Modular Pressure Control Equipment F.R.L. Replacement Procedure

AF	Modular Type Air Filter	P.398
AFM	Modular Type Mist Separator	P.402
AFD	Modular Type Micro Mist Separator	P.402
AR	Modular Type Regulators	P.404
AL	Modular Type Lubricators	P.412
AW	Modular Type Filter Regulators	P.420
ARG	Modular Type Regulator with Built-in Pressure Gauge	P.431
AWG	Modular Type Filter Regulator with Built-in Pressure Gauge	P.437
AR425 to 925	Pilot Operated Regulator	P.444
AMR3000 to 6000	MR Unit (Regulator with Mist Separator)	P.448
ARM5	Compact Manifold Regulator	P.449
ARM10/11	Compact Manifold Regulator	P.453

SMC

AF10 to 40 Exploded View 1



4) AF50/60



Warning

Before replacement, ensure that the regulator is not pressurized. After replacemet, ensure that specified function is satisfied and external leakage is not found before starting operation.

1. Bowl Assembly/Element

Applicable model	Process	Procedure	Tools	Check item
	Disassembly	 Remove the bowl assembly. Hold the bowl assembly by hand and rotate counterclockwise to remove the bowl assembly. If the bowl assembly is tightened too much to be removed, use hook spanner until it can be loosened by hand. 	(Hook spanner Nominal: 25/28)	_
		 Remove the baffle element Rotate the baffle by hand and counterclockwise to remove the baffle and element. 	_	_
Δ F 10	Assembly	 Mount the element. Mount the element to the element guide. 	_	_
		4) Mount the baffle. Hold the baffle by hand to rotate it clockwise and mount the element. Baffle has mount direction. See disassembly drawing. For baffle tightening torque, see check item.	_	Tightening torque: $0.35 \pm 0.05 \text{ N} \cdot \text{m}$
		 Mount the bowl assembly. Hold the bowl assembly by hand and rotate clockwise. Do not use tool for mounting because the bowl may be damaged. Refer to the "Check item" for referential tightening torque. 	_	Referential tightening torque: 1.5 N⋅m
Disa	Disassembly	 Remove the bowl assembly. Hold the bowl assembly by hand and rotate counterclockwise to remove the bowl assembly. If the bowl assembly is tightened too much to be removed, use hook spanner until it can be loos- ened by hand. 	(Hook spanner Nominal: 34/38)	_
		 2) Remove the cross recessed round head screw, baffle, element and deflector. Turn the cross recessed round head screw counterclockwise with a Phillips head screw driver to remove the baffle, element, and deflector. 	Phillips head screw driver	_
	Assembly	 Mount the deflector. Set the deflector into the body assembly while carefully checking the installation orientation (direction, in which the element enters the concave side). 	_	Direction of deflector (For element concave side →Refer to the exploded view.)
AF20		4) Mount the element. Insert the element into the recess of deflector.	_	_
		 Mount the baffle. Insert the element while carefully checking the installation orientation (direction, in which the element enters the convex side). 	_	Direction of baffle (For element convex side →Refer to the exploded view.)
		6) Tighten the cross recessed round head screw to secure the baffle, element, and deflector. Turn the cross recessed round head screw clockwise with a Phillips screwdriver to secure the baffle, element, and deflector. Refer to the "Check item" for tightening torque.	Phillips head screw driver	Tightening torque: $0.35 \pm 0.05 \text{ N} \cdot \text{m}$
		 7) Mount the bowl assembly. Hold the bowl assembly by hand and rotate clockwise. Do not use tool for mounting because the bowl may be damaged. See check item for referential tightening torque. 	_	Referential tightening torque: 2.2 N⋅m

Series AF10 to 60 Replacement Procedure of Element 2

Applicable model	Process	Procedure	Tools	Check item	
	Disassembly	 Remove the bowl assembly. Push the bowl assembly lock button. Lifting the bowl assembly, rotate the assembly 45 degree (right or left) to pull out the assembly. 	_	_	tors
		 Remove the baffle, element and deflector. Turn the baffle counterclockwise by hand to remove the baf- fle, element, and deflector. 	_	_	Actual
	Assembly	 Mount the deflector. Set the deflector into the body assembly while carefully checking the installation orientation (direction, in which the el- ement enters the concave side). 	_	Direction of deflector (For element concave side →Refer to the exploded view.)	
		 Mount the element. Insert the element into the recess of deflector. 	_	—	dular F.R
AF30 AF40		5) Mount the baffle. Insert the element while carefully checking the installation orientation (direction, in which the element enters the convex side).	_	Direction of baffle (For element convex side →Refer to the exploded view.)	Mo
		6) Tighten the baffle to secure the baffle, element, and deflector. Turn the baffle clockwise by hand until it is lightly connected to the element and deflector. After that, tighten the baffle further about 1/2 turn clockwise. Refer to the "Check item" for referential tightening torque.	_	Referential tightening torque: AF30: 0.5 N·m AF40: 0.9 N·m	Preparatio
		7) Mount the bowl assembly. Match the mating mark of the body and the bowl assembly to insert the assembly to the body. Rotate the assembly 45 de- gree (right or left) until the lock button is tossed up to mount the bowl assembly. Ensure the lock button is up.	_	Lock button is up.	ial Filters
	Disassembly	 Remove the bowl assembly Push the bowl assembly lock button. Lifting the bowl assem- bly, rotate the assembly 45 degree (right or left) to pull out the assembly. 	_	_	Industr
		 Remove the baffle element Rotate the baffle by hand and counterclockwise to remove the baffle and element. 	_	_	ment
	Assembly	 Mount the element. Insert the element into the recess of deflector. 	_	—	place
AF50 AF60		 Mount the baffle. Insert the element while carefully checking the installation orientation (direction, in which the element enters the convex side). 	_	Direction of baffle (For element convex side →Refer to the exploded view.)	Prs Re
		5) Tighten the baffle to secure the baffle and element. Turn the baffle clockwise by hand until it is lightly connected to the element and deflector. After that, tighten the baffle further about 1/2 turn clockwise. Refer to the "Check item" for referential tightening torque.	_	Referential tightening torque: 1.8 N·m	Actuato
		 7) Mount the bowl assembly. Match the mating mark of the housing and the bowl assembly to insert the assembly to the housing. Rotate the assembly 45 degree (right or left) until the lock button is tossed up to mount the bowl assembly. Ensure the lock button is up. 	_	Lock button is up.	Modular F.R.L.

AFM, AFD20 to 40 Disassembly Drawing 1

1) AFM, AFD20

2) AFM, AFD30/40



Warning

Before replacement, ensure that the regulator is not pressurized. After replacemet, ensure that specified function is satisfied and external leakage is not found before starting operation.

1. Bowl Assembly/Element

Applicable model	Process	Procedure	Tools	Check item	
	Disassembly	 Remove the bowl assembly. Hold the bowl assembly by hand and rotate counterclockwise to remove the bowl assembly. If the bowl assembly is tightened too much to be removed, use hook spanner until it can be loosened by hand. 	(Hook spanner Nominal: 34/38)	_	dular F.R.L.
A EM20		 Remove the element. Hold the element with a spanner to rotate it counterclockwise and remove the element. 	Spanner Nominal: 7	_	Mo
AFM20 AFD20 As	Assembly	 Mount the element. Hold the element with a spanner to rotate it clockwise and mount the element. Refer to the "Check item" for the tighten- ing torque. 	Spanner Nominal: 7	Tightening torque: $0.35\pm0.05~\text{N}{\cdot}\text{m}$	paration
		4) Remove the bowl assembly. Hold the bowl assembly by hand and rotate counterclockwise to remove the bowl assembly. If the bowl assembly is tightened too much to be removed, use hook spanner until it can be loos- ened by hand.	_	Referential tightening torque: 2.2 N·m	ers Air Pre
Applicable model	Process	Procedure	Tools	Check item	ial

Applicable model	Process	Procedure	Tools	Check item
AFM30 AFM40 AFD30 AFD40	Disassembly	 Remove the bowl assembly. Push the bowl assembly lock button. Lifting the bowl assembly, rotate the assembly 45 degree (right or left) to pull out the assembly. 	_	_
		 Remove the element. Hold the element with a round cutting to rotate it counter- clockwise and remove the element. 	Round cutting	_
	Assembly	 Mount the element. Hold the element with a round cutting to rotate it clockwise and mount the element. Refer to the "Check item" for the tightening torque. 	Round cutting	Tightening torque: 0.35 ± 0.05 N⋅m
		4) Mount the bowl assembly. Match the mating mark of the body and the bowl assembly to insert the assembly to the body. Rotate the assembly 45 de- gree (right or left) until the lock button is tossed up to mount the bowl assembly. Ensure the lock button is up.	_	Lock button is up.

Modular F.R.L. Pressure Control Equip

Industrial Filters



AR20(K)/25(K)/30(K)/40(K)/50(K)/60(K) Exploded View 2



Note) It is possible to mount the square embedded pressure gauge or the pressure gauge adaptor assembly or the plug assembly instead of the blanking plate assembly.

AW20K to 60K

Note) The flow direction can be changed by taking off the check valve assembly, and replacing it with the square embedded gauge, pressure gauge adaptor assembly and plug assembly.

Warning

Before replacement, ensure that the regulator is not pressurized.

Rotate the pressure adjusting handle to zero.

Replace referring to "Exploded View"

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

1. Diaphragm Assembly (Piston Assembly)

Applicable model	Process	Procedure	Tools	Check item
	Disassembly	 Remove the bonnet assembly. Hold the bonnet with a spanner on the width across flat, and rotate counterclockwise to remove the bonnet assembly. 	Spanner Nominal: 16	
		 Remove the piston assembly from the bonnet. Pull out the piston assembly facing the handle downwards. Otherwise, pressure adjustment screw assembly or spring fall off. 	_	
AR10	Assembly	 3) Mount the piston assembly to the bonnet assembly. Insert the piston assembly to the bonnet so that the piston assembly convex faces the body. If pressure adjustment screw or spring is not mounted on the bonnet, mount it before mounting the piston assembly. 	_	
		4) Ensure the chamber is mounted on the body. If the chamber is removed during disassembly, mount the chamber ensuring the right direction of the chamber. Convex of the chamber shall face the bonnet side.	_	Presence of chamber. Mount if there is not a chamber Direction
		5) Mount the bonnet assembly to the body. Hold the bonnet assembly with a spanner on the spanner flat, and rotate the body clockwise to settle. See check item for the tightening torque.	Spanner Nominal: 16	Tightening torque: 1.8 ± 0.3 N⋅m
	Disassembly	 Remove the bonnet. Rotate the set screw counterclockwise with a Phillips head screw driver to remove the bonnet from the body. 	Phillips head screw driver	_
AR20(K)		2) Remove parts in order of the pressure adjustment screw as- sembly, spring, and the diaphragm assembly. Please note that the diaphragm assembly will be attached to the bonnet if disassembled with the handle facing down.	_	_
AR25(K) AR30(K) AR40(K) AR50(K) AR50(K)	Assembly	 Mount parts to the body in order of the diaphragm assembly, spring, and pressure adjustment screw. 	_	Mind the direction of the diaphragm assembly and the pressure adjustment screw assembly
		4) Mount the bonnet to the body. Mount the convex IN side of the bonnet to the body, and tight- en half way with 4 mounting screws with a Phillips head screw driver. Then, tighten the screws completely in a diagonal pat- tern with the indicated tightening torque.	Phillips head screw driver	$\begin{tabular}{ c c c c c } \hline Tightening torque \\ \hline AR20(K) & 2.15 \pm 0.3 \ N\cdotm \\ \hline AR25(K) & 2.35 \pm 0.3 \ N\cdotm \\ \hline AR30(K) & 2.35 \pm 0.3 \ N\cdotm \\ \hline AR40(K) & 3.5 \pm 0.3 \ N\cdotm \\ \hline AR50(K) & 4.5 \pm 1 \ N\cdotm \\ \hline AR60(K) & 4.5 \pm 1 \ N\cdotm \\ \hline \end{tabular}$

2. Valve Guide (Assembly), Valve Assembly

Applicable model	Process	Procedure	Tools	Check item	
	Disassembly	 Remove the valve guide. Insert the hexagon wrench key to the valve guide hexagon socket, and rotate counterclockwise to remove it. 	Hexagon wrench key Nominal: 6	_	uators
		2) Remove the valve spring.	—	—	ct
		3) Remove the valve.	—	—	
	Assembly	 Mount the valve. Set the valve so that the convex surface faces to the valve guide. 	_	Concave surface (top) is the valve guide	ipment
AR10		 Mount the valve spring. Insert the valve so that the inner circumference of the valve spring fit in the convex surface of the valve. 	_	_	Modular F.R.I e Control Eq
		 Ensure O-ring is mounted. Ensure valve guide seal O-ring is mounted. Mount O-ring if the ring is missing. 	_	Presence of O-ring	Pressur
		7) Mount the valve guide. Insert the hexagon wrench key to the valve guide hexagon socket, and rotate the spanner clockwise to tighten the guide. Refer to the "Check item" for the tightening torque.	Hexagon wrench key Nominal: 6	Tightening torque: 0.75 ± 0.15 N⋅m	reparation
	Disassembly	 Remove the cap. Insert the watchmakers screw driver in the gap between the body and the cap and dig up the cap. 	Watchmakers screw driver (-)	_	Air Pi Equ
		 Remove the cover. Insert the circular pliers into the 2 small holes of the cover, ro- tate 45 degrees to one side or the other and lift. 	Circular pliers Nominal: 125	_	Filters
		 Remove the valve guide assembly. Hold the valve guide with a needle nose pliers, and lift it. 	Needle nose pliers	_	ustrial
		4) Remove the valve spring.	_	—	ndt
AR20(K)		5) Remove the valve.	_	—	(
AR25(K) AR30(K) AR40(K)	Assembly	 Mount the valve. Mate the stem convex and the valve center hole. 	_	Positioning the stem and the valve (centering)	e ut
AR50(K) AR60(K)		 Mount the valve spring. Insert the valve spring to the valve hole. 	_	_	aceme
		8) Mount the valve guide assembly and the cover assembly to the body. Align the body groove and the cover clamp, push in the valve guide and cover assembly, insert the circular pliers into the 2 second second	Circular pliers Nominal: 125	_	Replé
		the other to lock into place.			lo.
		 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.	Actual

3. Bracket Assembly, Panel Mount

AR10/20(K)/25(K)/30(K)/40(K) Bracket assembly; panel mount exploded View



AR50(K)/60(K) Bracket assembly; panel mount exploded View



Note) The AR10 set nut and bracket do not have roulette faces. The AR10 bracket and product do not have concave and convex interfaces.

Applicable model	Process	Procedure	Tools	Check item
	Assembly	 Mount the parts to the bracket (panel). Mate the bracket (panel) concave and the bonnet convex to mount the bracket. 	_	_
AR10 AR20(K) AR25(K) AR30(K) AR40(K)		 2) Settle the bracket (panel) with set nut. Rotate the set nut clockwise with a hook spanner (spanner for AR10) to settle the parts to the bracket (panel). For the tightening torque, refer to the "Check item" on the right. When mounting the bracket for AR20(K)/25(K)/30(K)/40(K), ensure that the roulette faces of the set nut and the bracket are mated appropriately. When mounting with bracket, set nut tightened manually is adequate for general used. (AR20(K)/25(K)/30(K)/40(K)) 	AR10 Spanner Nominal: 24 AR20(K)/25(K)/30(K)/40(K) Hook spanner Nominal AR20(K) 34/38 AR25(K) 40/42 AR30(K) 52/55 AR40(K) 52/55	Tightening torque AR10 0.8 ± 0.1 N·m Tightening torque AR20(K) 2.0 ± 0.2 N·m AR25(K) 2.5 ± 0.2 N·m AR30(K) 3.5 ± 0.3 N·m AR40(K) 4.0 ± 0.4 N·m
AR50(K) AR60(K)	Assembly (Bracket assembly)	 Mount the bracket to the product. Fix them by tightening two mounting screws using a hexagon wrench key. 	Hexagon wrench key Nominal: 5	Referential tightening torque: 2.6 N·m

4. Square Embedded Pressure Gauge

Applicable model	Process	Procedure	Tools	Check item	\bigcap
AR20(K) AR25(K) AR30(K) AR40(K) AR50(K) AR60(K)	Disassembly	 Remove the pressure gauge cover. Rotate the pressure gauge cover 15 degrees to the arrow mark (counterclockwise) to pull it out. 	_	_	uators
		 Remove the pressure gauge Rotate two mounting screws counterclockwise with Phillips head screw driver to remove the pressure gauge and two mounting screws. 	Phillips head screw driver	_	Acti
	Assembly	 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 mounting screws clockwise with Phillips head screw driver to mounting screws temporary. Then settle them with tightening torque in check item.	Phillips head screw driver	Tightening torque: $0.3 \pm 0.05 \text{ N} \cdot \text{m}$	Modular F.
		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.	_	_	reparation

5. Circular Pressure Gauge

Applicable model	Process	Procedure	Tools	Check item
	Disassembly	isassembly 1) Remove the pressure gauge. Hold the pressure gauge with a spanner on the spanner flat.	Spanner Nominal	
		Then, rotate the gauge.	AR10 21	
		Spanner for AR10 is a compact spanner.	AR20(K)	
			AR25(K) 12	
			AR30(K)	
			AR40(K)	
AR10			AR50(K) 14	
AR20(K)				
AR30(K)	Assembly	2) Wrap 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
AR50(K)		3) Mount the pressure gauge.	Spanner	
AR60(K)		Hold the pressure gauge on the spanner flat with a spanner.	Nominal	Tightening torque
		and rotate it clockwise to mount the circular pressure gauge.	AR10 21	AR10 3 to 4 N·m
		Use compact spanner for Refer to the "Check item" for tightening torque of processor	AR20(K)	AR20(K)
			AR25(K) 12	AR25(K) 7 to 9 N⋅m
		guugo.	AR30(K)	
				AR50(K) 12 to 14 N.m
			AR60(K)	AR60(K)

Replacemen

Modular F.R.L Pressure Control Equ

6. Pressure Gauge Adapter, Plug Assembly

Applicable model	Process	Procedure	Tools	Check item	
		Disassembly	 Remove the plug. Insert the hexagon wrench key to hexagon socket of the plug. Rotate the plug counterclockwise to remove the plug. 	Hexagon wrench key Nominal AR20(K) AR25(K) 4 AR30(K) AR40(K) AR50(K) 6 AR60(K)	_
AR20(K) AR25(K)		2) Remove the pressure gauge adapter. Rotate two mounting screws counterclockwise with Phillips head screw driver to remove the pressure gauge adapter and two mounting screws.	Phillips head screw driver	_	
AR30(K) AR40(K) AR50(K) AR60(K)	Assembly	 Ensure O-ring is mounted to the pressure gauge adapter. If not, mount O-ring. 	_	_	
	AR50(K) AR60(K)		 4) Mount pressure gauge adapter. Rotate two screws clockwise by Phillips head screw driver to fix pressure gauge adapter. Refer to the "Check item" for tightening torque of two screws. 	Phillips head screw driver (Torque driver)	Tightening torque: 0.3 \pm 0.05 N·m
		5) Mount plug assembly. Insert hexagon wrench key into hexagon socket on the plug and rotate clockwise to fix the plug. Refer to the "Check item" for tightening torque of two screws.	AR20(K) 4 AR25(K) 4 AR30(K) 4 AR30(K) 4 AR40(K) 6 AR60(K) 6	AR20(K) 0.6 ± 0.05 N·m AR30(K) AR40(K) AR40(K) 1.0 ± 0.1 N·m AR60(K) AR60(K)	

7. Hexagon Plug

Applicable model	Process	Procedure	Tools	Check item
AR10	Disassembly	 Remove the plug. Insert the hexagon wrench key to hexagon socket of the plug. Rotate the plug counterclockwise to remove the plug. 	Hexagon wrench key Nominal: 4	_

8. Blanking Plate Assembly

Applicable model	Process	Procedure	Tools	Check item
AR20 AR25 AR30 AR40 AR50 AR60	Disassembly	 Remove the blanking plate Rotate two mounting screws counterclockwise with Phillips head screw driver to remove the blanking plate and two mounting screws. 	Phillips head screw driver	_
	Assembly	 Ensure O-ring is mounted to the blanking plate. If not, mount O-ring. 	_	_
		 Mount blanking plate. Rotate two screws clockwise by Phillips head screw driver to fix blanking plate. Refer to the "Check item" for tightening torque of two screws. 	Phillips head screw driver (Torque driver)	Tightening torque: 0.3 ± 0.05 N⋅m

9. Check Valve Assembly

Applicable model	Process	Procedure	Tools	Check item	\square	
AR20K AR25K AR30K AR40K AR50K AR60K		Disassembly	 Remove check valve cover. Rotate two screws counterclockwise by Phillips head screw driver and remove the check valve cover and the screws. 	Phillips head screw driver	_	uators
		2) Remove the check valve assembly from body. The check valve can be removed by pulling it out by hand. At this time, confirm O-ring is mounted to body side properly so that it wouldn't come out from the body.	_	_	Act	
	Assembly	 Confirm two O-rings is mounted to body side. If not, mount it to the body. 	_	_		
		 Insert convexes on check valve into O-ring insert holes on body. 	_	Orientation of the check valve body assembly	odular F.	
		5) Mount check valve cover. Rotate two screws clockwise by Phillips head screw driver to fix check valve cover.	Phillips head screw driver (Torque driver)	Tightening torque: 0.3 ± 0.05 N·m		
		Heier to the Check lieff for tightening torque of two screws.			0	

AL10 to 40 Exploded View 1



AL50/AL60 Exploded View 2



AL30 to 60 1000cm³ Tank Exploded View 3





 Replacement
 Industrial Filters
 Air Preparation
 Modular FR.L.

 Procedure
 Equipment
 Pressure Control Equipment
 Actuators

Warning

Before replacement, ensure that the regulator is not pressurized. After replacemet, ensure that specified function is satisfied and external leakage is not found before starting operation.

1. Bowl Assembly, Sight Dome Assembly

Applicable model	Process	Procedure	Tools	Check item
AL10	Disassembly	 Remove the bowl assembly. Hold the bowl assembly by hand and rotate couterclockwise to remove the bowl assembly. If the bowl assembly is tightened too much to be removed, use hook spanner until it can be loos- ened by hand. 	(Hook spanner Nominal: 25/28)	_
		 Remove the sight dome assembly. Rotate counterclockwise with spanner to remove the sight dome assembly. 	Spanner Nominal: 14	_
	Assembly	3) Mount the bowl assembly. Hold the bowl assembly by hand and rotate clockwise. Do not use tool for mounting because the bowl may be damaged. Re- fer to the "Check item" for referential tightening torque.	_	Referential tightening torque: 1.5 N⋅m
		4) Mount the sight dome assembly. Rotate clockwise with spanner to mount the sight dome assembly. Tightening torque at this time is shown on "Check item".	Spanner Nominal: 14 (Torque wrench)	Tightening torque: 0.8 ± 0.2 N⋅m

2. Bowl Assembly (Housing), Bumper Retainer Assembly, Bumper, Sight Dome Assembly,

Applicable model	Process	Procedure	Tools	Check item				
- Philorano model	Disassembly	 Remove the bowl assembly. Hold the bowl assembly by hand and rotate counterclockwise to remove the bowl assembly. If the bowl assembly is tightened too much to be removed, use hook spanner until it can be loos- ened by hand. 	(Hook spanner Nominal: 34/38)	_	Actuators			
		2) Close the oil adjustment valve (outer of the sight dome) fully. Rotate the oil adjustment valve clockwise by manual until feel- ing the end of rotation with light force.	_	_	oment			
		 Remove bumper retainer assembly. Hold the bumper retainer assembly by round cutting pliers and rotate counterclockwise. 	Round cutting pliers Nominal: 125 or 150	_	odular F.R.L. Control Equi			
		4) Remove O-ring, bumper, holder assembly, steel ball, sight dome assembly and spacer. Push the sight dome assembly forward to the body by hand for disconnection. And the holder assembly and the sight dome assembly can be separated away by hand as well, but at the time the attention has to be paid not to lose the steel balls be- tween them. Bumper can be pulled out by tweezers.	Tweezers	_	aration ment			
	Assembly	5) Insert the spacer to the sight dome assembly.	_	_	lip			
AL20		6) Connect the sight dome assembly, the steel balls and the holder assembly. After inserting the steel balls into the path hole of oil on the holder assembly, put the sight dome assembly into the holder assembly by meeting zero point mark of both holder assembly and the sight dome.	_	Zero point mark on the holder assembly shall meet with zero point mark on the sight dome assembly.	Iters Air Pr			
					7) Insert the bumper into the holder assembly.For insertion, meet the setting concave (bumper) and convex (holder assembly)	_	Setting concave on the bump- er shall meet with the setting convex on the holder assem- bly.	ndustrial Fi
		8) Insert the assembly 5) to 7) mentioned above (sight dome + spacer + steel ball + holder assembly + damper) to the body. For insertion, meet the setting convex and concave on the body holder. Proper insertion makes the face of the holder and the body flat.	_	Setting concave on the body shall meet with the setting convex of the holder. The face of the holder and the body is made	ament dure			
		9) Mount the bumper retainer assembly. Hold the bumper retainer assembly by round cutting pliers and rotate clockwise. tightening torque at this time is shown on "Check item".	Round cutting pliers Nominal: 125 or 150	Tightening torque: 1.4 ± 0.1 N·m	Replace			
		10) Mount the bowl assembly. Hold the bowl assembly by hand and rotate clockwise. Do not use tool for mounting because the bowl may be damaged. Re- fer to the "Check item" for referential tightening torque.	_	Referential tightening torque: 2.2 N⋅m	uators			
	Disassembly	 Remove the bowl assembly. Push the lock button on the bowl assembly down and rotate clock or counterclockwise by 45 ° with the bowl assembly brought upward. After the rotation, the bowl assembly can be pulled out. 	_	_	Act			
		 Close the oil adjustment valve (outer of the sight dome) fully. Rotate the oil adjustment valve clockwise by manual until feel- ing the end of rotation with light force. 	_	_	r F.R.L. ol Equipmen			
AL30 AL40		3) Remove the bumper retainer assembly. Loosen and remove four cross recessed round head screws by phillips head screw driver to remove the bumper retainer assem- bly. At this time, the attention has to be paid not to lose O-ring between the bumper retainer assembly and the holder assembly.	Phillips head screw driver	_	Pressure Contre			
		4) Remove bumper, holder assembly, sight dome assembly and spacer. Push the sight dome assembly forward to the body by hand for disconnection. And the holder assembly and the sight dome assembly can be separated away by hand as well. Bumper can be pulled out by tweezers.	Tweezers	_	ndustrial Filter			
	Assembly	5) Insert the spacer into the assembly.		_	(=			
	y	6) Connect the sight dome assembly with the holder assembly. Put the sight dome assembly into the holder assembly by meet- ing zero point mark of both holder assembly and the sight dome assembly.	_	Zero point mark on the holder assembly shall meet with zero point mark on the sight dome assembly.				

Series AL10 to 60 Replacement Procedure 3

Applicable model	Process	Procedure	Tools	Check item
	Assembly	7) Insert the bumper into the holder assembly. For insertion, the shape of the bumper is matched to the shape of the convex part of the holder assembly.	_	Setting the shape of the bump- er shall meet with the setting convex of the holder assem- bly.
		8) Insert the assembly 5) to 7) mentioned above (sight dome + spacer + holder assembly + bumper) to the body. For insertion, meet the setting convex and concave on the body holder. Proper insertion makes the face of the holder and the body flat.	_	Setting concave on the body shall meet with the setting con- vex of the holder. The face of the holder and the body is made.
AL30 AL40		9) Mount the bumper retainer assembly. Place the bumper retainer assembly so that the oil path convex (bumper holder assembly) and concave (holder) could meet, and then fix it by four cross recessed round head screw by Phil- lips head screw driver. Tightening torque at this time is shown on "Check item". And the screw which is tightened next after first tightened screw shall be what is located at cross corner of first one.	Phillips head screw driver	Tightening torque AL30: 0.4 \pm 0.1 N·m AL40: 0.7 \pm 0.2 N·m
		10) Mount the bowl assembly. Insert the bowl assembly into the body by using individual setting mark and rotate clock or counterclockwise by 45° (until the lock button is released). If the release of the lock button is confirmed, mount of the bowl assembly is completed.	—	Lock button us up.
	Disassembly	 Remove the housing including the bowl assembly. Loosen four hexagon socket head cap screw by hexagon wrench to remove the housing (including the bowl assembly) and O-ring. 	Hexagon wrench Nominal: 5	_
		 Close the oil adjustment valve (outer of the sight dome) fully. Rotate the oil adjustment valve clockwise by manual until feel- ing the end of rotation with light force. 	_	_
		 Remove the damper retainer assembly. Loosen and remove four cross recessed round head screws by Phillips head screw driver to remove the bumper retainer assembly. 	Phillips head screw driver	_
		4) Remove O-ring, bumper assembly, holder assembly, sight dome assembly and spacer. Push the sight dome assembly forward to the body by hand for disconnection. And the holder assembly and the sight dome assembly can be separated away by hand as well.	_	_
	Assembly	5) Insert the spacer into the assembly.	_	—
		6) Connect the sight dome assembly with the holder assembly. Put the sight dome assembly into the holder assembly by meet- ing zero point mark of both holder assembly and the sight dome assembly.	_	Zero point mark on the holder assembly shall meet with zero point mark on the sight dome assembly.
AL50		 Insert the bumper into the holder assembly. For insertion, the setting hole of the bumper assembly is matched to the convex part of the holder assembly. 	_	Setting the setting hole of the bumper assembly shall meet with the convex of the holder assembly.
		8) Insert the assemblies 5) to 7) mentioned above (sight dome + spacer + holder assembly + bumper assembly) to the body. For insertion, meet the setting convex and concave on the body holder. Proper insertion makes the face of the holder and the body flat.	_	Setting concave on the body shall meet with the Setting convex of the holder. The face of the holder and the body is made flat.
		9) Install O-ring to the holder assembly.		
		10) Mount the bumper retainer assembly. Place the bumper retainer assembly so that the oil path convex (bumper holder assembly) and concave (holder) could meet, and then fix it by four cross recessed round head screw by Phillips head screw driver. Tightening torque at this time is shown on "Check item". And the screw which is tightened next after first tightened screw shall be what is located at cross corner of first one.	Phillips head screw driver	Tightening torque AL50: 1.4 ± 0.1 N⋅m AL60: 1.4 ± 0.1 N⋅m
		11) Install O-ring to the body.		
		12) Mount the housing including the bowl assembly. Place the housing including the bowl assembly on the body at the position with configuration match by checking the appear- ance of them and fix it by four hexagon socket head cap screw by hexagon wrench. Tightening torque at this time is shown on "Check item". And the screw which is tightened next after first tightened screw shall be what is located at cross corner of first one.	Hexagon wrench Nominal: 5 (Torque wrench)	Tightening torque AL50: 4.5 ± 1 N⋅m AL60: 4.5 ± 1 N⋅m



3. Lubrication Plug Assembly

Applicable model	Process	Procedure	Tools	Check item	
AL20 AL30 AL40 AL50 AL60	Disassembly	 Remove the lubrication plug assembly. Insert flat blade screw driver into the groove on the top of lubrication plug and rotate counterclockwise to remove the lubrication plug assembly from the body. 	Flat blade screw driver	_	Actuators
	Assembly	2) Mount the lubrication plug assembly. Insert flat blade screw driver into the groove on the top of lubrication plug and rotate clockwise to fix the lubrication plug assembly to the body. Tightening torque at this time is shown on "Check item".	Flat blade screw driver (Torque driver)	Tightening torque AL20: 0.3 ± 0.05 N·m AL30: 0.4 ± 0.05 N·m AL40 to 60: 0.55 ± 0.05 N·m	

AW10 Exploded View 1



AW20(K) Exploded View 2



Note.) It is possible to mount square embedded pressure gauge or pressure gauge adaptor assembly or plug assembly instead of blanking plate assembly.

AW20K

Note) The flow direction can be changed by taking off the check valve assembly, and replacing it with the square embedded gauge, pressure gauge adaptor assembly and plug assembly.

SMC

AW30(K)/40(K) Exploded View 3



Note.) It is possible to mount square embedded pressure gauge or pressure gauge adaptor assembly or plug assembly instead of blanking plate assembly.

AW30K/40K

Note) The flow direction can be changed by taking off the check valve assembly, and replacing it with the square embedded gauge, pressure gauge adaptor assembly and plug assembly.

AW60(K) Exploded View 4





Note) Set nut and bracket for AW10 is not equipped with roulette face. Product and bracket for AW10 is not equipped with convex and concave to mate.

AW60(K) Bracket Assembly Exploded View **6**



Actuators

Warning

Before replacement, ensure that the regulator is not pressurized. Rotate the pressure adjusting handle to zero.

Replace refering to "Exploded View".

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

1. Bowl Assembly/Element

Applicable model	Process	Procedure	Tools	Check item
	Disassembly	 Remove the bowl assembly. Hold the bowl assembly by hand and rotate counterclockwise to remove the bowl assembly. If the bowl assembly is tightened too much to be removed, use hook spanner until it can be loosened by hand. 	(Hook spanner Nominal: 25/28)	_
		 Remove the baffle and element. Rotate the baffle by hand and counterclockwise to remove the baffle and element. 	_	_
AW10	Assembly	 Mount the element. Mount the element to the element guide. (Directionless) 	_	—
		4) Mount the baffle. Hold the baffle by hand to rotate it clockwise and mount the element. Baffle has mount direction. Refer to the "Exploded View". For baffle tightening torque, refer to the "Check item".	Spanner Nominal: 16	Tightening torque: 0.35 ± 0.05 N⋅m
		 Mount the bowl assembly. Hold the bowl assembly by hand and rotate clockwise. Do not use tool for mounting because the bowl may be damaged. Refer to the "Check item" for referential tightening torque. 	_	Referential tightening torque: 1.5 N⋅m
	Disassembly	 Remove the bowl assembly. Hold the bowl assembly by hand and rotate counterclockwise to remove the bowl assembly. If the bowl assembly is tightened too much to be removed, use hook spanner until it can be loos- ened by hand. 	(Hook spanner Nominal: 34/38)	_
		 Remove the baffle and element. Rotate the baffle by hand and counterclockwise to remove the baffle and element. 	_	_
AW20(K)	Assembly	 Mount the element. Mount the element to the valve guide. 	_	—
		4) Mount the baffle. Insert the baffle so that concave on the valve guide could meet T convex on the baffle. And rotate it clockwise manually until feeling snap fit (approx. 110°) to fix to the element.	_	_
		 Mount the bowl assembly. Hold the bowl assembly by hand and rotate clockwise. Do not use tool for mounting because the bowl may be damaged. Refer to the "Check item" for referential tightening torque. 	_	Referential tightening torque: 2.2 N·m
	Disassembly	 Remove the bowl assembly Push the bowl assembly lock button. Lifting the bowl assembly, rotate the assembly 45 degree (right or left) to pull out the assembly. 	_	_
AW30(K) AW40(K) AW60(K)		 Remove the baffle and element. Rotate the baffle by hand and counterclockwise to remove the baffle and element. 	_	_
	Assembly	 Mount the element. Mount the element to the valve guide. 	_	_
		4) Mount the baffle. Insert the baffle so that concave on the valve guide could meet T convex on the baffle. And rotate it clockwise manually until feeling snap fit (approx. 110°) to fix to the element.	_	Direction of baffle. For element convex side.
		 Mount the bowl assembly. Match the mating mark of the body and the bowl assembly to insert the assembly to the body. Rotate the assembly 45 de- gree (right or left) until the lock button is tossed up to mount the bowl assembly. Ensure the lock button is up. 	_	Lock button is up.

SMC

2. Diaphragm Assembly

Applicable model	Process	Procedure	Tools	Check item	
	Disassembly	 Remove the bonnet assembly. Hold the bonnet with a spanner on the width across flat, and rotate counterclockwise to remove the bonnet assembly. 	Spanner Nominal: 16	_	tuators
		 Remove the piston assembly from the bonnet assembly. Pull out the piston assembly facing the handle downwards. Otherwise, pressure adjustment screw assembly or spring fall off. 	_	_	AC
AW10	Assembly	3) Mount the piston assembly to the bonnet assembly. Insert the piston assembly to the bonnet so that the piston as- sembly convex faces the body. If pressure adjusting screw or pressure adjusting spring is not mounted on the bonnet, mount it before mounting the piston assembly.	_	_	Modular F.R.L.
		4) Ensure the chamber is mounted on the body. If the chamber is removed during disassembly, mount the chamber ensuring the right direction of the chamber. Convex of the chamber shall face the bonnet.	_	Presence of chamber. Mounting direction	tion
		5) Mount the bonnet assembly to the body. Hold the bonnet assembly with a spanner on the width across flat, and rotate the body clockwise to settle. Refer to the "Check item" for the tightening torque.	Spanner Nominal: 16	Tightening torque: 1.8 ± 0.3 N·m	Prepara
	Disassembly	 Remove the bonnet. Rotate four mounting screws counterclockwise with Phillips head screw driver to remove the bonnet from the body. 	Phillips head screw driver	_	ers
AW20(K)		2) Remove parts in order of the pressure adjustment screw assembly, spring, and the diaphragm assembly. Please be noted that the diaphragm assembly adheres to the bonnet if disassemble parts with the handle facing downwards.	_	_	strial Filte
AW30(K) AW40(K) AW60(K)	Assembly	 Mount parts to the body in order of the diaphragm assembly, spring, and pressure adjustment screw. 	_	Direction of pressure adjustment screw assembly and diaphragm assembly	Indu
		4) Mount the bonnet to the body. Mount the convex IN side of the bonnet to the body, and tight- en half way with 4 mounting screws with a Phillips head screw driver. Then, tighten the screws completely in a diago- nal pattern with the indicated tightening torque.	Phillips head screw driver	$\begin{tabular}{ c c c c c }\hline Tightening torque & & & \\ \hline AW20 & 2.15 \pm 0.3 \ N\cdotm & \\ \hline AW30 & 2.35 \pm 0.3 \ N\cdotm & \\ \hline AW40 & 3.5 \pm 0.3 \ N\cdotm & \\ \hline AW60 & 4.50 \pm 1.0 \ N\cdotm & \\ \hline \end{tabular}$	Replacement

3. Valve Assembly

Applicable model	Process	Procedure	Tools	Check item	ġ	
		Disassembly	 Remove valve guide after removing bowl assembly and element. Hold the valve guide with a spanner on the spanner flat to rotate it counterclockwise and remove the valve guide. 	Spanner Nominal: 4	_	104
		2) Remove the valve spring.	_	—		
		3) Remove the valve.	_	—	8	
AW10	AW10	Assembly	 Mount the valve. Mount the valve so that convex on the valve could be turned to the valve guide. 	_	The convex surface of the valve is a valve guide side.	Modular
			 Mount the valve spring. Insert internal circumference of the valve spring to the convex on the valve. 	_	_	lare
		 6) Mount the valve guide. Hold the valve guide with a spanner on the spanner flat to rotate it clockwise and mount the valve guide. Refer to the "Check item" for the tightening torque. 	Spanner Nominal: 4	Tightening torque: $0.35\pm0.05~\text{N-m}$	uctrial Fill	
AW20(K) AW30(K) AW40(K)	Disassembly	 Remove valve guide after removing bowl assembly and element. Hold the valve guide with a spanner on the spanner flat to rotate it counterclockwise and remove the valve guide. 	Spanner Nominal: AW20(K) 7 AW30(K) 17 AW40(K) 21	_	Ind	



Pressure Co

Applicable model	Process	Procedure	Tools	Check item
	Disassembly	2) Remove the valve spring.	—	—
		3) Remove the valve assembly.	—	—
	Assembly	 Mount the valve assembly. Mate the stem convex and the valve center hole. 	_	Positioning the stem and the valve (centering)
AW20(K) AW30(K)		 Mount the valve spring. Insert the valve spring to the valve hole. 	_	_
AW40(K)		6) Mount the valve guide. Hold the valve guide with a spanner on the spanner flat to ro- tate it clockwise and mount the valve guide. Refer to the "Check item" for the tightening torque.	Spanner Nominal: AW20(K) 7 AW30(K) 17 AW40(K) 21	AW20(K) 0.8 ± 0.1 N·m AW30(K) 2.35 ± 0.3 N·m AW40(K) 3.5 ± 0.3 N·m
	Disassembly	 Remove the bowl assembly, housing, and element. Remove a housing from a body by rotating 4 mounting screws counterclockwise with a hexagon wrench key. 	Hexagon wrench key Nominal: 5	_
		 Remove the valve guide. Hold the valve guide with a spanner on the spanner flat to ro- tate it counterclockwise and remove the valve guide. 	Spanner Nominal: 30	_
		3) Remove the valve spring.	—	—
		4) Remove the valve assembly.	—	—
AW60(K)	Assembly	 Mount the valve assembly. Mate the stem convex and the valve center hole. 	_	Positioning the stem and the valve (centering)
AW00(R)		Mount the valve spring. Insert the valve spring to the valve hole.	—	_
		7) Mount the valve guide. Hold the valve guide with a spanner on the spanner flat to ro- tate it clockwise and mount the valve guide. Refer to the "Check item" for the tightening torque.	Spanner Nominal: 30	Tightening torque: 6.5 ± 0.3 N⋅m
		8) Mount the housing. Mount an O-ring on the body, assemble the housing, and tighten the 4 mounting screws temporary. Tighten the screws additionally and evenly with the tightening torque shown on the right using the hexagon wrench key.	Hexagon wrench key Nominal: 5	Tightening torque: 4.5 ± 1.0 N⋅m

4. Bracket Assembly, Panel Mount

Applicable model	Process	Procedure	Tools	Check item
	Assembly	 Mount the parts to the bracket (panel). Mate the bracket (panel) concave and the bonnet convex to mount the bracket. 	_	_
AW10(K) AW20(K) AW30(K) AW40(K)		2) Settle the bracket (panel) with set nut. Rotate the set nut clockwise with a hook spanner (spanner for AW10) to settle the parts to the bracket (panel). Refer to the "Check item" for tightening torque. Set nut knurling surface shall face the bracket. (except AW10) When mounting with bracket, set nut tightened manually is adequate for general used. (except AW10)	AW10 Spanner Nominal: 24 AW20(K)/30(K)/40(K) Hook spanner Nominal AW20(K) 34/38 AW30(K) 52/55 AW40(K) 52/55	Tightening torque AW10 0.8 ± 0.1 N·m Tightening torque AW20(K) 2.0 ± 0.2 N·m AW30(K) 3.5 ± 0.3 N·m AW40(K) 4.0 ± 0.4 N·m
AW60(K)	Assembly	 Mount the product to the bracket. Two mounting screws are tightened by spanner for holding. 	Spanner Nominal: 10	Tightening torque: 2.6 N⋅m

5. Square Embedded Pressure Gauge

Applicable model	Process	Procedure	Tools	Check item
AW20(K) AW30(K) AW40(K) AW60(K)	Disassembly	 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 mounting screws counterclockwise with Phillips head screw driver to remove the pressure gauge and two mounting screws.	Phillips head screw driver	_

Applicable model	Process	Procedure	Tools	Check item
AW20(K) AW30(K) AW40(K) AW60(K)	Assembly	 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 mounting screws clockwise with Phillips head screw driver to mounting screws temporary. Then settle them with tightening torque in "Check item".	Phillips head screw driver	Tightening torque: 0.3 ± 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. 	_	_

6. Circular Pressure Gauge

Applicable model	Process	Procedure	Tools	Check item
AW10 AW20(K) AW30(K) AW40(K) AW60(K)	Disassembly	 Remove the pressure gauge. Hold the pressure gauge with a spanner on the width across flat. Then, rotate the gauge counterclockwise to remove the gauge. Spanner for AW10 is a compact spanner. 	Spanner Nominal: AW10 21 AW20(K) 12 AW30(K) 12 AW40(K) 14	_
	Assembly	 Wrap 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 width across flat with a spanner, and rotate it clockwise to mount the circular pressure gauge. Use compact spanner for AW10. Refer to the "Check item" for tightening torque of pressure gauge. 	Spanner Nominal: AW10 21 AW20(K) 12 AW30(K) 14 AW60(K) 14	AW10 3 to 4 N·m AW20(K) 7 to 9 N·m AW30(K) 12 to 14 N·m

7. Pressure Gauge Adapter, Plug Assembly

Applicable model	Process	Procedure	Tools	Check item		
AW20(K) AW30(K) AW40(K) AW60(K)		Disassembly	 Remove the plug. Insert the hexagon wrench key to hexagon hole of hexagon plug. Rotate the plug counterclockwise to remove the plug. 	Hexagon wrench key Nominal: AW20(K) 4 AW30(K) 4 AW40(K) 6	_	Actuators
		 Remove the pressure gauge adapter. Rotate two mounting screws counterclockwise with Phillips head screw driver to remove the pressure gauge and two mounting screws. 	Phillips head screw driver	_	ar F.R.L.	
	Assembly	 Confirm pressure gauge adapter has O-ring. If not, mount O- ring. 	_	_	Modul	
		 4) Mount pressure gauge adapter. Rotate two mounting screws clockwise by Phillips head screw driver to fix pressure gauge adapter. Refer to the "Check item" for tightening torque of two screws. 	Phillips head screw driver (Torque driver)	Tightening torque: 0.3 to 0.05 N·m	ilters	
		 5) Mount plug assembly. Insert hexagon wrench key into hexagon hole on the plug and rotate clockwise to fix the plug. Refer to the "Check item" for tightening torque of two screws. 	Hexagon wrench key Nominal: AW20(K) 4 AW30(K) 4 AW40(K) 6	AW20(K) 0.6 ± 0.05 N·m AW30(K) 1.0 ± 0.1 N·m	Industrial F	



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Pressure Control Equip

8. Plug

Applicable m	odel Process	Procedure	Tools	Check item
AW10	Disassembly	 Remove the plug. Insert the hexagon wrench key to hexagon hole of hexagon plug. Rotate the plug counterclockwise to remove the plug. 	Hexagon wrench key Nominal: 4	—

9. Blanking Plate Assembly

Applicable model	Process	Procedure	Tools	Check item
AW20(K) AW30(K) AW40(K) AW60(K)	Disassembly	 Remove the blanking plate. Rotate two mounting screws counterclockwise with Phillips head screw driver to remove the blanking plate and two mounting screws. 	Phillips head screw driver	_
	Assembly	2) Confirm blanking plate has O-ring. If not, mount O-ring.	—	—
		 Mount the blanking plate. Rotate two mounting screws clockwise by Phillips head screw driver to fix blankin plate. Refer to the "Check item" for tightening torque of two screws. 	Phillips head screw driver (Torque driver)	Tightening torque: 0.3 ± 0.05 N⋅m

10. Check Valve Assembly

Applicable model	Process	Procedure	Tools	Check item
AW20K AW30K AW40K AW60K	Disassembly	 Remove the check valve cover. Rotate two mounting screws counterclockwise by Phillips head screw driver to remove the check valve cover. 	Phillips head screw driver	_
		 Remove the check valve assembly from the body. Pull and remove the check valve assembly. Then, ensure two O-rings don't fall out of the body. 	_	_
	Assembly	1) Ensure two O-rings don't fall out of the body and mount them if they fall off.	_	—
		 Insert convex on the check valve body into two inserting holes for the O-rings respectively. 	_	Direction of check valve body assembly
		 Mount the check valve cover. Rotate two mounting screws clockwise by Phillips head screw driver to fix the check valve cover to the body. Refer to the "Check item" for adequate tightening torque for the screws. 	Phillips head screw driver (Torque driver)	Tightening torque: $0.3 \pm 0.05 \text{ N} \cdot \text{m}$

ARG20(K)/30(K)/40(K) Exploded View 1



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Warning

Before replacement, ensure that the regulator is not pressurized.

Rotate the pressure adjusting handle to zero. Replace refering to "Exploded View"

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
ARG20(K) ARG30(K) ARG40(K)	Disassembly	 Remove the bonnet assembly. Rotate the mounting screw counterclockwise with Phillips head screw driver to remove the bonnet from the body. 	Phillips head screw driver	_
		2) Remove parts in order of the spring and the diaphragm as- sembly. Please be noted that the diaphragm assembly ad- heres to the bonnet if disassemble parts with the handle fac- ing downwards.	_	_
	Assembly	 Mount the diaphragm assembly first and then spring on the body. 	_	Direction of diaphragm assembly
		4) Mount the bonnet to the body. Mount the convex IN side of the bonnet to the body, and tight- en half way with 4 mounting screws with a Phillips head screw driver. Then, tighten the screws completely in a diago- nal pattern with the indicated tightening torque.	Phillips head screw driver	ARG20(K) 2.15 ± 0.3 N·m ARG30(K) 2.35 ± 0.3 N·m ARG40(K) 3.5 ± 0.3 N·m

2. Valve Guide Assembly, Valve

Applicable model	Process	Procedure	Tools	Check item	
	Disassembly	 Remove the cap. Insert the watchmakers screw driver in the gap between the body and the cap and dig up the cap. 	Watchmakers screw driver	_	
			 Remove the cover. Insert the circular pliers into the 2 small holes of the cover, ro- tate 45 degrees to one side or the other and lift. 	Circular pliers Nominal: 125	_
		 Remove the valve guide assembly. Hold the valve guide with a needle nose pliers, and lift it. 	Needle nose pliers	_	
		4) Remove the valve spring.	—	_	
		5) Remove the valve.	—	—	
ARG20(K) ARG30(K)	Assembly	 Mount the valve. Mate the stem convex and the valve center hole. 	_	Positioning the stem and the valve (centering)	
ARG40(K)		 Mount the valve spring. Insert the valve spring to the valve hole. 	_	_	
			 8) Mount the valve guide assembly and the cover assembly to the body. Align the body groove and the cover clamp, push in the valve guide and cover assembly, insert the circular pliers into the 2 small holes of the cover and rotate 45 degrees to one side or the other to lock into place. 	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 almost flat.	

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3. Bracket Assembly, Panel Mount

Applicable model	Process	Procedure	Tools	Check item
	Assembly	 Mount the parts to the bracket (panel). Mate the bracket (panel) concave and the bonnet convex to mount the bracket. 	_	_
ARG20(K) ARG30(K) ARG40(K)		 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). Refer to the "Check item" for tightening torque. When mounting the bracket for ARG20(K)/30(K)/40(K), en- sure that the roulette faces of the set nut and the bracket are mated appropriatelly. When mounting with bracket, set nut tightened manually is 	ARG20(K)/30(K)/40(K) Hook spanner Nominal: ARG20(K) 52/55 ARG30(K) 58/65	ARG20(K) 2.5 ± 0.2 N·m ARG30(K) 3.5 ± 0.3 N·m
		adequate for general used. (ARG20(K)/30(K)/40(K))	ARG40(K) 65/70	ARG40(K) 4.0 ± 0.4 N·m

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Warning

Before replacement, ensure that the regulator is not pressurized.

Rotate the pressure adjusting handle to zero.

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

ŀ	pplicable model	Process	Procedure	Tools	Check item	Actu	
		Disassembly	 Preparation Release the pressure adjustment handle lock with the pres- sure adjustment handle completely loosened. 	_	Orange line can be seen be- tween the pressure adjust- ment handle and the bonnet.	ent	
ARG20(K) ARG30(K) ARG40(K)		 2) Removal of the handle Pull out the handle to remove at the position where ▼ mark of the handle and ▲ mark of the bonnet meet. Handle Wark Wark Mark Bonnet 	_	_	Air Preparation Equipment		
				 3) Removal of the clip The clip becomes visible from the side window of the bonnet if ▲ mark of the bonnet and ▼ mark of the pressure adjustment guide meet, pull out the clip with tweezers. * Retate the pressure adjustment guide clockwise when matching the mark. 	Tweezers	_	Industrial Filters
		V mark Bonnet side A mark Bonnet			Replacement Procedure		
		 4) Removal of the pressure gauge Pull out the pressure gauge holding the outer circumference of the dial. * Don't touch the internal component of the pressure gauge (surrounded by dashed line). It may damage the indication ac- curacy of the pressure gauge. 		Actuators			
		of the dial	_	_	Modular F.R.L. Pressure Control Equipment		
		Assembly	 5) Setting the pressure gauge Hold the outer circumference of the dial and set the gauge at specified angle, and push in the gauge lightly. For reference, table 1 shows the gap dimension between the bottom surface of the dial and the top surface of the pressure adjustment guide after mounting the pressure gauge. Note 1) If the gauge does not enter by some interference when setting the pressure gauge, set the gauge by slightly rotating it in rotating direction. (The planet gear of the pressure adjustment guide and the set of the pressure gauge.) 	_		Industrial Filters	
			Note 2) Set the pressure gauge completely. Note 3) The end of the pressure gauge has greased O-ring. Attention should be taken so that dust and particle not enter to the pressure gauge.		FIG. 1. Gap dimension ARG20(K) ARG30(K) ARG40(K) (Reference value) (Reference value) 2.6 mm 3.3 mm 3.3 mm		



Applicable model	Process	Procedure	Tools	Check item
ARG20(K) ARG30(K) ARG40(K)	Assembly	 6) Setting the clip Insert the clip from the side window of the bonnet where ▲ mark of the pressure adjustment guide and ▼ mark of the bonnet meet. Use something sharp like tweezers when insert- ing the clip to the end. If the clip is not inserted to the end the handle may not rotate after setting the handle. Note 1) Clip is slightly tapered to the end to avoid falling off. Slight- ly open the end of the clip when setting the clip. Note 2) Following causes are possible when the clip is stuck in the middle. ① The pressure adjustment screw is lower than the original position. (Gap is made between the pressure adjustment nut and the spring. When the pressure adjustment screw is completely loosened, the pressure adjustment screw may be lowered if excessive press force applied to the pressure adjustment screw.) Countermeasure Turn the pressure adjustment guide approx. 5 times clockwise (pressure rise direction). ② Pressure gauge is not properly set. Countermeasure5) See setting the pressure gauge. 	Tweezers	_
		7) Setting the handle Set the handle, and finish.	_	

AWG20 Exploded View 1



AWG30, 40 Exploded View 2





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Warning

Before replacement, ensure that the regulator is not pressurized. Rotate the pressure adjusting handle to zero.

Replace refering to "Exploded View"

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

1. Bowl Assembly/Element

Applicable model	Process	Procedure	Tools	Check item
	Disassembly	 Remove the bowl assembly. Hold the bowl assembly by hand and rotate counterclockwise to remove the bowl assembly. If the bowl assembly is tight- ened too much to be removed, use hook spanner until it can be loosened by hand. 	(Hook spanner) (Nominal: 34/38)	_
		 Remove the baffle and element. Rotate the baffle by hand and counterclockwise to remove the baffle and element. 	_	_
AWG20	Assembly	3) Mount the element. Mount the element to the valve guide.	_	_
		 4) Mount the baffle. Insert the baffle so that concave on the valve guide could meet T convex on the baffle. And rotate it clockwise manually until feeling snap fit (approx. 110°) to fix to the element. 	_	_
		 5) Mount the bowl assembly. Hold the bowl assembly by hand and rotate clockwise. Do not use tool for mounting because the bowl may be damaged. Refer to the "Check item" for referential tightening torque. 	_	Referential tightening torque: 2.2 N⋅m
	Disassembly	 Remove the bowl assembly. Push the bowl assembly lock button. Lifting the bowl assembly, rotate the assembly 45 degree (right or left) to pull out the assembly. 	_	_
		 Remove the baffle and element. Rotate the baffle by hand and counterclockwise to remove the baffle and element. 	_	_
AWG30 AWG40	Assembly	 Mount the element. Mount the element to the valve guide. 	_	_
		4) Mount the baffle. Insert the baffle so that concave on the valve guide could meet T convex on the baffle. And rotate it clockwise manually until feeling snap fit (approx. 110°) to fix to the element.	_	Direction of baffle. For element convex side.
		5) Mount the bowl assembly. Match the mating mark of the body and the bowl assembly to insert the assembly to the body. Rotate the assembly 45 de- gree (right or left) until the lock button is tossed up to mount the bowl assembly. Ensure the lock button is up.	_	Lock button is up.

2. Diaphragm Assembly

Applicable model	Process	Procedure	Tools	Check item
	Disassembly	 Remove the bonnet assembly. Rotate the set screw counterclockwise with Phillips head screw driver to remove the bonnet from the body. 	Phillips head screw driver	_
AWG20 AWG30		2) Remove parts in order of the spring, and the diaphragm as- sembly. Please be noted that the diaphragm assembly ad- heres to the bonnet if disassemble parts with the handle fac- ing downwards.	_	-
AWG40	Assembly	3) Mount parts to the body in order of the diaphragm assembly, spring.	_	Diaphragm
		4) Mount the bonnet to the body. Mount the convex IN side of the bonnet to the body, and tight- en half way with 4 mounting screws with a Phillips head screw driver. Then, tighten the screws completely in a diago- nal pattern with the indicated tightening torque.	Phillips head screw driver	AWG20 2.15 ± 0.3 N·m AWG30 2.35 ± 0.3 N·m AWG40 3.5 ± 0.3 N·m

3. Valve Assembly

Applicable model	Process	Procedure	Tools	Check item	
	Disassembly	 Remove valve guide after removing bowl assembly and element. Hold the valve guide with a spanner on the spanner flat to rotate it counterclockwise and remove the valve guide. 	Awg20 7 Awg30 17 Awg40 21	_	Actuators
		2) Remove the valve spring.	—	—	\geq
		3) Remove the valve assembly.	_	_	
AWG20 AWG30 AWG40	Assembly	 Mount the valve assembly. Mate the stem convex and the valve centerhole. 	_	Positioning the stem and the valve (centering)	lodular F.R.L.
		5) Mount the valve spring. Insert the valve spring to the valve hole.	_	_	
		6) Mount the valve guide. Hold the valve guide with a spanner on the spanner flat to ro- tate it clockwise and mount the valve guide. Refer to the "Check item" for the tightening torque.	Spanner Nominal: AWG20 7 AWG30 17 AWG40 21	AWG20 0.8 ± 0.1 N·m AWG30 2.35 ± 0.3 N·m AWG40 3.5 ± 0.3 N·m	Preparation

4. Bracket Assembly, Panel mount

Applicable model	Process	Procedure	Tools	Check item
Assembly 1)		 Mount the parts to the bracket (panel) Mate the bracket (panel) concave and the bonnet convex to mount the bracket. 	_	_
AWG20 AWG30 AWG40		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). Refer to the "Check item" for tight- ening torque. Set nut knurling surface shall face the bracket (AWG20 to 40). When mounting with bracket, set nut tight- ened manually is adequate for general used. (AWG20 to 40)	AWG20/30/40 Hook spanner Nominal AWG20 52/55 AWG30 58/65 AWG40 65/70	AWG20 2.0 ± 0.2 N·m AWG30 3.5 ± 0.3 N·m AWG40 4.0 ± 0.4 N·m

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Warning

Before replacement, ensure that the regulator is not pressurized.

Rotate the pressure adjusting handle to zero.

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

Applicable model	Process	Procedure	Tools	Check item
	Disassembly	 Preparation Release the handle lock with the pressure adjustment handle completely loosened. 	_	Orange line can be seen be- tween the handle and the bon- net.
		 2) Removal of the handle. Pull out the handle to remove at the position where ▼ mark of the handle and ▲ mark of the bonnet meet. Handle Handle The mark Th	_	_
AWG20 AWG30 AWG40		 3) Removal of the clip. The clip becomes visible from the side window of the bonnet if ▲ mark of the pressure adjustment guide meet, pull out the clip with tweezers. * Retate the pressure adjustment guide clockwise when matching the mark. 	Tweezers	_
		 4) Removal of the pressure gauge. Pull out the pressure gauge holding the outer circumference of the dial. * Don't touch the internal component of the pressure gauge (surrounded by dashed line). It may damage the indication accuracy of the pressure gauge. Outer circumference of the dial Internal component 	_	_
	Assembly	 5) Setting the pressure gauge Hold the outer circumference of the dial and set the gauge at specified angle, and push in the gauge lightly. For reference, table 1 shows the gap dimension between the bottom surface of the dial and the top surface of the pressure adjustment guide after mounting the pressure gauge. Note 1) If the gauge does not enter by some interference when setting the pressure gauge, set the gauge by slightly rotat- ing it in rotating direction. (The planet gear of the pressure adjustment guide and the sun gear integrated in the pressure gauge interfere each other.) Note 2) Set the pressure gauge completely. Note 3) The end of the pressure gauge has greased O-ring. Atten- tion should be taken so that dust and particle not enter to the pressure gauge. 	_	FIG. 1. Gap dimension Xdimension 2.6 mm 3.3 mm 3.3 mm

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Applicable model	Process	Procedure	Tools	Check item	
AWG20 AWG30 AWG40	Assembly	 6) Setting the clip. Insert the clip from the side window of the bonnet where ▲ mark of the pressure adjustment guide and ▼ mark of the bonnet meet. Use something sharp like tweezers when inserting the clip to the end. If the clip is not inserted to the end the handle may not rotate after setting the handle. Note 1) Clip is slightly tapered to the end to avoid falling off. Slightly to open the end of the clip when setting the clip. Note 2) Following causes are possible when the clip is stuck in the middle. ① The pressure adjustment screw is lower than the original position. (Gap is made between the pressure adjustment screw is completely loosened, the pressure adjustment screw may be lowered if excessive press force applied to the pressure adjustment screw.) Countermeasure Turn the pressure adjustment guide approx. 5 times clockwise (pressure gauge. ② Pressure gauge is not properly set. Countermeasure5) See setting the pressure gauge. 	Tweezers	_	rial Filters Air Preparation Modular FRL. Actuators
		7) Setting the handle Set the handle, and finish.	_	_	snpu

Replaceme Procedur

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Component Parts

Item	Part Name	Qty	Remarks
1	Body	1	Chromate treatment
2	Bonnet	1	Chromate treatment
3	Chamber	1	Chromate treatment
4	Valve guide	1	Chromate treatment
(5)	Valve	1	Rubber lining material: HNBR
6	Diaphragm shell	1	Zinc chromate treatment
\bigcirc	O-ring holder	1	Chromate treatment
8	Name plate	1	Complete product No. indicated
9	Valve seat	1	
10	Diaphragm	1	
1	Stem	1	Rubber lining material: HNBR
12	Rod	1	
13	Diaphragm holder	1	
14)	Pilot valve	1	Rubber lining material: HNBR
15	Valve spring	1	
16	Diaphragm holder	1	
17	O-ring holder	1	Chromate treatment
18	Handle	1	

Item	Part Name	Qty	Remarks
19	Adjustment screw	1	Zinc chromate treatment
20	Diaphragm	1	
21)	Spring	1	Zinc chromate treatment
22	Diaphragm shell	1	Chromate treatment
23	Washer	1	
24)	Spring holder	1	Zinc chromate treatment
25	Seal	1	
26	Valve spring	1	
27)	O-ring	2	JIS B2401 P5
28	O-ring	1	JIS B2401 G35
29	O-ring	2	JIS B2401 P10
30	Steel ball	1	ø4
31)	Retaining ring	1	JIS B2805 4
32	Cross recessed round head screw	1	M5 x 0.8 x 8 Black Zn. chromate treatment
33	Cross recessed round head screw	4	M4 x 0.7 x 16 Nickel plating
34)	Cross recessed round head screw	6	M5 x 0.8 x 22 Nickel plating
37	Flat washer	1	ø10.5 x ø20 x 1.2 Zinc chromate treatment
(38)	Hexagon socket head plug	2	R(PT) 1/4 Nickel plating

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Component Parts

Item	Part Name	Qty	Remarks
1	Body	1	Chromate treatment
2	Valve guide	1	Chromate treatment
3	Diaphragm shell	1	Zinc chromate treatment
4	Valve	1	Rubber lining material: HNBR
5	Valve spring	1	
6	Diaphragm	1	
\bigcirc	Diaphragm holder	1	
8	Stem	1	Rubber lining material: HNBR
9	Rod	1	
10	Static pressure tube	1	
1	Bonnet	1	Chromate treatment
12	Chamber	1	Chromate treatment
13	O-ring holder	1	Chromate treatment
14	Name plate	1	Complete product No. indicated
(15)	Valve seat	1	
16	Diaphragm holder	1	
17	Pilot valve	1	Rubber lining material: HNBR
18	Valve spring	1	
19	Handle	1	
20	Adjustment screw	1	Zinc chromate treatment

Item	Part Name	Qty	Remarks
21)	Diaphragm	1	
22	Spring	1	Zinc chromate treatment
23	Diaphragm shell	1	Chromate treatment
24)	Washer	1	
25	Spring holder	1	Zinc chromate treatment
26	Seal	1	
27)	O-ring holder	1	Chromate treatment
28	O-ring	1	JIS B2401 P5
29	O-ring	1	JIS B2401 P6
30	O-ring	1	JIS B2401 P16
31)	O-ring	1	JIS B2401 P10
32	O-ring	1	JIS B2401 G40
33	Steel ball	1	ø4
34)	Retaining ring	1	JIS B2805 4
35	Cross recessed round head screw	1	M5 x 0.8 x 8 Black Zn. chromate treatment
36	Cross recessed round head screw	4	M4 x 0.7 x 16 Nickel plating
37	Cross recessed round head screw	6	M6 x 1 x 22 Nickel plating
38	Flat washer	1	ø10.5 x ø20 x 1.2 Zinc chromate treatment
39	Hexagon socket head plug	2	B(PT) 1/4 Nickel plating

Industrial Filters Air Preparation Pressure Control Equipment Pressure Control Equipment

Replacement Procedure



Component Parts

Item	Part Name	Qty	Remarks	Ite
1	Body	1	Chromate treatment	2
2	Diaphragm	1		2
3	Diaphragm shell	2	Zinc Chromate treatment	2
4	Valve spring	1		2
5	Chamber	1	Chromate treatment	2
6	Valve	1	Rubber lining material: HNBR	2
$\overline{\mathcal{I}}$	Stem	1		2
8	Diaphragm shell holder	1		2
9	Valve guide	1	Chromate treatment	2
10	Name plate	1	Complete product No. indicated	2
11	Static pressure tube	1		3
12	Set nut	1		3
13	Bonnet	1	Chromate treatment	3
14	Valve seat	1		3
15	Diaphragm holder	1		3
16	Pilot valve	1	Rubber lining material: HNBR	3
$\overline{1}$	Valve spring	1		3
18	Handle	1		3
19	Adjustment screw	1	Zinc Chromate treatment	3
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Item	Part Name	Qty	Remarks
20	Diaphragm	1	
21)	Spring	1	Zinc Chromate treatment
22	Diaphragm shell	1	Chromate treatment
23	Washer	1	
24)	Spring holder	1	Zinc Chromate treatment
25	Seal	1	
26	O-ring	1	JIS B2401 P7
27)	O-ring	1	JIS B2401 P10
28	O-ring	1	
29	O-ring	1	JIS B2401 P20
30	O-ring	1	JIS B2401 P30
31)	O-ring	1	JIS B2401 G50
32	Steel ball	1	ø4
33	Retaining ring	1	TE-23
34)	Cross recessed round head screw	1	M5 x 0.8 x 8 Black Zinc chromate treatment
35	Cross recessed round head screw	4	M4 x 0.7 x 16 Nickel plating
36	Hexagon socket head cap screw	8	M8 x 1.25 x 18 Nickel plating
37)	Hexagon socket head plug	2	R(PT) 1/4 Nickel plating
38	Flat washer	1	ø10.5 x ø20 x 1.2 Zinc Chromate treatment



Modular F.R.L. Pressure Control Equipment

Actuators

Actuators

Modular F.R.L. Pressure Control Equipment

Industrial Filters

_		_
Com	ponent	Part

Com	ponent Parts		
Item	Part Name	Qty	Remarks
1	Body	1	Chromate treatment
2	Diaphragm shell	2	Zinc chromate treatment
3	Diaphragm	1	
(4)	Valve spring	1	
(5)	Chamber	1	Chromate treatment
6	Diaphragm shell holder	1	
\bigcirc	Stem	1	
8	Valve	1	Rubber lining material: HNBR
9	Valve guide	1	Chromate treatment
10	Static pressure tube	1	
1	Set nut	1	
12	Bonnet	1	Chromate treatment
13	Valve seat	1	
14	Diaphragm holder	1	
15	Pilot valve	1	Rubber lining material: HNBR
16	Valve spring	1	
17	Name plate	1	Complete product No. indicated
18	Handle	1	
19	Adjustment screw	1	Zinc chromate treatment

nem	Part Name	Qly	Remarks
20	Diaphragm	1	
21)	Spring	1	Zinc chromate treatment
22	Diaphragm shell	1	Chromate treatment
23	Washer	1	
24)	Spring holder	1	Zinc chromate treatment
25	Seal	1	
26	O-ring	1	JIS B2401 P7
27)	O-ring	1	JIS B2401 P10
28	O-ring	1	
29	O-ring	1	JIS B2401 P20
30	O-ring	1	JIS B2401 P42
31)	O-ring	1	JIS B2401 G70
32	Steel ball	1	ø5
33	Retaining ring	1	TE-23
34)	Cross recessed round head screw	1	M5 x 0.8 x 8 Black Zinc chromate treatment
35	Cross recessed round head screw	4	M4 x 0.7 x 16 Nickel plating
36	Hexagon socket head cap screw	8	M10 x 1.5 x 20 Nickel plating
37	Hexagon socket head plug	2	R(PT) 1/4 Nickel plating
38	Flat washer	1	ø10.5 x ø20 x 1.2 Zinc chromate treatment

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1. Element Replacement Method

To replace the element, carry out the procedure of 1-1 to 1-8 below while referring to the figure.

- 1-1. Using a hexagonal wrench, loosen the four hexagon socket head cap screws and remove the bowl. At this time, confirm that the O-ring groove in the bowl. If the O-ring is out of place, fit it into the O-ring groove.
- 1-2. Using a spanner, loosen the domed cap nut and remove it together with the gasket.
- 1-3. Pull the element downwards and remove it. If the element is difficult to remove, remove it by pushing it in the horizontal direction.
- 1-4. Coat the top of the element seal with a thin layer of grease, then set the seal so that it is uppermost and pass the tension bolt through it.
- 1-5. Pass the tension bolt through the gasket, then tighten the domed cap nut to fix the gasket in place.
- 1-6. Confirm that the O-ring is fitted in the O-ring groove in the bowl, and set the liquid level gauge so that it is facing the front.
- 1-7. Fix the bowl by tightening the four hexagon socket head cap screws.
- 1-8. Confirm that there is no leakage between the bowl and the housing.



Warning

Before replacement, ensure that the regulator is not pressurized.

Rotate the pressure adjusting handle counterclockwise fully and to return it to zero.

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

1. Replacement of Pressure Gauge/Port Plug

Content	Replacement of pres	sure gauge/port plug	
Parts	Pressure gauge, port plug		
Tools	Watchmakers flat blade screw driver		ar EF
Process	Disassembly	Assembly	lodu
Procedure	 Insert a watchmakers flat blade screw driver along with taper of hole A on OUT side of the body. Hook the tip of the screw driver to the inserted clip, and pull out the clip. * As the clip may fly out, pull it slowly as holding it with a hand. Pull out the mounted pressure gauge/port plug. 	 Insert the pressure gauge/port plug all the way in properly. Put the clip back to the hole. Use the tip of the watchmakers flat blade screw driver to insert the clip to the end properly. 	paration
Check item	_	 Presence of O-ring. (If dust or particles are remained on the O-ring it may cause air leakage. Therefore take measures to prevent them from attaching on the O-ring. 	Air Pre
Exploded view	Port plug O-ring O-ring Clip Clip	Pressure gauge assembly O-ring Regulator	Idustrial Filters Modular F.R. Actuators Replacement Industrial Filters

2. Replacement of One-touch Fittings

Parts One-touch fittings Tools Watchmakers flat blade screw driver Procedure 1) Insert a watchmakers flat blade screw driver along with ta- per of hole B on OUT side of the body. 1) Insert the One-touch fitting all the way in properly. 2) Hook the tip of the screw driver to the inserted clip, and pull out the clip. 1) Insert the One-touch fitting. 2) Hook the tip of the screw driver to the inserted clip, and pull out the clip. 3) Pull out the mounted One-touch fitting. 1) Presence of O-ring. (If dust or particles are remained on the O-ring it may ca air leakage. Therefore take measures to prevent them fa attaching on the O-ring. Check item	Content	Exchange of One-touch fitting	gs (IN side and OUT side port)	
Tools Watchmakers flat blade screw driver Process Disassembly Assembly Procedure 1) Insert a watchmakers flat blade screw driver along with taper of hole B on OUT side of the body. 1) Insert the One-touch fitting all the way in properly. 2) Hook the tip of the screw driver to the inserted clip, and pull out the clip. 1) Insert the One-touch fitting all the way in properly. 2) Hook the flip of the screw driver to the inserted clip, and hand. 3) Pull out the mounted One-touch fitting. 1) Presence of O-ring. Check item — — 1) Presence of O-ring. If the sche measures to prevent them faatehing on the O-ring it may can already on the O-ring. Exploded view	Parts	One-touch fittings		
Process Disassembly Assembly Procedure 1) Insert a watchmakers flat blade screw driver along with taper of hole B on OUT side of the tody. 1) Insert the One-touch fitting all the way in properly. 2) Put the clip back to the hole. 2) Put the clip back to the hole. 2) Hok the tip of the screw driver to the inserted clip, and pull out the clip. * As the clip may fly out, pull it slowly as holding it with a hard. 1) Presence of O-ring. 1) Presence of O-ring. Check item — 1) Presence of O-ring. (If dust or particles are remained on the O-ring it may can air leakage. Therefore take measures to prevent them fatching on the O-ring. Exploded view	Tools	Watchmakers flat blade screw driver		
Procedure 1) Insert a watchmakers flat blade screw driver along with taper of hole B on OUT side of the body. 1) Unsert the One-buch fitting all the way in properly. Procedure 1) Host the tip of the screw driver to the inserted clip, and pull out the clip. 1) Unsert the clip back to the hole. 3) Pull out the clip. * As the clip may fly out, pull it slowly as holding it with a hand. 1) Presence of O-ring. (If dust or particles are remained on the O-ring it may can are leakage. Therefore take measures to prevent them frattaching on the O-ring. Exploded view	Process	Disassembly	Assembly	
Check item	Procedure	 Insert a watchmakers flat blade screw driver along with taper of hole B on OUT side of the body. Hook the tip of the screw driver to the inserted clip, and pull out the clip. * As the clip may fly out, pull it slowly as holding it with a hand. Pull out the mounted One-touch fitting. 	 Insert the One-touch fitting all the way in properly. Put the clip back to the hole. Use the tip of the watchmakers flat blade screw driver to insert the clip to the end properly. 	
Exploded View	Check item	_	 Presence of O-ring. (If dust or particles are remained on the O-ring it may cause air leakage. Therefore take measures to prevent them from attaching on the O-ring. 	
* If it is hard to remove the fitting, do not remove the release bushing with a strong force. It that case, install the tube and plug, and pull the fitting out together with them.	Exploded view	If it is hard to remove the fitting, do not remove the release be it that case, install the tube and plug, and pull the fitting out the fit	Visit of the strong force.	

3. Replacement of Manifold Stations (Common Supply Specification)



4. Replacement of Manifold Stations (Individual Supply Specification)



Warning

Before replacement, ensure that the regulator is not pressurized. Rotate the pressure adjusting handle counterclockwise fully and to return it to zero. operation.

1. ARM10 Regulator

Content	Wash and replacement of diaphra	nm O-ring valve and valve spring	
Tools	Spanner (18mm in width),	snap ring pliers, tweezers	
Process	Disassembly	Assembly	
Procedure	 Rotate bonnet counterclockwise by holding its width across flats by spanner to disconnect. (Remain pressure adjust- ment screw and spring mounted on the bonnet.) Remove diaphragm assembly manually. Remove valve seat assembly by holding by snap ring pli- ers. Remove valve and valve spring. 	 Mount valve spring and valve by tweezers. Mount valve seat assembly (with two O-rings mounted) by snap ring pliers so that static pressure part of valve seat and OUT passage could be in proper position. Hold the valve seat assembly accessing from side opening to prevent it from coming off. Mount diaphragm assembly. Mount bonnet which has pressure adjustment screw and spring installed to body and rotate it by holding width across flats by spanner clockwise to connect with the body. 	Preparation Modular FR
Check item	_	 Presence of O-ring. Position of static pressure part of valves at and OUT passage. 	Air
	Rotate counter- clockwise by holding width across flats by spanner to dis- connect.	Rotate clockwise by holding width across flats by spanner to connect.	Industrial Filter
Referential photo	分解方向 して で して で して で して で して で して で して で して で して で して で して で して して して して して して して して して して	組 立 方 向 】 】 】 】 】 】 】 】 】 Mounted condition of Coring	Actuators Replacement
		2) Position of static pressure part and OUT passage.	Iters Modular F.R.L. Pressure Control Equipment

2. ARM11 A/ARM11 C Regulator Block (Handle Position: Top or Bottom Type)

Content	Wash and replacement of gasket, diap	ohragm, O-ring, valve and valve spring
Tools	Phillips head screw driver, spanner (18	mm in width), snap ring pliers, tweezers
Process	Disassembly	Assembly
Procedure	 Loosen and remove round head screws of regulator assembly by Phillips head screw driver to become the regulator assembly able to be disconnected manually. Rotate bonnet counterclockwise by holding its width across flats by spanner to disconnect. (Remain pressure adjustment screw and spring mounted on the bonnet.) Remove diaphragm assembly manually. Remove valve seat assembly by holding by snap ring pliers. Remove valve and valve spring. 	 Mount valve spring and valve by tweezers. Mount valve seat assembly (with two O-rings mounted) by snap ring pliers so that static pressure par of valve seat and character "A" on body could be in proper position. Hold the valve seat assembly accessing from side opening to prevent it from coming off. Mount diaphragm assembly. Mount bonnet which has pressure adjustment screw and spring installed to body and rotate it by holding spanner flat by spanner clockwise to connect with the body. Mount regulator assembly on manifold block and hold it by tightening two round screws by Phillips driver.
Check item	_	 Presence of O-ring. Position of static pressure part of valve seat and character "A" on body. Tightening torque of round screw: 0.32 ± 0.03 N-cm
Referential photo	<text></text>	<image/>

3. ARM11 B Regulator Block (Handle Position: Front Type)

Content	Wash and replacement of gasket, diap	ohragm, O-ring, valve and valve spring	((0
Tools	Phillips head screw driver, spanner (18mm in width), snap ring pliers, tweezers		ors
Process	Disassembly	Assembly	lat
Procedure	 Loosen and remove round head screws of regulator assembly by Phillips head screw driver to become the regulator assembly able to be disconnected manually. Rotate bonnet counterclockwise by holding its width across flat by spanner to disconnect. (Remain pressure adjustment screw and spring mounted on the bonnet.) Remove diaphragm assembly manually. Remove valve seat assembly by holding by snap ring pliers. Remove valve and valve spring. 	 Mount valve spring and valve by tweezers. Mount valve seat assembly (with two O-rings mounted) by snap ring pliers so that static pressure par of valve seat and character "B" on body could be in proper position. Hold the valve seat assembly accessing from side opening to prevent it from coming off. Mount diaphragm assembly. Mount bonnet which has pressure adjustment screw and spring installed to body and rotate it by holding spanner flat by spanner clockwise to connect with the body. Mount regulator assembly on manifold block and hold it by tightening two round screws by Phillips head screw driv- er. 	on Modular F.R.L. Deserve Control F.R.L.
Check item	_	 Presence of O-ring. Position of static pressure part of valve seat and character "B" on body. Tightening torque of round head screw: 0.32 ± 0.03 N·cm 	Preparatio
Referential	<text></text>	<image/> <image/>	Modular F.R.L. Actuators Replacement Industrial Filters Air F

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4. ARM10, 11 Regulator, Manifold Block

Content	Wash, air blowing and repla	acement of O-ring of fittings
Tools	Watchmakers flat	blade screw driver
Process	Disassembly	Assembly
Procedure	 Remove clip with held by watchmakers flat blade screw driver. Pull fitting assembly out manually. 	 Push fitting assembly until it comes to a stop to mount. Push clip until it comes to a stop to mount.
Check item	_	 Confirmation that the fitting assembly reaches mounting end for it. Confirmation that the clip reaches mounting end for it.
Referential photo	方向	相対方向

5. ARM11 Regulator Block

Content	Wash and replacemen	nt of O-ring of bushing
Tools	Watchmakers flat blade screw driver	
Process	Disassembly	Assembly
Procedure	 Remove bushing with held by watchmakers flat blade screw driver. Remove O-ring from the bushing. 	 Mount O-ring to bushing. Push the bushing until it comes to a stop to mount.
Check item	_	1) Confirmation that the bushing reaches mounting end for it.
Referential photo	Hold here by driver.	

6. ARM10, ARM10F Regulator

Content	Wash and replacement of	O-ring of pressure gauge	
Tools	Phillips head screw driver		Ors
Process	Disassembly	Assembly	lat
Procedure	 Remove cover assembly by rotating counterclockwise manually. Loosen and remove two round head screw by Phillips head screw driver. Remove pressure gauge assembly. Remove O-ring. 	 Mount O-ring. Mount pressure gauge assembly. Hold the pressure gauge assembly by tightening two round head screws by Phillips head screw driver. Mount cover assembly by rotating clockwise manually. (Mind direction of cover and position of locating mark and detent.) 	FR.L. Actu
Check item		1) Presence of O-ring 2) Tightening torque of round head screw: 0.32 \pm 0.03 N·cm	Modular
Referential photo	Potate	回 す の date Potate	ndustrial Filters Air Preparation

7. ARM11 Regulator Block

Content	Wash and replacement of	O-ring of pressure gauge	Cen
Tools	Phillips head screw driver		
Process	Disassembly	Assembly	
Procedure	 Loosen and remove round head screws from regulator assembly by Phillips head screw driver to becomes the regulator assembly able to be disconnected. Remove cover assembly by rotating counterclockwise manu- ally. Remove two round head screws from pressure assembly by Phillips head screw driver. Remove pressure gauge assembly. Remove O-ring. 	 Mount O-ring to bush. Mount pressure gauge assembly. Hold the pressure gauge assembly by tightening two round head screws by Phillips head screw driver. Mount cover assembly by rotating clockwise manually. (Mind direction of cover and position of locating mark and detent.) Mount regulator assembly to manifold block and hold it by tightening two round screws by 	Actuators
Check item	_	1) Presence of O-ring 2) Tightening torque of round head screw: 0.32 \pm 0.03 N-cm	Ŀ.
Referential photo	Botate	Botate	Industrial Filters

Pressure Control