CKD

SM-292712-A

INSTRUCTION MANUAL

CLOSE CONTACT CONFIRMATION SWITCH

HPS, MHPS, UHPS

- Read this manual carefully and thoroughly before using this product.
- Pay extra attention to the instructions concerning safety.
- After reading this manual, keep it in a safe and convenient place.

9th Edition

CKD Corporation

For Safety Use

To use this product safety, basic knowledge of pneumatic equipment, including materials, piping, electrical system and mechanism, is required (to the level pursuant to JIS B 8370 Pneumatic System Rules).

We do not bear any responsibility for accidents caused by any person without such knowledge or arising from improper operation.

Our customers use this product for a very wide range of applications, and we cannot keep track of all of them. Depending on operating conditions, the product may fail to operate to maximum performance, or cause an accident. Thus, before placing an order, examine whether the product meets your application, requirements, and how to use it.

This product incorporates many functions and mechanisms to ensure safety. However, improper operation could result in an accident. To prevent such accidents, **read this operation manual carefully for proper operation.**

Observe the cautions on handling described in this manual, as well as the following instructions:

⚠ Precautions

- This product is designed for air and non-corrosive and non-combustible gasses, such as N2. Do not use it with corrosive and combustible gasses.
- Do not touch electric wiring connections (exposed live parts) : this will cause an electric shock. During wiring, keep the power off.
  Also, do not touch these live parts with wet hands.

INDEX

HPS , MHPS , UHPS
CLOSE CONTACT CONFIRMATION SWITCH
Manual No. SM-292712-A

Issued Oct.29.2002
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Revision Nov.01.2011
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Revision Sep.05.2014
Revision Jul.04.2022

1. Product

1.1 Specification

1.1.1 Single Type

Descriptions			HPS-05	HPS-07	HPS-10
orifice			ϕ0.5	ϕ0.7	ϕ1.0
Working fluid			Clean compressed air (must be oil free)		
Working pressure(Note2)		kPa	50 to 200	50 to 200	100 to 200
Detection distance range		mm	0.01 to 0.2	0.02 to 0.3	0.05 to 0.7
Repeatability		mm	±0.005 (detection distance range 0.01 to 0.1mm)	±0.005 (detection distance range 0.02 to 0.1mm)	±0.02 (detection distance range 0.05 to 0.3mm)
Hysteresis		mm	0.005 or less (detection distance range 0.01 to 0.1mm)	0.005 or less (detection distance range 0.02 to 0.1mm)	0.01 or less (detection distance range 0.05 to 0.3mm)
Type of detection nozzle		(Note1)	Single hole nozzle ϕ1.5		
Power supply voltage		V	10.2 to 26.4 DC		
Current consumption		mA	15 or less (at 24V DC)		
Output style			NPN, PNP open collector		
Output rated			30V DC, 100mA or less		
Internal voltage drop		V	2.0 or less (100mA)		
Indicator light			LED green or yellow		
Insulation resistance			10MΩ and over with 500V DC mega		
Withstand voltage			No failure impressed at 1000V AC for one minute		
Vibration resistance		m/s^2	98		
Ambient temperature		℃	5 to 60		
Degree of protection		(Note3)	IP67 or equivalent (connector type), IP64 or equivalent (DIN)		
Piping size		mm	Inner diameter 4		
Port size			Detection port Rc1/8, Supply port Rc1/4, Gauge port Rc1/4		
Weight		g	300 (electric connection C0)		
Standards			CE marking products		
Air consumption L/min(ANR)	Working pressure	50kPa	6 or less	11 or less	—
		100kPa	9 or less	15 or less	24 or less
		200kPa	14 or less	24 or less	38 or less

Note1: The above specifications apply to the 1.5 diameter single-hole detection nozzle.

Note2: If the nozzle clogs, supply pressure should be set between 100 and 200 kPa.

Note3: 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.

1.1.2 Specification at the time of back pressure nozzle use

By attaching the back pressure nozzle, the detection distance of HPS-05 can be extended up to 3mm.

Optional nozzle			APA4-DA10	APA4-DA20	APA4-DH10
Close contact confirmation switch			HPS-05		
Working pressure kPa			100 to 200		
Detection distance range mm			0.1 to 3.0		
Repeatability mm			±0.1 (detection distance range 0.1 to 1.0mm)		
Hysteresis mm			0.2 or less (detection distance range 0.1 to 1.0mm)		
Piping size mm			Inner diameter 4		
Air consumption L/min(ANR)	Working pressure	100kPa	34 or less		
		200kPa	69 or less		

Note) In case of using the back pressure nozzle, please select HPS-05.

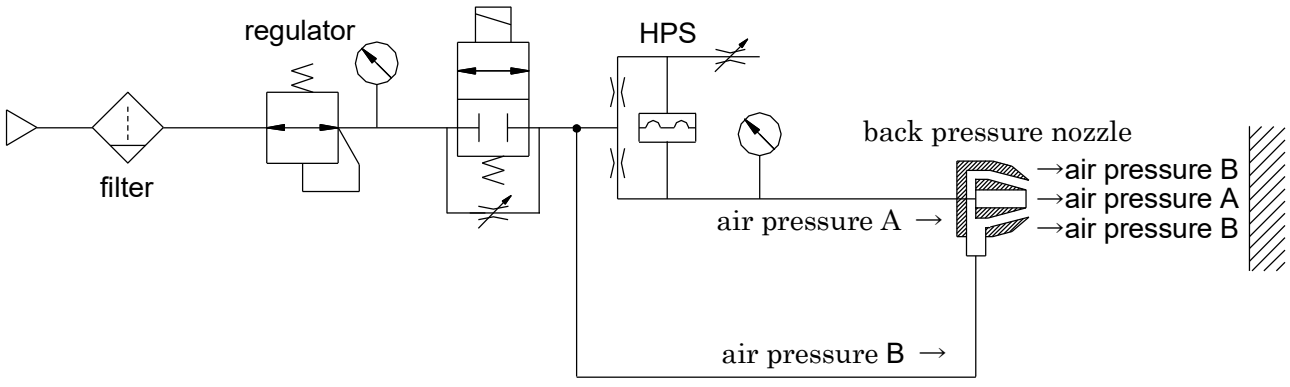


Figure 1 Standard circuit with back pressure nozzle

1.1.3 Manifold Type

Basic specification except for protection structure is as same as single type.

Degree of protection

Connecting Option	Degree of protection
T※	IP66
CT※	IP67
F※	IP64
C※	IP67

1.1.4 Unit Type

Basic specification is as same as single type.

Protection structure is as same as manifold type.
But it is not applicable to solenoid valve and regulator.

1.2 External dimension

1.2.1 Single Type

1.2.1.1 Goods for the common terminal box

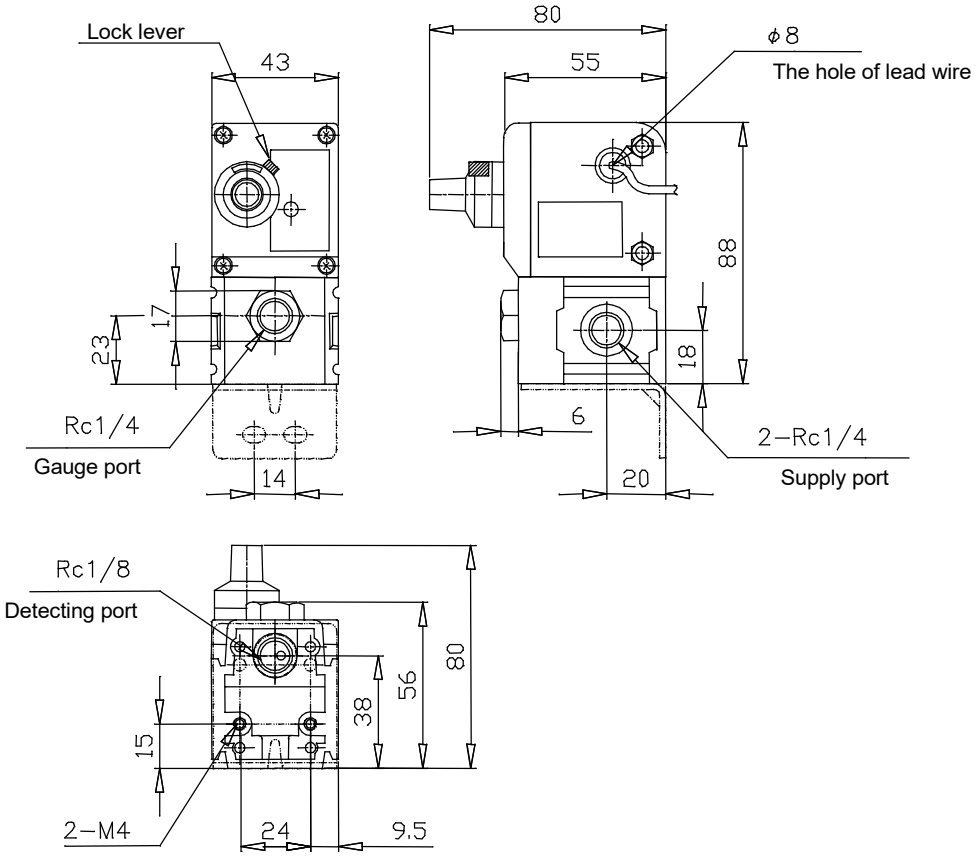


Figure 2

1.2.1.2 DIN-terminal

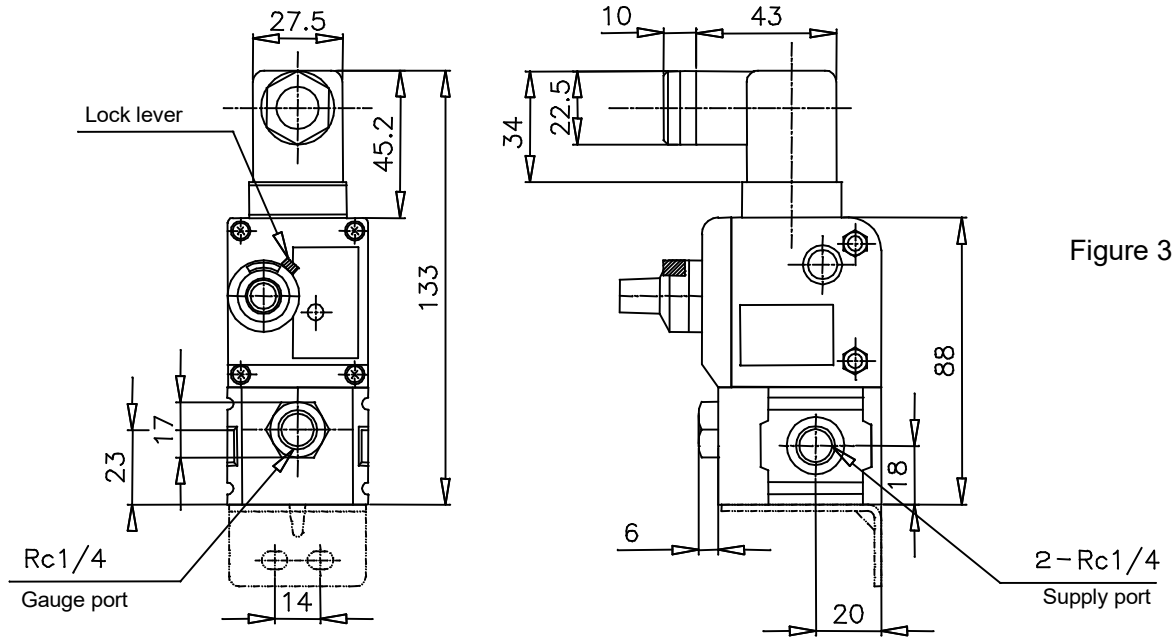


Figure 3

1.2.1.3 M12-connector

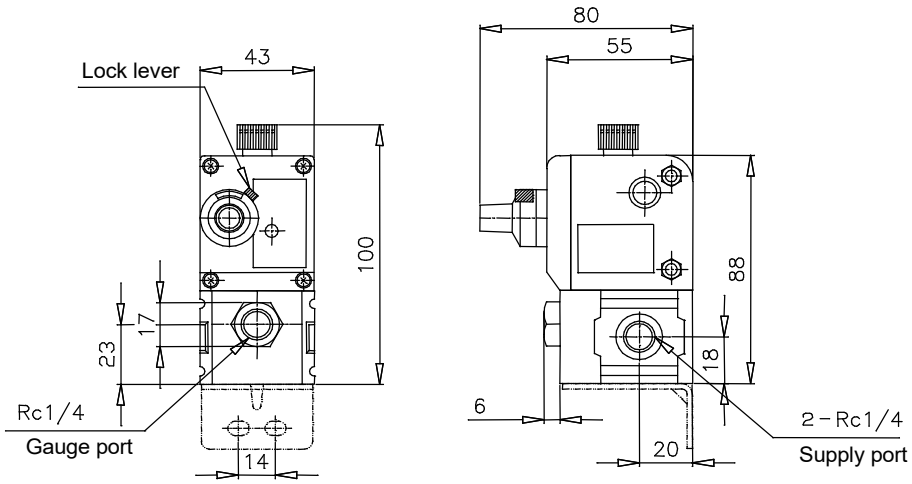


Figure 4

1.2.1.4 M12-connector Common terminal box

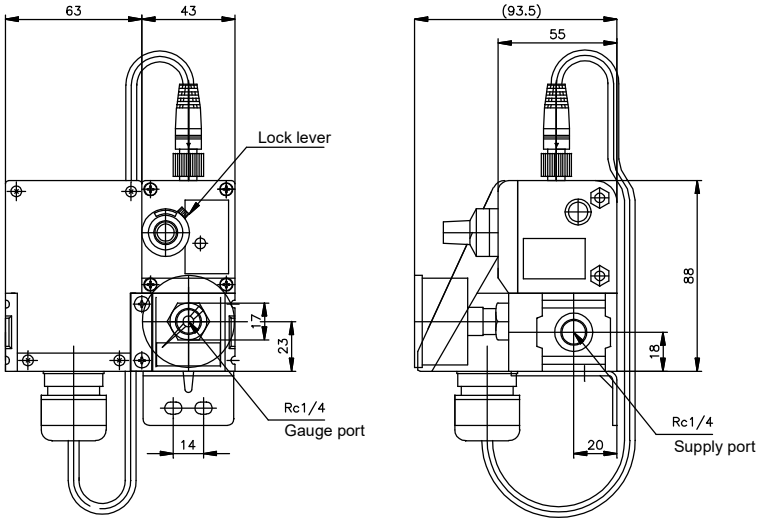


Figure 5

1.2.1.5 Lead wire type common terminal box

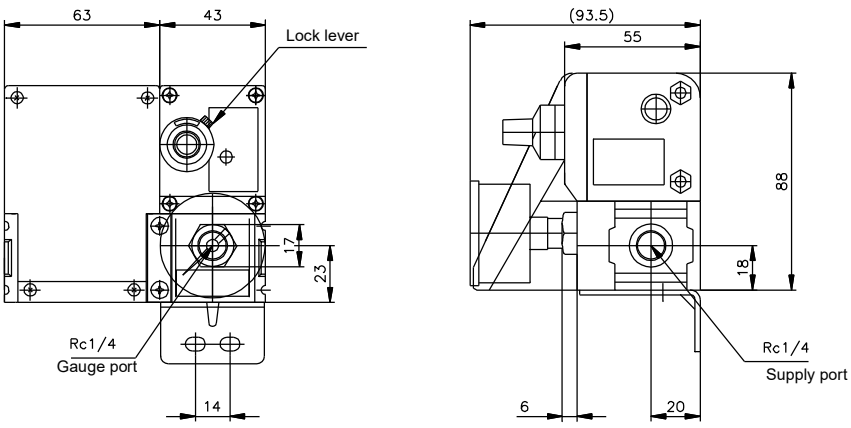
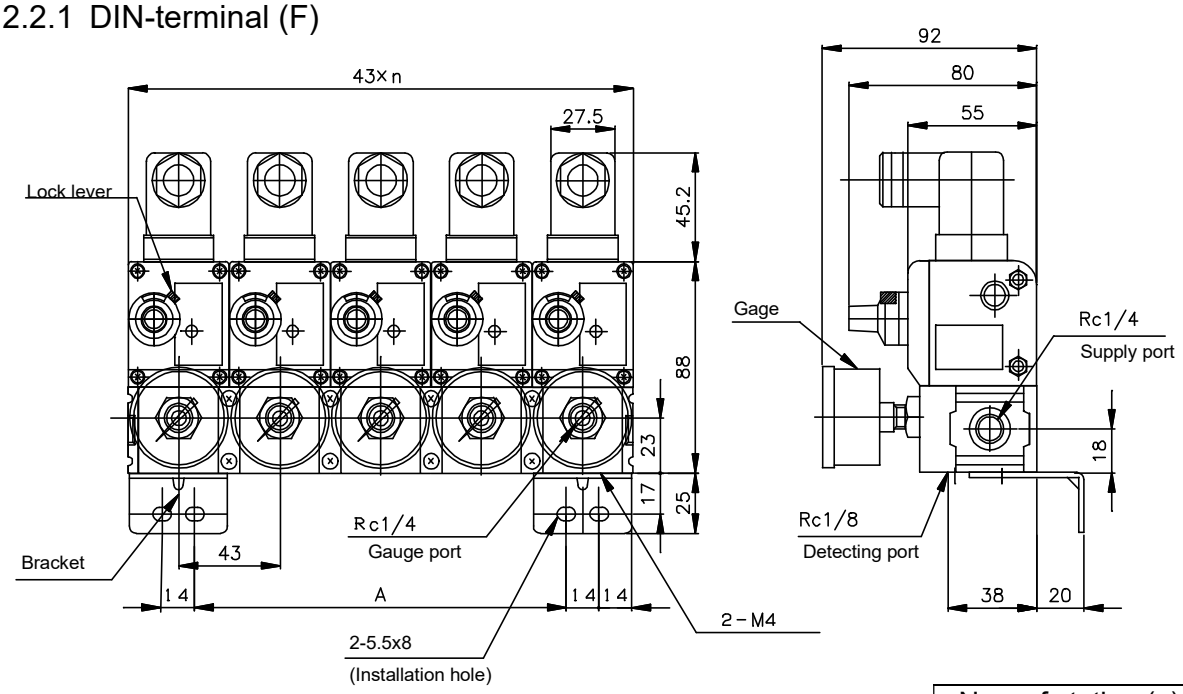


Figure 6

1.2.2 Manifold

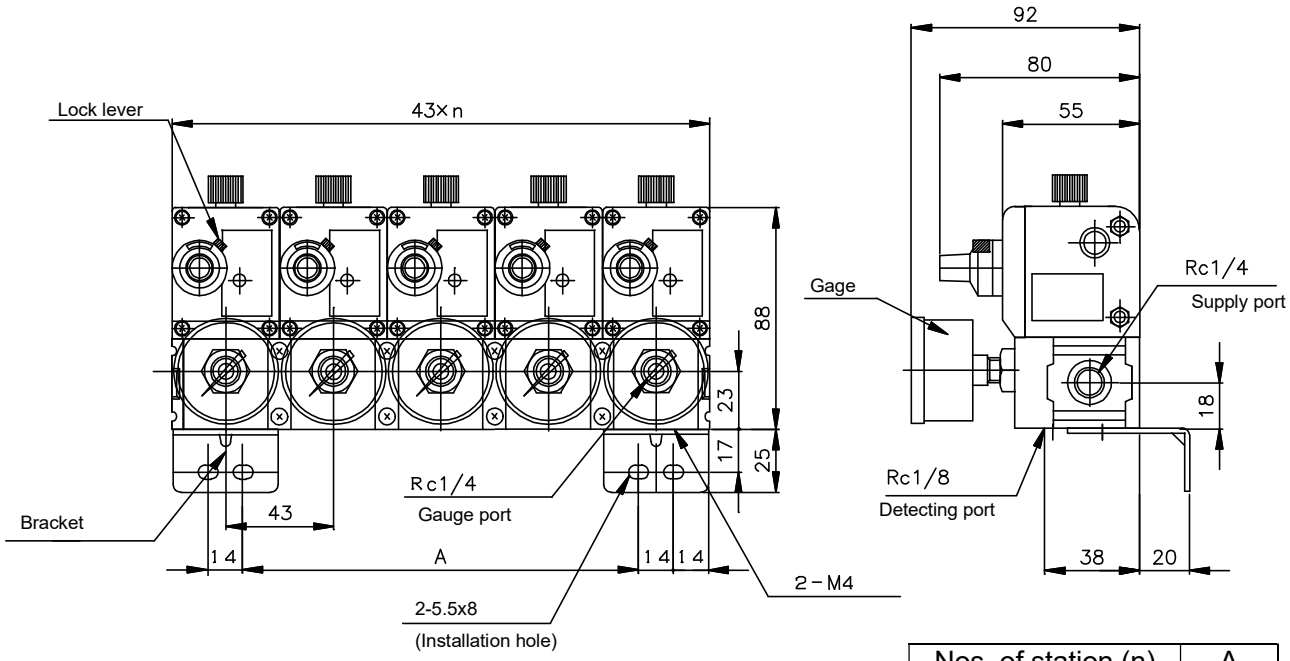
1.2.2.1 DIN-terminal (F)



Nos. of station (n)	A
2	29
3	72
4	115
5	158

Figure 7

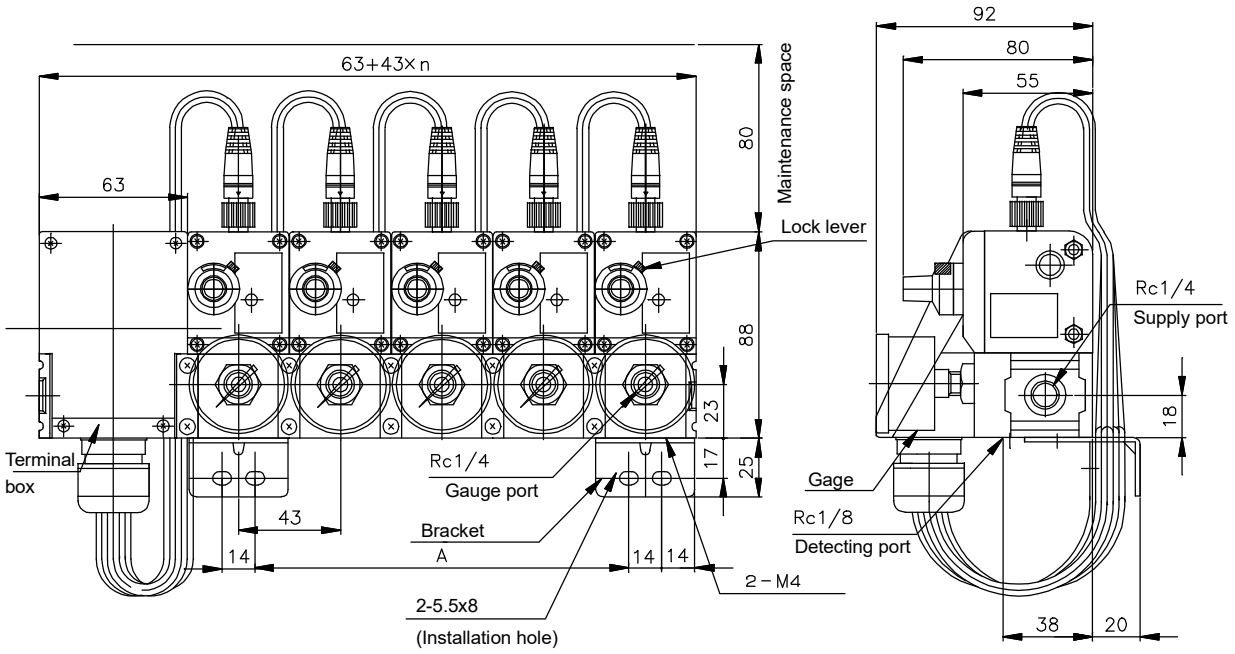
1.2.2.2 M12-connector (C)



Nos. of station (n)	A
2	29
3	72
4	115
5	158

Figure 8

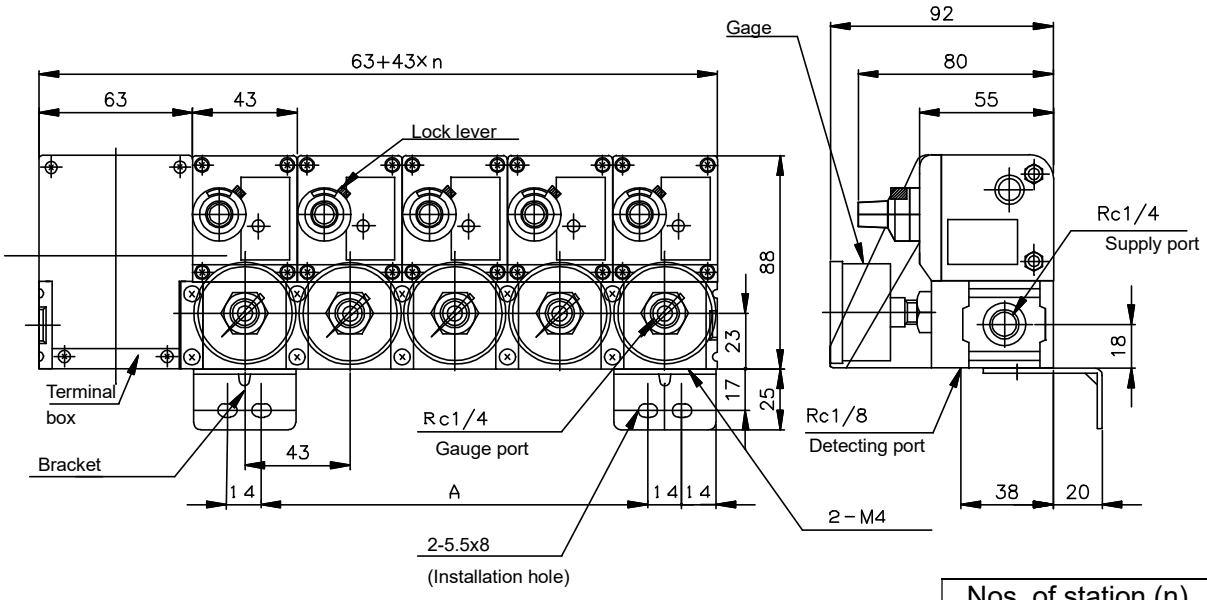
1.2.2.3 M12-connector type common terminal box (CTL,CTR)



Nos. of station (n)	A
2	29
3	72
4	115
5	158

Figure 9

1.2.2.4 Lead wire type common terminal box (TL,TR)



Nos. of station (n)	A
2	29
3	72
4	115
5	158

Figure 10

1.2.3 Unit

1.2.3.1 DIN-terminal box (F)

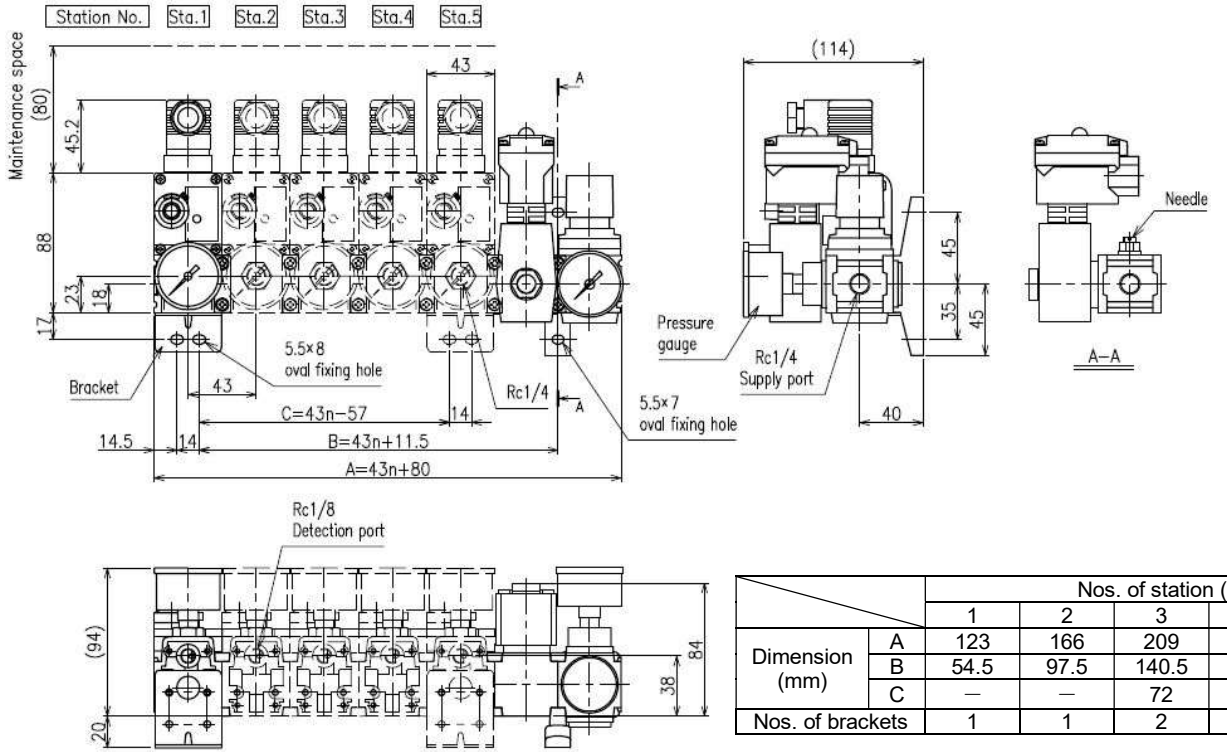


Figure 11

		Nos. of station (n)				
		1	2	3	4	5
Dimension (mm)	A	123	166	209	252	295
	B	54.5	97.5	140.5	183.5	226.5
	C	—	—	72	115	158
Nos. of brackets		1	1	2	2	2

1.2.3.2 M12-connector (C)

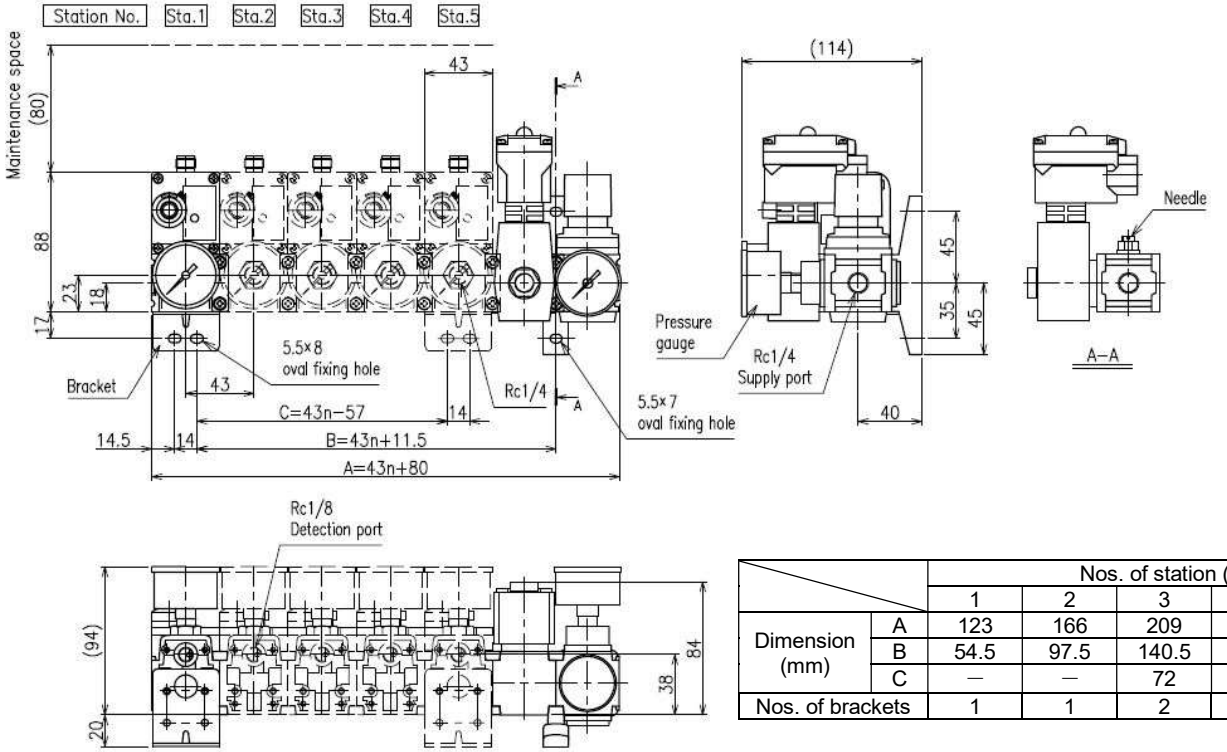


Figure 12

		Nos. of station (n)				
		1	2	3	4	5
Dimension (mm)	A	123	166	209	252	295
	B	54.5	97.5	140.5	183.5	226.5
	C	—	—	72	115	158
Nos. of brackets		1	1	2	2	2

1.2.3.3 M12-connector common terminal box (CTL,CTR)

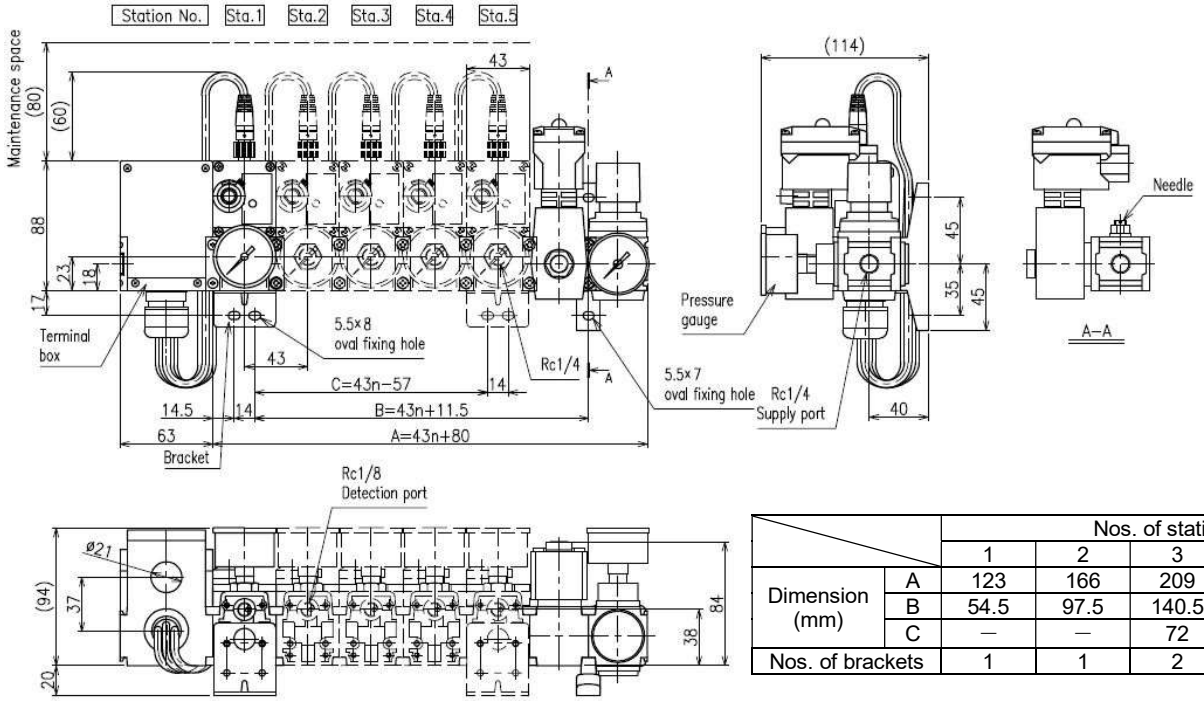


Figure 13

		Nos. of station (n)				
		1	2	3	4	5
Dimension (mm)	A	123	166	209	252	295
	B	54.5	97.5	140.5	183.5	226.5
	C	—	—	72	115	158
Nos. of brackets		1	1	2	2	2

1.2.3.4 Lead wire type common terminal box (TL,TR)

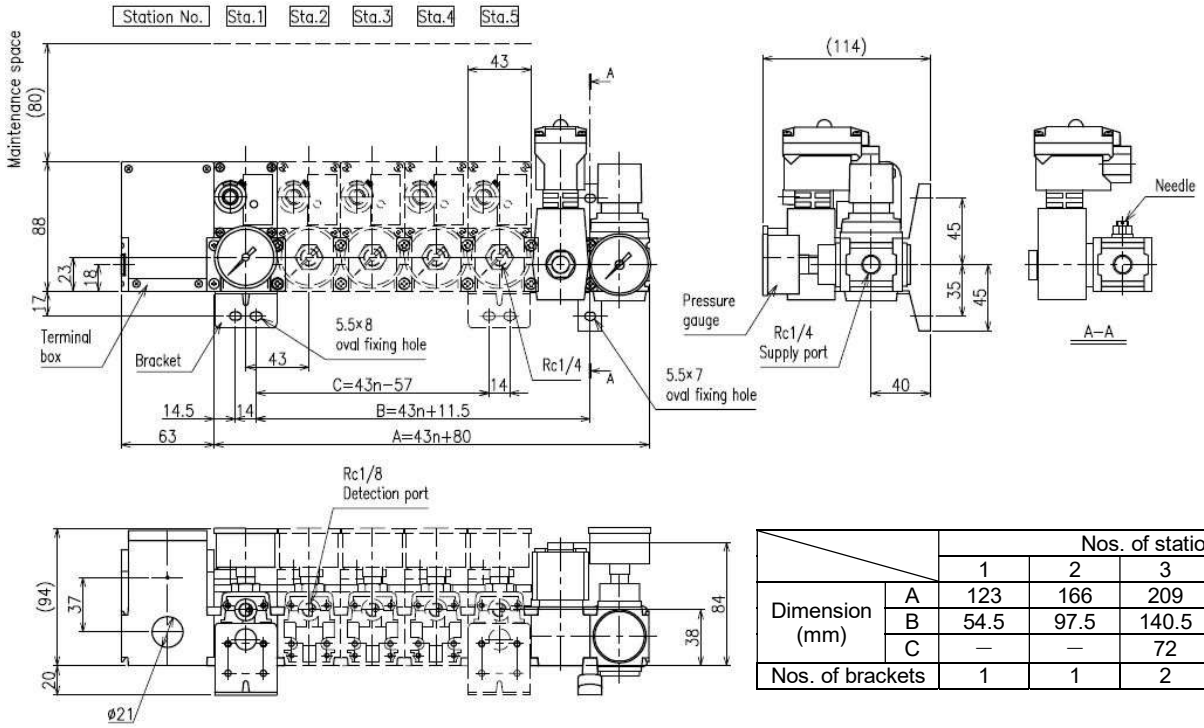


Figure 14

		Nos. of station (n)				
		1	2	3	4	5
Dimension (mm)	A	123	166	209	252	295
	B	54.5	97.5	140.5	183.5	226.5
	C	—	—	72	115	158
Nos. of brackets		1	1	2	2	2

1.2.4 Attachment

1.2.4.1 Back pressure nozzle

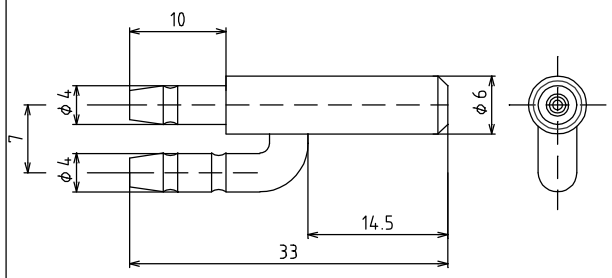


Figure 15 APA4-DA10

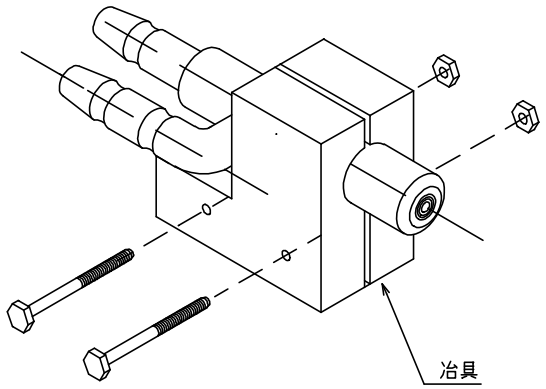


Figure 16 APA4-DA10 attachment example

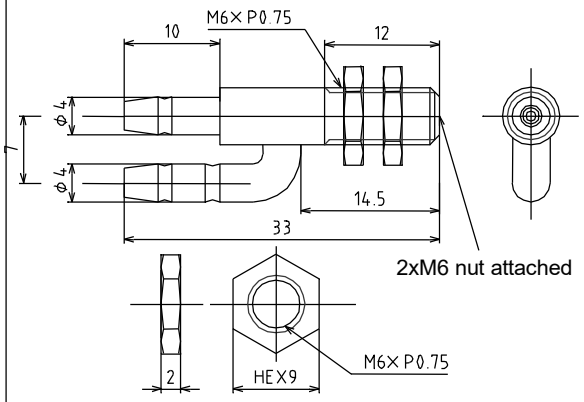


Figure 17 APA4-DA20

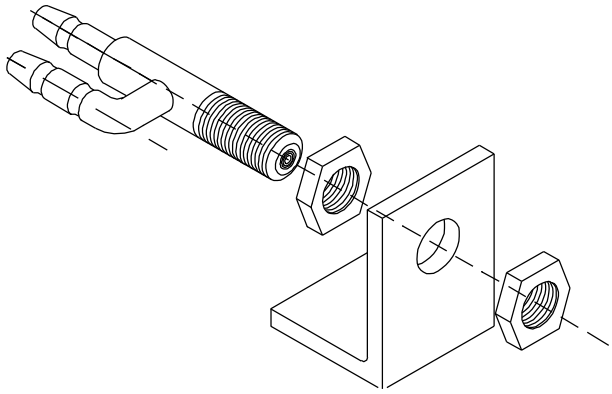


Figure 18 APA4-DA20 attachment example

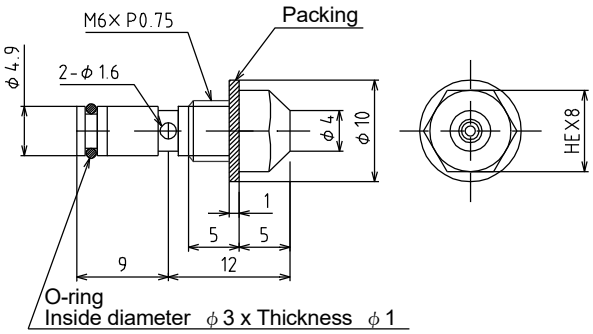


Figure 19 APA4-DH10

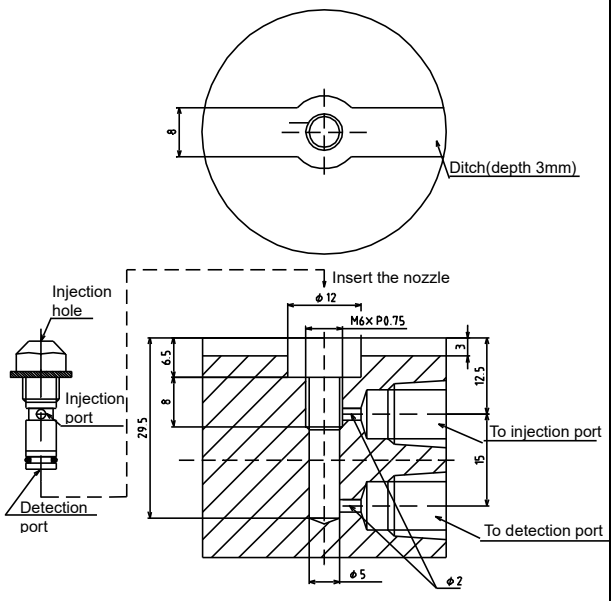


Figure 20 APA4-DH10 attachment example

1.2.4.2 cable

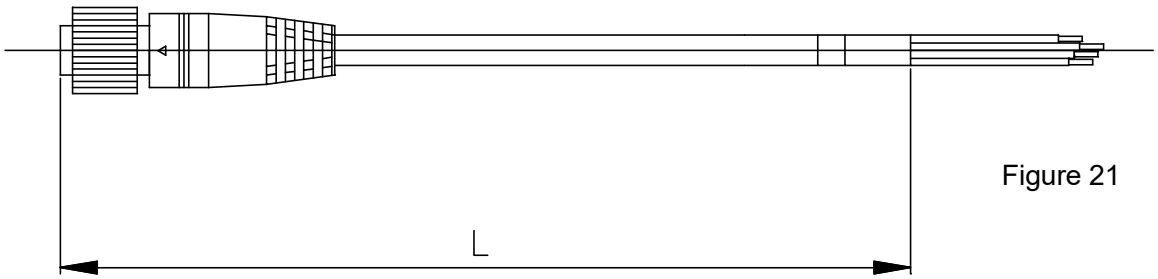


Figure 21

1.2.4.3 Bracket

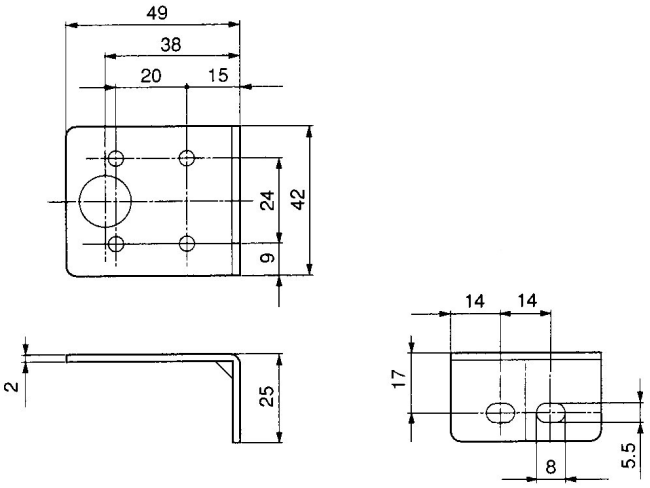


Figure 22

1.2.4.4 Terminal box

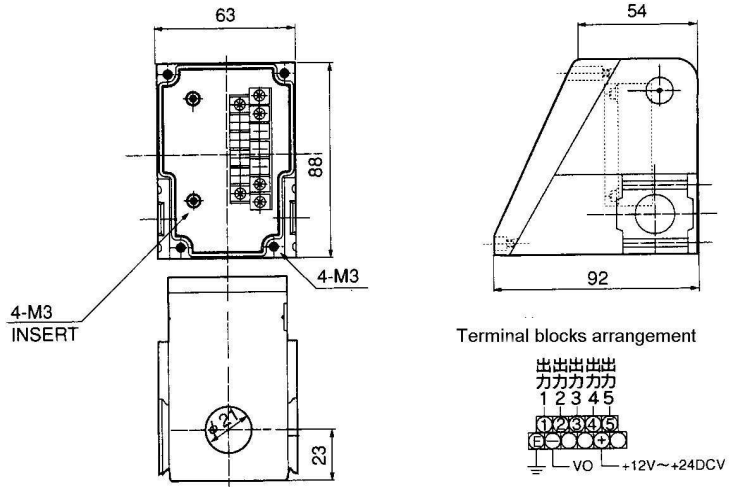


Figure 23

The order of terminal blocks which correspond to GPS2 is 1,2,3,4,5 order from the left of the front.

1.2.4.5 Pressure gauge with safety mark

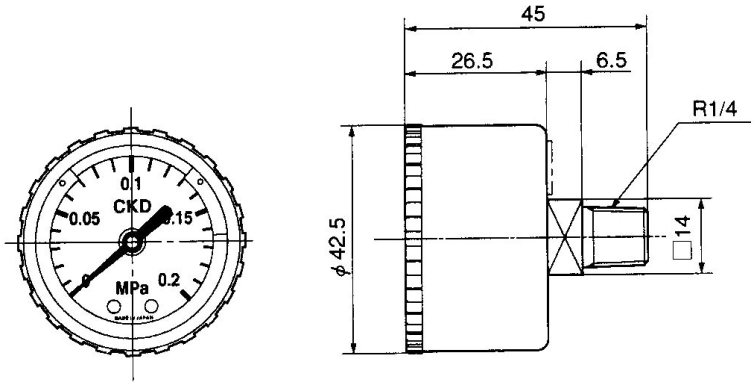


Figure 24

Setup range of safety zone : 0.03～0.2 MPa
Setup maximum width of safety zone : 0.09 MPa
Accuracy of gauge : JIS B 7505 3 class equivalence
Material of cover : transparent nylon

1.2.4.6 Joiner

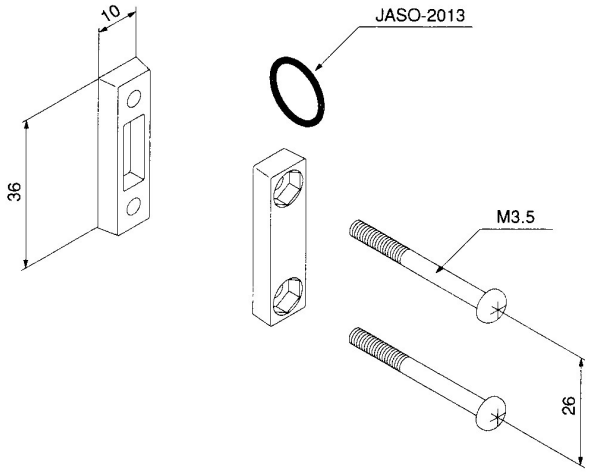


Figure 25

1.2.4.7 T type bracket

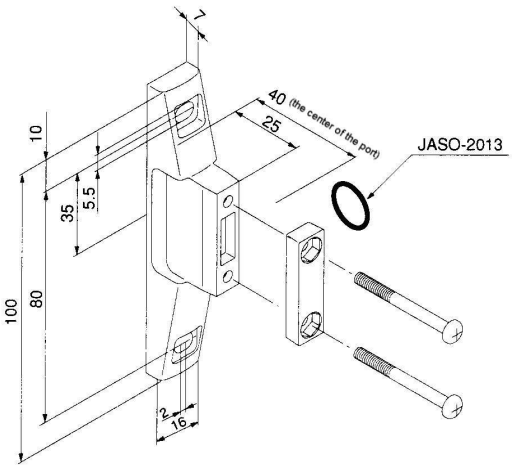
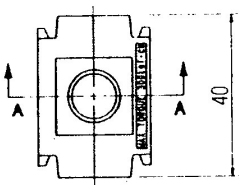


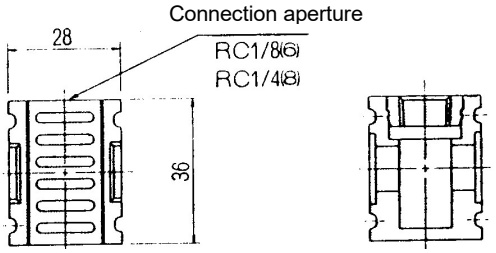
Figure 26

1.2.4.8 Distributor



Plane

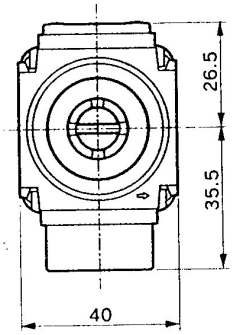
Figure 27

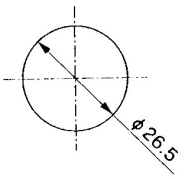


Front

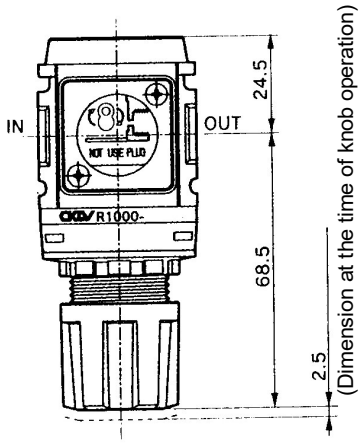
Section A-A

1.2.4.9 Regulator





Panel cut dimension
(Panel thickness : Max 6mm)



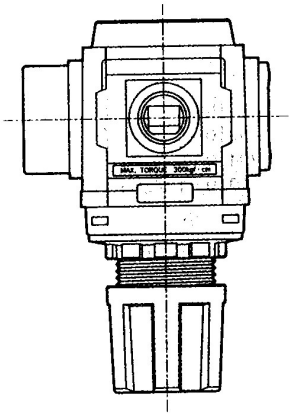


Figure 28

1.2.4.10 Solenoid valve with needle

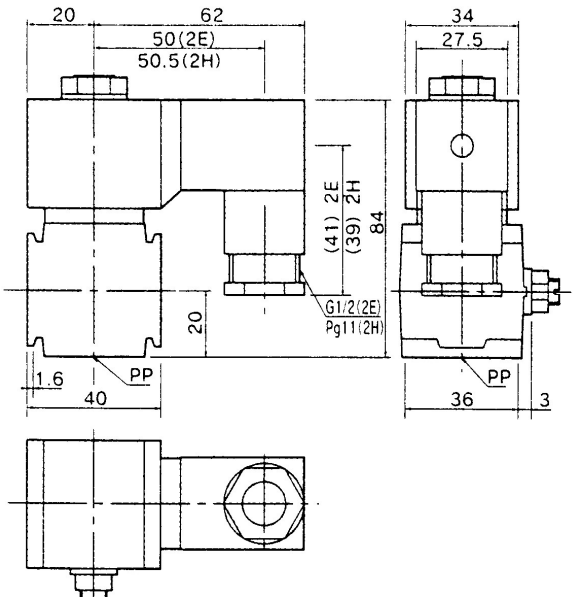


Figure 29 GPS2-AB3X-2E(2H)-AC100V(AC200V)

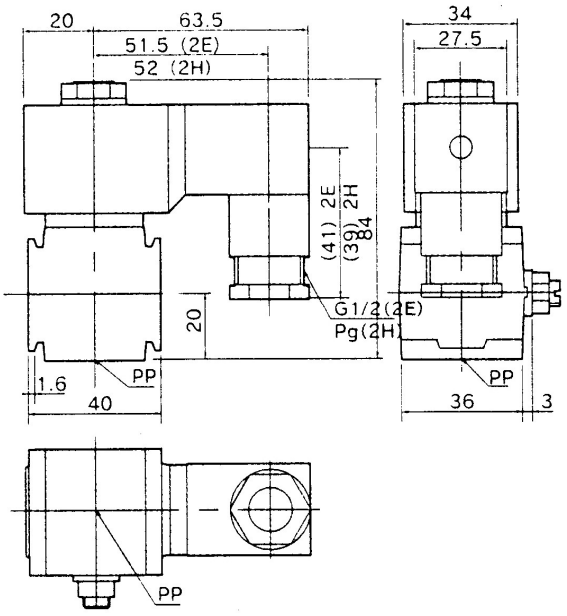


Figure 30 GPS2-AB3X-2E(2H)-DC24V

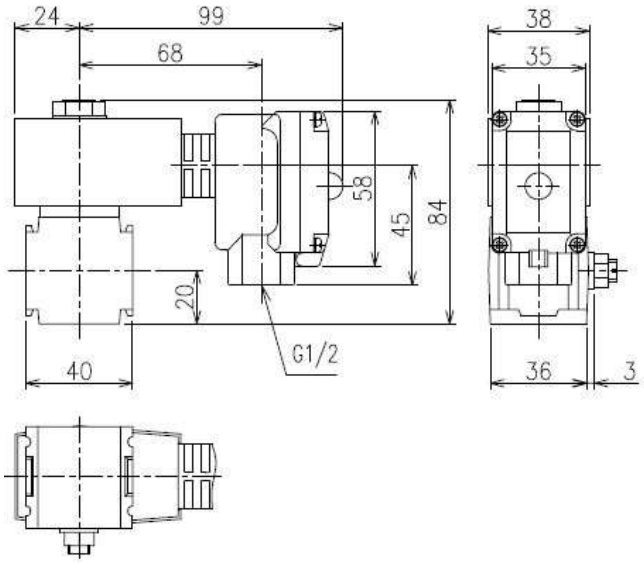


Figure 31 GPS2-AB3X-3N-AC100V(AC200V)

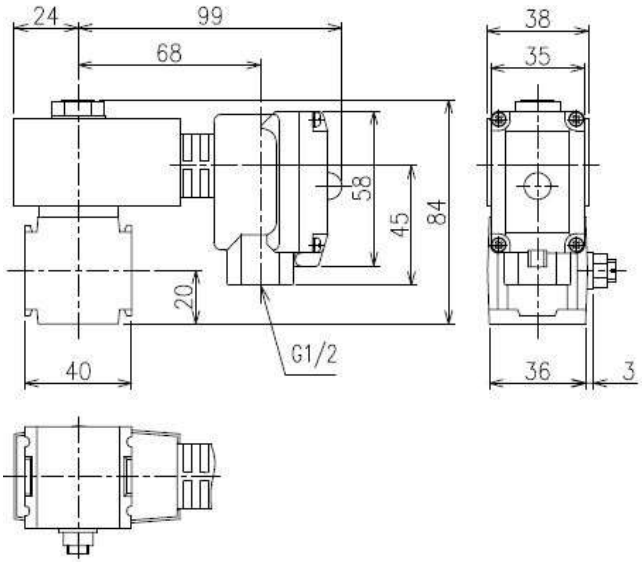


Figure 32 GPS2-AB3X-3N-DC24V

2. CAUTIONS

1) Use the product within the ranges permitted by the specifications. If you have to exceed the permitted ranges or use the product for a special purpose, consult us beforehand.

● Exceeding the permitted ranges will prevent the product from achieving the intended performance and may cause a safety problem.

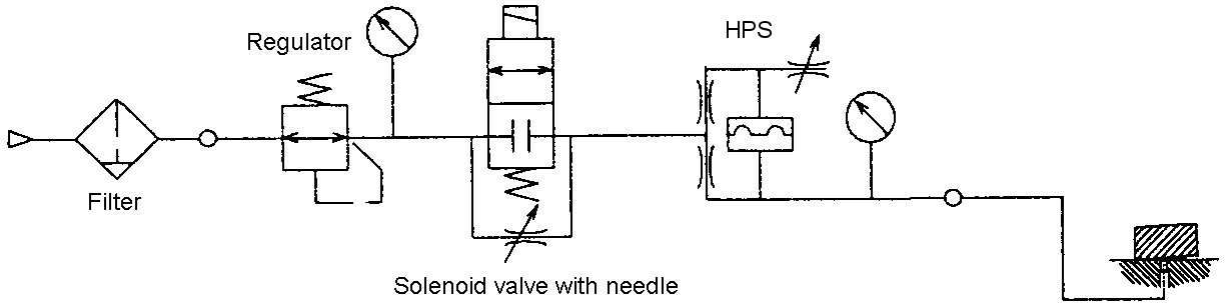
2) Make sure that the product will withstand the service environment.

● Do not install the gap switch in an environment that will be harmful to its functions.

● The gap switch is made mainly of aluminum and resin. Do not use the gap switch in an atmosphere that includes a corrosive gas. Avoid using the gap switch in a special environment such as the following: an environment in which a high temperature may prevail; in presence of chemical vapors or in proximity of chemicals; an environment in which ozone is produced; or an outdoor environment.

3) When designing the pneumatic circuit, pay attention to the particular requirements for the smooth flow of compressed air.

● The gap switch includes a small orifice. To prevent the orifice from being blocked by foreign matter or chips in the cutting fluid, supply clean air through the basic air-circuit given in Fig. 33 .



Filter : 5 μ m or less
Regulator : low pressure use
Solenoid valve with needle : GPS2-AB3X-□-FL-□ (2-way valve only)

Figure 33 basic air-circuit

4) The mixture of compressor oil or tar-like substances may block the air flow and cause a malfunction. Periodically inspect the compressor and discharge the drain.

5) To prevent the reverse flow of the cutting fluid or oil from the detection nozzle, maintain a constant flow of the air or supply a minute flow of air from the bypass circuit using a solenoid valve with a needle as in the Fig. 33 .

2
CAUTION

6) Cutting or grinder chips may block the nozzle. An increase in the supply pressure will not be able to blow the chips off because the internal orifice will choke the flow. To enable the blow-off, install a 3-way valve to the detection port side as in Fig. 2. The orifice of the 3-way valve has to be 2.5 mm or larger in diameter.

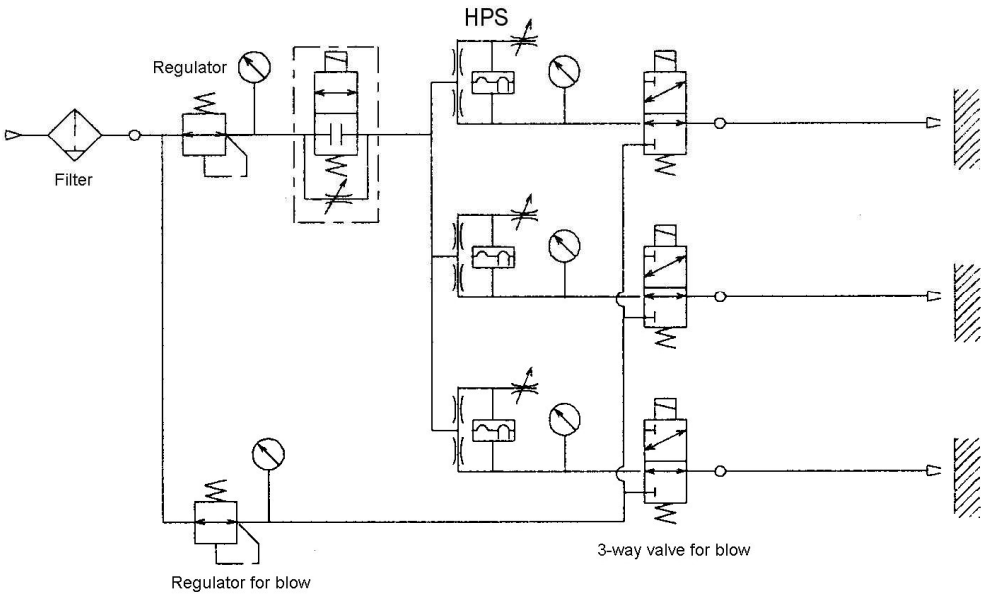


Figure 34 Using 3-way valve for blow

7) If you might perform an air-blow operation at the detection nozzle, do not use the pneumatic circuits given in Figs. 35 and 36 . With the circuit given in Fig. 35 , the cracking pressure at the check valve may disable detection at the higher end of the detection distance range.

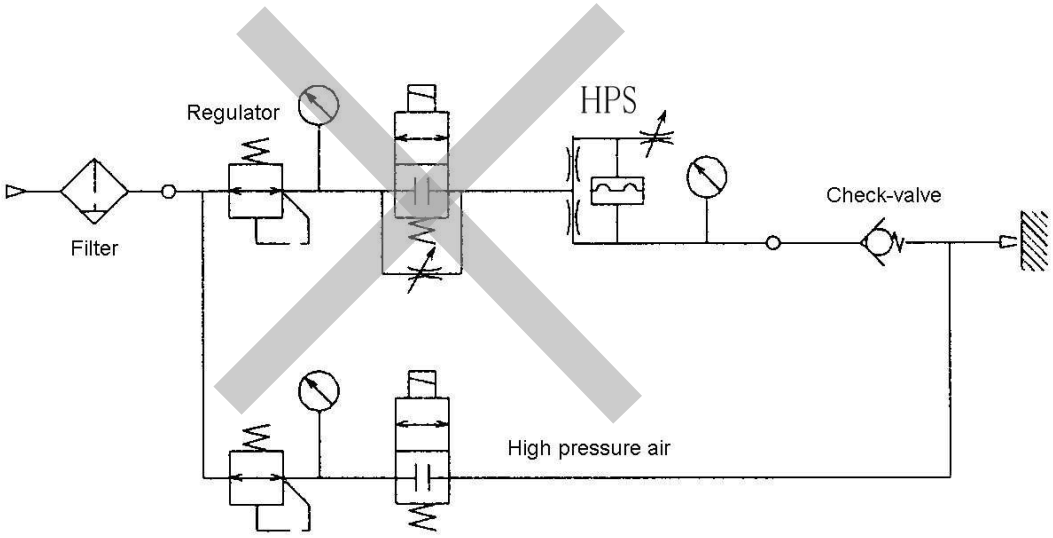


Figure 35 Using check-valve

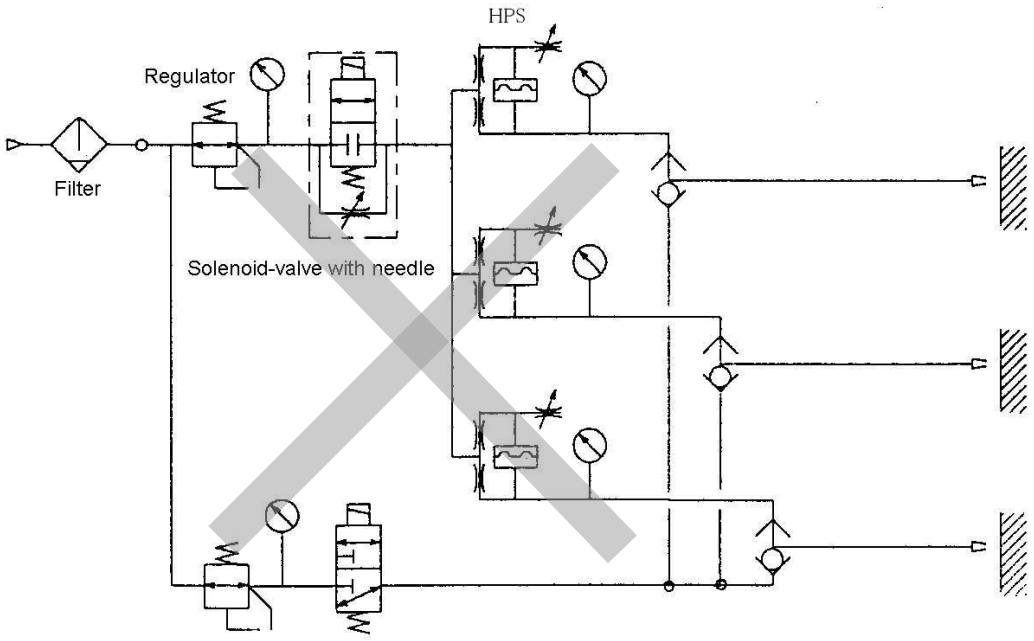


Figure 36　Using for shuttle-valve and 2-way valve

With the circuit given in Fig. 36, note that a successful action of the shuttle valve requires the minimum working pressure of 0.05 MPa . (HPS-10 requires the minimum working pressure of 0.1 MPa.)　The valve sealing force comes from the back pressure at the detection nozzle.　The back pressure will be so small without a workpiece that the sealing force will not be sufficient, causing a leak of the detection air from the exhaust port of the 3-way valve.　Once the air has leaked, the back pressure will not rise even when a workpiece is set; the gap switch will remain at the OFF position.　As in Fig. 34, use a solenoid valve or master valve as a reliable switching device.

8)　The detection side piping should be provided using a tube 4 mm in inside diameter and 6 mm in outside diameter.

9)　Select a HPS with an output style (NPN or PNP) that is compatible with the input unit of your programmable controller.

10)　The gap switch includes a pneumatic bridge circuit.　Note the difference in the signal retrieval timing between a conventional pressure switch circuit (Fig. 37) and the circuit we recommend for the gap switch.

● With the circuit given in Fig. 37, the closing of the solenoid valve turns OFF the pressure switch, regardless of the presence of a workpiece.

	No work	Existing work
Solenoid-valve close	OFF	OFF
Solenoid-valve open	OFF	ON

2
CAUTION

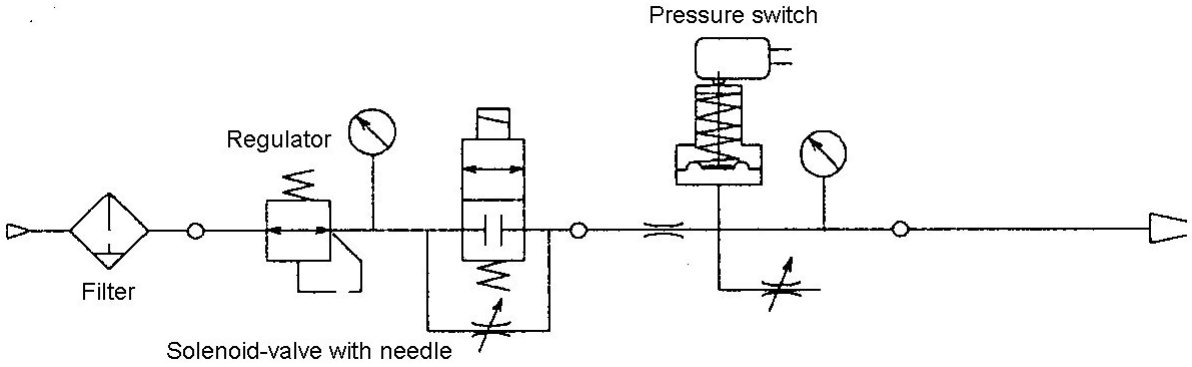


Figure 37　Pressure switch and Solenoid-valve with needle

● With the circuit given in Fig. 38, the presence of a workpiece turns ON the gap switch through the action of the minute flow of air.

	No work	Existing work
Solenoid-valve close	OFF	ON
Solenoid-valve open	OFF	ON

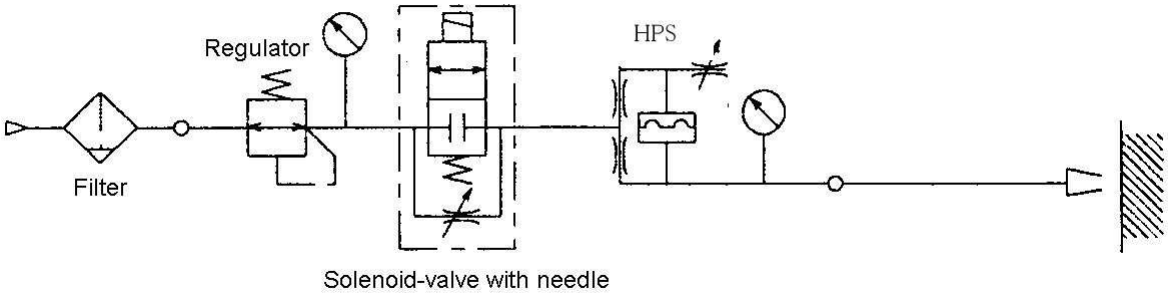


Figure 38　Gap switch and Solenoid-valve with needle

● If the circuit for a conventional pressure switch (Fig. 37) includes a control circuit that detects an air sensor abnormality, the OFF checking is performed when the solenoid valve is turned OFF.　With the basic circuit for the gap switch (Fig. 38), however, the OFF checking should be performed when a workpiece comes off while the solenoid valve is ON.　If the control circuit cannot be modified, the minute flow of air should be completely cut off.　This, however, will produce a delay of about one second in the switching from ON to OFF.

2
CAUTION

● If a circuit used with the gap switch includes a blow circuit as in Fig. 39, the minute flow of air will be supplied to the gap switch during the air blow operation as well, producing the ON signal. Design the control circuit in such a way that the Workpiece In Position signal will be rejected during the air blow operation.

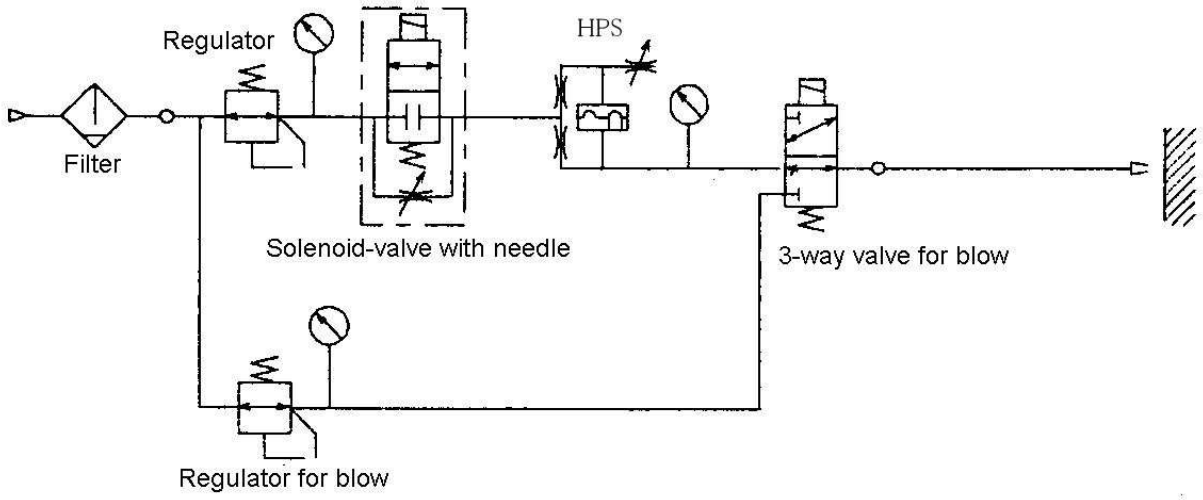


Figure 39 Circuit used with the gap switch includes a blow circuit

11) If a capacitive load such as a buzzer is connected to the load, an unintended action of the output protection circuit may interfere with the normal operation. When designing the load, consider not only the rated current but also the transient current value.

12) As to the nozzle used for seating check, it is recommended that a 1.5 or 2 mm dia. nozzle should be machined direct onto the seating surface as shown in Fig. 40 below. The nozzle tip should not be chamfered to prevent the differential pressure range from becoming narrow. For other designs, contact us separately. Also, where a back pressure type nozzle is used, refer to page 10.

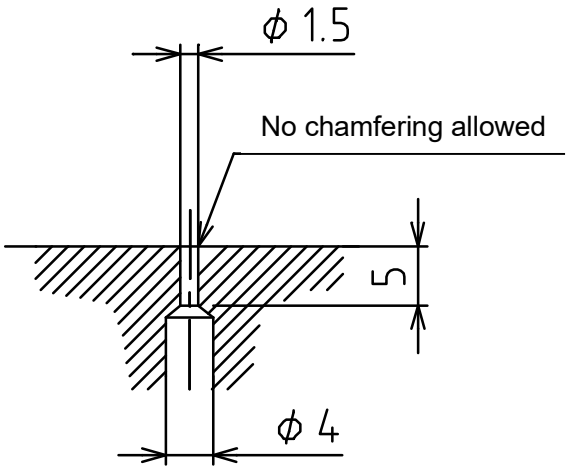


Fig. 40

3. Operation

3.1 Adjustment

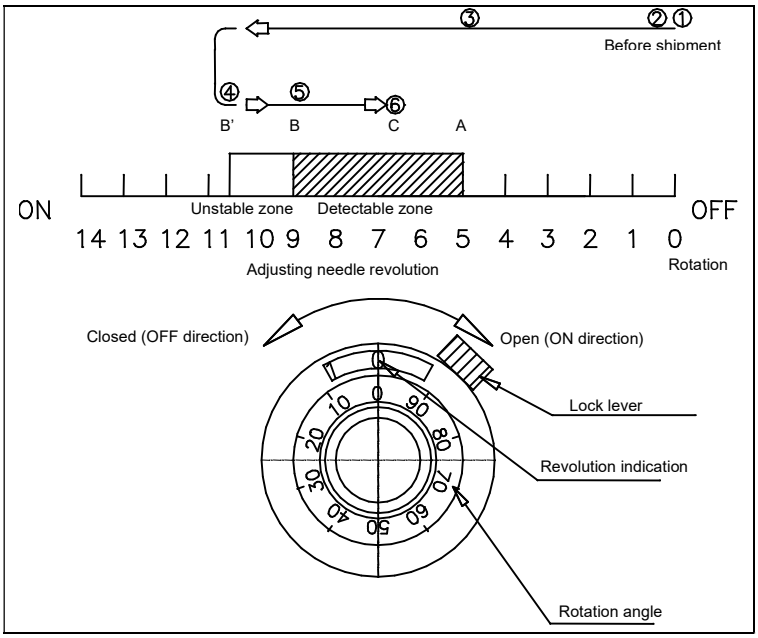


Figure 41

The adjustment method differs, depending on the applications.
According to the following adjustment procedure, set up correctly.

1) Adjustment method in using by setting the differential pressure range
(1) When the product is shipped from our factory, the adjusting needle is adjusted to rotation speed 0 and rotating angle 0. Supply air. The indicator lamp goes out. (OFF)
(2) Install it in the distance in which a work is to be detected from the nozzle, and in this condition, increase the scale on the adjusting needle of contact checking switch from zero (0). Lamp-OFF changes to Lamp-ON; at this point A where this change occurs, therefore, stop the adjusting needle.
* When a master gauge or clearance gauge is used for adjustment of the detection distance, refer to the "When a master or clearance gauge is used" paragraph.
(3) Move the lock lever to lock the adjusting needle.
(4) Ensure that the indicator lamp is turned "ON" and "OFF" by keeping a work apart from the objective position or approaching it thereto. It completes this adjustment.

2) Adjustment method in using for checking the absence or presence of a work
(1) When the product is shipped from our factory, the adjusting needle is adjusted to rotation speed 0 and rotating angle 0. Supply air.The indicator lamp goes out. (OFF)
(2) Increase the scale on the adjusting needle of contact checking switch from zero (0) with no work present, and find point B' in which Lamp-OFF is switched to Lamp-ON.
(3) Decrease the adjusting needle scale from point B' to find point B in which "Lamp ON" changes to "Lamp-OFF".
(4) Place a work, and ensure that the indicator lamp is turned "ON".
(5) Decrease the adjusting needle scale to find point A in which "Lamp-ON" changes to "Lamp-OFF".
(6) If the scale position C is near point B, the signal is readily turned ON, and the reaction time is quick, while this resetting is time-consuming. Providing the adjusting point C midway between points A and B enables stable detection.
(7) Move the lock lever to lock the adjusting needle.

3) Adjustment using a master or schemer gage

- Three people are needed to do the work: one person to set the gage, one person to operate the machine, and one person to adjust the gap switch. Since the adjustment will involve machine operations, each person should pay attention to their safety and that of the other two people. For safety considerations, adjustment using the adjustment dial is preferable.
- For a successful schemer setting, press the master or schemer gage firmly against the detection nozzle.

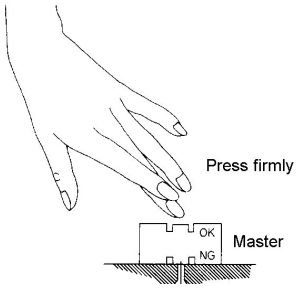


Figure 42

3.2 Notes on Use

1) If the adjustment dial receives a shock from being knocked, dropped, or hit, the marks on the dial will not indicate the correct detection distances any more. Handle carefully.

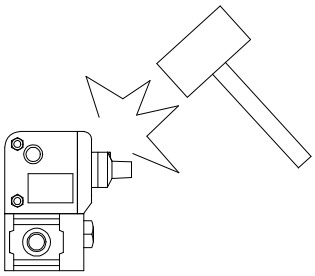


Figure 43

2) A caution label on the reverse side of the gap switch tells you not to adjust the product. Since the adjustment has been done during the delivery inspection, do not remove the caution label and touch the comparison nozzle inside.

3) If the nozzle is blocked, the needle of the monitor pressure gage will point to a high pressure value and will not return to zero. Disconnect the gap switch side piping and blow off the foreign matter using compressed air. If it does not work, insert a needle into the detection nozzle end.

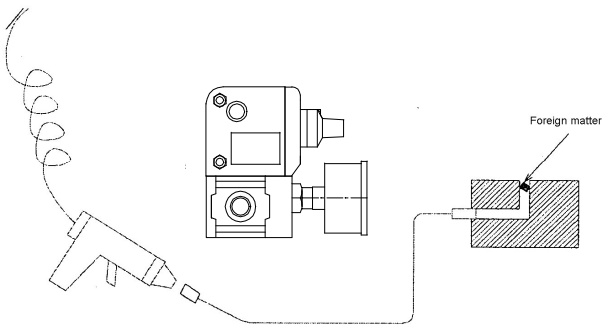


Figure 44

4) Use a single gap switch for each detection nozzle. If you connect a single gap switch to two nozzles, the gap switch will refer to the total of the values from the two nozzles when making a comparison.

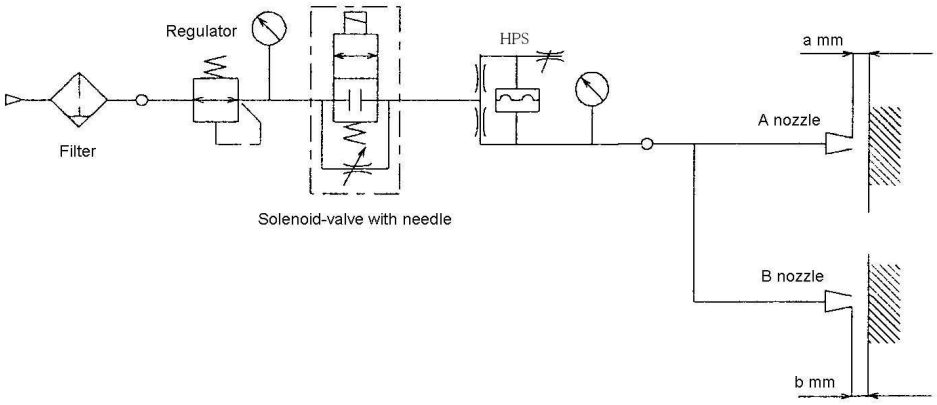


Figure 45 Using 1 HPS and 2 nozzle

a+b＞detection distance set judge as “off”
a+b≦detection distance set judge as “on”

With the detection distance set to 0.05 mm (red mark), the switch will be ON (indicating OK) when "a" is 0 mm and "b" is 0.05 mm. The switch will indicate "NG" when "a" is 0.03 mm and "b" is 0.03 mm. In the latter case, you would want the switch to indicate "OK" but the switch does not because it refers to the total of the values from the two nozzles. To ensure correct judgment, we recommend you to provide a gap switch for each nozzle.

5) For a short time after the startup, the switch will remain ON due to the presence, in the piping, of the cutting fluid that entered from the nozzle. Start the machine only after the cutting fluid has been drained by the detection air.

4. Installation

4.1 Installation

4.1.1 M-12 connector type

A connector can easily be disconnected by loosening the nut at the cable end. This feature allows speedy mounting and dismounting of individual gap switches.

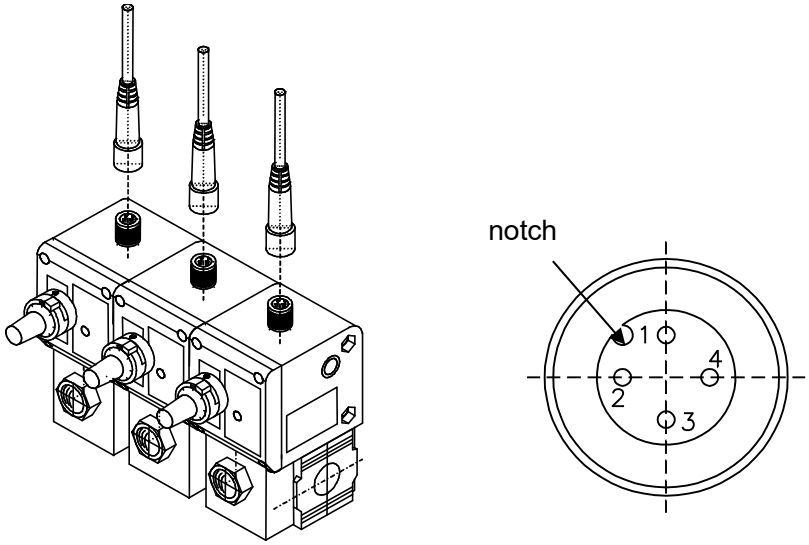


Figure 46 Disassembling M-12 connector cable

4.1.2 DIN-terminal type

After you remove the M3 screw at the top, the unit is split into a plug and a socket. This type of terminal requires a certain amount of work in the beginning for the wiring but enables speedy replacement of the gap switch afterward.

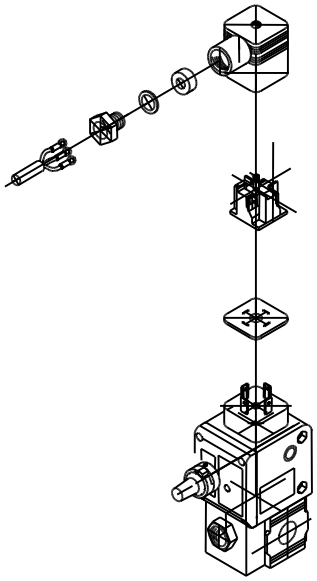


Figure 47 Disassembling DIN-terminal socket

4.1.3 Notes on installation

1) Pay attention to the following when installing the product:

- To prevent the penetration of cutting fluid, install the gap switch at a level higher than the seating face.
- Provide enough space for adjustment, monitoring, and holding.
- Choose rust-proof piping materials such as nylon and stainless tubes.
- Before connecting a tube, remove foreign matter and cutting chips from the inside of the tube by blowing air into it.
- When connecting a device or tube, pay attention not to allow the entry of a piece of seal tape or adhesive into the circuit.
- When mounting a device to the gap switch, do not allow the weight of the device to be held by the gap switch.
- If the gap switch is connected with a metal tube, the tube has to be fixed firmly at its position. Otherwise an excessive amount of stress may arise at the connecting portion.

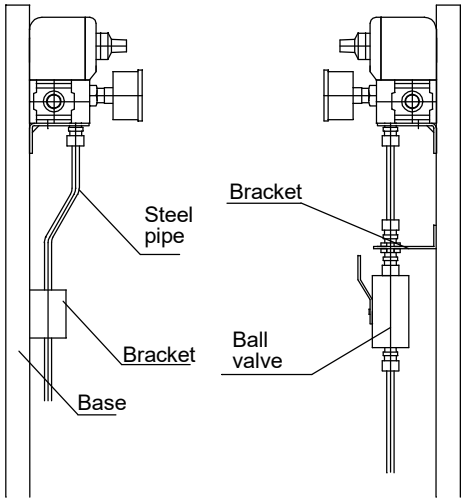


Figure 48

- Do not apply a shock to the gap switch by a hitting or knocking it.
- If you have to perform a welding operation nearby, cover the gap switch to protect it against the spatters.
- If you install the gap switch inside a box, be sure to provide a ventilation hole so that the pressure inside the box may remain the same as the barometric pressure. Arise in the internal pressure may cause a malfunction.

2) The bracket has two different bolt hole positions: one for the mounting of the gap switch with its rear panel facing the wall, another for the mounting via a T-type bracket.

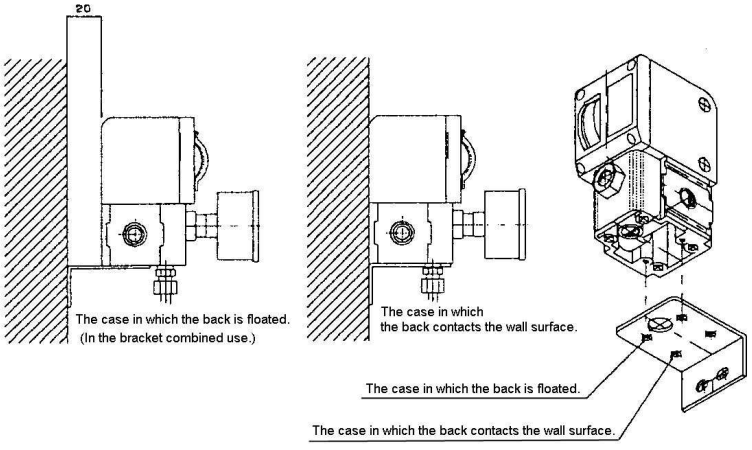


Figure 49

4.2 Wiring

4.2.1 M-12 connector type , wiring option (C＊)

In case of wiring to M-12 connector type, refer to the following figure.

Pin arrangement (HPS main body side)

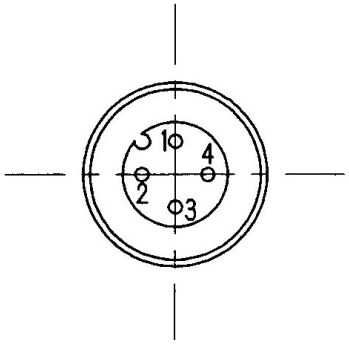


Figure 50

Pin No.	Wiring option (-C1、-C3、-C5) Lead wire color	Use
1	Brown	Power supply (+)
2	White	N.C. (no use)
3	Blue	Power supply (-)
4	Black	Output

4.2.2 DIN-terminal type

Pin arrangement (HPS main body side)

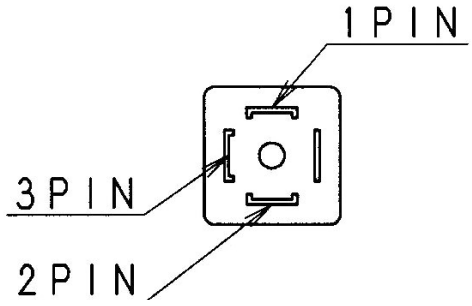


Figure 51

Pin No.	Use
1	Power supply (+)
2	Power supply (-)
3	Output

4.2.3 Common terminal box type

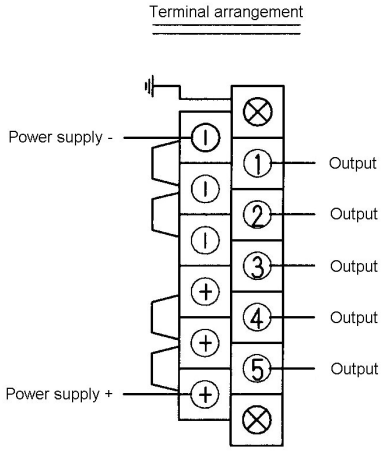
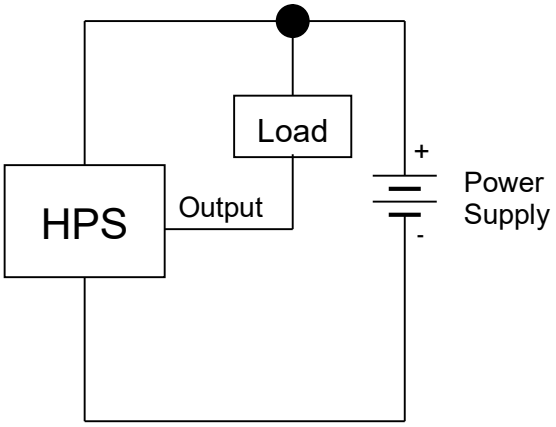


Figure 52

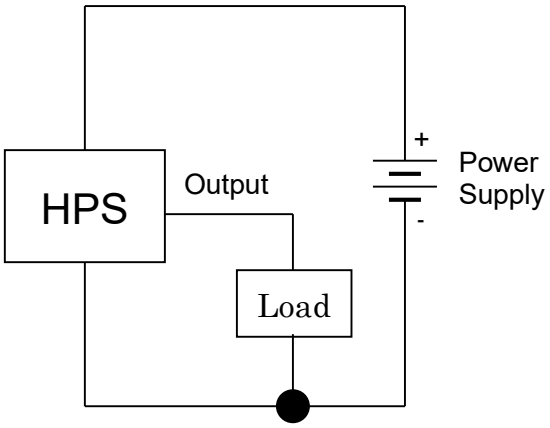
4.2.4 Notes on wiring

1) Gap switches come with two different output types: NPN open collector type and PNP open collector type. If you chose the wrong output type, the input unit will not be able to receive signals even though the internal lamps will function normally.
We recommend our customers carefully choose gap switches of an output type compatible with the input unit in use.



Connection method of NPN open collector

Figure 53



Connection method of PNP open collector

Figure 54

2) The presence of a motor or power cable in proximity of the gap switch wires may cause
the sensor element in the gap switch to deteriorate or fail due to surges and noise. Be sure to separate the cables.

3) If a source of a major surge current (a motor or welder, for example) is present near the gap switch, install a surge killer close to the source.

4) A mistake in the wiring may cause damage to the internal circuit. Take care not to make a mistake in the wiring.

5) If an excessive current is caused by a short circuit in the load, for example, the protection circuit will trip. To restart, turn the power OFF and then ON. Note, however, that you have to find and remove the cause of the trip before turning the power ON.

6) Do not use the gap switch immediately after the startup while it is still in a transient state.

7) If you use a switching regulator in the power supply, be sure to provide a FG (frame ground) terminal.

5. Model code

5.1 Single type

HPS - Ⅰ - Ⅱ Ⅲ Ⅳ - Ⅴ - Ⅵ

Ⅰ	Orifice diameter
0 5	ϕ 0.5
0 7	ϕ 0.7
1 0	ϕ 1.0

Ⅱ	Type of output
N	NPN open collector
P	PNP open collector

Ⅲ	Lamp color
G	Green
Y	Yellow

Ⅳ	Wiring option
F	DIN-terminal
C0	M-12 connector (cable : none)
C1	M-12 connector (1m cable : attached)
C3	M-12 connector (3m cable : attached)
C5	M-12 connector (5m cable : attached)
CTL	Assembled M-12 connector type common terminal box at the left side
CTR	Assembled M-12 connector type common terminal box at the right side
TL	Assembled lead wire type common terminal box at the left side
TR	Assembled lead wire type common terminal box at the right side
Goods for the common terminal box	
R	For the left assembling
L	For the right assembling
W	For the middle assembling

Ⅴ	Attachment , others
No code	Bracket : none
B	Bracket : attached

Ⅵ	Pressure gauge
No code	Pressure gauge : none
G2	Pressure gauge with safety mark : attached
GW2	Pressure gauge with safety mark : assembled

5.2 Manifold type

MHPS - Ⅰ - Ⅱ Ⅲ Ⅳ Ⅴ - Ⅵ - Ⅶ

Ⅰ	Orifice diameter
0 5	ϕ 0.5
0 7	ϕ 0.7
1 0	ϕ 0.7

Ⅱ	Nos. of station
2	2 stations
3	3 stations
4	4 stations
5	5 stations

Ⅲ	Type of output
N	NPN open collector
P	PNP open collector

Ⅳ	Lamp color
G	Green
Y	Yellow

Ⅴ	Wiring option
F	DIN-terminal
C0	M-12 connector (cable : none)
C1	M-12 connector (1m cable : attached)
C3	M-12 connector (3m cable : attached)
C5	M-12 connector (5m cable : attached)
CTL	Assembled M-12 connector type common terminal box at the left side
CTR	Assembled M-12 connector type common terminal box at the right side
TL	Assembled lead wire type common terminal box at the left side
TR	Assembled lead wire type common terminal box at the right side
T1	Assembled lead wire type common terminal box between 1st and 2nd unit from the left
T2	Assembled lead wire type common terminal box between 2nd and 3rd unit from the left
T3	Assembled lead wire type common terminal box between 3rd and 4th unit from the left
T4	Assembled lead wire type common terminal box between 4th and 5th unit from the left

Ⅵ	Attachment , others
No code	Bracket : none
B	Bracket : attached

Ⅶ	Pressure gauge
No code	Pressure gauge : none
G2	Pressure gauge with safety mark : attached
GW2	Pressure gauge with safety mark : assembled

5.3 Unit type

UHPS - Ⅰ - Ⅱ Ⅲ Ⅳ Ⅴ - Ⅵ - Ⅶ - Ⅷ - Ⅸ

Ⅰ	Orifice diameter
0 5	ϕ 0.5
0 7	ϕ 0.7
1 0	ϕ 1.0

Ⅱ	Nos. of station
1	1 station
2	2 stations
3	3 stations
4	4 stations
5	5 stations

Ⅲ	Type of output
N	NPN open collector
P	PNP open collector

Ⅳ	Lamp color
G	Green
Y	Yellow

Ⅴ	Wiring option
F	DIN-terminal
C0	M-12 connector (cable : none)
C1	M-12 connector (1m cable : attached)
C3	M-12 connector (3m cable : attached)
C5	M-12 connector (5m cable : attached)
TL	Assembled lead wire type common terminal box at the left side
TR	Assembled lead wire type common terminal box at the right side
CTL	Assembled M-12 connector type common terminal box at the left side
CTR	Assembled M-12 connector type common terminal box at the right side

Ⅵ	Attachment , others
B	Bracket : attached

Ⅶ	Pressure gauge
No code	Pressure gauge : none
GW2	Pressure gauge with safety mark : assembled

Ⅷ	Solenoid valve connecting type (note)
2E	DIN terminal box
2H	DIN terminal box with lamp
3N	HP terminal box with lamp

Ⅸ	Solenoid valve voltage
1	AC100V
2	AC200V
3	DC24V

note) The products for CE marking please select solenoid valve connecting type “2E” “2H” .

5.4 Attachment

5.4.1 Back pressure nozzle

APA4 - Ⅰ

Ⅰ	Back pressure nozzle
DA10	clamp mounting
DA20	nut mounting
DH10	embedding

5.4.2 Cable

GPS2 - Ⅰ

Ⅰ	cable length
C1	1m
C3	3m
C5	5m

5.4.3 Bracket

GPS2 - B

5.4.4 Terminal box

GPS2 - Ⅰ

Ⅰ	Terminal box
CTL	For assembling M-12 connector type common terminal box at the left side
CTR	For assembling M-12 connector type common terminal box at the right side
TL	For assembling lead wire type common terminal box at the left side
TR	For assembling lead wire type common terminal box at the right side
TW	For assembling lead wire type common terminal box at the middle

5.4.5 Pressure gauge with safety mark

G40D – 8 - Ⅰ - S501

Ⅰ	Range
P02	0～0.2MPa
P04	0～0.4MPa
P10	0～1.0MPa

5.4.6 Joiner set

C1000 – J100 – W

5.4.7 T type bracket set

B110 – W

5.4.8 Distributor

D101 – 00 – 8 – W

5.4.9 Adapter sets for 2 pipe arrangement (attached with joiner set)

A100 – Ⅰ – W

Ⅰ	Port size
8	Rc 1/4
10	Rc 3/8

5.4.10 Adapter set for pipe arrangement (attached with T type bracket set)

A100 – Ⅰ – W – B11W

Ⅰ	Port size
8	Rc 1/4
10	Rc 3/8

5.4.11 Solenoid valve with needle

GPS2 – AB3X – Ⅰ – FL – Ⅱ

Ⅰ	Solenoid valve connecting type
2E	DIN terminal box
2H	DIN terminal box with lamp
3N	HP terminal box with lamp

Ⅱ	Solenoid valve voltage
AC100V	
AC200V	
DC24V	

5.4.12 Regulator

R1000 – 8 – W – LT