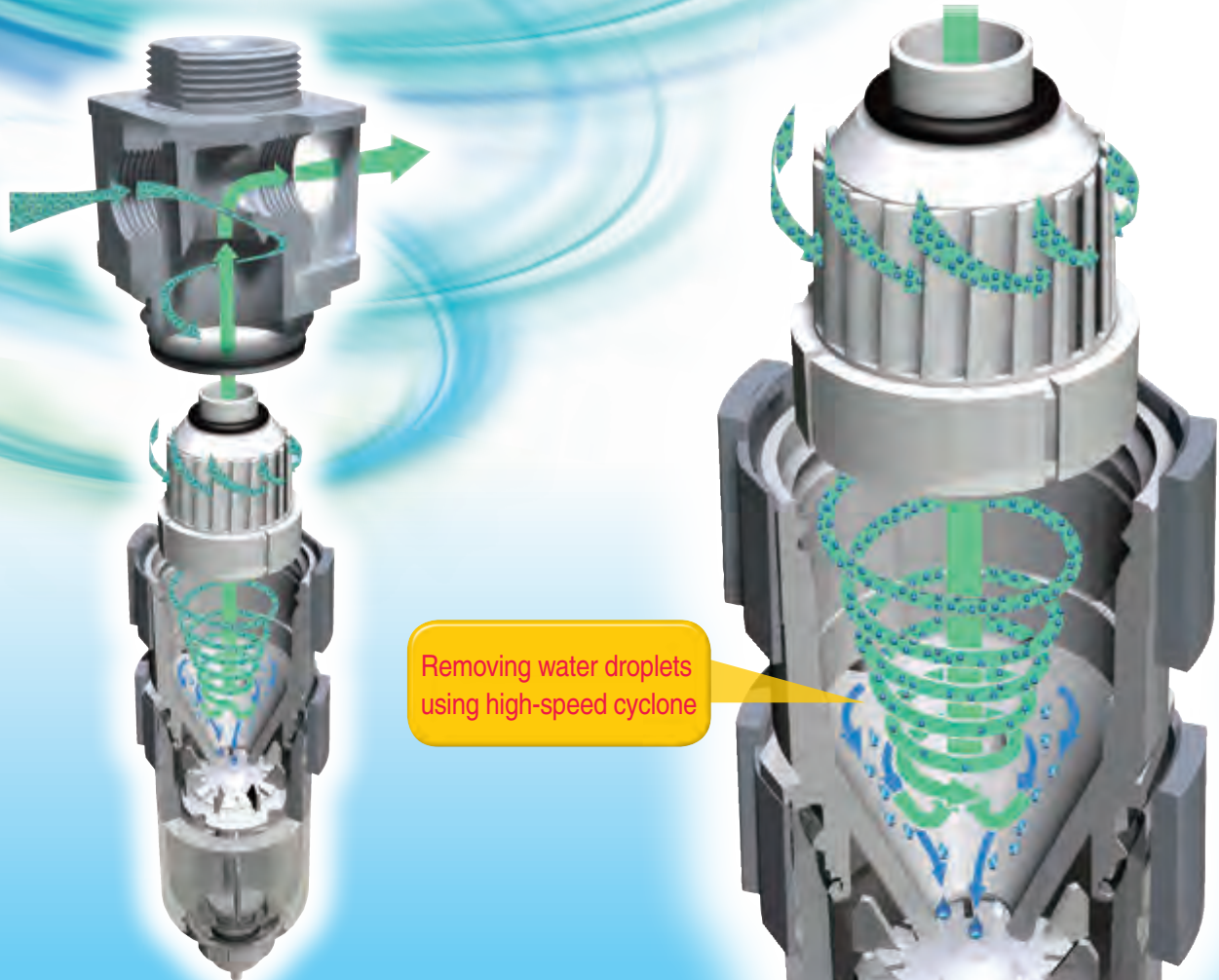


# iB-Cyclone

PAT. PEND.



**Superior water separation performance**

Half the size and over 99%<sup>Note</sup> water separation ratio compared to other devices. Note: According to Koganei measurement standards.

**Cyclone system**

**High-speed cyclone** water separator uses the power of centrifugal separation (patent pending).

**Maintainability improved**

Maintenance free because element is not used.  
Select NO type or NC type auto drain.

**Wide range of flow rates**

Excellent water separation performance in a wide range of flow rates.

**Compatible in a wide range of environments**

Specifications for ozone resistance, NCU specifications (copper free) compatible as standard.



**CAUTION**

Read the handling instructions and precautions on page 5 before using this product.

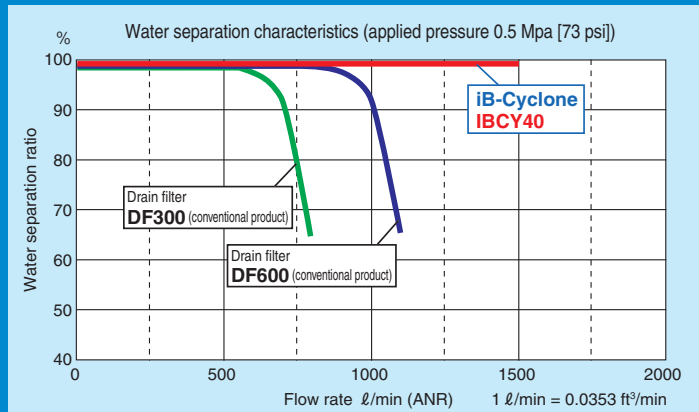
**CAUTION** Read the safety precautions on page 3 before using this product.

User issues

- Having trouble removing water in piping
- Changing elements and other maintenance is difficult.

Koganei provides solutions to user problems with **iB-Cyclone**, which delivers new value.

The iB-Cyclone uses a high-speed cyclonic system to maintain water separation rates even if flow is increased. Separation performance is always steady from small to large flow rates.

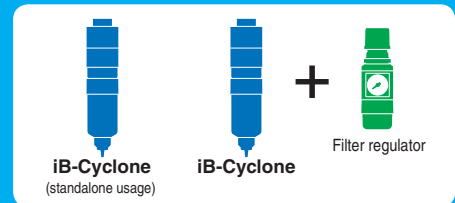


\*Water separation compared with Koganei drain filter (reference).

**iB-Cyclone application example**

- Removing water in sub-lines and from various equipment
- Removing primary-side water from filters and regulators
- Pre-processing air supply going to membrane dryer
- Removing water from equipment extremities

※ Air used must be free from oil and solids for iB-Cyclone use.



**Variations and Options**

IBCY30



IBCY40



IBCY50



Auto drain type  
NO (Normally open)  
NC (Normally closed)



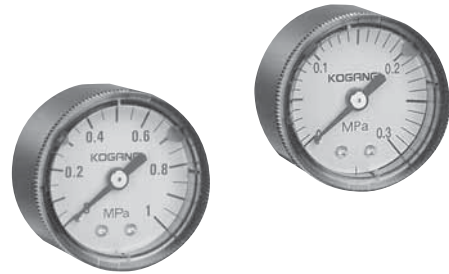
Drain cock with fitting



Bracket  
**8Z-CBK**

# Pressure gauge

G1-40·G3-40



## Symbol



## Order codes

G    - 40

**Outside diameter**

40 — Outside diameter 40 mm [1.575 in]

**Pressure indicator range**

1 — Standard specifications 1 MPa [145 psi]

3 — Low pressure specifications 0.3 MPa [44 psi]

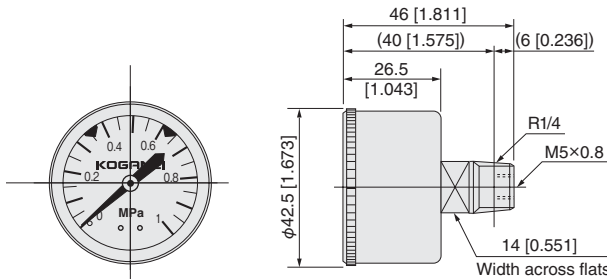
Pressure gauge

## Specifications

Item	Model	G1-40	G3-40
Medium		Air	
Port size		R1/4 (M5×0.8)	
Pressure indicator range	MPa [psi]	0 to 1.0 [0 to 145]	0 to 0.3 [0 to 44]
Accuracy		F.S. ±3%	
Outside diameter	mm [in]	40 [1.575]	
Maximum operating pressure	MPa [psi]	0.93 [135]	0.25 [36]
Operating temperature range (atmosphere and media)	°C [°F]	5 to 60 [41 to 140] (non-condensation)	
Mass	kg [lb]	0.09 [0.20]	
Materials	Case	ABS	
	Connection port thread	Brass	
	Bourdon tube	Brass	

## Pressure gauge dimensions mm [in]

G1-40  
G3-40



## Handling instructions and precautions



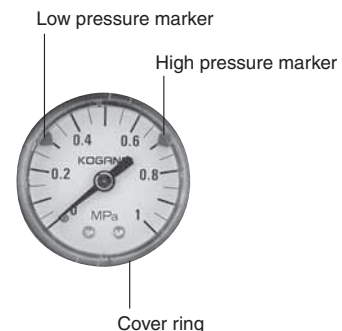
**NOTE** Pressure gauges are precision devices. Be careful of impacts and vibrations.

### Mounting and piping

During mounting and piping operations, do not grab the pressure gauge body to tighten. For tightening, always use a wrench on the piping connection port's square portion. Use a tightening torque of 3.0 to 5.0N·m [2.21 to 3.69 ft·lbf] if the pressure gauges are mounted on the pressure port plate with Rc1/4.

### Preset marker

You can set the preset marker. Rotate the cover ring to first set the low pressure and then set the high pressure.



# Pressure gauge

## G1S-40·G3S-40

- Stainless steel Bourdon tube pressure gauge.



### Symbol



### Order codes

G   S - 40

**Outside diameter**  
40 — Outside diameter 40 mm [1.575 in]

**Pressure indicator range**  
1 — Standard specifications 1 MPa [145 psi]  
3 — Low pressure specifications 0.3 MPa [44 psi]

Pressure gauge

### Specifications

Item	Model	G1S-40	G3S-40
Media		Air, N <sub>2</sub> , O <sub>2</sub> , CO <sub>2</sub> , He, Ar	
Port size		R1/4	
Pressure indicator range	MPa [psi]	0 to 1.0 [0 to 145]	0 to 0.3 [0 to 44]
Accuracy		F.S. ±2.5%	
Outside diameter	mm [in]	42.5 [1.673]	
Maximum operating pressure	MPa [psi]	0.93 [135]	0.25 [36]
Operating temperature range	°C [°F]	5 to 60 [41 to 140] (non-condensation)	
Mass	kg [lb]	0.091 [0.201]	

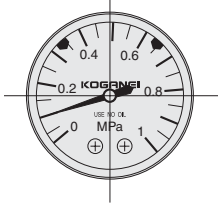
### Materials

Name	Materials
Case	SPCC (painted black)
Connection port thread	SUS316
Bourdon tube	SUS316
Clear cover	Plastic (PC)

### Pressure gauge dimensions mm [in]

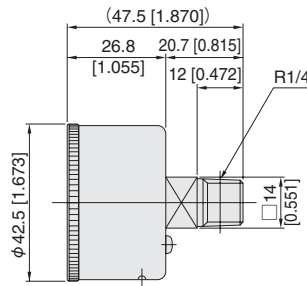
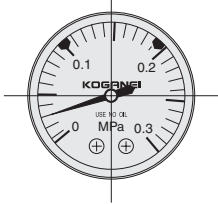
#### ● G1S-40

Standard specifications  
1 MPa [145 psi]



#### ● G3S-40

Low pressure specifications  
0.3 MPa [44 psi]



### Handling instructions and precautions



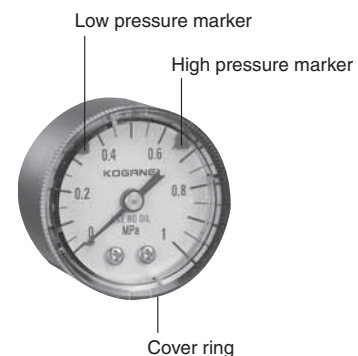
**NOTE** Pressure gauges are precision devices. Be careful of impacts and vibrations.

#### Mounting and piping

During mounting and piping operations, do not grab the pressure gauge body to tighten. For tightening, always use a wrench on the piping connection port's square portion. Use a tightening torque of 3.0 to 5.0N·m [2.21 to 3.69 ft·lbf] if the pressure gauges are mounted on the pressure port plate with Rc1/4.

#### Preset marker

You can set the preset marker. Rotate the cover ring to first set the low pressure and then set the high pressure.



## GFR Series



GFR

### Specification

Model	GFR200-06	GFR200-08	GFR300-08	GFR300-10	GFR300-15	GFR400-10	GFR400-15	GFR600-20	GFR600-25
Fluid	Air								
Port size	1/8"	1/4"	1/4"	3/8"	1/2"	3/8"	1/2"	3/4"	1"
Filtering grade	40 μm or 5 μm								
Pressure range	Semi-auto and automatic drain: 0.15~0.9MPa(20~130psi); Manual drain: 0.05~0.9MPa(7~130psi)								
Max. pressure	1.0MPa(145psi)								
Proof pressure	1.5MPa(215psi)								
Temperature range	-5~70°C								
Capacity of drain bowl	10CC			40CC			80CC		230CC
Weight	220g			500g			1030g		2400g

① PT thread, G thread and NPT thread are available.

### Ordering code

**GFR200 08 M L   F 1 W  K**

#### Model

GFR200: G200 Series filter-regulator  
 GFR300: G300 Series filter-regulator  
 GFR400: G400 Series filter-regulator  
 GFR600: G600 Series filter-regulator

#### Code of reflux valve ②

Blank: No reverse flow valve is attached  
 K: Reverse flow valve is attached

#### Thread type

Blank: PT  
 G: G  
 T: NPT

#### Filtering grade

Blank: 40 μm  
 W: 5 μm

#### Scale

1: MPa  
 2: psi  
 3: bar

#### Pressure gauge shape

F: Square  
 C: Circular

#### Pressure gauge

Blank: Pressure gauge  
 N: No pressure gauge

#### Type code

Blank: Standard  
 L: Lower pressure ①

#### Accessories

Blank: Bracket  
 J: No bracket

#### Port size

Model	Port size
GFR200	06: 1/8"
	08: 1/4"
GFR300	08: 1/4"
	10: 3/8"
	15: 1/2"
GFR400	10: 3/8"
	15: 1/2"
GFR600	20: 3/4"
	25: 1"

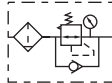
#### Drain type

Drain type	Adaptable product's series
Blank: Semi-auto drain	GFR200, GFR300
M: Manual drain	GFR400, GFR600
A: Automatic drain	GFR300, GFR400, GFR600

### Symbol

No reflux valve is attached

Reflux valve is attached



### Product feature

1. Embedded square pressure gauge is used to save installation space. (External circular pressure gauge is also optional).
2. The pressed-in self-locking mechanism can prevent the abnormal movement of the set pressure caused by external interfere.
3. Balanced design is adopted for the pressure adjustment mechanism.
4. In addition to standard type, lower pressure type is optional (The highest adjustable pressure is 0.4MPa).
5. Unique diversion structure spins the air flowing through to effectively separate the liquid from the air and reliably filter the solid grain.
6. The filtering grade includes 5 μm and 40 μm (optional).
7. Three drain types are available: manual drain, semi-auto drain and automatic drain.
8. The bracket can be selected for installation.

① The maximum work pressure of lower pressure type is 0.4MPa(58psi). ② Please refer to page 146 for details of reflux valve.

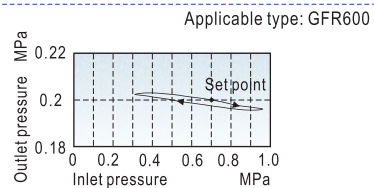
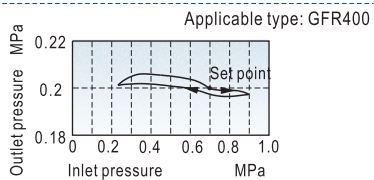
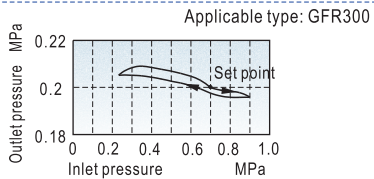
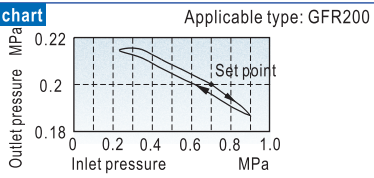
### Inner structure and material of major parts

GFR200		GFR600		No.	Item	Material
<p>Semi-Auto drain</p>	<p>Semi-Auto drain</p>	1	Drain bowl	Aluminum alloy(GFR600)\PC(others)		
		2	Umbrella baffle	High viscosity POM		
		3	Filter core	GFR600 others	Agglomerated by brass grain 40 μm Agglomerated by brass grain 5 μm Makrolon fiber	
		4	Air guider	High viscosity POM		
		5	O-ring	NBR		
		6	Body of filter-regulator	Aluminum alloy		
		7	Adjusting spool	Brass (GFR600)\POM(others)		
		8	O-ring	NBR		
		9	Diaphragm	SUS304 & Rubber		
		10	Fixation ring cap	Aluminum alloy(GFR600)\POM(others)		
		11	Adjusting spindle	Steel		
		12	Regulator nut	Steel		
		13	Pressure knob	POM		
		14	Spring	SWC		
		15	Adjusting seat	Aluminum alloy(GFR600)\POM(others)		
		16	Feedback tube	POM		
		17	Adjusting plug	Brass & Rubber		
		18	O-ring	NBR		
		19	Spring	SUS304		
		20	Liquid meter cover	SPCC		
		21	Liquid meter seal	VITON		
		22	Liquid meter inside	PC		

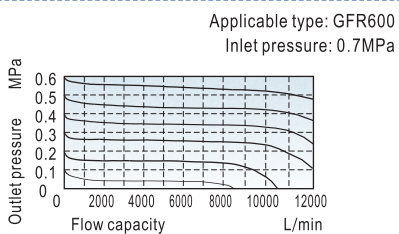
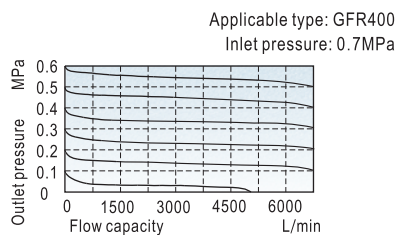
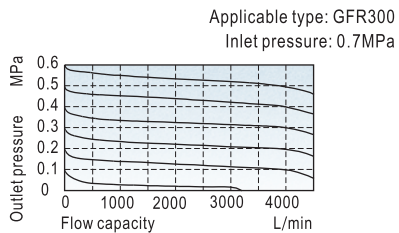
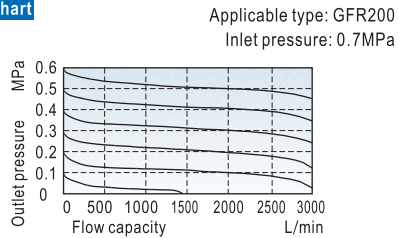
## GFR Series

### Pressure and feature of flow

#### Pressure chart



#### Flow chart



### Selection of drain mode

GFR200		GFR300/GFR400/GFR600		
Manual drain	Semi-auto drain	Manual drain	Semi-auto drain	Automatic drain
		GFR300: 1/8" GFR400, GFR600: 1/4"	GFR300: 1/8" GFR400, GFR600: 1/4"	GFR300: 1/8" GFR400, GFR600: 1/4"
PU tube with an inner diameter of $\Phi 5$ or $\Phi 5.5$ mm is recommended				

### Dimensions

#### GFR200

#### GFR600

#### GFR300/GFR400

Model\Item	A	AB	AC	B	BA	BC	C	D
GFR300-08	60	53	38	72	41	31	225.5	M40x1.5
GFR300-10	60	53	38	72	41	31	225.5	M40x1.5
GFR300-15	60	53	38	72	41	31	225.5	M40x1.5
GFR400-10	80	72	52	90	50	40	270.5	M55x2.0
GFR400-15	80	72	52	90	50	40	270.5	M55x2.0

Model\Item	K	KA	KB	KC	P	PA	Q
GFR300-08	6.5	40	8	46	1/4"	143	1/8"
GFR300-10	6.5	40	8	46	3/8"	143	1/8"
GFR300-15	6.5	40	8	46	1/2"	143	1/8"
GFR400-10	8.5	52	11	53	3/8"	166.5	1/4"
GFR400-15	8.5	52	11	53	1/2"	166.5	1/4"

### Regulating way

The use of GFR series regulators is the same as the SDR series, please refer to Page 164 for details.



GFR



## GF Series



### Symbol



### Product feature

1. Unique diversion structure spins the air flowing through to effectively separate the liquid from the air and reliably filter the solid grain.
2. It has low pressure loss, high efficiency in separating water and large drain bowl capacity.
3. Filtering grade includes 5 μm and 40 μm (Optional).
4. Three drain types are available: manual drain, semi-auto drain and automatic drain.
5. The bracket can be selected for installation.

### Specification

Model	GF200-06	GF200-08	GF300-08	GF300-10	GF300-15	GF400-10	GF400-15	GF600-20	GF600-25
Fluid	Air								
Port size	1/8"	1/4"	1/4"	3/8"	1/2"	3/8"	1/2"	3/4"	1"
Filtering grade	40 μm or 5 μm								
Pressure range	Semi-auto and automatic drain: 0.15~0.9MPa(20~130psi); Manual drain: 0.05~0.9MPa(7~130psi)								
Proof pressure	1.5MPa(215psi)								
Temperature range	-5~70°C								
Capacity of drain bowl	10CC		40CC		80CC		230CC		
Weirht	135g		360g		680g		1440g		

① PT thread, G thread and NPT thread are available.

### Ordering code

**GF200 08 M**  **W**

#### Model

GF200: G200 Series Filter  
 GF300: G300 Series Filter  
 GF400: G400 Series Filter  
 GF600: G600 Series Filter

#### Thread type

Blank: PT  
 G: G  
 T: NPT

#### Filtering grade

Blank: 40 μm  
 W: 5 μm

#### Accessories

Blank: Bracket  
 J: No bracket(standard configuration)

#### Port size

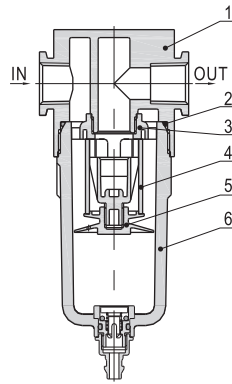
Model	Port size
GF200	06: 1/8"
	08: 1/4"
GF300	08: 1/4"
	10: 3/8"
	15: 1/2"
GF400	10: 3/8"
	15: 1/2"
GF600	20: 3/4"
	25: 1"

#### Drain type

Drain type	Addable product's series
Blank: Semi-auto drain	GF200, GF300
M: Manual drain	GF400, GF600
A: Automatic drain	GF300, GF400, GF600

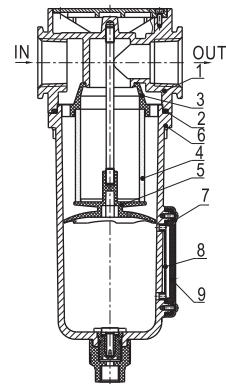
### Inner structure and Material of major parts

#### GF200



Semi-Auto drain

#### GF600

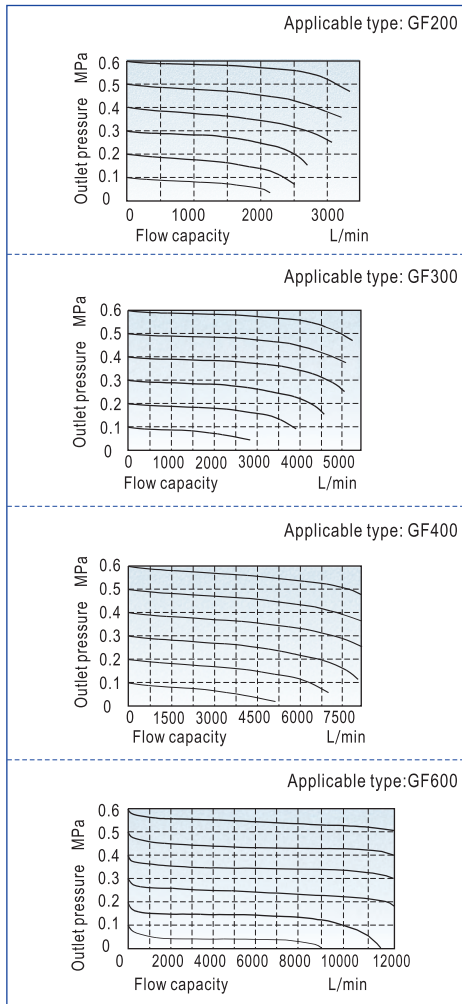


Semi-Auto drain

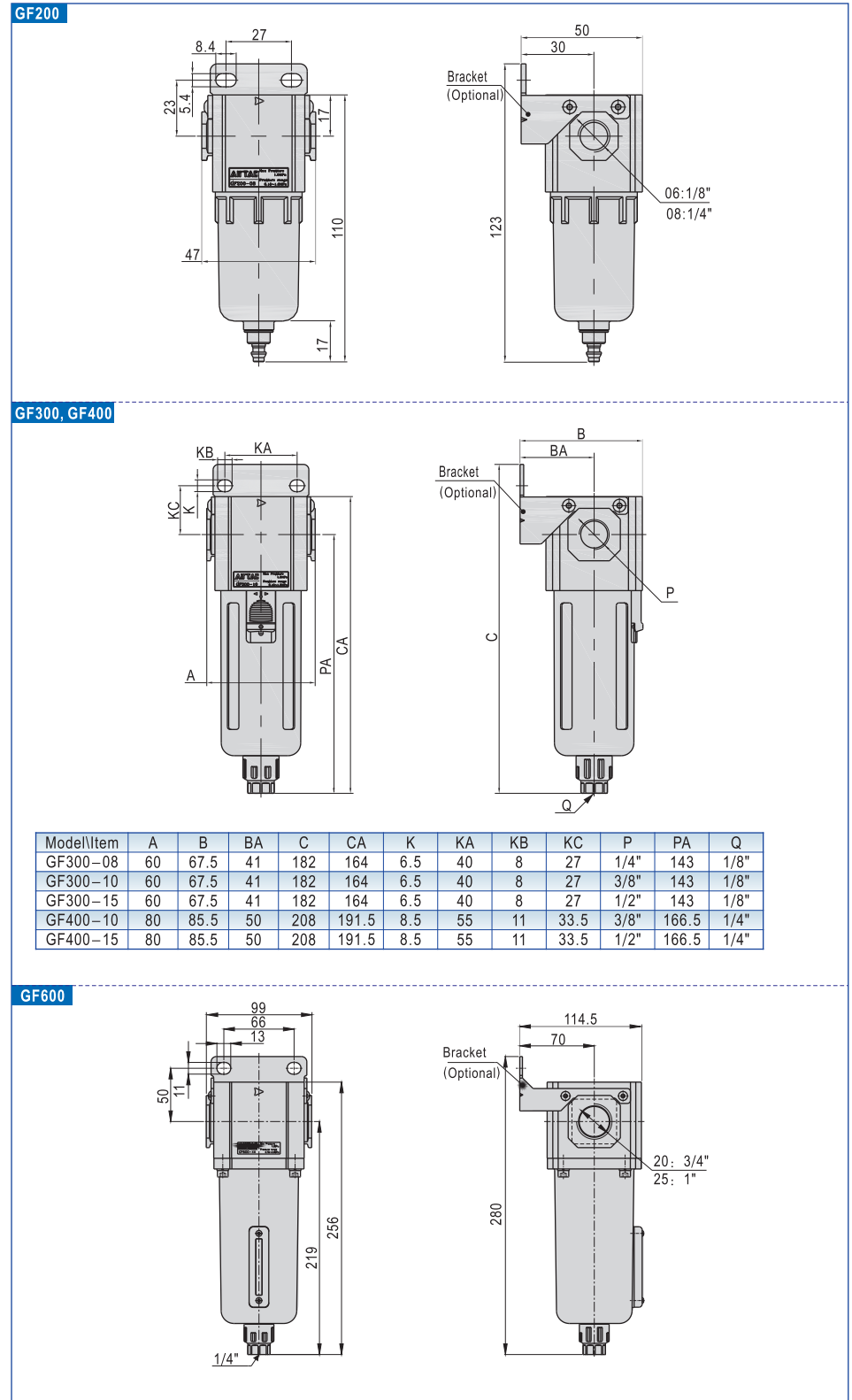
No.	Item	Material
1	Body	Aluminum alloy
2	O-ring	NBR
3	Air guide	High viscosity POM
4	Filter core	GF600 Agglomerated by bronze grain Others 40 μm: Agglomerated by bronze grain\5 μm: Makrolon fiber
5	Umbrella baffle	High viscosity POM
6	Drain bowl	Aluminum alloy(GF600)\PC(Others)
7	Liquid meter cover	SPCC
8	Liquid meter seal	VITON
9	Liquid meter inside cover	PC

## GF Series

### Flow chart



### Dimensions



### Selection of drain mode

GF series drain mode is the same as the GFR series, please refer to the specific P139.





## GR Series



GR

### Symbol

No Reverse Flow valve is attached      Reverse Flow valve is attached



### Product feature

1. Embedded square pressure gauge is used to save installation space. (External circular pressure gauge is also optional).
2. The pressed-in self-locking mechanism can prevent the abnormal movement of the set pressure caused by external interfere.
3. Balanced design is adopted for the pressure adjustment mechanism.
4. In addition to panel installation, the bracket is optional for installation.
5. In addition to standard type, lower pressure type is optional (the highest adjustable pressure is 0.4MPa).

### Specification

Model	GR200-06	GR200-08	GR300-08	GR300-10	GR300-15	GR400-10	GR400-15	GR600-20	GR600-25
Fluid	Air								
Port size	1/8"	1/4"	1/4"	3/8"	1/2"	3/8"	1/2"	3/4"	1"
Pressure range	0.05~0.9MPa(7~130psi)								
Max. pressure	1.0MPa(145psi)								
Proof pressure	1.5MPa(215psi)								
Temperature range	-20~70°C								
Weight	160g		350g			720g		1700g	

① PT thread, G thread and NPT thread are available.

### Ordering code

**GR200 08 L**   **F 1**  **K**

- Model**
  - GR200: G200 Series Regulator
  - GR300: G300 Series Regulator
  - GR400: G400 Series Regulator
  - GR600: G600 Series Regulator
- Code of reflux valve**
  - Blank: No Reverse flow valve is attached
  - K: Reverse flow valve is attached
- Thread type**
  - Blank: PT
  - G: G
  - T: NPT
- Scale**
  - 1: MPa
  - 2: psi
  - 3: bar
- Pressure gauge shape**
  - F: Square
  - C: Circular
- Pressure gauge**
  - Blank: Pressure gauge
  - N: No pressure gauge
- Accessories**
  - Blank: Bracket
  - J: No bracket(standard configuration)
- Port size**

Model	Port size
GR200	06: 1/8"
	08: 1/4"
GR300	08: 1/4"
	10: 3/8"
GR400	10: 3/8"
	15: 1/2"
GR600	20: 3/4"
	25: 1"
- Type code**
  - Blank: Standard
  - L: Lower pressure ①

① The maximum work pressure of lower pressure type is 0.4MPa(58psi). ② Please refer to page 146 for details of reflux valve.

### Inner structure and Material of major parts

**GR200**

**GR600**

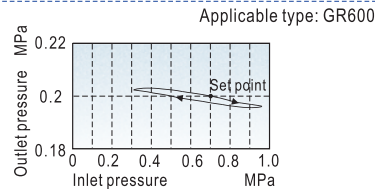
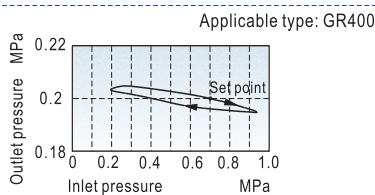
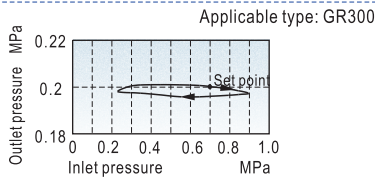
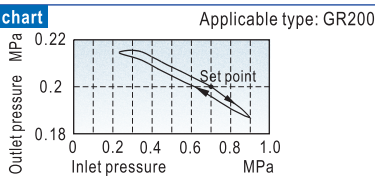
No.	Item	Material	No.	Item	Material
1	Valve cap	Aluminum alloy	9	Regulator nut	Steel
2	O-ring	NBR	10	Pressure knob	POM
3	Body	Aluminum alloy	11	Pressure spring	SWC
4	Spool	Brass(GR600)\POM(others)	12	Adjusting seat	Aluminum alloy(GR600)\POM(others)
5	O-ring	NBR	13	Feed back tube	POM
6	Diaphragm	SUS304 &Rubber	14	Pressure plug	Brass & steel
7	Fixed ring	Aluminum alloy(GR600)\POM(others)	15	O-ring	NBR
8	Adjusting spindle	Steel	16	Spring	Stainless steel



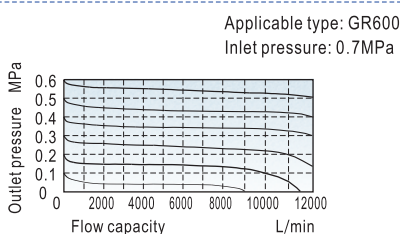
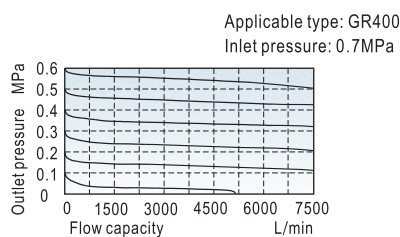
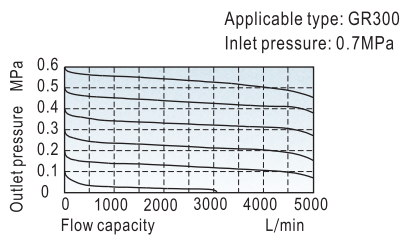
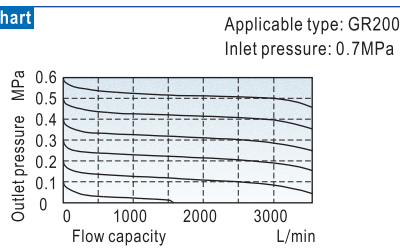
## GR Series

### Pressure and feature of flow

#### Pressure chart



#### Flow chart



### Dimensions

#### GR200

#### GR300, GR400

Model\Item	A	AB	AC	B	BA	BC	C	D	K	KA	KB	KC	P
GR300-08	60	53	38	72	41	31	112.5	M40x1.5	6.5	40	8	46	1/4"
GR300-10	60	53	38	72	41	31	112.5	M40x1.5	6.5	40	8	46	3/8"
GR300-15	60	53	38	72	41	31	112.5	M40x1.5	6.5	40	8	46	1/2"
GR400-10	80	72	52	90	50	40	140.5	M55x2.0	8.5	55	11	53	3/8"
GR400-15	80	72	52	90	50	40	140.5	M55x2.0	8.5	55	11	53	1/2"

#### GR600

### Regulating way

The use of GR series regulators is the same as the SDR series, please refer to Page 164 for details.



## GL Series



### Symbol



### Product feature

1. The structure of oil dripping adopts gap seal type, which makes the adjustment of oil supply more reliable.
2. Oil feed ring can only make one full turn. The quantity of oil supply basically takes on linear distribution. The quantity of oil supply can be generally calculated according to the position of graduation ring.
3. Special drip nozzle structure will produce negative pressure in oil dripping outlet and the mist flow is minimal.
4. Filling of oil while the lubricator is under pressure is made possible, and the oil bowl is large;
5. The bracket can be selected for installation.

### Specification

Model	GL200-06	GL200-08	GL300-08	GL300-10	GL300-15	GL400-10	GL400-15	GL600-20	GL600-25
Fluid	Air								
Port size	1/8"	1/4"	1/4"	3/8"	1/2"	3/8"	1/2"	3/4"	1"
Pressure range	0.05~0.9MPa(7~130psi)								
Proof pressure	1.5MPa(215psi)								
Temperature range	-5~70°C								
Recommended lubricant	ISO VG 32 or equivalent								
Capacity of oil bowl	25CC			75CC			160CC		380CC
Weight	130g			360g			670g		1300g

① PT thread, G thread and NPT thread are available.

### Ordering code

**GL200 08**

Model
GL200: G200 Series Lubricator
GL300: G300 Series Lubricator
GL400: G400 Series Lubricator
GL600: G600 Series Lubricator

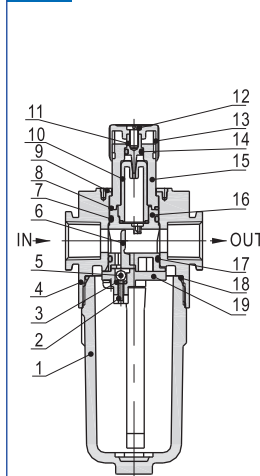
Thread type
Blank: PT
G: G
T: NPT

Model	Port size
GL200	06: 1/8"
	08: 1/4"
GL300	08: 1/4"
	10: 3/8"
	15: 1/2"
GL400	10: 3/8"
	15: 1/2"
GL600	20: 3/4"
	25: 1"

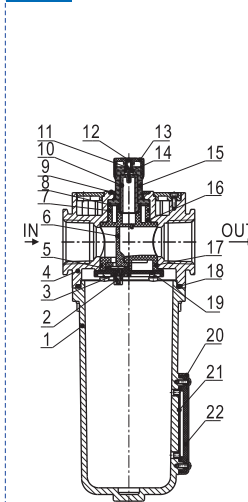
Accessories
Blank: Bracket
J: No bracket(standard configuration)

### Inner structure and Material of major parts

GL200



GL600

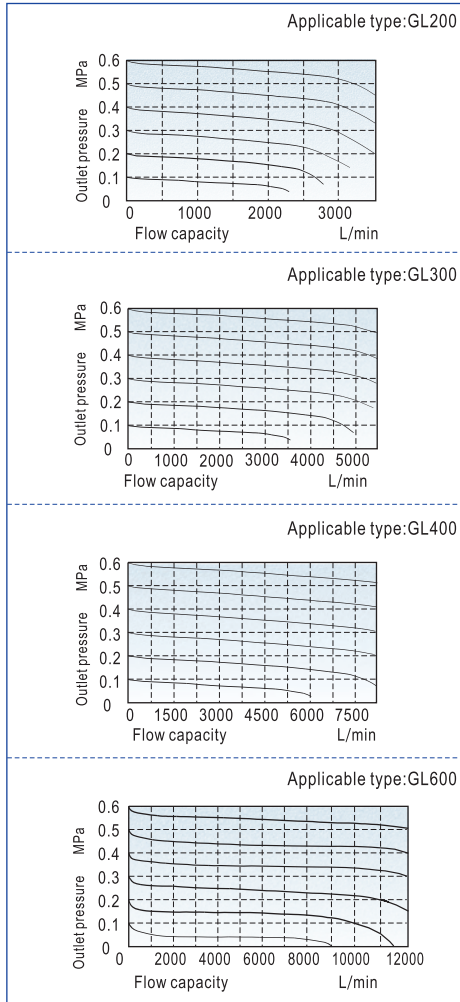


No.	Item	Material
1	Oil bowl	Aluminum alloy (GL600)\PC(others)
2	Adjusting spring	Stainless steel
3	O-ring	NBR
4	Body of lubricator	Aluminum alloy
5	Steel ball	Stainless steel
6	Distance block	TPU
7	O-ring	NBR
8	O-ring	NBR
9	Indicating ring	POM
10	Drip pipe	PC
11	Ejector pin	Brass
12	Screw	Carbon steel
13	Adjusting ring	POM
14	O-ring	NBR
15	Bowl	PC
16	Sprayer body	PA66
17	O-ring	NBR
18	O-ring	NBR
19	Sprayer bottom cap	POM
20	Liquid meter cover	SPCC
21	Liquid meter seal	NBR
22	Liquid meter inside cover	PC

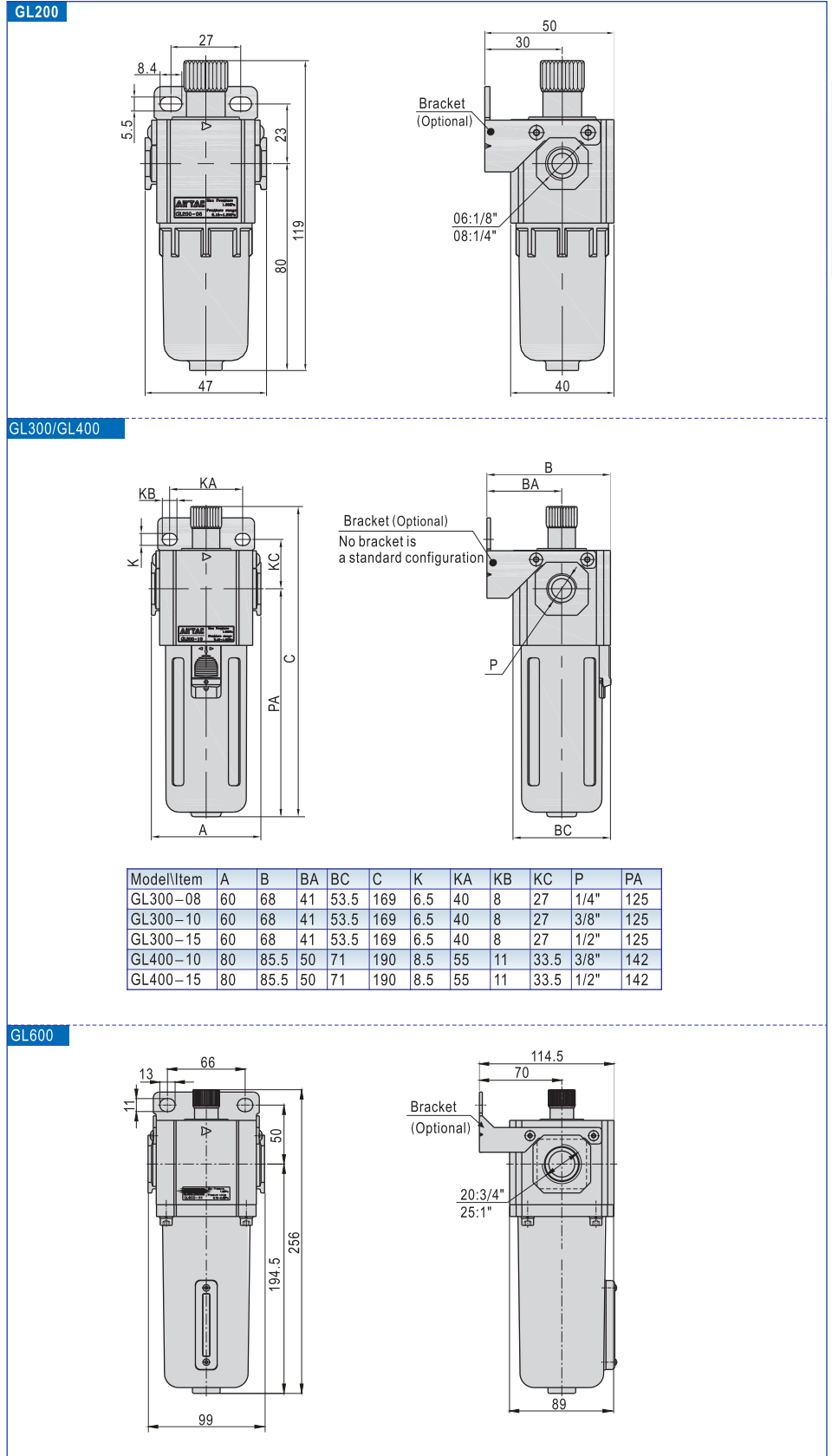


## GL Series

### Flow chart



### Dimensions



GL



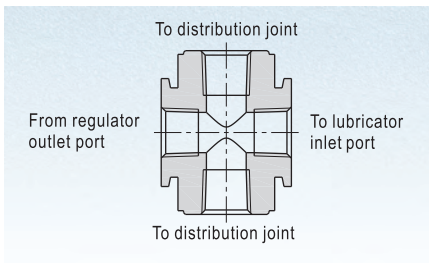
## GA series of gas-distribution block



### Product feature

1. It is installed between G series regulator (or filter & regulator) and G series Lubricator. The air flow is divided by the device that one enters Lubricator to supply oil for lubrication and the other (the second way) directly enters the equipment.
2. Several kinds of bracket can be selected to connect regulator and lubricator. Optional brackets are type T, type L and type U.

### Inner structure



### Specification

Model	GA200-06	GA200-08	GA300-08	GA300-10	GA400-10	GA400-15	GA600-20	GA600-25
Fluid	Air							
Port size	1/8"	1/4"	1/4"	3/8"	3/8"	1/2"	3/4"	1"
Way number	Four							
Pressure range	0~0.9MPa(0~130psi)							
Proof pressure	1.5MPa(215psi)							
Temperature range	-20~70°C							

① PT thread, G thread and NPT thread are available.

### Ordering code

#### GA200 08 □

Model	Thread type	Port size
GA200: 200 Series gas-distribution block	Blank: PT	Model
GA300: 300 Series gas-distribution block	G: G	Port size
GA400: 400 Series gas-distribution block	T: NPT	200 Series
GA600: 600 Series gas-distribution block		06: 1/8"
		08: 1/4"
		300 Series
		08: 1/4"
		10: 3/8"
		400 Series
		10: 3/8"
		15: 1/2"
		600 Series
		20: 3/4"
		25: 1"

Note: When it is used with F.R.L. combination, extra mounting bracket is need. Please refer to below for order detail.

### Dimensions

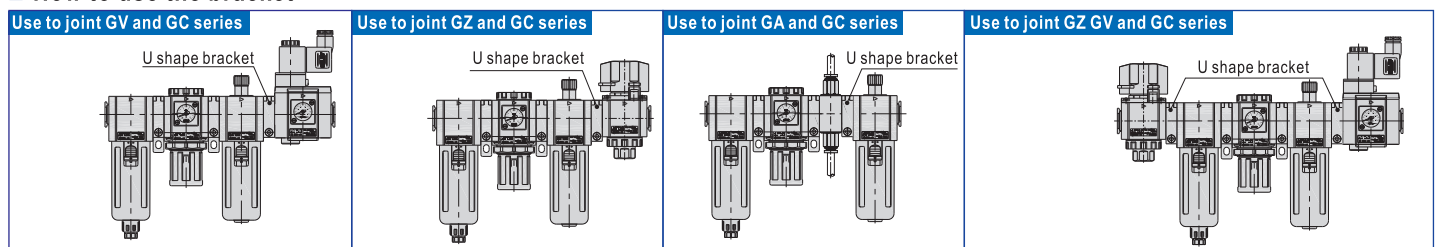
Model\Item	A	B	C	P
GA200 06	28.5	36	30	1/8"
GA200 08	28.5	36	30	1/4"
GA300 08	35	44	38	1/4"
GA300 10	35	44	38	3/8"
GA400 10	42	52	52	3/8"
GA400 15	42	52	52	1/2"
GA600 20	60	76	68	3/4"
GA600 25	60	76	68	1"

## Joint accessories—Bracket

### How to select the bracket


Bracket name	Code	Photo	Adapt accessories model		
T shape bracket	GA200T-P1		GV200	GZ200	GA200
	GA300T-P1		GV300	GZ300	GA300
	GA400T-P1		GV400	GZ400	GA400
	GA600T-P1		-	-	GA600
L shape bracket	GA200L-P1		GV200	GZ200	GA200
	GA300L-P1		GV300	GZ300	GA300
	GA400L-P1		GV300	GZ400	GA400
	GA600L-P1		-	-	GA600
U shape bracket	GA200U-P1		GV200	GZ200	GA200
	GA300U-P1		GV300	GZ300	GA300
	GA400U-P1		GV400	GZ400	GA400
	GA600U-P1		-	-	GA600

### How to use the bracket





## ■ Production's series

<p>F.R.L Combination: AC, BC Series 152</p> 	<p>FR.L Combination: AFC, BFC Series 154</p> 	<p>Filter &amp; Regulator: AFR, BFR Series 156</p> 
<p>Filter: AF, BF Series 158</p> 	<p>Regulator: AR, BR Series 159</p> 	<p>Lubricator: AL, BL Series 161</p> 
<p>Regulator: SR Series 162</p> 	<p>Regulator: SDR Series 163</p> 	<p>Drip leg drain: ADW Series 165</p> 
<p>Pressure gauge: GS, GF, GU Series 166</p> 	<p>DPS Series Digital Display Pressure Switch 167</p> 	<p>DPC Series No Display Pressure Switch 170</p> 



A Series  
B Series

## ■ Installation and application

1. Check whether the components have been damaged during transportation before installing and using.
2. Pay attention to whether the flow direction of air (notice "→" direction) and thread type are correct.
3. Please notice whether installation condition accords with technical requirements (such as "working pressure" and "applied temperature range").
4. The medium used or installation environment shall be noticed. The matters with chlorine, carbon compound, aromatic compound and oxidizing acid and alkali shall be avoided to prevent the damage of bowl and oil bowl.
5. Regularly clean or change filter core. Lubricators and regulators shall be in descending order.
6. Keep dust away. The dust cover shall be installed in intake and outlet when the device is dismantled and stored.

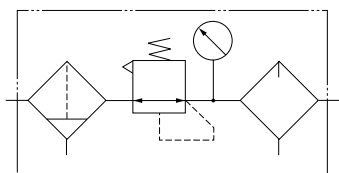


# F.R.L. COMBINATIONS

## C150, C200, C300, C400, C600

- An easy-mounting and easy-maintenance modular type.
- Many combinations of body sizes and port sizes.
- Full range of accessories and options with priority on performance.

### Symbol

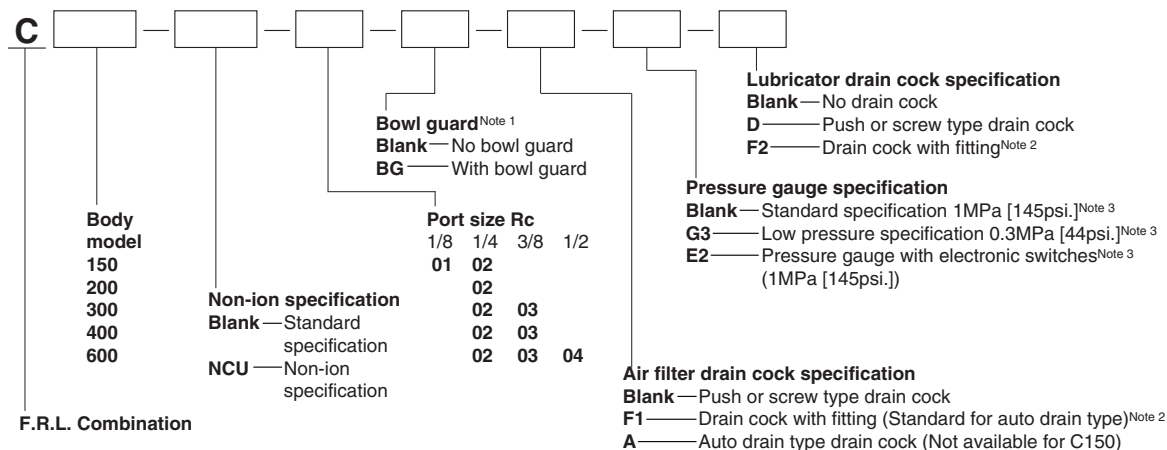


### Specifications

Item	Model	C150	C200	C300	C400	C600
Media		Air				
Port size	Rc	1/8, 1/4	1/4	1/4, 3/8	1/4, 3/8	1/4, 3/8, 1/2
Filtration rating	$\mu\text{m}$	5				
Pressure setting range	MPa [psi.]	0.05~0.83 [7~120]				
Maximum operating pressure	MPa [psi.]	0.93 [135]				
Proof pressure	MPa [psi.]	1.47 [213]				
Operating temperature range (atmosphere and media)	$^{\circ}\text{C}$ [ $^{\circ}\text{F}$ ]	5~60 [41~140]				
Air filter drain capacity	cc [in <sup>3</sup> ]	15 [0.92]	55 [3.36]		90 [5.49]	
Oil capacity for lubricator	cc [in <sup>3</sup> ]	25 [1.53]	85 [5.19]		160 [9.76]	
Recommended lubrication		Turbine oil Class 1 [ISO VG32] or equivalents.				
Mass (with pressure gauge)	kg [lb]	Standard	1.16 [2.56]	1.20 [2.65]	1.43 [3.15]	1.51 [3.33]
		Auto drain type	1.19 [2.62]	1.23 [2.71]	1.46 [3.22]	1.54 [3.40]
Materials	Body	Aluminum die-casting	Aluminum die-casting Zinc die-casting	Zinc die-casting	Aluminum die-casting Zinc die-casting	Aluminum die-casting
	Bowl	Polycarbonate				
Models of components	Air filter	F150	F300	F300	F600	F600
	Regulator	R150	R150	R300	R300	R600
	Lubricator	L150	L300	L300	L600	L600
Standard attachments	Bracket	D module				
	Air filter	Push type drain cock	Screw type drain cock, bowl guard			
	Regulator	Pressure gauge G1-40 ( $\phi$ 40×1MPa [145psi.])				
	Lubricator	—	Bowl guard			

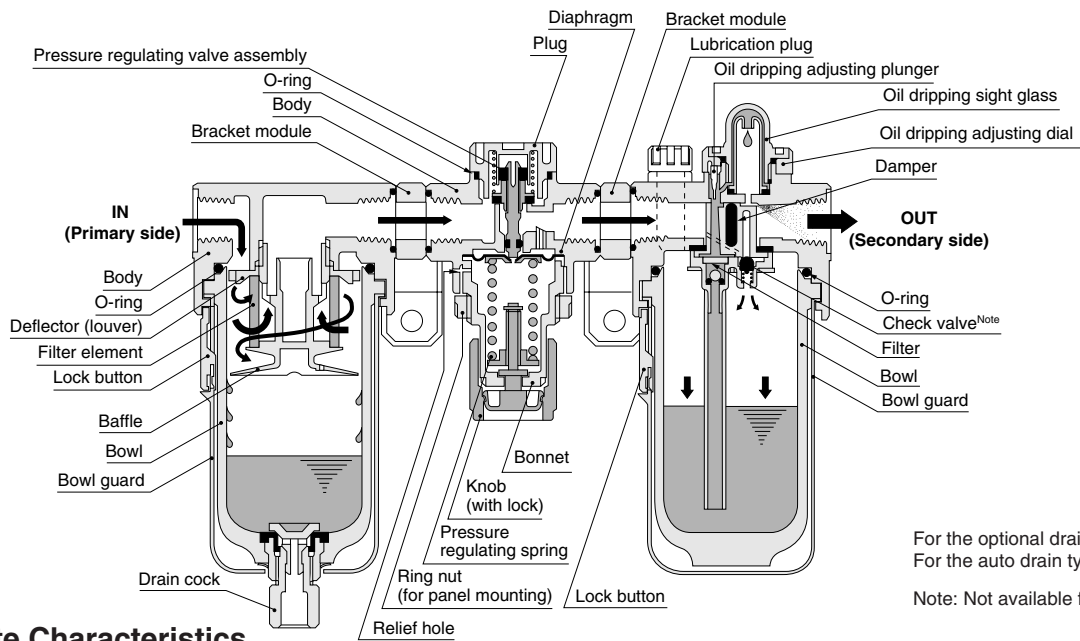
Note: Figure in parentheses ( ) shows mass with bowl guard.

### Order Codes



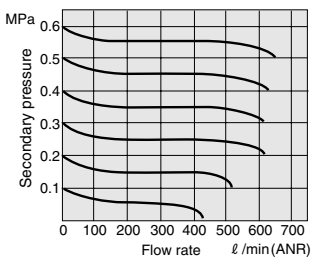
Notes: 1. For C150 only. Standard for all models other than C150.  
2. Available only for C150 with -BG (bowl guard).  
3. For the specifications and dimensions for the pressure gauge, and pressure gauge with electronic switches, see p.172 and 177~181.

# Inner Construction

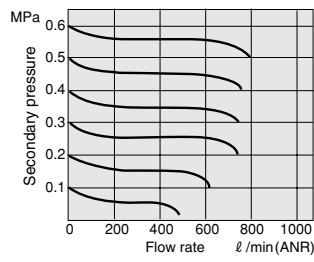


## Flow Rate Characteristics

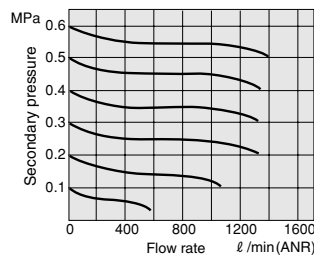
**C150**



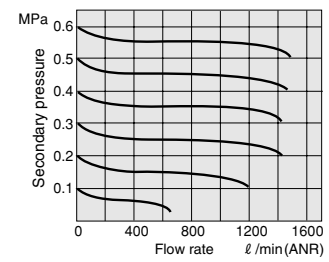
**C200**



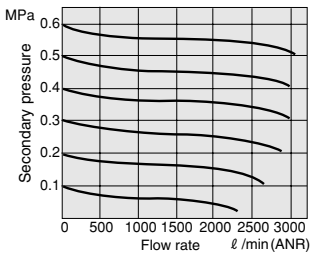
**C300**



**C400**



**C600**

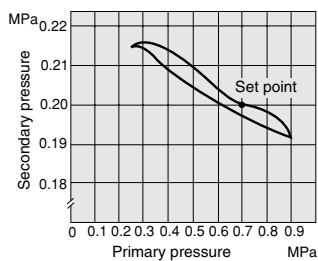


Remark: Graphs show flow rate characteristics when the primary pressure is fixed at 0.7MPa [102psi].

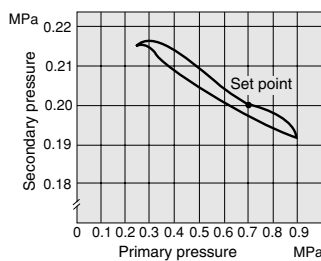
1MPa=145psi. 1 ℓ/min=0.0353ft<sup>3</sup>/min.

## Pressure Characteristics

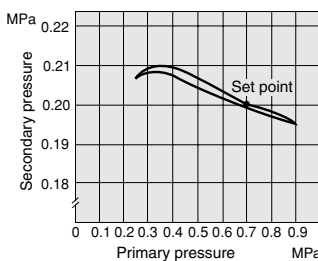
**C150**



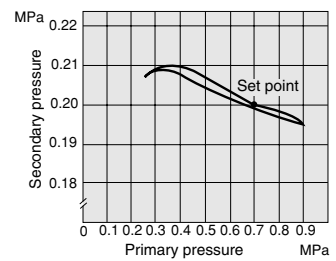
**C200**



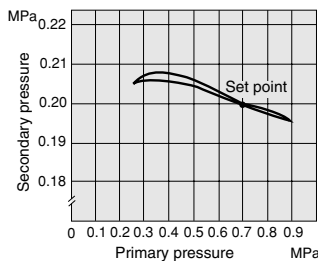
**C300**



**C400**



**C600**



1MPa=145psi. 1 ℓ/min=0.0353ft<sup>3</sup>/min.



# MICRO MIST FILTERS

## MMF150, MMF300, MMF400

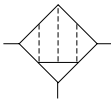


- A 0.01 $\mu\text{m}$  element eliminates fine particles and oil, protecting the equipment against breakdowns.
- Easy to attach and remove click-on bowl.
- Cartridge type element simplifies maintenance.
- Drain cock with fitting, and auto drain type drain cock, are optional.

### Specifications

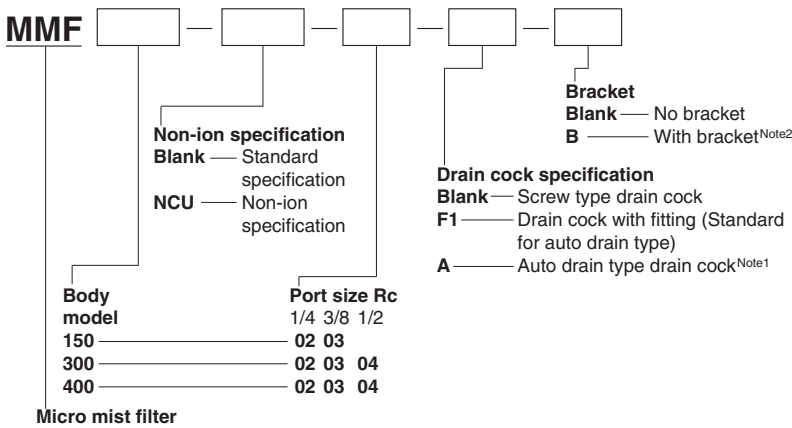
Item	Model	MMF150 <sup>Note 1</sup>	MMF300 <sup>Note 1</sup>	MMF400 <sup>Note 1</sup>	
Media		Air			
Port size	Rc	1/4, 3/8	1/4, 3/8, 1/2	1/4, 3/8, 1/2	
Filtering particle diameter	$\mu\text{m}$	0.01			
Filtering efficiency	%	99.9999			
Volume of processed air <sup>Note 2</sup>	$\ell/\text{min}$ [ $\text{ft}^3/\text{min}$ ] (ANR)	150 [5.3]	300 [10.6]	750 [26.5]	
Maximum operating pressure	MPa [psi.]	0.93 [135]			
Proof pressure	MPa [psi.]	1.47 [213]			
Operating temperature range (atmosphere and media)	$^{\circ}\text{C}$ [ $^{\circ}\text{F}$ ]	5~60 [41~140]			
Drain capacity	cc [in <sup>3</sup> ]	35 [2.14]	65 [3.97]	90 [5.49]	
Mass	kg [lb]				
		Standard	0.41 [0.90]	0.45 [0.99]	0.78 [1.72]
		Auto drain type	0.51 [1.12]	0.79 [1.74]	0.81 [1.79]
Materials	Body	Zinc die-casting	Aluminum die-casting		
	Bowl	Polycarbonate			
	Element type	E-15MM	E-30MM	E-40MM	
Standard attachments		Screw type drain cock, bowl guard			

### Symbol



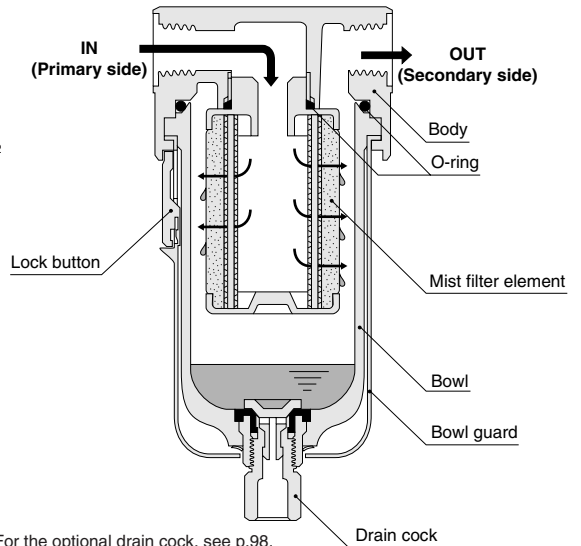
Notes: 1. The body size of the MMF150 is the same as the body size of the 300 series, while the body sizes of the MMF300 and the MMF400 are the same as the 600 series.  
2. Values are for air pressure of 0.7MPa [102psi.].

### Order Codes



Notes: 1. The auto drain type drain cock for the MF150 and MMF300 is a manufacturer option.  
2. For the bracket order codes and dimensions, see p.95~96.

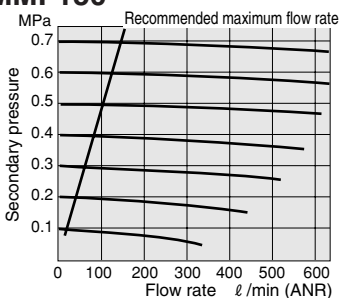
### Inner Construction



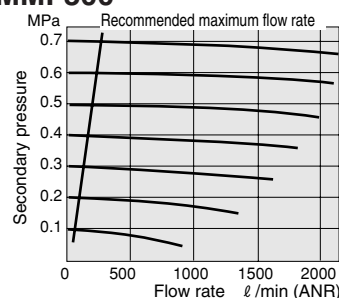
For the optional drain cock, see p.98.  
For the auto drain type, see p.73.

### Flow Rate Characteristics

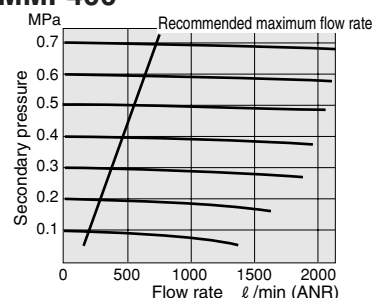
#### MMF150



#### MMF300



#### MMF400

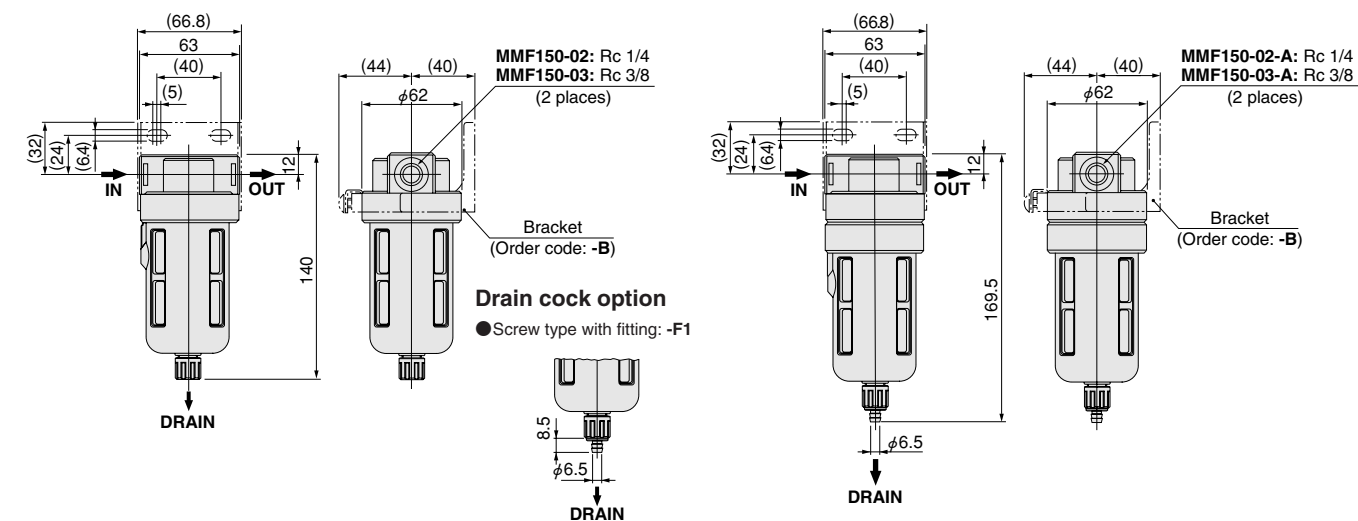


1MPa = 145psi.  
1  $\ell/\text{min}$  = 0.0353ft<sup>3</sup>/min.

**MMF150**

**MF300 MMF150-A**

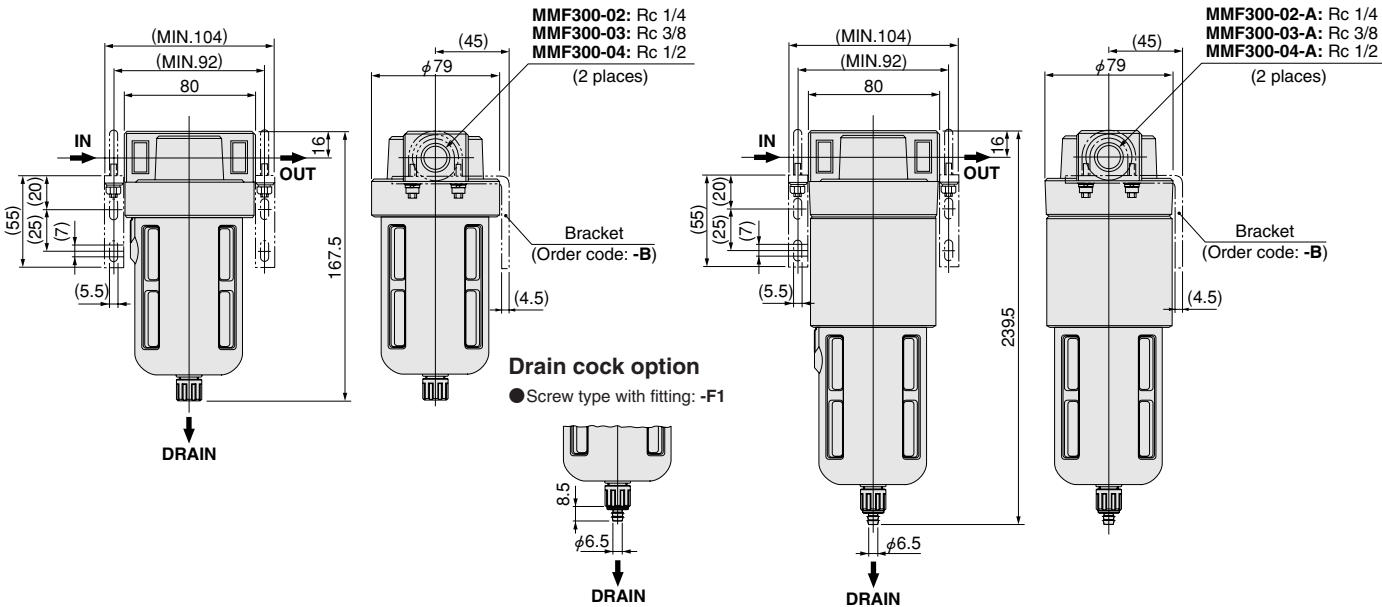
**MF300-A**



**MMF300**

**MF400 MMF300-A**

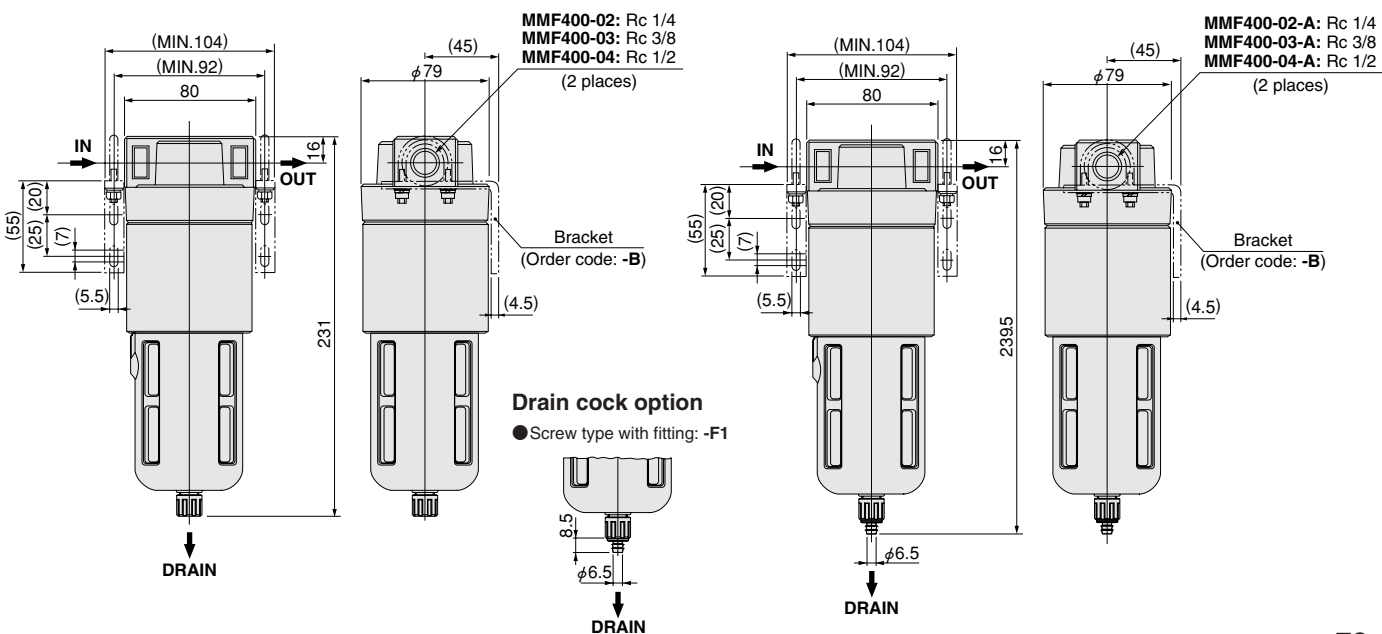
**MF400-A**



**MMF400**

**MF600 MMF400-A**

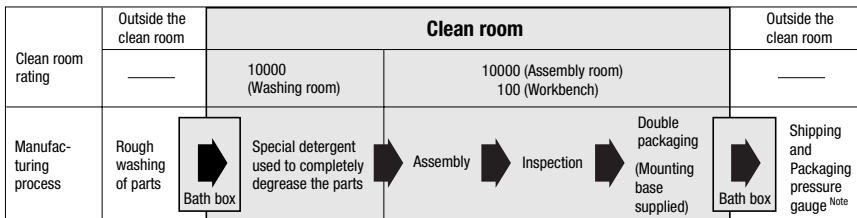
**MF600**



# Highly sensitive pressure balance control inside clean rooms

## STAINLESS REGULATORS

- Optimum for carrier gas control in various kinds of solvents and pure water circuits, for blow pressure control, for clean air and gas pressure control used in liquid crystal or semiconductor-related processes, for other food product-related lines requiring corrosion resistance, and for other non-grease type or non-oil type lines.
- Contamination-controlled manufacturing process.



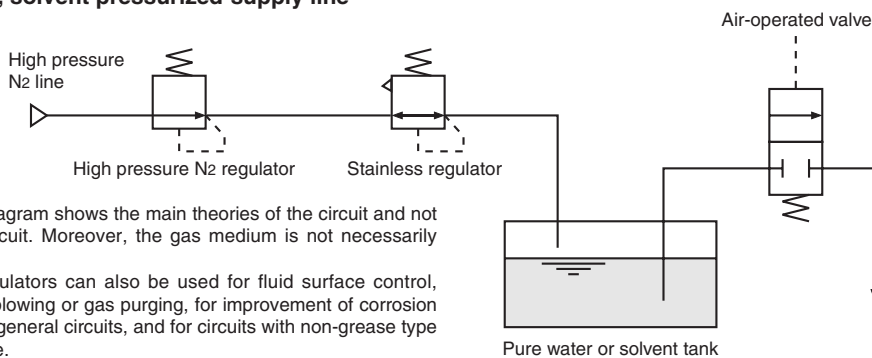
Note: The pressure gauge is just packed in single packaging at outside of the clean room.



- A push-lock mechanism is used in the pressure regulating knob.
- A mounting base for easy mounting is available as an option.
- The part that contacts gas uses SUS316, fluoro resin, or fluoro rubber materials.
- An optional pressure gauge is available.

### Application Example

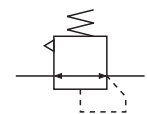
- Pure water, solvent pressurized-supply line



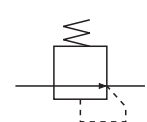
- ※ This circuit diagram shows the main theories of the circuit and not the actual circuit. Moreover, the gas medium is not necessarily limited to N<sub>2</sub>.
- ※ Stainless regulators can also be used for fluid surface control, including air blowing or gas purging, for improvement of corrosion resistance in general circuits, and for circuits with non-grease type or non-oil type.

### Symbols

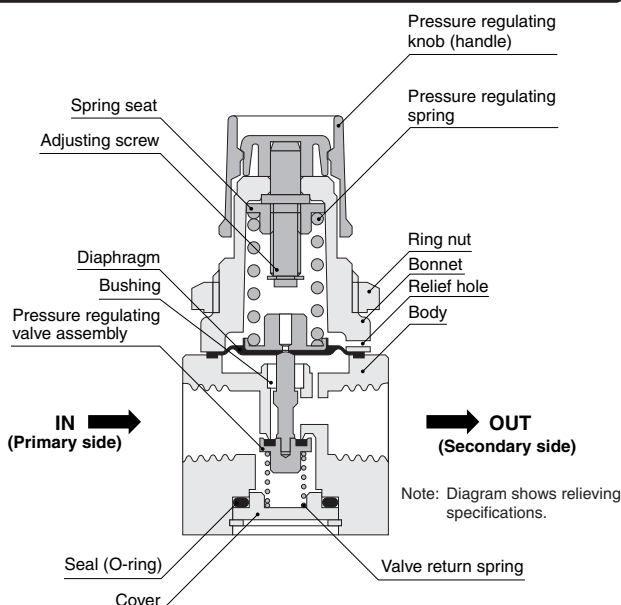
- Relief



- Non-relief



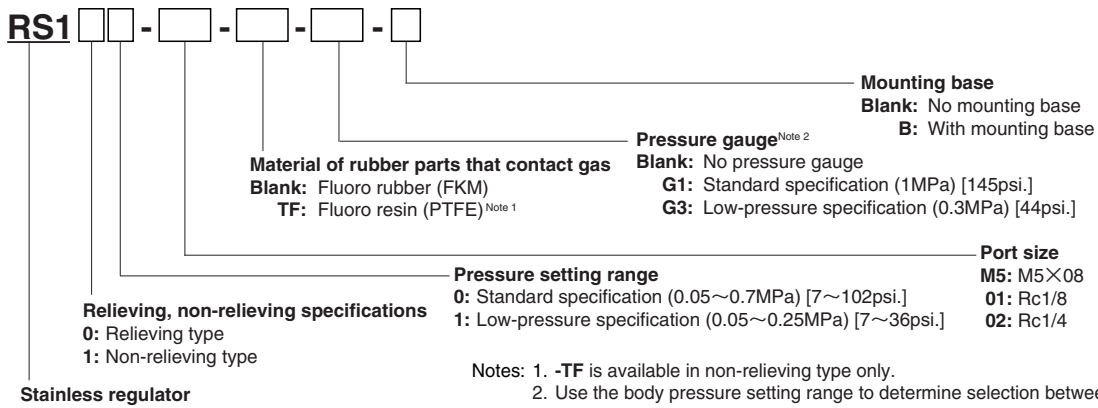
### Operation Principle and Inner Construction



### Major Parts and Materials

Parts	Materials
Body	SUS316
Pressure regulating knob (handle)	Plastic (ABS)
Bonnet	Plastic (PBT)
Diaphragm	Fluoro rubber (FKM), or fluoro rubber (FKM) with fluoro resin (PTFE) lining
Pressure regulating spring	Piano wire (zinc plated)
Seal	Fluoro rubber (FKM)
Pressure regulating valve assembly	SUS316 + fluoro rubber (FKM), or SUS316 + fluoro rubber (FKM) with fluoro resin (PTFE) lining
Cover	SUS316
Bushing	Fluoro plastic (PTFE)
Valve return spring	SUS316
Adjusting screw	Brass (nickel plated)
Spring seat	Brass (nickel plated)
Plug (supplied)	SUS316
Ring nut	Mild steel (nickel plated)
Mounting base (optional)	SPCC (nickel plated)

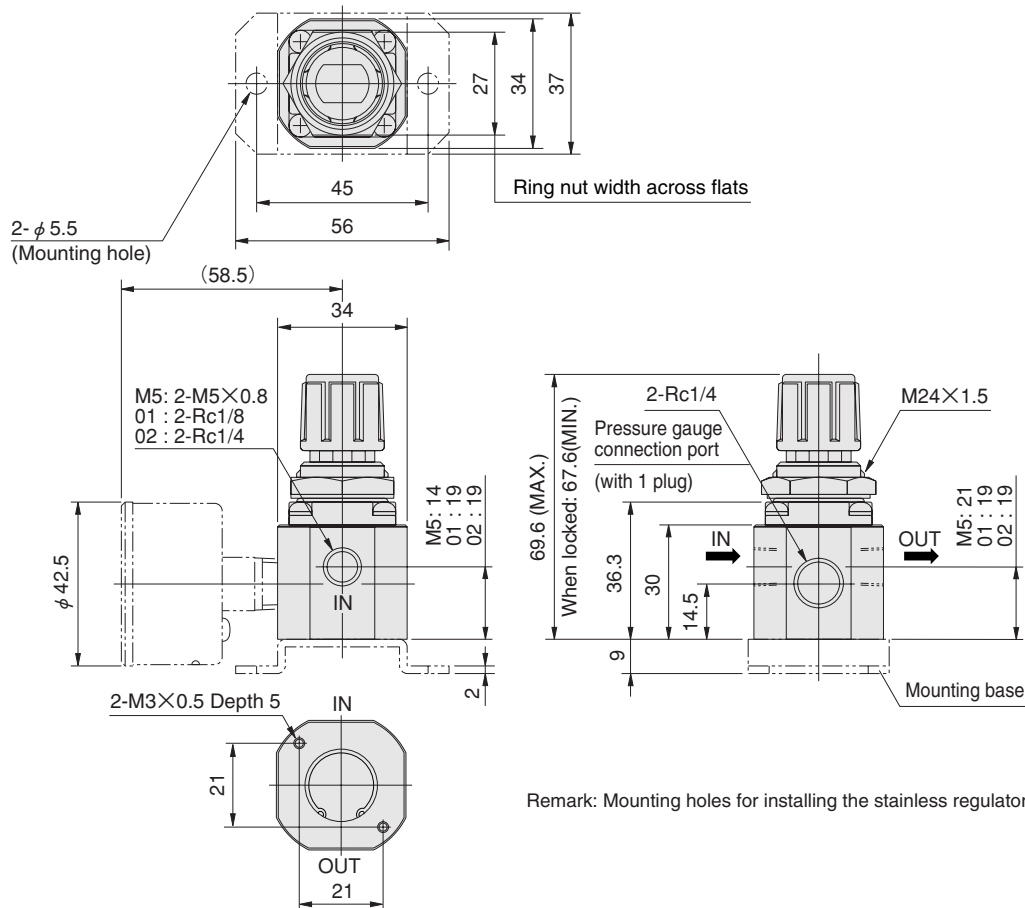
## Order Codes



## Specifications

Item	Model	RS10□		RS11□	
		RS100	RS101	RS110	RS111
Media		Air, nitrogen, carbon dioxide, helium, argon		Air, nitrogen, oxygen, carbon dioxide, helium, argon	
Operation type		Diaphragm type			
Port size		M5×0.8, Rc1/8, Rc1/4			
Pressure setting range	MPa [psi.]	0.05~0.7 [7~102]	0.05~0.25 [7~36]	0.05~0.7 [7~102]	0.05~0.25 [7~36]
Maximum operating pressure	MPa [psi.]	0.9 [131]			
Proof pressure	MPa [psi.]	1.5 [218]			
Operating temperature range	°C [°F]	5~60 [41~140]			
Mass	kg [lb.]	0.228 [0.503] (Including body, plug and hexagon nut)			
Optional	Material of valve and diaphragm that contacts gas	Fluoro rubber only (FKM)		Fluoro rubber (FKM), or fluoro plastic (PTFE)	
	Pressure gauge	G1: Standard specification (1MPa)	G3: Low-pressure specification (0.3MPa)	G1: Standard specification (1MPa)	G3: Low-pressure specification (0.3MPa)
	Mounting base	Base for mounting (mass: 0.035kg) [1.23oz.]			

## Dimensions of Stainless Regulators (mm)



Remark: Mounting holes for installing the stainless regulator on a panel are φ24.5.

# Regulators with Air Filter / Lubricator

# Air Filters / Regulators for Air / Drain Traps

### Regulators with Air Filter

**MSFR** (Regulators with Filter) **Accessory** (MSFR only) Pressure Gauge 1 pc. Bracket 1 pc.

**MSPGN1** (Pressure Gauge)

**8A-S**

**8A, 10A**

Pressure Gauge

Part Number Type	No.	Rc (PT)	Nomi. Filtration Rating (µm)	Operating Pressure (MPa)	Pressure Setting Range (MPa)	Pressure Resistance (MPa)	Ambient Temperature Range (°C)	Applicable Fluid	Mass (g)	Unit Price	Part Number	Unit Price
MSFR	8A-S	1/4	40	0-1.0	0.05-0.85	1.5	5-60	Air	210		MSPGN1 (Pressure Gauge)	
	8A	3/8	5	0.05-1.0	0.05-0.85	1.5	5-60	Air	460			
	10A	3/8	5	0.05-1.0	0.05-0.85	1.5	5-60	Air	460			

\* Structure Diagram ⑨ The drain valve automatically drains when the pressure becomes 0.05 MPa or less.

### Characteristic Data

This graph shows that when the primary pressure is constant at 0.7 MPa, the secondary set pressure drops according to the flow rate used.

**MSFR8A-S, 8A Flow Rate Characteristics**

**MSFR10A Flow Rate Characteristics**

### Component List

No.	Name	Material	No.	Name	Material
①	Main Body	ADC10	⑦	Adjusting Screw	SS400
②	Bonnet	PBT	⑧	Element	PE
③	Case Guard	ADC12	⑨	Drain Valve	C3604B POM
④	Case	PC	⑩	Lock Nut	A6063 POM
⑤	Valve	Nitrile Rubber	⑪	Bracket	SPC
⑥	Handle	POM	⑫	Pressure Gauge	-

### Lubricator

**MSRR** (Lubricator)

### Characteristic Data

This graph shows that when the primary pressure is constant, the secondary set pressure drops according to the flow rate used.

**MSRR8A Flow Rate Characteristics**

**MSRR10A Flow Rate Characteristics**

### Component List

No.	Name	Material	No.	Name	Material
①	Main Body	ADC10	⑨	Check Valve Body	C3604
②	Flow Guide Holder	POM	⑩	Syphon Tube	PU
③	Flow Guide	NBR	⑪	Feed Plug	SS400
④	Check Valve #1	SUS303	⑫	Feed Plug Gasket	NBR
⑤	Holder Gasket	NBR	⑬	Needle Valve Gasket	NBR
⑥	Check Valve #2	SUS303	⑭	Needle Valve	C3604
⑦	Check Valve Spring	SUS304	⑮	Inner Dome	PC
⑧	Air Nozzle	C3604	⑯	Inner Dome Gasket	NBR

### Component List

No.	Name	Material	No.	Name	Material
①	Main Body	ADC10	⑨	Check Valve Body	C3604
②	Flow Guide Holder	POM	⑩	Syphon Tube	PU
③	Flow Guide	NBR	⑪	Feed Plug	SS400
④	Check Valve #1	SUS303	⑫	Feed Plug Gasket	NBR
⑤	Holder Gasket	NBR	⑬	Needle Valve Gasket	NBR
⑥	Check Valve #2	SUS303	⑭	Needle Valve	C3604
⑦	Check Valve Spring	SUS304	⑮	Inner Dome	PC
⑧	Air Nozzle	C3604	⑯	Inner Dome Gasket	NBR

### Air Filters

**MSAF** (Air Filters)

**8A, 10A**

**8A-S**

### Characteristic Data

This graph shows that when the primary pressure is constant, the secondary set pressure drops according to the flow rate used.

**MSAF8A-S, 8A Flow Rate Characteristics**

**MSAF10A Nomi. Filtration Rating 5µ / 0.3µ / 0.01µ Flow Rate Characteristics**

Part Number Type	No.	Nomi. Filtration Rating (µm)	Rc (PT)	Operating Pressure (MPa)	Pressure Resistance (MPa)	Ambient Temperature Range (°C)	Applicable Fluid	Mass (g)	Unit Price
MSAF	8A-S	40	1/4	1.5	5-60	Air	140		
		0.01					250		
		0.3					270		
	10A	0.01	250						
		0.3	270						
		5	270						

### Regulators for Air

**MSR** (Regulators for Air) **Accessory**: Pressure Gauge 1 pc., Bracket 1 pc.

**8A-S**

**8A, 10A**

Part Number Type	No.	Rc (PT)	Operating Pressure (MPa)	Pressure Setting Range (MPa)	Pressure Resistance (MPa)	Ambient Temperature Range (°C)	Applicable Fluid	Mass (g)	Unit Price
MSR	8A-S	1/4	0.05-1.0	0.05-0.85	1.5	5-60	Air	250	
	8A	3/8	0.05-1.0	0.05-0.85	1.5	5-60	Air	420	
	10A	3/8	0.05-1.0	0.05-0.85	1.5	5-60	Air	420	

### Characteristic Data

This graph shows that when the primary pressure is constant at 0.7 MPa, the secondary set pressure drops according to the flow rate used.

**MSR8A-S, 8A Flow Rate Characteristics**

**MSR10A Flow Rate Characteristics**

### Ordering Example

Part Number - Nomi. Filtration Rating  
MSAF8A-S - 40  
MSR8A

### Drain Traps

**MDTNH**

### Structure Diagram

### Component List

No.	Name	Material
①	Cover	ZDC2
②	Clamp Ring	ZDC2
③	Case	PC
④	Float Assembly	-
⑤	Joint	POM
⑥	Coupling	POM

### Features

- These are Float Drain Traps and no air is allowed to escape.
- The use of a magnet ensures effective drainage.

# Conditioning Equipments / Pressure Gauge

### Regulators with Pressure Gauge + Filters

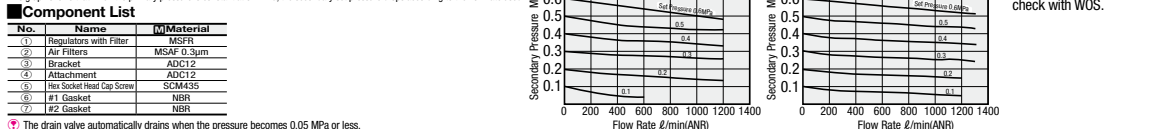
**MSFRAF**  
Regulators with Filter (5µm)  
Air Filter (0.3µm)

Accessory: Pressure Gauge 1 pc.  
Bracket 1 pc.

JIS Symbol

Part Number	No.	Rc (PT)	Nomi. Filtration Rating (µm)	Operating Pressure MPa	Pressure Setting Range MPa	Pressure Resistance MPa	Ambient Temperature Range (°C)	Applicable Fluid	Mass (g)	Unit Price
MSFRAF	8A 10A	1/4 3/8	5+0.3	0.05~1.0	0.05~0.85	1.5	5~60	Air	780	1 ~ 4 pc(s).

**Characteristic Data**  
This graph shows that when the primary pressure is constant at 0.7 MPa, the secondary set pressure drops according to the flow rate used.



**Component List**

No.	Name	Material
1	Regulators with Filter	MSFR
2	Air Filters	MSAF 0.3µm
3	Bracket	ADC12
4	Attachment	ADC12
5	Hex Socket Head Cap Screw	SCM435
6	#1 Gasket	NBR
7	#2 Gasket	NBR

For orders larger than indicated quantity, please check with WOS.

### Regulators with Filter + Lubricator

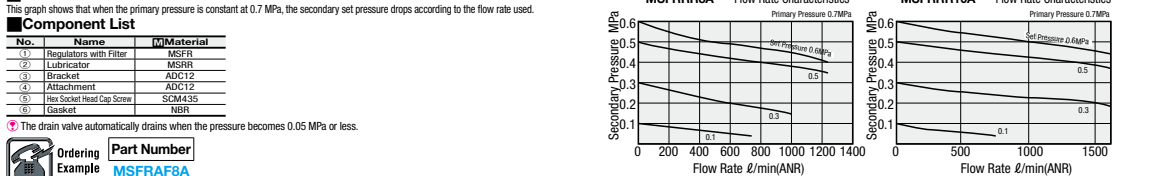
**MSFRRR**  
Regulators with Filter (5µm)  
Lubricator

Accessory: Pressure Gauge 1 pc.  
Bracket 1 pc.

JIS Symbol

Part Number	No.	Rc (PT)	Nomi. Filtration Rating (µm)	Operating Pressure MPa	Pressure Setting Range MPa	Pressure Resistance MPa	Oil Capacity (cm <sup>3</sup> )	Min. Dripping Flow Rate (l/min)	Recommended Oil	Ambient Temperature Range (°C)	Applicable Fluid	Mass (g)	Unit Price
MSFRRR	8A 10A	1/4 3/8	5	0.05~1.0	0.05~0.85	1.5	55	50 60	Turbine Oil 1 Type (ISO VG32)	5~60	Air	780	1 ~ 4 pc(s).

**Characteristic Data**  
This graph shows that when the primary pressure is constant at 0.7 MPa, the secondary set pressure drops according to the flow rate used.



### Pressure Gauge - Straight

**GPCS**

RoHS

Part Number	Type	No.	T	A	B	L	Mass (g)	Unit Price
GPCS	1	R1/8	8	21	17	8	10-20	
	2	R1/4	11	24	18	16.5		
	5	M5x0.8	3	16.5	13.5	6		

### Pressure Gauge - Union Straight

**GPUS**

RoHS

Part Number	Type	Tube O.D.D	P	C	E1	E2	Mass (g)	Unit Price
GPUS	4	10	15	17	24.5	12.5	10-20	
	6	13	17	20	26	15.5		
	8	15	18.5	22	28	20		

**Specifications**

Applicable Fluid	Air
Indicated Pressure Range	0~0.8MPa
Accuracy	±5% (Full Scale *)
Operating Temp. Range	0 ~ 60°C
Scale Angle	150°
Cap	Acrylic
Material	Metal Body: Brass (Nickel Plating) Resin Body: PBT

\*Displayed position differences when the displayed pressure has suddenly changed from 0 to Max. value of 0.8MPa.

• GPUS can be changed in direction using the hexagonal part of its body.

**Ordering Example**

Part Number	MSFRAF8A
Part Number	GPCS2

# Digital Pressure Sensors / Pressure Switches

### Digital Pressure Sensors

**MDPSA** (Low Pressure Type)  
**MDPSB** (High Pressure Type)

Connector-Terminal Arrangement Diagram

Terminal No.	Name
1	+V
2	Comparative Output 1
3	Comparative Output 2
4	0V

Cable with Connector (Accessory)

RoHS

Part Number	Type	Rated Pressure Range	Min. Voltage Resolution	Unit Price
MDPSA	Low Pressure Type	-100.0~+100.0kPa	0.1kPa	
MDPSB	High Pressure Type	-0.100~+1.000MPa	1kPa	

**Features**

- A compact type sensor with a size of 30x30mm.
- The current value and the threshold value are displayed on the sensor's dual screen panel, which allows to check or set both values smoothly without switching the display mode.
- The color of the main indication is displayed in 3 colors, which excels in operability and visibility.
- Response time can be set at 10 levels between 2.5ms and 5,000ms, which prevents chattering or malfunction due to rapid pressure change etc.

**Precautions for Use**

**Do not use this product as the detector for the purpose of human body protection.**  
(For human body protection, please use those products that satisfy laws and standards of human body protection made by each country, such as OSHA, ANSI and IEC.)

**Input/Output Circuit Diagram**

Terminal No. (Brown) +V, (Black) Comparative Output 1, (White) Comparative Output 2, (Blue) 0V

Internal Circuit: Tr1, ZD1, ZD2, Tr2

External Connection: Load, 12-24V DC ±10%

**Specifications**

Part Number	MDPSA	MDPSB
Type / Application	Low Pressure Type / (Mainly) Negative-pressure Gauge Pressure	High Pressure Type / (Mainly) Positive-pressure Gauge Pressure
Pressure Resistance	500kPa	1.5MPa
Applicable Fluid	Noncorrosive Gas (not useable for liquid or corrosive gas)	
Power Supply Voltage	12 ~ 24V DC±10% Ripple P-P 10% or less	
Power Consumption	Normal Times: 840mW or less (Supply Voltage: 24V, consumption current: 35mA or less) NPN Transistor / Open Collector Maximum Inflow Current: 100mA	
Comparative Output	Applied Voltage: 30V DC or less (Between comparative output and 0V) Residual Voltage: 2V or less (Inflow current 100mA) Select NO or NC by key operation	
Output Operation	1 digit minimum (variable)	
Response Differential (Hysteresis)	±0.1%F.S (±2 digits or less)	
Repeatability	±0.2%F.S (±2 digits or less)	
Response Time	Select from (2.5, 5, 10, 25, 50, 100, 250, 500, 1,000, 5,000) ms	
Short Circuit Protection	Provided	
External Input	Not Applicable	
Analog Voltage Output	Not Applicable	
Display	4 digits + 4 digits and 3 colors LCD display (display update cycle: select from 250, 500 and 1,000ms)	
Indicated Pressure Range	-100.0~+100.0kPa	-0.100~+1.000MPa
Indicator Light	Orange LED	
Protection Structure	IP40(IEC)	
Ambient Operating Temperature	-10~+50°C, for storage: -10~+60°C	
Ambient Operating Humidity	35 ~ 85% RH (However, no dewing and no freezing), for storage: 35 ~ 85% RH	
Withstand Voltage	1,000VAC 1 minute between charged parts and Case	
Insulation Resistance	50MΩ or more with 500VDC mega between Recharger and Case	
Vibration Resistance	Endurance: 10 ~ 50Hz Double Amplitude of 3mm X, Y, Z Directions Each	
Impact Resistance	Endurance: 100m/s <sup>2</sup> (Approx. 10g) 3 times for XYZ direction each	
Temperature Properties	Temperature: within ±0.5% F.S. within ±1% F.S.	
Pressure Port	M5 Tapped + R (PT) 1/8 Threaded	
Connection Method	Connector	
Wire Length	100m long cable with sectional area of 0.3 square millimeter or more Case: PBT, LCD Display: Acrylic, Switch: Silicon Rubber Pressure Port: SUS303 Screw, Brass (Nickel Plating) Mounting Metal: SPCC (Trivalent Bright Chromate)	
Material		
Body Mass	Approx. 40g	

\* The ambient operating temperature is +20°C for the measurement conditions without any specification.

### Pressure Switch

**MPSS**

Configuration of Parts

RoHS

Part Number	Type	No.	Unit Price
MPSS	6A		

**Features**

- A contact type pressure switch with a built-in lead switch.
- Operating Pressure can be easily set by handle rotating operation.
- LED display allows easy checking of ON/OFF operation.

**Ordering Example**

Part Number	MDPSA
Part Number	MPSS6A

**Specifications**

Applicable Fluid	Air
Set Pressure (Mpa)	0.1~0.7
Max. Operating Pressure (Mpa)	0.8
Pressure Resistance (Mpa)	1.0
Operating Temp. Range (°C)	5~60
Pipe Connection Bore Dia.	R1/8
Sensor Switches	Lead Switches (Contact Type) Normally Open / LED Lights when ON Lead Wire Length 1m Contact Capacity: 85 ~ 115VAC / 5 ~ 30VDC, 25mA or less
Mass	185g

