,DC6V) DC12V,DC24V AC100V,(AC200V) | (DC5V,DC6V) DC12V,DC24V | (DC12V) DC24V |
| Mounting direction | | Any | | | | | |
| Air supply port | | 3(R) port | | | | | |

Notes: 1. For details, see the effective area on p.43.

2. For details, see the port size on p.43.

3. Values when air pressure is 0.5MPa {5.1kgf/cm²} [73psi.]. Due to switching phase timing, add a maximum of 5ms to the AC response time.

4. Provide heat radiation measures to ensure that the ambient temperature (or when used in a control box, the internal temperature of the box) always remains within the temperature range specifications.

And for long-time continuous energizing, consult us.

5. Values in parentheses () are for made to order items. See the corresponding table of solenoid options/voltage on p.50.

Specifications (Vacuum)

| Item | Basic model | Direct piping, F type manifold | | | A type manifold | | |
|---|---|---|---------------------------|---|----------------------------|----------------------------|---------------------------|
| | | GV010E1 (standard) | GV010LE1 (low current) | GV010HE1 (large flow) | GAV010E1 (standard) | GAV010LE1 (low current) | GAV010HE1 (large flow) |
| Media | | Air | | | | | |
| Operation type | | Direct acting type | | | | | |
| Effective area $[C_v]$ mm ² | 1 (P) → 2 (A) | 0.3 [0.017] | 0.15 [0.008] | 0.55 [0.031] | 0.3 [0.017] | 0.15 [0.008] | 0.55 [0.031] |
| | 2 (A) → 3 (R) | 0.2 [0.011] | 0.1 [0.006] | 0.45 [0.025] | 0.2 [0.011] | 0.1 [0.006] | 0.45 [0.025] |
| Port size ^{Note 2} | | M3×0.5 | | | M5×0.8 | | |
| Lubrication | | Not required | | | | | |
| Operating pressure range MPa [kgf/cm ²] [psi.] | 1 (P) port | −100kPa~0 {−750.1mmHg~0} [−29.53in.Hg~0] | | | | | |
| | 3 (R) port | 0~0.5 {0~5.1} [0~73] | | 0~0.4 {0~4.1} [0~58] | 0~0.5 {0~5.1} [0~73] | | 0~0.4 {0~4.1} [0~58] |
| Proof pressure | MPa [kgf/cm ²] [psi.] | 1.05 [10.7] [152] | | | | | |
| Response time ^{Note 3} ON/OFF | ms | 4/8 | 5/10 | 3/6 | 4/8 | 5/10 | 3/6 |
| Maximum operating frequency | Hz | 5 | | | | | |
| Operating temp. range (atmosphere and media) | °C [°F] ^{Note 4} | 5~50 [41~122] | | | | | |
| Shock resistance | m/s ² {G} | 1373.0 {140.0} (Axial direction 196.2 {20.0}) | | | | | |
| Rated voltage ^{Note 5} | (DC5V,DC6V) DC12V,DC24V AC100V,(AC200V) | (DC5V,DC6V) DC12V,DC24V | (DC12V) DC24V | (DC5V,DC6V) DC12V,DC24V AC100V,(AC200V) | (DC5V,DC6V) DC12V,DC24V | (DC12V) DC24V | |
| | | | | | | | |
| Mounting direction | | Any | | | | | |
| Air supply port | Vacuum | 1 (P) port | | | | | |
| | Positive pressure | 3 (R) port | | | | | |

| Item | Basic model | Direct piping, F type manifold | | | A type manifold | | |
|---|---|---|------------------------------|---|----------------------------|-------------------------------|------------------------------|
| | | GV010E1-11 (standard) | GV010LE1-11 (low current) | GV010HE1-11 (large flow) | GAV010E1-11 (standard) | GAV010LE1-11 (low current) | GAV010HE1-11 (large flow) |
| Media | | Air | | | | | |
| Operation type | | Direct acting type | | | | | |
| Effective area $[C_v]$ mm ² | 2 (A) → 1 (P) | 0.2 [0.011] | 0.1 [0.006] | 0.45 [0.025] | 0.2 [0.011] | 0.1 [0.006] | 0.45 [0.025] |
| | 3 (R) → 2 (A) | 0.3 [0.017] | 0.2 [0.011] | 0.6 [0.033] | 0.3 [0.017] | 0.2 [0.011] | 0.6 [0.033] |
| Port size ^{Note 2} | | M3×0.5 | | | M5×0.8 | | |
| Lubrication | | Not required | | | | | |
| Operating pressure range MPa [kgf/cm ²] [psi.] | 1 (P) port | 0~0.5 {0~5.1} [0~73] | | 0~0.4 {0~4.1} [0~58] | 0~0.5 {0~5.1} [0~73] | | 0~0.4 {0~4.1} [0~58] |
| | 3 (R) port | −100kPa~0 {−750.1mmHg~0} [−29.53in.Hg~0] | | | | | |
| Proof pressure | MPa [kgf/cm ²] [psi.] | 1.05 [10.7] [152] | | | | | |
| Response time ^{Note 3} ON/OFF | ms | 4/8 | 5/10 | 3/6 | 4/8 | 5/10 | 3/6 |
| Maximum operating frequency | Hz | 5 | | | | | |
| Operating temp. range (atmosphere and media) | °C [°F] ^{Note 4} | 5~50 [41~122] | | | | | |
| Shock resistance | m/s ² {G} | 1373.0 {140.0} (Axial direction 196.2 {20.0}) | | | | | |
| Rated voltage ^{Note 5} | (DC5V,DC6V) DC12V,DC24V AC100V,(AC200V) | (DC5V,DC6V) DC12V,DC24V | (DC12V) DC24V | (DC5V,DC6V) DC12V,DC24V AC100V,(AC200V) | (DC5V,DC6V) DC12V,DC24V | (DC12V) DC24V | |
| | | | | | | | |
| Mounting direction | | Any | | | | | |
| Air supply port | Vacuum | 3 (R) port | | | | | |
| | Positive pressure | 1 (P) port | | | | | |

Notes: 1. For details, see the effective area on p.43.

2. For details, see the port size on p.43.

3. Values when air pressure is 0.5MPa {5.1kgf/cm²} [73psi.]. Due to the switching phase timing, add a maximum of 5ms to the AC response time.

4. Provide heat radiation measures to ensure that the ambient temperature (or when used in a control box, the internal temperature of the box) always remains within the temperature range specifications.
And for long-time continuous energizing, consult us.

5. Values in parentheses () are for made to order items. See the corresponding table of solenoid options/voltage on p.50.

Mass

Solenoid Valve Mass

g [oz.]

| Basic model | Mass |
|---------------|--|
| G (V) 010E1 | 14.6 [0.515] (16.8 [0.593]) ^{Note1} |
| G (V) 010LE1 | 14.6 [0.515] (16.8 [0.593]) ^{Note1} |
| G (V) 010HE1 | 15.3 [0.540] (17.5 [0.617]) ^{Note1} |
| GA (V) 010E1 | 14.2 [0.501] (26.2 [0.924]) ^{Note2} |
| GA (V) 010LE1 | 14.2 [0.501] (26.2 [0.924]) ^{Note2} |
| GA (V) 010HE1 | 14.8 [0.522] (26.8 [0.945]) ^{Note2} |

Notes: 1. Figures in parentheses () are the mass with mounting base: -21.

2. Figures in parentheses () are the mass with sub-base: -25.

Manifold Mass

g [oz.]

| Manifold model | Mass calculation of each unit (n=number of units) | Block-off plate |
|----------------|---|-----------------|
| G010M□F | (7×n) + 9 [(0.247×n) + 0.317] | 1 [0.035] |
| G010M□A | (7×n) + 9 [(0.247×n) + 0.317] | 1 [0.035] |
| G010MH□F | (7.2×n) + 33 [(0.254×n) + 1.164] | 1 [0.035] |
| G010MH□A | (7.2×n) + 33 [(0.254×n) + 1.164] | 1 [0.035] |

Solenoid Specifications

| Rated voltage | | DC5V | DC6V | DC12V | DC24V | AC100V <small>Note</small> | AC200V <small>Note</small> |
|----------------------------------|---|--------------------|--------------------|-----------------------|-----------------------|----------------------------|----------------------------|
| Operating voltage range | V | 4.5~5.5 (5±10%) | 5.4~6.6 (6±10%) | 10.8~13.2 (12±10%) | 21.6~26.4 (24±10%) | 90~110 (100±10%) | 180~220 (200±10%) |
| G(A) (V) (O) (E) (1) | Current (when rated voltage is applied) mA(r.m.s) | 200 | 168 | 84 | 42 | 11 | 8 |
| | Power consumption | 1.0W | | | | 1.1VA | 1.6VA |
| | Allowable leakage current mA | 2.0 | | | | 1.0 | |
| G(A) (V) (O) (E) (1) | Current (when rated voltage is applied) mA(r.m.s) | 100 | 84 | 42 | 21 | _____ | _____ |
| | Power consumption | 0.5W | | | | _____ | _____ |
| | Allowable leakage current mA | 1.0 | | | | _____ | _____ |
| G(A) (V) (O) (H) (E) (1) | Current (when rated voltage is applied) | Starting mA | _____ | 267 | 133 | _____ | _____ |
| | | Holding mA | _____ | 92 | 46 | _____ | _____ |
| | Power consumption | Starting W | _____ | 3.2 | | _____ | _____ |
| | | Holding W | _____ | 1.1 | | _____ | _____ |
| | Allowable leakage current | mA | _____ | 10 | 5 | _____ | _____ |
| | Start-up time (standard time) | ms | _____ | 48 | 27 | _____ | _____ |
| Insulation resistance | MΩ | Over 100 | | | | | |
| Wiring type and lead wire length | Grommet type: 300mm [11.8in.], Plug connector type: 300mm [11.8in.] | | | | | | |
| Color of lead wire | Red (+), Black (-) | | | | Yellow | White | |
| Color of LED indicator | Red | | | | | | |
| Surge suppression (as standard) | Flywheel diode | | | | Bridge diode | | |

Note: Since the AC types have built-in bridge diodes, the starting current value and energizing current value are virtually the same. In addition, the rated frequencies are 50Hz and 60Hz. Specification values are the same for both.

Effective Area [Cv]

| Basic model | Standard (Single valve) | Remarks | |
|-----------------|---|---|--|
| G010E1 (-11) | 1(P)→2(A) 0.2[0.011] (2(A)→1(P) 0.3[0.017]) 2(A)→3(R) 0.3[0.017] (3(R)→2(A) 0.2[0.011]) | <ul style="list-style-type: none"> For the case with quick fitting TSH4-M3M attached to the 1(P) and 2(A) ports on the mounting base. Same values as for the case with quick fitting TSH4-M3M attached to the 2(A) port on F type manifold. | |
| G010LE1 (-11) | 1(P)→2(A) 0.1 [0.006] (2(A)→1(P) 0.15 [0.008]) 2(A)→3(R) 0.2 [0.011] (3(R)→2(A) 0.1 [0.006]) | | |
| G010HE1 (-11) | 1(P)→2(A) 0.45 [0.025] (2(A)→1(P) 0.55 [0.031]) 2(A)→3(R) 0.6 [0.033] (3(R)→2(A) 0.45 [0.025]) | | |
| GV010E1 (-11) | 1(P)→2(A) 0.3 [0.017] (2(A)→1(P) 0.2 [0.011]) 2(A)→3(R) 0.2 [0.011] (3(R)→2(A) 0.3 [0.017]) | | |
| GV010LE1 (-11) | 1(P)→2(A) 0.15 [0.008] (2(A)→1(P) 0.1 [0.006]) 2(A)→3(R) 0.1 [0.006] (3(R)→2(A) 0.2 [0.011]) | | |
| GV010HE1 (-11) | 1(P)→2(A) 0.55 [0.031] (2(A)→1(P) 0.45 [0.025]) 2(A)→3(R) 0.45 [0.025] (3(R)→2(A) 0.6 [0.033]) | | |
| GA010E1 (-11) | 1(P)→2(A) 0.2 [0.011] (2(A)→1(P) 0.3 [0.017]) 2(A)→3(R) 0.3 [0.017] (3(R)→2(A) 0.2 [0.011]) | | <ul style="list-style-type: none"> For the case with quick fitting TSH4-M5M attached to the 1(P) and 2(A) ports on the mounting sub-base. |
| GA010LE1 (-11) | 1(P)→2(A) 0.1 [0.006] (2(A)→1(P) 0.15 [0.008]) 2(A)→3(R) 0.2 [0.011] (3(R)→2(A) 0.1 [0.006]) | | |
| GA010HE1 (-11) | 1(P)→2(A) 0.45 [0.025] (2(A)→1(P) 0.55 [0.031]) 2(A)→3(R) 0.6 [0.033] (3(R)→2(A) 0.45 [0.025]) | | |
| GAV010E1 (-11) | 1(P)→2(A) 0.3 [0.017] (2(A)→1(P) 0.2 [0.011]) 2(A)→3(R) 0.2 [0.011] (3(R)→2(A) 0.3 [0.017]) | | |
| GAV010LE1 (-11) | 1(P)→2(A) 0.15 [0.008] (2(A)→1(P) 0.1 [0.006]) 2(A)→3(R) 0.1 [0.006] (3(R)→2(A) 0.2 [0.011]) | | |
| GAV010HE1 (-11) | 1(P)→2(A) 0.55 [0.031] (2(A)→1(P) 0.45 [0.025]) 2(A)→3(R) 0.45 [0.025] (3(R)→2(A) 0.6 [0.033]) | | |

Remark: Figures in parentheses () are for the normally open (NO) type.

Port Size

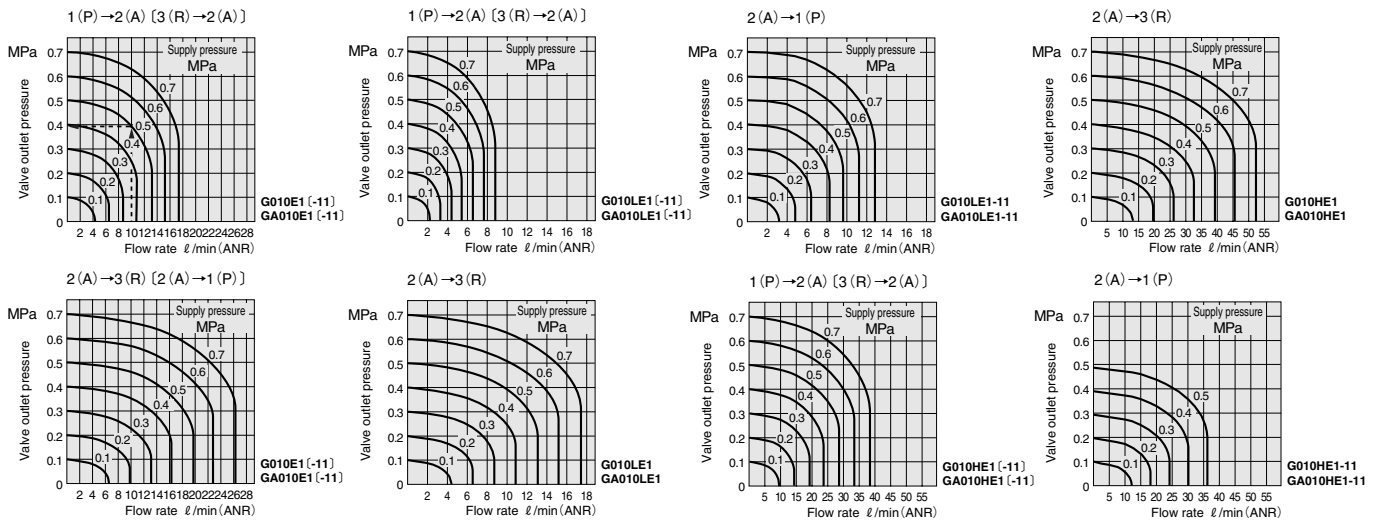
Solenoid Valve Port Size (With Base)

| Basic model | Port | Location of piping ports | Port size |
|---|-------------------|--------------------------|-----------|
| G (V) 010E1-21 G (V) 010LE1-21 G (V) 010HE1-21 | 1(P),3(R) 2(A) | Mounting base Valve | M3×0.5 |
| GA (V) 010E1-25 GA (V) 010LE1-25 GA (V) 010HE1-25 | 1(P),2(A),3(R) | Sub-base | M5×0.8 |

Manifold Port Size

| Manifold model | Port | Location of piping ports | Port size |
|----------------|-----------|--------------------------|-----------|
| G010M□F | 1(P),3(R) | Manifold | M5×0.8 |
| | 2(A) | Valve | M3×0.5 |
| G010M□A | 1(P),3(R) | Manifold | M5×0.8 |
| | 2(A) | | M3×0.5 |
| G010MH□F | 1(P),3(R) | Manifold | Rc1/8 |
| | 2(A) | Valve | M3×0.5 |
| G010MH□A | 1(P),3(R) | Manifold | Rc1/8 |
| | 2(A) | | M5×0.8 |

Flow Rate



1MPa = 145psi., 1 l /min = 0.0353ft.³/min.

Note: 0.6MPa [73psi.] and 0.7MPa [102psi.] are not available for G010HE1-11, GA010HE1-11.

How to read the graph (for G□010E1, 1(P)→2(A))

When the supply pressure is 0.5MPa [73psi.] and flow rate is 10 l /min [0.35ft.³/min.] (ANR), the valve outlet pressure becomes 0.39MPa [57psi.].

Figures in brackets [] indicate the normally open (NO) type.

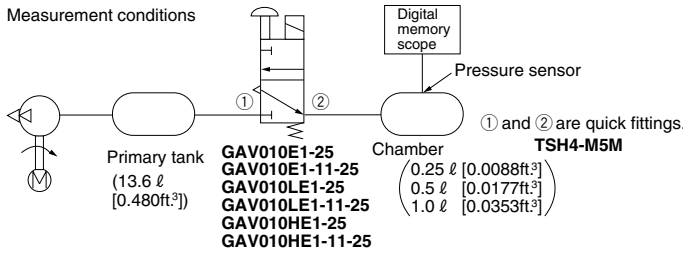
Air Supply Time and Exhaust Time

How to read the graph

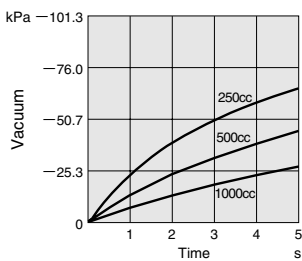
Exhaust time: Time required for chamber interior to convert from atmospheric pressure state to vacuum state.

Air supply time: Time required for chamber interior to convert from -100kPa [-29.53in.Hg] to atmospheric pressure state.

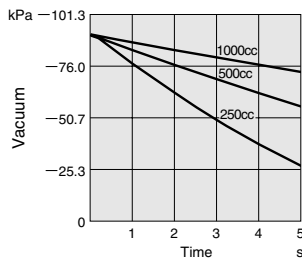
Measurement conditions



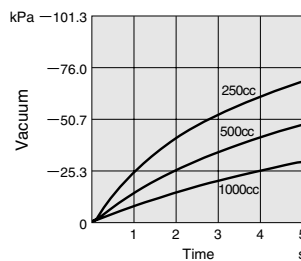
GAV010E1 Exhaust time



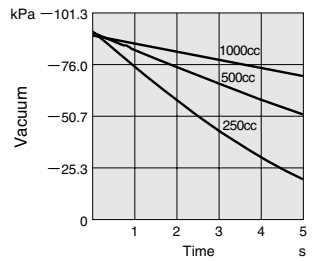
GAV010E1 Air supply time



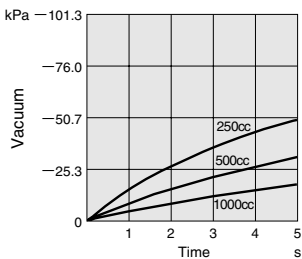
GAV010E1-11 Exhaust time



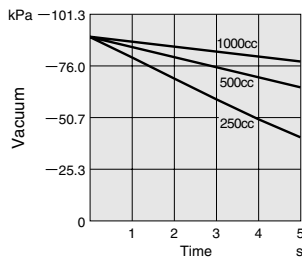
GAV010E1-11 Air supply time



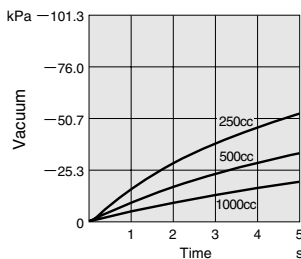
GAV010LE1 Exhaust time



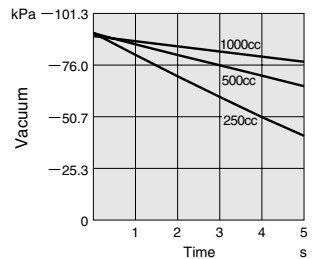
GAV010LE1 Air supply time



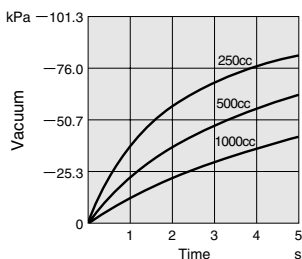
GAV010LE1-11 Exhaust time



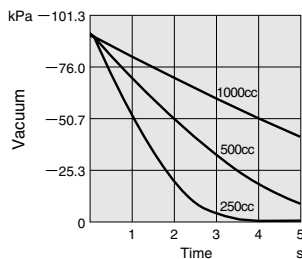
GAV010LE1-11 Air supply time



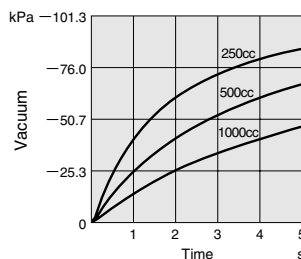
GAV010HE1 Exhaust time



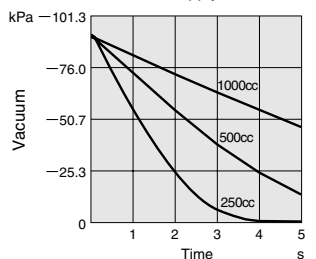
GAV010HE1 Air supply time



GAV010HE1-11 Exhaust time



GAV010HE1-11 Air supply time



-100kPa = -29.53in.Hg, 250cc = 0.0088ft.³, 500cc = 0.0177ft.³, 1000cc = 0.0353ft.³

G010 Series Solenoid Valve Order Codes

| | | 2-, 3-port valve Number of ports | 2-, 3-port valve Valve function | Mounting base | Sub-base | Wiring type | Voltage | |
|-----------------|-------------------|-------------------------------------|--|---|--|---|------------|-----------------------------|
| | | 3-port Blank | Blank Normally closed (NC) -11 Normally open (NO) Note: For the piping, see table on p.37. | Without mounting base Blank | Without sub-base Blank | ● Lead wire length: 300mm [11.8in.] is standard. Grommet type with LED indicator Blank | | |
| | | 2-port -2 | | With mounting base -21 ● Attached to a valve body at shipping. | With sub-base -25 ● Attached to a valve body at shipping. | Straight connector with LED indicator -PS | | |
| | | | | | | L connector with LED indicator -PL | | |
| | | | | | | | | |
| Direct piping | Positive pressure | 2-, 3-port standard type | G010E1 | -2 | -11 Note 2 | -21 Note 1 | -PS | DC12V, DC24V, AC100V |
| | | 2-, 3-port low current type | G010LE1 | | | | | DC12V, DC24V |
| | | 2-, 3-port large flow type | G010HE1 | | | | | DC24V |
| | Vacuum | 2-, 3-port standard type | GV010E1 | | | | | DC12V, DC24V, AC100V |
| | | 2-, 3-port low current type | GV010LE1 | | | | | DC12V, DC24V |
| | | 2-, 3-port large flow type | GV010HE1 | | | | | DC24V |
| Sub-base piping | Positive pressure | 2-, 3-port standard type | GA010E1 | -2 | -11 Note 2 | -25 Note 1 | -PS | DC12V, DC24V, AC100V |
| | | 2-, 3-port low current type | GA010LE1 | | | | | DC12V, DC24V |
| | | 2-, 3-port large flow type | GA010HE1 | | | | | DC24V |
| | Vacuum | 2-, 3-port standard type | GAV010E1 | | | | | DC12V, DC24V, AC100V |
| | | 2-, 3-port low current type | GAV010LE1 | | | | | DC12V, DC24V |
| | | 2-, 3-port large flow type | GAV010HE1 | | | | | DC24V |

Notes: 1. If using the solenoid valve as a single unit, always select it either with mounting base or with sub-base.
 2. Normally closed (NC) and normally open (NO) valves cannot be mounted together on the same manifold.

Made to Order (After the wiring order code, enter the codes below.)

| | | | | | | | |
|---|---|--|--|---|---|--|--|
| Straight connector with LED indicator Negative common -MS | L connector with LED indicator Negative common -ML | Lead wire length -1L -3L ● For plug connector ● Length -1L: 1000 [39in.] (mm) -3L: 3000 [118in.] | Voltage specifications ● G□010E1 : DC5V, DC6V, AC200V ● G□010LE1 : DC5V, DC6V ● G□010HE1 : DC12V ● For AC110V~120V, AC220V~240V specifications, consult us. | | | | |
| Straight connector with LED indicator (Without connector, contact and lead wire) Negative common -MSX | Straight connector with LED indicator (Without connector, contact and lead wire) Positive common -PSX | L connector with LED indicator (Without connector, contact and lead wire) Negative common -MLX | L connector with LED indicator (Without connector, contact and lead wire) Positive common -PLX | Straight connector with LED indicator (Connector, contact included.) Without lead wire. Negative common -MSN | Straight connector with LED indicator (Connector, contact included.) Without lead wire. Positive common -PSN | L connector with LED indicator (Connector, contact included.) Without lead wire. Negative common -MLN | L connector with LED indicator (Connector, contact included.) Without lead wire. Positive common -PLN |

G010 Series Manifold Order Codes

| Manifold model Number of units | | Station | Basic model | 2-, 3-port valve Number of ports | 2-, 3-port valve Valve function | Wiring type | Voltage |
|---|--------------|---------|-------------|-------------------------------------|------------------------------------|-------------|----------------------|
| P, R port (M5X0.8) type G010M | 2 ⋮ 20 | F | -G010E1 | Blank | Blank Normally closed (NC) | Blank | DC12V, DC24V, AC100V |
| | | | -G010LE1 | | | | DC12V, DC24V |
| | | | -G010HE1 | | | | DC24V |
| | | | -GV010E1 | | | | DC12V, DC24V, AC100V |
| | | | -GV010LE1 | | | | DC12V, DC24V |
| | | | -GV010HE1 | | | | DC24V |
| | | A | -GA010E1 | -2 | -11 | -PS -PL | DC12V, DC24V, AC100V |
| | | | -GA010LE1 | | | | DC12V, DC24V |
| | | | -GA010HE1 | | | | DC24V |
| | | | -GAV010E1 | | | | DC12V, DC24V, AC100V |
| | | | -GAV010LE1 | | | | DC12V, DC24V |
| | | | -GAV010HE1 | | | | DC24V |
| P, R port (Rc1/8) type G010MH | 2 ⋮ 20 | F | -G010E1 | Blank | Blank Normally closed (NC) | Blank | DC12V, DC24V, AC100V |
| | | | -G010LE1 | | | | DC12V, DC24V |
| | | | -G010HE1 | | | | DC24V |
| | | | -GV010E1 | | | | DC12V, DC24V, AC100V |
| | | | -GV010LE1 | | | | DC12V, DC24V |
| | | | -GV010HE1 | | | | DC24V |
| | | A | -GA010E1 | -2 | -11 | -PS -PL | DC12V, DC24V, AC100V |
| | | | -GA010LE1 | | | | DC12V, DC24V |
| | | | -GA010HE1 | | | | DC24V |
| | | | -GAV010E1 | | | | DC12V, DC24V, AC100V |
| | | | -GAV010LE1 | | | | DC12V, DC24V |
| | | | -GAV010HE1 | | | | DC24V |

● Valve mounting location from the left-hand side when facing the 2(A) port (□: 1~20)

- Specify the valve type for each station.
- Enter -BP when closing a station with a block-off plate without mounting a valve.
- Normally closed (NC) and normally open (NO) valves cannot be mounted together on the same manifold.

Additional Parts (To be ordered separately)

Mounting base



● For direct piping (With gasket)

Mounting base



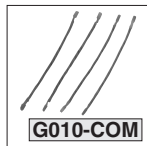
● For direct piping. For G010HE1-11, GV010HE1 only (With gasket).

Sub-base



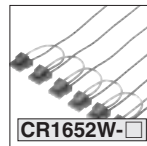
● For sub-base piping (With gasket)

Lead wire for common wiring



● For -PS, -PL, -MS, -ML (Set of 10 pcs.)

Common pre-wired lead wire assembly

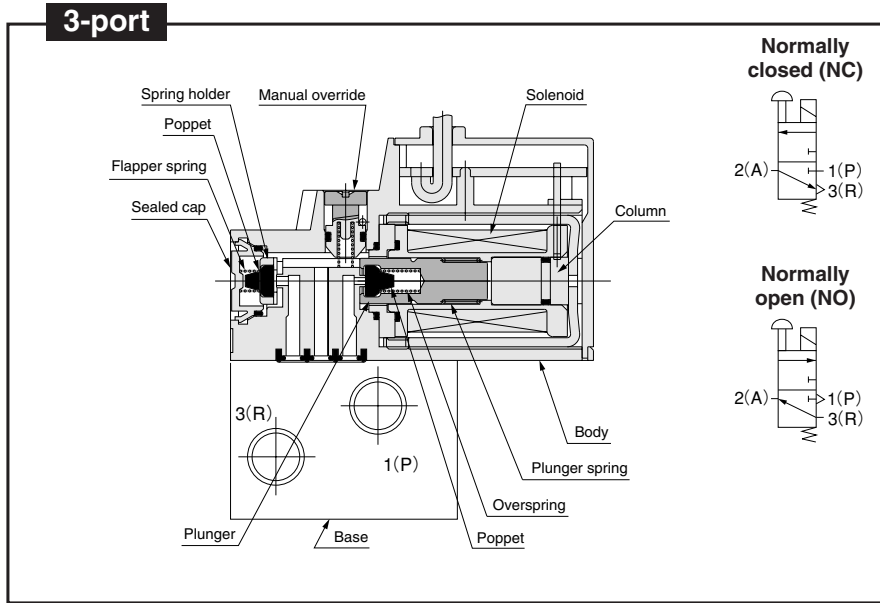


● For details, see p.39.

Block-off plate



Operating Principles and Symbols



Major Parts and Materials

| | Parts | Materials |
|----------|-----------------|---------------------------|
| Valve | Body | Plastic |
| | Poppet | Synthetic rubber |
| | Plunger | Magnetic stainless steel |
| | Column | Aluminum alloy (anodized) |
| | Base | Aluminum alloy (anodized) |
| Manifold | Body | Aluminum alloy (anodized) |
| | Block-off plate | Plastic |
| | Seal | Synthetic rubber |

Corresponding Table of Mounting Valve/Manifold

| Valve specifications | | | | Valve options | | | | Applicable manifolds | | | |
|----------------------|-------------|-------------------------------|------------|----------------|--|------------------------|-------------------|----------------------|---------|----------|----------|
| Piping configuration | Basic model | Power | Flow rate | -2 (2-port) | -11 ^{Note 1} (Normally open, NC) | -21 (Mounting base) | -25 (Sub-base) | G010M□F | G010M□A | G010MH□F | G010MH□A |
| Direct piping | G010E1 | 1.0W | Standard | ● | ● | ● | □ | ● | □ | ● | □ |
| | G010LE1 | 0.5W | Small flow | ● | ● | ● | □ | ● | □ | ● | □ |
| | G010HE1 | 3.2W (1.1W) ^{Note 2} | Large flow | ● | ● | ● | □ | ● | □ | ● | □ |
| | GV010E1 | 1.0W | Standard | ● | ● | ● | □ | ● | □ | ● | □ |
| | GV010LE1 | 0.5W | Small flow | ● | ● | ● | □ | ● | □ | ● | □ |
| | GV010HE1 | 3.2W (1.1W) ^{Note 2} | Large flow | ● | ● | ● | □ | ● | □ | ● | □ |
| Base piping | GA010E1 | 1.0W | Standard | ● | ● | □ | ● | ● | □ | ● | ● |
| | GA010LE1 | 0.5W | Small flow | ● | ● | □ | ● | ● | □ | ● | ● |
| | GA010HE1 | 3.2W (1.1W) ^{Note 2} | Large flow | ● | ● | □ | ● | ● | □ | ● | ● |
| | GAV010E1 | 1.0W | Standard | ● | ● | □ | ● | ● | □ | ● | ● |
| | GAV010LE1 | 0.5W | Small flow | ● | ● | □ | ● | ● | □ | ● | ● |
| | GAV010HE1 | 3.2W (1.1W) ^{Note 2} | Large flow | ● | ● | □ | ● | ● | □ | ● | ● |
| 2(A) port | | | | | | | | (M3) | M3 | (M3) | M5 |
| 1(P), 3(R) port | | | | | | | | M5 | M5 | Rc1/8 | Rc1/8 |

●: Selectable or mountable

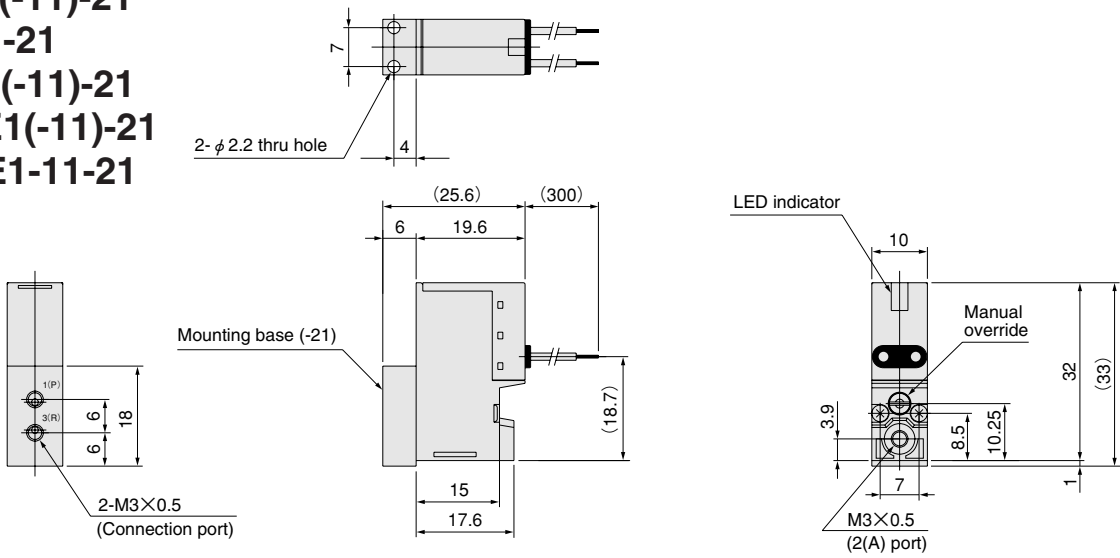
Notes: 1. Care should be taken when ordering, since the initial settings for the normally closed (NC) and normally open (NO) valves cannot be changed later on.

Normally closed (NC) and normally open (NO) valves cannot be mounted together on the same manifold.

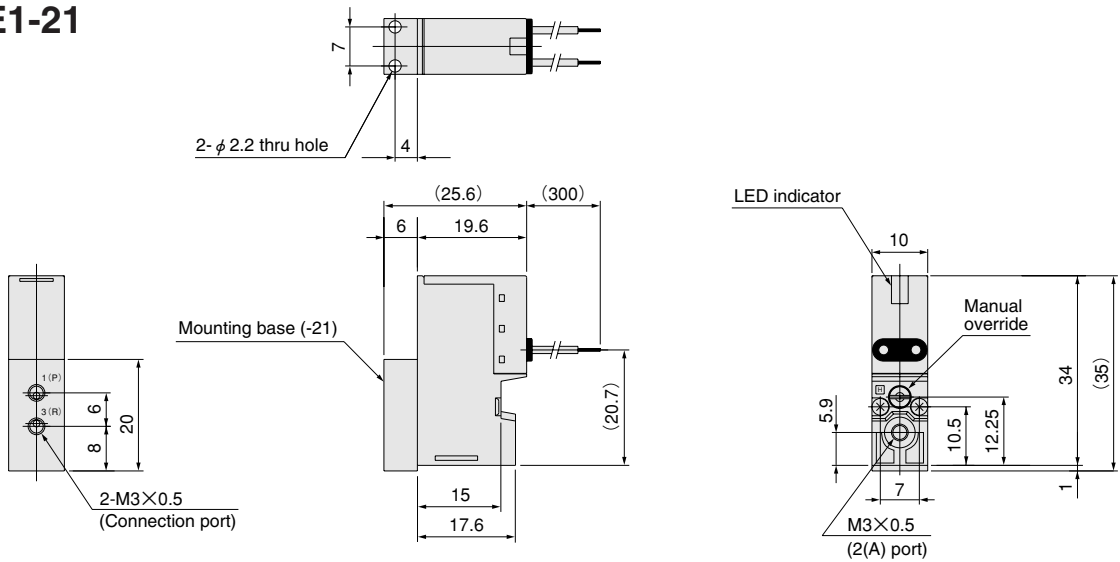
2. Values in parentheses () in power column are for holding state.

Dimensions of Direct Piping Solenoid Valve (mm)

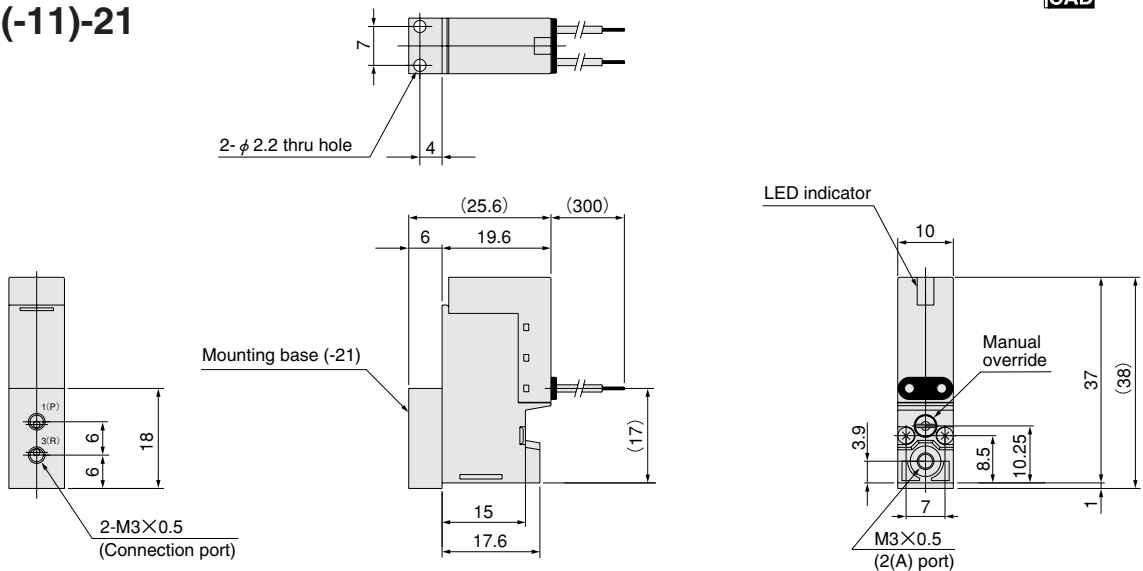
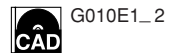
G010E1(-11)-21 (DC5V, DC6V, DC12V, DC24, AC100V)
 G010LE1(-11)-21
 G010HE1-21
 GV010E1(-11)-21
 GV010LE1(-11)-21
 GV010HE1-11-21



G010HE1-11-21 (DC24V)
 GV010HE1-21

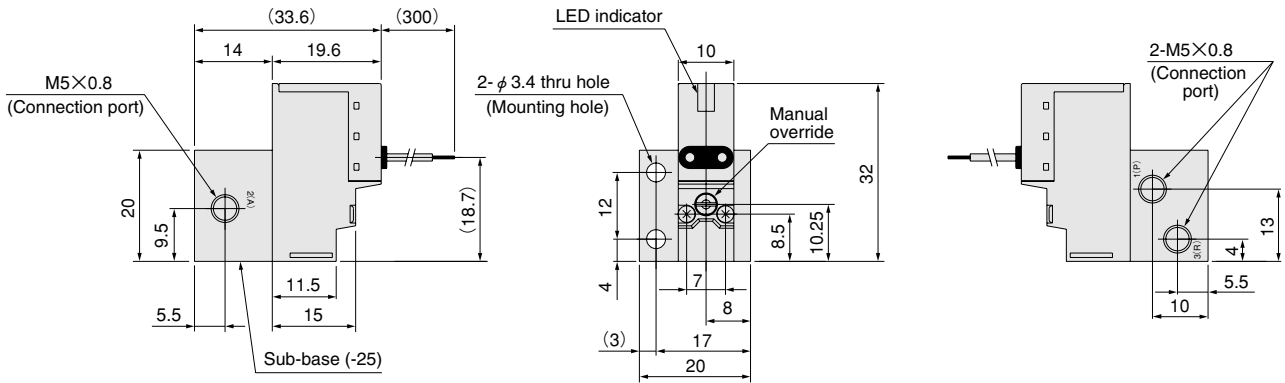


G010E1(-11)-21 (AC200V)
 GV010E1(-11)-21

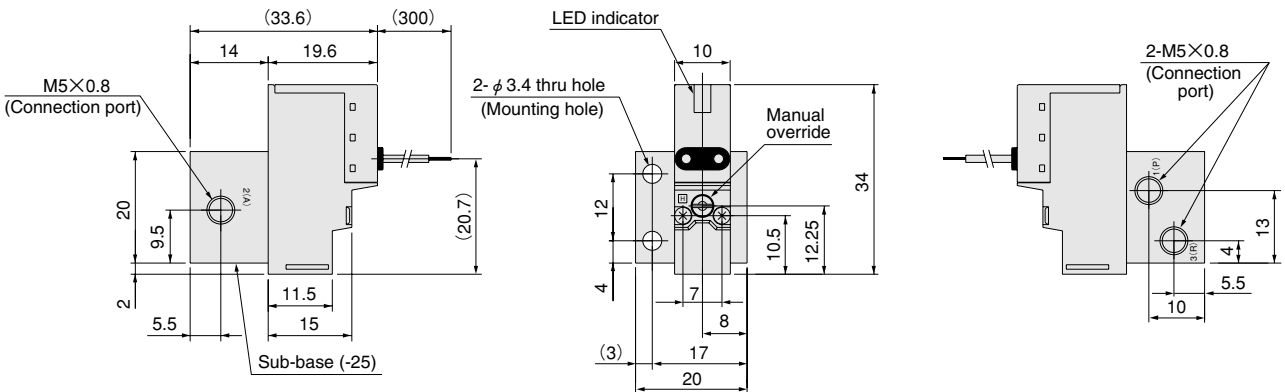


Dimensions of Sub-base Piping Solenoid Valve (mm)

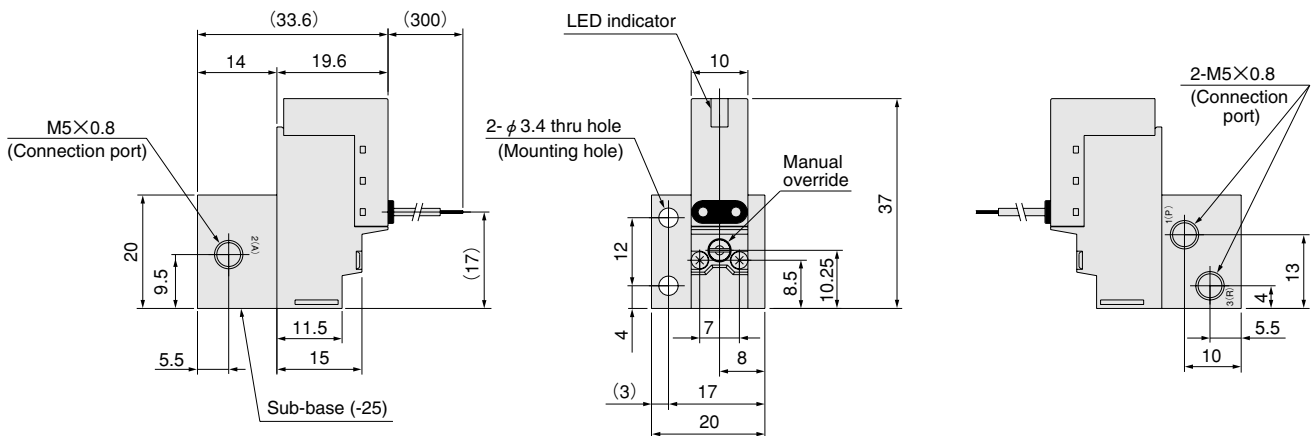
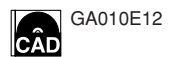
GA010E1(-11)-25 (DC5V, DC6V, DC12V, DC24V, AC100V)
GA010LE1(-11)-25
GA010HE1-25
GAV010E1(-11)-25
GAV010LE1(-11)-25
GAV010HE1-11-25



GA010HE1-11-25 (DC24V)
GAV010HE1-25





GA010E1(-11)-25 (AC200V)
GAV010E1(-11)-25





Dimensions of Connector (mm)

Options

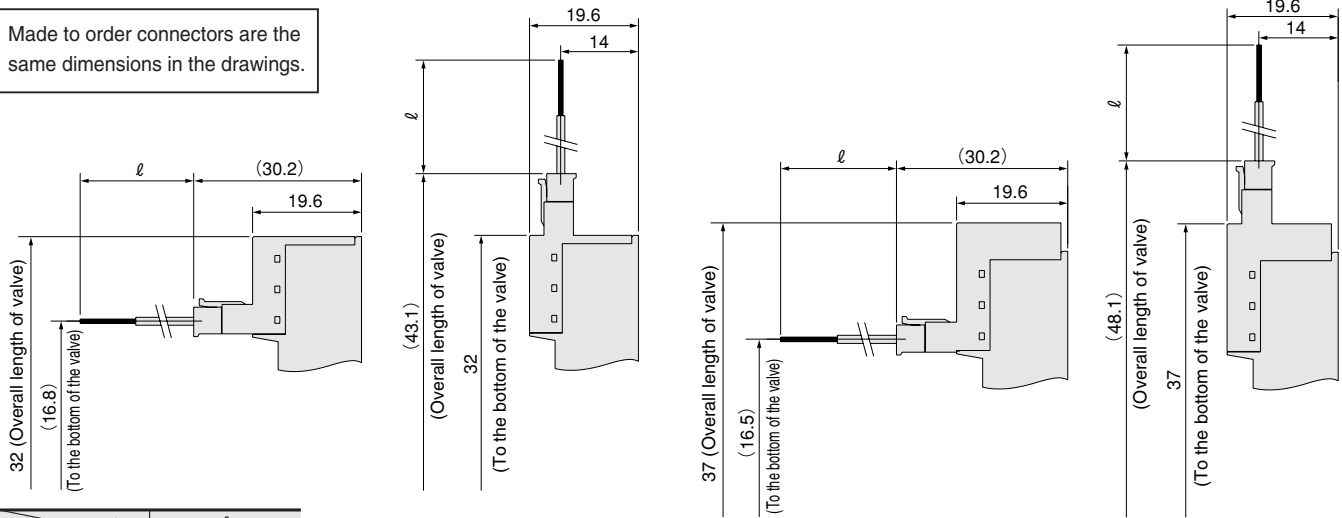
● Solenoid with L connector: **-PL**
 G010E1PL

● Solenoid with straight connector: **-PS**
 G010E1PS

● Solenoid with L connector (AC200V): **-PL**
 G010E1L2

● Solenoid with straight connector (AC200V): **-PS**
 G010E1P2

Made to order connectors are the same dimensions in the drawings.



| Model | Code | ℓ |
|-------|------|------|
| Blank | | 300 |
| -1L | | 1000 |
| -3L | | 3000 |

Corresponding Table of Solenoid Options/Voltage

| Basic valve models | Voltage specifications | Connector specifications | | | | | | | | | | | | | |
|---|------------------------|--------------------------|-----|-----|-----|-----|------|------|------|------|------|------|------|------|--|
| | | Blank (grommet) | -PS | -PL | -MS | -ML | -PSX | -PLX | -MSX | -MLX | -PSN | -PLN | -MSN | -MLN | |
| G(A)010E1 [-11] G(A)V010E1 [-11] (standard type) | DC5V | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | |
| | DC6V | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | |
| | DC12V | ● | ● | ● | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | |
| | DC24V | ● | ● | ● | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | |
| | AC100V | ● | ● | ● | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | |
| | AC200V | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | |
| G(A)010LE1 [-11] G(A)V010LE1 [-11] (low current type) | DC5V | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | | |
| | DC6V | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | | |
| | DC12V | ● | ● | ● | △ | △ | △ | △ | △ | △ | △ | △ | △ | | |
| | DC24V | ● | ● | ● | △ | △ | △ | △ | △ | △ | △ | △ | △ | | |
| G(A)010HE1 [-11] G(A)V010HE1 [-11] (large flow type) | DC12V | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | | |
| | DC24V | ● | ● | ● | △ | △ | △ | △ | △ | △ | △ | △ | △ | | |
| Lead wire length options same for all basic models | -1L | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | | |
| | -3L | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | | |

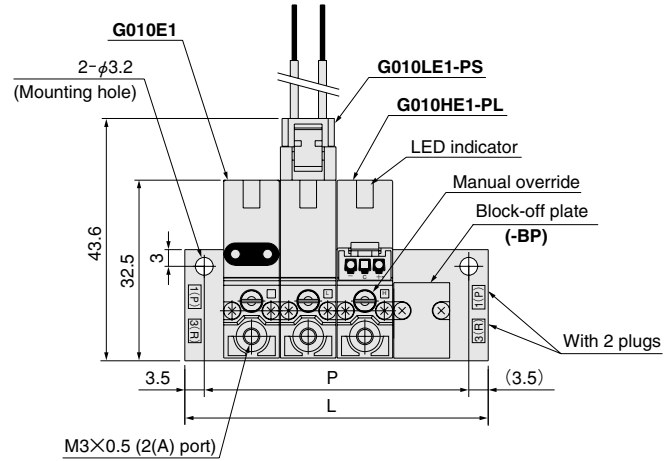
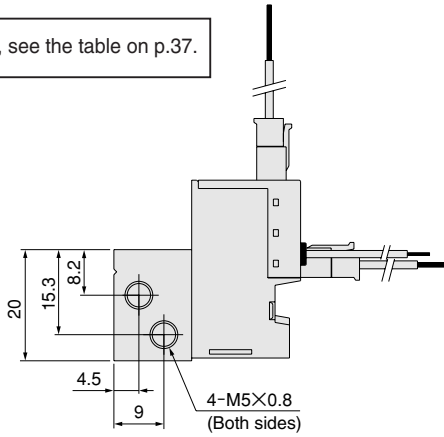
●: Standard specifications △: Made to order

Dimensions of F Type Manifold (for Direct Piping with Positive Pressure Solenoid Valves) (mm)

G010M□F (1(P), 3(R) port: M5×0.8)



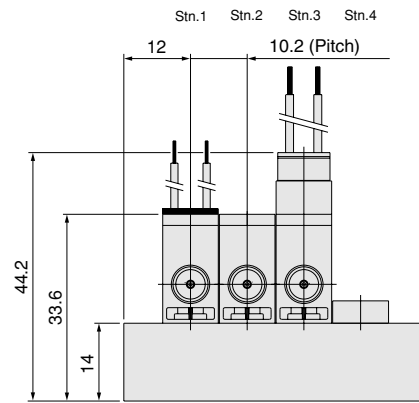
For the piping, see the table on p.37.



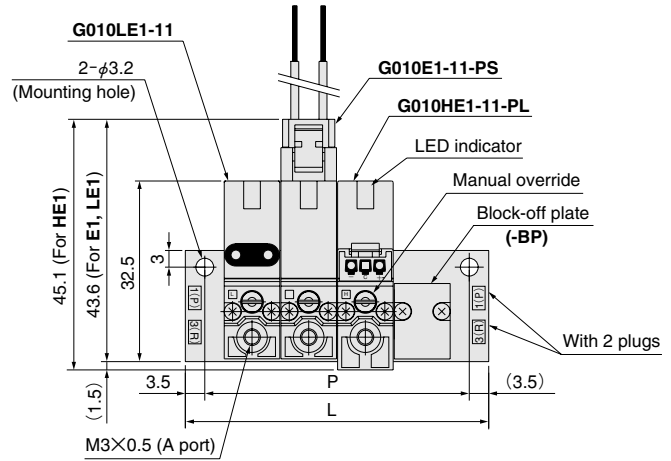
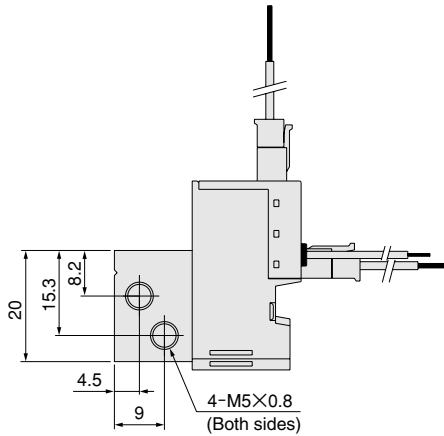
Unit dimensions

mm

| Number of units | L | P | Number of units | L | P |
|-----------------|-------|-------|-----------------|-------|-------|
| 2 | 34.2 | 27.2 | 12 | 136.2 | 129.2 |
| 3 | 44.4 | 37.4 | 13 | 146.4 | 139.4 |
| 4 | 54.6 | 47.6 | 14 | 156.6 | 149.6 |
| 5 | 64.8 | 57.8 | 15 | 166.8 | 159.8 |
| 6 | 75 | 68 | 16 | 177 | 170 |
| 7 | 85.2 | 78.2 | 17 | 187.2 | 180.2 |
| 8 | 95.4 | 88.4 | 18 | 197.4 | 190.4 |
| 9 | 105.6 | 98.6 | 19 | 207.6 | 200.6 |
| 10 | 115.8 | 108.8 | 20 | 217.8 | 210.8 |
| 11 | 126 | 119 | — | — | — |



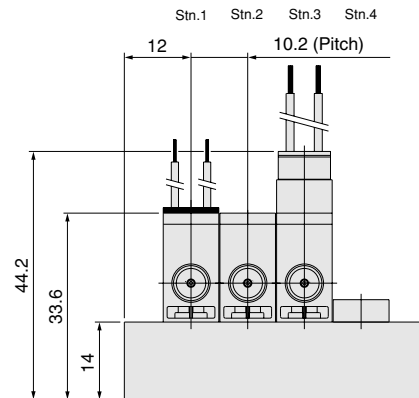
G010M□F (1(P), 3(R) port: M5×0.8)



Unit dimensions

mm

| Number of units | L | P | Number of units | L | P |
|-----------------|-------|-------|-----------------|-------|-------|
| 2 | 34.2 | 27.2 | 12 | 136.2 | 129.2 |
| 3 | 44.4 | 37.4 | 13 | 146.4 | 139.4 |
| 4 | 54.6 | 47.6 | 14 | 156.6 | 149.6 |
| 5 | 64.8 | 57.8 | 15 | 166.8 | 159.8 |
| 6 | 75 | 68 | 16 | 177 | 170 |
| 7 | 85.2 | 78.2 | 17 | 187.2 | 180.2 |
| 8 | 95.4 | 88.4 | 18 | 197.4 | 190.4 |
| 9 | 105.6 | 98.6 | 19 | 207.6 | 200.6 |
| 10 | 115.8 | 108.8 | 20 | 217.8 | 210.8 |
| 11 | 126 | 119 | — | — | — |

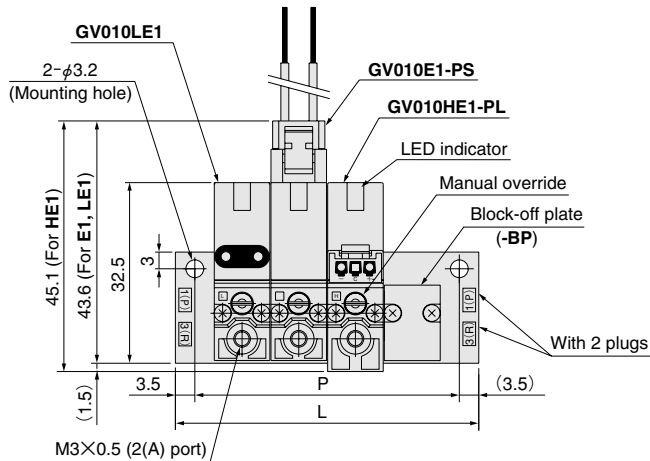
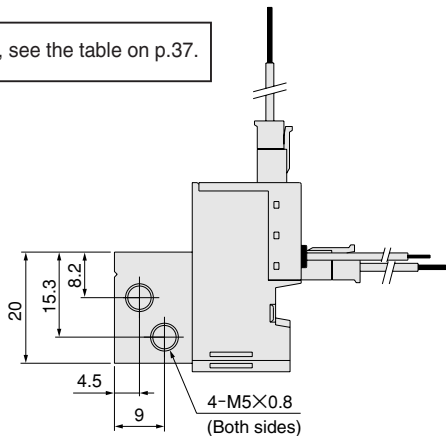


For optional wiring, see p.50.

Dimensions of F Type Manifold (for Direct Piping with Vacuum Solenoid Valves) (mm)

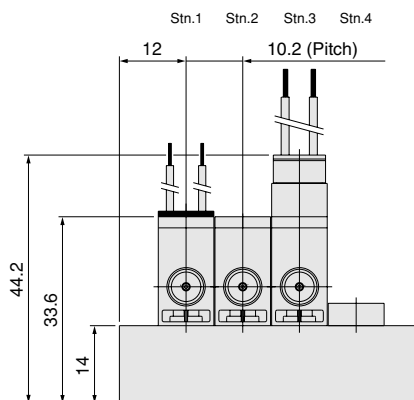
G010M□F (1(P), 3(R) port: M5×0.8)

For the piping, see the table on p.37.

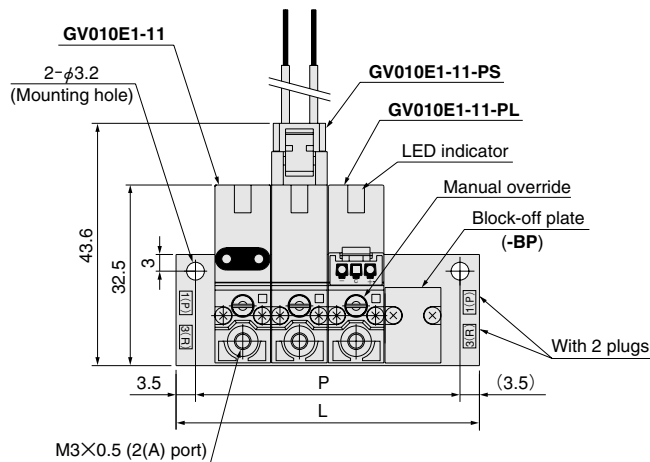
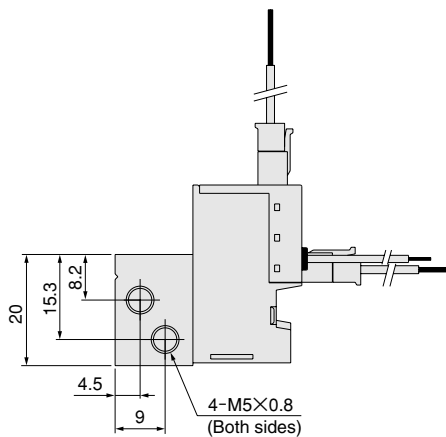


Unit dimensions

| | | mm | | | |
|-----------------|-------|-------|-----------------|-------|-------|
| Number of units | L | P | Number of units | L | P |
| 2 | 34.2 | 27.2 | 12 | 136.2 | 129.2 |
| 3 | 44.4 | 37.4 | 13 | 146.4 | 139.4 |
| 4 | 54.6 | 47.6 | 14 | 156.6 | 149.6 |
| 5 | 64.8 | 57.8 | 15 | 166.8 | 159.8 |
| 6 | 75 | 68 | 16 | 177 | 170 |
| 7 | 85.2 | 78.2 | 17 | 187.2 | 180.2 |
| 8 | 95.4 | 88.4 | 18 | 197.4 | 190.4 |
| 9 | 105.6 | 98.6 | 19 | 207.6 | 200.6 |
| 10 | 115.8 | 108.8 | 20 | 217.8 | 210.8 |
| 11 | 126 | 119 | — | — | — |

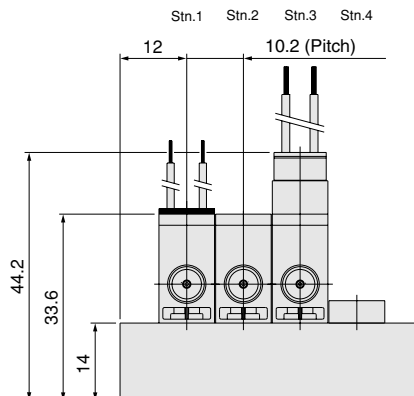


G010M□F (1(P), 3(R) port: M5×0.8)



Unit dimensions

| | | mm | | | |
|-----------------|-------|-------|-----------------|-------|-------|
| Number of units | L | P | Number of units | L | P |
| 2 | 34.2 | 27.2 | 12 | 136.2 | 129.2 |
| 3 | 44.4 | 37.4 | 13 | 146.4 | 139.4 |
| 4 | 54.6 | 47.6 | 14 | 156.6 | 149.6 |
| 5 | 64.8 | 57.8 | 15 | 166.8 | 159.8 |
| 6 | 75 | 68 | 16 | 177 | 170 |
| 7 | 85.2 | 78.2 | 17 | 187.2 | 180.2 |
| 8 | 95.4 | 88.4 | 18 | 197.4 | 190.4 |
| 9 | 105.6 | 98.6 | 19 | 207.6 | 200.6 |
| 10 | 115.8 | 108.8 | 20 | 217.8 | 210.8 |
| 11 | 126 | 119 | — | — | — |



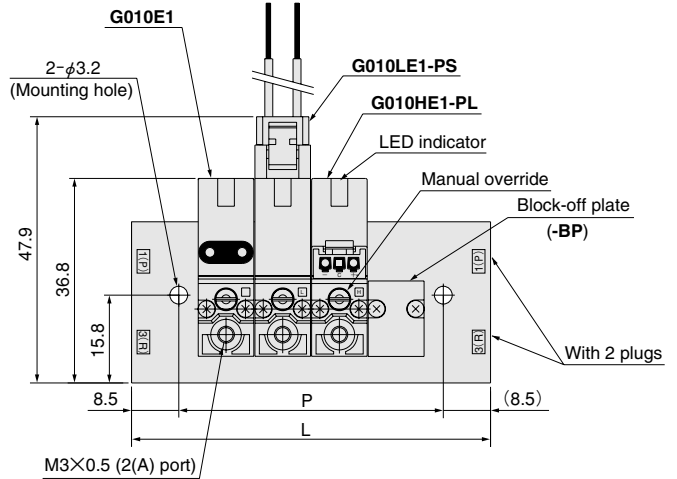
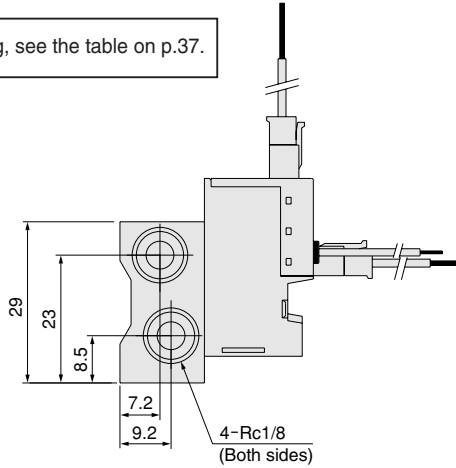
For optional wiring, see p.50.

Dimensions of F Type Manifold (for Direct Piping with Positive Pressure Solenoid Valves) (mm)

G010MH□F (1(P), 3(R) port: Rc1/8)



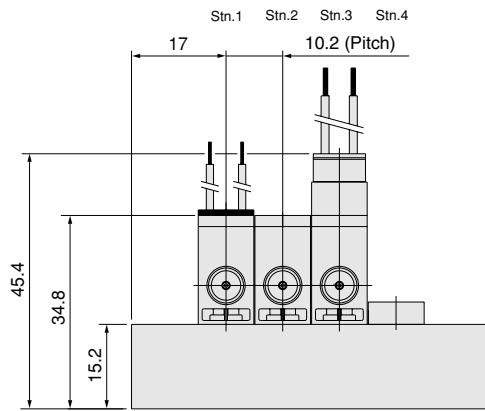
For the piping, see the table on p.37.



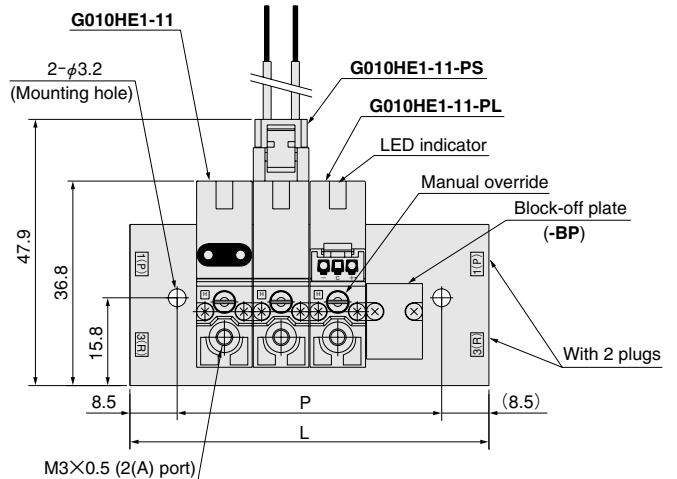
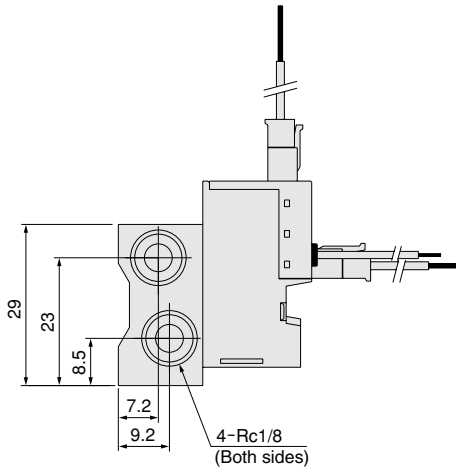
Unit dimensions

mm

| Number of units | L | P | Number of units | L | P |
|-----------------|-------|-------|-----------------|-------|-------|
| 2 | 44.2 | 27.2 | 12 | 146.2 | 129.2 |
| 3 | 54.4 | 37.4 | 13 | 156.4 | 139.4 |
| 4 | 64.6 | 47.6 | 14 | 166.6 | 149.6 |
| 5 | 74.8 | 57.8 | 15 | 176.8 | 159.8 |
| 6 | 85 | 68 | 16 | 187 | 170 |
| 7 | 95.2 | 78.2 | 17 | 197.2 | 180.2 |
| 8 | 105.4 | 88.4 | 18 | 207.4 | 190.4 |
| 9 | 115.6 | 98.6 | 19 | 217.6 | 200.6 |
| 10 | 125.8 | 108.8 | 20 | 227.8 | 210.8 |
| 11 | 136 | 119 | — | — | — |



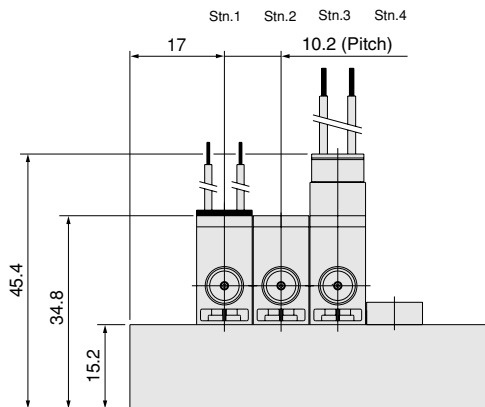
G010MH□F (1(P), 3(R) port: Rc1/8)



Unit dimensions

mm

| Number of units | L | P | Number of units | L | P |
|-----------------|-------|-------|-----------------|-------|-------|
| 2 | 44.2 | 27.2 | 12 | 146.2 | 129.2 |
| 3 | 54.4 | 37.4 | 13 | 156.4 | 139.4 |
| 4 | 64.6 | 47.6 | 14 | 166.6 | 149.6 |
| 5 | 74.8 | 57.8 | 15 | 176.8 | 159.8 |
| 6 | 85 | 68 | 16 | 187 | 170 |
| 7 | 95.2 | 78.2 | 17 | 197.2 | 180.2 |
| 8 | 105.4 | 88.4 | 18 | 207.4 | 190.4 |
| 9 | 115.6 | 98.6 | 19 | 217.6 | 200.6 |
| 10 | 125.8 | 108.8 | 20 | 227.8 | 210.8 |
| 11 | 136 | 119 | — | — | — |



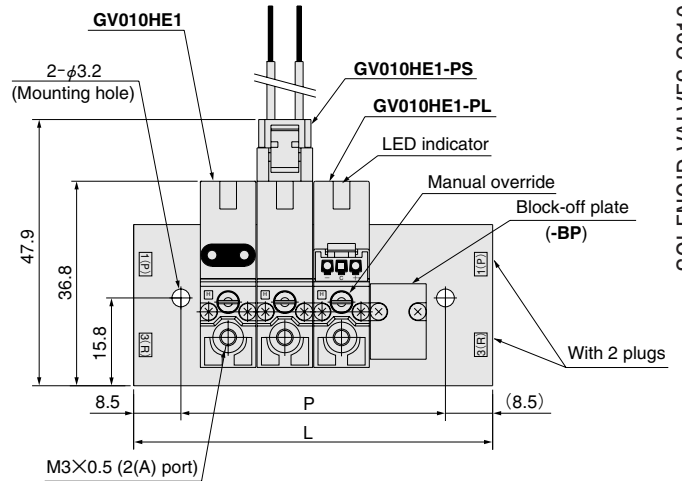
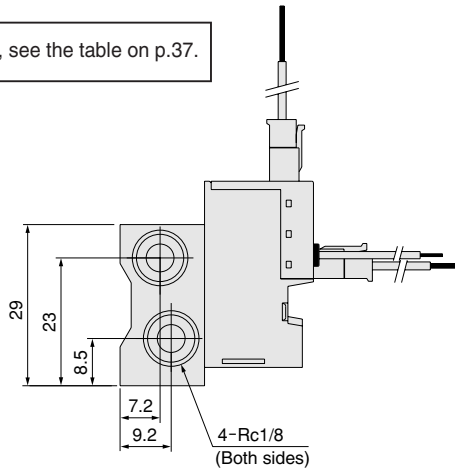
For optional wiring, see p.50.

Dimensions of F type Manifold (for Direct Piping with Vacuum Solenoid Valves) (mm)

G010MH□F (1(P), 3(R) port: Rc1/8)



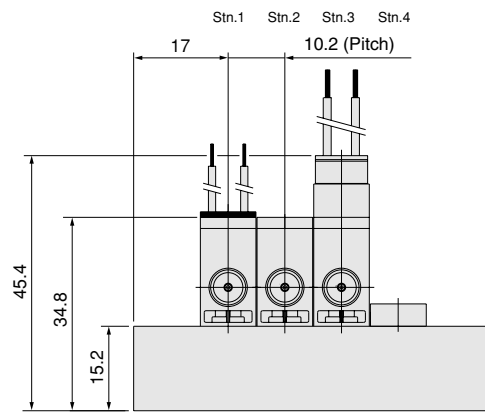
For the piping, see the table on p.37.



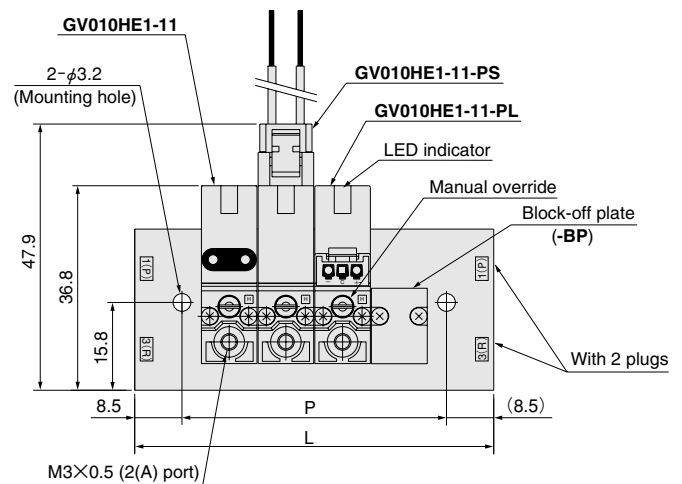
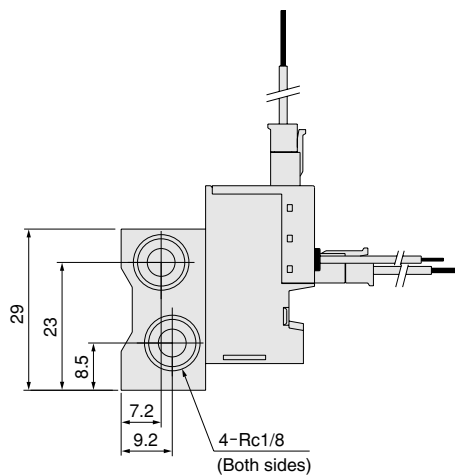
Unit dimensions

mm

| Number of units | L | P | Number of units | L | P |
|-----------------|-------|-------|-----------------|-------|-------|
| 2 | 44.2 | 27.2 | 12 | 146.2 | 129.2 |
| 3 | 54.4 | 37.4 | 13 | 156.4 | 139.4 |
| 4 | 64.6 | 47.6 | 14 | 166.6 | 149.6 |
| 5 | 74.8 | 57.8 | 15 | 176.8 | 159.8 |
| 6 | 85 | 68 | 16 | 187 | 170 |
| 7 | 95.2 | 78.2 | 17 | 197.2 | 180.2 |
| 8 | 105.4 | 88.4 | 18 | 207.4 | 190.4 |
| 9 | 115.6 | 98.6 | 19 | 217.6 | 200.6 |
| 10 | 125.8 | 108.8 | 20 | 227.8 | 210.8 |
| 11 | 136 | 119 | — | — | — |



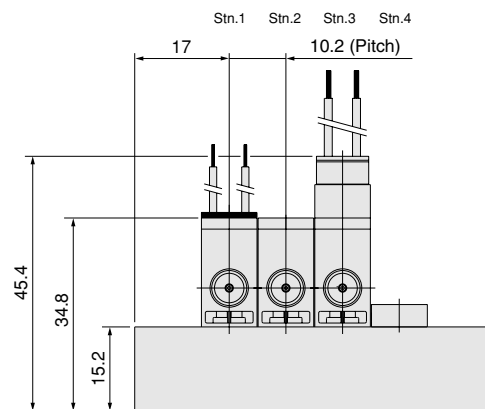
G010MH□F (1(P), 3(R) port: Rc1/8)



Unit dimensions

mm

| Number of units | L | P | Number of units | L | P |
|-----------------|-------|-------|-----------------|-------|-------|
| 2 | 44.2 | 27.2 | 12 | 146.2 | 129.2 |
| 3 | 54.4 | 37.4 | 13 | 156.4 | 139.4 |
| 4 | 64.6 | 47.6 | 14 | 166.6 | 149.6 |
| 5 | 74.8 | 57.8 | 15 | 176.8 | 159.8 |
| 6 | 85 | 68 | 16 | 187 | 170 |
| 7 | 95.2 | 78.2 | 17 | 197.2 | 180.2 |
| 8 | 105.4 | 88.4 | 18 | 207.4 | 190.4 |
| 9 | 115.6 | 98.6 | 19 | 217.6 | 200.6 |
| 10 | 125.8 | 108.8 | 20 | 227.8 | 210.8 |
| 11 | 136 | 119 | — | — | — |



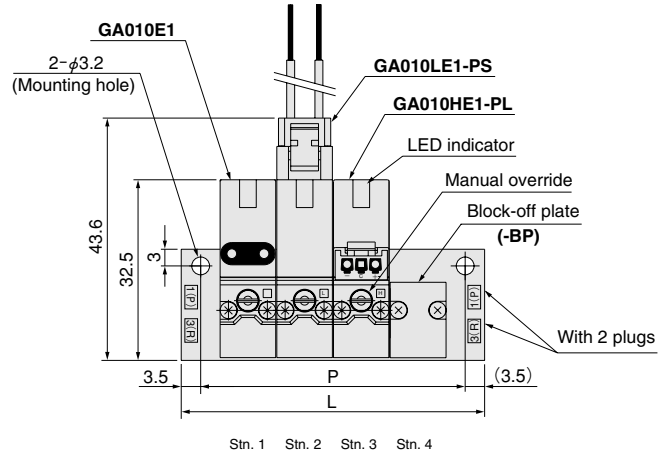
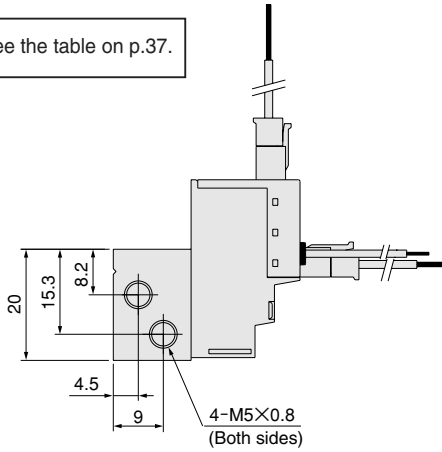
For optional wiring, see p.50.

Dimensions of A Type Manifold (for Manifold Piping with Positive Pressure Solenoid Valves) (mm)

G010M□A (1(P), 3(R) port: M5×0.8)

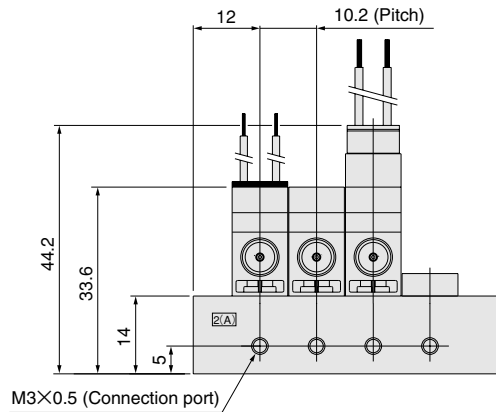


For the piping, see the table on p.37.

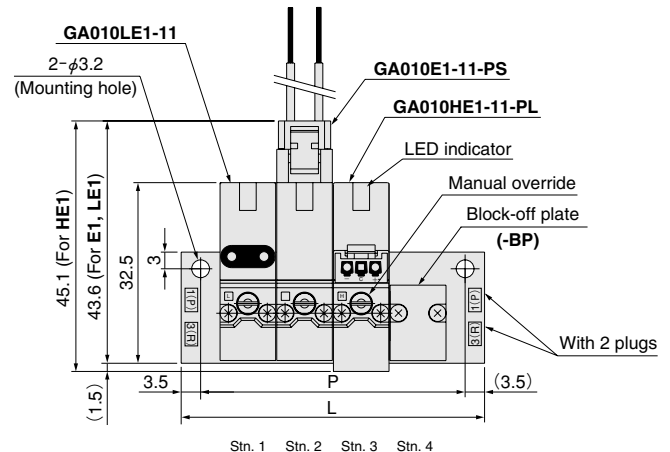
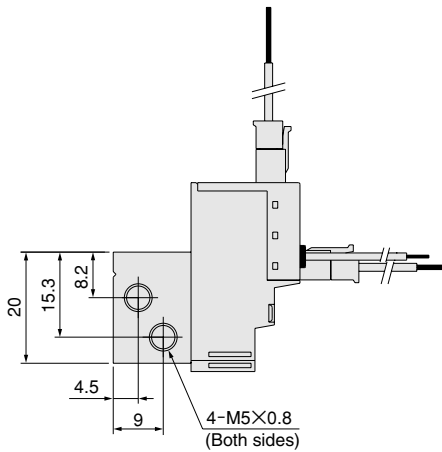


Unit dimensions

| | | mm | | | |
|-----------------|-------|-------|-----------------|-------|-------|
| Number of units | L | P | Number of units | L | P |
| 2 | 34.2 | 27.2 | 12 | 136.2 | 129.2 |
| 3 | 44.4 | 37.4 | 13 | 146.4 | 139.4 |
| 4 | 54.6 | 47.6 | 14 | 156.6 | 149.6 |
| 5 | 64.8 | 57.8 | 15 | 166.8 | 159.8 |
| 6 | 75 | 68 | 16 | 177 | 170 |
| 7 | 85.2 | 78.2 | 17 | 187.2 | 180.2 |
| 8 | 95.4 | 88.4 | 18 | 197.4 | 190.4 |
| 9 | 105.6 | 98.6 | 19 | 207.6 | 200.6 |
| 10 | 115.8 | 108.8 | 20 | 217.8 | 210.8 |
| 11 | 126 | 119 | — | — | — |

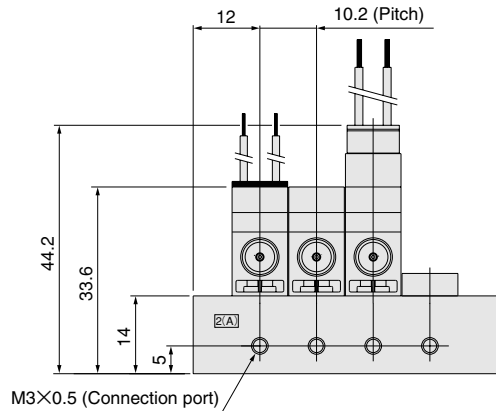


G010M□A (1(P), 3(R) port: M5×0.8)



Unit dimensions

| | | mm | | | |
|-----------------|-------|-------|-----------------|-------|-------|
| Number of units | L | P | Number of units | L | P |
| 2 | 34.2 | 27.2 | 12 | 136.2 | 129.2 |
| 3 | 44.4 | 37.4 | 13 | 146.4 | 139.4 |
| 4 | 54.6 | 47.6 | 14 | 156.6 | 149.6 |
| 5 | 64.8 | 57.8 | 15 | 166.8 | 159.8 |
| 6 | 75 | 68 | 16 | 177 | 170 |
| 7 | 85.2 | 78.2 | 17 | 187.2 | 180.2 |
| 8 | 95.4 | 88.4 | 18 | 197.4 | 190.4 |
| 9 | 105.6 | 98.6 | 19 | 207.6 | 200.6 |
| 10 | 115.8 | 108.8 | 20 | 217.8 | 210.8 |
| 11 | 126 | 119 | — | — | — |



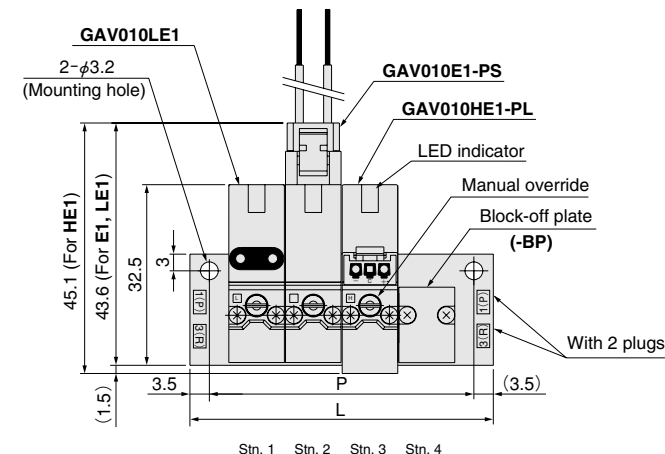
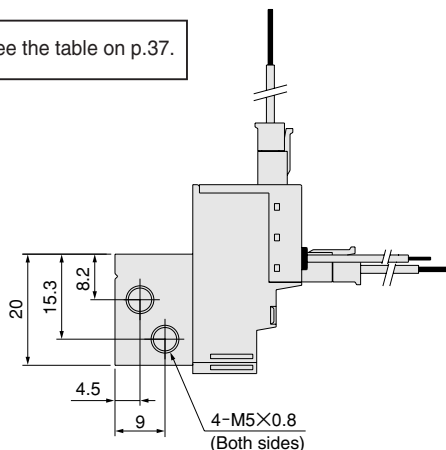
For optional wiring, see p.50.

Dimensions of A Type Manifold (for Manifold Piping with Vacuum Solenoid Valves) (mm)

G010M□A (1(P), 3(R) port: M5×0.8)

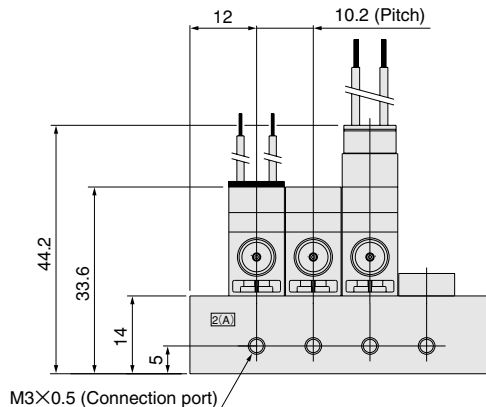


For the piping, see the table on p.37.

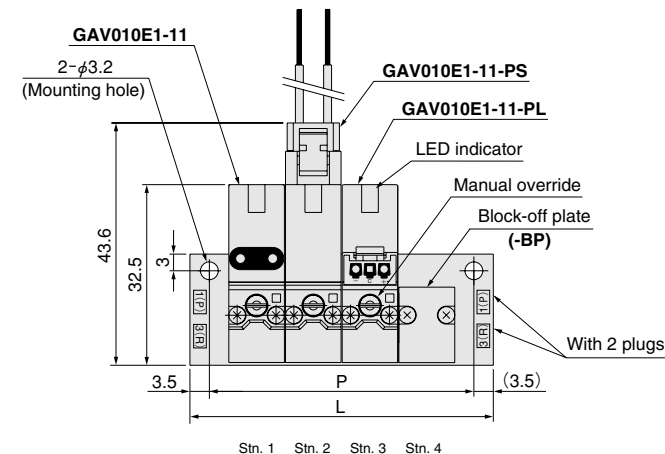
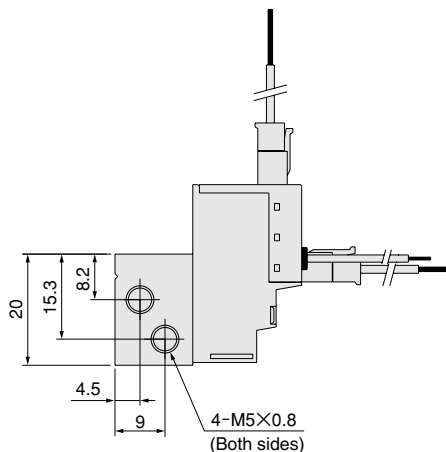


Unit dimensions

| | | mm | | | |
|-----------------|-------|-------|-----------------|-------|-------|
| Number of units | L | P | Number of units | L | P |
| 2 | 34.2 | 27.2 | 12 | 136.2 | 129.2 |
| 3 | 44.4 | 37.4 | 13 | 146.4 | 139.4 |
| 4 | 54.6 | 47.6 | 14 | 156.6 | 149.6 |
| 5 | 64.8 | 57.8 | 15 | 166.8 | 159.8 |
| 6 | 75 | 68 | 16 | 177 | 170 |
| 7 | 85.2 | 78.2 | 17 | 187.2 | 180.2 |
| 8 | 95.4 | 88.4 | 18 | 197.4 | 190.4 |
| 9 | 105.6 | 98.6 | 19 | 207.6 | 200.6 |
| 10 | 115.8 | 108.8 | 20 | 217.8 | 210.8 |
| 11 | 126 | 119 | — | — | — |

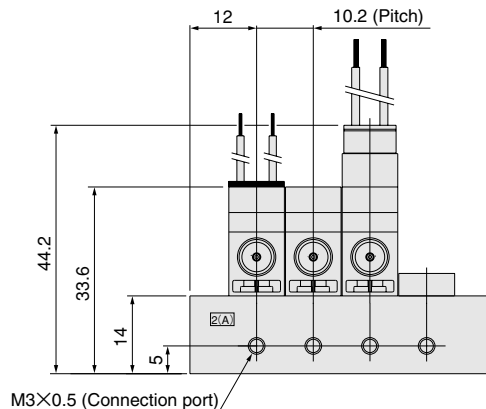


G010M□A (1(P), 3(R) port: M5×0.8)



Unit dimensions

| | | mm | | | |
|-----------------|-------|-------|-----------------|-------|-------|
| Number of units | L | P | Number of units | L | P |
| 2 | 34.2 | 27.2 | 12 | 136.2 | 129.2 |
| 3 | 44.4 | 37.4 | 13 | 146.4 | 139.4 |
| 4 | 54.6 | 47.6 | 14 | 156.6 | 149.6 |
| 5 | 64.8 | 57.8 | 15 | 166.8 | 159.8 |
| 6 | 75 | 68 | 16 | 177 | 170 |
| 7 | 85.2 | 78.2 | 17 | 187.2 | 180.2 |
| 8 | 95.4 | 88.4 | 18 | 197.4 | 190.4 |
| 9 | 105.6 | 98.6 | 19 | 207.6 | 200.6 |
| 10 | 115.8 | 108.8 | 20 | 217.8 | 210.8 |
| 11 | 126 | 119 | — | — | — |



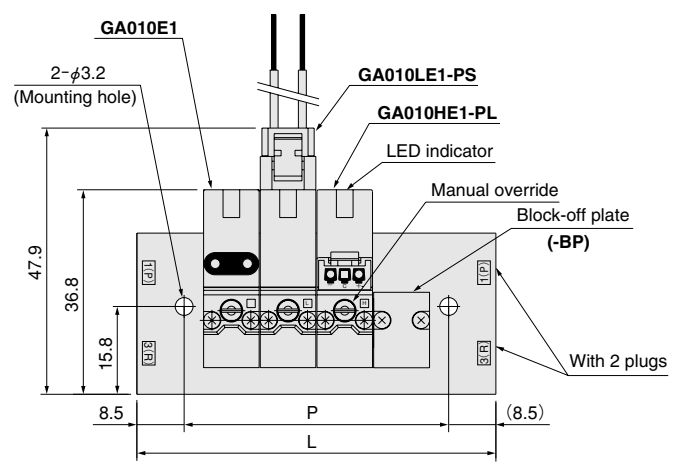
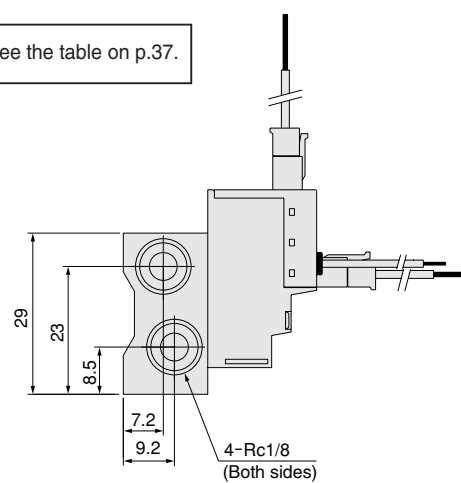
For optional wiring, see p.50.

Dimensions of A Type Manifold (for Manifold Piping with Positive Pressure Solenoid Valves) (mm)

G010MH□A (1(P), 3(R) port: Rc1/8)

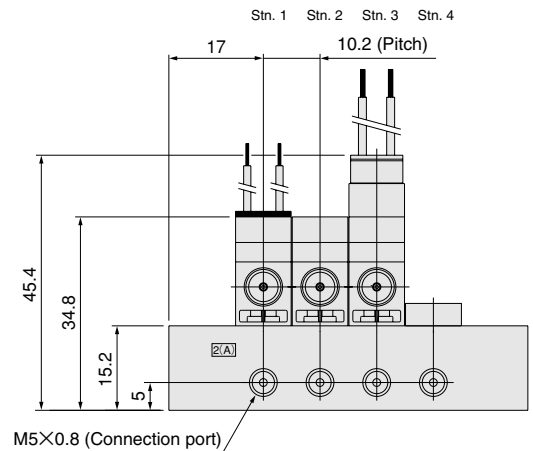


For the piping, see the table on p.37.

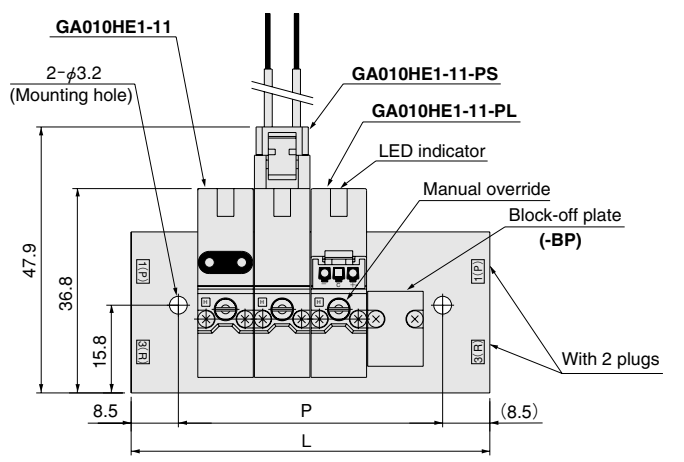
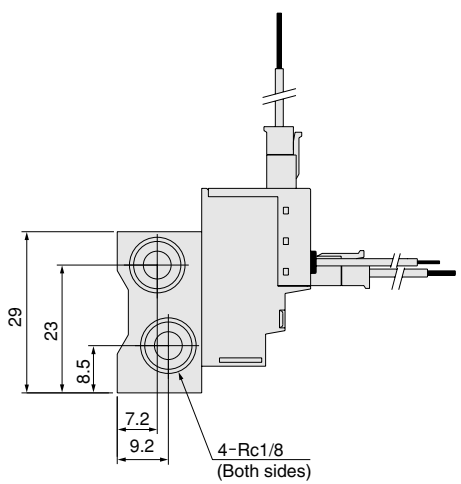


Unit dimensions

| | | mm | | | |
|-----------------|-------|-------|-----------------|-------|-------|
| Number of units | L | P | Number of units | L | P |
| 2 | 44.2 | 27.2 | 12 | 146.2 | 129.2 |
| 3 | 54.4 | 37.4 | 13 | 156.4 | 139.4 |
| 4 | 64.6 | 47.6 | 14 | 166.6 | 149.6 |
| 5 | 74.8 | 57.8 | 15 | 176.8 | 159.8 |
| 6 | 85 | 68 | 16 | 187 | 170 |
| 7 | 95.2 | 78.2 | 17 | 197.2 | 180.2 |
| 8 | 105.4 | 88.4 | 18 | 207.4 | 190.4 |
| 9 | 115.6 | 98.6 | 19 | 217.6 | 200.6 |
| 10 | 125.8 | 108.8 | 20 | 227.8 | 210.8 |
| 11 | 136 | 119 | — | — | — |

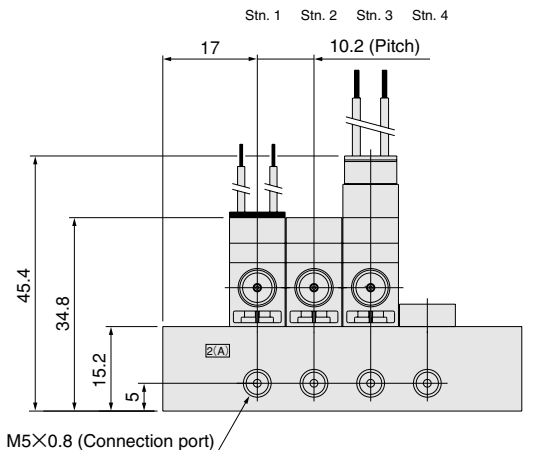


G010MH□A (1(P), 3(R) port: Rc1/8)



Unit dimensions

| | | mm | | | |
|-----------------|-------|-------|-----------------|-------|-------|
| Number of units | L | P | Number of units | L | P |
| 2 | 44.2 | 27.2 | 12 | 146.2 | 129.2 |
| 3 | 54.4 | 37.4 | 13 | 156.4 | 139.4 |
| 4 | 64.6 | 47.6 | 14 | 166.6 | 149.6 |
| 5 | 74.8 | 57.8 | 15 | 176.8 | 159.8 |
| 6 | 85 | 68 | 16 | 187 | 170 |
| 7 | 95.2 | 78.2 | 17 | 197.2 | 180.2 |
| 8 | 105.4 | 88.4 | 18 | 207.4 | 190.4 |
| 9 | 115.6 | 98.6 | 19 | 217.6 | 200.6 |
| 10 | 125.8 | 108.8 | 20 | 227.8 | 210.8 |
| 11 | 136 | 119 | — | — | — |



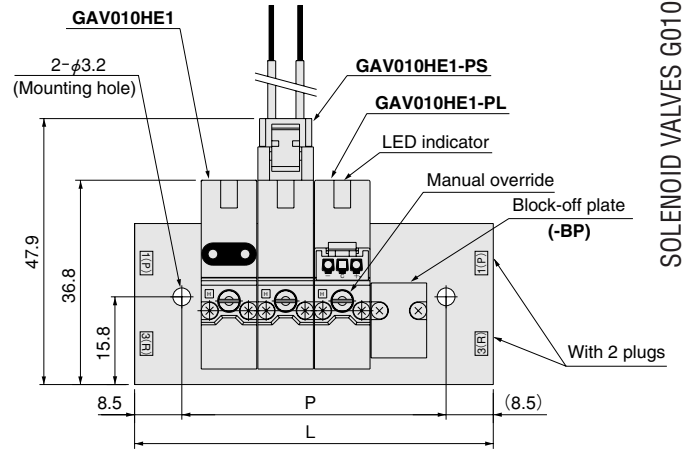
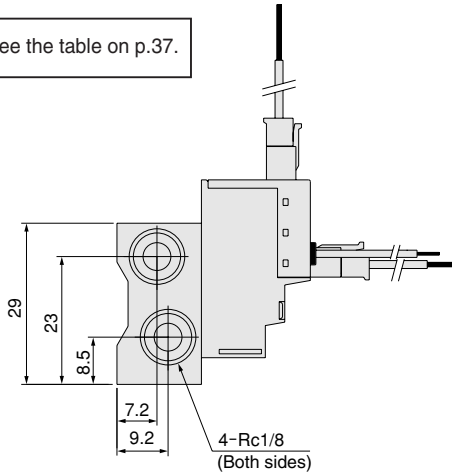
For optional wiring, see p.50.

Dimensions of A Type Manifold (for Manifold Piping with Vacuum Solenoid Valves) (mm)

G010MH□A (1(P), 3(R) port: Rc1/8)

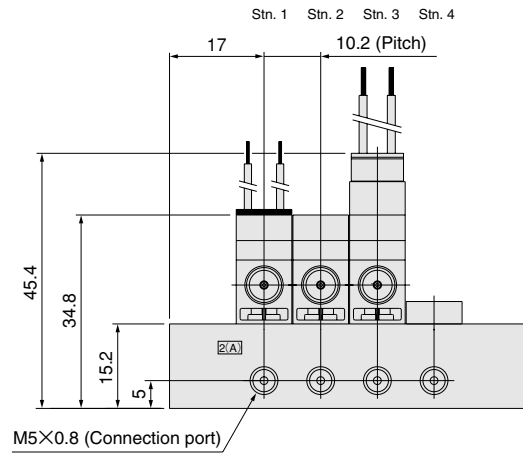


For the piping, see the table on p.37.

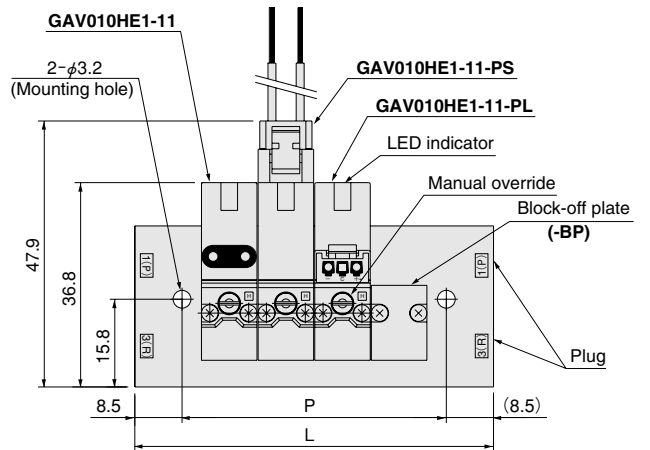
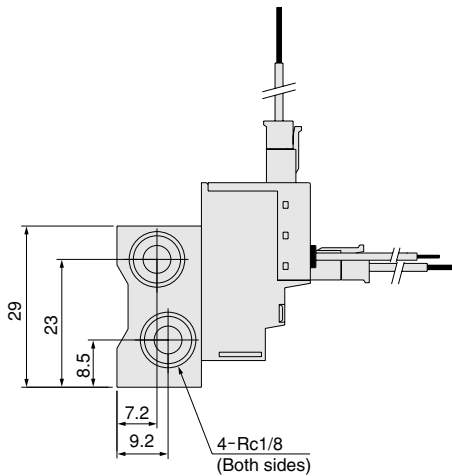


Unit dimensions

| | | mm | | | |
|-----------------|-------|-------|-----------------|-------|-------|
| Number of units | L | P | Number of units | L | P |
| 2 | 44.2 | 27.2 | 12 | 146.2 | 129.2 |
| 3 | 54.4 | 37.4 | 13 | 156.4 | 139.4 |
| 4 | 64.6 | 47.6 | 14 | 166.6 | 149.6 |
| 5 | 74.8 | 57.8 | 15 | 176.8 | 159.8 |
| 6 | 85 | 68 | 16 | 187 | 170 |
| 7 | 95.2 | 78.2 | 17 | 197.2 | 180.2 |
| 8 | 105.4 | 88.4 | 18 | 207.4 | 190.4 |
| 9 | 115.6 | 98.6 | 19 | 217.6 | 200.6 |
| 10 | 125.8 | 108.8 | 20 | 227.8 | 210.8 |
| 11 | 136 | 119 | — | — | — |

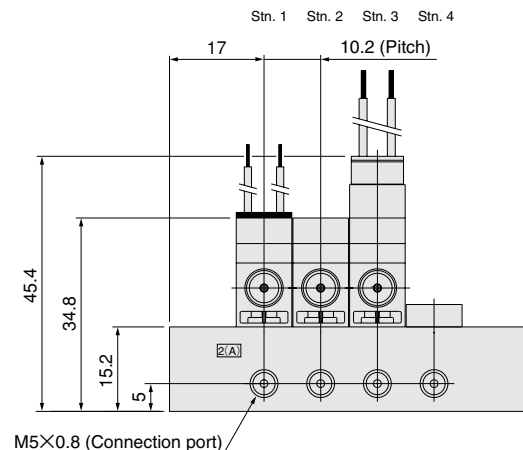


G010MH□A (1(P), 3(R) port: Rc1/8)



Unit dimensions

| | | mm | | | |
|-----------------|-------|-------|-----------------|-------|-------|
| Number of units | L | P | Number of units | L | P |
| 2 | 44.2 | 27.2 | 12 | 146.2 | 129.2 |
| 3 | 54.4 | 37.4 | 13 | 156.4 | 139.4 |
| 4 | 64.6 | 47.6 | 14 | 166.6 | 149.6 |
| 5 | 74.8 | 57.8 | 15 | 176.8 | 159.8 |
| 6 | 85 | 68 | 16 | 187 | 170 |
| 7 | 95.2 | 78.2 | 17 | 197.2 | 180.2 |
| 8 | 105.4 | 88.4 | 18 | 207.4 | 190.4 |
| 9 | 115.6 | 98.6 | 19 | 217.6 | 200.6 |
| 10 | 125.8 | 108.8 | 20 | 227.8 | 210.8 |
| 11 | 136 | 119 | — | — | — |



For optional wiring, see p.50.