



Operation Manual

PRODUCT NAME

REGULATOR

MODEL/ Series

AR20-(F,N)01 ~ (F,N)02(B,E,G,H,M)(-1,N,R,Y,Z)-B

AR25-(F,N)02 ~ (F,N)03(B,E,G,H,M)(-1,N,R,Y,Z)-B

AR30-(F,N)02 ~ (F,N)03(B,E,G,H,M)(-1,N,R,Y,Z)-B

AR40-(F,N)02 ~ (F,N)04(B,E,G,H,M)(-1,N,R,Y,Z)-B

AR40-(F,N)06(B,E,G,H,M)(-1,N,R,Y,Z)-B

AR50-(F,N)06 ~ (F,N)10(B,E,G,M)(-1,N,R,Y,Z)-B

AR60-(F,N)10(B,E,G,M)(-1,N,R,Y,Z)-B

SMC Corporation

Contents

	PAGE
1. SAFETY INSTRUCTIONS	1~4
2. APPLICATION	5
3. SPECIFICATIONS	5
4. HOW TO ORDER	6
5. TROUBLESHOOTING	7
6. CONSTRUCTION / PARTS LIST	8~9
7. REPLACEMENT PROCEDURE	10~12
8. DISASSEMBLY DRAWING	13~14
9. DIMENSIONS	15



REGULATOR

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), Japan Industrial Standards (JIS)*1) and other safety regulations*2).

*1) ISO 4414: Pneumatic fluid power -- General rules relating to systems

ISO 4413: Hydraulic fluid power -- General rules relating to systems

IEC 60204-1: Safety of machinery -- Electrical equipment of machines (Part 1: General requirements)

ISO 10218-1992: Manipulating industrial robots -- Safety

JIS B 8370: General rules for pneumatic equipment.

JIS B 8361: General rules for hydraulic equipment.

JIS B 9960-1: Safety of machinery -- Electrical equipment for machines. (Part 1: General requirements)

JIS B 8433-1993: Manipulating industrial robots - Safety. etc.

*2) Labor Safety and Sanitation Law, etc.



Caution

Operator error could result in injury or equipment damage.



Warning

Operator error could result in serious injury or loss of life.



Danger

In extreme conditions, there is a possibility of serious injury or loss of life.



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.

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.

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.

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

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

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

2) Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.

3) An application which could have negative effects on people, property, or animals requiring special safety analysis.

4) Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.



REGULATOR Safety Instructions

Caution

The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.

If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.

If anything is unclear, contact your nearest sales branch.

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

The warranty period of the product is 1 year in service or 1.5 years after the product is delivered.

Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

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.

Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

Compliance Requirements

When the product is exported, strictly follow the laws required by the Ministry of Economy, Trade and Industry (Foreign Exchange and Foreign Trade Control Law).

Caution

SMC products are not intended for use as instruments for legal metrology.

Products that SMC manufactures or sells are not measurement instruments that are qualified by pattern approval tests relating to the measurement laws of each country.

Therefore, SMC products cannot be used for business or certification ordained by the measurement laws of each country.

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. Do not use the regulator where containing those.
- ② Consult SMC if no leakage is allowed due to the environment, or operating fluid is not air.
- ③ Protect from ultra violet ray and radiation heat by shield.
- ④ A safety device needs to be installed if output pressure is exceeding the set pressure, otherwise this can cause the breakage of outlet device and equipment or malfunction.

CAUTION

- ① The use outside specifications is prohibited.
- ② Air consumption from release port is 0.1L/min(ANR) or less.

Selection

WARNING

- ① Mineral grease used on internal surfaces and packing may leak to the outlet. Please contact SMC if this is a problem.
- 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 outlet circuit sealed or balance circuit may cause pressure fluctuation in outlet set pressure. Please consult SMC if this is a problem.
- ④ Set pressure of outlet pressure shall be 85% or less of inlet pressure. Pressure over 85% makes operation susceptible to flow and inlet pressure which lead to cause unstable operation.
- ⑤ Maximum set pressure range in the spec. has margin. Pressure set may be higher than the maximum value.
- ⑥ If regulator is used with circuit which requires high exhaust sensitivity or set precision, please consult SMC.

Installation

WARNING

- ① Connect the regulator ensuring the direction of "1" (IN) and "2" (OUT) for air direction or an arrow. Wrong connection may cause malfunction.
- ② Install with enough space around regulator to perform regular maintenance and operation. The required space is shown on 「11. Dimensions」 (P15).
- ③ Do not drop nor apply impact during transportation or installation. These lead to cause precision failure of pressure.
- ④ Do not install in areas of high humid or high temperature. Or pressure gauge may malfunction.

Adjustment

WARNING

- ① Adjust the pressure adjusting handle ensuring correct inlet pressure and outlet pressure. Excessive rotation may cause damage to internal parts.
- ② Operate the pressure adjusting handle manually. Tools may break the handle.

CAUTION

- ① Check inlet pressure before setting up.
- ② Be sure to unlock the handle before adjusting the pressure and lock it after setting the pressure. Failure to follow this procedure can damage the handle and the outlet pressure may fluctuate.

- Pull the pressure regulator handle to unlock. (You can visually verify this with the "orange mark" that appears in the gap.)
- Push the pressure regulator handle to lock. When the handle is not easily locked, turn it left and right a little and then push it. (When the handle is locked, the "orange mark", i.e., the will disappear.)

- ③ For the regulator with the pressure gauge, do not apply pressure exceeding the maximum scale of the pressure gauge in order to protect the gauge.
- 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 to reduce the pressure. Moreover, please lock the handle after setting
- ⑤ 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.
- ⑥ Outlet pressure may change if regulator is used for long periods. Please confirm set pressure regularly.

Piping

WARNING

- ① Blow out or clean piping before piping to eliminate swarf, cutting oil, solid foreign material. Contamination of piping may cause damage or malfunction.
- ② When installing piping, avoid chips and sealing materials from piping screws entering the inside of equipment. Or malfunction may occur. When use sealing tapes, leave 1.5~2 threads of the end of thread exposed.
- 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 torque unit: N·m

Screw	1/8	1/4	3/8	1/2	3/4	1
Torque	3~5	8~12	15~20	20~25	28~30	36~38

- ④ Do not apply any torsional moment, or bending moment except the weight of the regulator itself. External piping needs to be supported separately. Hard piping like steel tube is susceptible to excessive moment load or vibration. Insert the flexible tube to cancel the influence.

Air Source

WARNING

- ① Use clean air. Compressed air containing chemicals, organic solvent, synthetic oil or corrosive gas may lead to cause breakage of parts or malfunction.
- ② Air containing too much moisture may cause malfunction. Install the air drier or the aftercooler before the regulator.

Maintenance

WARNING

- ① Maintenance and checks 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.

CAUTION

- ① If the first operation is performed and defective setting and the exhaust leakage is found, it is likely there is foreign object in an internal valve sliding surface or an internal valve seat part. Failure to remove these parts may cause damage to internal parts.

2. APPLICATION

This product aims at controlling the pressure of air lines.

3. SPECIFICATIONS

Model	AR20-B	AR25-B	AR30-B	AR40-B	AR40-06-B	AR50-B	AR60-B
Port size	1/8, 1/4	1/4, 3/8	1/4, 3/8	1/4, 3/8, 1/2	3/4	3/4, 1	1
Gauge port size ^{Note1)}	1/8						
Fluid	Air						
Ambient and fluid temperature	-5 ~ 60°C (Should be no freezing)						
Proof pressure	1.5 MPa						
Max. operating pressure	1.0 MPa						
Set pressure range	0.05 ~ 0.85 MPa						
Construction	Relieving type						
Mass (kg)	0.16	0.21	0.29	0.44	0.47	1.17	1.22

Note 1) Square embedding type pressure gauge, without pressure gauge mounting threads.

4. HOW TO ORDER

AR 30 - 03 BG - - B

1
2
3
4
5

		Symbol	Description	1								
				Body size								
				20	25	30	40	50	60			
2	Thread type	Nil	Rc	●	●	●	●	●	●			
		N	NPT	●	●	●	●	●	●			
		F	G	●	●	●	●	●	●			
		+										
3	Port size	01	1/8	●	—	—	—	—	—			
		02	1/4	●	●	●	—	—	—			
		03	3/8	—	●	●	—	—	—			
		04	1/2	—	—	—	●	—	—			
		06	3/4	—	—	—	●	●	—			
		10	1	—	—	—	—	●	●			
		+										
4	Option	a	Mounting	Nil	Without mounting option		●	●	●	●	●	●
				B	With bracket		●	●	●	●	●	●
				H	With set nut (for panel mounting)		●	●	●	●	—	—
				+								
		b	Pressure gauge	Nil	Without pressure gauge		●	●	●	●	●	●
				E	Square embedding type pressure gauge (with limit indicator)		●	●	●	●	●	●
				G	Round type pressure gauge (with limit indicator)		●	●	●	●	●	●
				M	Round type pressure gauge (with colour zone)		●	●	●	●	●	●
				+								
		5	Semi-standard	c	Set pressure	Nil	0.05 to 0.85 MPa setting		●	●	●	●
1	0.02 to 0.2 MPa setting					●	●	●	●	●	●	
				+								
d	Exhaust mechanism			Nil	Relieving type		●	●	●	●	●	●
				N	Non-relieving type		●	●	●	●	●	●
				+								
e	Flow direction			Nil	Flow direction: Left to right		●	●	●	●	●	●
				R	Flow direction: Right to left		●	●	●	●	●	●
				+								
f	Handle			Nil	Downward		●	●	●	●	●	●
				Y	Upward		●	●	●	●	●	●
				+								
g	Pressure unit			Nil	Name plate and pressure gauge in imperial units: Mpa		●	●	●	●	●	●
		Z	Name plate and pressure gauge in imperial units: psi		●	●	●	●	●	●		

※ Please refer to the catalog when you select the model.

5. TROUBLESHOOTING

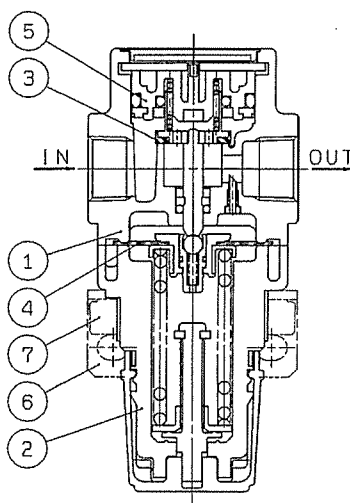
Refer to 「6. CONSTRUCTION / PARTS LIST」 (P8 to P9), 「8. DISASSEMBLY DRAWING」 (P13 to P14).

TROUBLE		POSSIBLE CAUSE	REMEDY
DEMARCATON	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 "O" ring.	4. Remove the valve guide and clean valve seat or valve "O" ring. Grease up after washing the sliding surface of valve "O" ring.
		5. Valve rubber seat is damaged.	5. Replace the valve.
	Set pressure does not return to zero when pressure handle is loosened.	1. Foreign materials caught in valve seat or valve "O" ring.	1. Remove the valve guide and clean valve seat or valve "O" ring. Grease up after washing the sliding surface of valve "O" ring.
		2. Valve rubber seat is damaged.	2. Replace the valve.
		3. Valve spring is damaged.	3. Replace the valve spring.
		4. Valve adheres to the valve guide.	4. Wash the sliding surface of valve "O" ring and grease up.
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 materials caught in valve seat or valve "O" ring.	3. Remove the valve guide and clean valve seat or valve "O" ring. Grease up after washing the sliding surface of valve "O" ring.
		4. Valve rubber seat is damaged.	4. Replace the valve.
		5. Back pressure exceeding the set pressure is applied to the outlet.	5. 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.

Note) The grease used recommends JX Nippon oil & Energy corporation diamond multipurpose No.2.

6. CONSTRUCTION / PARTS LIST

AR20-B / AR25-B / AR30-B



Component Parts

No.	Description	Model No.	Material	Note
①	Body	AR20-B / AR25-B / AR30-B	Aluminium die cast	Urban white 1
②	Bonnet	AR20-B / AR25-B / AR30-B	Polyacetal	Urban white 1

Option / Replacement Parts

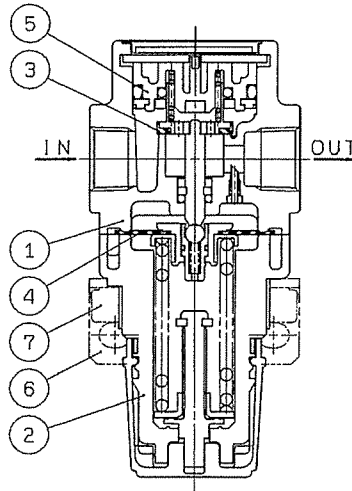
No.	Description	Thread Type	Option		Material	Part No.		
			Symbol	Specification		AR20-B	AR25-B	AR30-B
③	Valve	—	—	—	HNBR	AR20P-410S	AR25P-410S	AR30P-410S
④	Diaphragm assembly	—	—	—	Weatherproof NBR	AR20P-150AS	AR25P-150AS	AR30P-150AS
		—	N	Non-relieving type	Weatherproof NBR	AR20P-150AS-N	AR25P-150AS-N	AR30P-150AS-N
⑤	Valve guide assembly	—	—	—	Polyacetal / NBR	AR20P-050AS	AR25P-050AS	AR30P-050AS
⑥	Note1) Bracket assembly	—	—	—	Steel plate / Polyacetal	AR23P-270AS	AR28P-270AS	AR33P-270AS
⑦	Set nut	—	—	—	Polyacetal	AR23P-260S	AR28P-260S	AR33P-260S
⑧	Note2) Square embedding type pressure gauge	Rc	—	—	—	GC3-10AS		
			1	0.2MPa setting	—	GC3-4AS		
		NPT	—	—	—	GC3-10AS		
			1	0.2MPa setting	—	GC3-4AS		
			Z	Imperial unit: psi	—	GC3-P10AS		
			1Z	Imperial unit: psi, 0.2MPa setting	—	GC3-P4AS		
		G	—	—	—	GC3-10AS		
			1	0.2MPa setting	—	GC3-4AS		
⑨	Pressure gauge cover	—	—	—	—	GC3P-010AS		
⑩	Round type pressure gauge	Rc	—	—	—	G36-10-01		
			1	0.2MPa setting	—	G36-4-01		
		NPT	—	—	—	G36-10-N01		
			1	0.2MPa setting	—	G36-4-N01		
			Z	Imperial unit: psi	—	G36-P10-N01		
			1Z	Imperial unit: psi, 0.2MPa setting	—	G36-P4-N01		
		G	—	—	—	G36-10-01		
			1	0.2MPa setting	—	G36-4-01		
	Round type pressure gauge (with colour zone)	Rc	—	—	—	G36-10-01-L		
			1	0.2MPa setting	—	G36-4-01-L		
		NPT	—	—	—	G36-10-N01-L		
			1	0.2MPa setting	—	G36-4-N01-L		
⑪	Pressure gauge adaptor assembly	Rc	—	—	Aluminium die cast	ARP20P-310AS-01		
		NPT	—	—		ARP20P-310AS-N01		
		G	—	—		ARP20P-310AS-F01		
⑫	Plug assembly	Rc	—	—	—	ARP20P-320AS-01		
		NPT	—	—	—	ARP20P-320AS-N01		
		G	—	—	—	ARP20P-320AS-F01		
⑬	Plug	Rc	—	—	PBT RESIN	AR20P-370AS-01		
		NPT	—	—		AR20P-370AS-N01		
		G	—	—		AR20P-370AS-01		
⑭	Blanking plate assembly	—	—	—	—	AR20P-250AS		

Note 1) Bracket and Set nut assembly.

Note 2) With O ring (1 piece) and Mounting screws (2 pcs).

Note 3) The number in the table is corresponding to the number in structural drawing (above-mentioned figure) and 「8.Disassembly drawing」 (P13 to P14).

AR40-B / AR50-B / AR60-B



Component Parts

No.	Description	Model No.	Material	Note
①	Body	AR40-B / AR40-06-B / AR50-B / AR60-B	Aluminium die cast	Urban white 1
②	Bonnet	AR40-B / AR40-06-B	Polyacetal	Urban white 1
		AR50-B / AR60-B	Aluminium die cast	

Option / Replacement Parts

No.	Description	Thread Type	Option		Material	Part No.					
			Symbol	Specification		AR40-B	AR40-06-B	AR50-B	AR60-B		
③	Valve	—	—		HNBR	AR40P-410S	AR40P-410S	AR50P-410S	AR60P-410S		
④	Diaphragm assembly	—	—		Weatherproof NBR	AR40P-150AS	AR40P-150AS	AR50P-150AS	AR50P-150AS		
		—	N	Non-relieving type	Weatherproof NBR	AR40P-150AS-N	AR40P-150AS-N	AR50P-150AS-N	AR50P-150AS-N		
⑤	Valve guide assembly	—	—		Polyacetal / NBR	AR40P-050AS	AR40P-050AS	AR50P-050AS	AR60P-050AS		
⑥	^{Note1)} Bracket assembly	—	—		Steel plate / Polyacetal	AR43P-270AS	AR43P-270AS	^{Note2)} AR52P-270AS			
⑦	Set nut	—	—		Polyacetal	AR43P-260S	AR43P-260S	—			
⑧	^{Note3)} Square embedding type pressure gauge	Rc	—		—	GC3-10AS					
			1	0.2MPa setting	—	GC3-4AS					
		NPT	—		—	GC3-10AS					
			1	0.2MPa setting	—	GC3-4AS					
			Z	Imperial unit : psi	—	GC3-P10AS					
			1Z	Imperial unit : psi, 0.2MPa setting	—	GC3-P4AS					
		G	—		—	GC3-10AS					
			1	0.2MPa setting	—	GC3-4AS					
⑨	Pressure gauge cover	—	—		—	GC3P-010AS					
⑩	Round type pressure gauge	Rc	—		—	G36-10-01					
			1	0.2MPa setting	—	G36-4-01					
		NPT	—		—	G36-10-N01					
			1	0.2MPa setting	—	G36-4-N01					
			Z	Imperial unit : psi	—	G36-P10-N01					
			1Z	Imperial unit : psi, 0.2MPa setting	—	G36-P4-N01					
		G	—		—	G36-10-01					
			1	0.2MPa setting	—	G36-4-01					
	Round type pressure gauge (with colour zone)	Rc	—		—	G36-10-01-L					
			1	0.2MPa setting	—	G36-4-01-L					
		NPT	—		—	G36-10-N01-L					
			1	0.2MPa setting	—	G36-4-N01-L					
		G	—		—	G36-10-01-L					
			1	0.2MPa setting	—	G36-4-01-L					
		⑪	Pressure gauge adaptor assembly	Rc	—		Aluminium die cast	ARP20P-310AS-01			
				NPT	—			ARP20P-310AS-N01			
G	—			ARP20P-310AS-F01							
⑫	Plug assembly	Rc	—		—	ARP20P-320AS-01					
		NPT	—		—	ARP20P-320AS-N01					
		G	—		—	ARP20P-320AS-F01					
⑬	Plug	Rc	—		PBT RESIN	AR20P-370AS-01					
		NPT	—			AR20P-370AS-N01					
		G	—			AR20P-370AS-01					
⑭	Blanking plate assembly	—	—		—	AR20P-250AS					

Note 1) Bracket and Set nut assembly.

Note 2) Bracket and Mounting screws (2 pcs) assembly.

Note 3) With O ring (1 piece) and Mounting screws (2 pcs).

Note 4) The number in the table is corresponding to the number in structural drawing (above-mentioned figure) and 「8.Disassembly drawing」 (P13 to P14).

7. REPLACEMENT PROCEDURE

WARNING

Before replacement, ensure that the regulator is not pressurized.

Rotate the pressure adjusting handle to zero.

Replace referring to "8. DISASSEMBLY DRAWING" (P13 to P14).

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

1) Diaphragm assembly

Applicable model	Process	Procedure	Tools	Check item												
AR20-B AR25-B AR30-B AR40-B AR50-B AR60-B	Disassembly	1) Remove the bonnet. Rotate the set screw counterclockwise with cross pointed driver to remove the bonnet from the body.	Cross pointed driver	—												
		2) Remove parts in order of the pressure adjusting screw assembly, pressure adjusting spring, and the diaphragm assembly. Please be noted that the diaphragm assembly adheres to the bonnet if disassemble parts with the handle facing downwards.	—	—												
	Assembly	3) Mount parts to the body in order of the diaphragm assembly, pressure adjusting spring, and pressure adjusting screw. Mind the direction of the diaphragm assembly and pressure adjusting screw assembly. See attached disassembly drawing.	—	Direction of diaphragm assembly and pressure adjusting screw assembly.												
		4) Mount the bonnet to the body. Mount the bonnet to the body, and settle it roughly with four(4) set screws with a cross pointed driver. Then, Tighten screws diagonally with the tightening torque in the check item to settle.	Cross pointed driver	<table><tr><td colspan="2">Tightening torque</td></tr><tr><td>AR20-B</td><td>2.35±0.3 N·m</td></tr><tr><td>AR25-B</td><td>2.35±0.3 N·m</td></tr><tr><td>AR30-B</td><td>2.35±0.3 N·m</td></tr><tr><td>AR40-B</td><td>3.5±0.3 N·m</td></tr><tr><td>AR50-B</td><td>3.5±0.3 N·m</td></tr><tr><td>AR60-B</td><td>3.5±0.3 N·m</td></tr></table>	Tightening torque		AR20-B	2.35±0.3 N·m	AR25-B	2.35±0.3 N·m	AR30-B	2.35±0.3 N·m	AR40-B	3.5±0.3 N·m	AR50-B	3.5±0.3 N·m
Tightening torque																
AR20-B	2.35±0.3 N·m															
AR25-B	2.35±0.3 N·m															
AR30-B	2.35±0.3 N·m															
AR40-B	3.5±0.3 N·m															
AR50-B	3.5±0.3 N·m															
AR60-B	3.5±0.3 N·m															

2) Valve guide assembly, valve

Applicable model	Process	Procedure	Tools	Check item
AR20-B AR25-B AR30-B AR40-B AR50-B AR60-B	Disassembly	1) Remove the cap. Insert the small screw driver 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 valve spring.	—	—
		5) Remove the valve.	—	—
	Assembly	6) Mount the valve. Mate the stem convex and the valve center hole.	—	Positioning the stem and the valve
		7) Mount the valve spring. Insert the valve spring to the valve hole.	—	—
		8) 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	—
		9) 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

3) Bracket assembly, panel mount

Applicable model	Process	Procedure	Tools	Check item
AR20-B AR25-B AR30-B AR40-B	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. Rotate the set nut clockwise with a hook spanner to settle the parts to the bracket (panel). See check item for tightening torque. Set nut knurling surface shall face the bracket. When mounting with bracket, set nut tightened manually is adequate for general use.	Hook spanner Nominal: AR20-B 34/38 AR25-B 40/42 AR30-B 52/55 AR40-B 52/55	Tightening torque AR20-B 2.0±0.2 N·m AR25-B 2.5±0.2 N·m AR30-B 3.5±0.3 N·m AR40-B 4.0±0.4 N·m
AR50-B AR60-B	Assembly (Bracket assembly)	1) Mount the product to the bracket. Two mounting screws are tightened by hexagon spanner for holding.	Hexagon spanner Nominal: 5	Reference tightening torque: 2.6 N·m

4) Square embedding type pressure gauge

Applicable model	Process	Procedure	Tools	Check item
AR20-B AR25-B AR30-B AR40-B AR50-B AR60-B	Disassembly	1) Remove the pressure gauge cover. Rotate the pressure gauge cover 15 degree counterclockwise to pull out the pressure gauge cover.	—	—
		2) Remove the pressure gauge. Rotate two set screws counterclockwise with cross pointed driver to remove the pressure gauge and two set screws.	Cross pointed driver	—
	Assembly	3) Ensure "O" ring is mounted to the pressure gauge. Mount "O" ring to the pressure gauge if the ring fall off.	—	Presence of "O" ring
		4) Mount the pressure gauge. Rotate two set screws clockwise with cross pointed driver to set screws temporary. Then settle them with tightening torque in check item.	Cross pointed driver	Tightening torque: 0.6±0.05 N·m
		5) Mount the pressure gauge cover. Insert the pressure gauge mating two detent of the pressure gauge and holes for them so that the arrow of the pressure gauge cover comes upper right. Rotate the pressure gauge cover 15 degree opposite to the arrow to mount the pressure gauge.	—	—

5) Round type pressure gauge

Applicable model	Process	Procedure	Tools	Check item
AR20-B AR25-B AR30-B AR40-B AR50-B AR60-B	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: AR20-B AR25-B AR30-B AR40-B AR50-B AR60-B 12	—
	Assembly	2) Rap the pressure gauge thread with the seal tape leaving 1.5 to 2 threads from the end.	—	Wrap seal tape leaving 1.5 to 2 threads.
		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. See Check item for tightening torque of pressure gauge.	Spanner Nominal: AR20-B AR25-B AR30-B AR40-B AR50-B AR60-B 12	Tightening torque: AR20-B AR25-B AR30-B AR40-B AR50-B AR60-B 3~5 N·m

6) Pressure gauge adaptor assembly, Plug assembly

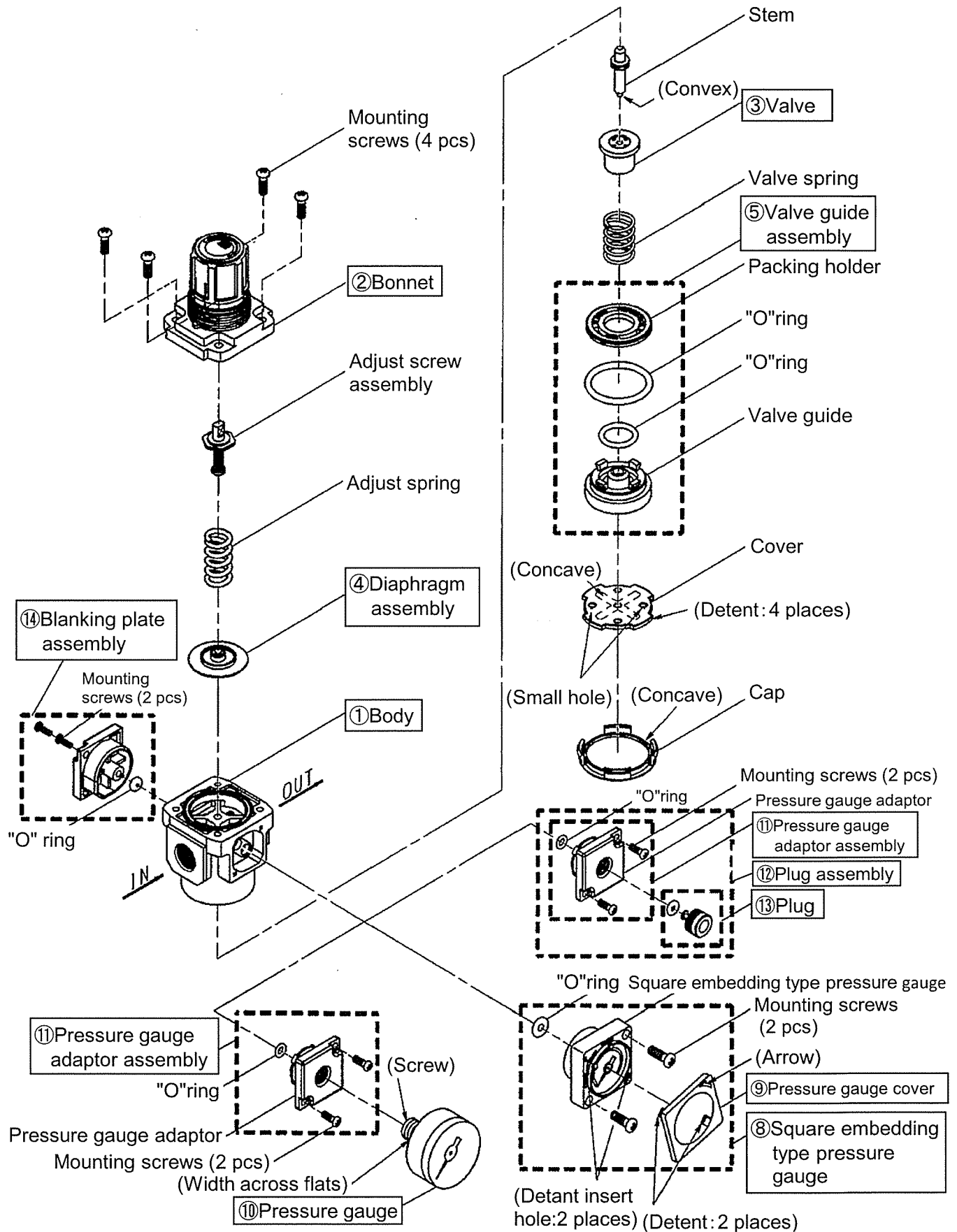
Applicable model	Process	Procedure	Tools	Check item
AR20-B AR25-B AR30-B AR40-B AR50-B AR60-B	Disassembly	1) Remove the plug. Insert the hexagon spanner to hexagon hole of hexagon plug. Rotate the plug counterclockwise to remove the plug.	Spanner Nominal: AR20-B AR25-B AR30-B AR40-B AR50-B AR60-B 4	—
		2) Remove the pressure gauge adaptor. Rotate two set screws counterclockwise with cross pointed driver to remove the pressure gauge and two set screws.	Cross pointed driver	—
	Assembly	3) Confirm pressure gauge adaptor has "O" ring. If not, mount "O" ring.	—	—
		4) Mount pressure gauge adaptor. Rotate two screws clockwise by Phillips driver to fix pressure gauge adaptor. See Check item for tightening torque of two screws.	Cross pointed driver (Torque driver)	Tightening torque: 0.6±0.05 N·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: AR20-B AR25-B AR30-B AR40-B AR50-B AR60-B 4	Tightening torque: AR20-B AR25-B AR30-B AR40-B AR50-B AR60-B 0.6±0.05 N·m

7) Blanking plate assembly

Applicable model	Process	Procedure	Tools	Check item
AR20-B AR25-B AR30-B AR40-B AR50-B AR60-B	Disassembly	1) Remove the blanking plate. Rotate two set screws counterclockwise with cross pointed driver to remove the blanking plate and two set screws.	Cross pointed driver	—
	Assembly	2) Confirm blanking plate has "O" ring. If not, mount "O" ring.	—	
		3) Mount the blanking plate. Rotate two screws clockwise by Phillips driver to fix blanking plate. See Check item for tightening torque of two screws.	Cross pointed driver (Torque driver)	Tightening torque: 0.6±0.05 N·m

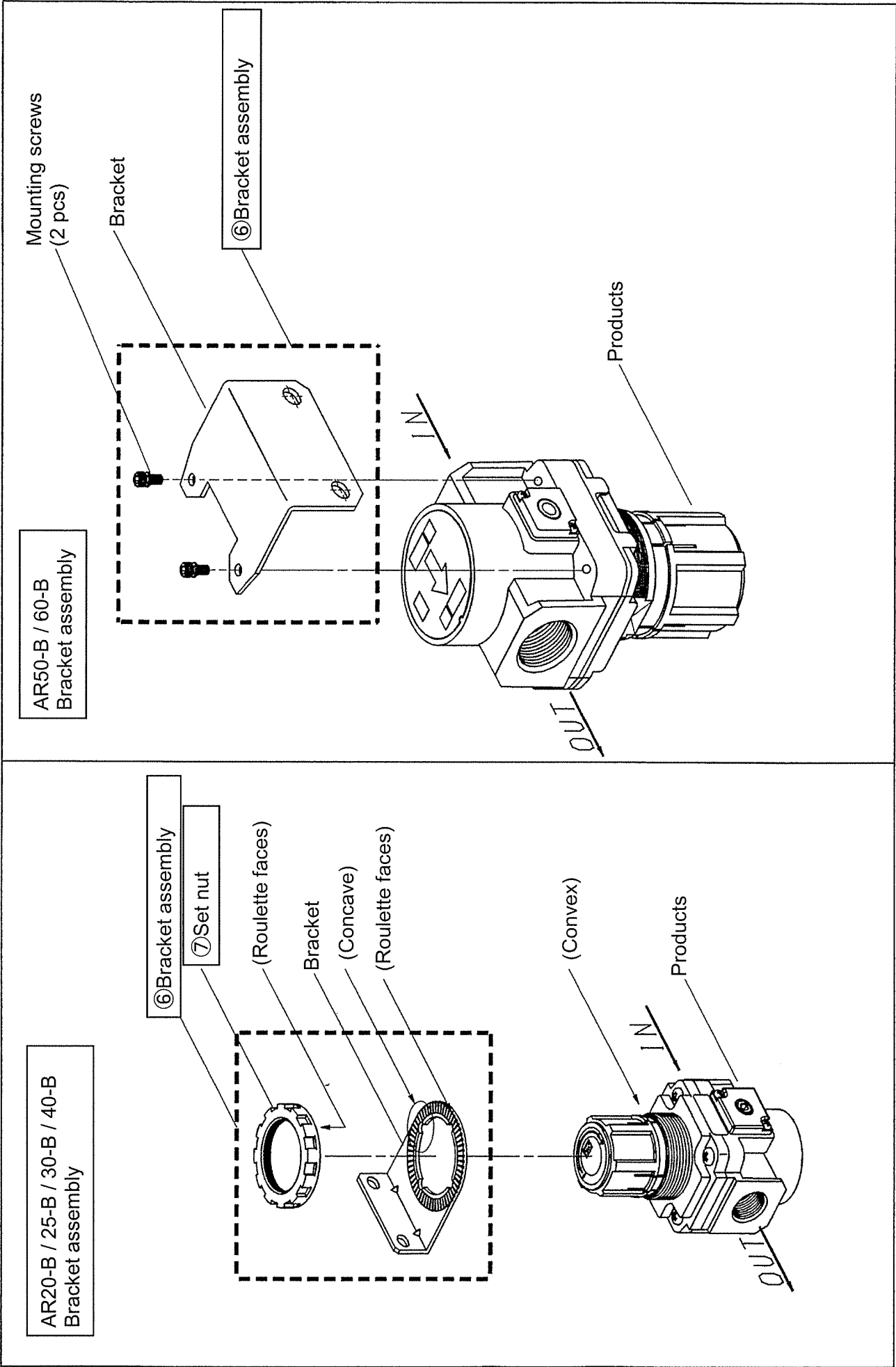
8. DISASSEMBLY DRAWING

1) AR20-B/25-B/30-B/40-B/50-B/60-B Disassembly drawing



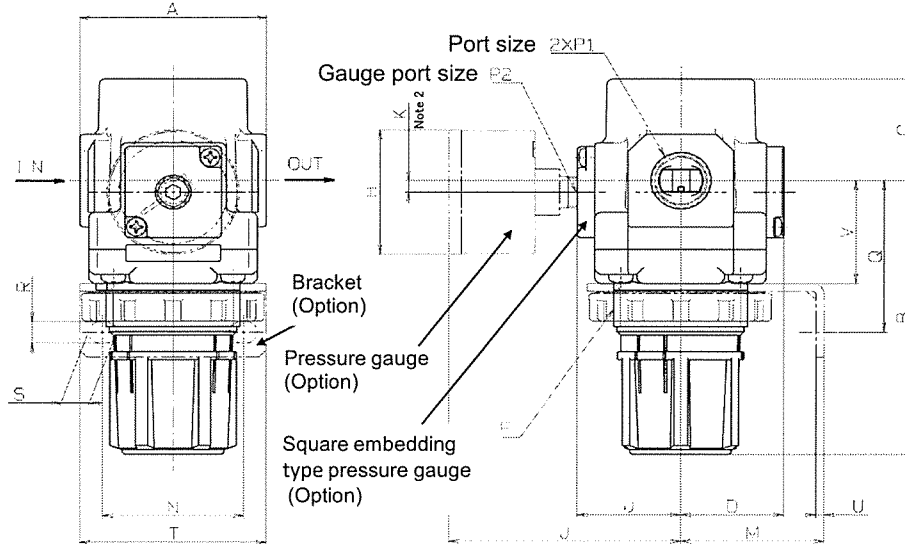
Note) It is possible to mount ⑧Square embedding type pressure gauge or ⑪Pressure gauge adaptor assembly or ⑫Plug assembly instead of ⑭Blanking plate assembly.

2) AR20-B/25-B/30-B/40-B/50-B/60-B Bracket assembly •Panel mounting disassembly drawing

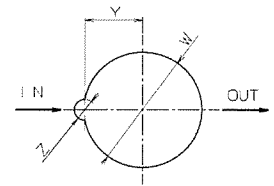


9. DIMENSIONS

AR20-B~AR40-06-B

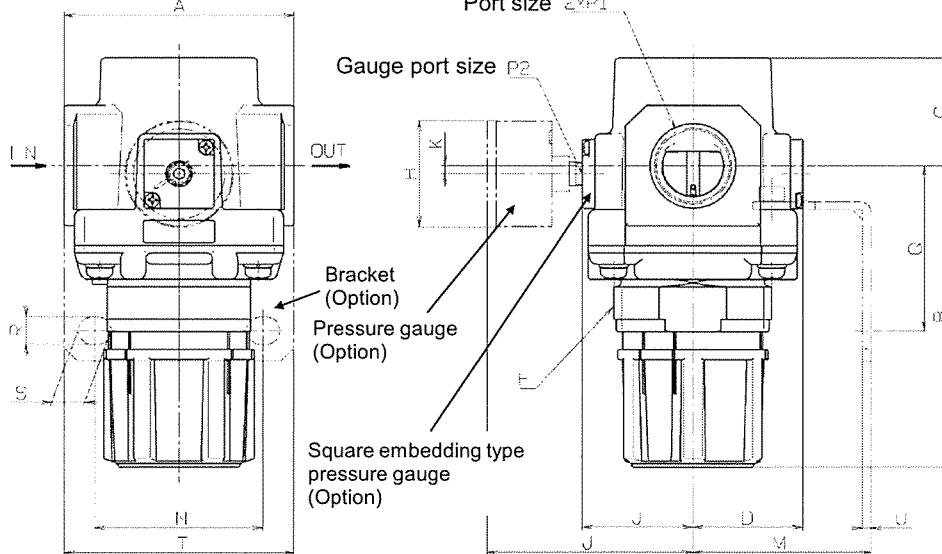


Panel fitting



Thickness of plate
AR20-B~30-B : MAX. 3.5
AR40-B : MAX. 5

AR50-B/AR60-B



Dimensions

Model	Standard specifications									Optional specifications					
										Square embedding type pressure gauge		Round type pressure gauge		Round type pressure gauge (with colour zone)	
	P1	P2	A	B ^{Note1}	C	D	F	J	K	H	J	H	J	H	J
AR20-B	1/8-1/4	1/8	40	67.4	26.5	28.5	M28X1	28.5	2 ^{Note2}	□28	29.5	φ37.5	65	φ37.5	66
AR25-B	1/4-3/8	1/8	53	71.9	28	27.5	M32X1.5	27.5	0	□28	28.5	φ37.5	64	φ37.5	65
AR30-B	1/4-3/8	1/8	53	85.6	30.7	29.4	M38X1.5	29.4	3.5	□28	30.4	φ37.5	65.9	φ37.5	66.9
AR40-B	1/4-3/8-1/2	1/8	70	91.7	35.8	33.8	M42X1.5	33.8	3.5	□28	34.8	φ42.5	71.3	φ42.5	71.3
AR40-06-B	3/4	1/8	75	93.2	35.8	33.8	M42X1.5	33.8	3	□28	34.8	φ42.5	71.3	φ42.5	71.3
AR50-B	3/4-1	1/8	90	125	43	43.3	M62X1.5	43.3	3.2	□28	44.3	φ42.5	80.8	φ42.5	80.8
AR60-B	1	1/8	95	130	46	43.3	M62X1.5	43.3	3.2	□28	44.3	φ42.5	80.8	φ42.5	80.8

Model	Optional specifications										
	Bracket mount dimensions							Panel mount dimensions			
	M	N	Q	R	S	T	U	V	W	Y	Z
AR20-B	30	34	43.9	5.4	15.4	55	2.3	24.7	28.5	14	6
AR25-B	30	34	43.9	5.4	15.4	55	2.3	25.7	32.5	16	6
AR30-B	41	40	45.8	6.5	8	53	2.3	31.1	38.5	19	7
AR40-B	50	54	54	8.5	10.5	70	2.3	35.5	42.5	21	7
AR40-06-B	50	54	55.5	8.5	10.5	70	2.3	37	42.5	21	7
AR50-B	70	66	65.8	11	13	90	3.2	-	-	-	-
AR60-B	70	66	65.8	11	13	90	3.2	-	-	-	-

Note 1) B dimension is a size in the state to unlock the handle.

Note 2) Pressure gauge mounting position is above piping center for AR20 only.