



# Operation Manual

## PRODUCT NAME

***Direct Operated Precision Regulator***

## MODEL / Series / Product Number

**ARP20(K)-(F,N)01~(F,N)02(B,E,E1,E2,E3,E4,E5,E6,E7,E8,E9,E0,G,H)  
(-1,3,R,Y,Z)**

**ARP30(K)-(F,N)02~(F,N)03(B,E, E1,E2,E3,E4,E5,E6,E7,E8,E9,E0,G,H)  
(-1,3,R,Y,Z)**

**ARP40(K)-(F,N)02~(F,N)04(B,E, E1,E2,E3,E4,E5,E6,E7,E8,E9,E0,G,H)  
(-1,3,R,Y,Z)**

**SMC Corporation**

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# Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)\*1, and other safety regulations.

\*1) ISO 4414: Pneumatic fluid power - General rules and safety requirements for systems and their components  
ISO 4413: Hydraulic fluid power - General rules and safety requirements for systems and their components  
IEC 60204-1: Safety of machinery - Electrical equipment of machines - Part 1: General requirements  
ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots  
etc.



## **Danger**

**Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.



## **Warning**

**Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.



## **Caution**

**Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.



## **Warning**

### **1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

### **2. Only personnel with appropriate training should operate machinery and equipment.**

The product specified here may become unsafe if handled incorrectly.

The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

### **3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.

2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.

3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

### **4. Our products cannot be used beyond their specifications. Our products are not developed, designed, and manufactured to be used under the following conditions or environments. Use under such conditions or environments is not covered.**

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.

2. Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, fuel equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogs and operation manuals.

3. Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.



# Safety Instructions

## Caution

**We develop, design, and manufacture our products to be used for automatic control equipment, and provide them for peaceful use in manufacturing industries.**

**Use in non-manufacturing industries is not covered.**

Products we manufacture and sell cannot be used for the purpose of transactions or certification specified in the Measurement Act.

The new Measurement Act prohibits use of any unit other than SI units in Japan.

## Limited warranty and Disclaimer/Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”. Read and accept them before using the product.

### Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.\*2)  
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.  
This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

**\*2) Vacuum pads are excluded from this 1 year warranty.**

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.

Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty

### Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

## Precautions for Design

### **Warning**

- (1) External parts including the bonnet, handle, cover (Material: polyacetal) are made of resin. Organic solvents including synthetic fluid, chemicals including acetone, alcohol, ethylene chloride, sulphuric acid, nitrate, hydrochloric acid, cutting oil, kerosene, gasoline, lock material of screw are harmful. Don't use the regulator where containing those.
- (2) Do not use the product if no leakage is allowed due to the environment, or if the fluid is not air.
- (3) Protect from ultra violet ray and radiation heat by shield.
- (4) Safety device needs to be installed if output pressure exceeding set pressure lead to cause the breakage of outlet device and equipment or malfunction.

### **Caution**

- (1) Select a model that is suitable for the desired purity by referring to SMC's Best Pneumatics "Air Line Equipment, Air Preparation Equipment."
- (2) Do not use the product outside of its specifications.

## Selection

### **Warning**

- (1) Grease used on the internal sliding parts and seals may flow to the outlet side.
- (2) Residual pressure(outlet pressure) is not released even if releasing inlet pressure. Select the regulator with counter flow function. Without the function, residual pressure may not be eliminated.
- (3) Long absence of operation or operation with sealed circuit or balancing circuit on the outlet side may cause set pressure fluctuation.
- (4) Do not use the product with the supply of inlet pressure stopped.
- (5) Set pressure of outlet pressure shall be 90% or less of inlet pressure. Pressure over 90% makes operation susceptible to flow and inlet pressure which lead to cause unstable operation.
- (6) Maximum set pressure range in the spec. has margin. Pressure set may be higher than the maximum value.
- (7) Cannot be used in circuits that requires high exhaust sensitivity or set precision.
- (8) Even when the product is used in the specified range, it may chatter depending on the operating conditions.

## Installation

### **Caution**

- (1) Connect the regulator ensuring the direction of "IN" and "OUT" for air direction or an arrow. Wrong connection lead to cause malfunction.
- (2) Reserve a space for maintenance at the top, bottom and front of the product. Specifically, on the valve guide side (opposite side from the pressure regulator handle), we recommend leaving a space of at least 100mm for maintenance.
- (3) Be careful not to drop the product or subject it to impact during transportation and installation. This can impair the display accuracy of the pressure gauge.
- (4) Don't install where highly humid or temperature is high. Or pressure gauge may malfunction.
- (5) When the product is installed between a solenoid valve and actuator, select a reverse flow check type.

## Adjustment

### **Warning**

- (1) Adjust the pressure ensuring inlet pressure and outlet pressure.  
Turning the pressure regulator handle (referred to as the "handle") excessively can cause damage to the internal parts.
- (2) Operate the pressure adjusting handle manually. Tools may break the handle.

### **Caution**

- (1) Check primary pressure before setting up.
- (2) For the regulator with the pressure gauge, don't apply pressure over the maximum scale of the pressure gauge in order to protect the gauge.
- (3) Release the lock to adjust the pressure. After the adjustment, engage the lock.  
Failure to observe this procedure can damage the handle or cause the outlet pressure to fluctuate.
  - Pull the handle to unlock.  
(You can visually verify with the "orange mark" that appears in the gap.)
  - Push the handle to lock. If the handle is hard to lock, turn it left and right a little and then push it (when the handle is locked, the "orange" mark will disappear.)
- (4) Adjust pressure incrementally. Pressure may become lower than set pressure if adjusted by decreasing the value. Rotate the handle clockwise to raise the set pressure.  
Counterclockwise, reduce the pressure.
- (5) The product consumes a small amount of fluid from the bleed port.  
The product is designed to have a bleed mechanism for highly accurate pressure adjustment, and consumes a small amount of fluid from the bleed port.  
This should not be considered abnormal.
- (6) Outlet pressure may rise if eliminate the inlet pressure after pressure setting and supply pressure again. The pressure becomes close to the set pressure after air is consumed in outlet.
- (7) Outlet pressure might change if uses for a long time. Please confirm set pressure regularly.

## Piping

### **Warning**

- (1) Flash or clean piping before piping to eliminate swarf, cutting oil, solid foreign material.  
Remaining of these lead to cause malfunction.
- (2) When screw in piping or fitting, avoid entering of chips and sealing materials from piping screws into the inside of equipment. Or malfunction is led to occur.  
When use sealing tapes, leave 1 thread of a screw and starts taping.
- (3) Hold the female screw side and screw in piping with recommended tightening torque.  
Insufficient tightening torque lead to cause loose piping or sealing failure. Excessive torque may lead to cause screw breakage. Tightening without holding female screw side applies excessive force to the piping bracket which lead to cause breakage.

Recommended tightening torque (Unit: N·m)

Thread	1/8	1/4	3/8	1/2
Torque	3 to 5	8 to 12	15 to 20	20 to 25

- (4) Don't apply any torsional moment, or bending moment except the weight of the regulator itself. External pipings need its support separately. Hard piping like steel tube is susceptible to excessive moment load or vibration. Insert the flexible tube to cancel the influence.

## Air Supply

### **Warning**

- (1) Use a mist separator on the inlet side of the product. If the supplied air contains condensate or dust, the bleed mechanism can malfunction.
- (2) Do not use a lubricator at the inlet side of the product, as the bleed mechanism can malfunction.
- (3) Use clean air. Compressed air containing chemicals, organic solvent, synthetic oil or corrosive gas may lead to cause breakage of parts or malfunction.

## Maintenance

### **Warning**

- (1) Maintenance or check should be done by following the procedure in the operation manual. Incorrect handling of the product may cause breakage or malfunction of the equipment or device.
- (2) When using the regulator with backflow function between a solenoid valve and an actuator, check the pressure gauge periodically. Sudden pressure fluctuations may shorten the durability of the pressure gauge. A digital pressure gauge is recommended for such applications or as deemed necessary.

## 2. Application

This instrument aims at pressure controlling of air lines.

## 3. Specifications

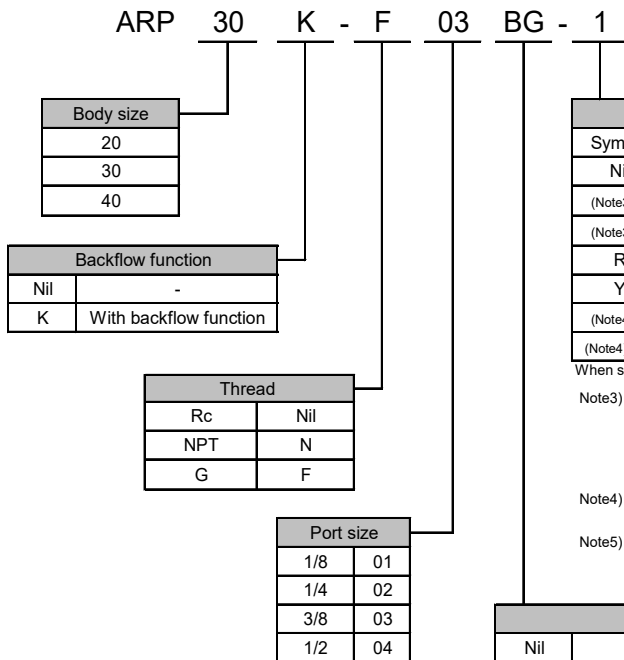
Model		ARP20(K)	ARP30(K)	ARP40(K)
Port size		1/8, 1/4	1/4, 3/8	1/4, 3/8, 1/2
Fluid		Air		
Proof pressure		1.2MPa		
Max. operating pressure		0.7MPa		
Set pressure <sup>Note1)</sup> range	0.4MPa setting type	Example) ARP30-02BG		0.005~0.4MPa
	0.2MPa setting type	Example) ARP30-02BG-1		0.005~0.2MPa
	0.6MPa setting type	Example) ARP30-02BG-3		0.008~0.6MPa
Setting Sensitivity		0.2% F.S.within		
Repeatability <sup>Note2)</sup>		±1% F.S.(or±3kPa) within		
Air Consumption	0.4MPa setting type	Example) ARP30-02BG		1L/min(ANR)within(P2=0.4MPa setting)
	0.2MPa setting type	Example) ARP30-02BG-1		0.6L/min(ANR)within(P2=0.2MPa setting)
	0.6MPa setting type	Example) ARP30-02BG-3		1.4L/min(ANR)within(P2=0.6MPa setting)
Gauge port size <sup>Note3)</sup>		1/8	1/4	
Ambient and fluid temperature		-5 to 60°C (No freezing)		
Digital pressure switch	Example) ARP30-02BE1	-5 to 60°C (No freezing)		
Construction		Bleed type		
Weight (kg)		0.2kg	0.3kg	0.5kg

Note 1) Set the inlet pressure 0.05MPa or higher than the set pressure with backflow function.

Note 2) The repeatability is ±3kPa, when 0.2MPa setting type is selected.

Note 3) Connection size is not applicable to a square embedded pressure gauge.

## 4. How To Order



Options	
Symbol	Contents
Nil	-
(Note3) 1	Setting pressure 0.005~0.2MPa
(Note3) 3	Setting pressure 0.008~0.6MPa
R	Flow-direction : From right to left
Y	Handle is upward
(Note4) Z	Nameplate, Pressure gauge Unit : psi
(Note4) ZA	Digital pressure switch with unit conversion function (Default setting: MPa)

When specifying more than one option, indicate symbols numerically then alphabetically.

Note3) Only the adjusting spring is different from the standard model.

Max. outlet pressure is 0.2MPa or more and it might go up.

Max. outlet pressure is 0.6MPa or more and it might go up.

When 0.2MPa setting type is selected, the pressure gauge for 0.2MPa is attached.

When 0.6MPa setting type is selected, the pressure gauge for 0.7MPa is attached.

Note4) Thread: NPT. Z is applicable to only overseas because of new measure ment law in Japan (SI unit)

Digital pressure switch with unit conversion function (Default setting: psi)

Note5) Accessory :E1,E2, E3, E4, E5, E6, E7, E8, E9 or E0.

ZA is applicable to only overseas because of new mentlaw in Japan (SI unit)

Note1) Accessories	
Nil	-
B	With bracket (with set nut)
E	Square embedded pressure gauge (With limit indicator)
E1 <sup>Note2)</sup>	NPN output / Wiring bottom entry
E2 <sup>Note2)</sup>	NPN output / Wiring top entry
E3 <sup>Note2)</sup>	PNP output / Wiring bottom entry
E4 <sup>Note2)</sup>	PNP output / Wiring top entry
E5 <sup>Note2)</sup>	Analog voltage output / Wiring bottom entry
E6 <sup>Note2)</sup>	Analog voltage output / Wiring top entry
E7 <sup>Note2)</sup>	Analog current output / Wiring bottom entry
E8 <sup>Note2)</sup>	Analog current output / Wiring top entry
E9 <sup>Note2)</sup>	IO-Link or switch: 1 output / Wiring bottom entry
E0 <sup>Note2)</sup>	IO-Link or switch: 1 output / Wiring top entry
G	Circular pressure gauge (With limit indicator)
H	With set nut (Panel mounting)

When specifying more than one option, indicate symbols numerically then alphabetically.

Note1) Accessory is packed together and is not mounted. (Except type E, E1, E2, E3, E4, E5, E6, E7, E8, E9 or E0.)

Note2) If "H" option is selected together, there will be no space for connecting the lead wire.

Therefore, in that case, select electrical entry option so that the lead wire is in the opposite direction from the handle.

For the handling of the digital pressure switch, refer to the Operation Manual of the digital pressure switch, ISE35 series.

## 5. Trouble Shooting

Refer to construction, disassembly drawing. (Shown in next page.)

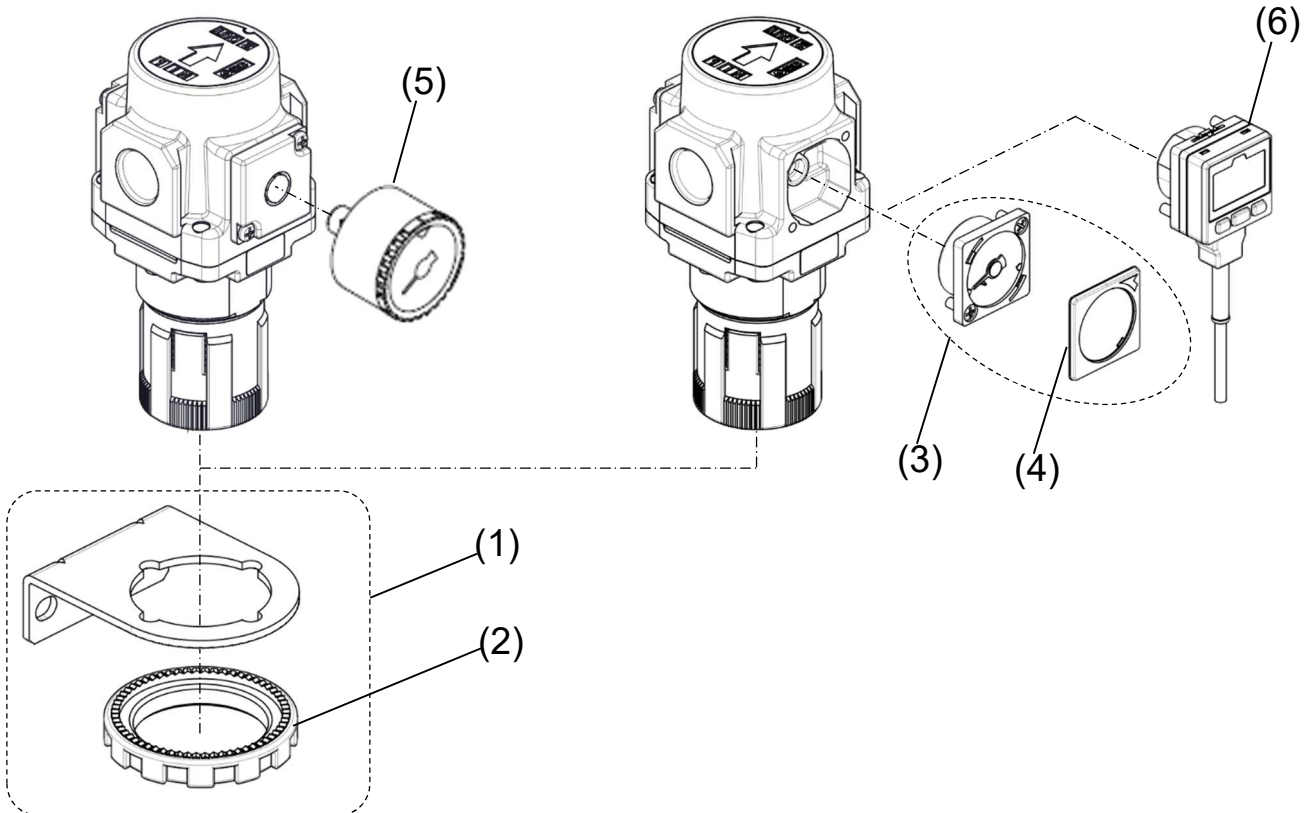
TROUBLE		POSSIBLE CAUSE	REMEDY
Demarcation	Phenomenon		
Pressure	Pressure is not regulated	1. Opposite flow direction or opposite installation of regulator.	1. Check flow direction and install the regulator correctly if wrong.
		2. Adjust spring is damaged.	2. Replace the adjust spring.
		3. Valve spring is damaged.	3. Replace the valve spring.
		4. Foreign materials caught in valve seat or valve Y-rubber.	4. Remove valve guide and clean the valve seat or valve Y-rubber. Then, grease up the valve Y-rubber and the sliding surface.
		5. Valve rubber seat is damaged.	5. Replace the valve.
		6. Foreign material is caught in the check valve seat.	6. Replace the check valve assembly.
	Set pressure does not return to zero when pressure handle is loosened	1. Foreign materials caught in valve seat or valve Y-rubber.	1. Remove the valve guide to clean valve, valve seat and the valve Y-rubber. Then, grease up the valve Y-rubber and the sliding surface.
		2. Valve rubber seat is damaged.	2. Replace the valve.
		3. Foreign material is caught in the check valve seat.	3. Replace the check valve assembly.
		4. Valve spring is damaged.	4. Replace the valve spring.
Air leaks	Air leaks from the bonnet exhaust port	1. Diaphragm is damaged.	1. Replace the diaphragm assembly.
		2. Foreign material is caught in the relieving valve seat.	2. Clean the relieving valve seat, or replace the diaphragm assembly.
		3. Foreign material is caught in the valve seat of valve O-ring.	3. Remove the valve guide to clean valve, valve seat and the valve O-ring. Then, grease up the valve O-ring and the sliding surface.
		4. Valve rubber seat is damaged.	4. Replace the valve.
		5. Foreign material is caught in the check valve seat.	5. Replace the check valve assembly.
		6. Back pressure exceeding the set pressure is applied to the outlet.	6. Revise the air circuit so that back pressure does not exceed the set pressure.
	Air leaks between the bonnet and the body.	1. Loosened bonnet.	1. Fasten the bonnet.
		2. Diaphragm is damaged.	2. Replace the diaphragm assembly.
Reverse flow	Air does not flow in the reverse direction.	1. Foreign matter is caught in the check valve so it cannot operate normally.	1. Replace the check valve assembly with a new one.
		2. The check valve has stuck.	2. Replace the check valve assembly with a new one.

Note) The grease used recommends multipurpose No.2.

## 6. Options

Without pressure gauge /  
With round type pressure gauge  
(Backflow function: Yes / No)

With square embedded type pressure gauge /  
With digital pressure switch  
(Backflow function: Yes / No)



### Option / Replacement Parts

No.	Description	Thread	Option	Material	Part No.		
					ARP20	ARP30	ARP40
(1)	<sup>Note1</sup> Bracket assembly	—	—	Steel plate	ARP20P-270AS	ARP30P-270AS	ARP40P-270AS
(2)	Set nut	—	—	POM	AR23P-260S	AR33P-260S	AR43P-260S
(3)	<sup>Note2</sup> Square embedded pressure gauge	NPT	Z	—	<sup>Note3</sup> GC3-4AS		
(4)	Pressure gauge cover	—	—	—	<sup>Note3</sup> GC3-P4AS		
(5)	Circular pressure gauge	Rc	—	—	<sup>Note4</sup> G36-4-01	<sup>Note5</sup> G46-4-02	
		NPT	—	—	<sup>Note4</sup> G36-4-N01	<sup>Note5</sup> G46-4-N02	
			Z	—	<sup>Note4</sup> G36-P4-N01	<sup>Note5</sup> G46-P4-N02	
		G	—	—	<sup>Note4</sup> G36-4-01	<sup>Note5</sup> G46-4-02	
(6)	Digital pressure switch (with accessories for mounting)				<Common for all sizes>		
					Output specification	Bottom entry wiring	Top entry wiring
		—	—	—	NPN	ISE35-N-25-MLA	ISE35-R-25-MLA
				—	PNP	ISE35-N-65-MLA	ISE35-R-65-MLA
				—	Analog voltage	ISE35-N-26-MLA	ISE35-R-26-MLA
				—	Analog current	ISE35-N-28-MLA	ISE35-R-28-MLA
		—	ZA	—	IO-Link or switch: 1	ISE35-N-L-MLA	ISE35-R-L-MLA
				—	NPN	ISE35-N-25-LA	ISE35-R-25-LA
				—	PNP	ISE35-N-65-LA	ISE35-R-65-LA
				—	Analog voltage	ISE35-N-26-LA	ISE35-R-26-LA
		NPT	Z	—	Analog current	ISE35-N-28-LA	ISE35-R-28-LA
				—	IO-Link or switch: 1	ISE35-N-L-LA	ISE35-R-L-LA
				—	NPN	ISE35-N-25-PLA	ISE35-R-25-PLA
				—	PNP	ISE35-N-65-PLA	ISE35-R-65-PLA
		—	—	—	Analog voltage	ISE35-N-26-PLA	ISE35-R-26-PLA
				—	Analog current	ISE35-N-28-PLA	ISE35-R-28-PLA
—	IO-Link or switch: 1			ISE35-N-L-PLA	ISE35-R-L-PLA		

Note1) Bracket and Set nut assembly.

Note2) With O-ring (1 pcs.) and mounting screws (2 pcs.).

Note3) Part no. for 0.2MPa is GC3-2AS / GC3-P2AS(NPT · Z)

Part no. for 0.6MPa is GC3-7AS / GC3-P7AS(NPT · Z)"

Note4) Part no. for 0.2MPa is G36-2-01(Rc) / G36-2-N01(NPT) / G36-P2-N01(NPT · Z)

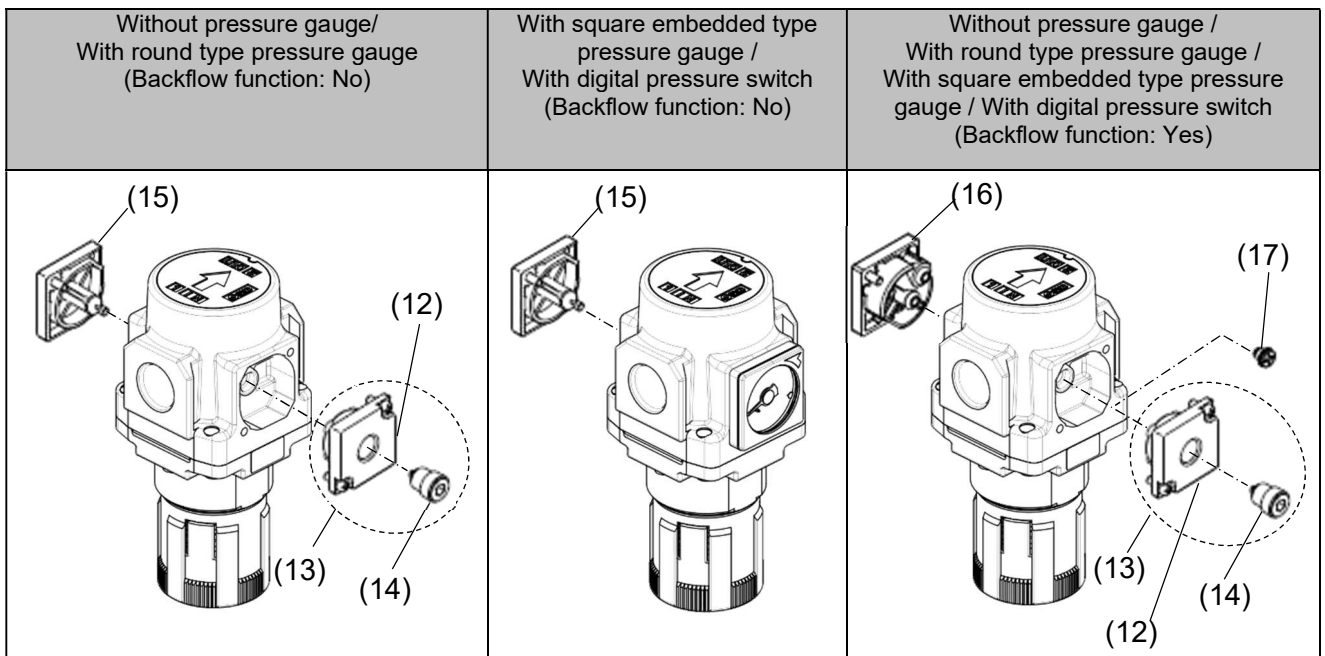
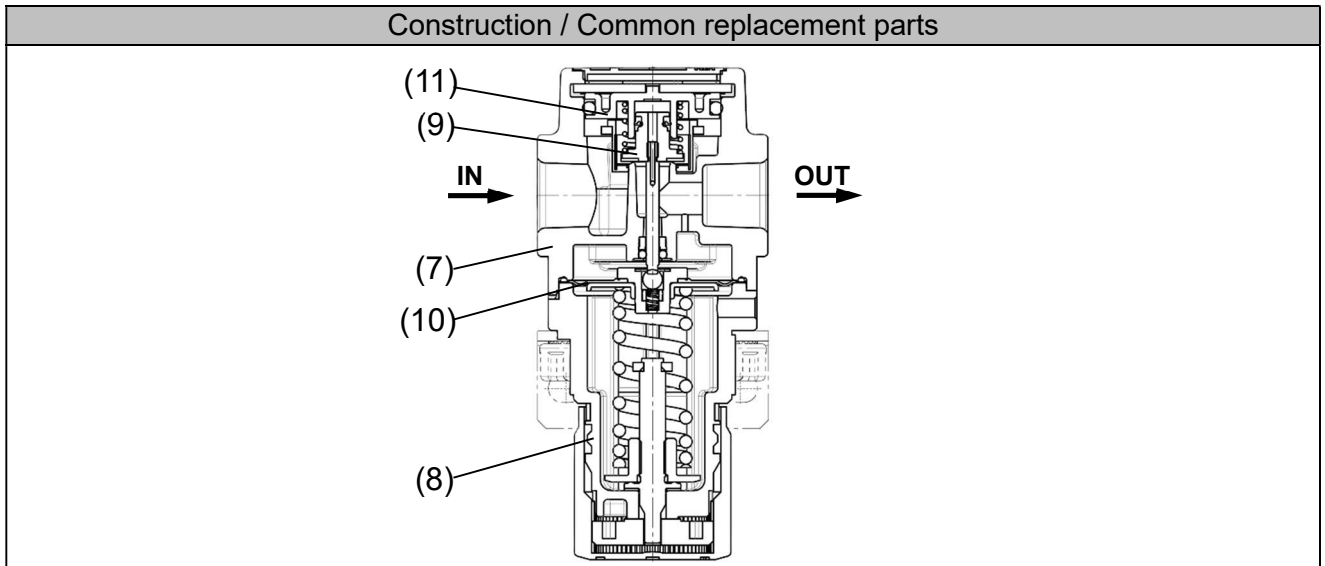
Part no. for 0.6MPa is G36-7-01(Rc) / G36-7-N01(NPT) / G36-P7-N01(NPT · Z)"

Note5) Part no. for 0.2MPa is G46-2-02(Rc) / G46-2-N02(NPT) / G46-P2-N02(NPT · Z)

Part no. for 0.6MPa is G46-7-02(Rc) / G46-7-N02(NPT) / G46-P7-N02(NPT · Z)"

Note) The number in the table is corresponding to the number in structural drawing (above-mentioned figure) and "9.Disassembly drawing".

## 7. Structural Drawing and Replacement Parts



### Component Parts

No.	Description	Material	Note
(7)	Body	Aluminium die cast	color:White
(8)	Bonnet	POM	color:White

### Option / Replacement Parts

No.	Description	Thread	Option	Material	Part no.		
					ARP20	ARP30	ARP40
(9)	Valve assembly	—	—	Brass	ARP20P-330AS	ARP30P-330AS	ARP40P-330AS
				HNBR			
				NBR			
(10)	Diaphragm assembly	—	—	Brass	ARP20P-151AS	ARP30P-151AS	ARP40P-151AS
				HNBR			
(11)	Valve guide assembly	—	—	POM·NBR	ARP20P-050AS	ARP30P-050AS	ARP40P-050AS
(12)	Pressure gauge adaptor assembly	Rc	—	Aluminum die cast	ARP20P-310AS-01		ARP20P-310AS-02
		NPT	—		ARP20P-310AS-N01		ARP20P-310AS-N02
		G	—		ARP20P-310AS-F01		ARP20P-310AS-F02
(13)	Plug assembly	Rc	—	—	ARP20P-320AS-01	ARP40P-320AS-02	
		NPT	—	—	ARP20P-320AS-N01	ARP40P-320AS-N02	
		G	—	—	ARP20P-320AS-F01	ARP40P-320AS-F02	
(14)	Plug	Rc	—	PBT	AR20P-370AS-01		AR20P-370AS-02
		NPT	—		AR20P-370AS-N01		AR20P-370AS-N02
		G	—		AP20P-370AS-01		AP20P-370AS-02
(15)	Blanking plate assembly	—	—	—	AR20P-250AS		
(16)	Check valve assembly	—	—	—	AR20KP-020AS		
(17)	Check valve plug assembly	—	—	—	AR20KP-090AS		

Note) The number in the table is corresponding to the number in structural drawing (above-mentioned figure) and "9. Disassembly drawing".

## 8. How To Replace the Components



### WARNING

Before replacement, ensure that the regulator is not pressurized.

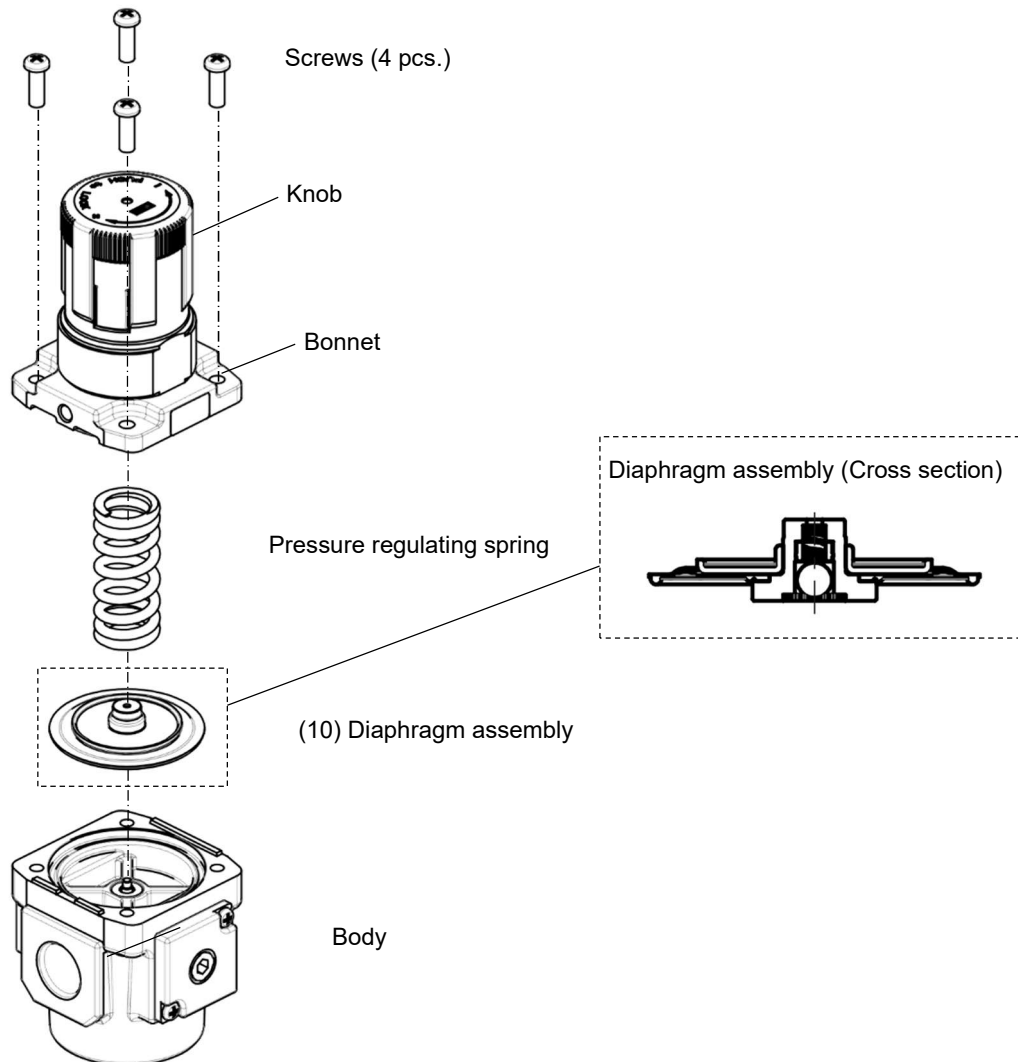
Rotate the pressure adjusting handle to zero.

Replace referring to “8. Disassembly Drawing”.

After replacement, ensure that specified function is satisfied and external leakage is not found before starting operation.

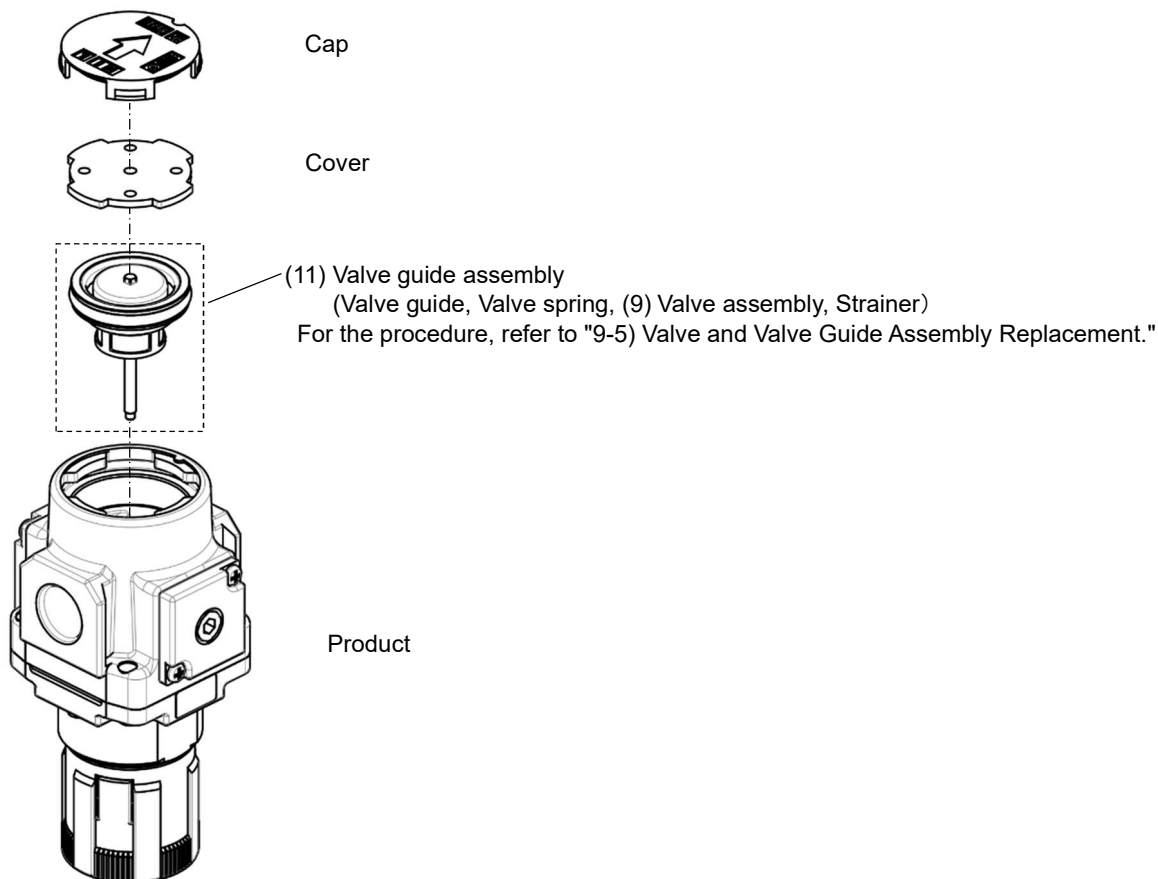
### 8-1) Diaphragm Assembly Replacement

Applicable model	Process	Procedure	Tools	Check item						
ARP20 ARP20K ARP30 ARP30K ARP40 ARP40K	Disassembly	1) Loosen the knob completely before disassembly.	—	—						
		2) Remove the 4 screws and remove the bonnet.	Phillips screwdriver	—						
		3) Remove parts in order of the pressure regulating spring, and the diaphragm assembly. Please note that the diaphragm assembly adheres to the bonnet if disassemble parts with the handle facing	—	—						
	Assembly	4) Assemble the diaphragm assembly, pressure regulating spring assembly.	—	Direction of diaphragm assembly.						
	5) Assemble the bonnet to the body. While the convex side of the bonnet is facing the IN side, mount it onto the body. Then tighten the 4 mounting screws temporarily, before tightening them diagonally and evenly to fix the bonnet..	Phillips screwdriver	<table border="1"> <thead> <tr> <th colspan="2">Tightening torque</th> </tr> </thead> <tbody> <tr> <td>ARP20(K)</td> <td>2.35+/-0.3N·m</td> </tr> <tr> <td>ARP30(K)</td> <td>2.35+/-0.3N·m</td> </tr> <tr> <td>ARP40(K)</td> <td>3.5 +/-0.3N·m</td> </tr> </tbody> </table>	Tightening torque		ARP20(K)	2.35+/-0.3N·m	ARP30(K)	2.35+/-0.3N·m	ARP40(K)
Tightening torque										
ARP20(K)	2.35+/-0.3N·m									
ARP30(K)	2.35+/-0.3N·m									
ARP40(K)	3.5 +/-0.3N·m									



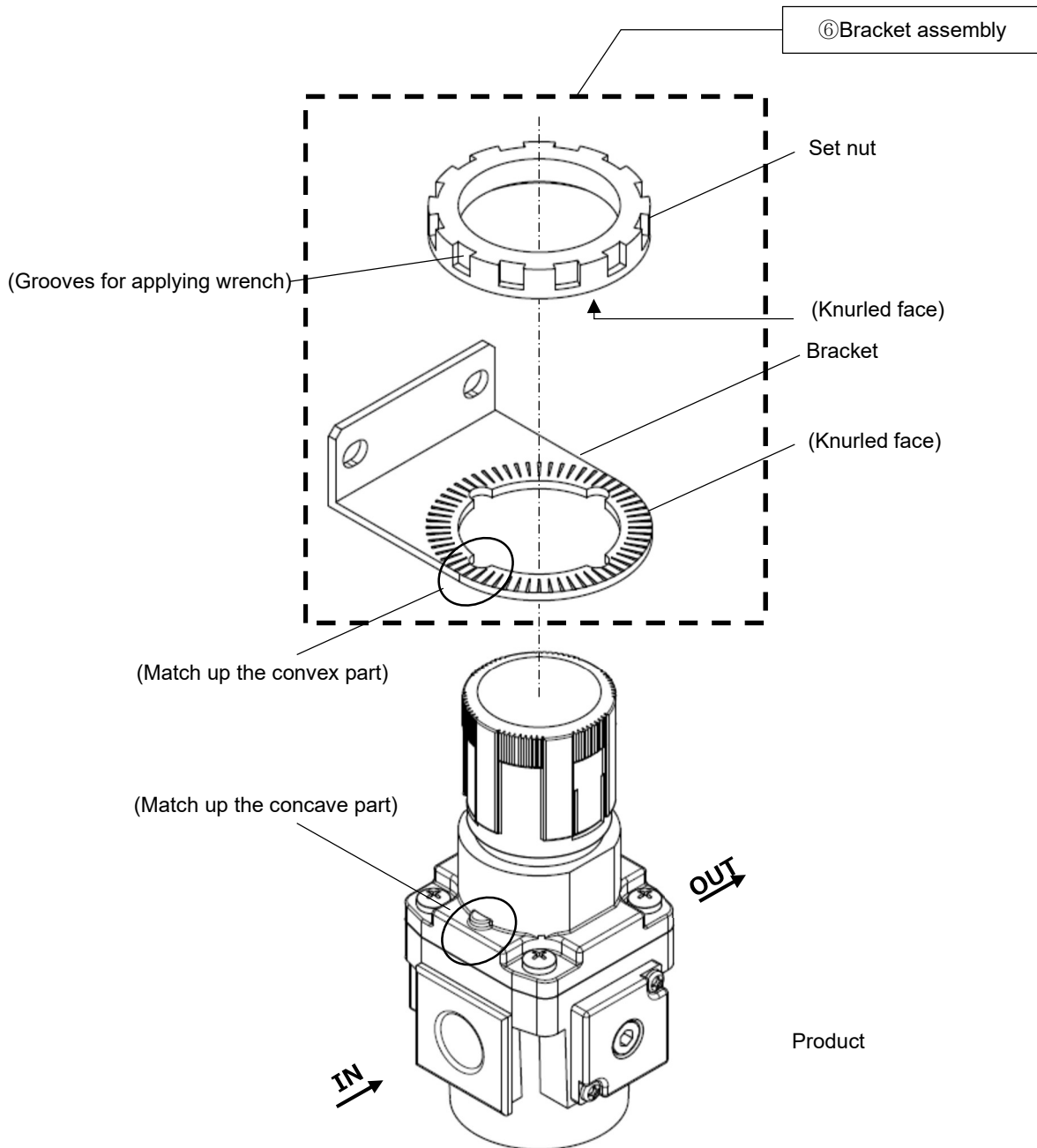
## 8-2) Valve Guide Assembly and Valve Assembly Replacement

Applicable model	Process	Procedure	Tools	Check item
ARP20 ARP20K ARP30 ARP30K ARP40 ARP40K	Disassembly	1) Remove the cap Insert the small screwdriver in the gap between the body and the cap and dig up the cap.	Small driver	—
		2) Remove the cover Insert the circular pliers to two holes of the cover and rotate 45 degree, and lift it.	Circular pliers Nominal : 125	—
		3) Remove the valve guide assembly Hold the valve guide with a small pliers, and lift.	Small pliers	—
		4) Remove the strainer. When removing the strainer, pay attention to the valve as it may pop out. (For the procedure, refer to "9-5) Valve and Valve Guide Assembly Replacement.")	—	—
		5) Remove the valve	—	—
		6) Remove the valve spring	—	—
	Assembly	7) Mount the valve spring Install the valve spring to the valve guide. (refer to "9-5) Valve and Valve Guide Assembly Replacement.")	—	—
		8) Mount the valve Install the valve on the valve spring.	—	—
		9) Mount the strainer (For the Installation method, refer to "9-5) Valve and Valve Guide Assembly Replacement.")	—	—
		10) Mount the assembly of the valve guide and the cover Mate the notch of the body cover hole and the detent of the cover. Then push the assembly of them. Insert the circular plier to two holes of the cover to rotate 45 degree to settle.	Circular pliers Nominal : 125	—
		11) Mount the cap Mate the convex of the body cover and the concave of the cap, and push them in to settle. Ensure the end of the body and the cap are almost flat.	—	Orientation of the body and the cap. Body end and the cap are almost flat.



### 8-3) Bracket Assembly and Set Nut (Panel mount) assembly

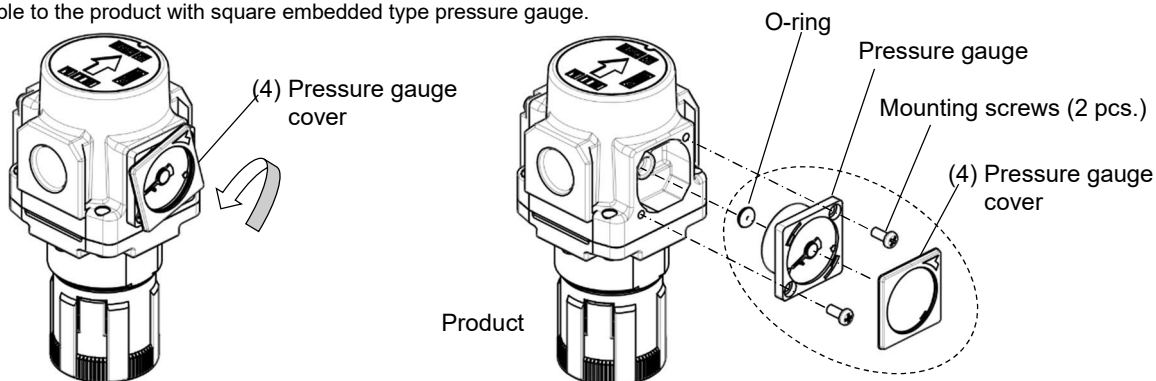
Applicable model	Process	Procedure	Tools	Check item										
ARP20 ARP20K ARP30 ARP30K ARP40 ARP40K	Assembly	1) Mount the parts to the bracket(panel) Mate the bracket(panel) concave and the bonnet convex to mount the bracket.	—	—										
		2) Settle the bracket(panel) with set nut. Ensure that the knurled faces of the bracket and the set nut are facing each other.	—	—										
		3) Turn the set nut while the product is aligned correctly with the bracket. The knurling of the bracket and set nut stops loosening of the screw. Usually, these can be tightened adequately by hand. (Extra tightening is recommended for panel mounting). *When retightening Please use a hook wrench on the grooves of the set nut. See check item for tightening torque.	Hook spanner Nominal: <table border="1"> <tr> <td>ARP20(K)</td> <td>34/38</td> </tr> <tr> <td>ARP30(K)</td> <td>52/55</td> </tr> <tr> <td>ARP40(K)</td> <td>52/55</td> </tr> </table>	ARP20(K)	34/38	ARP30(K)	52/55	ARP40(K)	52/55	Tightening torque: <table border="1"> <tr> <td>ARP20(K)</td> <td>2.0+/-0.2N·m</td> </tr> <tr> <td>ARP30(K)</td> <td>3.5+/-0.3N·m</td> </tr> <tr> <td>ARP40(K)</td> <td>4.0+/-0.4N·m</td> </tr> </table>	ARP20(K)	2.0+/-0.2N·m	ARP30(K)	3.5+/-0.3N·m
ARP20(K)	34/38													
ARP30(K)	52/55													
ARP40(K)	52/55													
ARP20(K)	2.0+/-0.2N·m													
ARP30(K)	3.5+/-0.3N·m													
ARP40(K)	4.0+/-0.4N·m													



### 8-4) Square Embedded Type Pressure Gauge Replacement

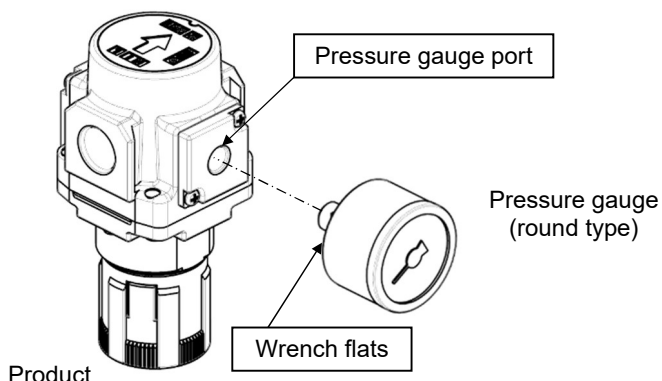
Applicable model	Process	Procedure	Tools	Check item
ARP20 ARP20K ARP30 ARP30K ARP40 ARP40K	Disassembly	1) Remove the pressure gauge cover. Rotate the pressure gauge cover 15 degrees in the arrow direction (counterclockwise) and pull it out.	—	—
		2) Remove the pressure gauge. Remove the 2 mounting screws and remove the pressure gauge.	Phillips screwdriver	—
	Assembly	3) Confirm that the O-ring is mounted onto the pressure gauge. When the O-ring comes out or is left on the product, mount the O-ring to the pressure gauge correctly.	—	Presence of O-ring
		4) Mount the pressure gauge. Mount the pressure gauge to the product with the mounting screws and tighten the screws referring to the tightening torque specified in the right column.	Phillips screwdriver	Tightening torque: 0.85+/-0.05N·m
		5) Mount the pressure gauge cover Set the pressure gauge cover with its arrow on the lower right corner. Mate the 2 fingers of the pressure gauge cover with the 2 finger slits of the pressure gauge, and rotate the pressure gauge cover 15 degrees to the opposite direction of the arrow (clockwise).	—	—

Note) Applicable to the product with square embedded type pressure gauge.



### 8-5) Pressure gauge (round type) Replacement

Applicable model	Process	Procedure	Tools	Check item
ARP20 ARP20K ARP30 ARP30K ARP40 ARP40K	Disassembly	1) Remove the pressure gauge. Hold the pressure gauge with a spanner on the spanner flat. Then, rotate the gauge counterclockwise to remove the gauge.	Spanner Nominal: ARP20(K) 12 ARP30(K) 14 ARP40(K) 14	—
		2) Wrap the pressure gauge thread with the seal tape leaving 1 thread from the end.	—	Wrap seal tape leaving 1 thread
	Assembly	3) Mount the pressure gauge Hold the pressure gauge on the spanner flat with a spanner, and rotate it clockwise to mount the circular pressure gauge. Please refer to "Safety Instructions / Piping" for tightening torque of pressure gauge.	Spanner Nominal: ARP20(K) 12 ARP30(K) 14 ARP40(K) 14	Torque control : Please refer to "Safety Instructions / Piping"

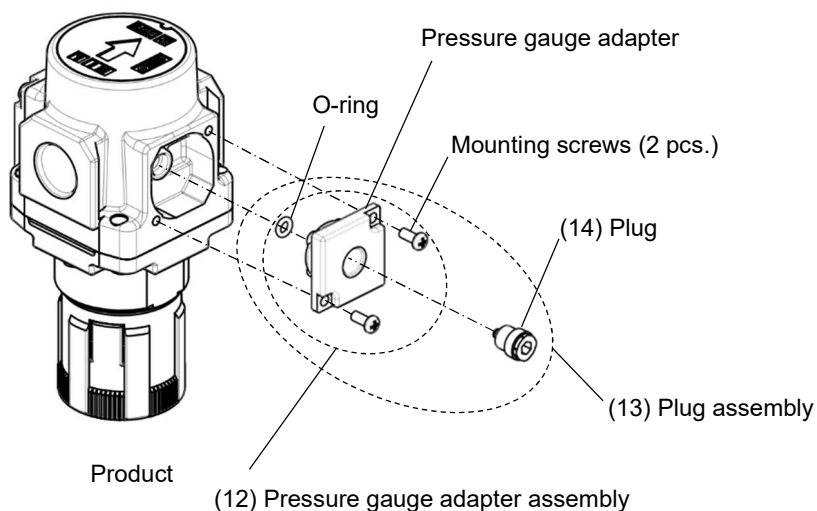


Note1) Positioning of pressure gauge  
Adjust the pressure gauge position by tightening it. Adjustment in loosening direction may cause air leakage.

Note2) No plug is mounted onto the pressure gauge port of product with a round type pressure gauge.

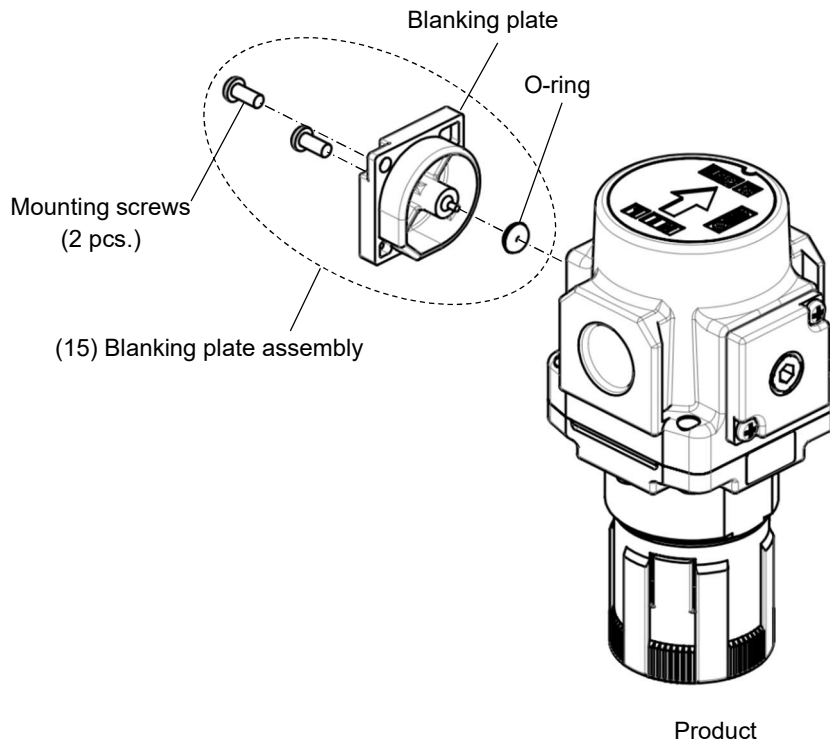
### 8-6) Pressure Gauge Adapter Assembly, Plug Assembly Replacement

Applicable model	Process	Procedure	Tools	Check item
ARP20 ARP20K ARP30 ARP30K ARP40 ARP40K	Disassembly	1) Remove the plug Insert the hexagon spanner to hexagon hole of hexagon plug. Rotate the plug counterclockwise to remove the plug.	Spanner Nominal: ARP20(K)   4 ARP30(K)   4 ARP40(K)   6	—
		2) Remove the pressure gauge adapter Rotate two set screws counterclockwise with Phillips screwdriver to remove the pressure gauge and two set screws.	Phillips screwdriver	—
	Assembly	3) Confirm pressure gauge adapter has O-ring. If not, mount O-ring.	—	—
		4) Mount pressure gauge adapter. Rotate two screws clockwise by Phillips driver to fix pressure gauge adapter. See Check item for tightening torque of two screws.	Phillips screwdriver	Tightening torque: 0.6+/-0.05N·m
		5) Mount plug assembly. Insert hexagon spanner into hexagon hole on the plug and rotate clockwise to fix the plug. See Check item for tightening torque of two screws.	Spanner Nominal: ARP20(K)   4 ARP30(K)   4 ARP40(K)   6	Tightening torque: ARP20(K)   0.6+/-0.05N·m ARP30(K)   0.6+/-0.05N·m ARP40(K)   1.0+/-0.1N·m



### 8-7) Blanking Plate Assembly Replacement

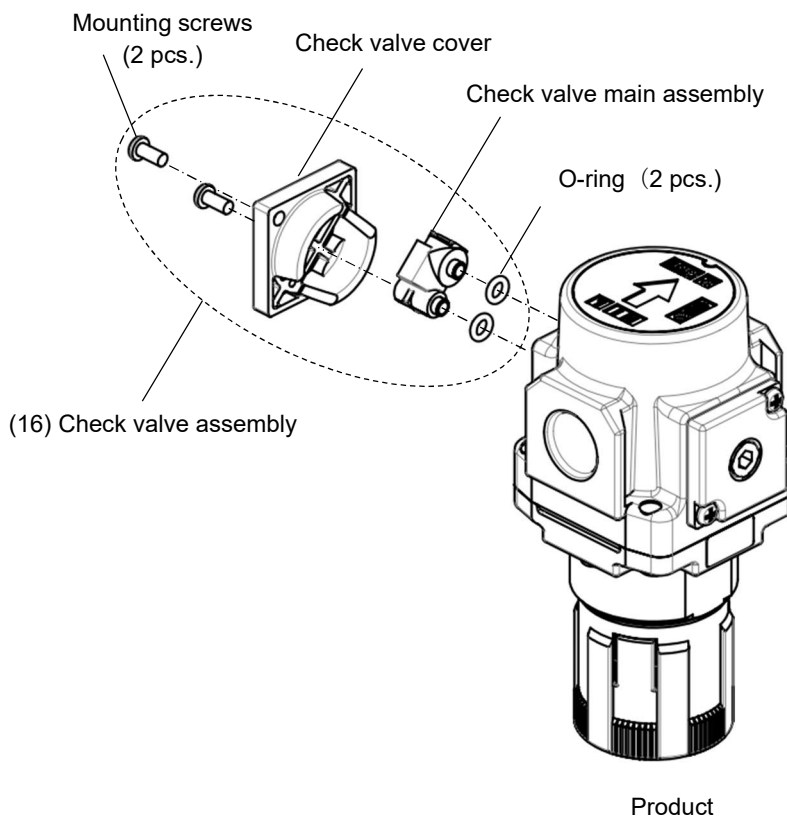
Applicable model	Process	Procedure	Tools	Check item
ARP20 ARP30 ARP40	Disassembly	1) Remove the blanking plate. Remove the 2 mounting screws and remove the blanking plate.	Phillips screwdriver	—
	Assembly	2) Confirm that the O-ring is mounted onto the blanking plate. When the O-ring comes out or is left on the product, mount the O-ring to the blanking plate correctly.	—	—
		3) Mount the blanking plate. Mount the blanking plate to the product with the mounting screws and tighten the screws referring to the tightening torque specified in the right column.	Phillips screwdriver	Tightening torque: 0.6+/-0.05N·m



### 8-8) Check Valve Assembly Replacement

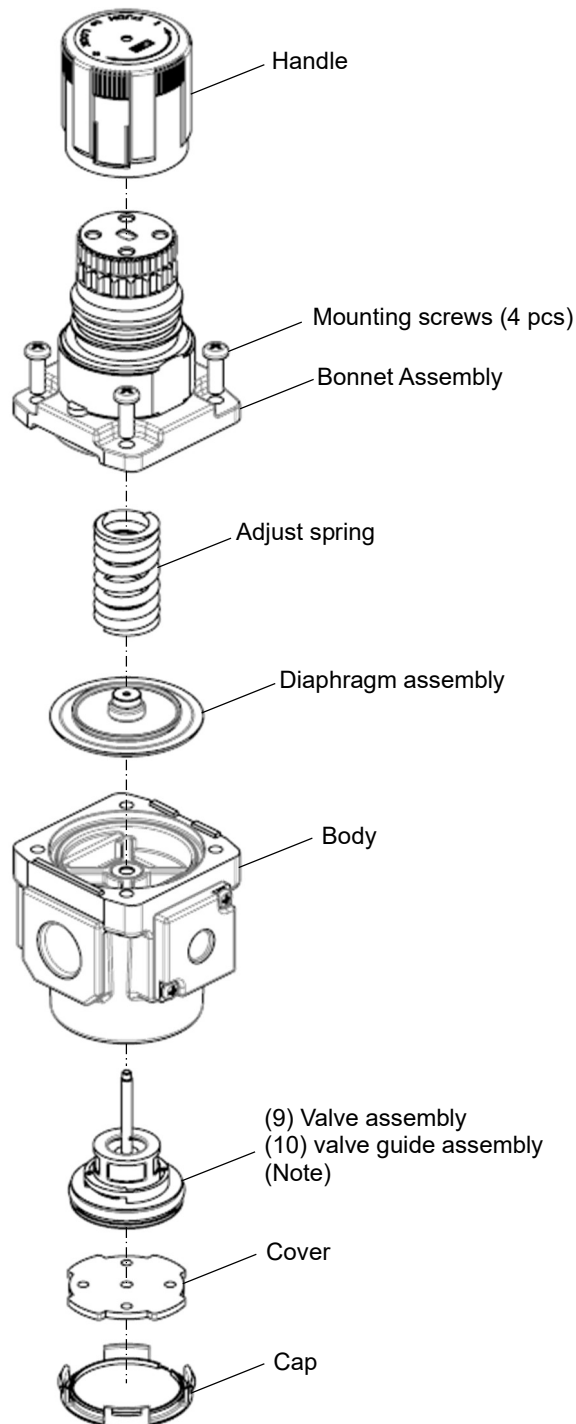
Applicable model	Process	Procedure	Tools	Check items
ARP20K ARP30K ARP40K	Disassembly	1) Remove the check valve cover. Remove the 2 mounting screws and the check valve cover.	Phillips screwdriver	
		2) Remove the check valve assembly. Remove the check valve assembly by pulling it toward the operator.	—	—
	Assembly	3) Confirm that the O-ring is mounted onto the check valve assembly. When the O-ring comes out or is left on the product, mount the O-ring to the check valve assembly correctly.	—	—
		4) Insert convex of the check body assembly into two O-ring mounting holes on the main body respectively.	—	Orientation of check valve body assembly
		5) Mount the check valve cover. Mount the check valve cover to the product with the mounting screws and tighten the screws referring to the tightening torque specified in the right column.	Phillips screwdriver	Tightening torque : 0.6+/-0.05N·m

Note) Applicable to the product with backflow function.



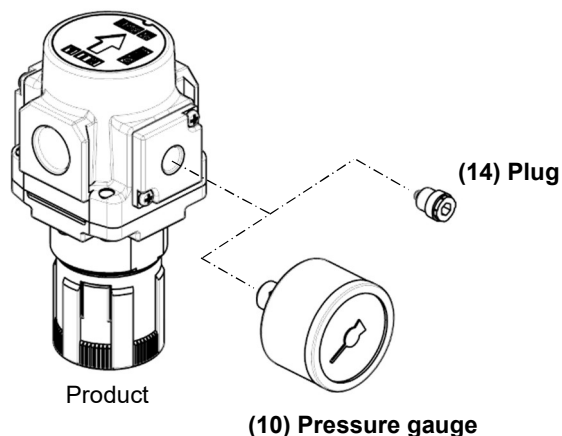
## 9. Disassembly Drawing

9-1) ARP20/30/40 Disassembly drawing.

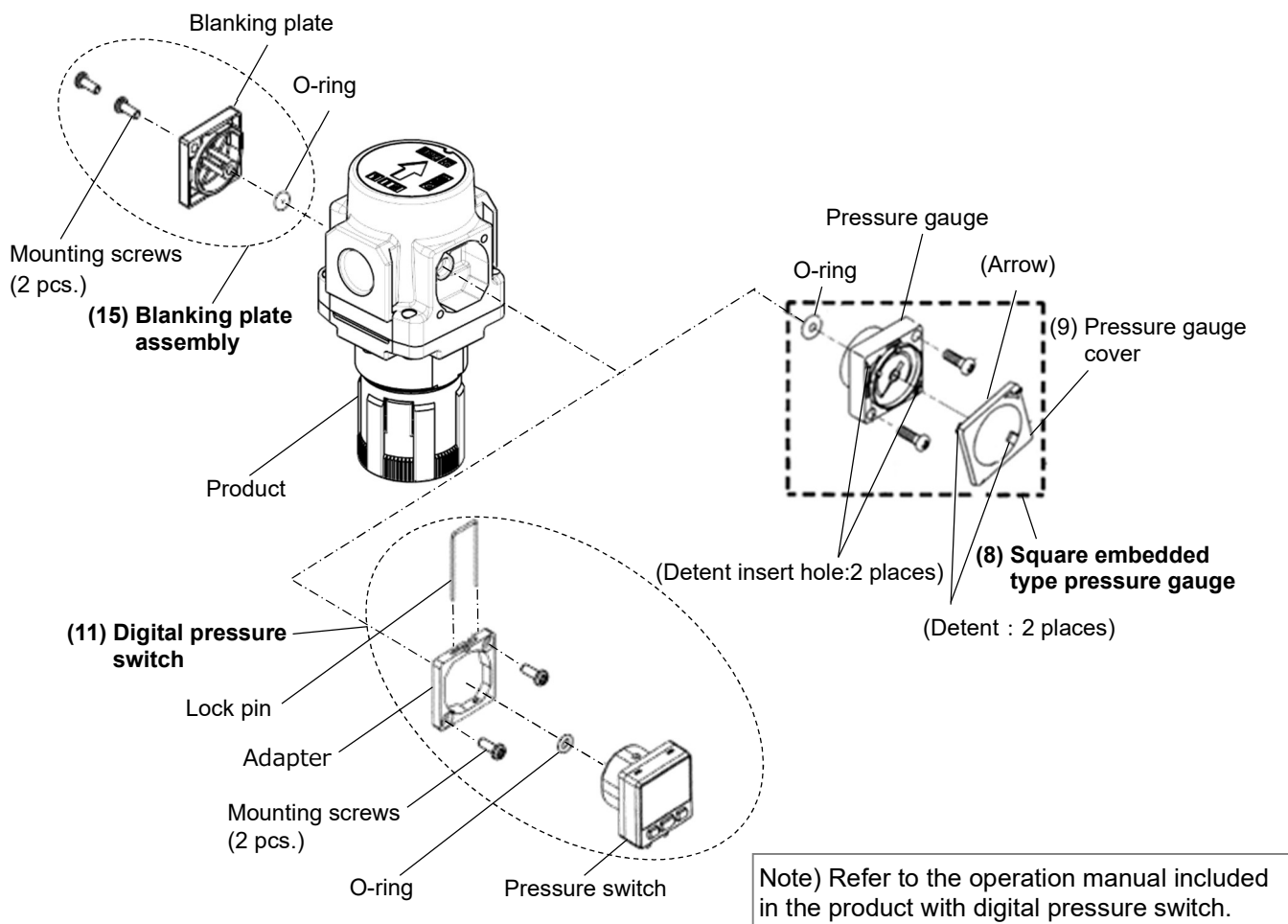


Note) For the assembly of the valve and valve guide assembly, refer to "9-6) Valve and Valve Guide Assembly Replacement".

9-2) Disassembly Drawing of the Pressure Gauge Port  
 [Applicable model: without pressure gauge / with pressure gauge (round type)]



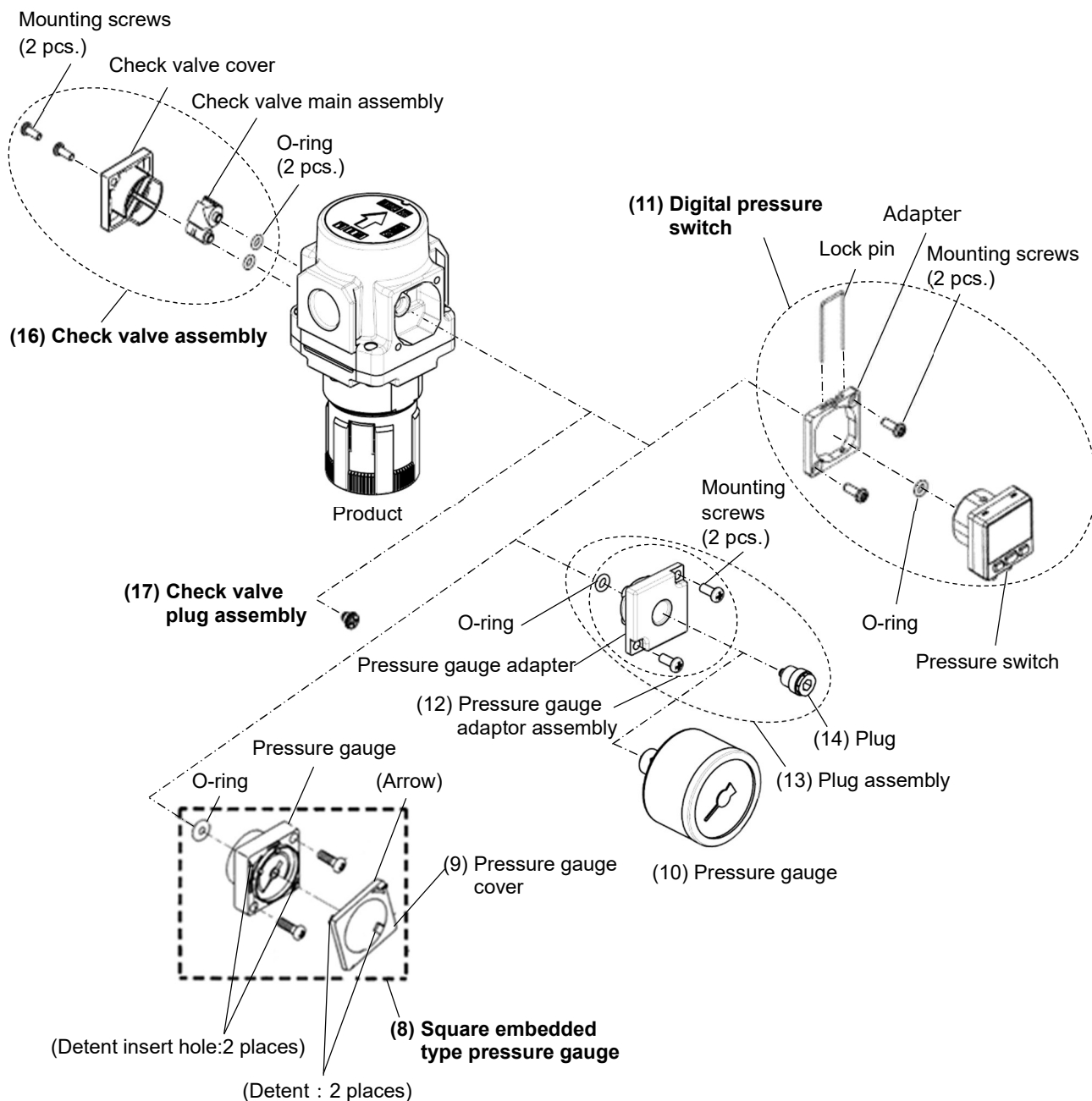
9-3) Disassembly Drawing of the Pressure Gauge Port  
 [Applicable model: with square embedded type pressure gauge / with digital pressure switch]



- When the pressure gauge or the digital pressure switch is mounted on the back of the product, swap all parts for the front and back.
- When swapping (8) Square embedded type pressure gauge and (11) Digital pressure switch, tighten them with  $0.85 \pm 0.05 \text{ N}\cdot\text{m}$ . Tighten others with  $0.6 \pm 0.05 \text{ N}\cdot\text{m}$ .

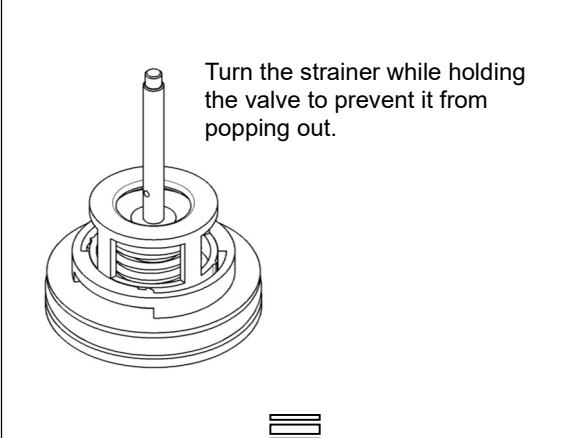
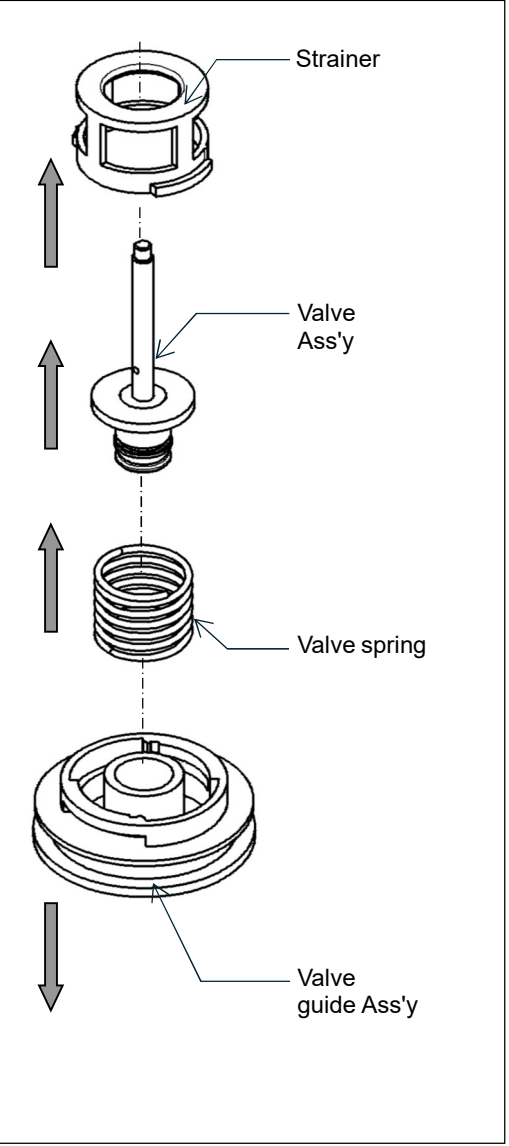
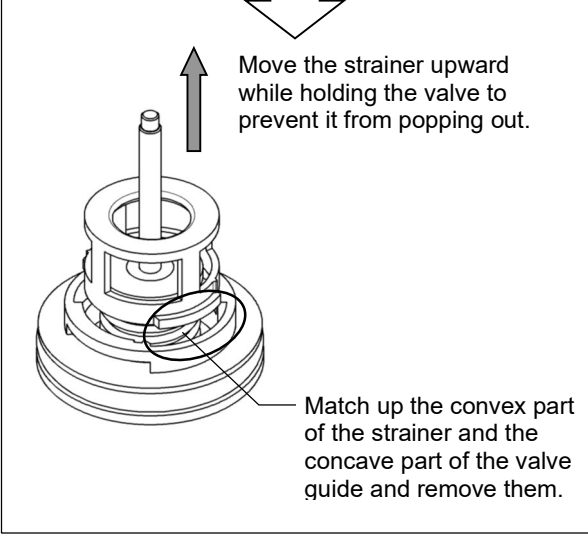
9-4) Disassembly Drawing of the Pressure Gauge Port  
 [Applicable model: with backflow function]

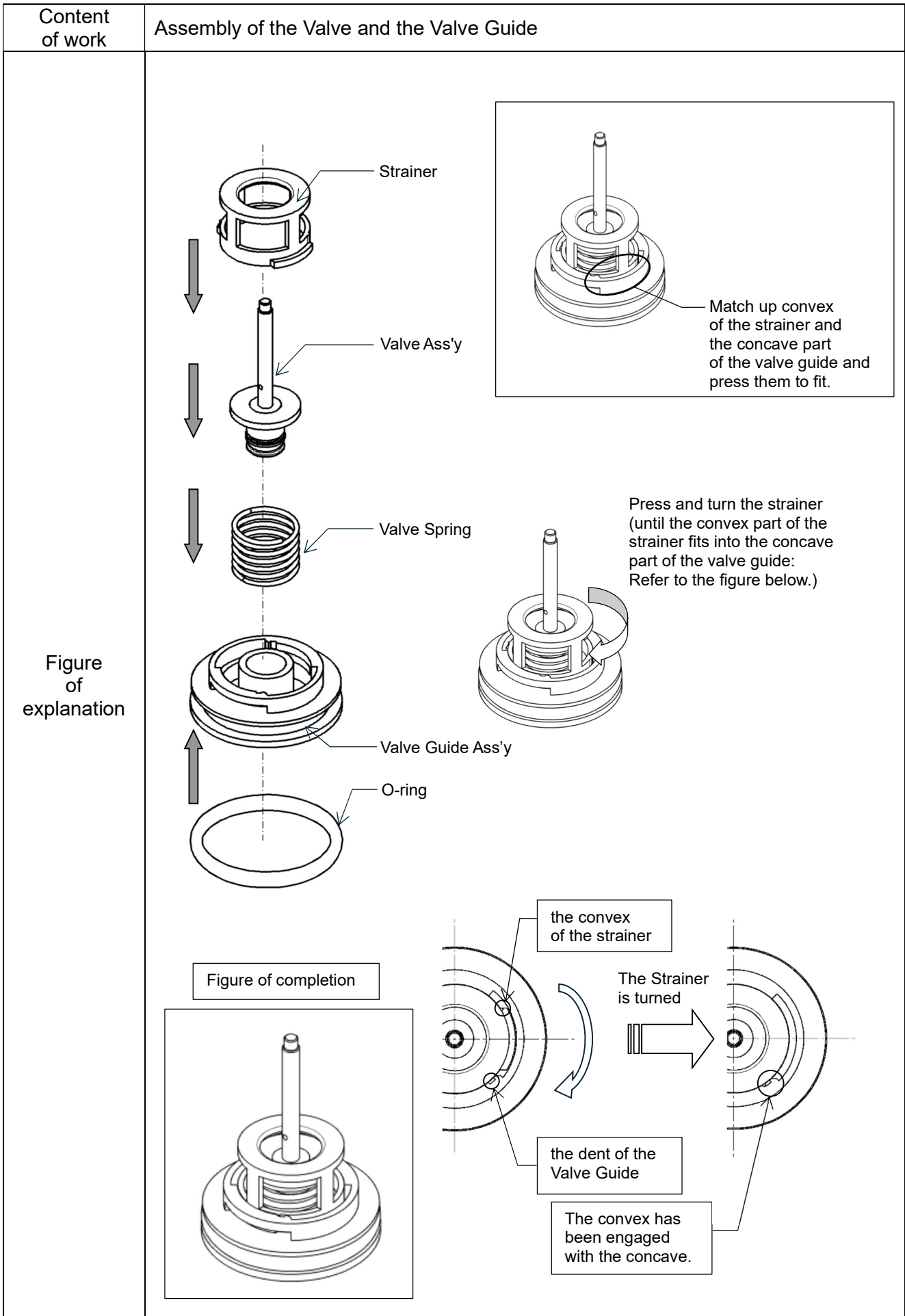
Note) Refer to the operation manual included in the product with digital pressure switch.



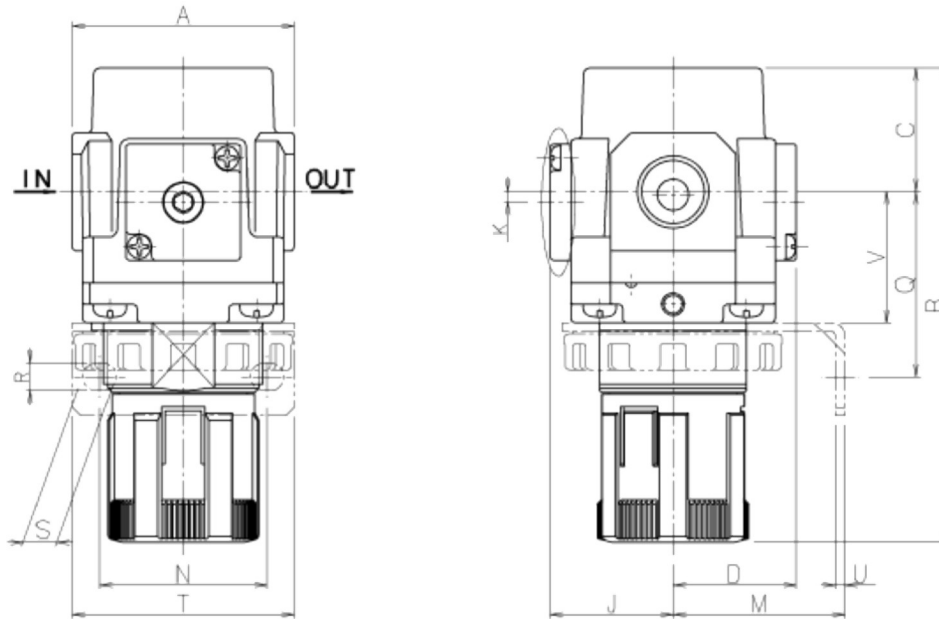
- When the pressure gauge or the digital pressure switch is mounted on the back of the product, swap all parts for the front and back.
- When swapping (8) Square embedded type pressure gauge and (11) Digital pressure switch, tighten them with  $0.85 \pm 0.05 \text{ N} \cdot \text{m}$ . Tighten others with  $0.6 \pm 0.05 \text{ N} \cdot \text{m}$ .

9-5) Valve and Valve Guide Assembly Replacement

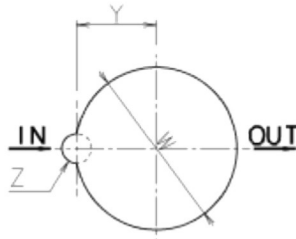
Content of work	Disassembly of the valve guide assembly	
<p>Figure of explanation</p>	 <p>Turn the strainer while holding the valve to prevent it from popping out.</p>	 <p>Strainer</p> <p>Valve Ass'y</p> <p>Valve spring</p> <p>Valve guide Ass'y</p>
	 <p>Move the strainer upward while holding the valve to prevent it from popping out.</p> <p>Match up the convex part of the strainer and the concave part of the valve guide and remove them.</p>	



## 10. Dimensions



Panel fitting



## Gauges

Options	Square embedded pressure gauge	Digital pressure switch		Circular pressure gauge
		(Electrical entry: Bottom)	(Electrical entry: Top)	
Figure of Externals				

## Dimensions

Model	Port size	Gauge port size	Standard							
			A	Note.1 B	C	D	F	J	K	
ARP20(K)	1/8 • 1/4	1/8	40	98	27	28.5	M28×1	28.5	Note.2	
ARP30(K)	1/4 • 3/8	1/8	53	117	29	29.5	M38×1.5	29.5	2.5	
ARP40(K)	1/4 • 3/8 • 1/2	1/4	70	148	41	34	M42×1.5	34	1.0	

Model	Accessory																
	Square embedded pressure gauge		Digital pressure switch		Circular pressure gauge		Bracket mounting dimensions							Panel mounting			
	H	J	H	J	H	J	M	N	Q	R	S	T	U	V	W	Y	Z
ARP20(K)	□28	29.5	□27.8	40	Φ37.5	66	30	34	47	5.4	15.4	55	2.3	28	28.5	14	6
ARP30(K)	□28	30.5	□27.8	41	Φ37.5	67	41	40	44	6.5	8	53	2.3	31	38.5	19	7
ARP40(K)	□28	35	□27.8	45	Φ42.5	74	50	54	54	8.5	10.5	70	2.3	35.5	42.5	21	7

Note 1) The dimension B is measured with the handle unlocked.

Note 2) For ARP20 only, the pressure gauge is mounted higher than the piping center.

#### Revision history

B	Change : Set nut No. ,New format
	Dec. 2017.
C	Change: "Safety Instructions
	Add: Digital Pressure Switch Part Number
	Add: Models with backflow function
	June. 2026.

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Note: Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.  
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