

## WO81 Airflow rate/airflow speed meter

RoHS



This page and the following page introduce the WO81 airflow rate/airflow speed meters. For WO81 micro differential pressure gauges, refer to page 11.

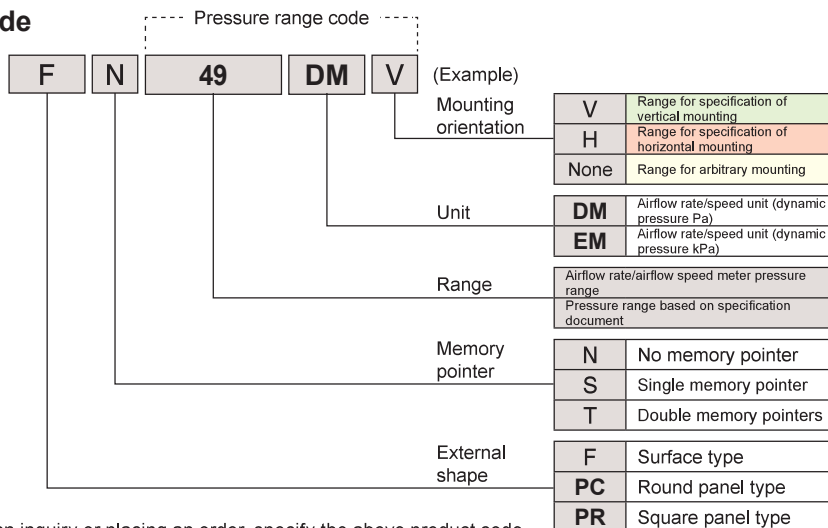
### Display units

Airflow rate meter				Airflow speed meter
m <sup>3</sup> /h	m <sup>3</sup> /h (nor)	m <sup>3</sup> /min	m <sup>3</sup> /min (nor)	m / s
m <sup>3</sup> /h ×10	m <sup>3</sup> /h ×10 (nor)	m <sup>3</sup> /min ×10	m <sup>3</sup> /min ×10 (nor)	
m <sup>3</sup> /h ×1000	m <sup>3</sup> /h ×1000 (nor)	m <sup>3</sup> /min ×1000	m <sup>3</sup> /min ×1000 (nor)	
m <sup>3</sup> /h ×10000	m <sup>3</sup> /h ×10000 (nor)	m <sup>3</sup> /min ×10000	m <sup>3</sup> /min ×10000 (nor)	

WO81 airflow rate meter

### Product code

WO81



To procure an airflow rate/speed meter, it is necessary to first prepare a specification document and check it. Because we will prepare a specification document, please fill in (1) or (2) in the sheet below and let us know the specifications.

### Airflow rate/airflow speed specification document preparation sheet

	Pressure detector	Duct size	Specified airflow rate (speed)	Measured gas density
①	<b>Procuring device based on use conditions</b> *Select any of the following. <input type="checkbox"/> Overall/static pressure tube (Pitot tube) <input type="checkbox"/> Total pressure tube + static pressure tube <input type="checkbox"/> Composite Pitot tube (Aero eye, etc.)	*Select any of the following, and enter the desired values in the squares below. <input type="checkbox"/> Round type Inner diameter: <input type="text"/> mm <input type="checkbox"/> Square type <input type="text"/> x <input type="text"/> mm	*Indicate the unit as well. Normal flow rate (speed) value: <input type="text"/> Maximum flow rate (speed) value: <input type="text"/>	*Select any of the following, and enter the desired values in the squares below. <input type="checkbox"/> Standard air density: 1.198 kg/m <sup>3</sup> <input type="checkbox"/> Mixed gas density: <input type="text"/> kg/m <sup>3</sup> <input type="checkbox"/> When gas density is unknown Measured gas temperature: <input type="text"/> °C Measured gas humidity: <input type="text"/> % RH Static pressure at measurement point: <input type="text"/> Pa
②	<b>Procuring device based on relationship between airflow rate (speed) and pressure</b>	When the airflow rate (speed) is <input type="text"/> , the airflow rate (speed) up to <input type="text"/> is measured with the conversion condition of dynamic pressure of <input type="text"/> Pa.		

◆The maximum airflow rate/speed scale value is applied after rounding it to our scale value.

## WO81 Airflow rate/airflow speed meter

List of products

WO81

WO71

FR51A

MS99

MS99S

MS61A-RA

QDP33

EMD8A

EMD7

EMT1

EMTGP1

EMT1H

EMT6

EMP5A

EMRT1

HWS15A

Accessories

Application

Precautions

Maintenance

### Specifications

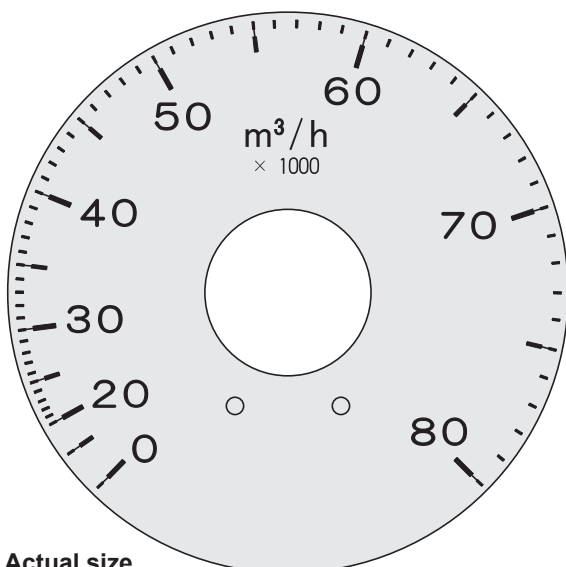
Model	Main body		Surface type	Round panel type	Square panel type
	Memory pointer		F	PC	PR
	No memory pointer	N	WO81FN	WO81PCN	WO81PRN
	Single memory pointer (red)	S	WO81FS	WO81PCS	WO81PRS
	Double memory pointers (one each for red and green)	T	WO81FT	WO81PCT	WO81PRT
<b>Unit</b>	Airflow rate/airflow speed Differential pressure method		<b>Compatible pipe</b>	<ul style="list-style-type: none"> <li>Vinyl pipe or rubber pipe (inner diameter of 6 mm)</li> <li>..... Base for resin vinyl pipe (already mounted on gauge)</li> <li>Metallic pipe (outer diameter of 6 ± 0.1 mm)</li> <li>..... Separately sold base for metallic pipe is necessary.</li> <li>Hard plastic pipe (outer diameter 6 mm × inner diameter 4 mm)</li> <li>..... Separately sold base for metallic pipe and inner sleeve set (refer to page 111) or push-in joint is necessary.</li> </ul>	
<b>Pressure measurement method</b>	Diaphragm				
<b>Pressure-receiving element</b>	Air and noncorrosive gas (liquid cannot be measured)		<b>Polarity of piping connector</b>	<ul style="list-style-type: none"> <li>Identification with red on high pressure side and blue on low pressure side</li> <li>By exchanging the base on the high-pressure side with that on the low pressure side, it is possible to change the polarity.</li> </ul>	
<b>Measured gas</b>	Wide-angle indication of approx. 270 degrees				
<b>Scale indication angle</b>	-10°C to +50°C (no freezing allowed)		<b>Mass</b>	Approx. 270 g	
<b>Operating ambient temperature</b>	90% RH or below (no condensation allowed)				
<b>Operating ambient humidity</b>	200 kPa (refer to page 118)				
<b>Instrument body withstanding pressure</b>	Polycarbonate and polyamide				
<b>Exterior material</b>	100 m/s <sup>2</sup> (six times each for three axial directions)				
<b>Durable impact</b>	5 to 10 Hz Amplitude of 10 mm,				
<b>Durable vibration</b>	10 to 50 Hz Acceleration of 39 m/s <sup>2</sup> (two hours each for three axial directions)				
<b>Accessories</b>	WO81F		WO81PC		WO81PR
	Mounting screw set		Two sets of mounting fittings (already mounted on gauge body)		Mounting nut set (already mounted on gauge body)
<b>Pressure range code</b>	<b>Airflow rate/airflow speed range</b>	<b>Mounting orientation (Refer to page 18)</b>	<b>Accuracy (Note) (at 20°C)</b>	<b>Pressure-receiving element material</b>	<b>Withstanding pressure of pressure-receiving element (Refer to page 118)</b>
49 DMH	Depends on airflow rate/airflow speed scale specification document.	Horizontal (specification)	Within ± 5% FS	Silicone rubber	10 kPa
49 DMV		Upright (specification)			
70 DMH		Horizontal (specification)			
70 DMV		Upright (specification)			
100 DMH		Horizontal (specification)			
100 DMV		Upright (specification)			
130 DMH		Horizontal (specification)	Within ± 2.5% FS		
130 DMV		Upright (specification)			
180 DMH		Horizontal (specification)			
180 DMV		Upright (specification)			
250 DM		Between horizontal and upright Arbitrary mounting			Within ± 1.5% FS
300 DM					
400 DM					
580 DM					
1000 DM					
1.8 EM					
3.2 EM		40 kPa			
4.5 EM					
8.5 EM					
10 EM	150 kPa				

(Note) [Value]: Arbitrary (to be rounded), [magnification]: ×10, ×1000, ×10000, [units]: m<sup>3</sup>/h, m<sup>3</sup>/min, m<sup>3</sup>/h (nor), m<sup>3</sup>/min (nor), m/s

(Note) Accuracy at full span of pressure value (refer to page 121)

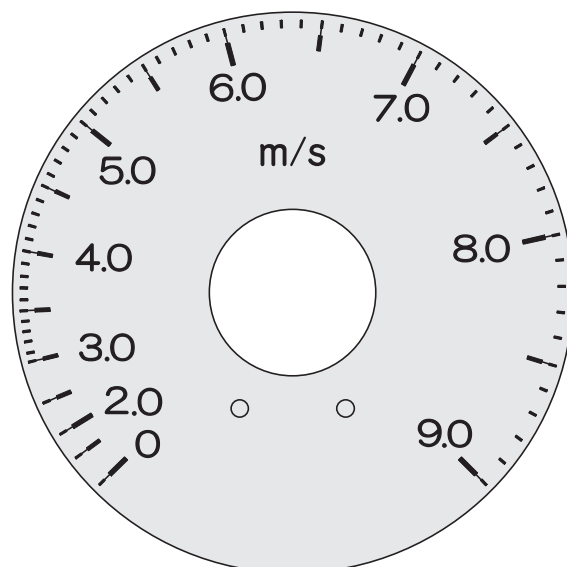
◆For use environment, refer to page 118.

### Airflow rate/airflow speed range (scale example)



Actual size

Airflow rate scale



Airflow speed scale

## Model WO81F

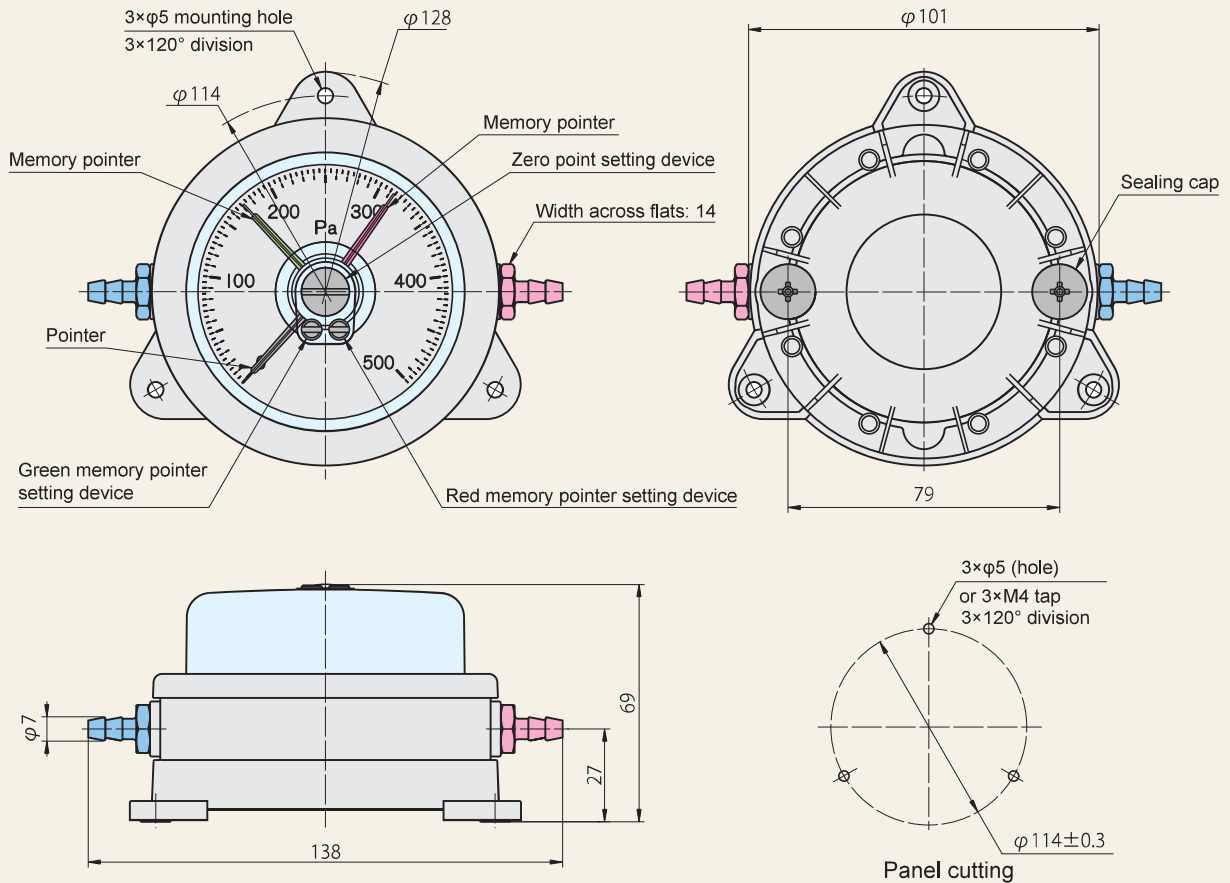
List of products

WO81

### External dimension drawing

Installation of base on side face.....(standard condition at time of shipment from factory)

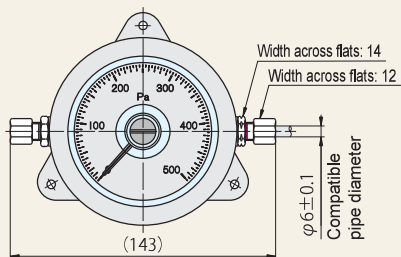
#### VT base (for vinyl pipe)



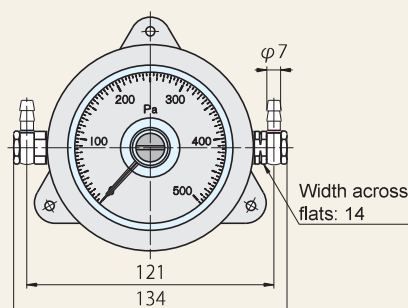
### Example of base arrangement

Installation of base on side face

#### MT base (for metallic pipe)

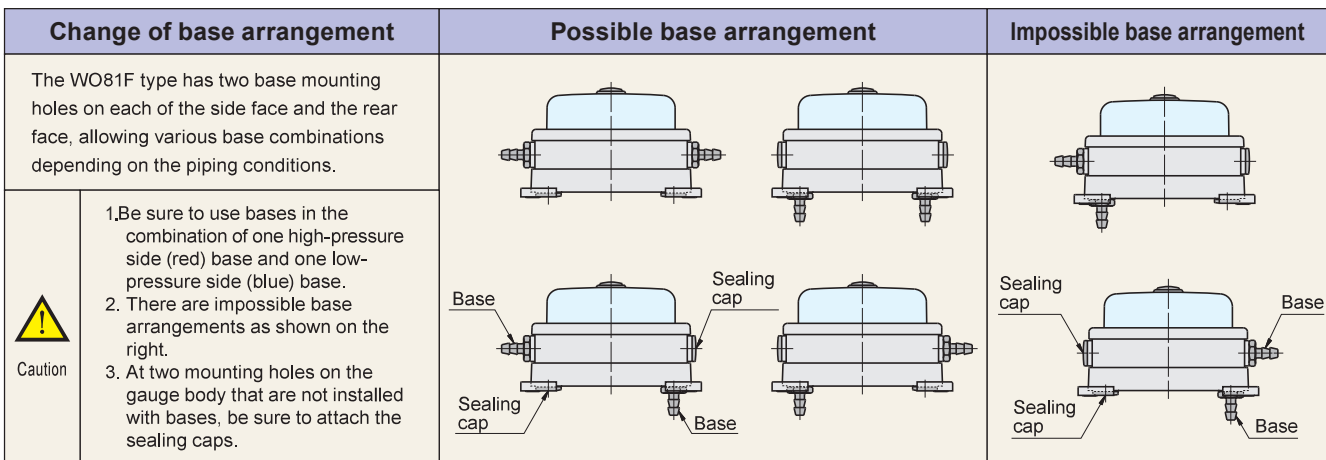
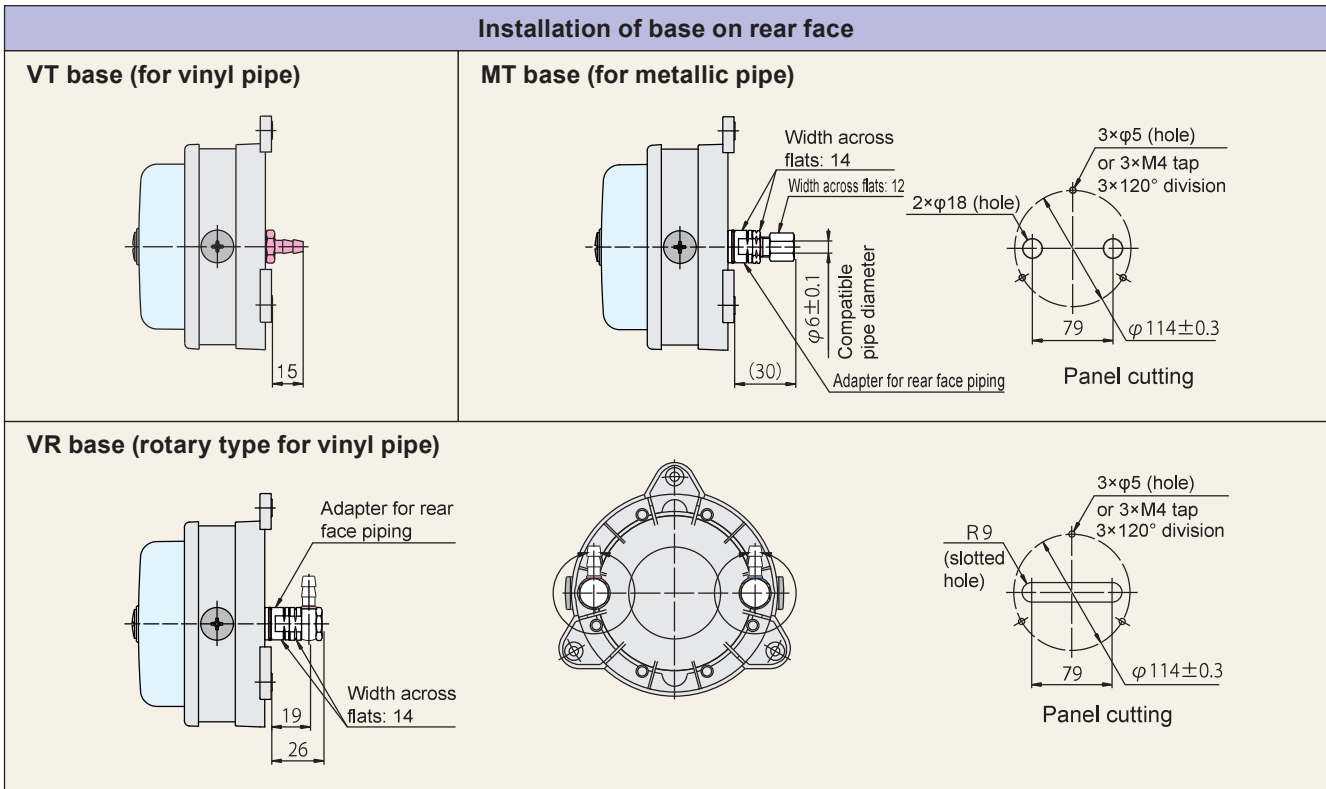


#### VR base (rotary type for vinyl pipe)

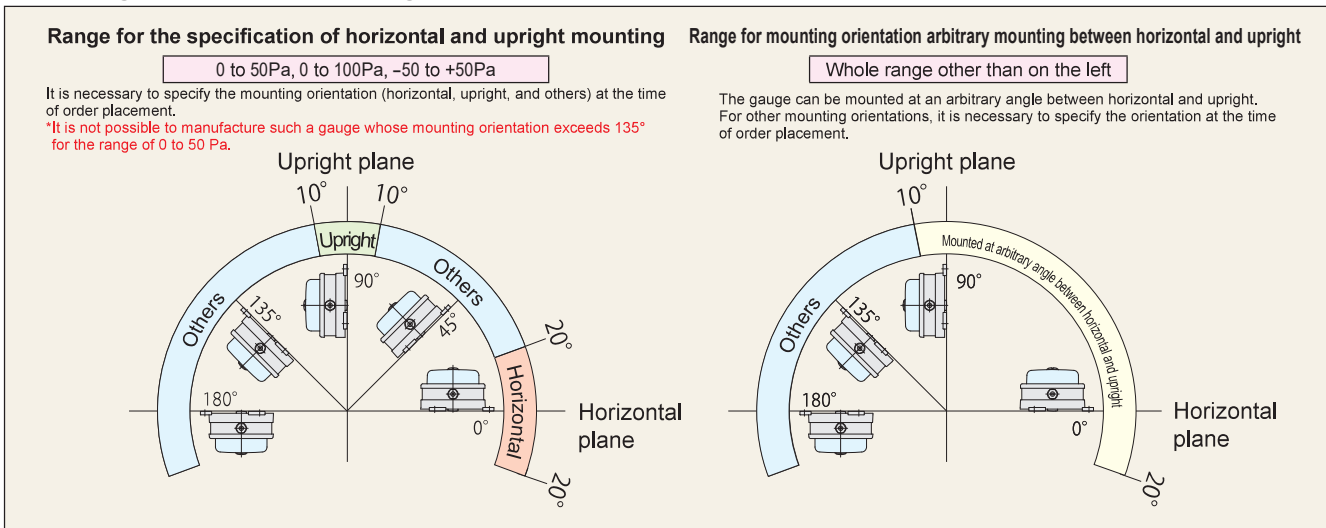


Caution

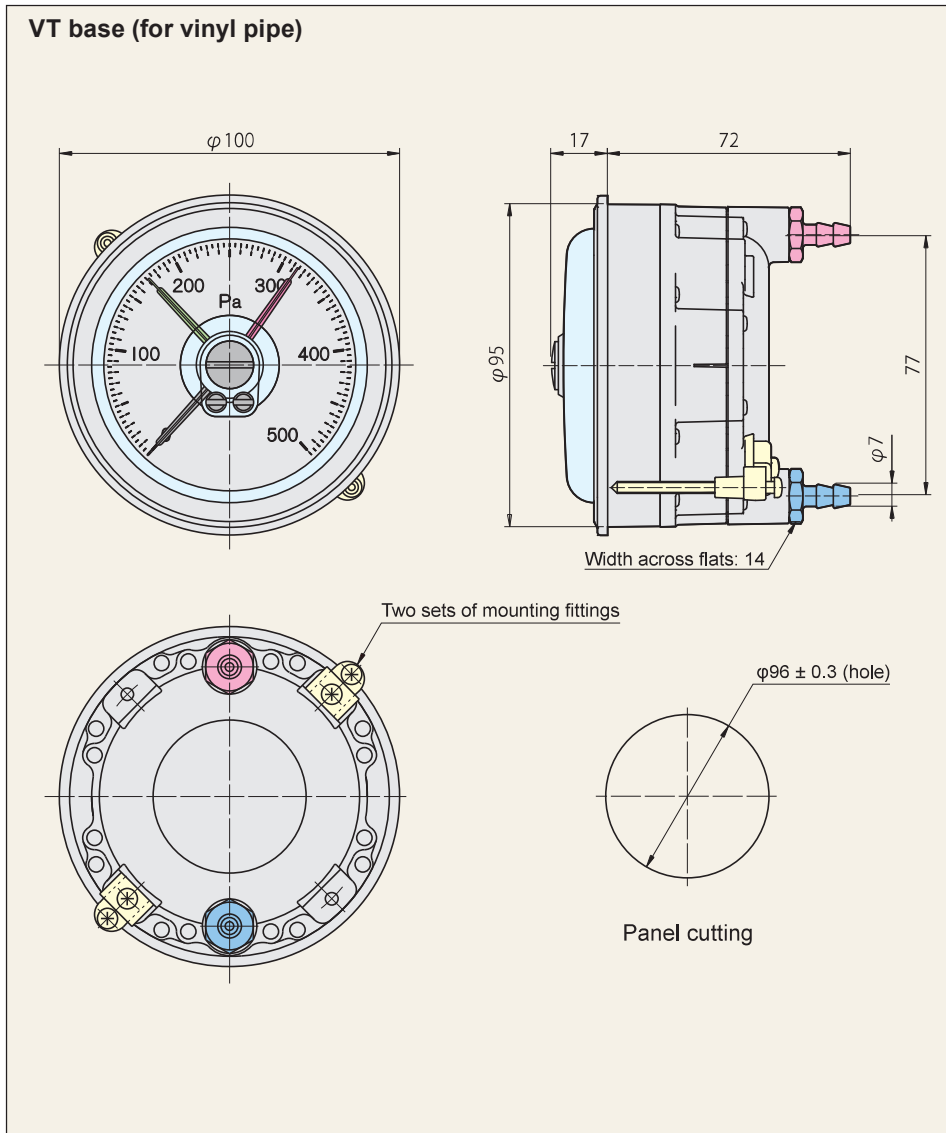
Base tightening torque: 1 N·m    Sealing cap tightening torque: 0.5 N·m  
Do not tighten to a torque that exceeds the specified value because doing so breaks the gauge body. (Refer to page 120.)



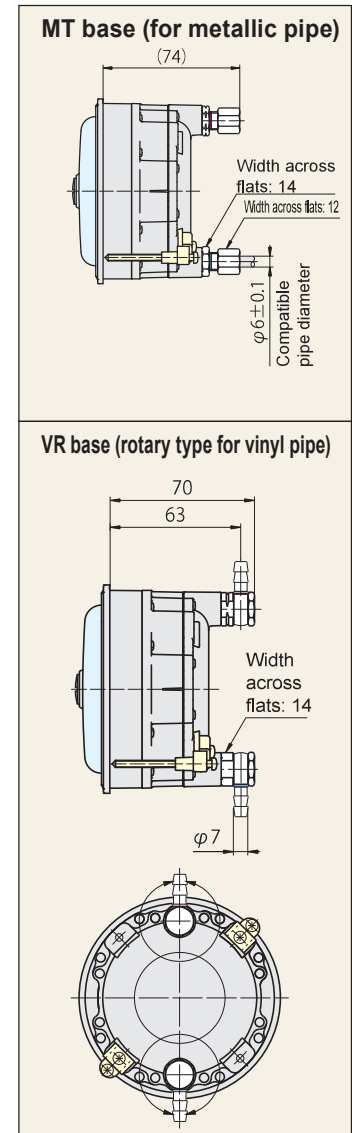
### Mounting orientation and range



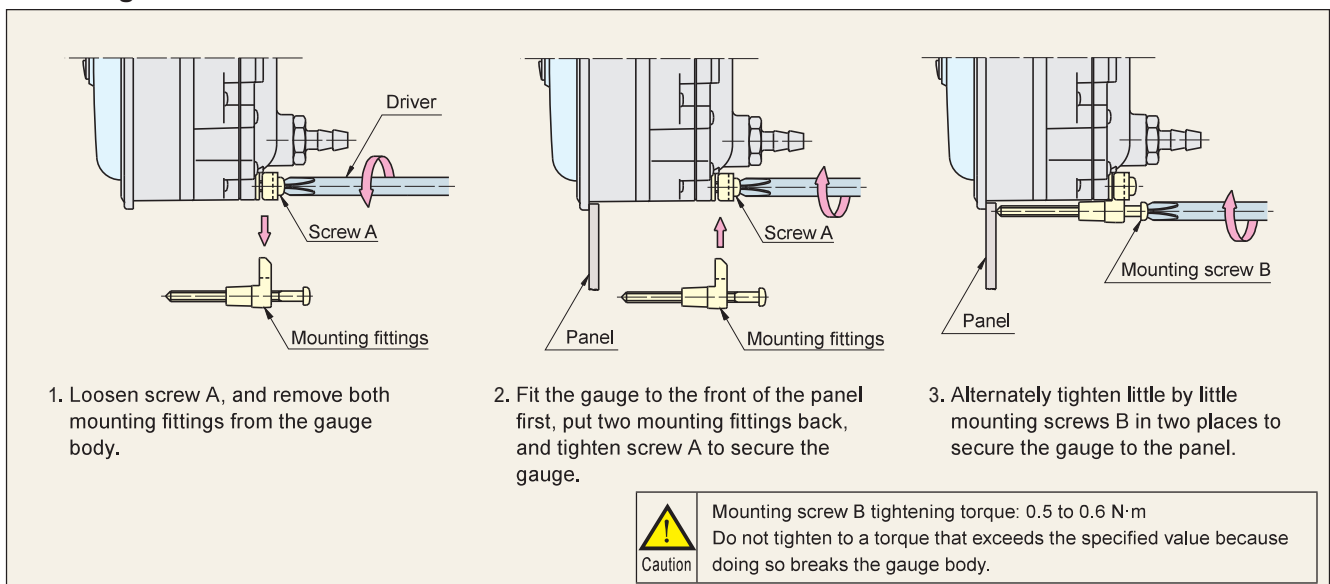
### External dimension drawing



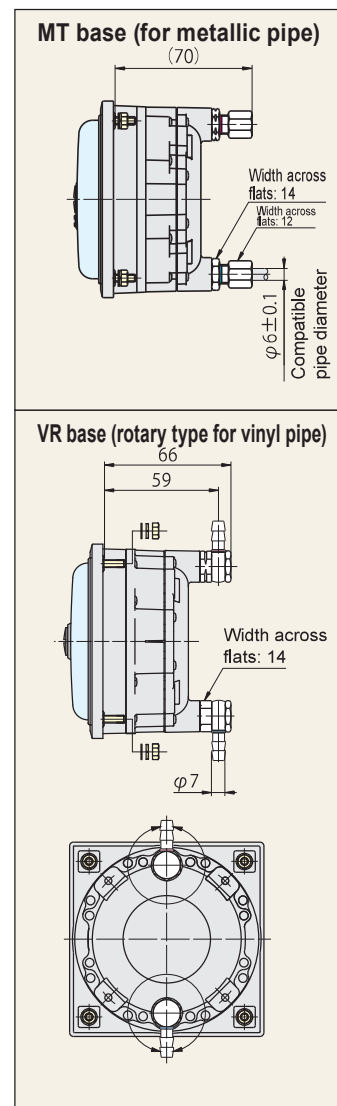
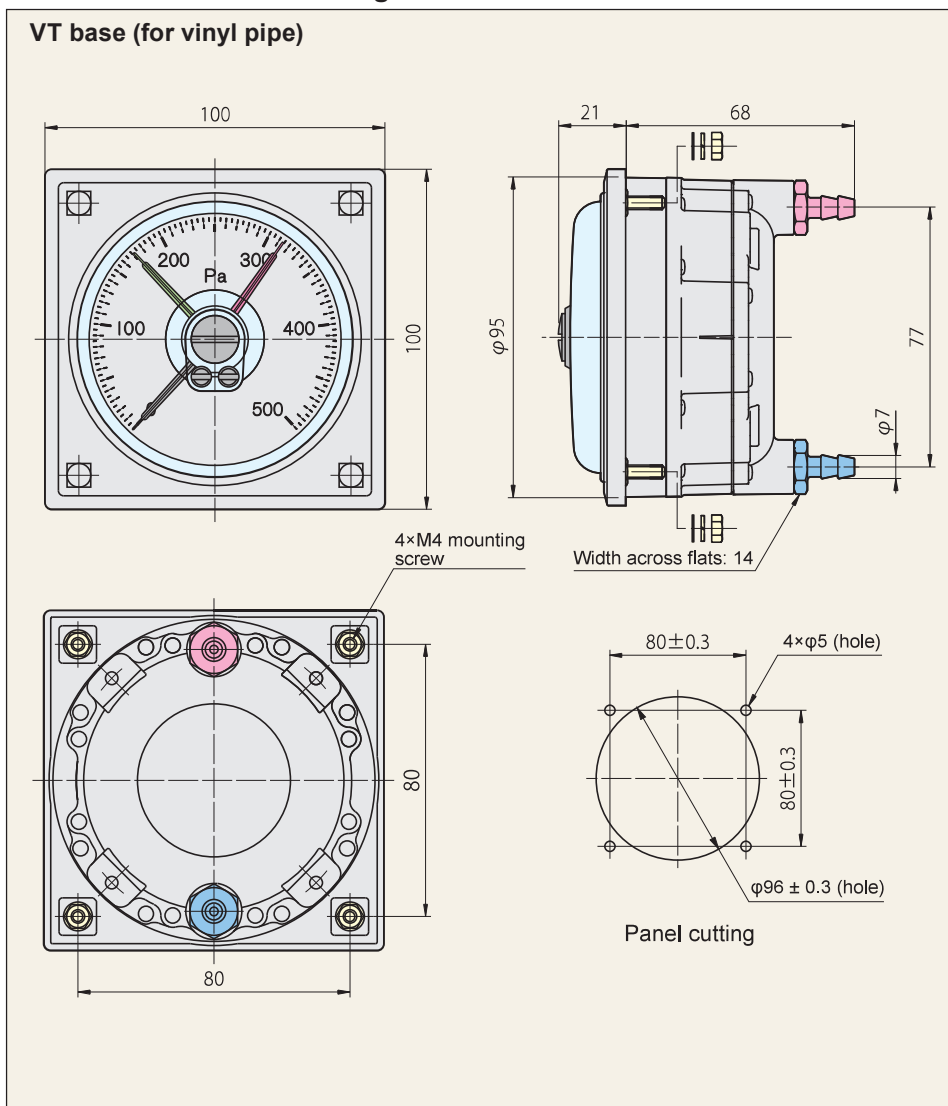
### Example of base arrangement



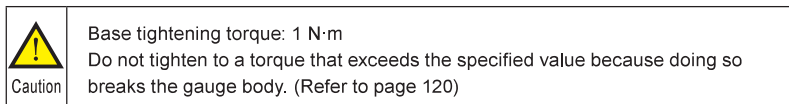
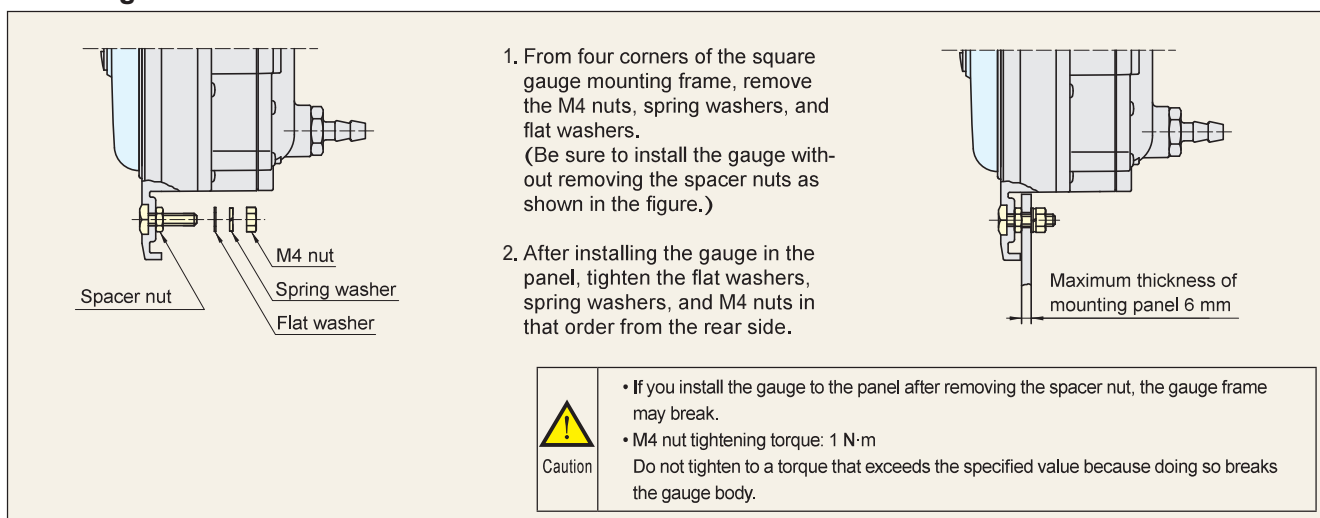
### Mounting method



### External dimension drawing

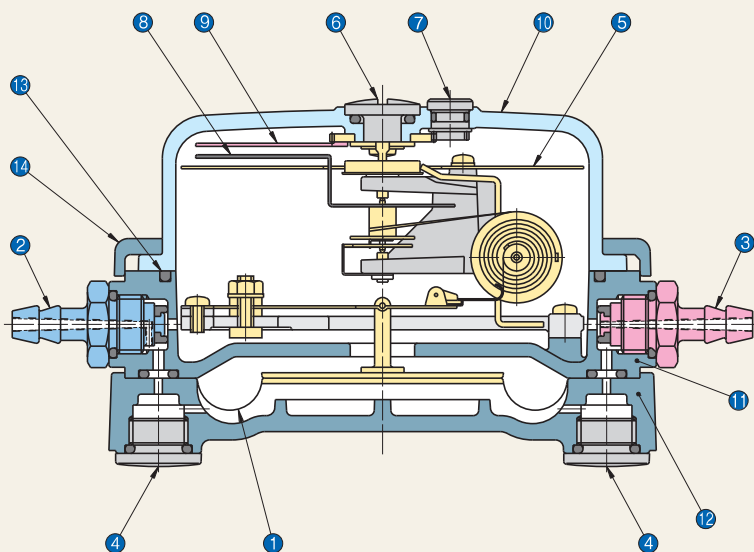


### Mounting method



## WO81

### Overview of structure



Number	Name
1	Diaphragm
2	Low-pressure side base (blue)
3	High-pressure side base (red)
4	Sealing cap
5	Scale plate
6	Zero point setting device
7	Memory pointer setting device
8	Pointer
9	Memory pointer
10	Transparent cover
11	Housing
12	Base
13	Cover packing
14	Cover retention ring

### Accessories dedicated to WO81

RoHS

#### Sealing cap

Dedicated to F type



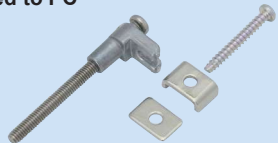
(Auxiliary item)

This is already installed when the gauge is purchased.

Item number	Material
KGA81PLG	Polypropylene

#### Mounting fitting set

Dedicated to PC type



(Auxiliary item)

The combination of parts in the photograph constitutes one set. On the gauge, two sets (for one gauge) are already installed as a standard accessory.

Item number	Material
TKA81PC	Aluminum die casting/steel

#### Portable box

Dedicated to F type



Item number	Material
PB-01	Steel

\*Gauge body is not included.

### Accessories for WO81

RoHS

#### VT base

High-pressure side

(Auxiliary item)



Low-pressure side

(Auxiliary item)



Item number	Material
KGA81VT-H-P	Polypropylene

Item number	Material
KGA81VT-L-P	Polypropylene

A vinyl pipe or rubber pipe with an inner diameter of 6 mm can be connected. This is already installed when the gauge is purchased.

#### VR base

High-pressure side



Low-pressure side



Item number	Material
KGA81VR-H	Brass

Item number	Material
KGA81VR-L	Brass

This serves as an elbow whose tube mounting part rotates. A vinyl pipe or rubber pipe with an inner diameter of 6 mm can be connected.

## WO81

List of products

WO81

WO71

FR51A

MS99

MS99S

MS61A-RA

QDP33

EMD8A

EMD7

EMT1

EMTGP1

EMT1H

EMT6

EMP5A

EMRT1

HWS15A



Accessories



Application



Precautions



Maintenance



### Accessories for WO81 RoHS



PT base																			
High-pressure side		Low-pressure side																	
																			
<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81PT-H</td><td>PBT/brass</td></tr></table>	Item number	Material	KGA81PT-H	PBT/brass	<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81PT-L</td><td>PBT/brass</td></tr></table>	Item number	Material	KGA81PT-L	PBT/brass	<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81PT-L</td><td>PBT/brass</td></tr></table>	Item number	Material	KGA81PT-L	PBT/brass	<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81PT-L</td><td>PBT/brass</td></tr></table>	Item number	Material	KGA81PT-L	PBT/brass
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KGA81PT-L	PBT/brass																		
Item number	Material																		
KGA81PT-L	PBT/brass																		
Item number	Material																		
KGA81PT-L	PBT/brass																		
<p>The tube mounting part is a push-in joint. For piping, use the separately sold tube (refer to page 112) or a tube compatible with JIS B 8381-1. (Connectable tube outer diameter: 6 mm)</p>																			



PR base																			
High-pressure side		Low-pressure side																	
																			
<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81PR-H</td><td>PBT/brass</td></tr></table>	Item number	Material	KGA81PR-H	PBT/brass	<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81PR-L</td><td>PBT/brass</td></tr></table>	Item number	Material	KGA81PR-L	PBT/brass	<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81PR-L</td><td>PBT/brass</td></tr></table>	Item number	Material	KGA81PR-L	PBT/brass	<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81PR-L</td><td>PBT/brass</td></tr></table>	Item number	Material	KGA81PR-L	PBT/brass
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KGA81PR-L	PBT/brass																		
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KGA81PR-L	PBT/brass																		
<p>The tube mounting part is a rotary elbow push-in joint. The piping is the same as that for the PT base. (Connectable tube outer diameter: 6 mm)</p>																			



MT base																			
High-pressure side		Low-pressure side																	
																			
<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81MT-H</td><td>Brass</td></tr></table>	Item number	Material	KGA81MT-H	Brass	<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81MT-L</td><td>Brass</td></tr></table>	Item number	Material	KGA81MT-L	Brass	<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81MT-L</td><td>Brass</td></tr></table>	Item number	Material	KGA81MT-L	Brass	<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81MT-L</td><td>Brass</td></tr></table>	Item number	Material	KGA81MT-L	Brass
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KGA81MT-L	Brass																		
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KGA81MT-L	Brass																		
Item number	Material																		
KGA81MT-L	Brass																		
<p>A metallic pipe, such as copper pipe and aluminum pipe, with an outer diameter of <math>6 \pm 0.1</math> mm can be connected. However, for stainless steel pipe, use an MTW base. When connecting with a plastic pipe (outer diameter 6 mm <math>\times</math> inner diameter 4 mm), remove the brass sleeve and use the separately sold resin inner sleeve set (XIN6<math>\times</math>4; refer to page 111).</p>																			

MR base																			
High-pressure side		Low-pressure side																	
																			
<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81MR-H</td><td>Brass</td></tr></table>	Item number	Material	KGA81MR-H	Brass	<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81MR-L</td><td>Brass</td></tr></table>	Item number	Material	KGA81MR-L	Brass	<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81MR-L</td><td>Brass</td></tr></table>	Item number	Material	KGA81MR-L	Brass	<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81MR-L</td><td>Brass</td></tr></table>	Item number	Material	KGA81MR-L	Brass
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KGA81MR-L	Brass																		
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KGA81MR-L	Brass																		
Item number	Material																		
KGA81MR-L	Brass																		
<p>This serves as an elbow whose tube mounting part rotates. The piping material is the same as that for the MT base. When connecting with a plastic pipe (outer diameter 6 mm <math>\times</math> inner diameter 4 mm), remove the brass sleeve and use the separately sold resin inner sleeve set (XIN6<math>\times</math>4; refer to page 111).</p>																			

MTW base																			
High-pressure side		Low-pressure side																	
																			
<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81MTW-H-S</td><td>Stainless steel</td></tr></table>	Item number	Material	KGA81MTW-H-S	Stainless steel	<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81MTW-L-S</td><td>Stainless steel</td></tr></table>	Item number	Material	KGA81MTW-L-S	Stainless steel	<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81MTW-L-S</td><td>Stainless steel</td></tr></table>	Item number	Material	KGA81MTW-L-S	Stainless steel	<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81MTW-L-S</td><td>Stainless steel</td></tr></table>	Item number	Material	KGA81MTW-L-S	Stainless steel
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KGA81MTW-L-S	Stainless steel																		
Item number	Material																		
KGA81MTW-L-S	Stainless steel																		
Item number	Material																		
KGA81MTW-L-S	Stainless steel																		
<p>This is used to connect a stainless steel pipe with an outer diameter of <math>6 \pm 0.1</math> mm.</p>																			

Adapter for rear face piping																			
High-pressure side (Dedicated to F type rear face piping)		Low-pressure side (Dedicated to F type rear face piping)																	
																			
<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81FBA-H</td><td>Brass</td></tr></table>	Item number	Material	KGA81FBA-H	Brass	<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81FBA-L</td><td>Brass</td></tr></table>	Item number	Material	KGA81FBA-L	Brass	<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81FBA-L</td><td>Brass</td></tr></table>	Item number	Material	KGA81FBA-L	Brass	<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81FBA-L</td><td>Brass</td></tr></table>	Item number	Material	KGA81FBA-L	Brass
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KGA81FBA-L	Brass																		
Item number	Material																		
KGA81FBA-L	Brass																		
<p>When arranging an MT base on the rear face of the WO81F type, this adapter is required as a spacer for hooking a stabilizing wrench to the base at the time of pipe connection. This adapter is also required when arranging the VR base or MR base (excluding MTW base) on the rear face in order to avoid interference between the base and panel. When connecting an R1/8 joint, use an R1/8 base adapter.</p>																			

R1/8 base adapter																			
High-pressure side		Low-pressure side																	
																			
<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81R1/8AD-H</td><td>Brass</td></tr></table>	Item number	Material	KGA81R1/8AD-H	Brass	<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81R1/8AD-L</td><td>Brass</td></tr></table>	Item number	Material	KGA81R1/8AD-L	Brass	<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81R1/8AD-L</td><td>Brass</td></tr></table>	Item number	Material	KGA81R1/8AD-L	Brass	<table border="1" style="width: 100%;"><tr><th>Item number</th><th>Material</th></tr><tr><td>KGA81R1/8AD-L</td><td>Brass</td></tr></table>	Item number	Material	KGA81R1/8AD-L	Brass
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Item number	Material																		
KGA81R1/8AD-L	Brass																		
<p>It is possible to connect an R1/8 joint. *The specifications of this adapter differ from those of the adapter for rear face piping.</p>																			

R1/8 base adapter (SUS)																			
High-pressure side		Low-pressure side																	
																			
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<p>It is possible to connect an R1/8 joint. *The specifications of this adapter differ from those of the adapter for rear face piping.</p>																			



## Warranty

### Warranty period

The warranty period for our product is one (1) year from delivery to the location specified by the orderer who makes a direct transaction with us.

### Scope of warranty

If any failure or defect attributable to us becomes clear during the above warranty period, we will repair the product or supply a substitute product free of charge. However, even during the warranty period, we will exclude the product from the scope of the warranty if the failure or defect corresponds to any of the following:

- (1) The failure or defect was caused by an unreasonable condition, environment, handling, or usage not mentioned in the instruction manual, specifications, and our product catalog.
- (2) The failure or defect was caused by a factor other than our product.
- (3) The failure or defect was caused by a modification or repair conducted by a party other than us.
- (4) The failure or defect was caused by an event that could not be foreseen at the scientific and technical levels at the time of product shipment from us.
- (5) The failure or defect was caused by an external factor not attributable to us, such as acts of God and disasters.

Please note that the warranty mentioned here means the warranty for our individual product, and damage provoked by a failure or defect of the product is excluded from the scope of the warranty.

\*This warranty is valid only in Japan.

## Application and usage

Our products are designed and manufactured as general-purpose instruments for general industries.

Therefore, our products are not intended for the following uses, and our products used in such a manner are outside the scope of application.

- (1) Equipment that is anticipated to greatly affect lives and properties, such as nuclear power generation, aviation, railways, marine vessels, vehicles, and medical devices
- (2) Utilities that include electricity, gas, and service water
- (3) Use in outdoor locations and under similar conditions or environments other than those stipulated in the instruction manual
- (4) Usage to which considerable safety consideration and attention equivalent to (1) and (2) above need to be given

## Service

### Scope of service

Because the product price does not include service expenses, such as the dispatch of engineers, we will separately charge for the expenses in the following cases:

- (1) Instruction for installation and adjustment and a witnessed test run
- (2) Maintenance inspection, adjustments, and repairs
- (3) Technical guidance and technical education
- (4) Witnessed inspections of products at our factory

<<Note>> The product specifications and information in this catalog are subject to change without prior notice for product improvement or other reasons.

● For order placement, contact

General  
agent



**Manostar Co., Ltd.**

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Manufacturer



**Yamamoto Electric Works Co., Ltd.**

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