



Operation Manual

PRODUCT NAME

FILTER REGULATOR

MODEL/ Series

IW212

IW213

IW215

SMC Corporation

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Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “Caution,” “Warning” or “Danger.”

They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC), 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.



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.*3)

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.

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

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

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

Compliance Requirements

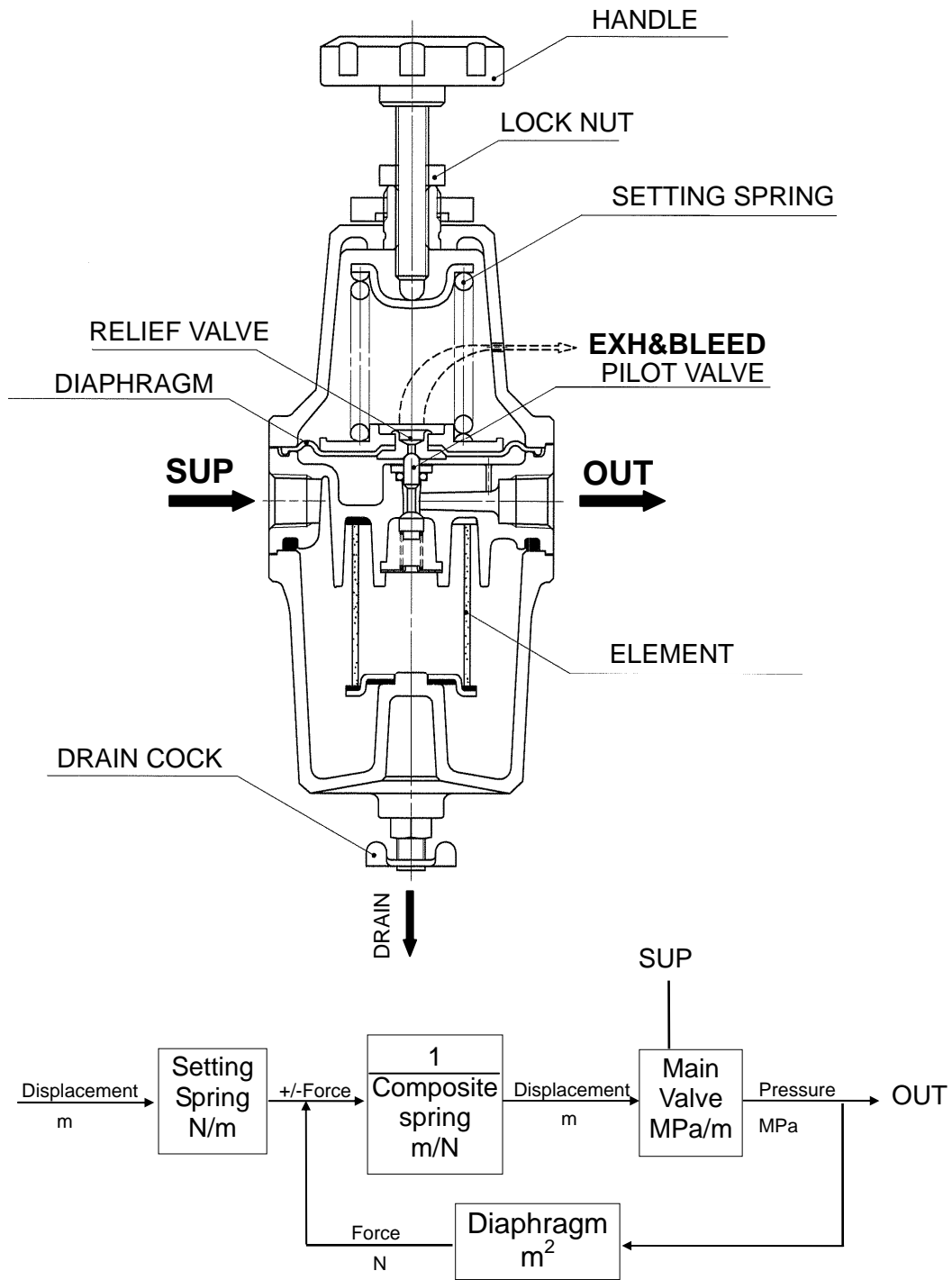
When the product is exported, strictly follow the laws required by the Ministry of Economy, Trade and Industry (Foreign Exchange and Foreign Trade Control Law).

1. Specifications

Model	IW212	IW213	IW215
Max. supply pressure[MPa]	MAX. 1.0		
Setting pressure[MPa]	0.02~0.2	0.02~0.3	0.02~0.5
Air consumption	1L/min(ANR) or less		
Ambient and fluid temperature	-10 to 60°C (No freezing)		
Degree of filtraion	5 μ m		
Port size	Rc1/4		
Port size of pressure gauge	Rc1/4 [2 places]		

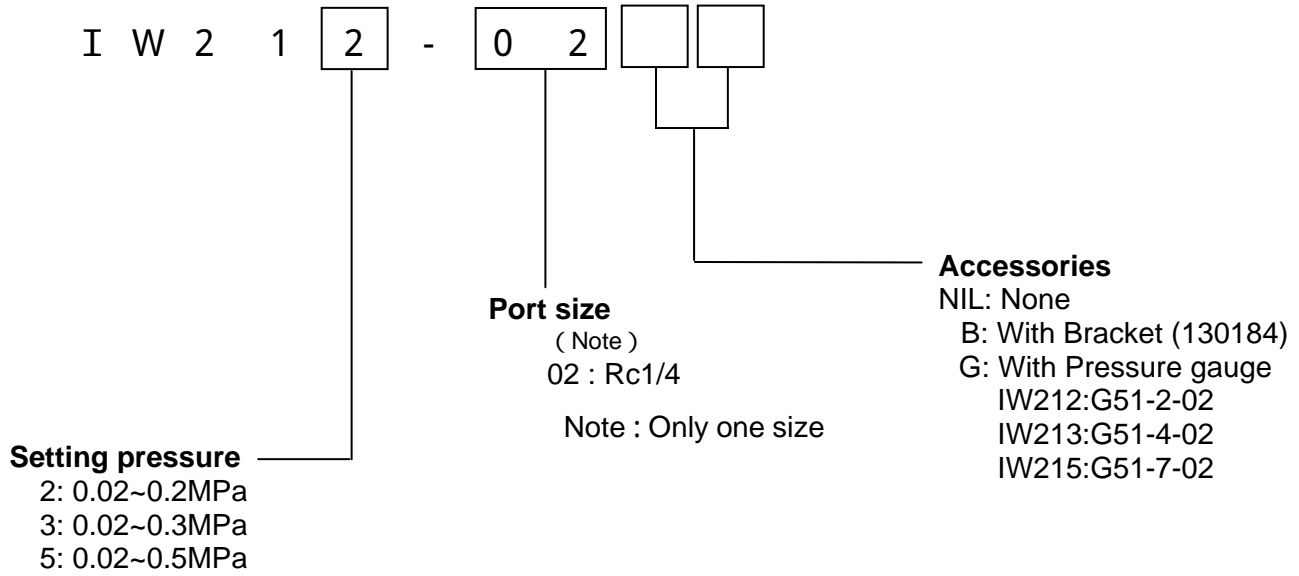
2. Construction and operation principle

Compressed air from inlet passes filter (sintered metal) to get rid of fine particles. Rotating handle opens the supply valve by set spring compressed force, and clean air flows into the outlet. Outlet pressure acts on diaphragm, and is balanced with pressure corresponding to the compressed pressure of set spring. If outlet pressure becomes high, the force act on diaphragm becomes larger than compressed force of set spring. And simultaneously the supply valve closes, the exhaust port opens to release excess pressure to the atmosphere so that consistent pressure is kept.



Block Diagram

3. How to order



4. Precautions for handling



Warning

Handling

- (1) When adding the pressure gauge to mount, reduce the set pressure to 0 before removing the plug.
- (2) When open the drain cock, move personnel's body (especially "eye") away from the drain cock end.
- (3) If the system is expected to be dangerous when the filter regulator fail, please consider system with safety circuit to avoid danger.



Caution

Operation

- (1) Operation out of specification range lead to cause failure. (See item 1. Spec.)
- (2) Drain cock is shipped opened. Close the cock for operation.
- (3) Rotate the drain cock counterclockwise to open, clockwise to close.
- (4) Although air is discharged from the breed port (hole on bonnet side),this is necessary discharge. Not a problem.
- (5) Tighten the lock nut after adjusting the pressure.



Caution

Handling

- (1) Vibration and impact on the filter regulator with a pressure gauge cause failure. Care should be taken for transporting and handling.
- (2) When left untouched for long at operating site, plug the piping port to keep rain water from entering inside of piping.
Atmosphere of high temp, high humidity, solution against dew formation has to be prepared, especially for package for transporting.
- (3) When mounting, ensure the letter "IN" indicating air inlet and connect piping placing the case downwards for draining. Do not lay sideway or place upwards.

Caution

Air

- (1) Do not use compressed air containing chemicals, synthetic fluid containing organic solvent, sodium, corrosive gas. They lead to cause malfunction.
- (2) Use air dryers or aftercoolers when the air contain drain a lot to avoid air compressor malfunction.

Caution

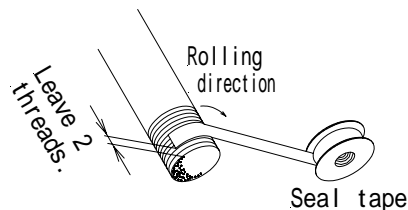
Operating Condition

- (1) Do not use in atmosphere containing corrosive gas, chemicals or exposed to sea water or vapor.
- (2) Do not use where vibrate or exposed to impact.
- (3) When heat source exist nearby, protect the regulator from the radiation heat.

Caution

Piping

- (1) Fully flush or wash pipes before piping to remove cutting oil and dust in pipes.
- (2) When inserting pipes and fittings, keep pipe screw chip dust and sealing material from entering to them. When using a seal tape, leave two threads.



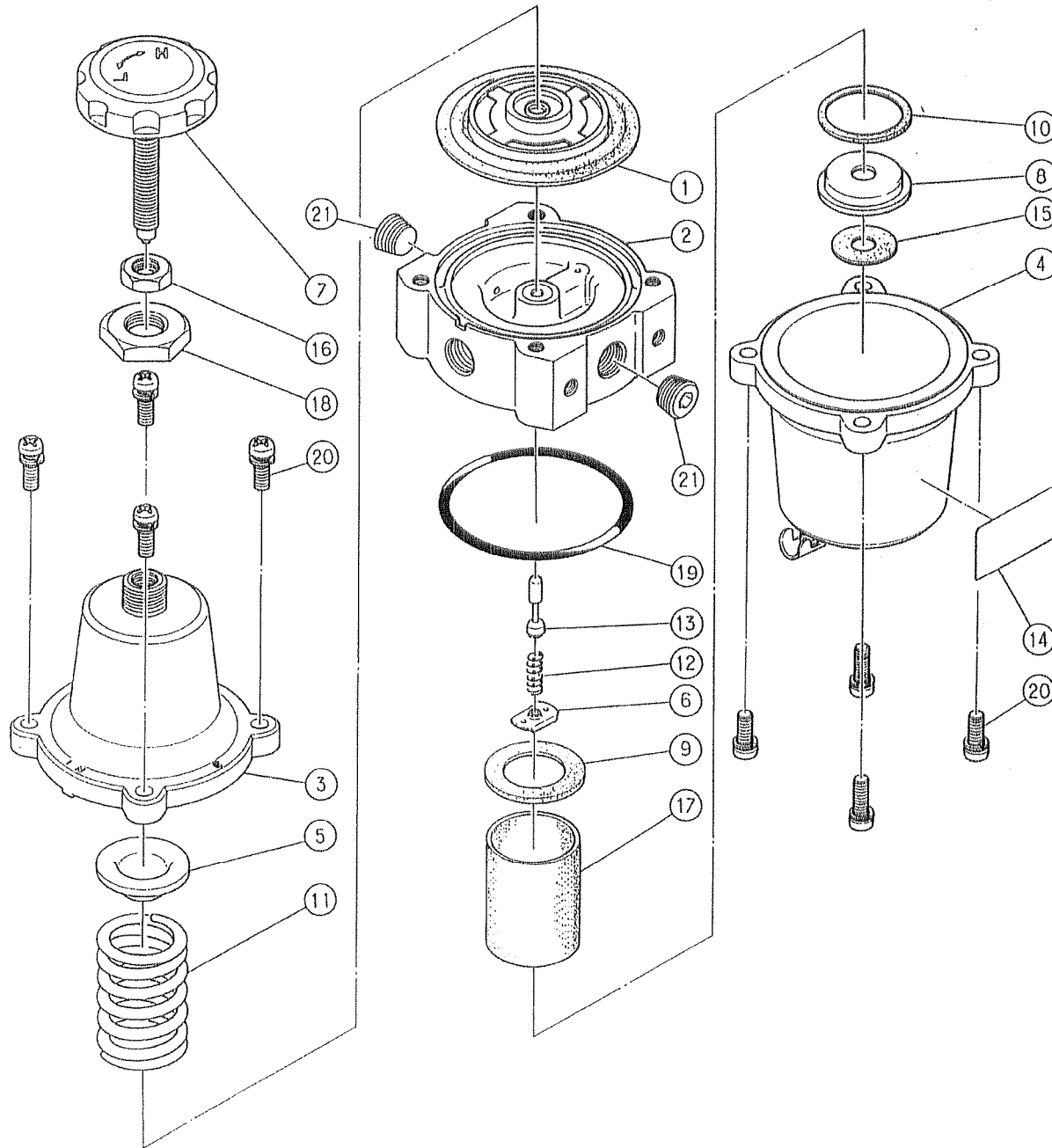
Caution

Maintenance

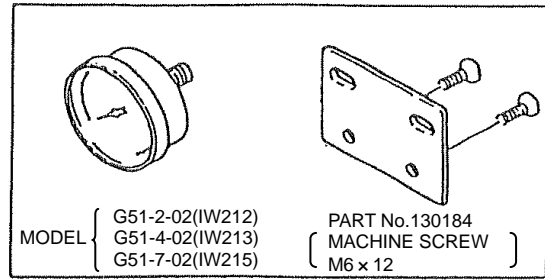
- (1) Care should be taken to handle compressed air. Keep the product specification. It must be experienced person with knowledge of pneumatic who is in charge of maintenance including replacing element.
- (2) Rubber parts such as diaphragm, "O" ring and packing are worn out. Periodic check and replace are necessary. (Perform annual inspection and replacement every three years)
- (3) Discharge condensed fluid in the drain and wash elements periodically. (Although depends on operating condition, every month or every three months is rough scale)

5. Troubleshooting

Failure	Check items	Cause	Troubleshoot
Pressure is not output	Pressure supplied?	No supply pressure is in	Supply pressure
	Handle is set?	Handle is not set	Rotate handle for adjustment
	Pressure gauge of inlet is broken?	Inlet pressure gauge is broken	Replace pressure gauge
	Pressure gauge of outlet broken?	Outlet pressure gauge is broken	Replace pressure gauge
Too much air leaks from bleed hole	Leakage more than spec. [1L / min (ANR)] with no cause of reverse flow	Dust adheres to exhaust valve seat	Remove bonnet and diaphragm to remove dust of seat
Air leak from drain cock	Drain cock open?	Drain cock is not closed firmly	Tighten drain cock
		Dust adhere to drain cock seat	Remove case to remove dust of seat



OPTION



21	PLUG	STEEL	2	R1/4 Zn.CHROMATE	
20	MACHINE SCREW AND WASHER ASSEMBLIES	STAINLESS STEEL	8	M5x0.8 LENGTH 15	
19	"O" RING	NBR	1	AS56B-22B	
18	1301116 NUT	ZINC ALLOY	1	NI PLATED	
17	1301111-5B ELEMENT	BRONZE	1	5μm	
16	13016 LOCK NUT	BRASS BAR	1	NI PLATED	
15	1301522 PACKING	NBR	1		
14	P2180133 NAME PLATE	PET	1		
13	1301516 PILOT VALVE	STAINLESS WIRE	1		
12	1301513 VALVE SPRING	STAINLESS WIRE	1		
11	1301512-2 (IW215) 1301512-1 (IW213) 1301512-3 (IW212)	ADJUSTING SPRING	STEEL WIRE	1 Zn.CHROMATE	
10	1301511 PACKING	NBR	1		
9	1301510 PACKING	NBR	1		
8	1301508 FILTER DISK	BRASS PLATE	1		
7	1301507 HANDLE	ABS RESIN	1		
6	1301506 VALVE SPRING HOLDER	ALUMINIUM ALLOY	1	CHROMATE	
5	1301504 SPRING HOLDER	STEEL PLATE	1	Zn.CHROMATE	
4	1301503 CASE	ALUMINIUM ALLOY	1	SILVER FINISH	
3	1301501 BONNET	ALUMINIUM ALLOY	1	SILVER FINISH	
2	P218010-12 BODY Ass'y		1		
1	P218010-1 DIAPHRAGM Ass'y		1		
ITEM	PART NO	PART NAME	MATERIAL	QTY	REMARKS

FINISH					
PAINT					
MASS					
PACKING					
REV/QTY	DESCRIPTION	DATE PREPARED	REV NO	MODEL	QTY
TOLERANCES J15 0 0405	DRAWN	SCALE	FINISH		
RANGE (mm)	DATE	FREE	MATERIAL		THIRD ANGLE
0.05053	DESIGNED	DWG NAME FILTER REGULATOR			
3<0.06	DATE				
6<0.0320	CHECKED				
30<0.020	DATE				
120<0.040	APPROVED	DWG NO			
400<0.1000	DATE	(TA) IW21*-02**			
2000<0.2000	DATE	REVISION			

FINISH:表面処理 / PAINT:塗装 / MASS:質量
PACKING:包装区分 / MATERIAL:材質
MATERIAL SIZE:材料寸法

DWG NAME

DWG REC

DWG ID

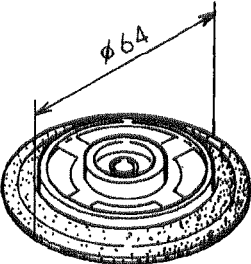
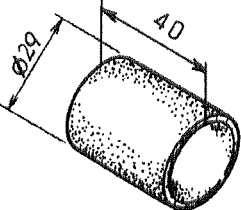
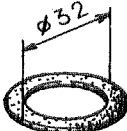
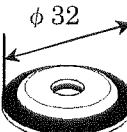

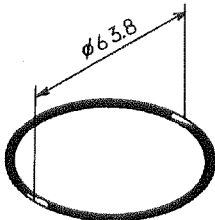
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Spare parts list

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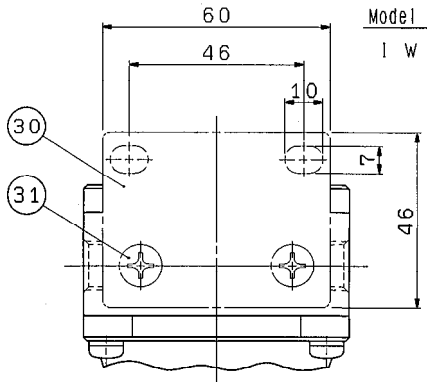
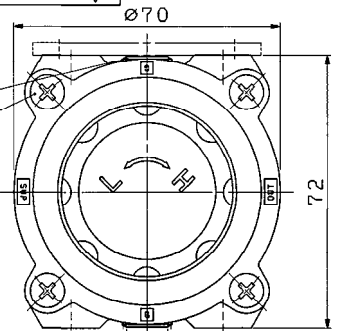
Model Name IW212/213/215/217 Repairing parts kits

Model No. KT-IW212

No.	Description	Sketch	Material	Pcs.		Drawing		Note
				Using	Spare	Drawing No.	Symbol	
1	Diaphragm Ass'y		ALUMINIUM ALLOY BRASS NBR	1		P218010-1		
2	Element		BRONZE (5 μm)	1		1301111-5B		
3	Packing		NBR	1		1301510		
4	Filter disk Ass'y		BRASS NBR NBR	1		P218010-16		C
5	O-Ring		NBR	1		KA00081 [JIS B2401 P4 1A]		
6	O-Ring		NBR	1		KA00755 [AS568-228 JIS W1516 AN6230-6]		

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**20-12M1



Model identification numbering

I W 2 1 2 - 0 2

Accessories
 B: with Bracket
 130184
 G: with Pressure Gauge
 IW212: G51-2-02
 IW213: G51-4-02
 IW215: G51-7-02

Setting pressure
 2: 0.02~0.2MPa
 3: 0.02~0.3MPa
 5: 0.02~0.5MPa

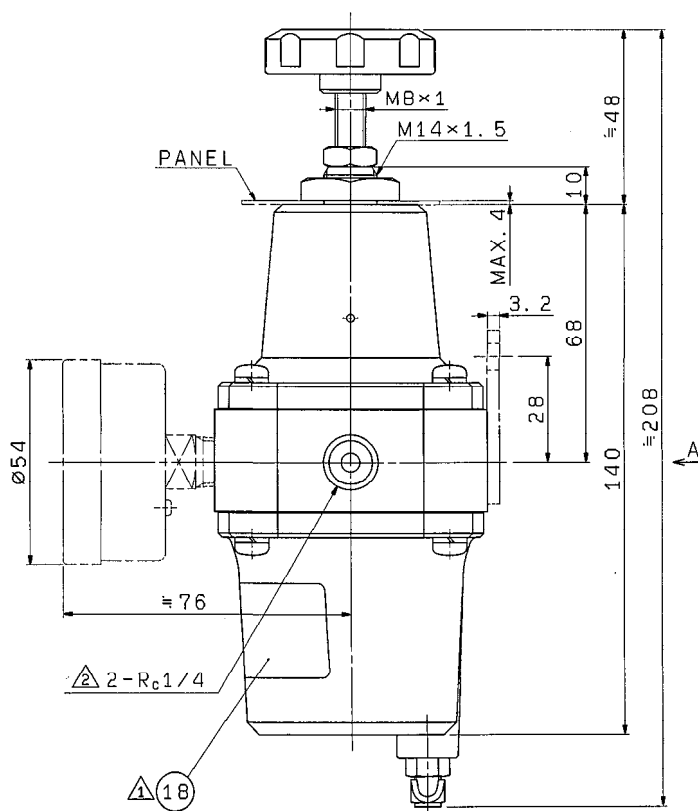
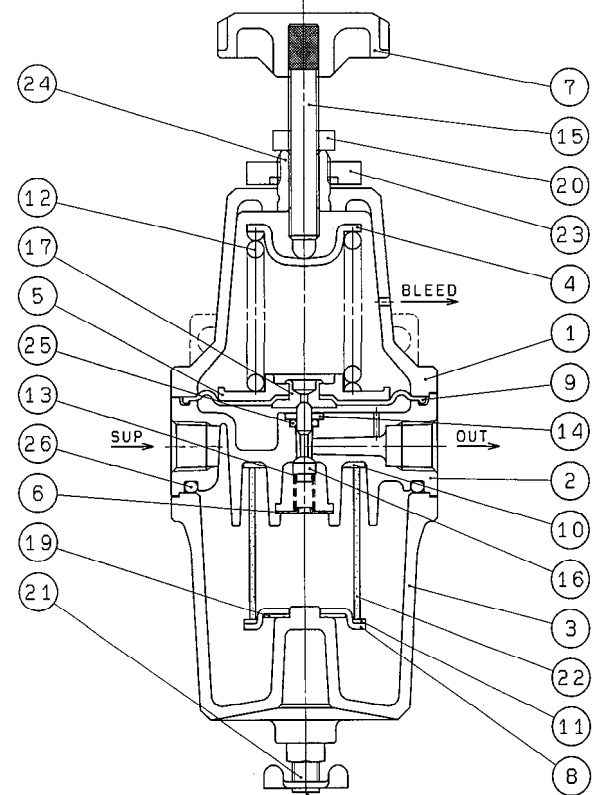
VIEW "A"

SPECIFICATIONS

SUPPLY PRESSURE	MAX. 1.0MPa
SETTING PRESSURE	IW212: 0.02~0.2MPa IW213: 0.02~0.3MPa IW215: 0.02~0.5MPa
OPERATING TEMPERATURE	-10°C~60°C
DEGREE OF FILTRATION	5µm
AIR CONSUMPTION	Less than 12/min(ANR) [at maximum set pressure]

NOTE: In case of with gauge, plug is attached only one.

31		MACHINE SCREW	STEEL	2	M6×1×12 Zn. CHROMATE
30	130184	BRACKET	STEEL PLATE	1	Ni PLATED
29	G51-7-02 (IW215) G51-4-02 (IW213) G51-2-02 (IW212)	PRESSURE GAUGE		1	
28		PLUG	STEEL	2	R1/4 Zn. CHROMATE
27		MACHINE SCREW AND WASHER ASSEMBLIES	STAINLESS	8	M5×0.8 LENGTH 15
26		"O" RING	NBR	1	AS568-228
25		"O" RING	NBR	1	JIS B2401. P4
24	23022	BUSHING	BRASS BAR	1	
23	1301116	NUT	ZINC DIE CASTING	1	Ni PLATED
22	1301111	ELEMENT	BRONZE	1	5µm
21	130169	DRAIN COCK	BRASS BAR AND PLATE	1	
20	13016	LOCK NUT	BRASS BAR	1	Ni PLATED
19	1301522	PACKING	NBR	1	
18	P2180133	NAME PLATE	NAMER	1	
17	1301517	RELIEF VALVE	BRASS BAR	1	
16	1301516	PILOT VALVE	STAINLESS WIRE	1	
15	1301515	ADJUSTING SCREW	STAINLESS BAR	1	
14	1301514	SPACER	ALUMINIUM BAR	1	CHROMATE
13	1301513	VALVE SPRING	STAINLESS WIRE	1	
12	1301512-2 (IW215) 1301512-1 (IW213) 1301512-3 (IW212)	ADJUSTING SPRING	STEEL WIRE	1	Zn. CHROMATE
11	1301511	PACKING	NBR	1	
10	1301510	PACKING	NBR	1	
9	1301509	DIAPHRAGM	NBR	1	
8	1301508	FILTER DISK	BRASS PLATE	1	
7	1301507	HANDLE	ABS RESIN	1	
6	1301506	VALVE SPRING HOLDER	ALUMINIUM PLATE	1	CHROMATE
5	1301505	CENTER DISK	AL. DIE CASTING	1	Zn. CHROMATE
4	1301504	SPRING HOLDER	STEEL PLATE	1	CHROMATE
3	1301503	FILTER CASE	AL. DIE CASTING	1	SILVER FINISH
2	1301502	BODY	AL. DIE CASTING	1	SILVER FINISH
1	1301501	BONNET	AL. DIE CASTING	1	SILVER FINISH



Open counterclock wise, close clock wise.

TITLE FILTER REGULATOR

SMC CORPORATION

DRAWN BY	t. i	DATE	DEC. 14, '99
DESIGNED BY	J. Shirane	DATE	DEC. 27, '99
CHECK'D BY	T. Uehara	DATE	Jan. 6, 2000
APPR'D BY	M. Sakata	DATE	Jan. 7, '00

SCALE 1/1 DWG. NO. (A) IW21*-02**

Revision history
A Total revision
B Change of address

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