

WO81 Airflow rate/airflow speed meter

RoHS



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

Display units

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

WO81 airflow rate meter

Product code

WO81

Pressure range code

F	N	49	DM	V	(Example)
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Mounting
orientation

Unit

Ran

point

External
shape

V	Range for specification of vertical mounting
H	Range for specification of horizontal mounting
None	Range for arbitrary mounting
DM	Airflow rate/speed unit (dynamic pressure Pa)
EM	Airflow rate/speed unit (dynamic pressure kPa)
Airflow rate/airflow speed meter pressure range	
Pressure range based on specification document	
N	No memory pointer
S	Single memory pointer
T	Double memory pointers
F	Surface type
PC	Round panel type
PR	Square panel type

◆When making an inquiry or placing an order, specify the above product code.

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

①	Procuring device based on use conditions	Pressure detector *Select any of the following.	Duct size *Select any of the following, and enter the desired values in the squares below.	Specified airflow rate (speed) *Indicate the unit as well.	Measured gas density *Select any of the following, and enter the desired values in the squares below.
		<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.)	<input type="checkbox"/> Round type Inner diameter <input type="text"/> mm <input type="checkbox"/> Square type <input type="text"/> x <input type="text"/> mm	Normal flow rate (speed) value: <input type="text"/> Maximum flow rate (speed) value: <input type="text"/>	<input type="checkbox"/> Standard air density: 1.198 kg/m ³ <input type="checkbox"/> Mixed gas density: <input type="text"/> kg/m ³ <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	Procuring device based on relationship between airflow rate (speed) and pressure	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.

Specifications

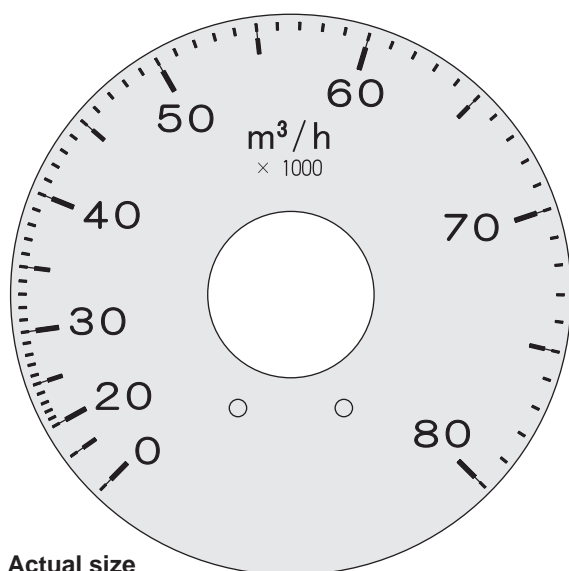
Model	Main body		Surface type	Round panel type	Square panel type	
	Memory pointer		F	PC	PR	
	No memory pointer	N	WO81FN	WO81PCN	WO81PRN	
	Single memory pointer (red)	S	WO81FS	WO81PCS	WO81PRS	
	Double memory pointers (one each for red and green)	T	WO81FT	WO81PCT	WO81PRT	
Unit	Airflow rate/airflow speed		Compatible pipe	• Vinyl pipe or rubber pipe (inner diameter of 6 mm)Base for resin vinyl pipe (already mounted on gauge) • Metallic pipe (outer diameter of 6 ± 0.1 mm)Separately sold base for metallic pipe is necessary. • Hard plastic pipe (outer diameter 6 mm × inner diameter 4 mm)Separately sold base for metallic pipe and inner sleeve set (refer to page 111) or push-in joint is necessary.		
Pressure measurement method	Differential pressure method					
Pressure-receiving element	Diaphragm					
Measured gas	Air and noncorrosive gas (liquid cannot be measured)					
Scale indication angle	Wide-angle indication of approx. 270 degrees		Base polarity	• Identification with red on high pressure side and blue on low pressure side • By exchanging the base on the high-pressure side with that on the low pressure side, it is possible to change the polarity.		
Operating ambient temperature	-10°C to +50°C (no freezing allowed)					
Operating ambient humidity	90% RH or below (no condensation allowed)					
Instrument body withstanding pressure	200 kPa (refer to page 118)					
Exterior material	Polycarbonate and polyamide		Mass	Approx. 270 g		
Durable impact	100 m/s ² (six times each for three axial directions)					
Durable vibration	5 to 10 Hz Amplitude of 10 mm, 10 to 50 Hz Acceleration of 39 m/s ² (two hours each for three axial directions)					
Accessories	WO81F		WO81PC		WO81PR	
	Mounting screw set		Two sets of mounting fittings (already mounted on gauge body)		Mounting nut set (already mounted on gauge body)	
Pressure range code	Airflow rate/ airflow speed range	Mounting orientation (Refer to page 18)	Accuracy (Note) (at 20°C)	Pressure-receiving element material	Withstanding pressure of pressure- receiving element (Refer to page 118)	
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)	Within ± 2.5% FS			40 kPa
100 DMV		Upright (specification)				
130 DMH		Horizontal (specification)				
130 DMV		Upright (specification)				
180 DMH		Horizontal (specification)	Within ± 1.5% FS		150 kPa	
180 DMV		Upright (specification)				
250 DM		Between horizontal and upright Arbitrary mounting				
300 DM						
400 DM						
580 DM						
1000 DM						
1.8 EM						
3.2 EM						
4.5 EM						
8.5 EM						
10 EM						

(Note) [Value]: Arbitrary (to be rounded), [magnification]: ×10, ×1000, ×10000, [units]: m³/h, m³/min, m³/h (nor), m³/min (nor), m/s

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

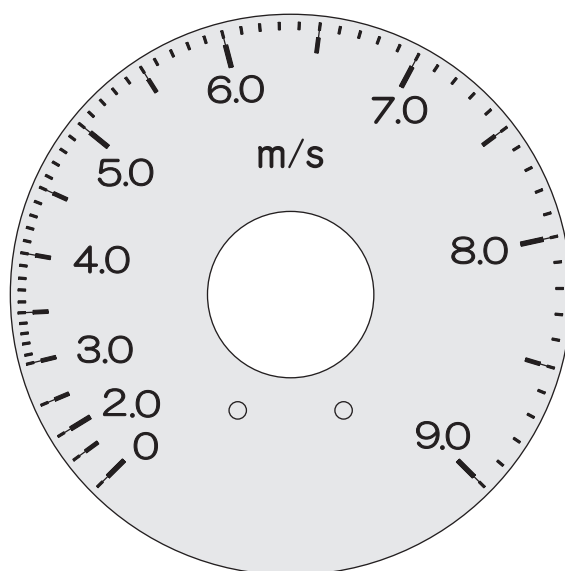
◆For use environment, refer to page 118.

Airflow rate/airflow speed range (scale example)



Actual size

Airflow rate scale

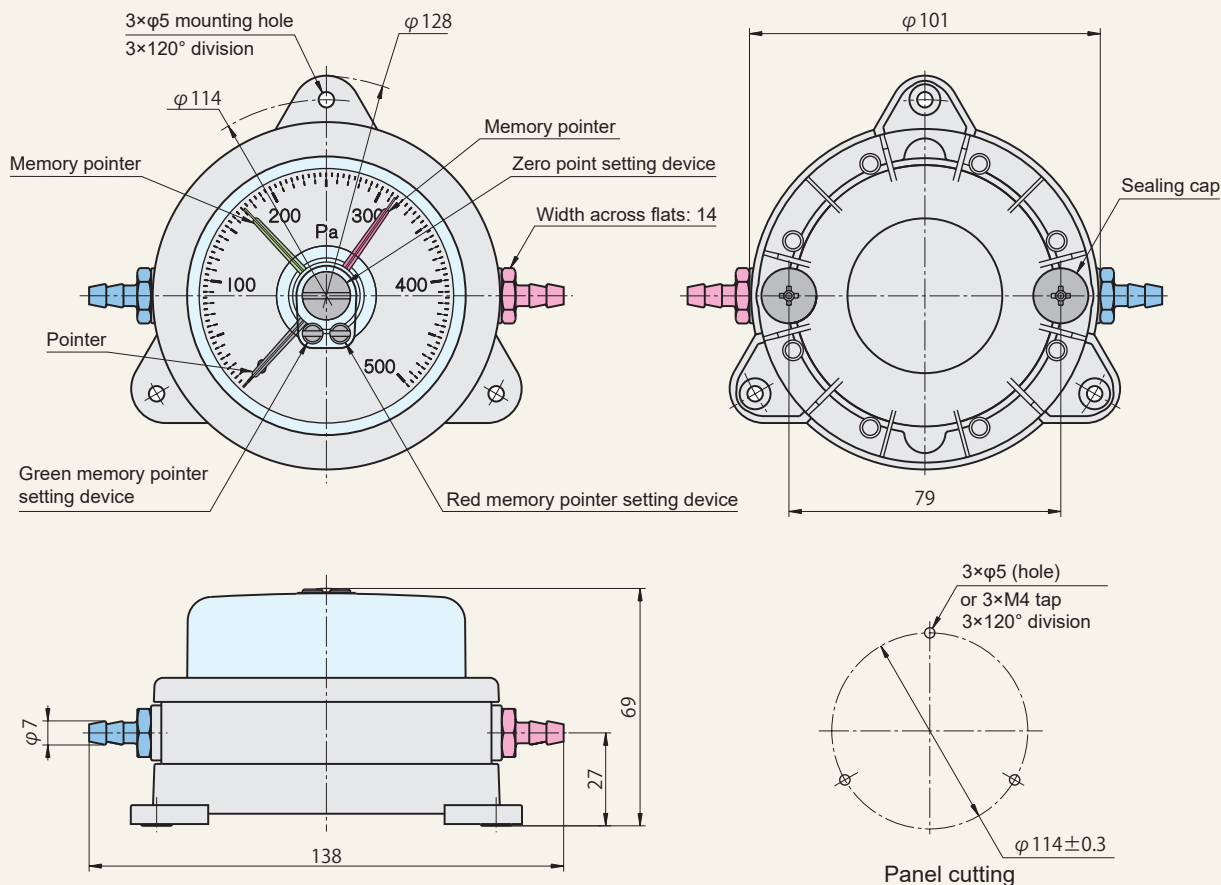


Airflow speed scale

External dimension drawing

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

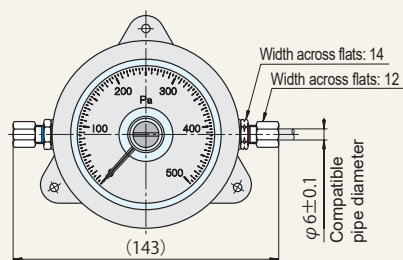
VT base (for vinyl pipe)



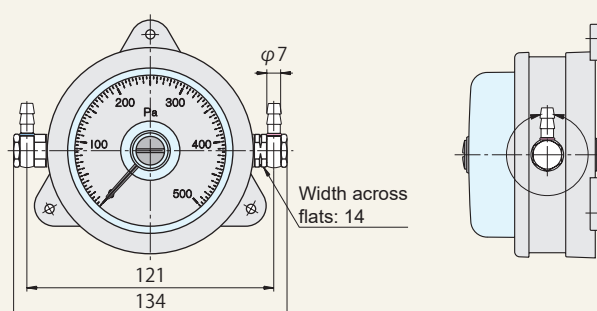
Example of base arrangement

Installation of base on side face

MT base (for metallic pipe)

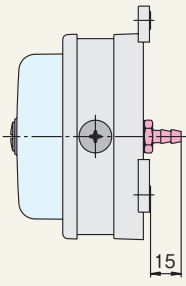
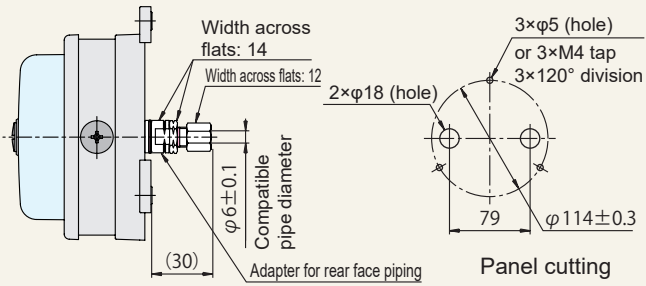
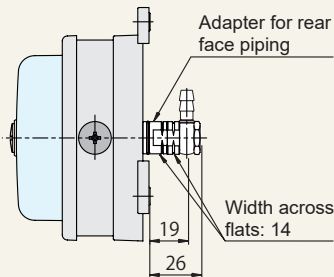
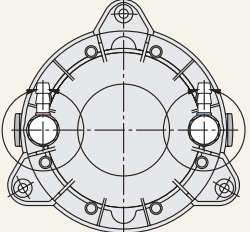
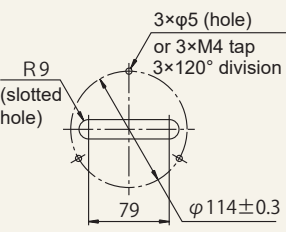


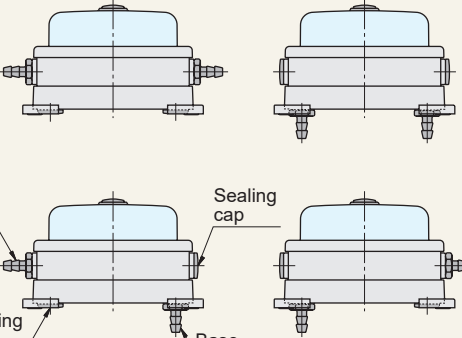
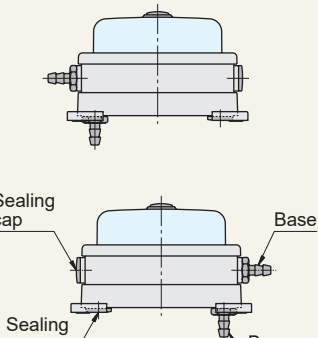
VR base (rotary type for vinyl pipe)



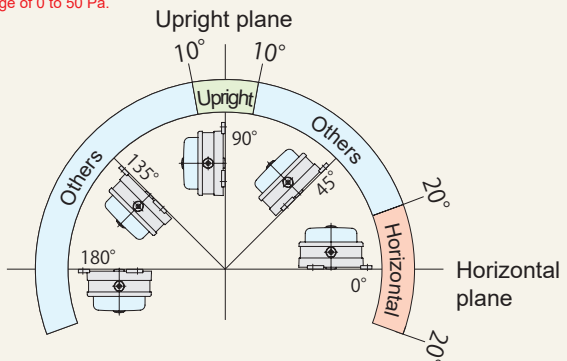
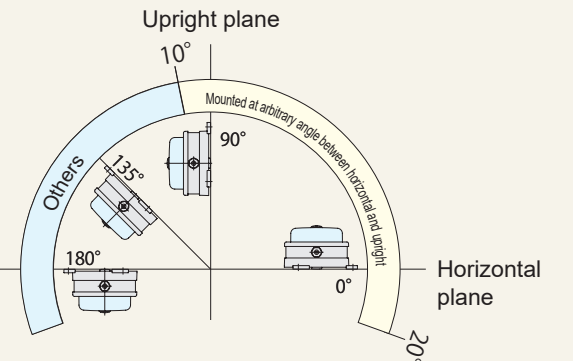
Caution

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.)

Installation of base on rear face	
VT base (for vinyl pipe) 	MT base (for metallic pipe) 
VR base (rotary type for vinyl pipe) 	 

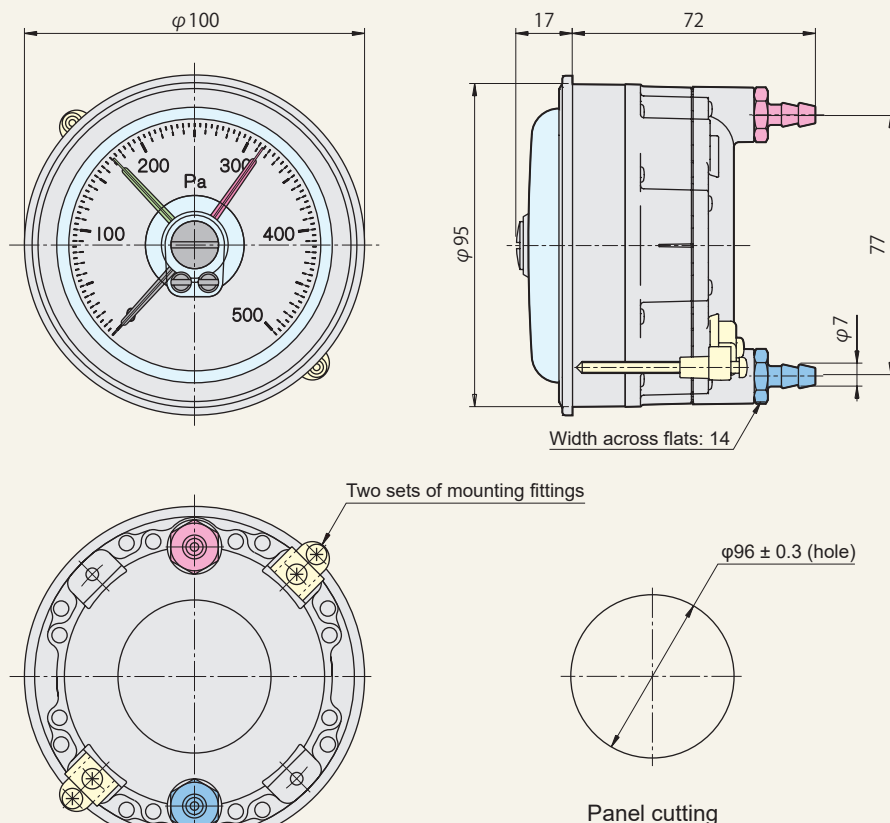
Change of base arrangement	Possible base arrangement	Impossible base arrangement
<p>The WO81F type has two base mounting holes on each of the side face and the rear face, allowing various base combinations depending on the piping conditions.</p> <p>Caution</p> <ol style="list-style-type: none"> 1. Be sure to use bases in the combination of one high-pressure side (red) base and one low-pressure side (blue) base. 2. There are impossible base arrangements as shown on the right. 3. At two mounting holes on the gauge body that are not installed with bases, be sure to attach the sealing caps. 		

Mounting orientation and range

Range for the specification of horizontal and upright mounting	Range for mounting orientation arbitrary mounting between horizontal and upright
<p>0 to 50Pa, 0 to 100Pa, -50 to +50Pa</p> <p>It is necessary to specify the mounting orientation (horizontal, upright, and others) at the time of order placement.</p> <p>*It is not possible to manufacture such a gauge whose mounting orientation exceeds 135° for the range of 0 to 50 Pa.</p> 	<p>Whole range other than on the left</p> <p>The gauge can be mounted at an arbitrary angle between horizontal and upright. For other mounting orientations, it is necessary to specify the orientation at the time of order placement.</p> 

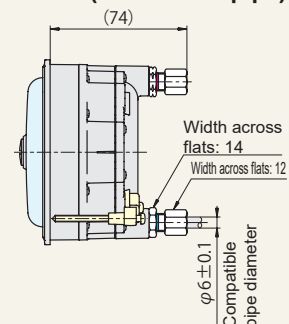
External dimension drawing

VT base (for vinyl pipe)

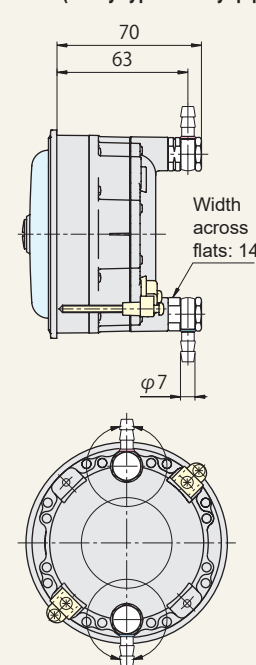


Example of base arrangement

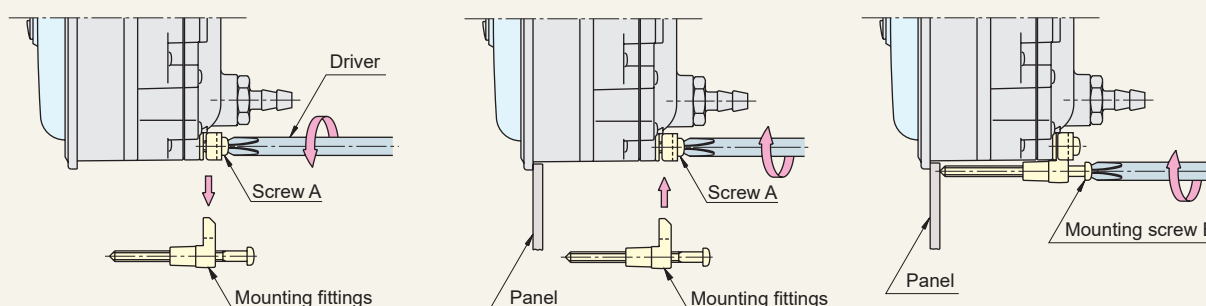
MT base (for metallic pipe)



VR base (rotary type for vinyl pipe)



Mounting method



1. Loosen screw A, and remove both mounting fittings from the gauge body.

2. Fit the gauge to the front of the panel first, put two mounting fittings back, and tighten screw A to secure the gauge.

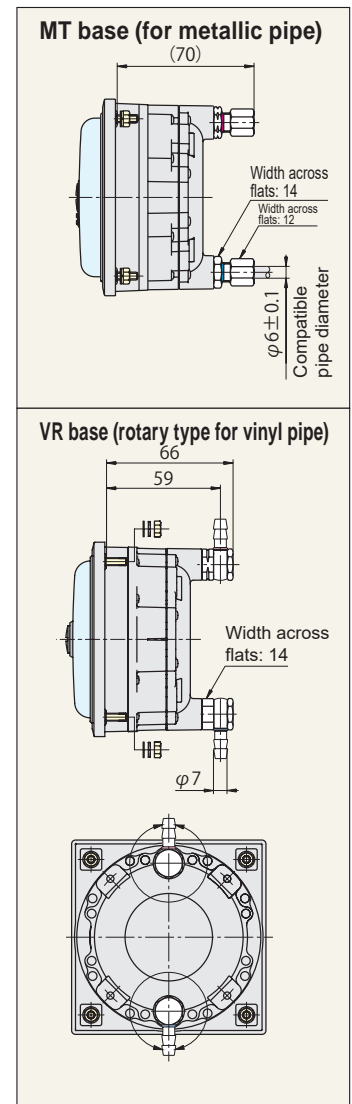
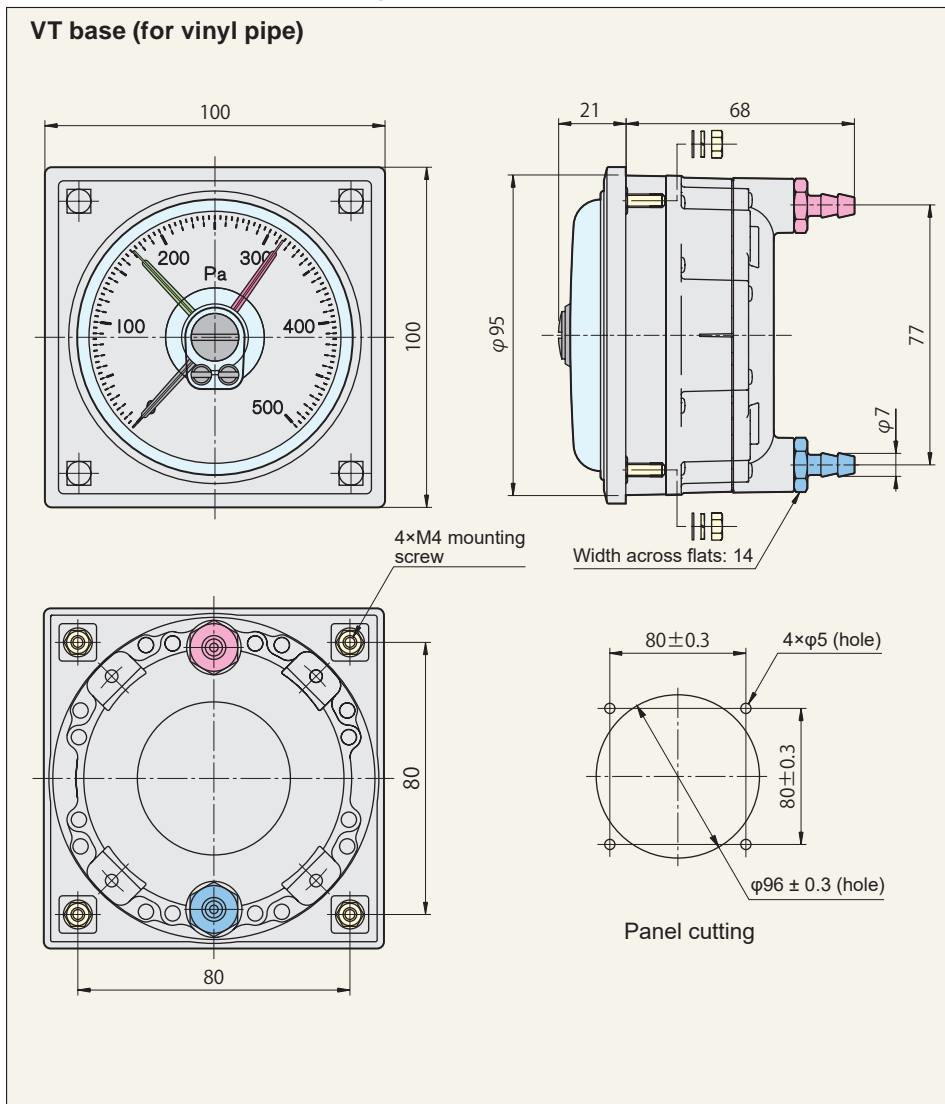
3. Alternately tighten little by little mounting screws B in two places to secure the gauge to the panel.



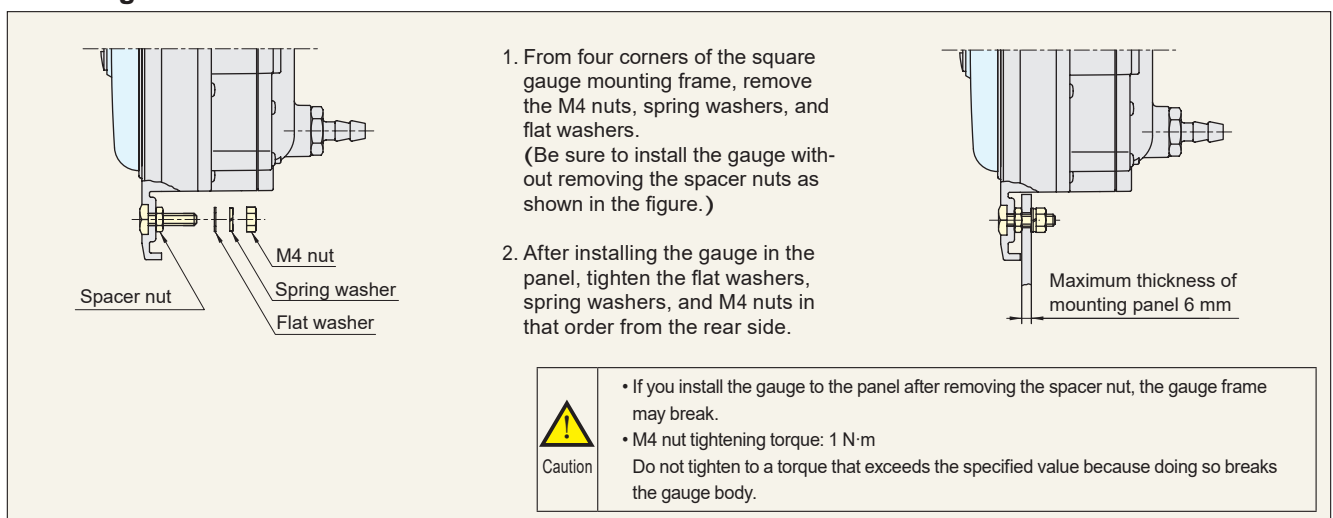
Caution

Mounting screw B tightening torque: 0.5 to 0.6 N·m
Do not tighten to a torque that exceeds the specified value because doing so breaks the gauge body.

External dimension drawing



Mounting method

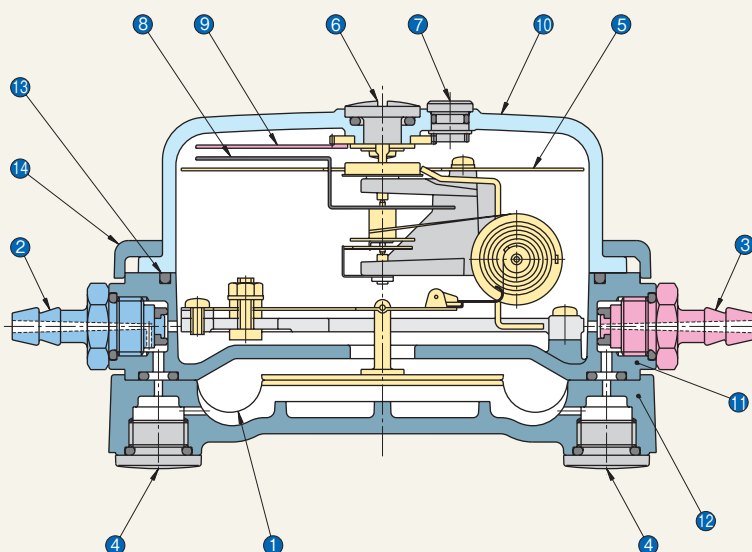


Caution

Base tightening torque: 1 N·m

Do not tighten to a torque that exceeds the specified value because doing so breaks the gauge body. (Refer to page 120)

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)



Item number	Material
KGA81VT-H-P	Polypropylene

Low-pressure side

(Auxiliary item)



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



Item number	Material
KGA81VR-H	Brass



Low-pressure side







Item number	Material
KGA81VR-L	Brass


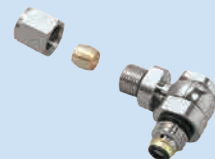
This serves as an elbow whose tube mounting part rotates. A vinyl pipe or rubber pipe with an inner diameter of 6 mm can be connected.



Accessories for WO81 RoHS



PT base			
High-pressure side		Low-pressure side	
			
Item number	Material	Item number	Material
KGA81PT-H	PBT/brass	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.</p> <p>(Connectable tube outer diameter: 6 mm)</p>			



PR base			
High-pressure side		Low-pressure side	
			
Item number	Material	Item number	Material
KGA81PR-H	PBT/brass	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	
			
Item number	Material	Item number	Material
KGA81MT-H	Brass	KGA81MT-L	Brass
<p>A metallic pipe, such as copper pipe and aluminum pipe, with an outer diameter of 6 ± 0.1 mm can be connected. However, for stainless steel pipe, use an MTW base. When connecting with a plastic pipe (outer diameter 6 mm \times inner diameter 4 mm), remove the brass sleeve and use the separately sold resin inner sleeve set (XIN6\times4; refer to page 111).</p>			

MR base			
High-pressure side		Low-pressure side	
			
Item number	Material	Item number	Material
KGA81MR-H	Brass	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 \times inner diameter 4 mm), remove the brass sleeve and use the separately sold resin inner sleeve set (XIN6\times4; refer to page 111).</p>			

MTW base			
High-pressure side		Low-pressure side	
			
Item number	Material	Item number	Material
KGA81MTW-H-S	Stainless steel	KGA81MTW-L-S	Stainless steel
<p>This is used to connect a stainless steel pipe with an outer diameter of 6 ± 0.1 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)	
			
Item number	Material	Item number	Material
KGA81FBA-H	Brass	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	
			
Item number	Material	Item number	Material
KGA81R1/8AD-H	Brass	KGA81R1/8AD-L	Brass
<p>It is possible to connect an R1/8 joint.</p> <p>*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	
			
Item number	Material	Item number	Material
KGA81R1/8AD-H-S	Stainless steel	KGA81R1/8AD-L-S	Stainless steel
<p>It is possible to connect an R1/8 joint.</p> <p>*The specifications of this adapter differ from those of the adapter for rear face piping.</p>			

List of products

WO81

WO71

FR51A

MS99

MS99S

MS61A-RA

QDP33

EMD8A

EMD7

EMT1

EMTGP1

EMT1H

EMT6

EMP5A

EMRT1

HWS15A

Accessories

Application

Precautions

Maintenance

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



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Manufacturer



Yamamoto Electric Works Co., Ltd.

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TEL. +81-78-631-6000 FAX. +81-78-631-6020