List of products

Utility model registration No. 823971

RoHS

WO81

WO71

FR51A

MS99

MS99S

MS61A-RA

QDP33

EMD8A

EMD7

EMTGP1

EMT1

EMT1H

EMT6

EMP5A

EMRT1

HWS15A

Accessories

Application

Precautions

Maintenance

High-accuracy micro differential pressure gauge

- · Boasting a wide variety, the product is also compatible with airflow rate and speed scales (refer to page 15).
- Easy-to-read wide angle scale (pointer rotation angle of 270°)
- · Pipe connection port that facilitates polarity conversion

1 150

200

250

100

Model WO81F

(surface type)

- Unique mechanism less subject to abnormal high pressure inrush
- · High-performance silicone rubber diaphragm with small hysteresis
- · Band-link mechanism that prevents the pointer from vibrating



Model WO81PC (round panel type)





Model WO81PR (square panel type)





*Memory pointer can be set at an arbitrary



With single memory pointer

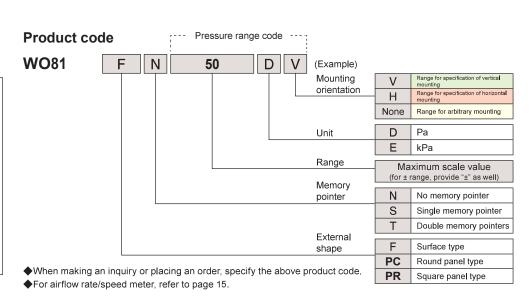


With double memory pointers

<Main application fields> • Nuclear facilities

- · Food-related factory management equipment
- Air-conditioning control equipment in high-rise building
- Hospital and medical facilities
 Automotive manufacturing/
- semiconductor manufacturing lines Control of air discharge pressure from coffee roaster

- · Room pressure measurement in a
- · Detection of clogging of air filter Measurement of airflow rate/speed of ventilation/exhaust device and
- *(Refer to pages 114 to 117)



WO81

Specifications

	Maii	Surfa	ce type	Round panel type		Square panel type		
	Memory pointer		F	PC		PR		
Model	No memory pointer	N	wo	81FN	WO81F	PCN	WO81PRN	
	Single memory pointer (red)	S	wo	81FS	WO81F	PCS	WO81PRS	
	Double memory pointers (one each for red and green)	Т	wo	81FT	WO81PCT		WO81PRT	
Pressure unit Pressure	Pa, kPa Differential pressure method			Compatible pip			nner diameter of 6 mm) I pipe (already mounted on	
neasurement nethod	Differential pressure method					gauge)		
Pressure-receiving	Diaphragm						er of 6 ± 0.1 mm) ase for metallic pipe is ameter 6 mm × inner diameter	
Measured gas	Air and noncorrosive gas (liq	uid cannot be	measured)		• Hard pla	necessary. astic pipe (outer dia		
Scale indication	Wide-angle indication of app	rox. 270 degre	es		4 mm)	Separately sold ba	se for metallic pipe and inner	
Operating ambient emperature	-10°C to +50°C (no freezing a	allowed)				sleeve set (refer to necessary.	page 111) or push-in joint is	
Dperating ambient	90% RH or below (no conder	nsation allowed	d)	Polarity of pipir		•	gh pressure side and blue on	
numidity nstrument body	200 kPa (refer to page 118)			connector	By exch	anging the base on	the high-pressure side with	
vithstanding pressure					that on the pola		de, it is possible to change	
Exterior material Durable impact	Polycarbonate and polyamide 100 m/s ² (six times each for t		ctions)	Mass	Approx. 2	.70 g		
Durable vibration	5 to 10 Hz Amplitude of 10 m	m,	,			-		
	10 to 50 Hz Acceleration of 3 three axial directions)	⊎ m/s~ (two ho	urs each for					
Accessories	WO81F			WO81PC			WO81PR	
7.00000.100	Mounting screw	/ set	Two sets	of mounting fittings (a gauge body		Mounting nut set (already mounted on gauge body)	
Pressure range code	Pressure range	Mounting of (Refer to		Accuracy (N (at 20°C)		sure-receiving nent material	Withstanding pressure of pressure-receiving elemen (Refer to page 118)	
50 DH	0–50 Pa	Horizontal (s	pecification)	±5% FS				
50 DV	0-50 Pa	Upright (sp	ecification)	10 % F S				
100 DH	0–100 Pa	Horizontal (s	pecification)				10 kPa	
100 DV	0-1001 a	Upright (sp	ecification)	±2.5% FS	;			
200 D	0–200 Pa							
300 D	0–300 Pa							
500 D	0–500 Pa							
1000 D	0–1000 Pa							
1 E	0–1 kPa						40 kPa	
2 E	0–2 kPa	Between ho						
3 E	0–3 kPa	upri		±1.5% FS	,			
5 E	0–5 kPa	Arbitrary i	mounting	20,010				
10 E	0–10 kPa							
20 E	0–20 kPa				Sil	icone rubber		
30 E	0–30 kPa						150 kPa	
50 E	0–50 kPa							
100 E	0–100 kPa							
+- 50 DH	-50 to +50	Horizontal (s	·					
+- 50 DV		Upright (sp	ecification)	±2.5% FS			10 kPa	
+- 100 D	-100 to +100 Pa		-					
+- 200 D	-200 to +200 Pa							
+- 300 D	-300 to +300 Pa	Between ho	rizontal and					
+- 500 D	−500 to +500 Pa	upri	ght	±1.5%FS			45.15	
+-1000 D	-1000 to +1000 Pa	Arbitrary i	mounting				40 kPa	
+- 1E	-1 to +1 kPa							
+- 2E	−2 to +2 kPa							
+- 3 F	-3 to +3 kDa				1		i	

(Note) Accuracy in full span (refer to page 121)

−3 to +3 kPa

+- 3 E

List of product

WO81

WO71

FR51A

MS99

MS99S

MS61A-RA

QDP33

EMD8A

EMD7

EMT1

EMTGP1

EMT1H

EMT6

EMP5A

EMRT1

HWS15A

Accessories

Application

Precautions

For single pressure range, the polarity symbol "-" can be indicated for a fee. If the indication is necessary, make a request at the time of order placement.

[◆]For use environment, refer to page 118.

2.5

WO81 List of scales



WO81

WO71

FR51A

MS99

MS99S

MS61A-RA

QDP33

EMD8A

EMD7

EMT1

EMTGP1

EMT1H

EMT6

EMP5A

EMRT1

HWS15A

Accessories

Application

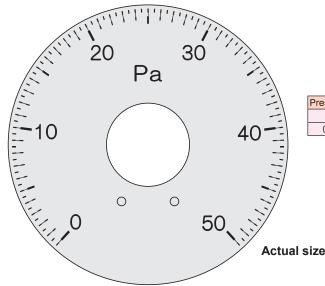
Precautions

Maintenance

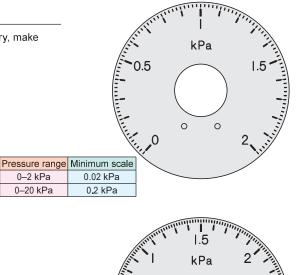




◆The polarity symbol "-" can be indicated for a fee. If the indication is necessary, make a request at the time of order placement.



Pressure range Minimum scale 0-50 Pa 0.5 Pa

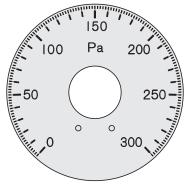


0.5

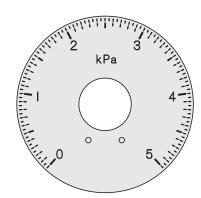
Pressure range	Minimum scale			
0-3 kPa	0.02 kPa			
0–30 kPa	0.2 kPa			

0-2 kPa

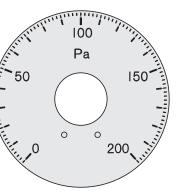
0-20 kPa



Pressure range	Minimum scale
0-300 Pa	2 Pa



Pressure range	Minimum scale		
0-5 kPa	0.05 kPa		
0–50 kPa	0.5 kPa		



Pressure range Minimum scale

0-100 Pa

0–1000 Pa 0–1 kPa

60

100

10 Pa

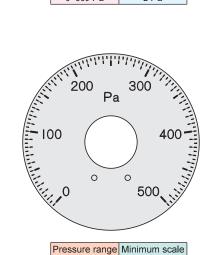
0.01 kPa

80

Pa

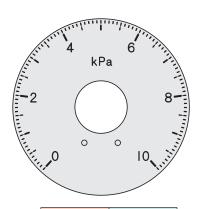
20

Pressure range	Minimum scale
0–200 Pa	2 Pa



5 Pa

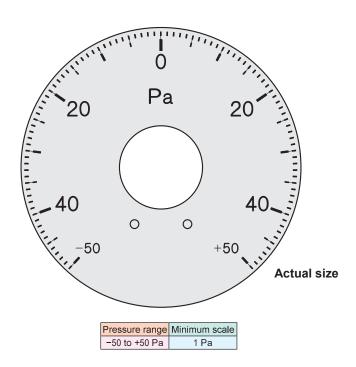
0-500 Pa

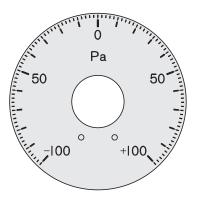


Pressure range	Minimum scale
0–10 kPa	0.1 kPa
0–100 kPa	1 kPa

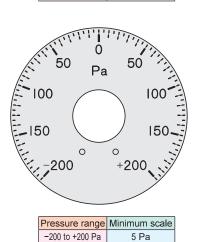
WO81 List of scales

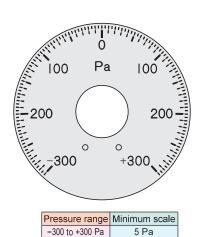
Zero center range





Pressure range	Minimum scale
-100 to +100 Pa	2 Pa
-1000 to +1000 Pa	20 Pa
−1 to +1 kPa	0.02 kPa

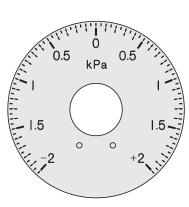




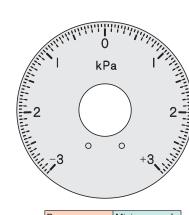
0 Pa 200 Pa 400 +500 +500
Pressure range Minimum scale

10 Pa

-500 to +500 Pa



Pressure range	Minimum scale
−2 to +2 kPa	0.05 kPa



Pressure range Minimum scale −3 to +3 kPa 0.05 kPa

List of products

WO81

WO71

FR51A

MS99

MS99S

MS61A-RA

QDP33

EMD8A

EMD7

EMT1

EMTGP1

EMT1H

EMT6

EMP5A

EMRT1

HWS15A

Accessories

Application

Precautions

RoHS

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

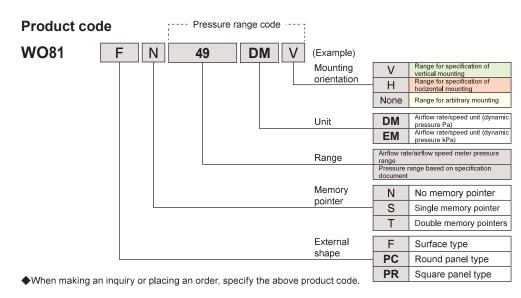


This page and the following page introduce the WO81 airflow rate/ airflow speed meters. For WO81 micro differential pressure gauges, refer to page 11.

Display units

	Airflow speed meter			
m³/ h	m³/h (nor)	m³/min	m³/min (nor)	m/s
m³/h	m³/h	m³/min	m³/min	
×10	×10 (nor)	×10	×10 (nor)	
m³/h	m³/h	m³/min	m³/min	
×1000	×1000 (nor)	×1000	×1000 (nor)	
m ³ /h	m³/h	m³/min	m³/min	
×10000	×10000 (nor)	×10000	×10000 (nor)	

WO81 airflow rate meter



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 *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.		
1)	Procuring device based on use conditions	Overall/static pressure tube (Pitot tube) Total pressure tube + static pressure tube Composite Pitot tube (Aero eye, etc.)	□Round type Inner diameter mm □Square type x mm	Maximum flow rate (speed) value: Maximum flow rate (speed) value:	□Standard air density: 1.198 kg/m³ □Mixed gas density: kg/m³ □When gas density is unknown Measured gas temperature: □ ℃ Measured gas humidity: □ % RH Static pressure at measurement point: Pa		
2	Procuring device based on relationship between airflow rate (speed) and pressure	relationship between When the airflow rate (speed) is, the airflow rate (speed) up to is measured with the conversion condition of dynamic pressure of Pa.					

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

WO81 Airflow rate/airflow speed meter

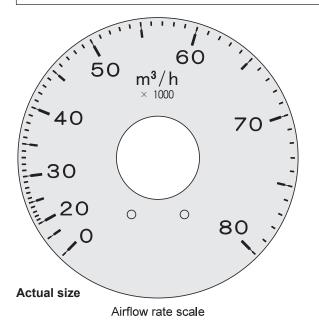
Specifications

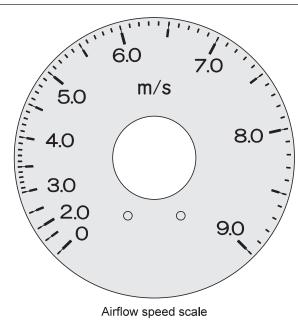
	Main body			Surfac	Surface type		Round pan	el type	Square panel type	
	Memory pointer				=		PC		PR	
Model	No memory pointer		N	WO	81FN		WO81P	CN	WO81PRN	
	Single memory pointer (red)		S	WO	81FS		WO81P	cs	WO81PRS	
	Double memory pointers (one each for red and green) T WO81FT		81FT		WO81P	СТ	WO81PRT			
Unit			Compatible pipe			or rubber pipe (inner				
Pressure measurement method	Differential pressure method Diaphragm						Base for resin vinyl pipe (already mounted on gauge) • Metallic pipe (outer diameter of 6 ± 0.1 mm)			
Pressure-receiving element							• Hard plas	Separately sold base for metallic pipe is necessary. Istic pipe (outer diameter 6 mm × inner diameter 4 mm)		
Measured gas	Air and noncorrosive gas (liquid c	cannot be	measu	ured)			Separately sold base for metallic pipe and inner sleeve set (refer to page 111) or push-in joint is necessary.			
Scale indication angle	Wide-angle indication of approx. 2		ees					set (refer to page 111)	or pusiting form is necessary.	
Operating ambient temperature	−10°C to +50°C (no freezing allow	,			Polarity of piping	,	• Identificat	tion with red on high p	ressure side and blue on low	
Operating ambient humidity	90% RH or below (no condensation	on allowe	ed)		connector			nging the base on the	high-pressure side with that on	
Instrument body withstanding pressure	200 kPa (refer to page 118)						the low pr	ressure side, it is poss	ible to change the polarity.	
Exterior material	Polycarbonate and polyamide				Mass		Approx. 27	0 g		
Durable impact	100 m/s ² (six times each for three	axial dir	ections)			•			
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		
Accessories	Mounting screw set Two set			Two sets of mo	ounting fittings (already	mounted o	on gauge body)	Mounting nut set (a	Iready mounted on gauge body)	
Pressure range code	Airflow rate/ airflow speed range		•	rientation page 18)	Accuracy (N (at 20°C)	•			Withstanding pressure of pressure- receiving element (Refer to page 118)	
49 DMH		<u> </u>		pecification)	()				, , , ,	
49 DMV		Upright (specification) Horizontal (specification)					-			
70 DMH					Within ± 5% FS		5			
70 DMV				ecification)						
100 DMH	 			pecification)					10 kPa	
100 DMV		Upright (specification)								
130 DMH	 			pecification)						
130 DMV				ecification)	Within ± 2.5% FS					
180 DMH	Depends on airflow rate/			pecification)						
180 DMV	<u> </u>			ecification)						
250 DM	airflow speed scale —	Oprigi	п (орс	zomodion)			Sili	icone rubber		
300 DM	specification document.						\dashv			
400 DM	,									
580 DM									40 kPa	
1000 DM		Betwee		izontal and						
1, 8 EM			. uprig		Within ± 1.5%	6 FS				
3, 2 EM Arbitra		trary n	nounting	***************************************						
4.5 EM										
8.5 EM										
10 EM							150 kPa			
Notes Notes	(4 - 1		.40	100010000			-3/1- ()		100 Ki u	

(Note) $\overline{\text{Value}}$: Arbitrary (to be rounded), $\overline{\text{magnification}}$: ×10, ×1000, ×10000, $\overline{\text{units}}$: m^3/h , m^3/min , m^3/h (nor), m^3/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)





List of products

WO81

WO71

FR51A

MS99

MS99S

MS61A-RA

QDP33

EMD8A

EMD7

EMT1

EMTGP1

EMT1H

EMT6

EMP5A

EMRT1

HWS15A

Accessories

Application

Precautions

Model WO81F

List of products

WO81

WO71

FR51A

MS99

MS99S

MS61A-RA

QDP33

EMD8A

EMD7

EMT1

EMTGP1

EMT1H

EMT6

EMP5A

EMRT1

HWS15A

Accessories

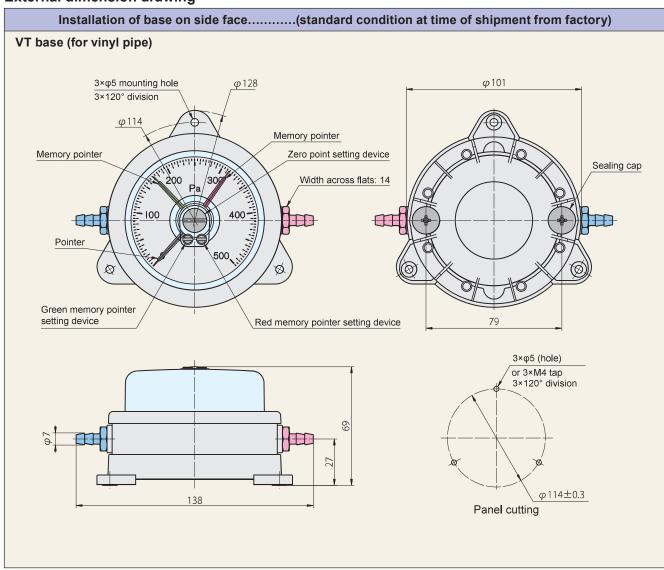
Application 1

Precautions

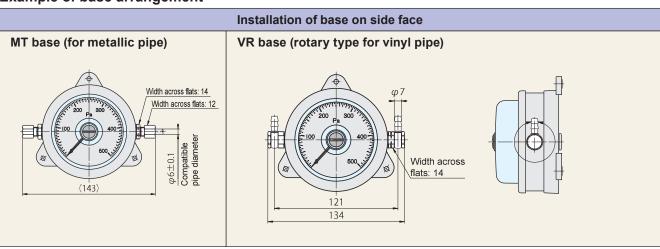
. . .

Maintenance

External dimension drawing



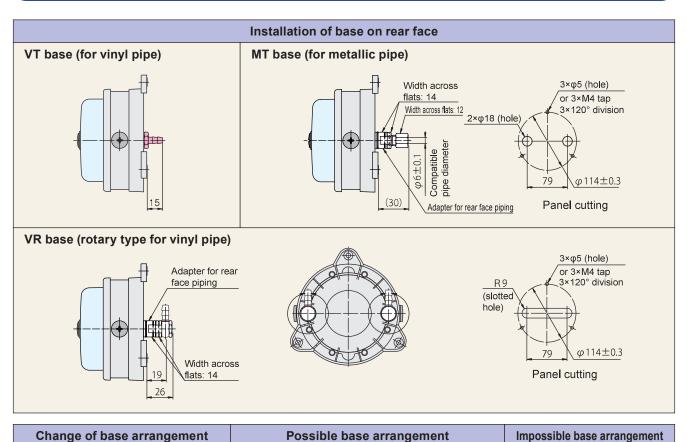
Example of base arrangement





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.)

Model WO81F



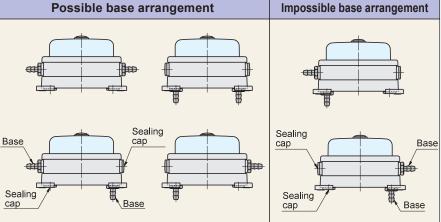
The WO81F type has two base mounting holes on each of the side face and the rear face, allowing various base combinations depending on the piping conditions.

Caution

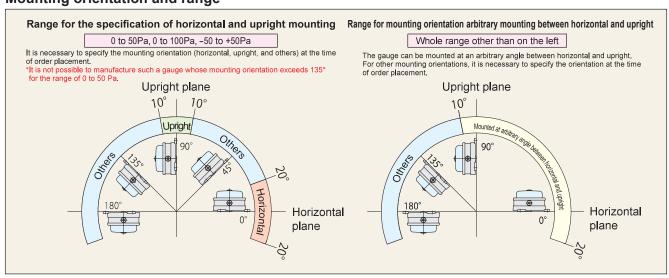
1.Be sure to use bases in the combination of one high-pressure side (red) base and one lowpressure side (blue) base.

There are impossible base arrangements as shown on the right.

 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



List of products

WO81

WO71

FR51A

MS99

MS99S

MS61A-RA

QDP33

EMD8A

EMD7

EMT1

EMTGP1

EMT1H

EMT6

EMP5A

EMRT1

HWS15A

Accessories

Application 4 1

Precautions

Model WO81PC

List of products

WO81

WO71

FR51A

MS99

MS99S

MS61A-RA

QDP33

EMD8A

EMD7

EMT1

EMTGP1

EMT1H

EMT6

EMP5A

EMRT1

HWS15A

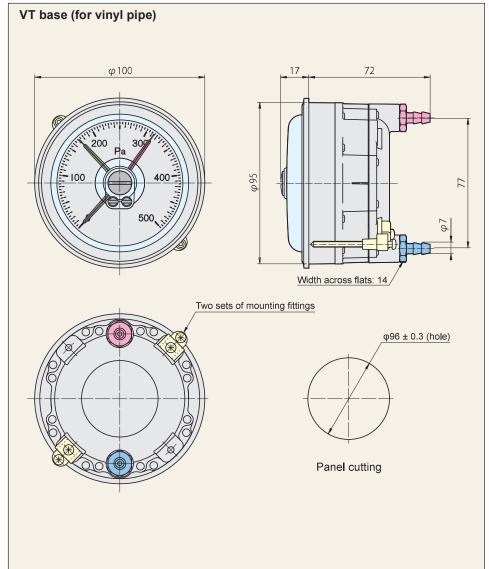
Accessories

Application

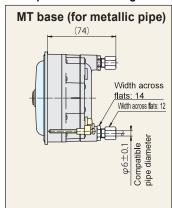
Precautions

Maintenance

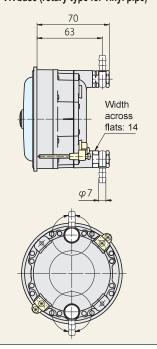
External dimension drawing



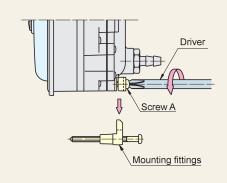
Example of base arrangement



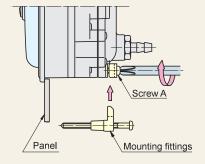
VR base (rotary type for vinyl pipe)



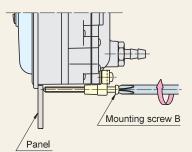
Mounting method



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



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



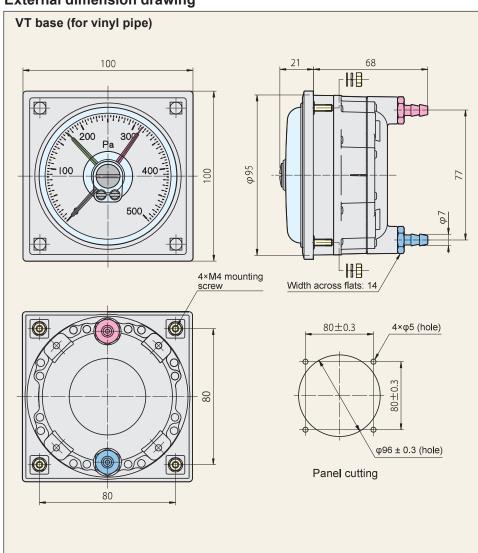
Alternately tighten little by little mounting screws B in two places to secure the gauge to the panel.

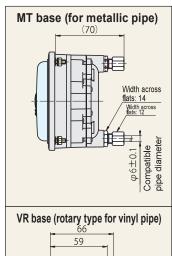


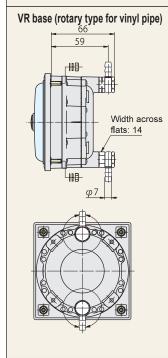
Mounting screw B tightening torque: 0.5 to 0.6 N·m Do not tighten to a torque that exceeds the specified value because doing so breaks the gauge body.

Model WO81PR

External dimension drawing







List of products

WO81

WO71

FR51A

MS99

MS99S

MS61A-RA

QDP33

EMD8A

EMD7

EMT1

EMTGP1

EMT1H

EMT6

EMP5A

EMRT1

HWS15A

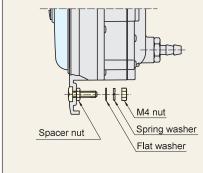
Accessories

Application

Precautions

Maintenance

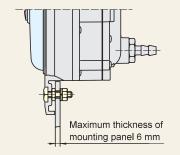
Mounting method



1. From four corners of the square gauge mounting frame, remove the M4 nuts, spring washers, and flat washers.

(Be sure to install the gauge without removing the spacer nuts as shown in the figure.)

2. After installing the gauge in the panel, tighten the flat washers, spring washers, and M4 nuts in that order from the rear side.





• If you install the gauge to the panel after removing the spacer nut, the gauge frame may break.

• M4 nut tightening torque: 1 N·m Do not tighten to a torque that exceeds the specified value because doing so breaks the gauge body.



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)

List of products

WO81

WO71

FR51A

MS99

MS99S

MS61A-RA

QDP33

EMD8A

EMD7

EMT1

EMTGP1

EMT1H

EMT6

EMP5A

EMRT1

HWS15A

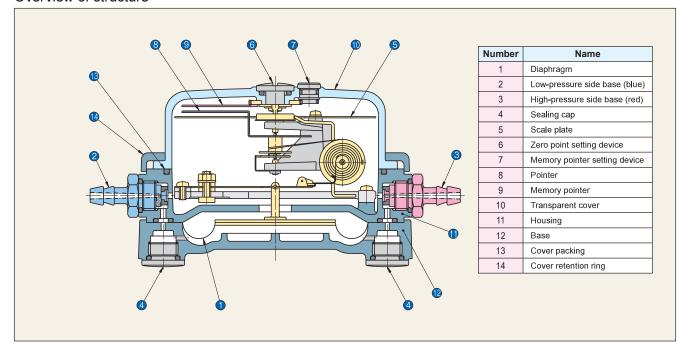
Accessories

Application

Precautions

Maintenance

Overview of structure



Accessories dedicated to WO81 RoHS

Dedicated to

F type

type

Sealing cap



This is already installed when the gauge is purchased. Material

	KGA81PLG	Polypropylene	
	110/1011 20	т опурторують	
	Mounting	fitting set	
Dedicate	ed to PC		(Auxiliary
tyne		10	item)

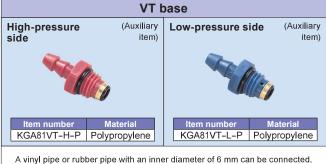
The combination of parts in the photograph constitutes one set. On the gauge, two sets (for one gauge) are already installed as a standard accessory.

Item number	Material
TKA81PC	Aluminum die casting/steel
	J

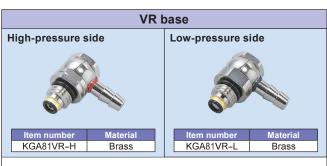
Portable box **Dedicated** to F type Material em number *Gauge body is not included. Steel

Accessories for WO81





This is already installed when the gauge is purchased.



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

PT base

High-pressure side



Item number	Material
KGA81PT-H	PBT/brass

Low-pressure side

Low-pressure side

KGA81MT-I



Item number	Material
KGA81PT-L	PBT/brass

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)

PR base

High-pressure side



Item number	Material
KGA81PR-H	PBT/brass

Low-pressure side



Item number	Material
KGA81PR-L	PBT/brass

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)

MR base

High-pressure side



600-	
Item number	Material
KGA81MR-H	Brass

Low-pressure side KGA81MR-I Brass

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 × inner diameter 4 mm), remove the brass sleeve and use the separately sold resin inner sleeve set (XIN6×4; refer to page 111).

High-pressure side



Item number	Material
KGA81MT-H	Brass

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 × inner diameter 4 mm), remove the brass sleeve and use the separately sold resin inner sleeve set (XIN6×4; refer to page 111).

MTW base

High-pressure side



Item number	Material
KGA81MTW-H-S	Stainless steel

Low-pressure side



Item number	Material
KGA81MTW-L-S	Stainless steel
KGA81MTW-L-S	Stainless st

This is used to connect a stainless steel pipe with an outer diameter of 6 ± 0.1 mm.

Adapter for rear face piping

High-(Dedicated to F type pressure rear face piping) side



Item number	Material
KGA81FBA-H	Brass

Lowpressure . side

(Dedicated to F type rear face piping)



Item number	Material
KGA81FBA-L	Brass

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.

R1/8 base adapter

High-pressure side



Item number	Material
KGA81R1/8AD-H	Brass

Low-pressure side



Item number	Material
KGA81R1/8AD-L	Brass

It is possible to connect an R1/8 joint.

*The specifications of this adapter differ from those of the adapter for rear face piping.

R1/8 base adapter (SUS)

High-pressure side



Item number	Material
KGA81R1/8AD-H-S	Stainless steel

Low-pressure side



Item number	Material
KCARIDI/RAD I S	Stainlage steel

It is possible to connect an R1/8 joint.

*The specifications of this adapter differ from those of the adapter for rear face piping.

List of products

WO81

WO71

FR51A

MS99

MS99S

MS61A-RA

QDP33

EMD8A

EMD7

EMT1

EMTGP1

EMT1H

EMT6

EMP5A

EMRT1

HWS15A

Accessories

Application

Precautions

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	



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