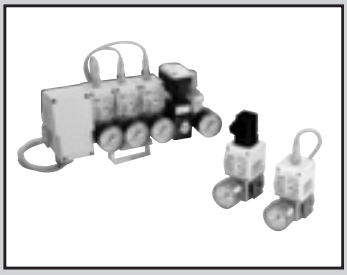


Contact confirmation switch (gap switch)

GPS2/MGPS2/UGPS2 Series

RoHS

Overview

The GPS2 Series gap switch is an air sensor used to confirm the workpiece seating and clamping contacts. While retaining the features of the conventional GPS Series, a modular unit has been realized by incorporating a joiner connection structure, and the body strength has been increased by using aluminum die-cast.

Features

● High stability

Air bridge circuit prevents the effect of fluctuations in the supply pressure.

● Easy adjustment

The sensitivity can be easily adjusted with the scale on the sensitivity adjustment dial.

● Non-contact detection

A non-contact measurement is taken, and so the product is not directly touched. Detection is possible without damaging valuable products.

● Energy saving

The air consumption rate can be suppressed since this can be used with a working pressure of 0.03 MPa.

● High precision

● Modularization

By incorporating a joiner connection, GPS2 units can be connected together, and can also be connected easily to the CKD regulator or filter.

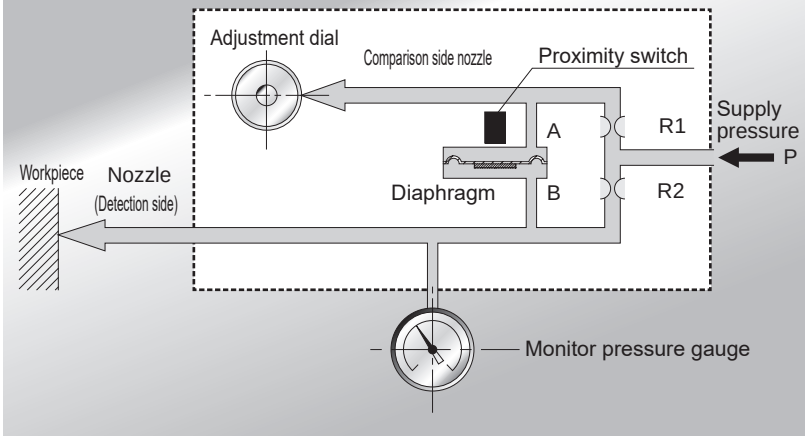
● Robustness

The body strength has been increased by using aluminum die-cast.

● Environmental resistance

The product can be used in environments where water, etc., may splash, as it has degree of protection IP67 (connector) equivalent.

● Gap switch principle drawing



Operational explanation

The air pressurized into port P passes through orifice R1 and R2 of the air bridge circuit, and flows to the nozzles on the comparison side and on the detection side. When the detection side nozzle clearance becomes smaller than the clearance set with the adjustment dial in the comparison side nozzle, a back pressure reverses and presses up the diaphragm. This activates the proximity switch and generates an electric signal.

Contact confirmation switch (gap switch) single unit

GPS2 Series

● Port size: Rc1/8 ● Nozzle diameter: ø1.5

Specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Item			GPS2-05-15	GPS2-07-15
Working fluid			Compressed clean air (lubrication not possible)	
Working pressure (*2) kPa			30 (≈4.4 psi, 0.3 bar) to 200 (≈29 psi, 2 bar)	50 (≈7.3 psi, 0.5 bar) to 200 (≈29 psi, 2 bar)
Detection range scale mm			0.03 to 0.25	0.03 to 0.4
Repeatability mm			±0.01 (detection range scale 0.03 to 0.1 mm)	
Hysteresis mm			0.01 or less (detection range scale 0.03 to 0.1 mm)	
Detection nozzle (*1)			Single hole nozzle ø1.5 standard (ø1, ø2)	
Power supply voltage V			10.2 to 26.4 VDC	
Current consumption mA			15 or less (when using 24 VDC)	
Output style			NPN, PNP open collector	
Output rating			30 VDC, 100 mA or less	
Internal voltage drop V			2.0 or less (using 100 mA)	
Indicator lamp			LED green or yellow	
Insulation resistance			10 MΩ and over at 500 VDC megger	
Withstand voltage			No failure impressed at 1000 VAC for one minute	
Vibration resistance m/s^2			98	
Ambient temperature °C			5 (41°F) to 60 (140°F)	
Degree of protection (*3)			IP67 equivalent (connector), IP64 equivalent (DIN terminal box)	
Connection tube mm			Inner diameter 4	
Port size			Detection port Rc1/8, supply port Rc1/4, pressure gauge port Rc1/4	
Weight g			290 (electric connection option C0)	
Air consumption ℓ/min (ANR)	Working press	50 kPa	6 or less	11 or less
		100 kPa	9 or less	15 or less
		200 kPa	14 or less	24 or less

*1: The above specifications apply to the ø1.5 single-hole detection nozzle.
*2: If the nozzle clogs, working pressure should be set between 100 and 200 kPa.
*3: This product must be used under the following conditions:
(1) Piping and wiring must be completed and pressure applied. (2) A waterproof bushing must be used on the wires to the terminal box. (3) A dial cover with lock must be provided and the cover screw must be tightened.

How to order

GPS2 - 07 - 15 - N G TL - B - G2

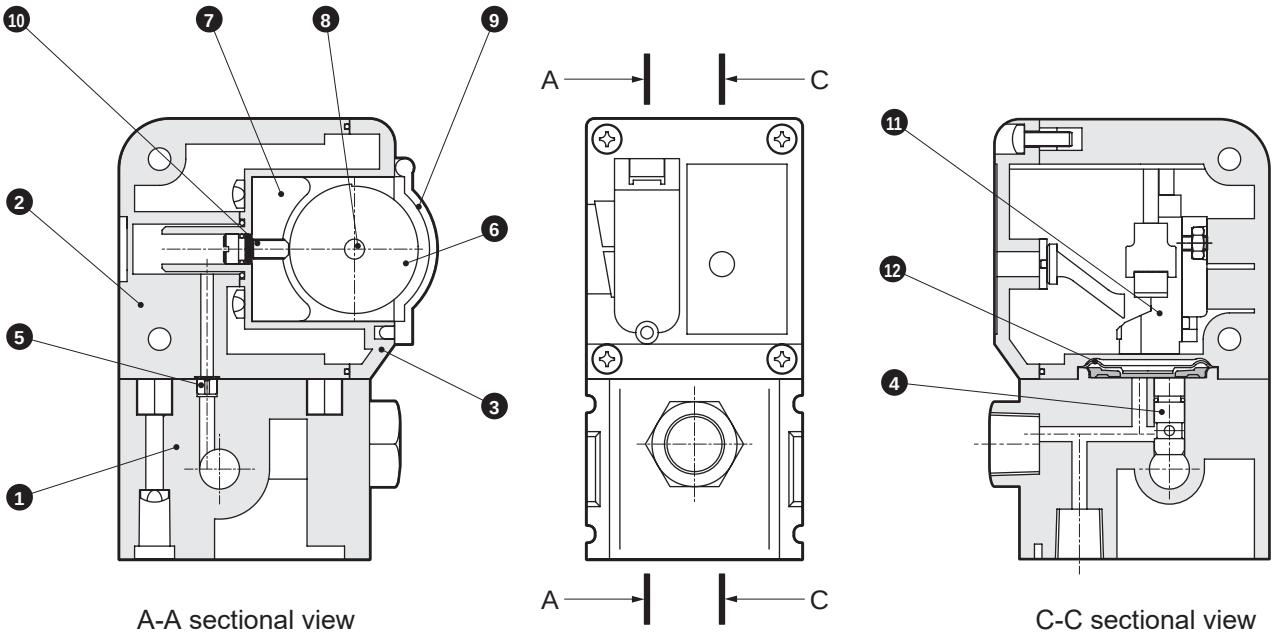
- GPS2: Gap switch
- A Orifice size: 07
- B Setting type: 15
- C Output style: N
- D Light color: G
- E Electric connection option: TL
- F Attachments and others: B
- G Pressure gauge: G2

Code	Description
A Orifice size	
05	ø0.5
07	ø0.7
B Setting type	
15	Dial detection nozzle diameter
C Output style	
N	NPN open collector
P	PNP open collector
D Light color	
G	Green
Y	Yellow
E Electric connection option	
F	DIN terminal box (Pg11)
C0	Connector (without cable)
C1	Connector (cable 1 m attached)
C3	Connector (cable 3 m attached)
C5	Connector (cable 5 m attached)
CTL	Connector common terminal box left assembly
CTR	Connector common terminal box right assembly
TL	Lead wire common terminal box left assembly
TR	Lead wire common terminal box right assembly
Lead wire central terminal box expanding manifold	
R	Lead wire outlet direction right (left end for mounting)
L	Lead wire outlet direction left (right end for mounting)
W	Lead wire outlet direction both sides (intermediate for mounting)
F Attachments and others	
Blank	Without bracket
B	With bracket
L (*1)	Dial cover with lock
G Pressure gauge	
Blank	No pressure gauge
G2	Pressure gauge with safety mark included (G40D-8-P02-S501)
GW2	Pressure gauge assembly with safety mark (G40D-8-P02-S501)

⚠ Precautions for model No. selection

*1 : Select L for automobile- and processing machine-related applications.
*2 : Refer to pages 1302 to 1307 for option and model No. of related components.

Internal structure and parts list



A-A sectional view

C-C sectional view

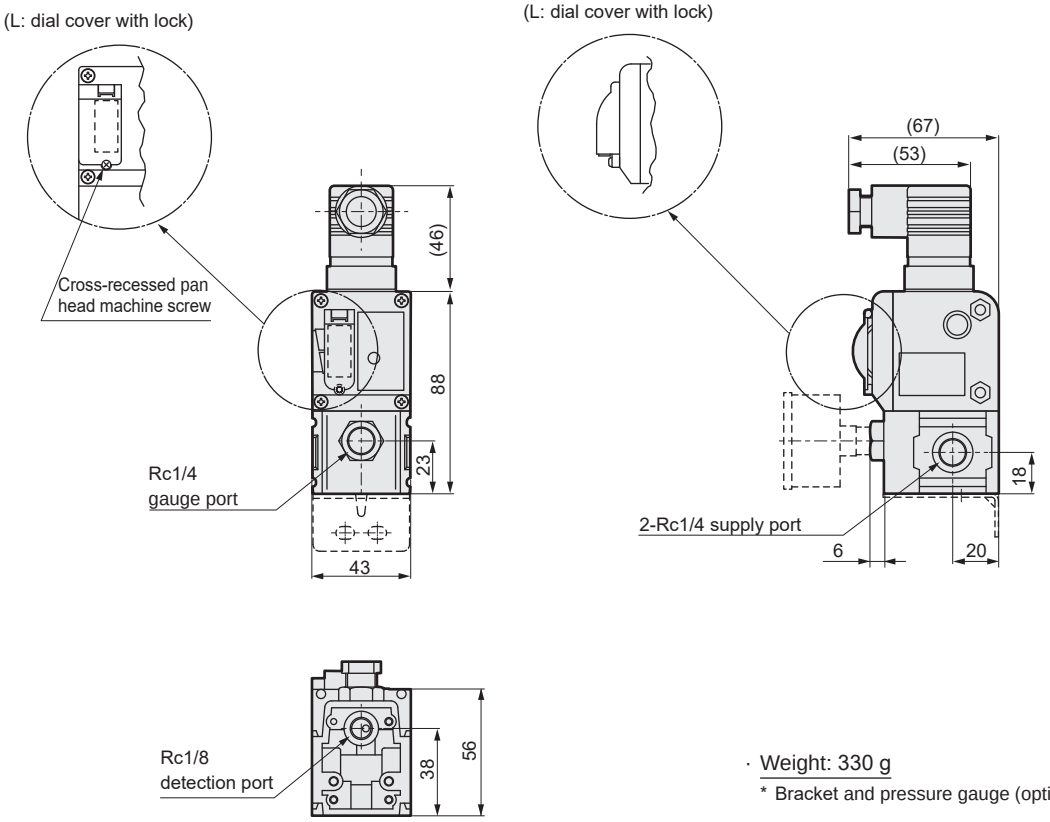
Parts list

No.	Part name	Material	No.	Part name	Material
1	Base	Aluminum	7	Dial/bracket	Aluminum
2	Body	Polybutylene terephthalate	8	Press fit pin	Stainless steel
3	Front cover	Polybutylene terephthalate	9	Dial cover	Polypropylene
4	Orifice nozzle A	Copper alloy	10	Dial nozzle	Copper alloy
5	Orifice nozzle B	Copper alloy	11	Proximity switch	-
6	Dial	Stainless steel	12	Diaphragm	HNBR

Dimensions CAD

● DIN terminal

● GPS2-*-*-**F

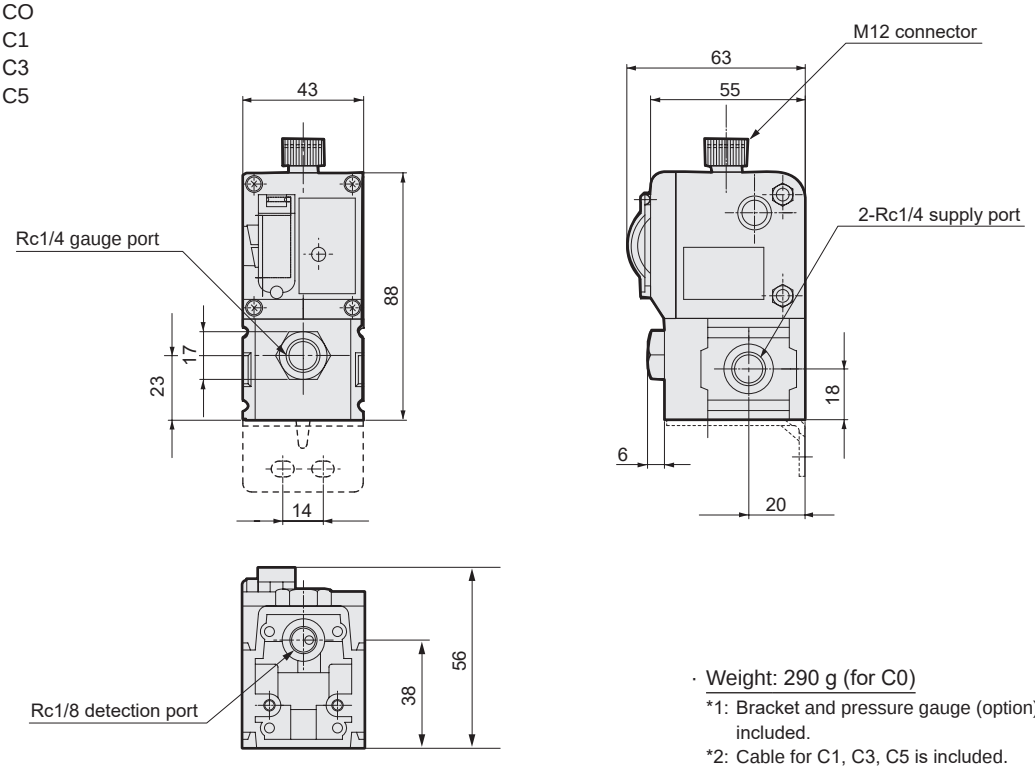


· Weight: 330 g

* Bracket and pressure gauge (option) are not included.

● Connector

● GPS2-*-*-** CO C1 C3 C5



· Weight: 290 g (for C0)

*1: Bracket and pressure gauge (option) are not included.

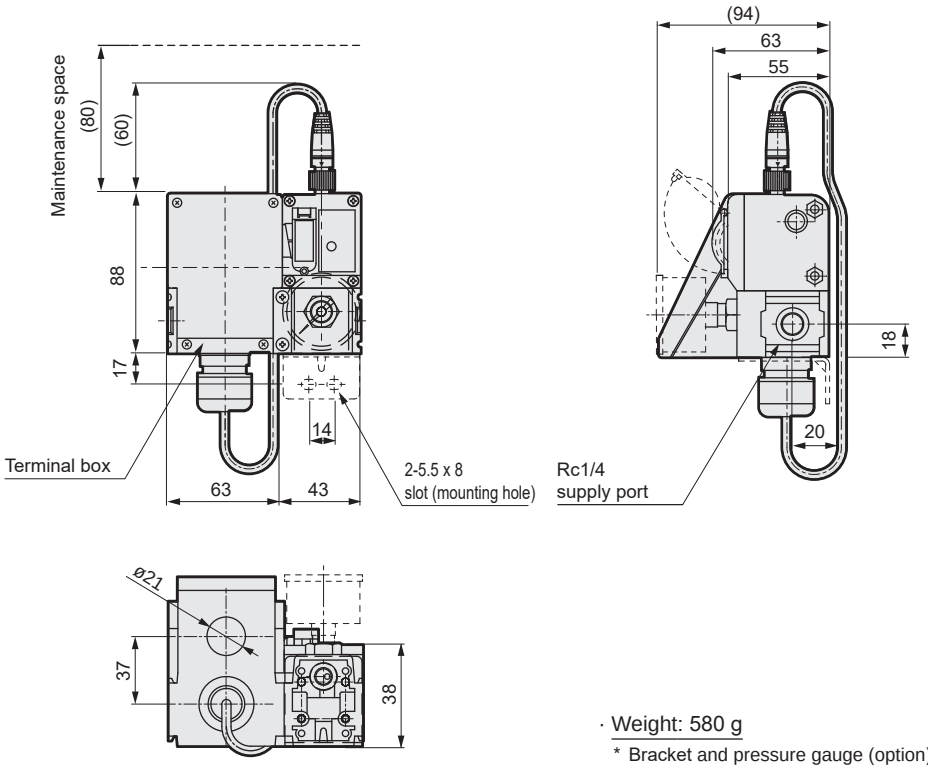
*2: Cable for C1, C3, C5 is included. (For the cable weight, refer to the option pages.)

Note) The dial cover shape differs for the dial cover with lock. Refer to above DIN terminal.

Dimensions

● Connector common terminal box

● GPS2-**-** CTL (CTR)



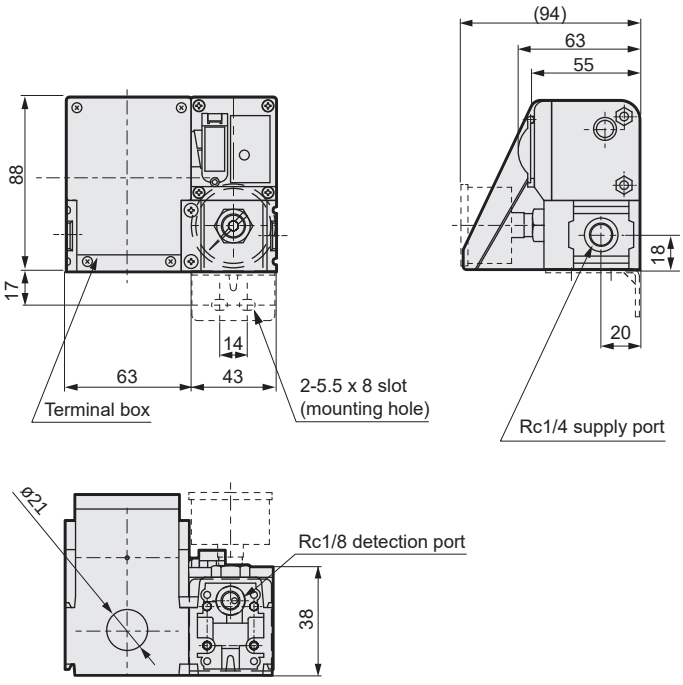
· Weight: 580 g

* Bracket and pressure gauge (option) are not included.

Note) The dial cover shape differs for the dial cover with lock. Refer to the DIN terminal box on page 1263 for shapes.

● Lead wire common terminal box

● GPS2-*-*-** TL (TR)



· Weight: 510 g

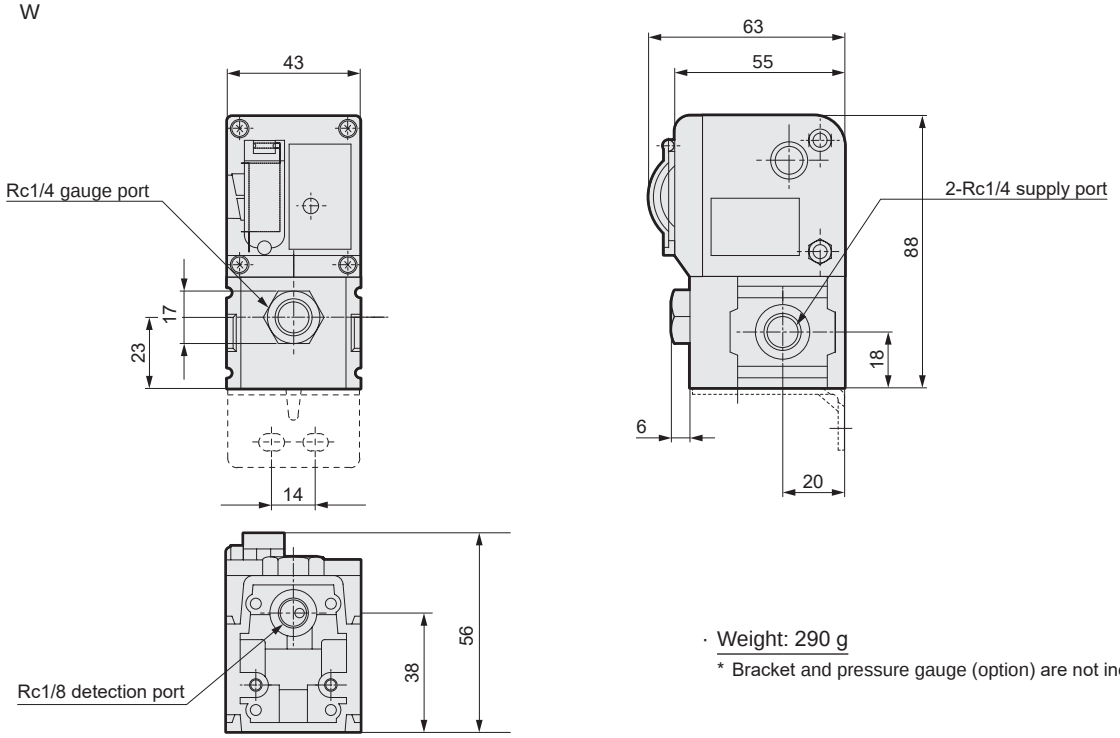
* Bracket and pressure gauge (option) are not included.

Note) The dial cover shape differs for the dial cover with lock. Refer to the DIN terminal box on page 1263 for shapes.

Dimensions CAD

● Single unit for lead wire common terminal box expanding manifold

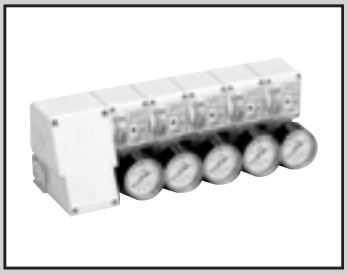
● GPS2-*-*-** R L W



· Weight: 290 g

* Bracket and pressure gauge (option) are not included.

Note) The dial cover shape differs for the dial cover with lock. Refer to the DIN terminal box on page 1263 for shapes.



Gap switch Manifold

MGPS2 Series

● Nozzle diameter: ø1.5 (standard) ● Station No.: 2 to 5 stations

Specifications

Basic specifications are the same as the single units on page 1261.

How to order gap switch manifold

MGPS2 - 07 - 15 - 2 N Y TL - B - G2

Gap switch Manifold

Ⓐ Orifice size
Ⓑ Setting type
Ⓒ Station No.
Ⓓ Output style
Ⓔ Lamp color
Ⓕ Electric connection option
Ⓖ Attachments and others
Ⓗ Pressure gauge

Code	Description
Ⓐ Orifice size	
05	ø0.5
07	ø0.7
Ⓑ Setting type	
15	Dial detection nozzle diameter
Ⓒ Station No.	
2	2 stations
3	3 stations
4	4 stations
5	5 stations
Ⓓ Output style	
N	NPN open collector
P	PNP open collector
Ⓔ Lamp color	
G	Green
Y	Yellow
Ⓕ Electric connection option	
TL	Lead wire common terminal box left assembly
TR	Lead wire common terminal box right assembly
T1	Lead wire common terminal box (1st from left)
T2	Lead wire common terminal box (2nd from left)
T3	Lead wire common terminal box (3rd from left)
T4	Lead wire common terminal box (4th from left)
CTL	Connector common terminal box left assembly
CTR	Connector common terminal box right assembly
F	DIN terminal box (Pg11)
C0	Connector (without cable)
C1	Connector (cable 1 m attached)
C3	Connector (cable 3 m attached)
C5	Connector (cable 5 m attached)
Ⓖ Attachments and others	
Blank	Without bracket
B	With bracket
L (*1)	Dial cover with lock
Ⓗ Pressure gauge	
Blank	No pressure gauge
G2	Pressure gauge with safety mark included (G40D-8-P02-S501)
GW2	Pressure gauge assembly with safety mark (G40D-8-P02-S501)

Degree of protection

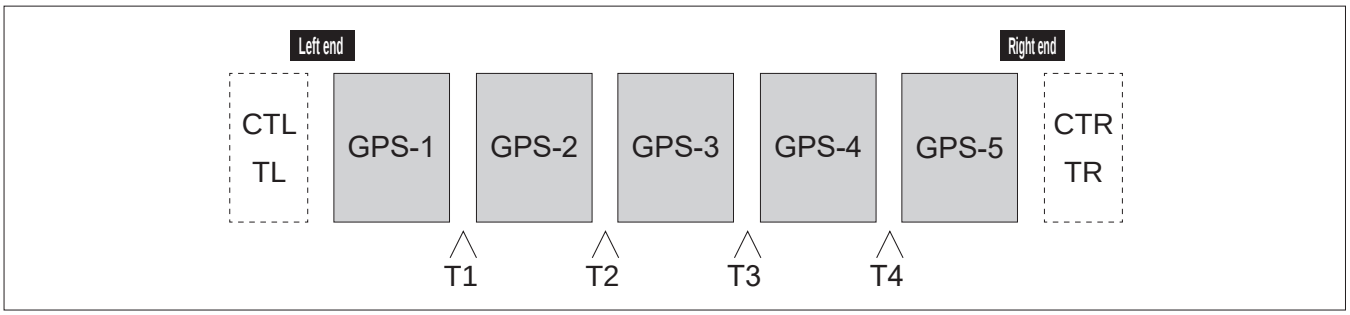
Electric connection option	Degree of protection
T *	IP66 equivalent
CT*	IP67 equivalent
F *	IP64 equivalent
C *	IP67 equivalent

Note: This product must be used under the following conditions.
(1) Piping and wiring must be completed and pressure applied.
(2) A waterproof bushing must be used on the wires to the terminal box.
(3) A dial cover with lock must be provided and the cover screw must be tightened.

⚠ Precautions for model No. selection

*1 : Select L for automobile- and processing machine-related applications.
*2: Refer to pages 1302 to 1307 for option and model No. of related components.

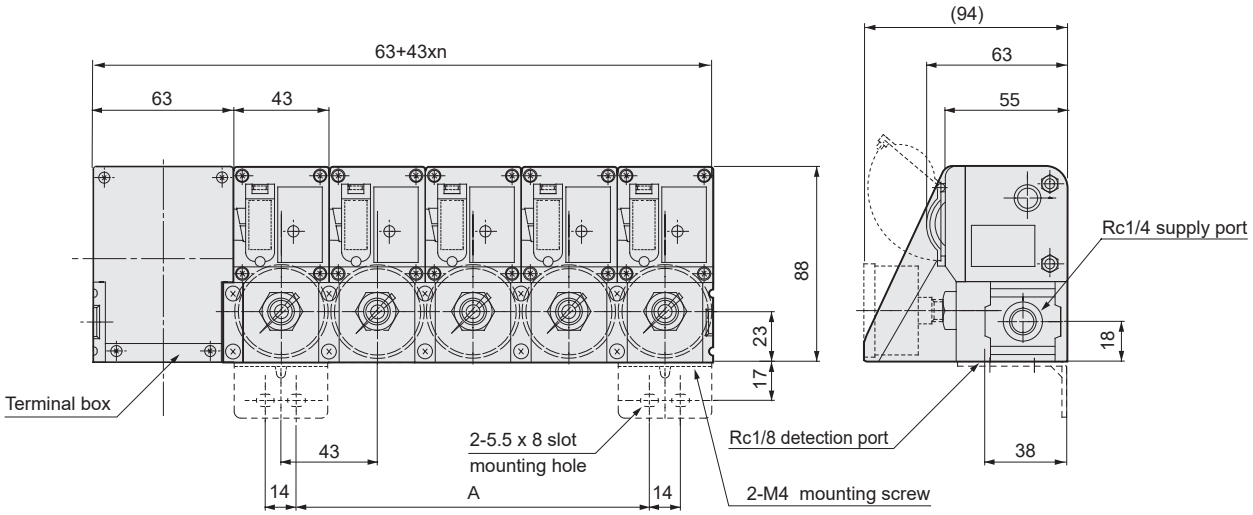
Terminal box installation position relation diagram



Dimensions CAD

● Manifold (lead wire common terminal box: TL/TR)

● MGPS2-*-*-*** TL (TR)



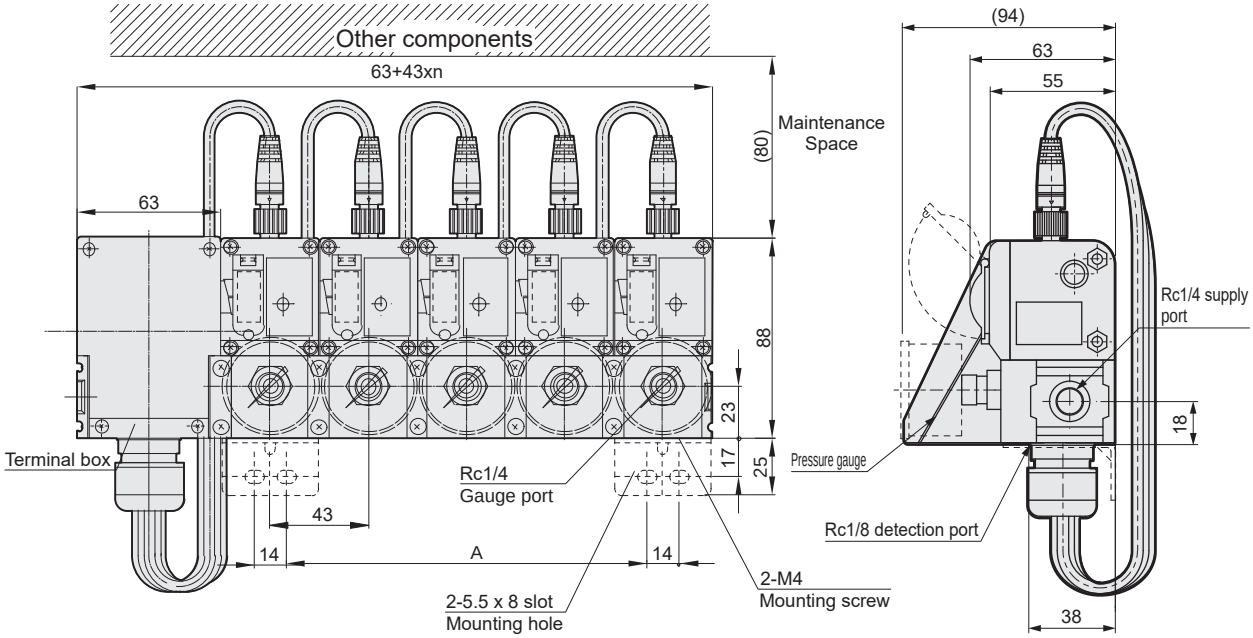
Station No.	n	A	Weight g
2 stations	2	29	820
3 stations	3	72	1130
4 stations	4	115	1440
5 stations	5	158	1750

* Bracket and pressure gauge (option) are not included.

Note) The dial cover shape differs for the dial cover with lock.
Refer to the DIN terminal box on page 1263 for shapes.

● Manifold (connector common terminal box: CTL/CTR)

● MGPS2-*-*-*** CTL (CTR)



Station No.	n	A	Weight g
2 stations	2	29	930
3 stations	3	72	1270
4 stations	4	115	1610
5 stations	5	158	1960

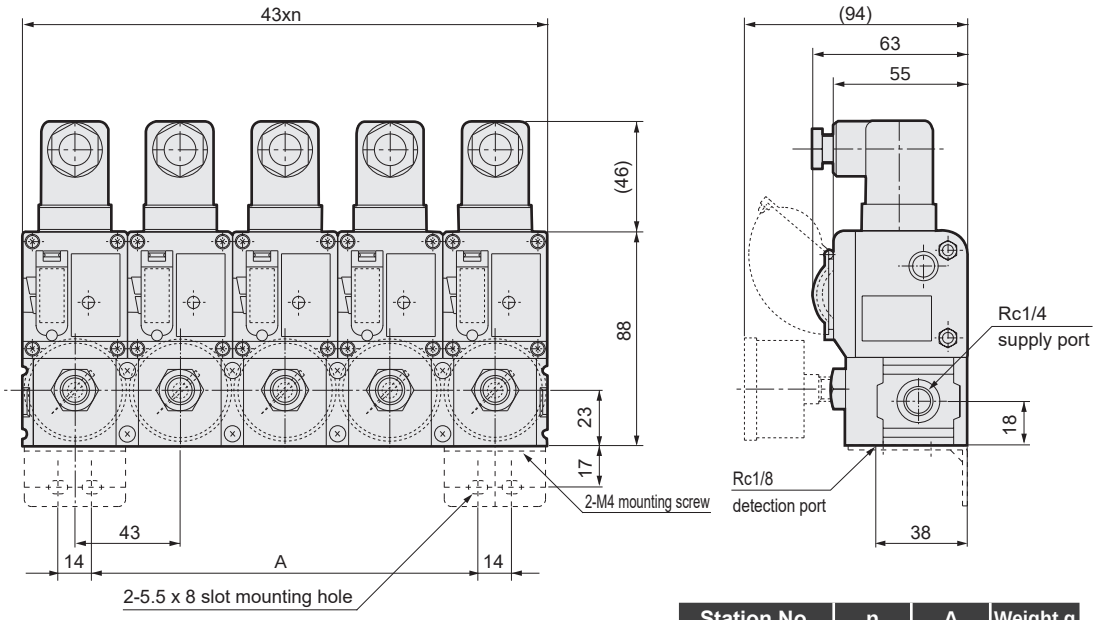
* Bracket and pressure gauge (option) are not included.

Note) The dial cover shape differs for the dial cover with lock.
Refer to the DIN terminal box on page 1263 for shapes.

Dimensions CAD

● Manifold (DIN terminal box: F)

● MGPS2-*-*-***F



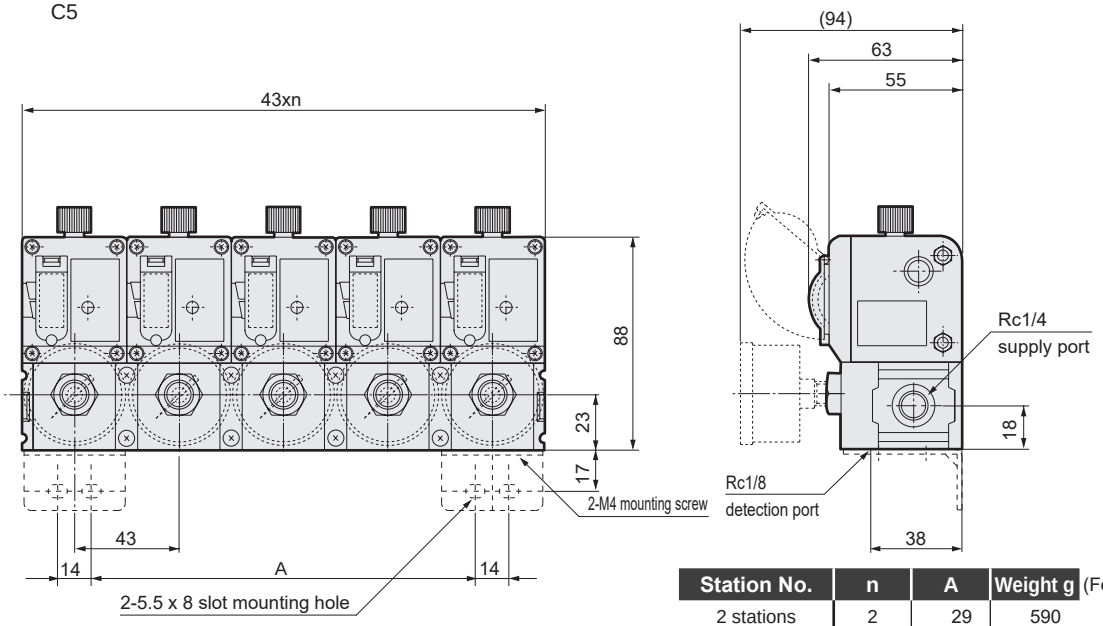
Station No.	n	A	Weight g
2 stations	2	29	680
3 stations	3	72	1020
4 stations	4	115	1360
5 stations	5	158	1700

* Bracket and pressure gauge (option) are not included.

Note) The dial cover shape differs for the dial cover with lock.
Refer to the DIN terminal box on page 1263 for shapes.

● Manifold (connector: C*)

● MGPS2-*-*-*** C0 C1 C3 C5



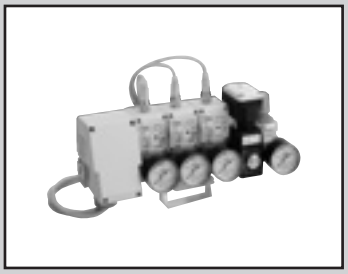
Station No.	n	A	Weight g (For C0)
2 stations	2	29	590
3 stations	3	72	880
4 stations	4	115	1180
5 stations	5	158	1480

*1: Bracket and pressure gauge (option) are not included.
*2: Cable for C1, C3, C5 is included.
(For the cable weight, refer to the option pages.)

Note) The dial cover shape differs for the dial cover with lock.
Refer to the DIN terminal box on page 1263 for shapes.

* Refer to pages 1302 to 1307 for dimensions of options and peripheral devices.

MEMO



Gap switch unit

UGPS2 Series

● Solenoid valve with needle, regulator integrated general purpose unit

Specifications

Basic specifications are the same as the single units on page 1261.

How to order gap switch unit

UGPS2 - 07 - 15 - 2 N Y TL - L - GW2 - 2H - 1

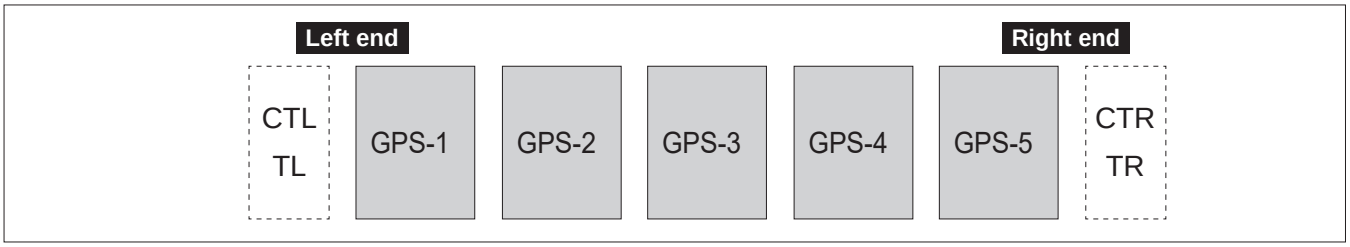
Gap switch Standard unit

Code	Description
A Orifice size	
05	ø0.5
07	ø0.7
B Setting type	
15	Dial type detection nozzle diameter
C Station No.	
1	1 station
2	2 stations
3	3 stations
4	4 stations
5	5 stations
D Output style	
N	NPN open collector
P	PNP open collector
E Lamp color	
G	Green
Y	Yellow
F Electrical connection option	
TL	Lead wire common terminal box left assembly
TR	Lead wire common terminal box right assembly
CTL	Connector common terminal box left assembly
CTR	Connector common terminal box right assembly
F	DIN terminal box (Pg11)
C0	Connector (without cable)
C1	Connector (cable 1 m attached)
C3	Connector (cable 3 m attached)
C5	Connector (cable 5 m attached)
G Attachments and others	
Blank	No
L(*1)	Dial cover with lock
H Pressure gauge	
Blank(*4)	No
GW2	Pressure gauge assembly with safety marker (G40D-8-P02-S501)
I Solenoid valve electrical connection	
2E	DIN terminal box
2H	DIN terminal box with lamp
3 N	HP terminal box with lamp
J Solenoid valve voltage	
1	100 VAC
2	200 VAC
3	24 VDC

⚠ Precautions for model No. selection

*1 : Select L for automobile- and processing machine-related applications.
*2 : For CE-Marking-compatible parts, select ① Solenoid valve electric connection from 2E or 2H.
*3 : Refer to pages 1302 to 1307 for option and model No. of related components.
*4 : Regulator is also provided without pressure gauge.

Terminal box installation position relation diagram

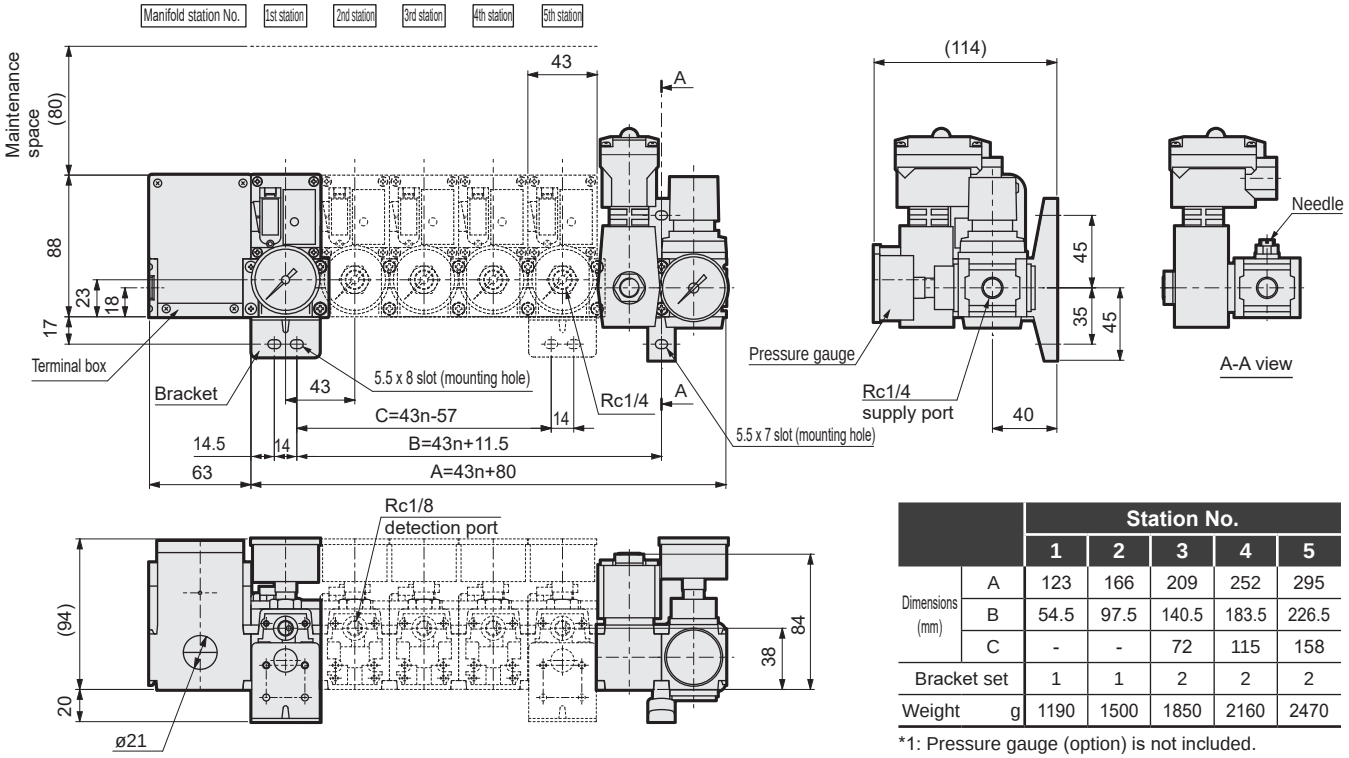


Note: The solenoid valve with needle and regulator are mounted on the opposite side of the terminal box (right side when terminal box is on left side). The terminal box does not have a supply port.

Dimensions CAD

● Gap switch unit (lead wire common terminal box: TL/TR)

● UGPS2-*-*-***TL



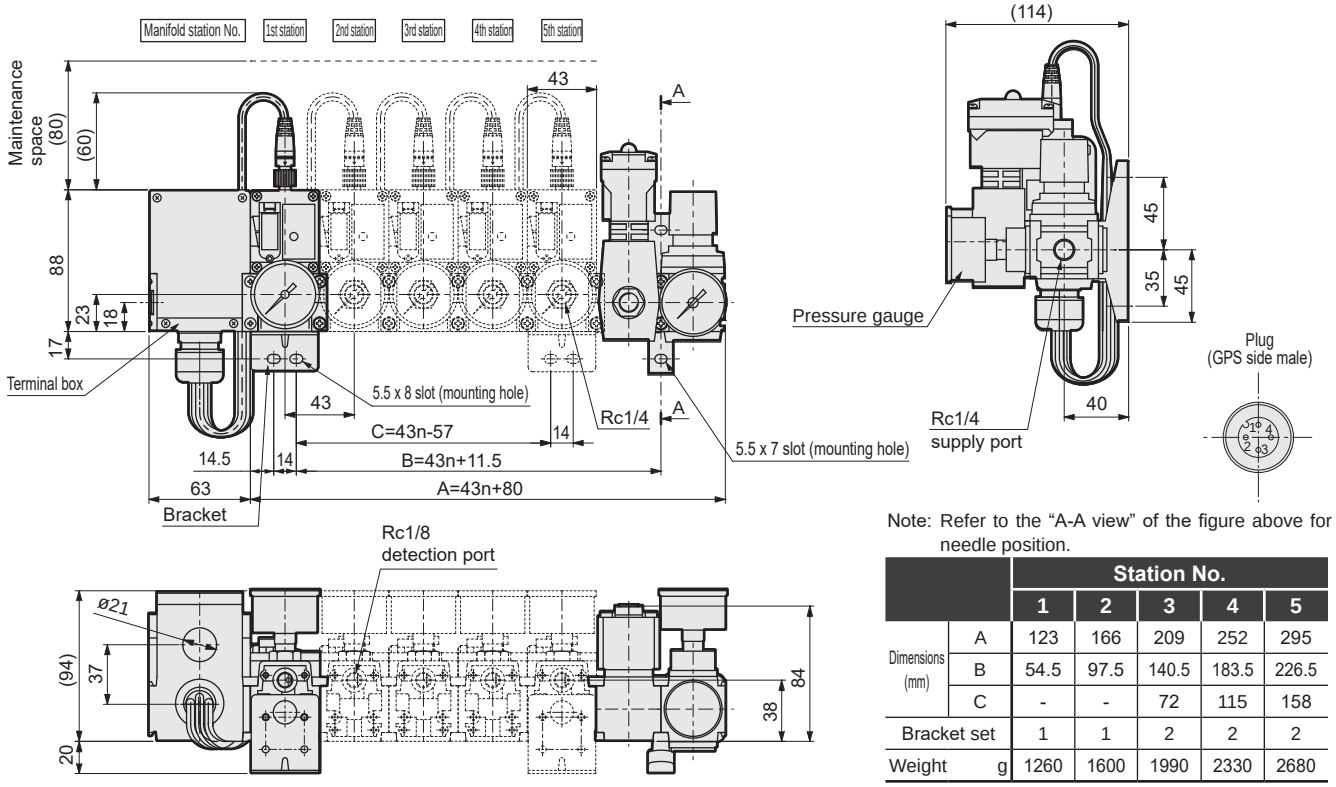
		Station No.				
		1	2	3	4	5
Dimensions (mm)	A	123	166	209	252	295
	B	54.5	97.5	140.5	183.5	226.5
	C	-	-	72	115	158
Bracket set		1	1	2	2	2
Weight	g	1190	1500	1850	2160	2470

*1: Pressure gauge (option) is not included.
*2: Solenoid valve with 3 N electrical connection.

Note) The dial cover shape differs for the dial cover with lock. Refer to the DIN terminal box on page 1263 for shapes.

● Gap switch unit (connector common terminal box: CTL/CTR)

● UGPS2-*-*-***CTL



Note: Refer to the "A-A view" of the figure above for needle position.

		Station No.				
		1	2	3	4	5
Dimensions (mm)	A	123	166	209	252	295
	B	54.5	97.5	140.5	183.5	226.5
	C	-	-	72	115	158
Bracket set		1	1	2	2	2
Weight	g	1260	1600	1990	2330	2680

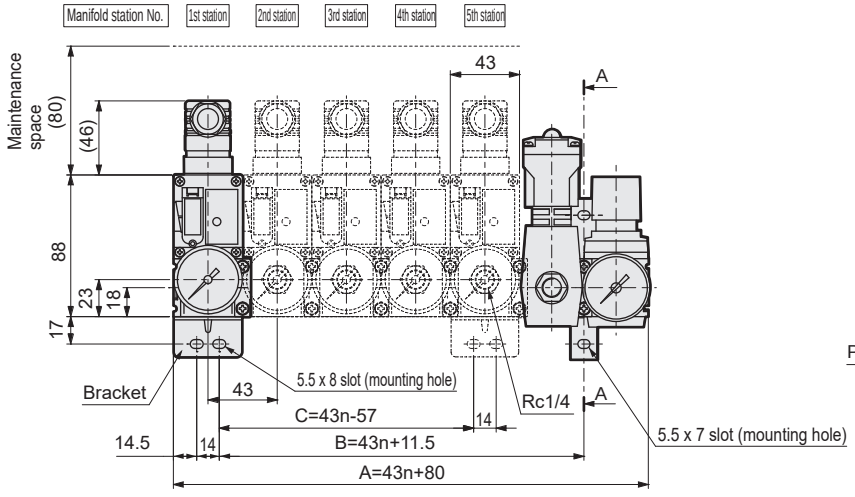
*1: Pressure gauge (option) is not included.
*2: Solenoid valve with 3 N electrical connection.

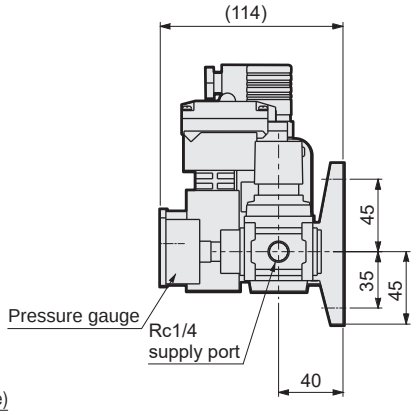
Note) The dial cover shape differs for the dial cover with lock. Refer to the DIN terminal box on page 1263 for shapes.

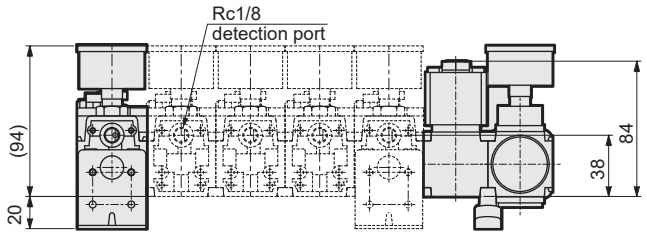
Dimensions CAD

● Gap switch unit (DIN terminal box: F)

● UGPS2-*-*-***F







Note: Refer to the “A-A view” on the previous page for needle position.

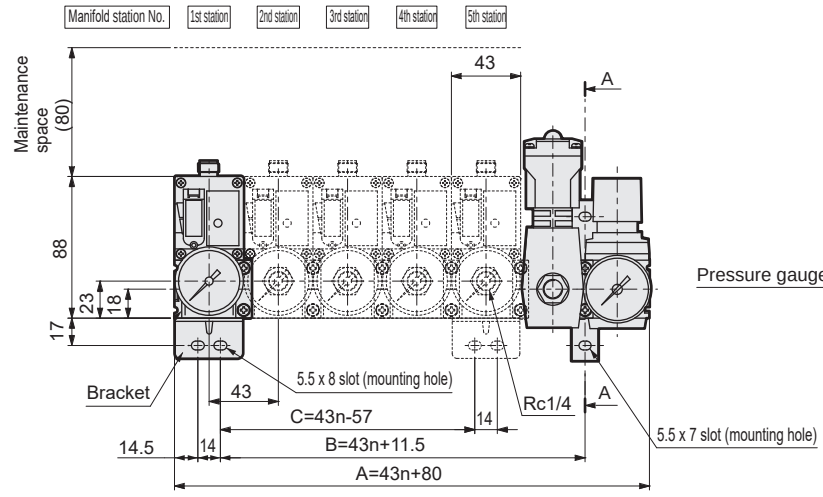
		Station No.				
		1	2	3	4	5
Dimensions (mm)	A	123	166	209	252	295
	B	54.5	97.5	140.5	183.5	226.5
	C	-	-	72	115	158
Bracket set		1	1	2	2	2
Weight g		1010	1360	1740	2080	2420

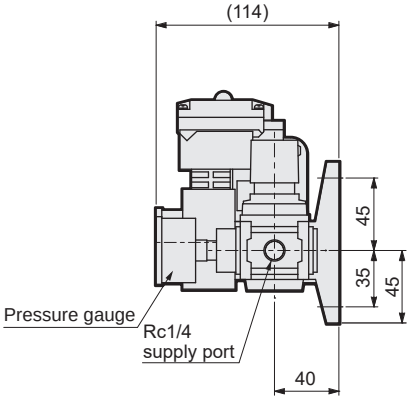
*1: Pressure gauge (option) is not included.
*2: Solenoid valve with 3 N electrical connection.

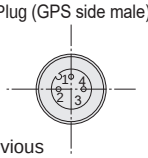
Note) The dial cover shape differs for the dial cover with lock. Refer to the DIN terminal box on page 1263 for shapes.

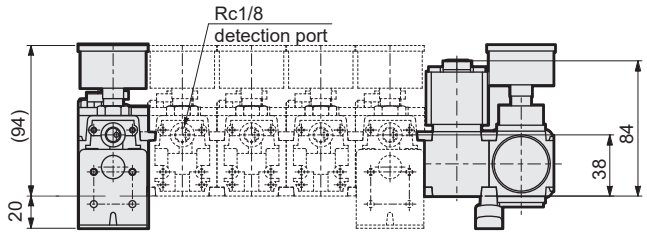
● Gap switch unit (connector: C*)

● UGPS2-*-*-*** C0 C1 C3 C5









Note: Refer to the “A-A view” on the previous page for needle position.

		Station No.				
		1	2	3	4	5
Dimensions (mm)	A	123	166	209	252	295
	B	54.5	97.5	140.5	183.5	226.5
	C	-	-	72	115	158
Bracket set		1	1	2	2	2
Weight (For C0) g		970	1270	1610	1900	2200

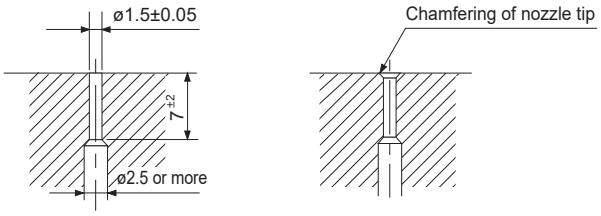
*1: Pressure gauge (option) is not included.
*2: Solenoid valve with 3 N electrical connection.
*3: Cable for C1, C3, C5 is included.
(For the cable weight, refer to the option pages.)

Note) The dial cover shape differs for the dial cover with lock. Refer to the DIN terminal box on page 1263 for shapes.

● Refer to pages 1302 to 1307 for dimensions of options and peripheral devices.

Design of detection nozzle

● Single hole nozzle

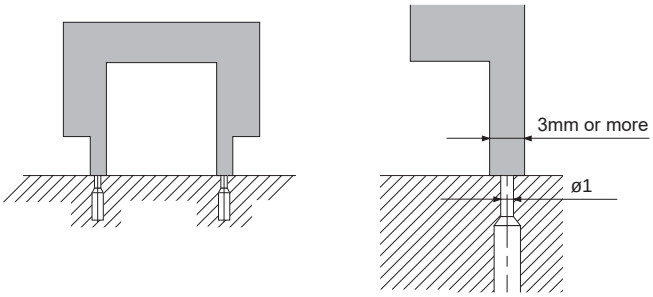


Correct nozzle shape　　Incorrect nozzle shape

Design the detection nozzle with a point size of ø1.5 mm and depth of 7 ±2 mm. The blow-off section of the nozzle cannot be chamfered. If chamfered, the nozzle retracts from the seating place, and the scale on the adjustment dial and actual dimensions do not match.

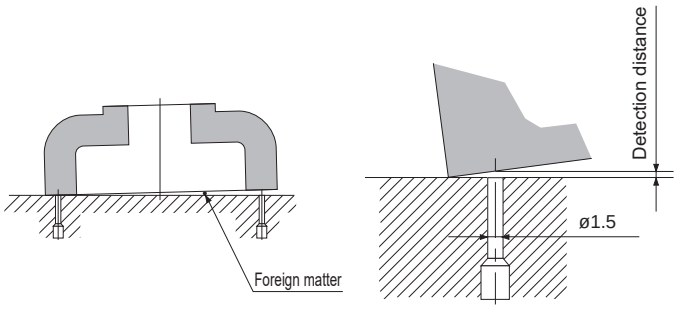
Selection of detection nozzle diameter

● When the workpiece detection surface is narrow: use ø1 mm nozzle. Contact CKD if the width is less than 3 mm.



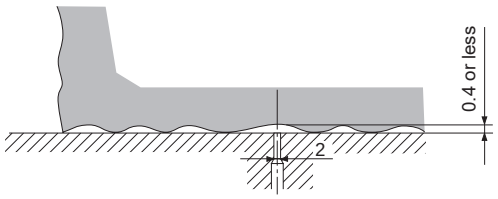
· Use with a detection distance of 0.1 mm or less.
· Use with a workpiece surface roughness of Rz = 5 or less.
· Check that nozzle does not separate from the detection surface.

● When the workpiece detection surface is sufficiently wide: Use ø1.5 mm nozzle.



· Use with a detection distance of 0.2 mm or less.
· Use with a workpiece surface roughness of Rz = 5 or less.

● When detecting the presence of a workpiece with a rough detection surface: Use ø1.5 mm or ø2.0 mm nozzle.



· The max. detection distance of the GPS2 is 0.4 mm. The workpiece cannot be detected if bumps exceed 0.4 mm. In that case, use the HPS-10.