

Product Catalog

TAKASHIMAKEIKI [2024.01]



株式会社 高島計器
TAKASHIMAKEIKI

Table of contents

Pressure gauge

Pressure Gauges Portfolio	2.3.4
Pressure Gauge Overview	5
Standard Pressure Gauge (ST)	6.7
Sealing Case Pressure Gauge (WP)	8.9
Stainless Pressure Gauge (WS)	10.11
Plastic Case Pressure Gauge (PC)	12.13
Glycerin Bath Pressure Gauge (GR)	14.15
Pressure Gauge with Electric Contacts (Micro Switch Type) (MS)	16.17
Pressure Gauge with Electric Contacts (Contact Switch Type) (CS)	18.19
Small Size Pressure Gauge (KG)	20.21
Twin Needle Pressure Gauge (DP)	22.23
Differential Pressure Gauge (DF)	24
Link type Gear-less Pressure Gauge (RS)	25
Spiral type Gear-less Pressure Gauge (SP)	26
Micromanometer (Indoor use) (MP1)	27
Micromanometer (Sealed type) (MP2)	28
Micromanometer (SUS Bellows Gauge) (MP3)	29
Pressure Gauge for General gas (OG)	30
Pressure Gauge for High purity gas (HC)	31
Pressure Gauge for High pressure hydrogen (HP)	32
Pressure Gauge 0.6 Class (MA)	33
Diaphragm Pressure Gauge (Direct Connection Type) (SA)	34.35
Diaphragm Pressure Gauge (Remote Sensing B Type) (SB)	36.37
Diaphragm Pressure Gauge (Remote Sensing D Type) (SD)	38.39

Accessories for Pressure Gauge

Throttle Screw (FS)	41
Dampener (KD)	41
Joint (KJ)	42
Siphone Pipe (SO•SU)	43
Gauge Ball Cock (KC)	44
Gauge Valve (VS•VL)	44
Packing (KP)	45
Marker Pointer	45

Pressure related Products

Pressure Reducing Valve (RV)	46
Pressure Switch (TS•MPS)	47

Thermometer

Thermometer Portfolio	48.49
Thermometer Overview	50
Bimetal Thermometer (Standard type) (BS)	51
Bimetal Thermometer (Stainless Sealing type) (BW•BG)	52
Bimetal Thermometer (Small-sized type) (BK)	53
Wate Pressure Temperature Gauge (PB)	54
Bourdon Tube Filled Type Termometer (TF)	55.56
Vapor Pressure Thermometer (VP)	57.58

References

► Pressure Gauge

Unit of Pressure Gauge	59
Accuracy Class and Tolerance	59
Scale	60
Applications	61
Pressure Media Category and Special Treatment	62
Joint Thread	62
Hooking a wrench	63
Characteristics of Plastic Material	63
Instrumental error test	63

► Thermometer

Insertion length of Temperature Sensor	64
Response Time	65
Thermowell	65

► Warnings in use

.....	66
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Note

Drawings

They are representative examples and may differ from actual shapes depending on the size.

Specifications

Please note that they are subject to change without advance notice from improvement.

Pressure Gauge Portfolio

■ Shape and symbol

[Shape]

Rim-less

Circular rim

Front rim

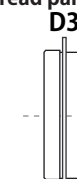
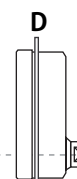
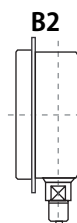
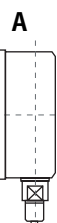
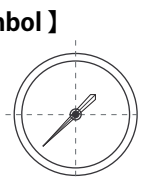
Embedded

Embedded rim-less

Embedded
(Thread part in center)

Embedded rim-less
(Thread part in center)

[Symbol]



Model	Type	Application	Feature	Shape per size						
				30	40	50	60	75	100	150
ST	Standard Pressure Gauge	General	<ul style="list-style-type: none"> General use, Indoor Ambient temp -5 ~ 45°C Vibration of pointer is within tolerance accuracy. 				A B D D2 D3 D4	A B D D2	A B D D2	A B D D2
		Steam	<ul style="list-style-type: none"> General use, Indoor Ambient temp 10 ~ 50°C Vibration of pointer is within tolerance accuracy. 							
		Heatproof	<ul style="list-style-type: none"> General use, Indoor Ambient temp -5 ~ 80°C Vibration of pointer is within tolerance accuracy. 							
		Vibration-proof	<ul style="list-style-type: none"> Improved vibration proof for general use (See "Reference Pressure Gauge 4. Application" page for detail.) 							
		Vibration-proof for steam	<ul style="list-style-type: none"> Provide both of vibration-proof and steam performance. 							
		Heatproof / vibration-proof	<ul style="list-style-type: none"> Provide both of heatproof and vibration-proof performance. 							
WP	Sealing Case Pressure Gauge	General	<ul style="list-style-type: none"> Improved water-proof and dust-proof performance compared to standard gauge by using sealed structure cover. (Size ϕ 60: Stainless case) 			A	A B D D2 D3 D4	A B D D2	A B D D2	A B
		Steam								
		Heatproof								
		Vibration-proof								
		Vibration-proof for steam								
		Heatproof / vibration-proof								
WS	Stainless Pressure Gauge	General	<ul style="list-style-type: none"> In addition to the performance of the standard pressure gauge, all main parts are made of stainless steel and sealed. Thus, make possible usage outdoors with robust, excellent water-proof and anti-corrosion and chemical resistance. 				A B D D2	A B D D2	A B D D2	
		Steam								
		Heatproof								
		Vibration-proof								
		Vibration-proof for steam								
PC	Plastic Case Pressure Gauge	General	<ul style="list-style-type: none"> The standard pressure gauge in plastic case, making it rust-proof and light weight at low cost. 			A	A B	A B	A B	
		Steam								
		Vibration-proof								
		Vibration-proof for steam								

※ Refer to the published pages of each types for more details.

Pressure Gauge Portfolio

Model	Type	Application	Features	Shape per size						
				30	40	50	60	75	100	150
GR	Glycerin Filled Pressure Gauge	Vibration-proof	• Encapsulated glycerin effectively reduces the impact of vibrations and pulsations on the gauge needle, leading to more accurate readings and extending the life of the gauge by protecting its internal components from wear and tear.		D3 D4	A D4	A B D D2 D3 D4	A B D D2	A B D D2	A
MS	Pressure Gauge W /micro switch	General	Microswitch activates when the pressure has reached the set point.			A		A	A	
CS	Pressure Gauge W/ electric contacts	General						A		
KG	Small-sized Pressure Gauge	General	Suitable for small-spaced area or integration into equipment.	A D4	A D D2 D3 D4	A D3 D4				
DP	Twin Needle Pressure Gauge	General	• Indicates two different pressures simultaneously on a single gauge. • Suitable for pressure comparison				D	D	B D	
DF	Differential Pressure Gauge	General	• Display the difference between 2 pressure points. • Used to measure filter's clogging					PA		
RS	Gear-less (Link Type) Pressure Gauge	Vibration-proof	• High vibration -proof due to no gear installed for expansion mechanism and small sized • Suitable for portable devices with non strict accuracy required		A D	A				
SP	Gear-less (Spiral Type) Pressure Gauge	Vibration-proof	• High vibration -proof due to no gear installed for expansion mechanism and small sized • Suitable for portable devices with non strict accuracy required	※ (25 A, D4 22:D4)						
MP1	Micromanometer (Indoor use Type)	General	• Capable of measuring ultra low pressure of 60kPa(Approx.6000mmH2O) or less.			A D3 D4	A			
MP2	Micromanometer (Waterproof Type)	Waterproof	• Capable of measuring ultra low pressure of 60kPa(Approx.6000mmH2O) or less. • IP22 equivalent					A D3 D4	A D3 D4	
MP3	Micromanometer (SUS Bellows Type)	General	• Capable of measuring ultra low pressure of 60kPa(Approx.6000mmH2O) or less.						B	
OG	General Gas Pressure Gauge	General gas	• For measurement of various type of gas pressure.		A	A	A	A	A	
HC	High purity Gas Pressure Gauge	High purity gas	• For measurement of various type of gas pressure.			A D2 D4				
HP	High pressure Gas Pressure Gauge	High pressure gas	• Capable for measuring high pressure hydrogen gas.						B D	

※ Refer to the published pages of each types for more details.

Pressure Gauge Portfolio

Model	Type	Application	Features	Shape per size						
				30	40	50	60	75	100	150
SA	Diaphragm (Direct Connection Type) Pressure Gauge	—	<ul style="list-style-type: none"> • Used to measure the pressure of high viscous and corrosive fluid in system. Diaphragm and sealing protect inner mechanism from aggressive liquids and gases. • Various type of pressure gauge can be connected to the indicator. 					Direct connection type A		
SB	Diaphragm (Remote Sensing B Type) Pressure Gauge	—	<ul style="list-style-type: none"> • Used to measure the pressure of high viscous and corrosive fluid in system. Diaphragm and sealing protect inner mechanism from aggressive liquids and gases. • Various type of pressure gauge can be connected to the indicator. 					Remote sensing type B		
SD	Diaphragm (Remote Sensing D Type) Pressure Gauge	—	<ul style="list-style-type: none"> • Used to measure the pressure of high viscous and corrosive fluid in system. Diaphragm and sealing protect inner mechanism from aggressive liquids and gases. • Various type of pressure gauge can be connected to the indicator. 					Remote sensing type D		
MA	0.6 Class Pressure Gauge	General	<ul style="list-style-type: none"> • For testing and inspection that requires precision. 						A B	

※ Refer to the published pages of each types for more details

Pressure Gauge Overview

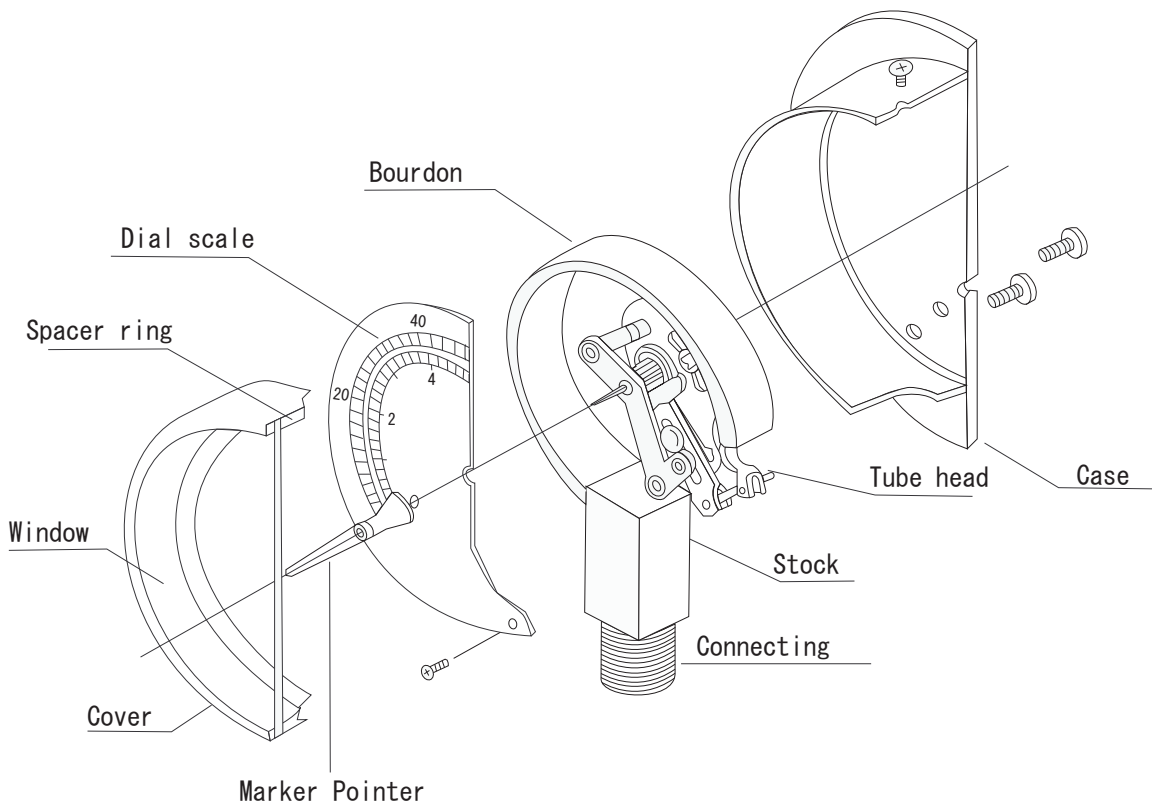
■ Overview

Our pressure gauge uses the Bourdon as conversional element to transduce pressure energy into mechanical movement by magnifying mechanism which indicates the pressure value. It has following features.

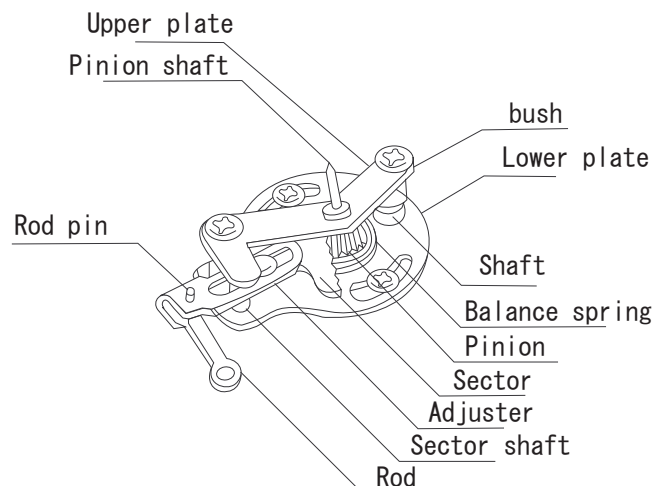
1. Simple structure for reasonable price provides high accuracy of measuring.
2. Moreover, simple structure makes possible to fulfill wide variety of needs only by changing some parts.
3. In addition, measuring could be done anywhere because any energy is not required (such as electricity, fuel) to power it.

■ Structure of Pressure gauge

● Overview



● Movement



Standard Pressure Gauge ST

- Manufactured and specified in accordance with JIS B 7505, this pressure gauge could be used widely.
- Pressure gauge with highly reliable production track records.



※ When select the pressure gauge, please refer to "Operational Conditions" in the "Applications" page and "Applicable Pressure Medium" in the "Pressure Media Category and Special Treatment" page for safety and sufficient performance.

《Legend》(Sym.:) Model symbol

■ Specification																			
Size (φ)		60				75				100				150					
Shape		A	B	D	D2	D3	D4	A	B	D	D2	A	B	D	D2	A	B	D2	
Accuracy Class ⁽⁶⁾		[STD] 1.6										[STD] 1.6 [Specified] 1.0							
Thread ⁽¹⁾		G1/4 R1/4				G3/8 R3/8				G3/8 R3/8 G1/2 R1/2									
Max. Scale (MPa) ⁽²⁾	Pressure	0.06 0.1 0.16 0.25 0.4 0.6 1 1.6 2.5 4 6 10 16 25 40 60 100 (except for size 60)																	
	Vacuum	-0.1																	
	Compound	[Pressure part] 0.1 0.16 0.25 0.4 0.6 1 1.6 2.5										[Vacuum part] -0.1							
Application		General (no symbol) Steam-proof (Sym.: M) ⁽⁶⁾ Heatproof (Sym.: H) Vibration-proof (Sym.: V) Steam&Vibration-proof (Sym.: MV) ⁽⁶⁾ Heat&Vibration-proof (Sym.: HV)																	

■ Main Part Material, etc.					
Wet Part	Medium	[STD] General use		[Specified] Steam&heatproof (Sym.: S1)	[Specified] Anti-corrosion (Sym.: S2)
	Stock	C3604		C3604	SUS316
	Bourdon Tube	[Low Pressure] C2700 C2680 [High Pressure] C5191, SUS316		SUS316	SUS316
Movement		[STD] Copper Alloy [Specified] SUS (Sym.: P2)			
Case		SPC • Cr plating	SPC • Black paint (Shape D material: SUS)		SPC • Cr plating
Cover		SPC • Crplating (Shape D: Aluminium • alumite)	SPC • Black paint (Shape D material: SUS)		SPC • Cr plating
Window		[STD] Inorganic glass [Specified] Polycarbonate panel (Sym.: P7)			
Scale(Dial)		Aluminium Color • • • Pressure part: Black Vacuum part: Red			
Pointer		Aluminium			

Special Treatment	No oil treatment (Sym.: E1) Clean treatment (Sym.: E2) Gas leak test (Sym.: E3)
Other Additional Option	With throttle screw (Sym.: F1) Drilled mounting hole (Shape D only) (Sym.: F2) Mounting bracket (Shape D only) (Sym.: F3) Case with safety window (Sym.: F4) ⁽⁴⁾ Set pointer: label type (Sym.: F5) Ring type (Shape A / B and size 60, 75, 100) (Sym.: F6) Knob type (Sym.: F7) ⁽⁵⁾ Colored scale (Sym.: F8) Zero point adjustment needle (Size: 75, 100, 150) (Sym.: P9)
Attached Documents	Inspection certificate Mill test report Standard instrument inspection certificate Calibration certificate Traceability chart

■ Remarks

- (1) In case you need other screws please contact us.
- (2) In case you need other maximum scale, please contact us.
- (3) The standard diameter of the throttle screw is φ 0.5, but the buffering effect will vary depending on the fluids viscosity, flow speed, etc.
In case you need other throttle, please refer the page "Throttle screw" in Reference section of this catalog.
- (4) For details about the set pointer type of pressure gauge, please refer to "Pressure Gauge Accessory" (set pointer) in this catalog.
- (5) For scale colored customized dial, please specify the scale range and color.
- (6) Accuracy class for Heatproof (H) and Heat & Vibration-proof (HV) is 2.5.

■ Order form example Please select symbols inside (Sym.:) from type/ usage table.

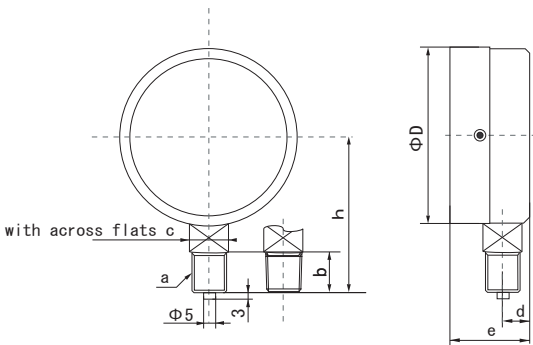
ST **A** **M** **G3/8** x **100** x **2.5** **S1** • **E1** •
 Model Shape Application Joint thread Size Max. scale Main part material symbol Special addition symbol
 Precision class: STD: N/A Specified: Accuracy class value
 Pressure gauge: Max scale value STD: N/A
 Vacuum gauge: -0.1 Specified: Symbol
 Compound gauge: Value x -0.1

Standard Pressure Gauge ST

External Dimensions

【Shape A】

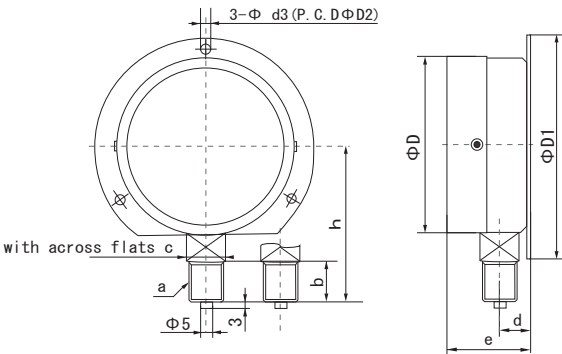
STA—□□×□×□□



Size	a	b	c	d	e	h	D
6 O	1/4	14	14 square	11	30	54	63
7 5	3/8	18	17 square	13	35	68.5	78
1 O O	3/8	18	17 square	13	37	84.5	103
	1/2	20	22 square	15.5	37	87.5	
1 5 O	3/8	18	22 hexagon	15	41	122.5	153
	1/2	20	22 hexagon	15	41	124.5	

【Shape B】

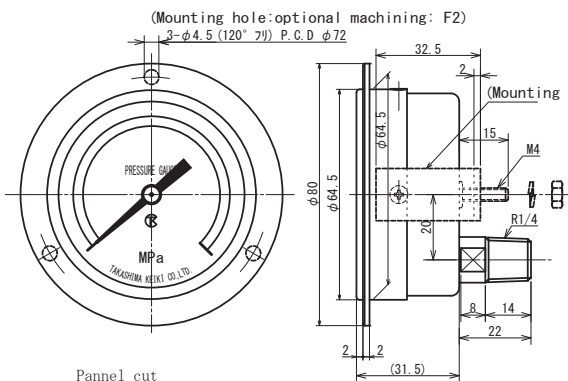
STB—□□×□×□□



Size	a	b	c	d	e	h	D	D1	D2	D3
6 O	1/4	14	14 square	11	29	54	63	80	72	4.5
7 5	3/8	18	17 square	13	35	68.5	78	98	88	4.5
1 O O	3/8	18	17 square	13	37	84.5	103	128	115	5.5
	1/2	20	22 square	15.5	37	87.5				
1 5 O	3/8	18	22 hexagon	15	41	122.5	153	178	165	5.5
	1/2	20	22 hexagon	15	41	124.5				

【Shape D Size 60】

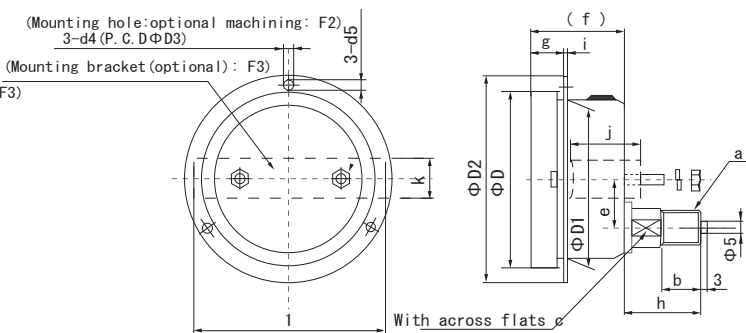
STD—□□×60×□□



Pannel cut
Example φ65~φ67

【Shape D Size 75・100】

STD—□□×□×□□



Size		Option																	
		Mounting hole						Mounting bracket											
7 5		a	b	c	h	e	f	g	i	D	D1	D2	D3	d4	d5	j	k	l	
7 5	1/4	16	19	34	21	(44)	(15)	1.2	83	76	98	88	4.5	6	34	16	91		
	3/8	18	19	36															
1 O O	3/8	18	22	36	21	(46)	(16)	1.2	108	101	128	115	5.5	7.5	36	20	117		
	1/2	20	22	38															

Sealing Case Pressure Gauge WP

- Inserting an Oring or a rubber packing in the joint part helps to maintain stable sealing properties and protects the internal structure.
- It can be used under rain, dew conditions (IP54 equivalent)
- The ST type, which has a proven track record, has been adopted for the internal structure, inheriting its reliability.



※ When select the pressure gauge, please refer to "Operational Conditions" in the "Applications" page and "Applicable Pressure Medium" in the "Pressure Media Category and Special Treatment" page for safety and sufficient performance.

《Legend》(Sym.:) Model symbol

■ Specification														
Size (φ)		50		60				75				100		
Shape		A D4		A	B	D	D2	D3	D4	A B D D2				A B
Accuracy Class ⁽⁶⁾		[STD] 2.5		[STD] 1.6				[STD] 1.6				[Specified] 1.0		
Thread ⁽¹⁾		R1/4		G1/4 R1/4				G3/8 R3/8				G3/8 R3/8 G1/2 R1/2		
Max. Scale (MPa) ⁽²⁾	Pressure	0.06		0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10
	Vacuum													
	Compound			[Pressure part] 0.1				0.16	0.25	0.4	0.6	1	1.6	2.5
Application				General (No symbol)				Steam-proof (Sym.: M)				⁽⁶⁾ Heatproof (Sym.: H)		
								Steam&Vibration-proof (Sym.: MV)				⁽⁶⁾ Heat&Vibration-proof (Sym.: HV)		
												Vibration-proof (Sym.: V)		

■ Main Part Material, etc.				
Wet Part	Medium	[STD] General use		[Specified] Steam&Heatproof (Sym.: S1)
	Stock	C3604		[Specified] Anti-corrosion (Sym.: S2)
	Bourdon Tube	[Low Pressure] C2700, C2680		SUS316 (except for Size50, 60 & Shape D3, D4)
		[High Pressure] C5191, SUS316		SUS316 (except for Size50)
Movement		[STD] Copper Alloy		[Specified] SUS (* A Balance Spring part is Copper Alloy if size is 50 and shape is D4) (Sym.: P2)
Case		SUS (Aluminum silver for size 150)		
Ring		SUS (Aluminum silver for size 150)		
Window		[STD] Polycarbonate (Tempered glass for size 60)		[Specified] Tempered glass (Sym.: P8)
Scale (Dial)		Aluminum Color · · · Pressure part:Black Vacuum part: Red		
Pointer		Aluminum		

■ Additional Specifications				
Special Treatment	No oil treatment (Sym.: E1) Clean treatment (Sym.: E2) Gas leak test (Sym.: E3)			
Other Additional Option	With throttle screw (Sym.: F1) Drilled Mounting hole (Shape D only) (Sym.: F2) Mounting bracket (Shape D only) (Sym.: F3)			
	Case with safety window (Sym.: F4) ⁽⁴⁾ Set pointer: label type (Sym.: F5) ⁽⁵⁾ Colored Scale (Sym.: F8)			
	Zero point adjustment needle (Size: 75, 100, 150) (Sym.: P9)			
Attached documents	Inspection certificate Mill test report Standard instrument inspection certificate Callibration certificate Traceability chart			

■ Remarks

- (1) In case you need other screws, please contact us.
- (2) In case you need other maximum scale, please contact us.
- (3) The standard diameter of the throttle screw is φ 0.5, but the buffering effect will vary depending on the fluids viscosity, flow, speed, etc. If you need other throttle, please refer the page "Throttle screw" in Reference section in this catalog.
- (4) Dual label type installation needles are available, red and green. Please use them for marking on the transparent plate pressure range.
- (5) For colored customized dial, please specify the scale range and color.
- (6) Accuracy class for Heatproof (H) and Heat & Vibration-proof (HV) is 2.5.

■ Order form example Please quote symbols inside (Sym.:) from type/ usage table.

WP **A** **M** **G3/8** x **100** x **2.5** **S1** · **E1** ·
 Model Shape Application Joint Thread Size Main part material symbol Special Addition symbol
 STD: N/A Specified: Symbol
 Precision class: STD: N/A Specified: Accuracy class value
 Max. scale Pressure gauge: Max scale value Vacuum gauge: -0.1 Compound gauge: Value x -0.1

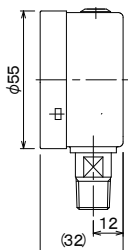
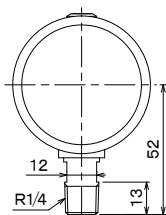
Sealing Case Pressure Gauge WP External Dimensions

Size 50

(Note: Taper screws in the following charts are reference charts and non standard specification.)

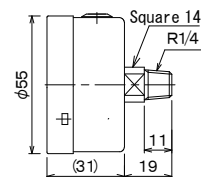
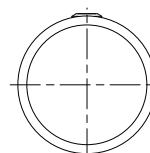
【Shape A】

GRA R1/4 x 50 x □



【Shape D4】

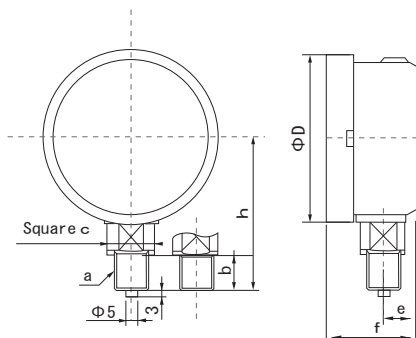
GRD4 R1/4 x 50 x □



Size 60・75・100

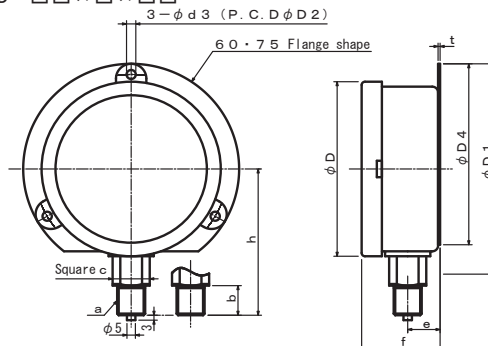
【Shape A】

WPA-□□×□×□□



【Shape B】

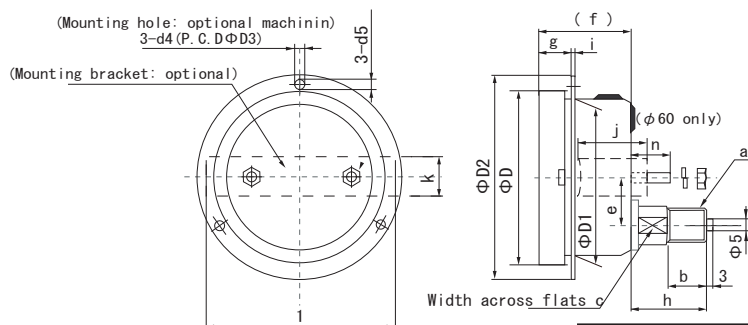
WPB-□□×□×□□



サイズ	a	b	c	e	f	h	D	D1	D2	d3	D4	t
60	1/4	14	14	12.5	33.5	56	68	80	72	4.5	71	1.0
75	3/8	18	22	18	46	70	83	98	88	4.5	87	1.2
	3/8	18				72						
100	3/8	18	22	19	46.7	89	108	128	115	5.5	100.5	1.2
	1/2	20				91						

【Shape D】

WPD-□□×□×□□

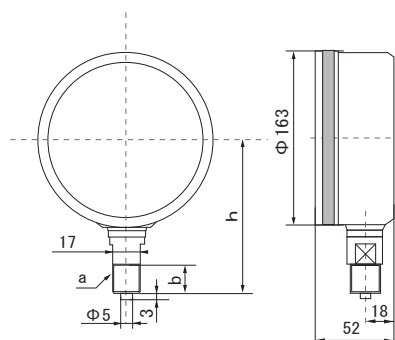


Option																
Mounting hole Mounting bracket																
Size	a	b	c	h	e	f	g	i	D	D1	D2	D3	d4	d5	j	k
60	1/4	14	14	26	18	32	12	1	68	64.5	84	76	Φ4.5	32	16	70
	1/4	16	19	34	21	(44)	(15)	1.2	83	76	98	88	4.5	6	34	91
75	3/8	18	19	36	24	(46)	(16)	1.2	108	101	128	115	5.5	7.5	36	20
	3/8	18	22	36	24	(46)	(16)	1.2	108	101	128	115	5.5	7.5	36	20
100	1/2	20	22	38	24	(46)	(16)	1.2	108	101	128	115	5.5	7.5	36	20

Size 150

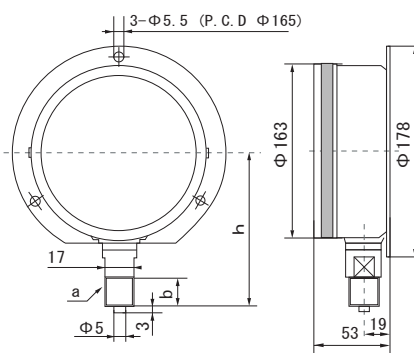
【Shape A】

WPA-□□×□×□□



【Shape B】

WPB-□□×□×□□



a	b	h
3/8	18	125
1/2	20	127

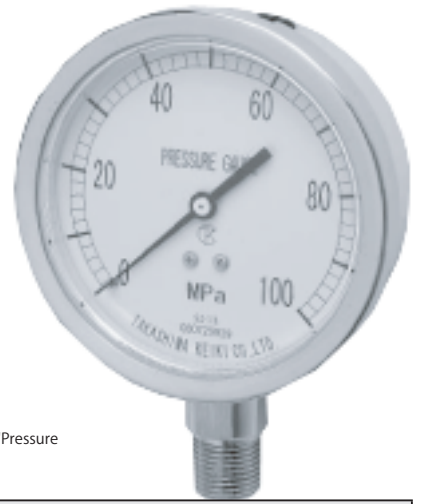
Stainless Steel Pressure Gauge WS

- All main parts are made of stainless steel (except of some parts like a dial scale, which are not functionally necessary), it is robust and has excellent corrosion resistance.
- All-round pressure gauge with sealed structure, that can be used anywhere (IP54 equivalent).
- Electrolytic polishing is applied, it is suitable for medical and food use.

※ Salt damage is not supported. Please inquire for more information for salt damage support compatible product.

※ When select the pressure gauge, please refer that to "Operational Conditions" in the "Applications" page and "Applicable Pressure Medium" in the "Pressure Media Category and Special Treatment" page for safety and sufficient performance.

《Legend》 Sym.: Model symbol



■ Specification																						
Size (φ)		60										75					100					
Shape		A B D D2										A B D D2										
Accuracy Class ⁽⁶⁾		1.6															[STD] 1.6		[Specified] 1.0			
Thread ⁽¹⁾		G1/4 R1/4										G3/8 R3/8					G3/8 R3/8 G1/2 R1/2					
Max.Scale (MPa) (2)	Pressure Gauge	0.06	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40	60	100	(except for size 60)	150 200 (except for size 60, 75)		
	Vacuum	-0.1																				
	Compound	[Pressure part] 0.1 0.16 0.25 0.4 0.6 1 1.6 2.5										[Vacuum part] -0.1										
Application		General(No symbol) Steam-proof(Sym.: M) ⁽⁶⁾ Heatproof(Sym.: H) Vibration-proof(Sym.: V) Steam&Vibration-proof (Sym.: MV) ⁽⁶⁾ Heat&Vibration-proof (Sym.: HV)																				

■ Main Part Material, etc.		
Wet Part	Stock	SUS316
	Bourdon Tube	SUS316
Movement		[STD] Copper Alloy [Specified] SUS (Sym.: P2)
Case		SUS
Ring		SUS
Window		[STD] Polycarbonate panel (Tempered glass for Size 60) [Specified] Tempered glass (Sym.: P8)
Scale (Dial)		Aluminum Color . . . Pressure part: Black Vacuum part : Red
Pointer		Aluminum

■ Special Addition		
Special Treatment	No oil treatment (Sym.: E1) Clean treatment (Sym.: E2) Gas leak test (Sym.: E3)	
Other Additional	With throttle screw (Sym.: F1) Drilled Mounting hole (Shape D only) (Sym.: F2) Mounting bracket (Shape D only) (Sym.: F3)	
Option	Case With safety window (Sym.: F4) ⁽⁴⁾ Set pointer: label type (Sym.: F5) ⁽⁵⁾ Colored Scale (Sym.: F8) Glycerin filled (Sym.: E4)	
Attached Documents	Inspection certificate Mill test report Standard instrument inspection certificate Calibration certificate Traceability chart	

■ Remarks

- (1) In case you need other screws, please contact us.
- (2) In case you need other maximum scale, please contact us.
- (3) The standard diameter of throttle screw is φ 0.5, but the buffering effect will vary depending on the fluids viscosity, flow, speed etc.
If you need other throttle, please refer the page "Throttle screw" in Reference section in this catalog.
- (4) Dual label type installation needles are available, red and green. Please use them for marking on the transparent plate pressure gauge.
- (5) For scale colored customized dial, please specify the scale range and color.
- (6) Accuracy class for Heatproof (H) and Heat & Vibration-proof (HV) is 2.5.

■ Order form example

Please quote symbols inside (Sym.:) from type/ usage table.

WS	A	M	G3/8	x	100	x	2.5	E1	•
Model	Shape	Application	Joint thread		Size		Max. scale	Special Addition symbol	
		Precision class: STD: N/A Specified: Accuracy class value					Pressure gauge: Max scale value Vacuum: -0.1 Compound: Value x -0.1		

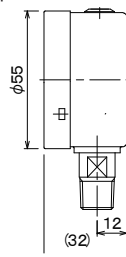
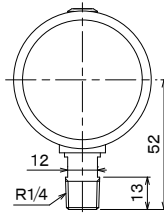
Stainless Steel Pressure Gauge WS External Dimensions

(Note: Taper screws in the following charts are reference charts and non standard specification.)

■Size 50 (These are built-to-order product. Please ask for detail.)

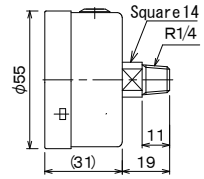
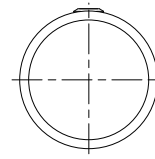
【Shape A】

WSA R1/4 × 50 × □



【Shape D4】

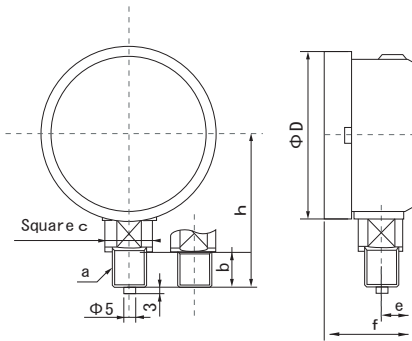
WS D4 R1/4 × 50 × □



■Size 60・75・100

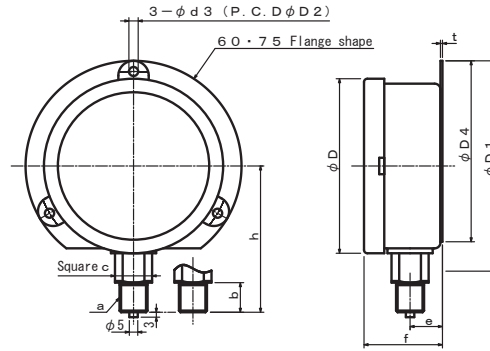
【Shape A】

WSA-□□×□×□□



【Shape B】

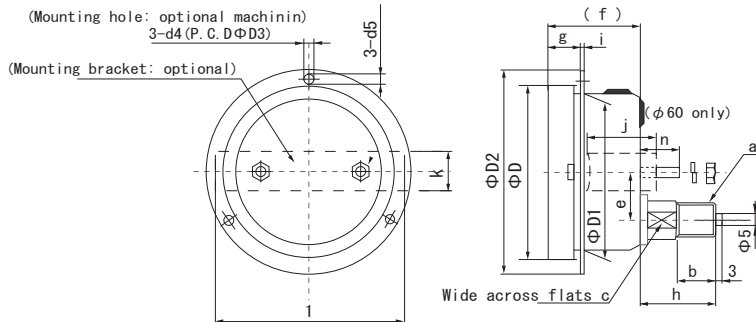
WSB-□□×□×□□



サイズ	a	b	c	e	f	h	D	D1	D2	d3	D4	t
60	1/4	14	14	12.5	33.5	56	68	80	72	4.5	71	1.0
75	3/8	18	22	18	46	70	83	98	88	4.5	87	1.2
	3/8	18				72						
100	3/8	18	22	19	46.7	89	108	128	115	5.5	100.5	1.2
	1/2	20				91						

【Shape D】

WSD-□□×□×□□



												Option					
												Mounting hole			Mounting bracket		
Size	a	b	c	h	e	f	g	i	D	D1	D2	D3	d4	d5	j	k	l
6 0	1/4	14	14	26	18	32	12	1	68	64.5	84	76	Φ4.5		32	16	70
7 5	1/4	16	19	34	21	(44)	(15)	1.2	83	76	98	88	4.5	6	34	16	91
	3/8	18	19	36													
1 0 0	3/8	18	22	36	24	(46)	(16)	1.2	108	101	128	115	5.5	7.5	36	20	117
	1/2	20	22	38													

Plastic Case Pressure Gauge PC

- To reduce cost, ABS resin is used for the case.
- Ideal for rust-prone places (such as water environment) that do not require so tight sealability compared with sealed type.



※ When select the pressure gauge, please refer to "Operational Conditions" in the "Applications" page and "Applicable Pressure Medium" in the "Pressure Media Category and Special Treatment" page for safety and sufficient performance.
 (Legend) (Sym.:) Model symbol

■ Specification																					
Size (φ)		50					60					75					100				
Shape		A					A B														
Accuracy Class ⁽⁷⁾		[STD] 2.5		[Specified] 1.6			1.6										[STD] 1.6		[Specified] 1.0		
Thread (1)		G1/4 R1/4										G3/8 R3/8									
Max.Scale (MPa) (2)	Pressure	0.06 0.1 0.16 0.25 0.4 0.6 1 1.6 2.5 4 6 10 16 25 40 60 100 (except for size 60)																			
	Vacuum	-0.1																			
	Compound	[Pressure part] 0.1 0.16 0.25 0.4 0.6 1 1.6 2.5										[Vacuum part] -0.1									
Application		Steam-proof (Sym.: M)					Steam & Vibration-proof (Sym.: MV)					(7) Heatproof (Sym.: H)					(7) Heat & Vibration-proof (Sym.: HV)				

※ For Steam-proof / Steam & Vibration-proof, keep away from direct high temperature steam.

※ For Heat-resistant / Heat & Vibration-proof, make sure that temperature of plastic case does not exceed 80°C due to radiant heat.

■ Main Part Material, etc.			
Wet Part	Medium	[STD] General use	[Specified] Anti-corrosion (Sym.: S2)
	Stock	C3604	SUS316
	Bourdon Tube	[Low Pressure] C2700, C2680 [High Pressure] C5191, SUS316	SUS316
Movement		[STD] Copper Alloy	[Specified] SUS (* Balance Spring part is Copper Alloy if size 50 and shape is D4) (Sym.: P2)
Case		ABS resin ⁽³⁾ • Black	
Ring		ABS resin • Black	
Window		[STD] Inorganic glass panel	[Specified] Polycarbonate panel (Sym.: P7)
Scale (Dial)		Aluminium Color • • • Pressure part: Black Vacuum part: Red	
Pointer		Aluminium	

■ Special Addition			
Special Treatment	No oil treatment (Sym.: E1) Clean treatment (Sym.: E2) Gas leak test (Sym.: E3)		
Other Additional Option	(4) With throttle screw (Sym.: F) (5) Set pointer: label type (Sym.: F5) Knob type (Sym.: F7) (6) Colored Scale (Sym.: F8) Semi-sealed (IP22 equivalent) (Sym.: W1)		
Attached documents	Inspection certificate Mill test report Standard instrument inspection certificate Calibration certificate Traceability chart		

■ Remarks

- (1) In case you need other screws, please contact us.
- (2) In case you need other maximum scale, please contact us.
- (3) Structure is not hermetically sealed. If sealed construction is required, please specify it.
- (4) The standard diameter of the throttle screw is φ 0.5, but the buffering effect will vary depending on the fluids viscosity, flow, speed etc.
In case you need other throttle, please refer the page "Throttle screw" in Reference section of this catalog.
- (5) For details about the set pointer type of pressure gauge, please refer the page "Pointer Options" in Accessories section.
- (6) For scale colored customized dial, please specify the scale range and color.
- (7) Accuracy class for Heatproof (H) and Heat & Vibration-proof (HV) is 2.5.

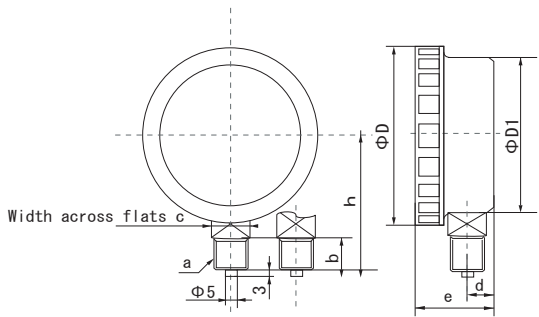
■ Order form example

Please quote symbols inside (Sym.:) from type/ usage table.

PC	A	V	G3/8	x	100	x	2.5	S1	•	E1	•
Model	Shape	Application	Joint Thread		Size		Max. scale			Special Addition symbol	
		Precision calss: STD: N/A Specified: Accuracy class value					Pressure gauge: Max scale value Vacuum: -0.1 Compound: Value x -0.1			Main part material symbol STD: N/A Specified: Symbol	

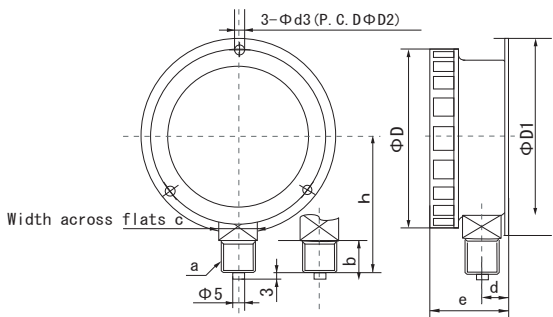
Plastic Case Pressure Gauge PC External Dimensions

【Shape A】
PCA—□□×□×□□



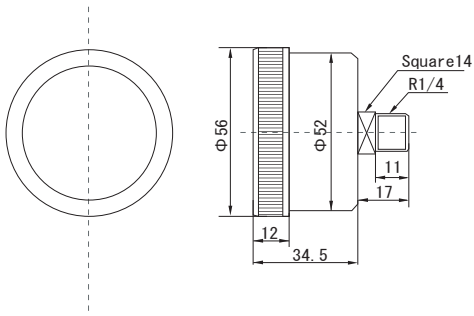
Size	a	b	c	d	e	h	D	D1
5 0	1/4	14	14 Square	12	31	49	57	53
6 0	1/4	14	14 Square	12	32	54	67.5	64
7 5	3/8	18	17 Square	12.5	40	68.5	84	77
1 0 0	3/8	18	17 Square	14	41	84.5	110	103

【Shape B】
PCB—□□×□×□□



Size	a	b	c	d	e	h	D	D1	D2	d3
6 0	1/4	14	14 Square	12.5	32	54	67.5	80	72	4.5
7 5	3/8	18	17 Square	14	40	68.5	84	98	88	4.5
1 0 0	3/8	18	17 Square	14	41	84.5	110	128	115	5.5

【Shape D4×Size50】
PCD4—□□×50×□□



Glycerin Filled Pressure Gauge GR

- To protect the internal mechanism and ensure excellent durability and vibration resistance, glycerin is encapsulated inside the pressure gauge.
- Ideal for the places of intense vibration and pulsation, which were considered impossible with regular pressure gauges.



* When select the pressure gauge, please refer to "Operational Conditions" in the "Applications" page and "Applicable Pressure Medium" in the "Pressure Media Category and Special Treatment" page for safety and sufficient performance.

《Legend》 Sym.: Model symbol

■ Specification																																									
Size (φ)		40				50				60				75				100				150																			
Shape		D3	D4	A				D4	A	B	D	D2	D3	D4	A				B	D	D2	A																			
Accuracy Class		3% F.S.								2.5								1.6																							
Thread (1)		R1/8				R1/4				G1/4				R1/4				G3/8				R3/8				G3/8				R3/8				G1/2				R1/2			
Max. Scale (MPa) (2)	Pressure	1	1.6	2.5	4	6	10	16	25	40	0.1 0.16 0.25 0.4 0.6 1 1.6 2.5 4 6 10 16 25 40 60 100 (except for size 60, 75)																														
	Vaccum	-										-0.1																													
	Compound	-										[Pressure part] 0.1 0.16 0.25 0.4 0.6 1 1.6 2.5										[Vaccum part] -0.1																			
Application		General (no symbol)										Anti-corrosion (Sym.: S2)																													

■ Main Part Material, etc.

Wet Part	Medium	[STD] General use	[Specified] Anti-Corrosion (Sym.: S2)
	Stock	C3604	SUS316 (except for : size 40, 60 and shape D3, D4) : size 50 and shape A, D4)
	Bourdon Tube	[Low Pressure]C2700, C5191、C2680 [High Pressure]C5191, SUS316	SUS316 (except for size 40, 50)
Movement		[STD]Copper Alloy	[Specified] SUS (* Balance Spring part is Copper Alloy if size 40,50 and shape is D4) (Sym.: P2)
Case		SUS (Aluminium for size 150)	
Ring		SUS (Aluminium for size 150)	
Window		[STD] Polycarbonate panel (Tempered glass for Size 60)	[Specified] Tempered glass(except for size 40, 50)(Sym.: P8)
Scale (Dial)		Aluminium Color ・ ・ ・ Pressure part: Black Vacuum part: Red	
Pointer		Aluminium	

■ Special Addition

Special Treatment	No oil treatment (Sym.: E1)	Clean treatment (Sym.: E2)	Gas leak test (Sym.: E3)
Other Additional Option	(3)With throttle screw (Sym.: F1) Drilled mounting hole(Shape D, D3 only) (Sym.: F2) Food additive glycerin (Sym.: E47)		
	Mounting bracket (Shape D, D3 only. Except for size 40) (Sym.: F3) (4)Set pointer: label type (Sym.: F5) (5)Colored scale (Sym.: F8)		
Attached documents	Inspection certificate Mill test report Standard instrument inspection certificate Calibration certificate Traceability chart		

■ Remarks

- (1) In case you need other screws, please contact us.
- (2) In case you need other maximum scale, please contact us.
- (3) The standard diameter of the throttle screw is φ 0.5, but the buffering effect will vary depending on the fluids viscosity, flow speed, etc. In case you need other throttle, please refer the page "Throttle screw" in Reference section of this catalog.
- (4) Label type of set pointer, red and green, are available. Please put them on a transparent plate of the pressure scale line you want to mark.
- (5) For scale colored customized dial, please specify the scale range and color.

■ **Order form example** Please quote symbols inside Sym.: from type/ usage table.

GR A G3/8 x 100 x 2.5 E1 •

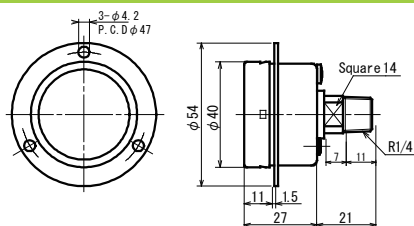
Model Shape Joint Thread Size Max. scale
Pressure gauge: Max scale value
Vacuum: -0.1
Compound: Value x -0.1

Glycerin Filled Pressure Gauge GR External Dimensions

Size 40

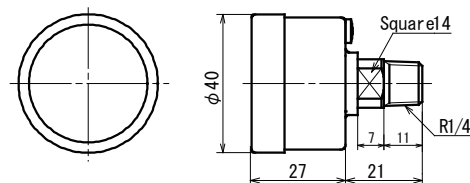
【Shape D3】

GRD3 R1/4×40×□



【Shape D4】

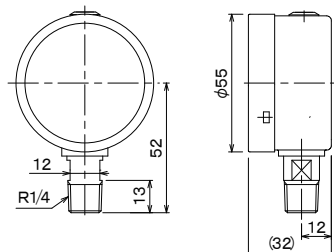
GRD4 R1/4×40×□



Size 50

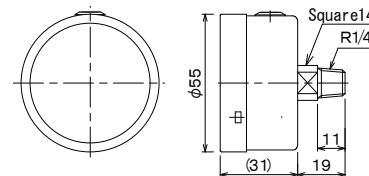
【Shape A】

GRA R1/4×50×□



【Shape D4】

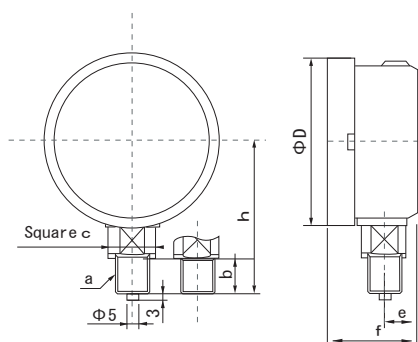
GRD4 R1/4×50×□



Size 60・75・100

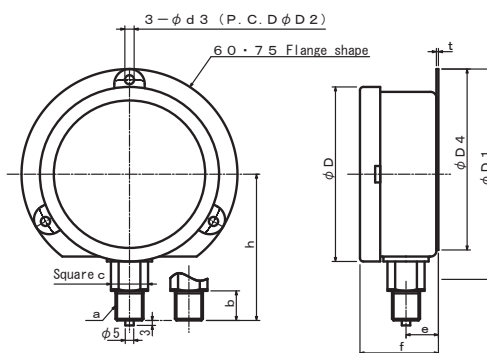
【Shape A】

GRA—□□×□×□□



【Shape B】

GRB—□□×□×□□

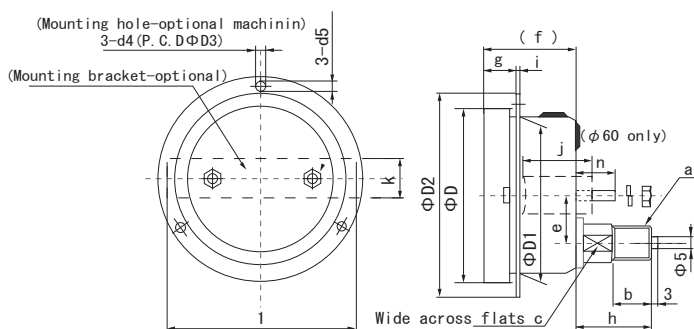


Size	a	b	c	e	f	h	D
60	1/4	15	14	11	32	56	68
75	1/4	16	22	16.8	44.5	70	83
	3/8	18				72	
100	3/8	18	22	18	46	89	108
	1/2	20				91	

サイズ	a	b	c	e	f	h	D	D1	D2	d3	D4	t
60	1/4	14	14	12.5	33.5	56	68	80	72	4.5	71	1.0
75	3/8	18	22	18	46	70	83	98	88	4.5	87	1.2
	3/8	18				72						
100	3/8	18	22	19	46.7	89	108	128	115	5.5	100.5	1.2
	1/2	20				91						

【Shape D】

GRD—□□×□×□□

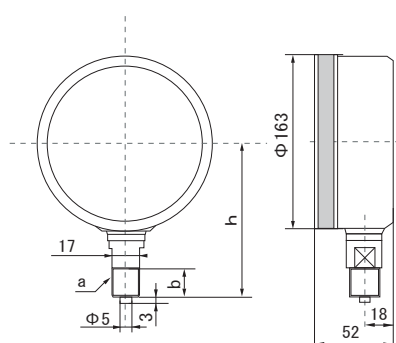


												Option						
												Mounting hole			Mounting bracket			
Size	a	b	c	h	e	f	g	i	D	D1	D2	D3	d4	d5	j	k	l	
6 0	1/4	14	14	26	18	32	12	1	68	64.5	84	76	Φ4.5		32	16	70	
7 5	1/4	16	19	34	21	(44)	(15)	1.2	83	76	98	88	4.5	6	34	16	91	
	3/8	18	19	36														
1 0 0	3/8	18	22	36	24	(46)	(16)	1.2	108	101	128	115	5.5	7.5	36	20	117	
	1/2	20	22	38														

Size 150

【Shape A】

GRA—□□×□×□□



a	b	h
3/8	18	125
1/2	20	127

Pressure Gauge with Electric Contacts(Micro Switch Type) MS

- When set pressure is reached, it activates micro switch to use for alarm or control.
- The micro switch has a proven track records, which improved its reliability.

■ Specification

■ Pressure Gauge

※ When select the pressure gauge, please refer to "Operational Conditions" in the "Applications" page and "Applicable Pressure Medium" in the "Pressure Media Category and Special Treatment" page for safety and sufficient performance.

《Legend》(Sym.:) Model symbol

Size(φ)		50	75	100
Shape		A		
Accuracy Class		2.5		
Thread ⁽¹⁾		R1/8	G3/8	
Max. Scale (MPa) ⁽²⁾	Pressure	10 Mpa (180° Scale)	0.1 0.16 0.25 0.4 0.6 1 1.6 2.5 4 6 10 16 25	
	Vaccum	-	-0.1	
Application		General use		

■ Main Part Material, etc.

Wet Part	Medium	[STD] General use	[STD] General use	[Specified] Anti-corrosion (Sym.: S2)
	Stock	C3604	C3604	SUS316
	Bourdon Tube	C5191	Low Pressure] C2700, C2680 [High Pressure] C5191, SUS316	SUS316
Movement		Copper Alloy		
Case		SPC • Cr plating	SUS	
Ring		SPC • Cr plating	SUS	
Window		Polycarbonate panel		
Scale (Dial)		Aluminium	Color • • • Pressure part: Black	Vacuum part: Red
Pointer		Aluminium		

※ Please specify Upper limit and Lower limit when ordering. (For size 50, the contact operating pressure is fixed.)

■ Special Addition

Special Treatment	No oil treatment(Sym.: E1)	Gas leak test(Sym.: E3)
Other Additional Option	(3)With throttle screw(Sym.: F1)	(4)Set pointer:label(Sym.: F5)

■ Remarks

- (1) In case you need other screws, please contact us.
- (2) In case you need other maximum scale, please contact us.
- (3) The standard diameter of the throttle screw is φ 0.5, but the buffering effect will vary depending on the fluids viscosity, flow speed, etc.
In case you need other throttle, please refer the page "Throttle screw" in Reference section of this catalog.
- (4) Label type of set pointer, red and green, are available. Please put them on a transparent plate of the pressure scale line you want to mark.

■ Electrical Equipment

Connecting method		Multi-pole connector
Switch activation accuracy	Setting	4% F.S.
	Repetition	1% F.S.
	Return hysteresis	4% F.S.
Switch activation chart		<div> Pressure 0 ← Setting → Max. </div> <div> <p>【Upper Limit Setting】</p> <p>【Lower Limit Setting】</p> </div>

■ Micro Switch Rated

Electrical Rating		Resistive load		Inrush Current		Ambient Humidity
AC	125	Normally off	Normally on	Normally off	Normally on	85%RH or lower
	250			20A Max.	10A Max.	
D.C. with inrush surges may require a surge-protector.						

■ Order form example

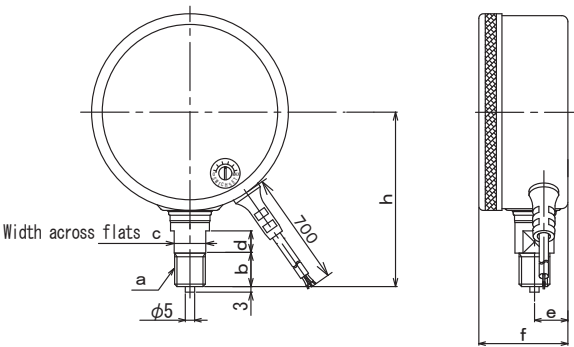
Please quote symbols inside(Sym.:) from type/ usage table.

MS 1 A G3/8 x 100 x 2.5 E1 •

Model Number of Shape Joint Thread Size Max. scale Special Addition symbol
 Contacts
 Pressure gauge: Max scale value
 Vacuum: -0.1
 Compound: Value x -0.1

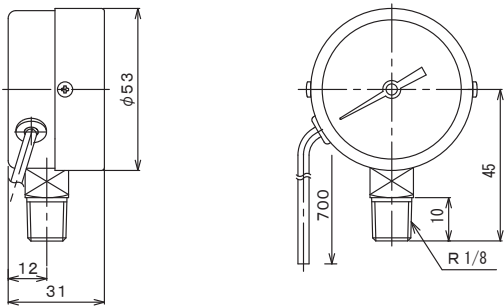
【 Shape A 】

MSA- x x



Size	a	b	c	d	e	f	h
7 5	1/4	16	14	10	17.5	44	73
	3/8	18	14	10	17.5	44	75
1 0 0	3/8	18	17	12	18	48	94
	1/2	20	17	12	18	48	96

MS 1 A R1/4 x 50 x



Pressure Gauge with Electric Contacts(Contact Switch Type) CS

● When the set pressure is reached, it activates micro switch to use for alarm or control.

■ Specification

■ Pressure Gauge

※ When select the pressure gauge, please refer to "Operational Conditions" in the "Applications" page and "Applicable Pressure Medium" in the "Pressure Media Category and Special Treatment" page for safety and sufficient performance.

《Legend》Sym.: Model symbol

Size (φ)		75
Shape		A
Accuracy Class		2.5
Thread ⁽¹⁾		R1/4
Max. Scale (MPa) ⁽²⁾	Pressure	0.1 0.16 0.25 0.4 0.6 1 1.6 2.5 4 6 10 16 25
	Vacuum	-0.1
	Compound	[Pressure part] 0.1 0.16 0.25 0.4 0.6 1 1.6 2.5 [Vacuum part] -0.1
Application		General use

■ Main Part Material, etc.

Wet Part	Medium	[STD] General use	[Specified] Anti-corrosion Sym.: S2
	Thread	C3604	SUS316
	Bourdon Tube	[Low Pressure] C2700, C2680 [High Pressure] C5191, SUS316	SUS316
Movement		Copper Alloy	
Case		ABSResin	
Ring		ABSResin	
Window		Acrylic acid Resin	
Scale (Dial)		Aluminium Color . . . Pressure part:Black Vacuum part: Red	
Pointer		Aluminium	

■ Special Addition

Special Treatment	No oil treatment Sym.: E1	Gas leak test Sym.: E3
Other Additional Option	⁽³⁾ With throttle screw Sym.: F1	⁽⁴⁾ Set pointer:label Sym.: F5

■ Remarks

- (1) In case you need other screws, please contact us.
- (2) In case you need other maximum scale, please contact us.
- (3) The standard diameter of the throttle screw is φ 0.5, but the buffering effect will vary depending on the on the fluids viscosity, flow speed, etc.
In case you need other throttle, please refer the page "Throttle screw" in Reference section of this catalog.
- (4) Label type of set pointer, red and green, are available. Please put them on a transparent plate of the pressure scale line you want to mark.

■ Contact Part

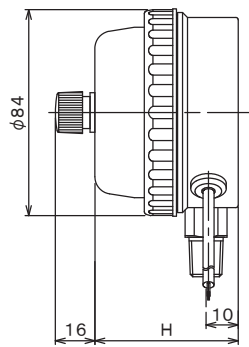
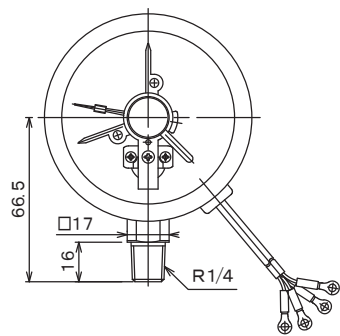
(1)	Contact	Upper limit contact or Lower limit contact
(2)	Contact current capacity	50VA
(3)	Setting accuracy	5 ~ 9.5 % F.S
(4)	Switch activation accuracy	± 2.5 % F.S

■ Order form example Please quote symbols inside Sym.: from type/ usage table.

CS	A	R1/4	x	75	x	2.5	Upper limit	E1
Model	Shape	Thread		Size		Max. Scale	Contacts:	Special additional symbol
						Pressure gauge: Max. Scale value	Upper limit	
						Vacuum gauge: -0.1	Lower limit	
						Compound gage: value x -0.1	Upper and Lower limit	

【 Type CS Shape A 】

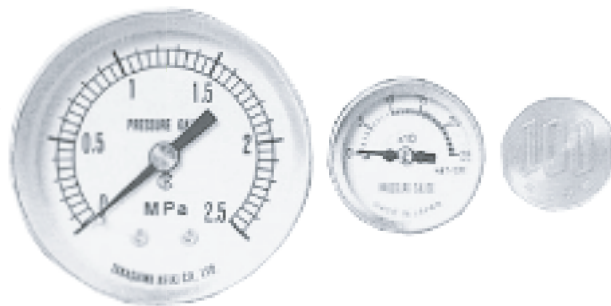
CS □ A R1/4 × 75 × □ □



Contact configuration	H
Upper limit contact	5 4
Lower limit contact	5 4
Upper and lower limit contact	6 0

Small Size Pressure Gauge KG

- Compact pressure gauges are perfectly sized for integration into equipment and devices.
- The maximum pressure range is ultra-wide, with 0.1 to 40pa (size 40, 50) and used for pneumatic equipment and high pressure hydraulic equipment.
- We respond flexibly to customers requests such as name insertion and special additional processing.



※ When select the pressure gauge, please refer to "Operational Conditions" in the "Applications" page and "Applicable Pressure Medium" in the "Pressure Media Category and Special Treatment" page for safety and sufficient performance.

《Legend》(Sym.:) Model symbol

■ Specification															
Size (φ)		30				40				50					
Shape		A D4				A D D2 D3 D4				A D3 D4					
Accuracy Class		4% F.S.				3% F.S.				[STD] 2.5% F.S. [Specified] 1.6% F.S.					
Thread ⁽¹⁾		R1/8				R1/8				R1/4					
Max.Scale (MPa) ⁽²⁾	Pressure	0.4 0.6 1 1.6				0.1 0.16 0.25 0.4 0.6 1 1.6 2.5 4 6 10 16 25 40(size 50 and shape A only)									
	Vacuum	-				-0.1 (size 40: The scale is 180°)									
	Compound	-				[Pressure part] 0.1 0.16 0.25 0.4 0.6 1 1.6 2.5 [Vaccum part] -0.1									
Application		General													

■ Main Part Material, etc.				
Wet Part	Medium	[STD] General use	[Specified] (Sym.: S1)	[Specified] Anti-corrosion (Sym.: S2)
	Stock	C3604	C3604	SUS316 (size40 and Shape D2: SUS304)
	Bourdon Tube	[Low Pressure] C2700, C5191 [High Pressure] C5191	SUS316 (Please inquire for availability.)	
Movement		[STD] Copper Alloy	[STD] Copper Alloy [Specified] SUS (Sym.: P2) (* The size 40: Balance spring is Coppler Alloy * The size 50 and the shape is A: All SUS * The size 50 and the shape is D3 or D4. : Balance spring is Coppler A)	
Case		SUS	[STD] SPC • Cr plating	[Specified] SUS (Shape D4 only) (Sym.: P3)
Ring		SUS	[STD] SPC • Cr plating	[Specified] SUS (Shape D4 only) (Sym.: P3)
Window		Polycarbonate panel	[STD] Polycarbonate panel	[Specified] Inorganic glass (Sym.: P5)
Scale (Dial)		Aluminium Color • • • Pressure part: Black Vacuum part: Red		
Pointer		Aluminium		

■ Special Addition	
Special Treatment	No oil treatment (Sym.: E1) Clean treatment (Sym.: E2) Gas leak test (Sym. E3:)
Other Additional Option	(3)With throttle screw (Sym.: F1) Drilled mounting hole (Shape D,D3 only) (Sym.: F2)
	Mounting bracket (Shape D, D3 only) (Sym.: F3) Case with safety window (Sym.: F4)
	(4)Set pointer:label type (Sym.: F5) (5)Colored scale (Sym.: F8)
Attached documents	Inspection certificate Mill test report Standard instrument inspection certificate Calibration certificate Traceability chart

■ Remarks

- (1) In case you need other screws, please contact us.
- (2) In case you need other maximum scale, please contact us.
- (3) The standard diameter of the throttle screw is φ 0.5, but the buffering effect will vary depending on the fluids viscosity, flow speed, etc.
In case you need other throttle, please refer the page "Throttle screw" in Reference section of this catalog.
- (4) Label type of set pointer, red and green, are available . Please put them on transparent plate of the pressure scale line you want to mark.
- (5) For scale colored customized dial, please specify the scale range and color.

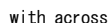
■ Order form example Please quote symbols inside (Sym.:) from type/ usage table.

KG A R1/8 x 40 x 2.5 P3 • E1 •
 Model Shape Thread Size Main part material symbol Special Addition symbol
 STD: N/A
 Specified: Symbol
 Max. Scale
 Pressure gauge: Max. Scale value
 Vacuum: -0.1

External Dimensions

【 Shape A 】

KG A × ×

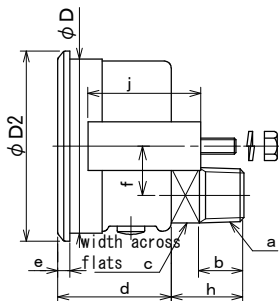
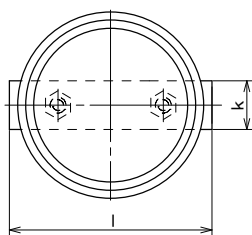


Size	a	b	c	d	e	h	D
4 0	R1/8	10	12	8	27	37	43.5
	R1/4	11	14	9	27	38	
5 0	R1/8	10	14	10	30	45	53
	R1/4	14	14	10	30	49	
	G1/4	16	14	10	30	51	

【 Shape D 】

KG D × ×

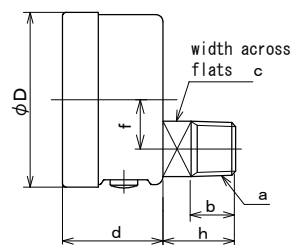
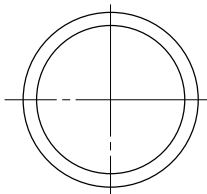
(bracket accompanied)



Size	a	b	c	h	d	e	f	D	D2	j	k	l
4 0	R1/8	9	13	15	27	3	12	43	45	30	12	50
	R1/4	11		19								

【 Shape D2 】

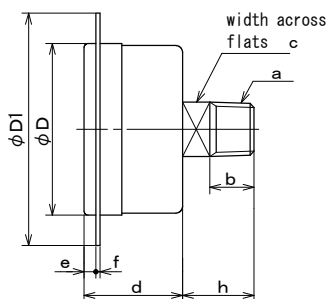
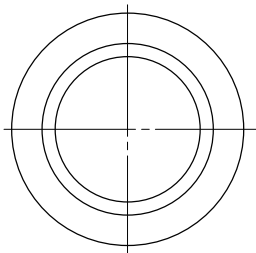
KG D2 × ×



Size	a	b	c	h	d	f	D
40	R1/8	9	13	15	27	12	43.5
	R1/4	11		19			

【 Shape D3 】

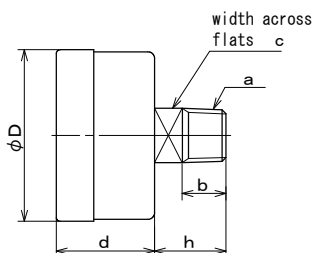
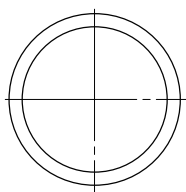
KG D3 × ×



Size	a	b	c	h	d	e	f	D	D1
40	R1/8	9	13	15	27	3	1.5	44.5	58
	R1/4	11	13	17					
50	R1/8	9	13	14	29	2	2	54.5	70
	R1/4	11	13	16					

【 Shape D4 】

KG D4 × ×



Size	a	b	h	c	d	D
3 0	R1/8	7	11	12 hexagon	17	30
4 0	R1/8	9	15	13	27	43.5
	R1/4	11	17			
5 0	R1/8	9	14	13	29	53
	R1/4	11	16			

Duplex Pressure Gauge DP

- Space saving by measuring two pressures simultaneously in one pressure gauge.
- It is perfect to display compared two pressures.



※ When select the pressure gauge, please refer to "Operational Conditions" in the "Applications" page and "Applicable Pressure Medium" in the "Pressure Media Category and Special Treatment" page for safety and sufficient performance.

《Legend》(Sym.:) Model symbol

■ Specification												
Size (φ)		60			75				100			
Shape		D							B D			
Accuracy Class		4% F.S.			3% F.S.				2.5% F.S.			
Thread ⁽¹⁾		G1/4			G3/8				G3/8			
Max. Scale (MPa) (2)	Pressure Gauge	0.1 0.16 0.25 0.4 0.6 1 1.6 2.5 4										
	Vaccum	-0.1										
	Compound	[Pressure Part] 0.1 0.16 0.25 0.4 0.6 1 1.6 2.5 [Vacuum part] -0.1										
Application		General use (No symbol)										

■ Main Part Material, etc.

Wet Part	Medium	[STD] General use		
	Thread	C3604		
	Bourdon Tube	[Low Pressure] C2700, C2680		
Movement		Copper Alloy		
Case		Aluminium • black paint (Size 60)	SUS304 • black paint (Size 75 • 100)	
Ring		Aluminium • black paint (Size 60)	SUS304 • black paint (Size 75 • 100)	
Window		[STD] Inorganic glass	[Specified] Polycarbonate panel	(Sym.: P7)
Scale (Dial)		Aluminium	Color • • • Pressure part: Black	Vacuum part: Red
Pointer		Aluminium		

■ Special Addition

Special Treatment	No oil treatment (Sym.: E1) Clean treatment (Sym.: E2) Gas leak test (Sym.: E3)								
Other Additional Option	(3) With throttle screw (Sym.: F1) Drilled mounting hole (Shape D only) (Sym.: F2) (4) Colored scale (Sym.: F8)								
Attached documents	Inspection certificate Mill test report Standard instrument inspection certificate Calibration certificate Traceability chart								

■ Remarks

- (1) In case you need other screws, please contact us.
- (2) In case you need other maximum scale, please contact us.
- (3) The standard diameter of the throttle screw is φ 0.5, but the buffering effect will vary depending on the fluids viscosity, flow speed, etc.
In case you need other throttle, please refer the page "Throttle screw" in Reference section of this catalog.
- (4) For scale colored customized dial, please specify the scale range and color.

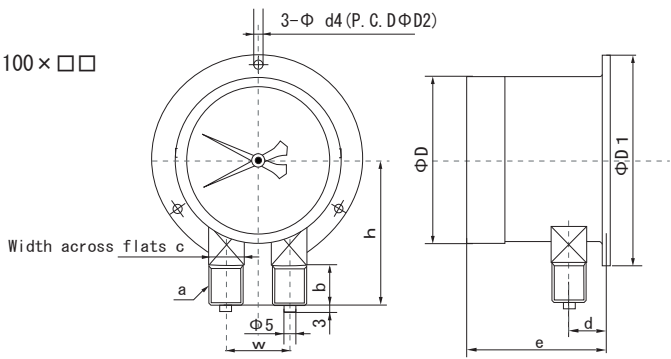
■ Order form example

Please quote symbols inside (Sym.:) from type/ usage table.

DP	D		G3/8	x	100	x	2.5		E1	•
Model	Shape	Accuracy Class STD: N/A Specified: Accuracy Class value	Thread		Size				Special Additional symbol	
Max. Scale Pressure gauge: Max. Scale value Vacuum gauge: -0.1 Compound gauge: Pressure value x -0.1										

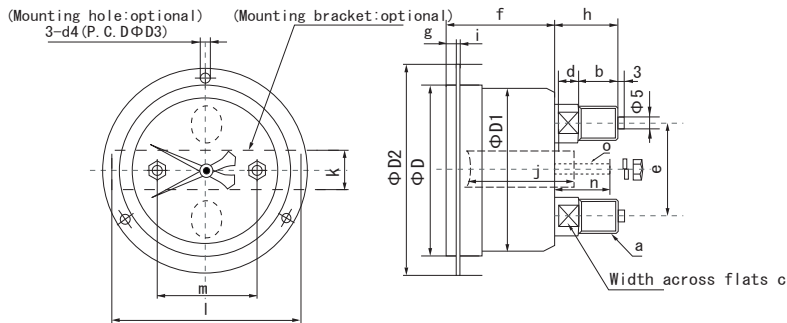
Twin Needle Pressure Gauge DP External Dimensions

【Shape B】
DPB—□G3/8×100×□□



Size	a	b	c	d	e	h	w	D	D1	D2	d4
1 O O	G3/8	18	17 square	19	50	80	36	106	128	115	5.5

【Shape D】
DPD—□□×□×□□



													Option							
													Mounting hole		Mounting bracket					
Size	a	b	c	d	h	e	f	g	i	D	D1	D2	D3	d4	j	k	l	m	n	o
6 0	1/4	14	12	8	25.5	40	52	3.5	2	65	62	80	72	4.5	50	16	71	42	16	M4
7 5	1/4	18	14	12	30	44	52	5	2	80	77	99	88	4.5	50	18	91	48	21	M5
1 0 0	3/8	18	14	12	30	44	52	6	2.5	105	102	128	115	5.5	50	20	117	72	21	M5

Differential Pressure Gauge DF

- Indicates pressure difference between 2 points
- Measurement of flow rate, measurement of clogging of filter, measurement of internal and external pressure difference in clean room

※ When selecting the pressure gauge, please confirm that it conforms to "Operational Conditions" in the "Applications" page and "Applicable Pressure Medium" in the "Pressure Media Category and Special Treatment" page for safety and sufficient performance.

《Legend》(Sym.:) Model symbol

■ Specification					
Size (φ)		75			
Shape		PA (Wall type)			
Accuracy Class		2.5			
Joint ⁽¹⁾		Hose base (HK)			
Max. Scale (MPa) (2)	Unit	kPa			
	Differential Value	3	5	10	20
	Max. over-differential pressure	3	5	10	20
Application		General use			

■ Main Part Material, etc.		
Wet Part	Medium	Non corrosive gas (Liquid prohibited)
	Connection	C3604
	Pressure element	C1720 or C5210
Movement		Copper Alloy
Case		SUS304
Ring		SUS304
Window		Polycarbonate panel
Scale (Dial)		Aluminum
Pointer		Aluminum

■ Remarks

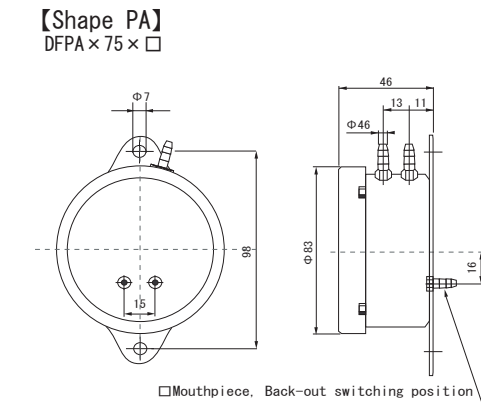
- (1) If you need other screws, please contact us.
- (2) If you need other maximum scale, please contact us.

■ Order form example Please quote symbols inside(Sym.:) from type/ usage table.

DF PA HK x 75 x () ()

Model Shape Joint Size Differential Value Max. over-differential pressure

■ External Dimensions



Link type Gear-less Pressure Gauge RS

- A pressure gauge that does not use gears for the enlarging mechanism and improves durability
- The link formula instructs the displacement of the Bourdon tube to the pointer using the link.
- It is used for pulsating pressure measurment of a Plunger type pump and a portable cylinder for aircraft

■ Specification		
Size (φ)	40	50
Shape	A D	A
Accuracy Class	3% F.S.	
Thread	R1/4	
Max. Scale (MPa)	※ 1 1.6 2.5 4	
Application	Vibration-proof	

■ Main Part Material, etc.		
Wet Part	Thread	C3604
	Bourdon Tube	C2680、C2700、C5191
Case	※ SPC・Cr plating, SUS304	
Ring	※ SPC・Cr plating, SUS304	
Window	※ Inorganic glass Polycarbonate panel	

- ※ Reference example
- ※ For measurement of pulsating pressure, use a gauge valve together and open only ath the time of measurement.

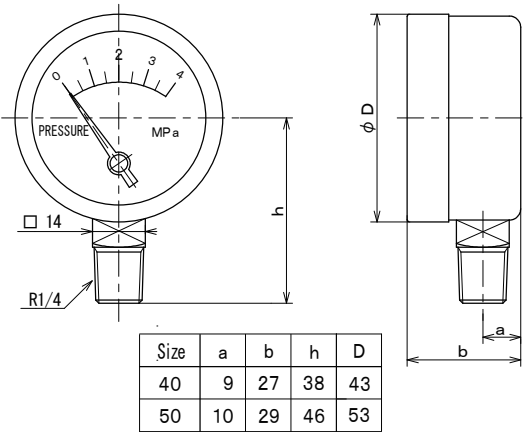
■ Order form example

RS A R1/4 x 50 x 2.5

Model Shape Thread Size Max. scale

【 Shape A 】

RS A R1/4 x Size x



Spiral type Gear-less Pressure Gauge SP

- A pressure gauge that does not use gears for the enlarging mechanism and improves durability
- The spiral type winds the Bourdon tube a number of times to set the pointer and directs the pressure.
- Spiral type has marvelous durability because of no sliding part, therefore ultra miniaturization can be realized.
- It is used for pulsating pressure measurement of a Plunger type pump and a portable cylinder for aircraft

■ Specification		
Size (φ)	22	25
Shape	D4	A D4
Accuracy Class	Measuring area: ± 4% F.S. Others: ± 8% F.S.	
Thread	※ R・G1/8 R・G1/4	※ M5 R1/8 G1/4
Max. Scale (MPa)	※ 35 40 50	※ 6 15
Accuracy Class	Vibration proof	

■ Main Part Material, etc.		
Wet Part	Thread	※ SUS304, C3604
	Bourdon Tube	※ SUS304
Case	※ C3604 SUS	※ C3604
Window	※ Polycarbonate panel	

※ Reference example. It is decided according to the use.

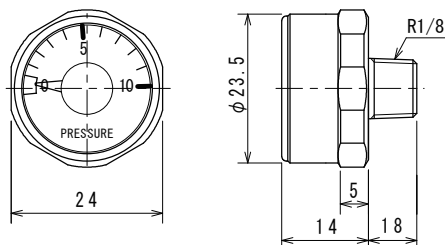
■ Order form example

SP D4 R1/8 x 25 x 15

Model Shape Thread Size Max. Scale

【 Shape D4 R1/8 】

SP D4 R1/8 x 25 x □



Micromanometer (Indoor use) MP1

- It is used for low pressure measurement which can not be taken with an ordinary pressure gauge of 60kPa (6000mmH₂O) or less.
- Used for indoor pressure monitoring

■ Specification										
Size (φ)		60					75			
Shape		A D3 D4					A			
Accuracy Class		[STD] 2.5 [Specified] 1.6								
Thread ⁽¹⁾		R1/4					R3/8			
Max. Scale (kPa) (2)	Pressure Gauge	4 6 10 16 25 40 50								
	Vacuum	-4 -10 -25 -40								
	Compound	[Pressure Part] 4 6 10 16 25 40 [Vaccum Part] Separate discussion								
Application		General Use								
Medium		Gas								

■ Main Part Material, etc.									
Thread		C3604							
Pressured Element		C5191 C1720							
Case		SPC					SPC		
Cover		SPC Aluminum (Shape D3)					SPC		

■ Remarks

- (1) Please ask when special thread required.
- (2) Please ask when other Max. scale needed

■ Order form example

MP1

A

R3/8

x

75

x

10

Model

Shape

Thread

Size

Max. Scale

Pressure gauge: Max. value

Vaccum meter : Designated value

Compound: Value of pressured portion x designated vacuum value

Micromanometer (Drip-proofed type) MP2

- It is used for low pressure measurement which can not be taken with an ordinary pressure gauge of 60kPa (6000mmH₂O) or less.
- The case is drip-proofed (IP22 equivalent).



■ Specification										
Size (φ)		75					100			
Shape		A D3 D4					A D3 D4			
Accuracy Class		[STD] 2.5					[Specified] 1.6			
Thread ⁽¹⁾		R・G3/8・Hose base					R・G3/8			
Max. Scale (kPa) (2)	Pressure Gauge	4 6 10 16 25 40 50								
	Vacuum	-4 -10 -25 -40								
	Compound	[Pressure Part] 4 6 10 16 25 40					[Vacuum Part] Need separate discussion			
Application		General Use								
Medium		Gas								

Main Part Material, etc.									
Thread		C3604							
Pressured Element		C5191 C1720							
Case		SUS							
Cover		SUS							

Remarks

- (1) Please ask when special thread required.
- (2) Please ask when other Max. scale needed.

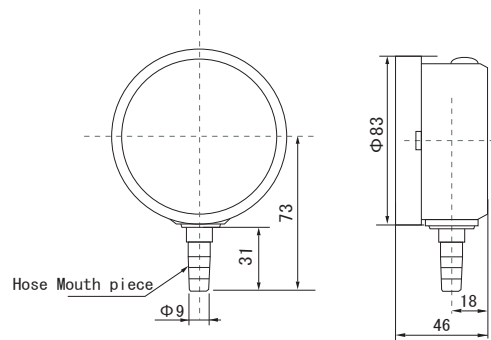
Order form example

MP2 A G3/8 x 100 x 10

Model Shape Thread Size Max. Scale

Pressure gauge: Max. value
Vaccum meter : Designated value
Compound: Value of pressured portion x - designated vacuum value

【MP2 Shape A – HK】
MP2A—HK×75×□□



Micromanometer (SUS Bellows Gauge) MP3

- It is used for low pressure measurement which can not be taken with an ordinary pressure gauge of 60kPa (6000mmH₂O) or less.

■ Specification	
Size (φ)	100
Shape	B
Accuracy Class	[STD] 2.5 [Specified] 1.6
Thread ⁽¹⁾	G3/8
Max. Scale(kPa) (2)	Pressure Gauge 4 6 10 16 25 40 50
	Vacuum -4 -10 -25 -40
	Compound [Pressure Part] 4 6 10 16 25 40 [Vacuum Part] Need separate descussion
Application	General Use
Medium	Gas

■ Main Part Material, etc.	
Thread	SUS304
Pressured Element	SUS316、ORing・NBR
Case	Aluminum
Cover	Aluminum

■ Remarks

- (1) Please ask when special thread required.
- (2) Please ask when other Max. scale needed.

■ Order form example

MP3 B G3/8 x 100 x 10

Model

Shape

Thread

Size

Max. Scale

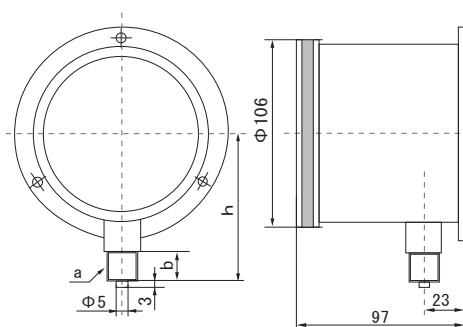
Pressure gauge: Max. value

Vacuum meter : Designated value

Compound: Value of pressured portion x designated vacuum value

【SUS Bellows MP3 Shape A】

MP3A—□□×100×□□S2



a	b	h
3/8	18	87
1/2	20	89

Pressure Gauge for general gas OG

- It is used for gas pressure measurement of oxygen, acetylene, hydrogen, helium, etc.
- Gas leak test, adoption of safety blowhole and self-extinguishing resin and thorough safety measures.
- Completely dry treatment that does not emit any harmful water or oil to connected equipment such as pressure regulator.

※ When selecting the pressure gauge, please confirm that it conforms to "Operational Conditions" in the "Applications" page and "Applicable Pressure Medium" in the "Pressure Media Category and Special Treatment" page for safety and sufficient performance.

■ Specification												
Size(φ)		40		50		60		75 100				
Shape ⁽¹⁾		A										
Accuracy Class		3.0		2.5		1.6						
Thread ⁽²⁾		G1/4							G3/8			
Max. Scale (MPa) (3)	Pressure Gauge	0.25 0.4 0.6 1 1.6 2.5 6 10 16 25 40 60										
	Vacuum	-0.1										
	Compound	[Pressure Part] 0.1 0.25 0.4 0.6 1 1.6							[Vacuum Part] -0.1			
Application		for general gas										

Main Part Material, etc.				
Thread	C3604		SUS316	
Pressured Element	C2700	C2680	C5191	SUS316
Case	SPC			
Cover	SPC			

Remarks

- (1) Please ask when other shapes required.
(2) Please ask when special thread required.
(3) Please ask when other Max. scale needed.

Order form example

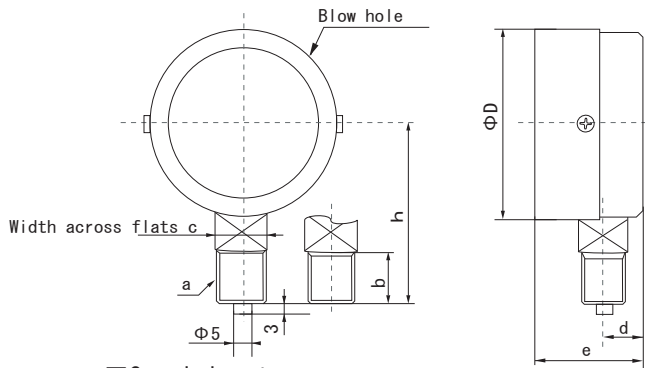
OG A G1/4 x 60 x 2.5

Model Shape Thread Size Max. Scale

Pressure gauge: Max. value
Vaccum meter : -0.1
Compound: Value of pressured portion x -0.1

【Shape A】

OGA × □ × □ × □ □



Special note

- (1) Size 40 does not have small screw for ring stopper.
(2) Blow holes vary in size and position depending on the type.

Size	a	b	c	d	e	h	D
40・50	1/4	Same dimension as model		Small-sized pressure gauge (KG).			
60	1/4	Same dimension as model		Standard pressure gauge (ST).			
75・100	3/8						

Pressure Gauge for high purity gas HC

- It is used for gas pressure measurement of oxygen, acetylene, hydrogen, helium, etc.
- Gas leakage test, safety blowhole and self-extinguishing resin , adopted thorough safety measures.
- Completely dry treatment does not emit any harmful water or oil into connected equipment such as pressure regulator.
- For high-purity gases, airtightness and cleanliness are fully considered, making it ideal for semiconductor process.



※ When select the pressure gauge, please refer to "Operational Conditions" in the "Applications" page and "Applicable Pressure Medium" in the "Pressure Media Category and Special Treatment" page for safety and sufficient performance.

Specification									
Size (φ)		50							
Shape (1)		A D2 D4							
Accuracy Class		1.6							
Thread(2)		9/16-18 UNF male-female union 1/4 tube							
Max. Scale (MPa) (3)	Pressure Gauge	1 1.6							
	Vacuum	-0.1							
	Compound	[Pressure Part] 0.1 0.25 0.4 0.6 1 1.6 [Vacuum Part] -0.1							
Application		for high purity gas							

Main Part Material, etc.	
Thread	SUS316
Pressured Element	SUS316
Case	SUS304
Cover	SUS304
Window	Polycarbonate panel

Remarks

- (1) In case you need other shapes, please contact us .
- (2) In case you need other special thread, please contact us .
- (3) In case you need other Max. scale, please contact us .

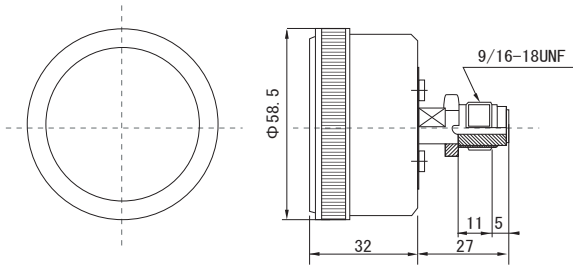
Order form example

HC A 9/16-18 UNF Male x 50 x 1

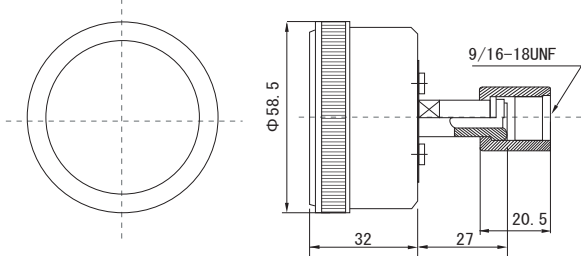
Model Shape Thread Size Max. Scale
Pressure gauge: Max. value
Vaccum meter : -0.1
Compound: Value of pressured portion x-0.1

【Model H C Shape D4】

HC D4 MS9/16 × 50 × □ □



HC D4 FS9/16 × 50 × □ □



Pressure gauge for high pressure HP

- It is used for gas pressure measurement of oxygen, acetylene, hydrogen, helium, etc.
- Gas leakage test, safety blowhole and self-extinguishing resin, adopted thorough safety measures.
- Completely dry treatment does not emit any harmful water or oil into connected equipment such as pressure regulator.
- The structure for high pressure gas is made of hydrogen-conscious material and has a bulkhead which allows the Bourbon tube movement backward in case of rupture as a safety measure .

※ When select the pressure gauge, please refer to "Operational Conditions" in the "Applications" page and "Applicable Pressure Medium" in the "Pressure Media Category and Special Treatment" page for safety and sufficient performance.

■ Specification			
Size (φ)		100	
Shape ⁽¹⁾		B D	
Accuracy Class		1.6	
Thread ⁽²⁾		G1/2 9/16-18 UNF female	
Max. Scale (MPa) ⁽³⁾	Pressure Gauge	100 150 200	
	Vacuum	-	
	Compound	-	
Application		for high pressure gas	

■ Main Part Material, etc.	
Thread	SUS316L
Pressured Element	SUS316L
Case	SUS304

■ Remarks

- (1) In case you need other screws, please contact us.
- (2) In case you need other special thread, please contact us.
- (3) In case you need other maximum scale, please contact us.

■ Order form example

HP B G1/2 x 100 x 100

Model Shape Thread Size Max. Scale

Pressure Gauge 0.6 Class MA

- High precision pressure gauge for test or inspection.

■ Specification												
Size (φ)		100										
Shape		A B										
Accuracy Class		0.6 Class										
Connection		G3/8 G1/2										
Max. Scale (MPa)	Pressure Gauge	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4		
	Vacuum	-0.1										
	Compound	[Pressure Part]	0.1	0.16	0.25	0.4	0.6	1	1.6	[Vacuum Part]	-0.1	
Medium		Non corrosive liquid										

■ Order form example

MA **A** **G3/8** x **100** x **2.5**
Model Shape Connection Size

Max. Scale
 Pressure gauge: Max. value
 Vacuum meter : -0.1
 Compound: Value of pressured portion x -0.1

Diaphragm Pressure Gauge (Direct Connection Type) SA

- Provide a diaphragm to prevent from entering the measured liquid directly into the pressure gauge.
- For the measuring of corrosive, high viscosity fluid in chemical plants, food factories, etc.
- Possible to separate the pressure receiving part and indicating part as a separate type.
- All models are done with no oil treatment.

※ For pressure measurement, in order to obtain safety and sufficient performance, the service pressure should be less than 2/3 of the maximum pressure.

《Legend》(Sym.:) Model symbol

■ Specification						
Size (φ)		75 100 150				
Shape		Direct connection type - A type pressure gauge				
Accuracy		[STD] 2.5 [Specified] 1.6				
Variation of Joint	Joint Type	Thread type(Sym.: S)	I type flange(Sym.: I)	Ftype flange(Sym.: F)	For sanitary use(Sym.: H)	Nut type(Sym.: N)
	Joint Size	(1) R3/8、R1/2	(2) Conforms to JIS pipe flange (Suitable for Outer Diameter less than φ 140)		1S 1 1/2S 2S	
Max. Scale (MPa) (3)	Pressure Gauge	20 Kpa ~ 50 Kpa		0.1 0.16 0.25 0.4 0.6 1 1.6 2.5 4 6 10 16 25、 For connected JIS pipe flange is below the nominal pressure value, for connected part made of resin is 1MPa or less.		
	Vacuum	For low pressure use, please ask us.		-0.1		
	Compound	For low pressure use, please ask us.		[Pressure Part] 0.1 0.16 0.25 0.4 0.6 1 1.6 2.5 [Vacuum Part] -0.1		

■ Main Part Material, etc.						
(4) Indicator	(5) Type of Pressure Gauge	[STD] Sealing Case Pressure Gauge (SUSCase、C3604 screw) [Specified] Stainless Steel Pressure Gauge(Sym.: WS) Other pressure gauge described in this catalog(Sym.: Pressure Gauge type Symbol)				
	Upper flange	[STD] C3604 • Cr plating SUS316 (Sym.: U6) PP Resin (Sym.: UP)				
	Pipe	-				
(7) Wet part	Diaphragm	[STD] SUS316L [Specified] (6) PTFE Resin (Sym.: ST) Fluororesin coating (Sym.: SF)				
	Thread • bottom flange	[STD] SUS304 [Specified] SUS316 (Sym.: L6) (8) PP Resin (Sym.: LP) Fluororesin coating (Sym.: LF)				
Filler liquid	Usage	[STD] For general use • food use		[Specified] For high temp. (Sym.: Q2)		For oxygen (Sym.: Q3)
	Type	Propylene glycol		Silicone oil		Trifluorochloroethylene low polymerization oil
	Temp. range(°C)	-30 ~ 160		-30 ~ 100		-30 ~ 150

■ Special Addition						
Additional option		(9) With throttle screw or Dampner (Sym.: F1) Drilled Mounting hole (Shape D only) (Sym.: F2)				
		Mounting bracket (Shape D only) (Sym.: F3) With intermediate flange (Cleaning hole) (Sym.: F9)				
Attached documents		Inspection certificate Mill test report Standard instrument inspection certificate Callibration certificate Traceability chart				

■ Remarks

- (1) If other dimensions are required , please contact us.
- (2) Almost all flanges are with flat face (FF). Raised face (RF) is available upon request.
- (3) In case you need other maximum scale, please contact us.
- (4) For sanitary use , the indicating part is the stainless steel pressure gauge.
- (5) For specifications of pressure gauges, please refer to each product page.
- (6) Please consider PTFE Resin permeability sufficient.
- (7) There is no material that can withstand all fluids. Therefore, when used for corrosive fluids. it is necessary to select the most suitable material for each fluid. Please specify the fluid name.
- (8) Maximum working pressure is 1 MPa. Please contact us for temperature range.
- (9) The constant liquid seal between the diaphragm and the pressure gauge provides an effective pulsation dampening effect. However, since dampener is a no-leak type, please select 2.5 MPa or less.

■ Order form example

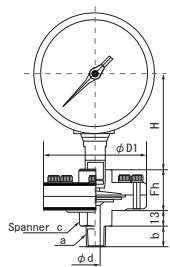
Please quote symbols inside (Sym.:) from type/ usage table.

SA	S • R3/8	x 100	x 2.5	WS A • U6	L6	T1 •	
Model	Variation of Joint: (Example)	Size	Max. scale	Indicator Symbol	Material of wet part	Symbol of filler liquid	Special Additional symbol
	Thread type: S • Thread size (S • R1/2)		Pressure gauge: Max. value	(Type of Pressure gauge •	[STD]: Blank	[STD]: Blank	
	I type flange: I • JIS name of pipe flange (I • JIS 10k 20)		Vacuum: -0.1	Upper flange material)	[Specified]: Symbol	[Specified]: Symbol	
	F type flange: F • JIS name of pipe flange (F • JIS 10k 50)		Compound: Value of pressured	[STD]: Blank			
	For sanitary use: Symbol • Joint size (H • 11/25)		portion x -0.1	[Specified]: Symbol			

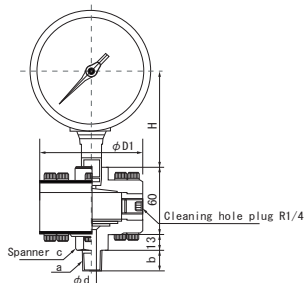
Diaphragm Pressure Gauge (Direct Connection Type) SA External Dimensions

【Direct connection — thread type】

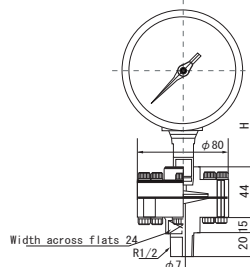
SAS-□×□×□



<With intermediate flange>
SAS-□×□×□-F9

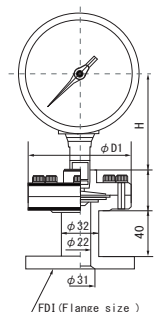


<With diagram thread>
SAS-□×□×□-LP

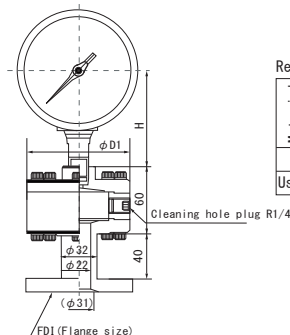


【Direct connection — I type flange】

SAI-□×□×□

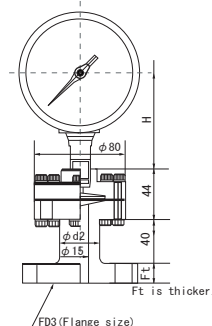


<With intermediate flange>
SAI-□×□×□-F9



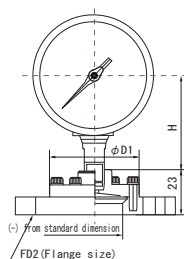
<Resin made connection>
SAI-□×□×□-U3 L5

Resin made connection	
Material	Upper flange PP resin
	Diaphragm PTFE resin
	Joint thread PP resin
Max. Pressure	1 MPa
Usable max. temp.	50 °C



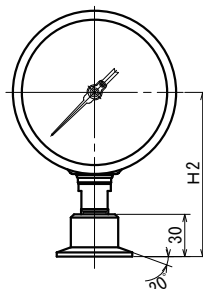
【Direct connection — F type flange】

SAF-□×□×□

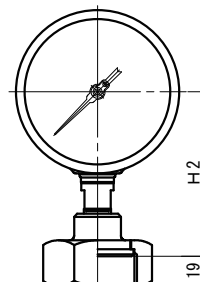


【Direct connection — for sanitary】

Clamp type
SAH-□×□×□



Nut type
SAN-□×□×□



* Standard: Sealed type all stainless made pressure gauge

Dimension of designated part

Size	H	H2
75	(65)	(90)
100	(84)	(109)
150	(115)	—

Dimension of Diaphragm portion

Pressured area	D1	Fh
Low pressure (600kPa or lower)	119	36
Middle pressure (0.1MPa~4MPa)	89	36
High pressure (4MPa or higher)	58	41

Thread type-Connected portion dimension

a	b	c	d
R3/8	18	Hex flat diameter 24	8
R1/2	20	Hex flat diameter 24	10

※Dimension when using a standard sealed type pressure gauge.
In case of other pressure gauges, please calculate from the
h dimension of the described page. H-h-10

Flange type - Connected flange dimension

Flange name	FD 1	FD 2	FD 3
JIS B 2212 10kg/cm ² tube flange	10A, 15A, 20A, 25A, 40A recommended	50A, 65A, 80A, 100A recommended	10A, 15A, 20A, 25A recommended
JIS B 2213 16kg/cm ² tube flange	10A, 15A, 20A, 25A, 40A recommended	50A, 65A, 80A, 100A recommended	
JIS B 2214 20kg/cm ² tube flange	10A, 15A, 20A, 25A, 40A recommended	50A, 65A, 80A, 100A recommended	
JIS B 2215 30kg/cm ² tube flange	10A, 15A, 20A, 25A recommended	40A, 50A, 65A, 80A, 100A recommended	
JIS B 2216 40kg/cm ² tube flange	10A, 15A, 20A, 25A recommended	40A, 50A, 65A, 80A, 100A recommended	
JIS B 2217 63kg/cm ² tube flange	10A, 15A, 20A, 25A recommended	40A, 50A, 65A, 80A, 100A recommended	

Diaphragm Pressure Gauge (Remote Sensing B Type) SB

- Provide a diaphragm so that fluid does not enter directly into the pressure gauge.
- For the measurement of corrosive fluid, high viscosity fluid in chemical plants, food factories, etc.
- Possible to separate the pressure receiving part and indicating part as a separate type.
- No oil treatment is done for all models.

※ For pressure measurement, in order to obtain safety and sufficient performance, the service pressure should be less than 2/3 of the maximum pressure.

《Legend》(Sym.:) Model symbol

■ Specification						
Size (φ)		75 100				
Shape		Remote sensing type - B type pressure gauge				
Accuracy		[STD] 2.5 [Specified] 1.6				
Variation of Joint	Joint Type	Thread type(Sym.: S)	I type flange(Sym.: I)	Ftype flange(Sym.: F)	For sanitary use(Sym.: H)	Nut type(Sym.: N)
	Joint Size	(1) R3/8、 R1/2	(2) Conforms to JIS pipe flange (Suitable for Outer Diameter less than φ 140)		1S 1 1/2S 2S	
Max. Scale (MPa) (3)	Pressure Gauge	0.1 0.16 0.25 0.4 0.6 1 1.6 2.5 4 6 10 16 25、 Connected JIS pipe flange to be below the nominal pressure value. , Resin material of connected part to be 1MPa or less.				
	Vacuum	-0.1				
	Compound	[Pressure Part] 0.1 0.16 0.25 0.4 0.6 1 1.6 2.5 [Vacuum Part] -0.1				

■ Main Part Material, etc.						
(4) Indicator	(5) Type of Pressure gauge	[STD] Sealing Case Pressure Gauge (SUSCase、C3604 screw) [Specified] Stainless Steel Pressure Gauge (Sym.: WS) Other pressure gauge described in this catalog. (Sym.: Pressure Gauge type Symbol)				
	Upper flange	[STD] C3604 • Cr plating SUS316 (Sym.: U6) PPRResin (Sym.: UP)				
	Pipe	-				
(7) Wet part	Diaphragm	[STD] SUS316 L [Specified] (6) PTFE Resin (Sym.: ST) Fluororesin coating (Sym.: SF)				
	Thread • bottom flange	[STD] SUS304 [Specified] SUS316 (Sym.: L6) (8) PPRResin (Sym.: LP) Fluororesin coating (Sym.: LF)				
Filler liquid	Usage	[STD] For general use • food use		[Specified] For high temp (Sym.: Q2)		For oxygen (Sym.: Q3)
	Type	Propylene glycol		Silicone oil		Trifluorochloroethylene low polymerization oil
	Temp. range (°C)	-30 ~ 160		-30 ~ 100		-30 ~ 150

■ Special Addition			
Additional option	(9)With throttle screw or Dampner (Sym.: F1)	Mounting hole machining (Shape D only) (Sym.: F2)	
	Mounting bracket (Shape D only) (Sym.: F3)	With intermediate flange (Cleaning hole) (Sym.: F9)	
Attached documents	Inspection certificate Mill test report Standard instrument inspection certificate Calibration certificate Traceability chart		

■ Remarks

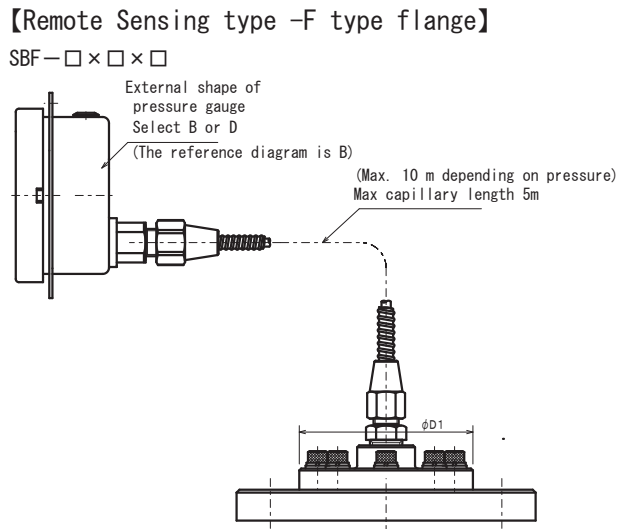
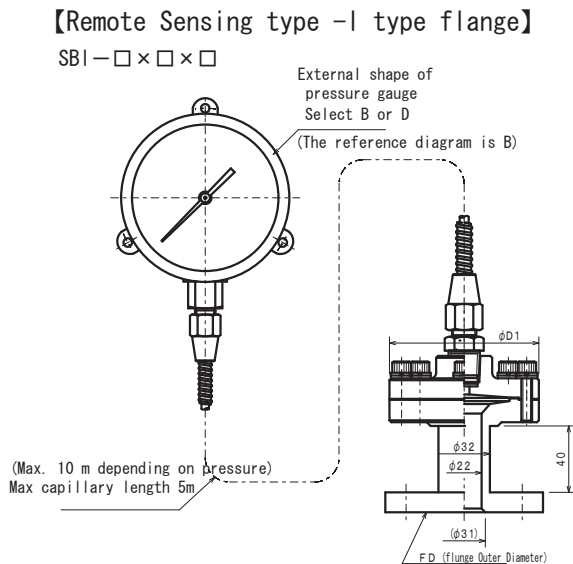
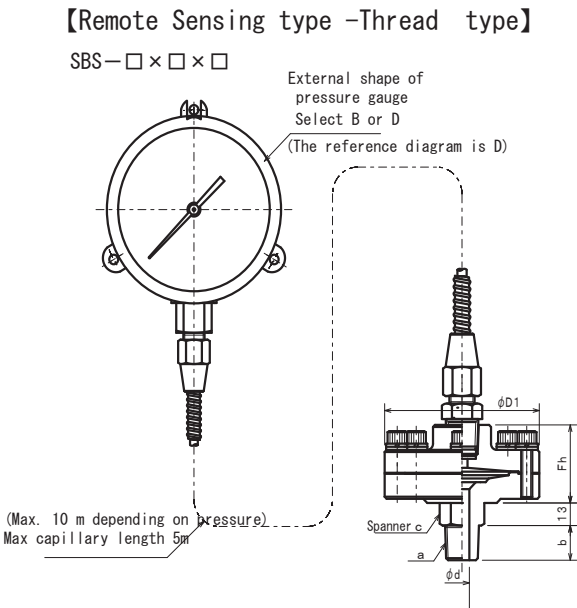
- (1) Please ask us if other dimensions needed.
- (2) The flange is full seat (FF). Please specify planar seat (RF).
- (3) Please ask us if other maximum scale needed.
- (4) For sanitary, the indicator is the stainless pressure gauge.
- (5) For specifications concerning pressure gauge, please see the catalog entry page. However, the pointer is a zero point adjustment type guide. Please use after adjustment.
- (6) Please consider PTFE Resin sufficient for permeability.
- (7) Here is no material that can withstand all corrosion -resistant fluids. Therefore, when used for corrosive fluids. it is necessary to select the most suitable material for each fluid. Please mention fluid name.
- (8) Maximum working pressure 1 MPa. Please ask temperature range.
- (9) Inserted between the diaphragm and pressure gauge. Because the filling liquid is constant, the pulsation alleviating effect can be effectively obtained. However, Dampener is a no-leak type, so it is 2.5 MPa or less.

■ Order form example

Please quote symbols inside (Sym.:) from type/ usage table.

SB	S • R3/8	x	100	x	2.5	WS • U6	L6	Q1	T1 •
Model	Variation of Joint: (Example)	Size	Max. scale	Indicator Symbol	Material of wet part	Symbol of filler liquid	Special Additional symbol		
	Thread type: S • Thread size (S • R1/2)		Pressure gauge: Max. value	(Type of Pressure gauge • Upper flange material)	[STD]: Blank	[STD]: Blank			
	I type flange: I • JIS name of pipe flange (I • JIS 10k 20)		Vacuum: -0.1	[Specified]: Symbol	[Specified]: Symbol	[Specified]: Symbol			
	F type flange: F • JIS name of pipe flange (F • JIS 10k 50)		Compound: Value of pressured portion x -0.1	[STD]: Blank					
	For sanitary use: Symbol • Joint size (H • 11/25)			[Specified]: Symbol					

Diaphragm Pressure Gauge(Remote Sensing B Type) SB External Dimensions



※ When installing a hole in the panel from the front, please adopt a pressure gauge larger than the outer diameter of the diaphragm.

Dimension of Diaphragm portion

Pressured area	D1	Fh
Low pressure (600kPa or lower)	119	36
Middle pressure (0.1MPa~4MPa)	89	36
High pressure (4MPa or higher)	58	41

Thread type-Connected portion dimension

a	b	c	d
R3/8	18	Hex flat diameter 24	8
R1/2	20	Hex flat diameter 24	10

Flange type - Connected flange dimension

Flange name	FD 1	FD 2	FD 3
JIS B 2212 10kg/cm ² tube flange	10A, 15A, 20A, 25A, 40A recommended	50A, 65A, 80A, 100A recommended	10A, 15A, 20A, 25A recommended
JIS B 2213 16kg/cm ² tube flange	10A, 15A, 20A, 25A, 40A recommended	50A, 65A, 80A, 100A recommended	
JIS B 2214 20kg/cm ² tube flange	10A, 15A, 20A, 25A, 40A recommended	50A, 65A, 80A, 100A recommended	
JIS B 2215 30kg/cm ² tube flange	10A, 15A, 20A, 25A recommended	40A, 50A, 65A, 80A, 100A recommended	
JIS B 2216 40kg/cm ² tube flange	10A, 15A, 20A, 25A recommended	40A, 50A, 65A, 80A, 100A recommended	
JIS B 2217 63kg/cm ² tube flange	10A, 15A, 20A, 25A recommended	40A, 50A, 65A, 80A, 100A recommended	

Diaphragm Pressure Gauge (Remote Sensing D Type) SD

- Provide a diaphragm so that fluid does not enter directly into the pressure gauge.
- For the measurement of corrosive fluid, high viscosity fluid in chemical plants, food factories, etc.
- Possible to separate the pressure receiving part and indicating part as a separate type.
- No oil treatment is done for all models.

※ For pressure measurement, in order to obtain safety and sufficient performance, the service pressure should be less than 2/3 of the maximum pressure.

《Legend》Sym.: Model symbol

■ Specification						
Size(φ)		75 100				
Shape		Remote snsing type -D type pressure gauge				
Accuracy		[STD] 2.5 [Specified] 1.6				
Variation of Joint	Joint Type	Thread type(Sym.: S)	I type flange(Sym.: I)	Ftype flange(Sym.: F)	For sanitary use(Sym.: H)	Nut type(Sym.: N)
	Joint Size	(1) R3/8、 R1/2	(2) Conforms to JIS pipe flange (Suitable for Outer Diameter less than φ 140)		1S 1 1/2S 2S	
Max. Scale (MPa) (3)	Pressure Gauge	0.1 0.16 0.25 0.4 0.6 1 1.6 2.5 4 6 10 16 25、 Connected JIS pipe flange to be below the nominal pressure value. , Resin material of connected part to be 1MPa or less.				
	Vacuum	-0.1				
	Compound	[Pressure Part] 0.1 0.16 0.25 0.4 0.6 1 1.6 2.5				[Vacuum Part] -0.1

■ Main Part Material, etc.						
(4) Indicator	(5) Type of Pressure gauge	[STD] Sealing Case Pressure Gauge (SUS Case、C3604 screw) [Specified] Stainless Steel Pressure Gauge(Sym.: WS) Other pressure gauge described in this catalog. (Sym.: Pressure Gauge type Symbol)				
	Upper flange	[STD] C3604 • Cr plating SUS316(Sym.: U6) PP Resin(Sym.: UP)				
	Pipe	-				
(7) Wet part	Diaphragm	[STD] SUS316L [Specified] (6) PTFE Resin(Sym.: ST) Fluororesin coating(Sym.: SF)				
	Thread • bottom flange	[STD] SUS304 [Specified] SUS316(Sym.: L6) (8) PP Resin(Sym.: LP) Fluororesin coating(Sym.: LF)				
Filler liquid	Usage	[STD] For general use • food use	[Specified] For high temp(Sym.: Q2)	For oxygen(Sym.: Q3)		
	Type	Propylene glycol	Silicone oil for high temp.	Trifluorochloroethylene low polymerization oil		
	Temp. range(°C)	-30 ~ 160	-30 ~ 200	-30 ~ 150		

■ Special Addition						
Additional option	(9) With throttle screw or Dampner(Sym.: F1) Mounting hole machining (Shape D only)(Sym.: F2)					
	Mounting bracket (Shape D only)(Sym.: F3) With intermediate flange (Cleaning hole)(Sym.: F9)					
Attached documents	Inspection certificate Mill test report Standard instrument inspection certificate Calibration certificate Traceability chart					

■ Remarks

- (1) Please ask us if other dimensions needed.
- (2) The flange is full seat (FF). Please specify planar seat (RF).
- (3) Please ask us if other maximum scale needed.
- (4) For sanitary, the indicator is the stainless pressure gauge.
- (5) For specifications concerning pressure gauge, please see the catalog entry page. However, the pointer is a zero point adjustment type guide. Please use after adjustment.
- (6) Please consider PTFE Resin sufficient for permeability.
- (7) Here is no material that can withstand all corrosion -resistant fluids. Therefore, when used for corrosive fluids. it is necessary to select the most suitable material for each fluid. Please mention fluid name.
- (8) Maximum working pressure 1 MPa. Please ask temperature range.
- (9) Inserted between the diaphragm and pressure gauge. Because the filling liquid is constant, the pulsation alleviating effect can be effectively obtained. However, Dampener is a no-leak type, so it is 2.5 MPa or less.

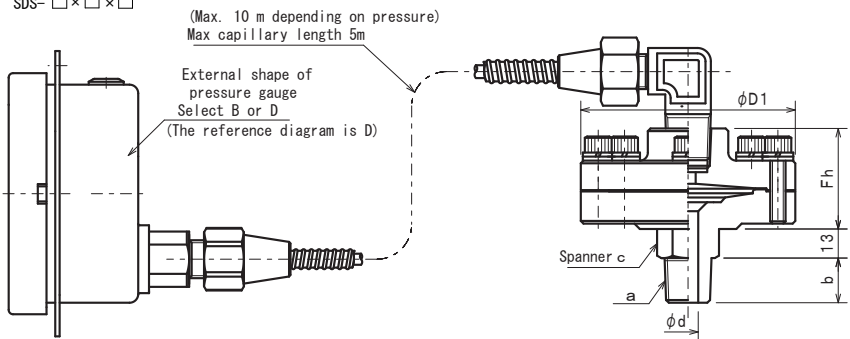
■ Order form example Please quote symbols inside(Sym.:) from type/ usage table.

SD	S • R3/8	x 100	x 2.5	PC B • U6	L6	Q3	T1 •
Model	Variation of Joint: (Example) Thread type: S • Thread size (S • R1/2) I type flange: I • JIS name of pipe flange (I • JIS 10k 20) F type flange: F • JIS name of pipe flange (F • JIS 10k 50) For sanitary use: Symbol • Joint size (H • 11/2S)	Size	Max. scale Pressure gauge: Max. value Vacuum: -0.1 Compound: Value of pressured portion x -0.1	Indicator Symbol (Type of Pressure gauge • Upper flange material) [STD]: Blank [Specified]: Symbol	Material of wet part [STD]: Blank [Specified]: Symbol	Symbol of filler liquid [STD]: Blank [Specified]: Symbol	Special Additional symbol

Diaphragm Pressure Gauge (Remote Sensing D Type) SD External Dimensions

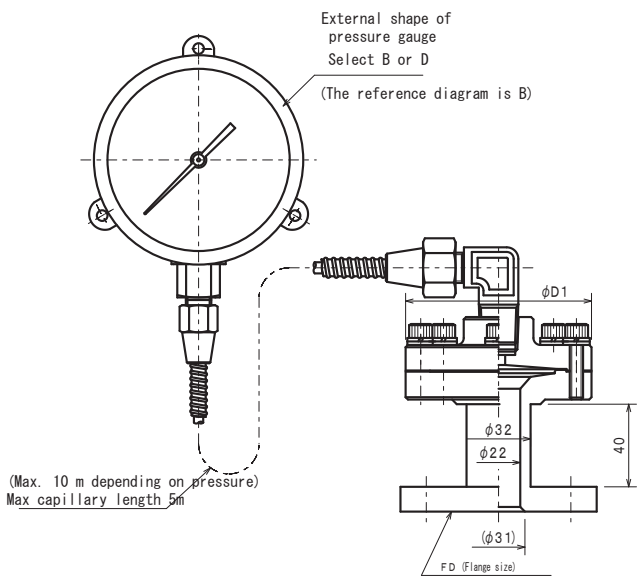
【Remote Sensing type -Thread type】

SDS- □×□×□



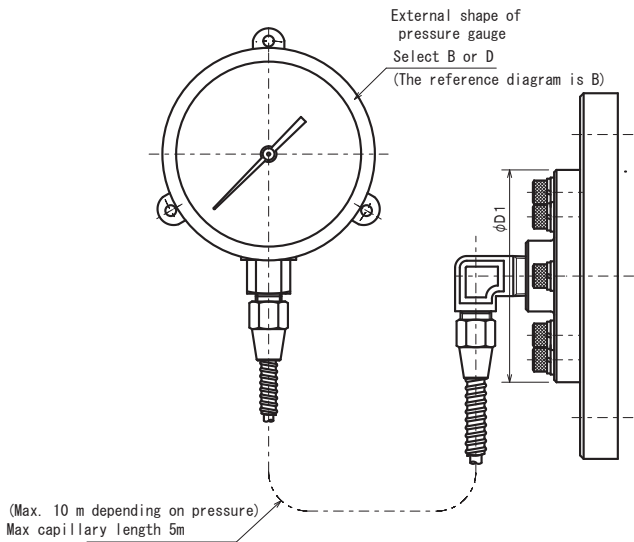
【Remote Sensing type- I type flange】

SDI- □×□×□



【Remote Sensing type- F type flange】

SDF- □×□×□



※ When installing a hole in the panel from the front, please adopt a pressure gauge larger than the outer diameter of the diaphragm.

Dimension of Diaphragm portion

Pressured area	D1	Fh
Low pressure (600kPa or lower)	119	36
Middle pressure (0.1MPa~4MPa)	89	36
High pressure (4MPa or higher)	58	41

Thread type-Connected portion dimension

a	b	c	d
R3/8	18	Hex flat diameter 24	8
R1/2	20	Hex flat diameter 24	10

Flange type - Connected flange dimension

Flange name	F D
JIS B 2220 5kg/cm ² tube flange	10A, 15A, 20A, 25A, 40A
JIS B 2220 10kg/cm ² tube flange	10A, 15A, 20A, 25A, 40A
JIS B 2220 16kg/cm ² tube flange	10A, 15A, 20A, 25A, 40A
JIS B 2220 20kg/cm ² tube flange	10A, 15A, 20A, 25A

※If you need a flange of a size not listed in the table, please contact us.

List of pressure gauge accessories

Throttle Screw
Dampener
Joint
Packing
Siphon Pipe
Gauge Ball Cock
Marker Pointer

Accessories for Pressure Gauge Throttle Screw FS Dampener KD

■ Throttle Screw FS

- Fixed type diaphragm which is attached directly to the pressure inflow port of the pressure gauge to protect the pressure gauge by alleviating the pulsating pressure.

■ Specification					
Model code	FS406B	FS405S	FS435B	FS436B	FS437B
Material	Bs	SUS304	Bs	Bs	Bs
(1) Fluid path diameter	0.5	0.5	0.3	0.25	0.2
(2) Example of used pressure range (MPa)	for standard common use	for non-corrosive	1 ~ 6 (Spindle oil)	1 ~ 6 (spindle oil)	2.5 ~ 40 (Spindle oil)

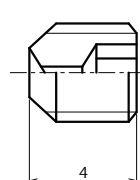
■ Remarks

- (1) Not be used for pressure medium containing solid matter.
- (2) The buffering effect varies depending on the viscosity, flow rate, etc. of the fluid. When the operation of the pointer is significantly slow or there is no effect, it is necessary to experimentally try other dimensions. Please contact us.

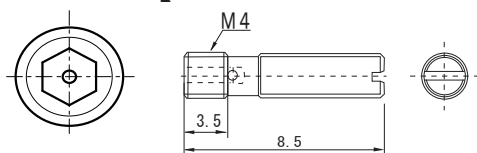
■ Order

Please specify the model code.

【FS405S】



【FS435B · FS436B · FS437B】



In order to obtain sufficient performance, please secure a depth of mounting tap accuracy M4 - H6 of 9mm.

■ Dampener KD

- Variable adjustment type diaphragm which relieves impact and protects the pressure gauge.

■ Specification						
Thread	Gauge side	Female screw	G・R1/4	G・R3/8	G・R1/2	others
	Piping Sie	Male screw	G・R1/4	G・R3/8	G・R1/2	others
Material		Bs	SUS303 O ring NBR			
Max. Pressure (MPa)		~ 20				

* Depending on the application, the material of the O-ring can be changed. Please contact us.

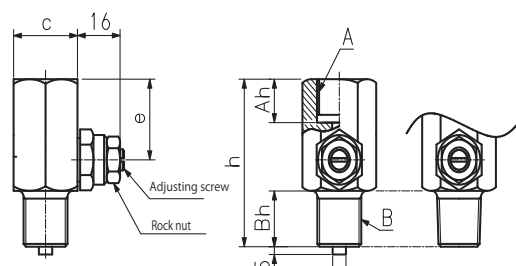
■ Model code · Dimension ⁽¹⁾									
Model code		A	B	Ah	Bh	h	c	d	e
Bs made	SUS made	G1/4	G1/4	12	16	49	22 Hexagon	(27)	23
KD2-G2G2B	KD2-G2G2S		R1/4						
KD2-G2R2B	KD2-G2R2S	G3/8	G3/8	14	18	53	24 Hexagon	(28)	25
KD2-G3G3B	KD2-G3G3S		R3/8						
KD2-G3R3B	KD2-G3R3S	G1/2	G1/2	16	20	57	27 Hexagon	(29)	27
KD2-G4G4B	KD2-G4G4S		R1/2						
KD2-G4R4B	KD2-G4R4S								

■ Remarks

- (1) Under design change, dimensions may be different. Please ask us the dimensions when you order.
- (2) Packing is not included.

■ Order

Please specify the model code.



Accessories for Pressure Gauge Joint KJ Packing KP

● Used for screw connection of heterogeneous and different diameter.

■ Specification						
Thread	Gauge side	Female screw		G • R1/4	G • R3/8	G • R1/2 Others
	Piping side	Male screw		G • R1/4	G • R3/8	G • R1/2 Others
Material		Bs			SUS	
Max. Pressure(MPa)		25			70	

■ Model code • Dimension (1)							
Model code		K1	K2	A	B	C	E
Bs made	SUS made						
KJ-G2G3B	KJ-G2G3S	G1/4	G3/8	37	14	18	19
KJ-G2G4B	KJ-G2G4S		G1/2	39		20	
KJ-G3G2B	KJ-G3G2S	G3/8	G1/4	37	16	16	22
KJ-G3G4B	KJ-G3G4S		G1/2	41		20	
KJ-G4G2B	KJ-G4G2S	G1/2	G1/4	39	18	16	27
KJ-G4G3B	KJ-G4G3S		G3/8	41		18	

KJ-R2G3B	KJ-R2G3S	R1/4	G3/8	37	14	18	19
KJ-R2G4B	KJ-R2G4S		G1/2	39		20	
KJ-R3G2B	KJ-R3G2S	R3/8	G1/4	37	16	16	22
KJ-R3G4B	KJ-R3G4S		G1/2	41		20	
KJ-R4G2B	KJ-R4G2S	R1/2	G1/4	39	18	16	27
KJ-R4G3B	KJ-R4G3S		G3/8	41		18	

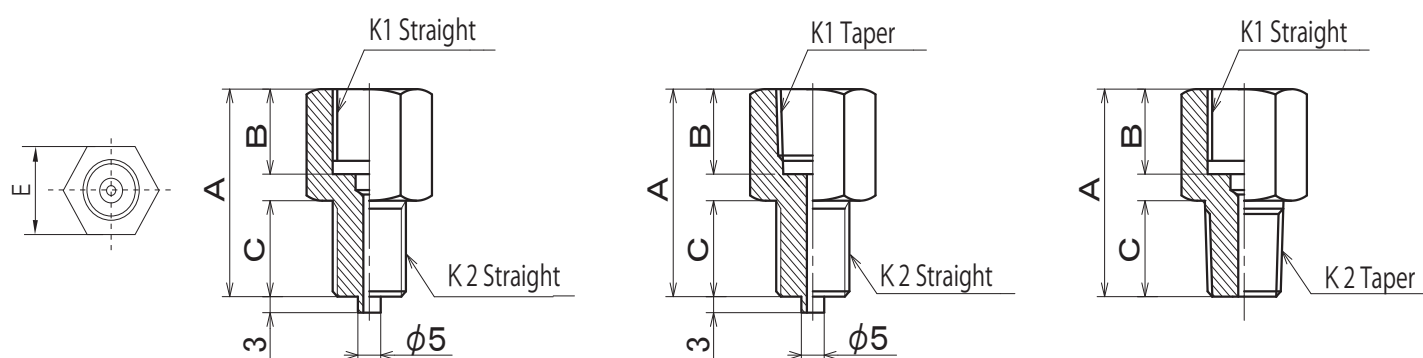
KJ-G2R3B	KJ-G2R3S	G1/4	R3/8	37	14	18	19
KJ-G2R4B	KJ-G2R4S		R1/2	39		20	
KJ-G3R2B	KJ-G3R2S	G3/8	R1/4	37	16	16	22
KJ-G3R4B	KJ-G3R4S		R1/2	41		20	
KJ-G4R2B	KJ-G4R2S	G1/2	R1/4	39	18	16	27
KJ-G4R3B	KJ-G4R3S		R3/8	41		18	

■ Remarks

(1) Packing is not included.

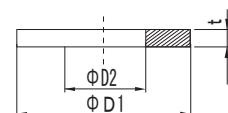
■ Order

Please specify the model code.



■ Packing KP

■ Specification				
Applicable thread	Size	Model code	Outer ϕ D (mm)	Inner ϕ D2
		※ Copper made		
	1/4	KP201C	11 mm	6 mm
	3/8	KP301C	14 mm	6 mm
	1/2	KP401C	18 mm	6 mm
Applicable thread	Size	Model code	Outer ϕ D (mm)	Inner ϕ D2
		Fluororesin made		
	1/4	KP201T	11.5 mm	5.5 mm
	3/8	KP301T	14.7 mm	5.5 mm
	1/2	KP401T	18 mm	5.5 mm



※ Copper packing is annealing.

■ Order

Please specify the model code.

Accessories for Pressure Gauge Siphon pipe SO • SU

■ Siphon pipe SO • SU

- Used for measuring maximum pressure such as steam.

■ Specification		
Material	Gauge fixing screw	SUS
	Pipe	SUS
Max. Pressure(MPa)	for Low Pressure	2
	for High Pressure	20

■ Model code • Dimension													
Variation		Model code	A ⁽¹⁾	B	Ah ⁽²⁾	Bh ⁽²⁾	H ⁽²⁾	c ⁽²⁾	φ D	Re	f ⁽²⁾	g	φ d
O Type-SO	for Low Pressure	SO-GR3SL	G3/8	R3/8	13	15	180	90	68	-	20	22 Hexagon	JIS 10A Sch20S
		SO-RR3SL	RC3/8		15							-	JIS 10A Sch20S
		SO-GR4SL	G1/2	R1/2	15	18	200	100	100	-	32	27 Hexagon	JIS 10A Sch20S
		SO-RR4SL	RC1/2		18							-	JIS 15A Sch40S
	for High Pressure	SO-GG3SH	G3/8	G3/8	13	18	215	105	90	-	13	22 Hexagon	JIS 6A Sch80S
		SO-GR3SH		R3/8									JIS 6A Sch80S
		SO-RR3SH	RC3/8	R3/8	14	18					13	-	JIS 6A Sch80S
		SO-GG4SH	G1/2	G1/2	15	20					217	105	90
		SO-GR4SH		R1/2			JIS 6A Sch80S						
		U Type-SU	for Low Pressure	SU-GR3SL	G3/8	R3/8	13	15	45	80	-	35	85
SU-RR3SL	RC3/8			15	-		JIS 10A Sch20S						
SU-GR4SL	G1/2			R1/2	15	18	65	110	-	40	125	27 Hexagon	JIS 10A Sch20S
SU-RR4SL	RC1/2				18							-	JIS 15A Sch40S

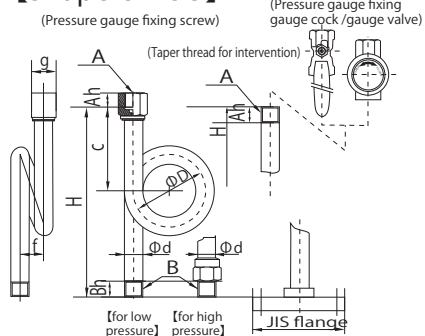
■ Remarks

- (1) G (Straight) thread is union nut. RC (Taper female thread) is fixed.
- (2) Depending the characteristic of material, dimensional difference may occur.
- (3) Packing is not included.

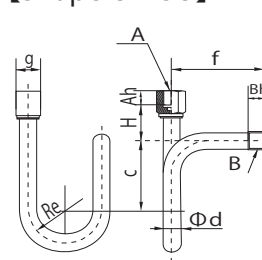
■ Order

Please specify the model code.

【Shape O—SO】



【Shape U—SU】



Accessories for Pressure Gauge Gauge Ball Cock KC Gauge Valve VS • VL

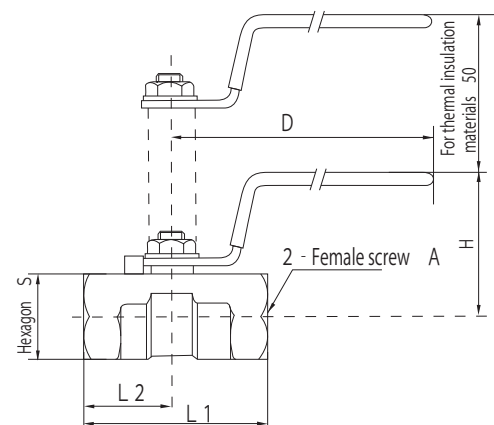
■ Gauge Ball Cock KC

● For Low Pressure shutoff

■ Specification					
Thread	Gauge side	Female screw	R1/4	R3/8	R1/2
	Piping side	Female screw	R1/4	R3/8	R1/2
Material		Bs NBR	SUS NBR		
Max. Pressure (MPa)		2	4		

※ Please use taper (R) screw for pressure gauge connection screw.

■ Model code • Dimension							
Variation	Model code	A	L1	L2	S	H	D
Bs made	KCR2B	R1/4	39	19	17	31	61
	KCR3B	R3/8	44	21	21	36	72
	KCR4B	R1/2	56.5	27.5	25	41	85
SUS made	KCR2S	R1/4	39	19	17	31	61
	KCR3S	R3/8	44	21	21	36	72
	KCR4S	R1/2	56.5	27.5	25	41	85



■ Order

Please specify the model code.

■ Gauge Valve VS • VL

● For High Pressure shutoff

■ Specification						
Thread	Gauge side	Union nut	G1/4	G3/8	G1/2	
	Piping side	Female screw	R1/4	R3/8	R1/2	
Material		Bs NBR			SUS NBR	
Max. Pressure (MPa)		15 Mpa (for 1/2screw, 10MPa)			25Mpa	

※ Depending on the application, the material of the O-ring can be changed. Please contact us.

■ Model code • Dimension*					
Model code		A	B	H	d
BS made	SUS made				
VS2-GR1/4 BS	VS2-GR1/4 SUS	G1/4	Rc1/4	22.5	25
VS2-GR3/8 BS	VS2-GR3/8 SUS	G3/8	Rc3/8	24	25
VS2-GR1/2 BS	VS2-GR1/2 SUS	G1/2	Rc1/2	24	25
VL2-GR1/4 BS	VL2-GR1/4 SUS	G1/4	Rc1/4	27	42
VL2-GR3/8 BS	VL2-GR3/8 SUS	G3/8	Rc3/8	-	42
VL2-GR3/8 BS	VL2-GR3/8 SUS	G1/2	Rc1/2	37	27

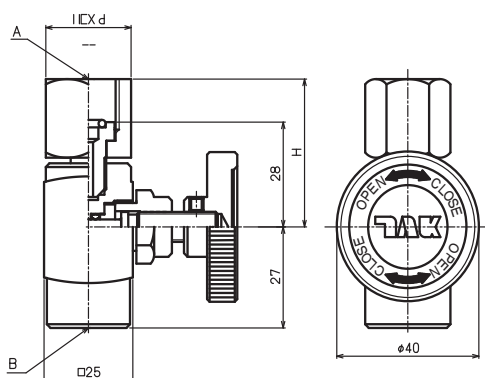
■ Remarks

- (1) Under design change, dimensions may be different. Please ask us the dimensions when you order.
- (2) O-ring (NBR) on union nut part is built in. Additional packing is not necessary.

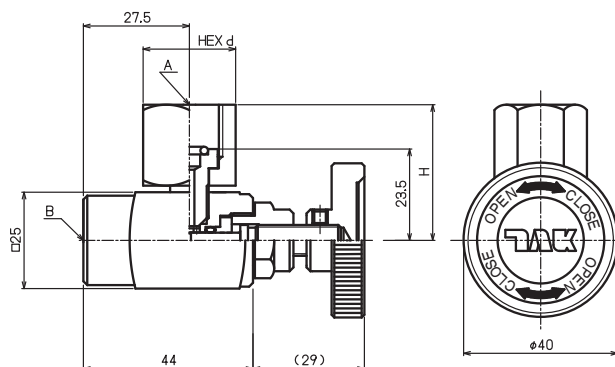
■ Order

Please specify the model code.

【Shape S—VS】



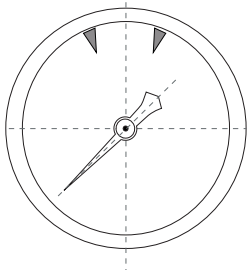
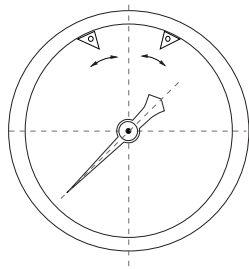
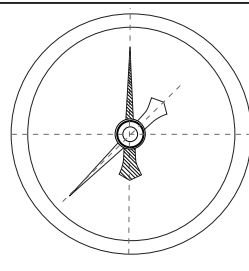
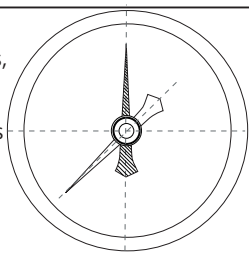
【Shape L—VL】



■ Marker Pointer

- A marker attached to know the management pressure at glance when pressure management being performed.

■ Specification

Varidation						用途、特徴																		
Label Type	Order Model Code	F150	F520	F530	F540	Fixed type affixed on transparent plate of control value. • Fixed type. • Multi-Marker Pointer possible. • Low cost. • Optimum for vibration • Adaptive models not limited.																		
	Size of applicable gauge	40	50, 60	75, 100	150																			
	Color of Marker Pointer	Green x 2、Red x 2																						
Ring Type	Order Model Code	Fill in the color combination in the additional specification column when ordering because it is pre-set in the pressure gauge. <table border="1"><tr><td>For low pressure</td><td>For high pressure</td><td>Symbol</td></tr><tr><td>Green</td><td>Green</td><td>F6</td></tr><tr><td>Green</td><td>Red</td><td>F6GR</td></tr><tr><td>Red</td><td>Red</td><td>F6RR</td></tr><tr><td>Red</td><td>Green</td><td>F6RG</td></tr></table>				For low pressure	For high pressure	Symbol	Green	Green	F6	Green	Red	F6GR	Red	Red	F6RR	Red	Green	F6RG	A type setting the control value to rotate Marker Pointer on the circumference. One set to combine two. • Two-needle semi-movable type. • Ideal for pressure management of upper and lower limit.			
	For low pressure	For high pressure	Symbol																					
	Green	Green	F6																					
	Green	Red	F6GR																					
	Red	Red	F6RR																					
Red	Green	F6RG																						
Size of applicable gauge (※ 1)	40、60、75、100				<Note> Loosen and fix the ring set screw after setting to prevent movement of the Marker Pointer due to vibration.																			
Color of Marker Pointer	[STD]Green、 [Specified]Combination of green and red ※ 1 Only ST and PC types are available for sizes 75 and 100.																							
Knob Type	Order Model Code	Fill in the symbol (F7) in the additional specification column when ordering the pressure gauge. It will be pre-set on gauge.				A type rotating center knob to set the control value. • 1 needle movable type. • Optimum whe the control value changes every time.																		
	Size of applicable gauge	50、60、75、100、150																						
	Color of Marker Pointer	Red																						
Leave Behind Pointer Type	Order Model Code	Fill in the symbol (F7) in the additional specification column when ordering the pressure gauge. It will be pre-set on gauge.				Equipped with a red maximum value indicator needle and when pressure drops, the needle stays at the highest value. When the pressure drops, the needle stays at its highest value. Rest is done manually by turning the center knob. • The rest is done by manually returning the center knob to the zero point. • Ideal for when you want to know the maximum pressure value. Not compatible with negative pressure.																		
	Size of applicable gauge	50、60、75、100																						
	Color of Marker Pointer	Red																						

Pressure related Product Pressure reducing valve RV

- It controls to constant pressure by reducing the pressure of air, carbon dioxide gas, nitrogen gas, etc.
- Compact design, fixed control pressure type and adjustable type are available.

■ Specification					
Type		RV01	RV10	RV20	RV21
Pressure range (MPa) ⁽¹⁾	Source pressure	0.6 ~ 1.2	0.4 ~ 2	10 Mpa below	
	Adjustable pressure range	0.05 ~ 0.3	0.05 ~ 0.35	0.05 ~ 0.5	
Pressure adjustment method		Fixed	Adjustment screw (Semi-fixed)		Adjustment handle
(1) Joint	Inlet	UNF-20 Male UNF7/16-20 Male	UNF-20 Female UNF7/16 Female	W22-14 Cap nut	W22-14 Cap nut
	Outlet	UNF-20 Male UNF7/16-20 Male	UNF-20 Male UNF7/16 Male	[STD]Rc1/8	[STD]Rc1/8
Material of main portion		C3604 NBR			
Applicable gas		Air N2 CO2 ⁽²⁾			

■ Remarks

- (1) Please ask us when other pressure or other joint screww needed.
- (2) Please ask us when other gas needed.

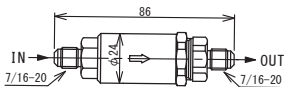
■ Order form example

RV01 1 x 0.07 7/16 Flare x 7/16 Flare

Type Source pressure Adjusted pressure Adjust screw inlet Adjust screw outlet

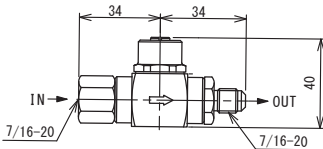
【RV01—Low pressure fixed type】

RV01-□ □ x □



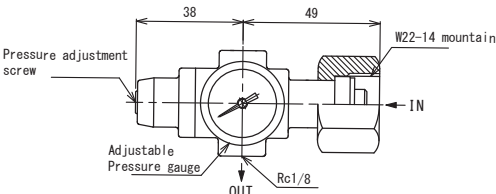
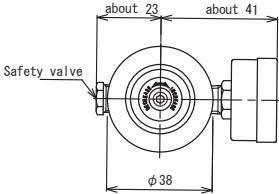
【RV10—Low pressure adjustable type】

RV10-□ x □ □ x □



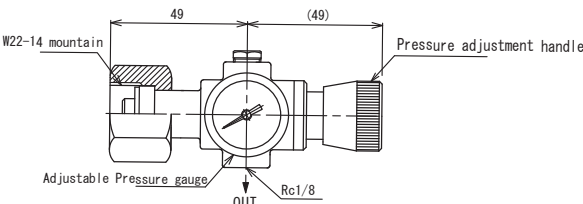
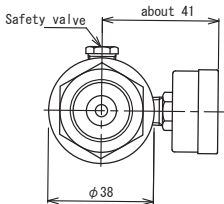
【RV20—High pressure adjustable type】

RV20-□ x □ W22 x Rc1/8



【RV21—High pressure adjustable type】

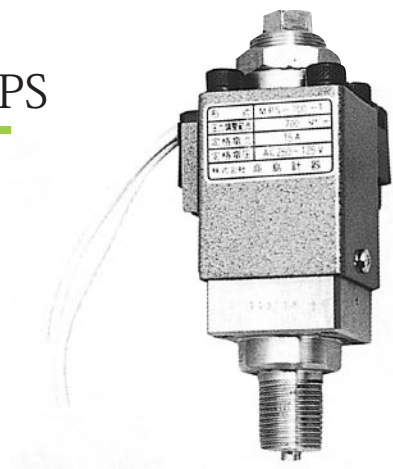
RV21-□ x □ W22 x Rc1/8



Pressure related Product

Pressure Switch TS MPS

- Reliable switch using microswitch as contact.
- No leak type using a bellows or a Bourdon tube and high pressure type using a piston as a pressure receiving element are available



Specification		
Type		MPS
Pressure range (MPa)	Switch set pressure	10 ~ 70
	Switching tolerance	± 7% of set pressure
	Pressure resistance	140% of set pressure
Accuracy		± 2% F.S.
Thread		G3/8
Number of Contact		[STD] 1 contact
Capacity of Conact		AC 250V 15A
Wet part material, Remarks	Thread	C3604
	Element	SUJ • Piston

Order form example

MPS70 x G3/8

Type

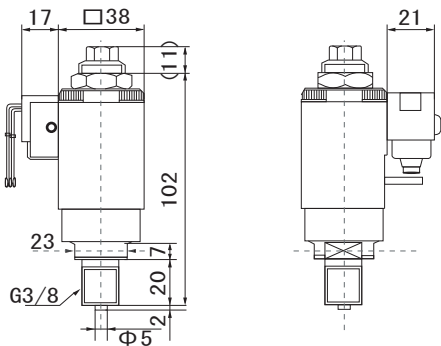
Set pressure

Thread

Number of contact
[STD] 1 Contact: Blanc
[Specified] 2 Contact: P2

Wet part matrial
[STD] C5191: Blanc
[Specified] SUS316

【Type MPS】
MPS-□ × G3/8



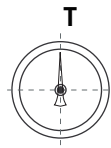
Thermometer Portfolio

■ Shape and symbol for Bimetal Thermometer & Water Pressure Temperature Gauge

[Shape]

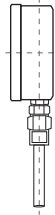
[Symbol]

Angle type



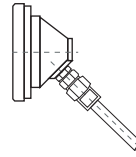
Straight type

S



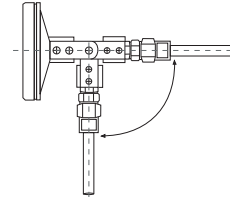
Tilt type

R



Movable type

J



Model	Type	Application	Features	Measuring part material (Wet part)	※ Temperature Range (°C)	Shape per size				
						40	50	60	75	100
BS	Bimetal Thermometer (Standard Type)	Standard type (General use)	• Simple structure and robust (good for shielded, no-vibration area)	Bs • SUS	-30 ~ 300				T S R J	T S R J
BW	Bimetal Thermometer (Stainless sealing Type)	Sealing type	• IP52 equivalent • Good for few vibration area or outdoor.	Bs • SUS	-30 ~ 300				T S J	T S J
BK	Bimetal Thermometer (Small-sized Type)	Small type	• Suitable for embedding into device.	Bs • SUS	-30 ~ 400	T	T	T		
PB	Water Pressure Temperature Gauge	General use	• Unifying pressure gauge and bimetal thermometer, suitable for boiler etc.	Bs • SUS	Pressure range (Mpa) 0.2 ~ 1.6 Temp. range 0 ~ 120				T S	T S

※ Manufacturable range indicated: Refere to the following page in this brochure per gauge type.

■ Common matters

● Shape of connection and temp. measuring part

The shape varies as below. Please select suitable one for your application. (Some type of shape can not be applicable to certain type of thermometer. Please check the details by product catalog.)

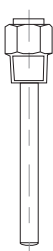
[Throw-in type]

X



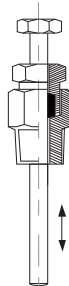
[Fixed type]

K



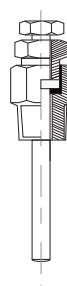
[Slide type]

S



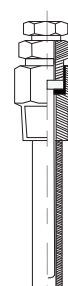
[Union type]

U



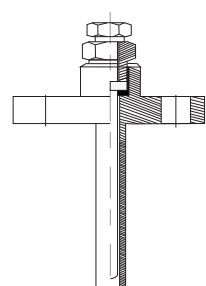
[Thermowell type]

P



[Flange type]

F



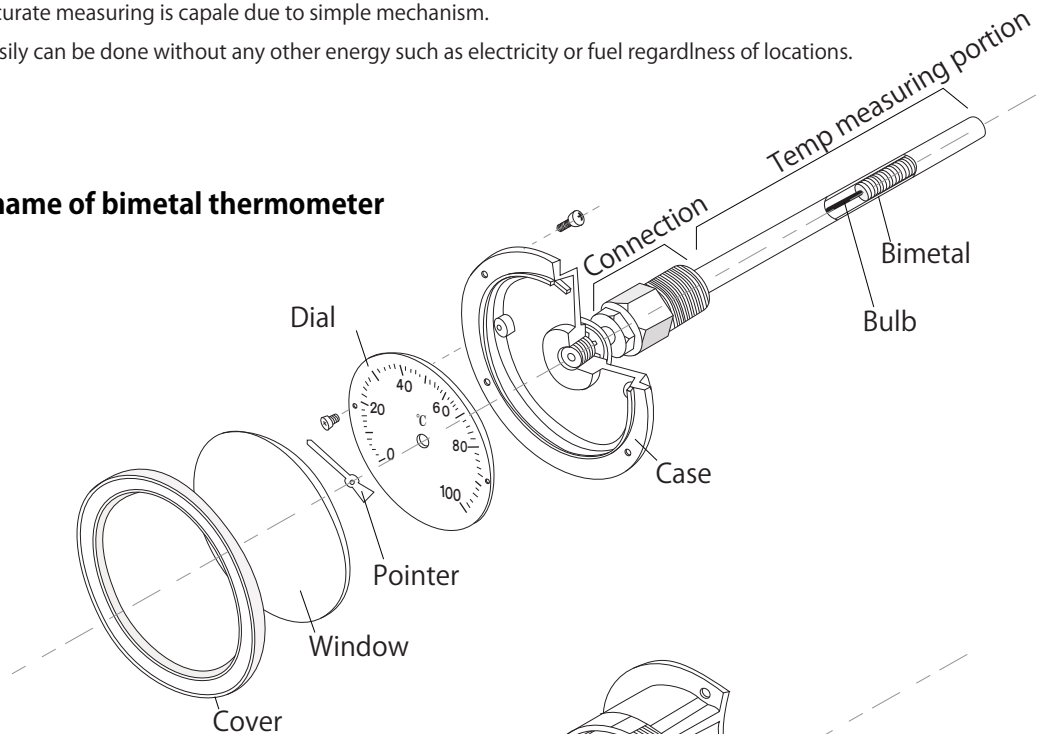
Thermometer Overview

■ Overview

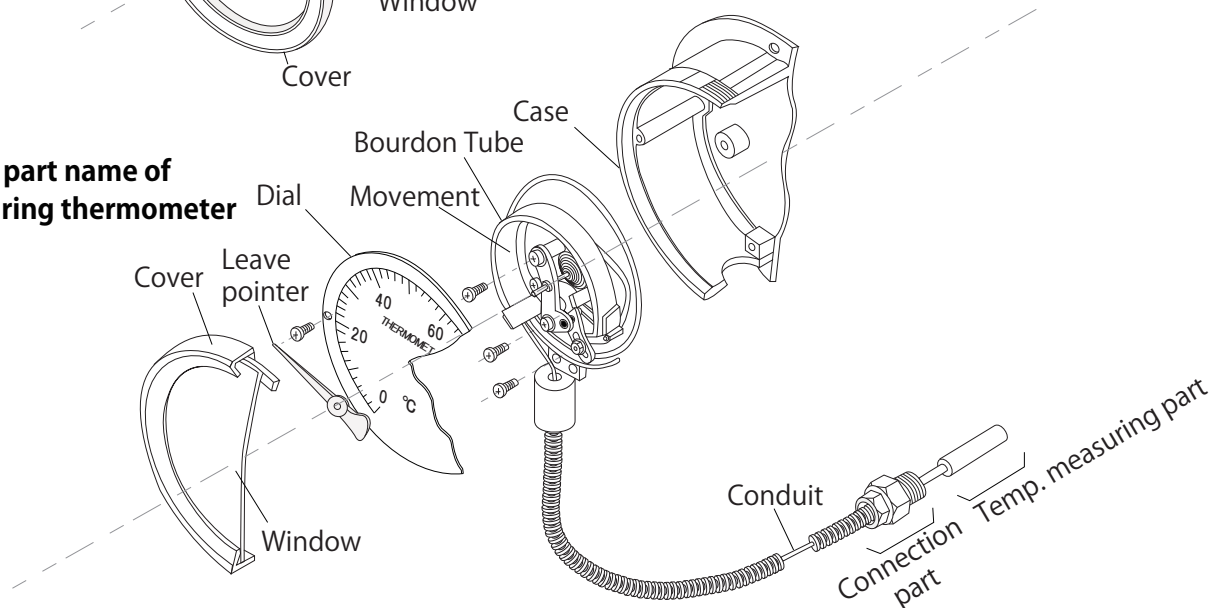
Our thermometer indicates the temperature energy itself directly by utilizing the expansion and contraction of the object or indicates the temperature by converting the energy into mechanical motion. Therefore, features are shown below.

1. Inexpensive and highly accurate measuring is capable due to simple mechanism.
2. Measuring temperature easily can be done without any other energy such as electricity or fuel regardless of locations.

■ Structure and part name of bimetal thermometer



■ Structure and part name of remote measuring thermometer



Bimetal Thermometer (Standard type) BS

- Simple structure and high durability.
- Easy to use and low cost.
- Safety due to no sealing liquid and gas used.
- Wide range of size and appearance are available for designing because of direct indication of bimetal displacement.

※ When selecting the thermometer, the material of the wetted part must conform to the measuring fluid for safety and sufficient performance.
Also please note that the temperature range to be measured is within the range of 30 to 60% of the whole scale.

《Legend》(Sym.:) Model symbol



■ Specification									
Size	75 100								
Shape	Angle type (Sym.: T) Straight type (Sym.: S) Title type (Sym.: R) Movable type (Sym.: J)								
Accuracy	± 2.0% F.S.								
Temp Range (°C)	-30 ~ -50	-10 ~ 50	0 ~ 50	0 ~ 100	0 ~ 120	0 ~ 150	0 ~ 200	0 ~ 250	0 ~ 300
Mounting Shape	Fixed type (Sym.: K) Slide type (Sym.: S) Union type (Sym.: U) Union flange type (Sym.: F) Protective tube flange type (Sym.: PF)								
	Thermowell type (Sym.: P)								
Mounting Size	[STD] R 1/2 [Specified] R3/4 Please specify the flange size.								
Temp sensor	Length: L	50 (from 100° and above), 75, 100, 150, 200, 300, 400, 500							
	Condition for use	Please refer to page "Reference Thermometer" for details.							

■ Main Part Material, etc.	
Sensor, Protective pipe	[STD] C3604 / C2700 (SUS304 : Union flange type and Thermowell flange type) [Specified] SUS304 (Sym.: S2) SUS316 (Sym.: S6)
Case	Aluminum • Black paint (Tile type's cover is ABS, Black)

■ Special Addition	
Additional specification	Marker pointer (Sym.: F7) Water proofed (IP52 equivalent) (Sym.: W2)

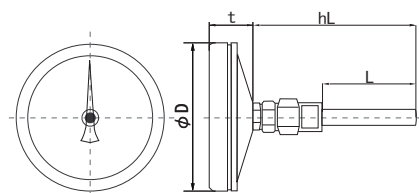
■ Order form example Please quote symbols inside (Sym.:) from type/ usage table.

BS **T** **100** x **0 ~ 100** **U** **R3/4** **L100** **S2** • **F7**
 Model Shape Size Temp range (°C) Mounting Shape Thread or Flange size Temp sensor length (mm) Material of sensor STD: Blank (C3604/C2700) Specified : S2 (SUS304) Special Additional symbol

■ Standard type : BS

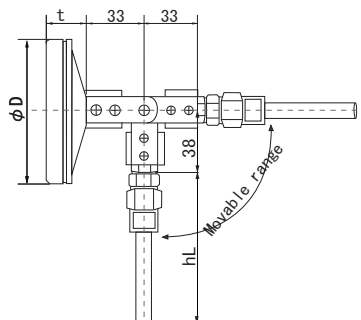
【Shape T: Angle type】

BS-□ × □°C □□L □□



【Shape J: Movable type】

BSJ-□ × □°C □□L □□



Size	D	t	hL (L)
75	88	20	Refer to "Appearance of mounting and temp sensor" in previous page (The product drawing is a example)
100	110	20	

Bimetal Thermometer (Stainless Sealing Type) BW

- Simple structure and high durability.
- Easy to use and low cost.
- Safety due to no sealing liquid and gas used.
- Wide range of size and appearance are available for designing because of direct indication of bimetal displacement.
- IP52 equivalent sealing.
- It can be used under rain, dew environment.

※ When selecting the thermometer, the material of the wetted part must conform to the measuring fluid for safety and sufficient performance.
Also please note that the temperature range to be measured is within the range of 30 to 60% of the whole scale.

《Legend》(Sym.:) Model symbol

■ Specification									
Size	75 100								
Shape	Angel type(Sym.:T) Straight type(Sym.:S) Movable type(Sym.:J)								
Accuracy	± 2.0% F.S.								
Temp Range(°C)	-30 ~ -50	-10 ~ 50	0 ~ 50	0 ~ 100	0 ~ 120	0 ~ 150	0 ~ 200	0 ~ 250	0 ~ 300
Mounting Shape	Fixed type(Sym.:K) Slide type(Sym.:S) Union type(Sym.:U) Union flange type(Sym.:F) Protective tube flange type(Sym.:PF)								
	Thermowell type(Sym.:P)								
Mounting Size	[STD] R 1/2 [Specified] R3/4 Please specify the flange size.								
Temp sensor	Length: L	50 (from 100° and above), 75, 100, 150, 200, 300, 400, 500							
	Condition for use	Please refer to page "Reference Thermometer" for details.							

■ Main Part Material, etc.

Sensor, Protective pipe	[STD] C3604 / C2700 (SUS304: Union flange type and Thermowell flange type) [Specified] SUS304(Sym.:S2) SUS316(Sym.:S8)
Case	SUS

■ Order form example Please quote symbols inside(Sym.:) from type/ usage table.

BW T 100 x 0 ~ 100 U R3/4 L100 S2

Model
BW: without Glycerin

Shape

Size

Temp range(°C)

Mounting
shape

Thread
or
Flange size

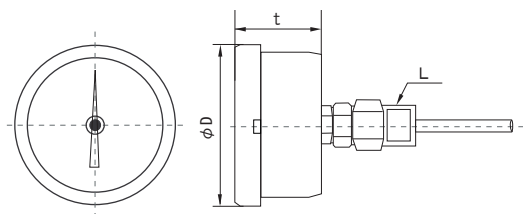
Temp sensor
length (mm)

Material of sensor
STD: Blank (C3604/C2700)
Specified: S2 (SUS304)
S8 (SUS316)

■ Stainless case sealing type - BW

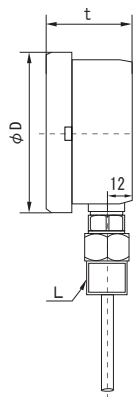
【Shape T: Angle type】

BWT-□ × □°C □□ℓ □□



【Shape S: Straight type】

BWS-□ × □°C □□ℓ □□



Size	D	t	L
75	83	45	Select the length by mounting shape and sensor shape (fixed type only)
100	108	46	

Bimetal Thermometer (Small-sized Type) BK

- Simple structure and high durability.
- Easy to use and low cost.
- Safety due to no sealing liquid and gas used.

※ When selecting the thermometer, the material of the wetted part must conform to the measuring fluid for safety and sufficient performance.
Also please note that the temperature range to be measured is within the range of 30 to 60% of the whole scale.

《Legend》(Sym.:) Model symbol

■ Specification									
Size		40 50				60			
Shape		Angel type(Sym.:T)							
Accuracy		± 2.0% F.S.							
Temp Range(℃)		-30 ~ -50	-10 ~ 50	0 ~ 50	0 ~ 100	0 ~ 120	0 ~ 150	0 ~ 200	0 ~ 250 0 ~ 300
Mounting Shape		Fixed Type(Sym.:K)				Union type (size 60)(Sym.:U)		Thermowell type(Sym.:P)	
Temp sensor	Length: L	50 (from 100° and above)、 75、 100、 150							
	condition for use	Please refer to page "Reference Thermometer" for details.							

■ Main Part Material, etc.	
Sensor	[STD] C3604 / C2700 (Union flange type and Thermowell flange type is SUS304)(Sym.:B1) [Specified]SUS304(Sym.:S1) SUS316(Sym.:S2)
Protective pipe	[STD]No Protective pipe(Sym.:B0) C3604 / C2700 (Union flange type and Thermowell flange type is SUS304)(Sym.:B1) [Specified]SUS304(Sym.:S1) SUS316(Sym.:S2)
Case	SUS Aluminum (S type size 60)

■ Special Addition	
Additional specification	Drip-proofed (IP52equivalent) (Sym.:W2)

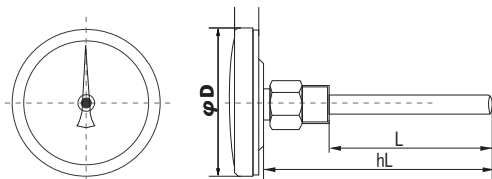
■ Order form example Please quote symbols inside(Sym.:) from type/ usage table.

BK **T** **60** x **0 ~ 100** **U** **R1/2** **L100** **B1** • **B1** • **W2**
Model Shape Size Temp range(°C) Mounting Shape Thread Temp sensor length (mm) Material of sensor STD: B1 (C3604/C2700) Specified: S1 (SUS304) : S2 (SUS316) Material of protective pipe STD: B0 (No protective pipe) B1 (C3604/C2700) Specified: S1 (SUS304) : S2 (SUS316) Special Additional symbol

■ Small-sized type • B K

【Shape T: Angle type】

BKT-□ × □°CK □L □



Size	D	t	hL (L)
40	45	12	Select the length by mounting shape and sensor shape (fixed type only)
50	55	13	
60	63	14	

Water Pressure Temperature Gauge PB

- Both water pressure (volume) and temperature measurable by all-in-one gauge.
- Easy to install and maintain by connecting protective tube with valve.
- Capable to measure pressure and temperature of various type of machine at same time due to improvement of corrosion resistance by using stainless steel for all portions.

《Legend》(Sym.:) Model symbol

■ Specification					
Size		75		100	
Shape		Angle type (Sym.: T)		Straight type (Sym.: S)	
Accuracy		Pressure Gauge $\pm 2.5\%$ F.S.		Thermometer $\pm 3.0\%$ F.S.	
Pressure range (MPa)		0.2	0.4	0.6	1 1.6
Temperature range (°C)		[STD] 0 ~ 120		[Specified] -10 ~ 50 (For antifreeze liquid)	
Mounting	Shape	[STD] Union screw (Sym.: U)		Open well union type (Sym.: Po)	
	Thread	[STD] R1/2		[Specified] R3/4	
				Well with valve union type (Sym.: Pv)	

■ Main Part Material, etc.

	[STD] (No Symbol)	[Specified] (for corrosion) (Sym.: S2)
Bourdon Tube	C5191	SUS316
Thread	C3604	SUS304
Temperature measuring tube, Thermowell	C2700T (SUS304: Over L200)	SUS304
Case	SUS	

※ Fluorine rubber is used for O ring material of Union mounting. Depending the application, the material of O ring can be changed. Please ask us.

■ Special Addition

Additional Specification	Drip- proofed (Equivalent to IP52) (Sym.: W2)	Label type set-pointer (Sym.: F5)
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■ Order form example

Please quote symbols inside (Sym.:) from type/ usage table.

PB T 75 x 0.4 (120) Pv R1/2 L50 • W2

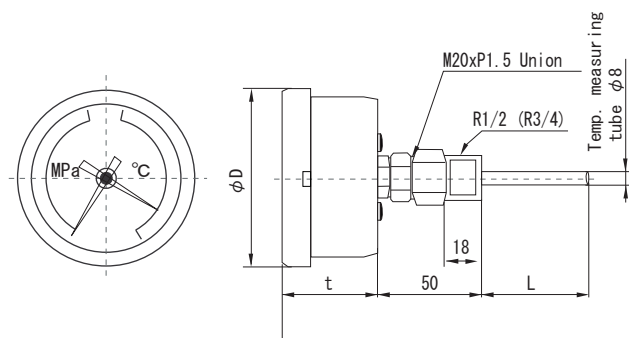
Model Shape Size Pressure (MPa) Temperature (°C) Mounting Type Thread Length of temp. measuring tube (mm) Special Additional symbol

【Shape T: Angle type】

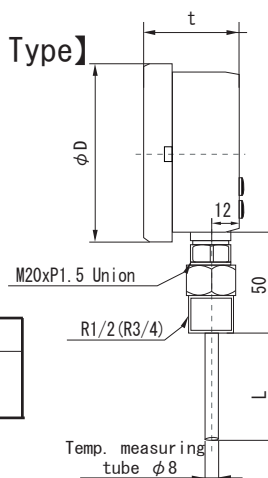
PBT—□ × □

【Shape S: Straight Type】

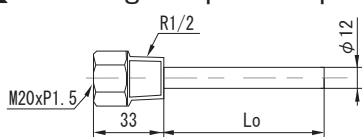
PBS—□ × □



Size	D	t	L
75	83	45	STD.: 50 60 85 135
100	108	46	

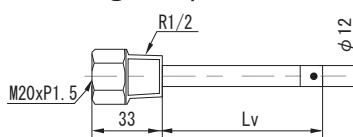


【Mounting Shape Po: Open Well type】



• The temperature measuring tube is protected from flowing. When the its tip is opened and water drains as the gauge is removed.

【Mounting Shape Pv: Well with valve】



• By installing a water gauge, the valve at the tip opens and water pressure is applied, and when removed it closes.

Lo	Lv
STD.: 50	(N/A 50)
60	STD.: 65
100	100
150	150
200	200

■ Allowable flow rate

• If the natural frequent of the temperature measuring tube (thermowell) matches with the frequency generated by flowing, resonance phenomena may occur to damage against the tube. Please hence select the appropriate conditions as specified the table.

• (*) Intended for water alone, flow rate (Moving distance is divided by moving time.) defines. Please refer to other tables for other fluids. The natural frequency (allowable flow rate) is varies depending on a length of thermowell. Please contact us for details.

Length of Temp. measuring tube/ Well L (mm)	(*) Allowable flow rate (m/s)		
	φ12 well		φ8 Temp. measuring tube
	Open type	W/valve	
50	3	(N/A)	1.5
65	3	3	1
100	2	2	Applicable when flowing remained
150	1.5	1.5	
200	1	1	

Reference Pressure Gauges

(JIS B 7505 quoted partially)

1. Unit of Pressure Gauge

(1) Correlation among Unit, Measurement Act and JIS Standards (B 7505)

Unit (New / Old)	Pa	bar	Kgf/cm ²	atm	mmH ₂ O	mmHg 又は Torr
Conversion table	1	1 x 10 ⁻⁵	1.01972 x 10 ⁻⁵	9.86923 x 10 ⁻⁶	1.01972 x 10 ⁻¹	7.50062 x 10 ⁻³
	1 x 10 ⁵	1	1.01972	9.86923 x 10 ⁻¹	1.01972 x 10 ⁴	7.50062 x 10 ²
	9.80665 x 10 ⁴	9.80665 x 10 ⁻²	1	9.67841 x 10 ⁻¹	1 x 10 ⁴	7.35559 x 10 ²
	1.01325 x 10 ⁵	1.01325 x 10 ⁻¹	1.03323	1	1.03323 x 10 ⁴	7.60000 x 10 ²
	9.80665	9.80665 x 10 ⁻⁵	1 x 10 ⁻⁴	9.67841 x 10 ⁻⁵	1	7.35559 x 10 ⁻²
	1.33322 x 10 ²	1.33322 x 10 ⁻³	1.35951 x 10 ⁻³	1.31579 x 10 ⁻³	1.35951 x 10	1
Measurement Act	Measurement unit	Measurement unit	Not used since 01 Oct., 1999	Measurement unit	Not used since 01 Oct., 1999	Not used since 01 Oct., 1999, but blood pressure (mmHg) and In-vivo pressure excluded
JIS STD.	Applicable to Pressure gauge	N/A	Not used	N/A	Not used	Not used

(2) Units per JIS standards

Unit	Symbo	Corresponding Value	Remark
Pascal	Pa	1MPa = 10 ³ kPa = 10 ⁴ hPa = 10 ⁶ Pa	MPa and kPa applied

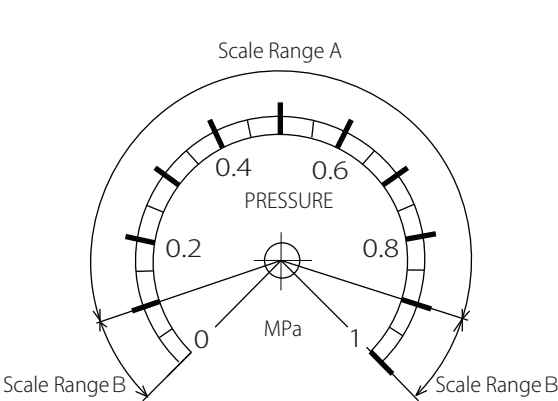
2. Accuracy Class and Tolerance

Details specified in the table, below

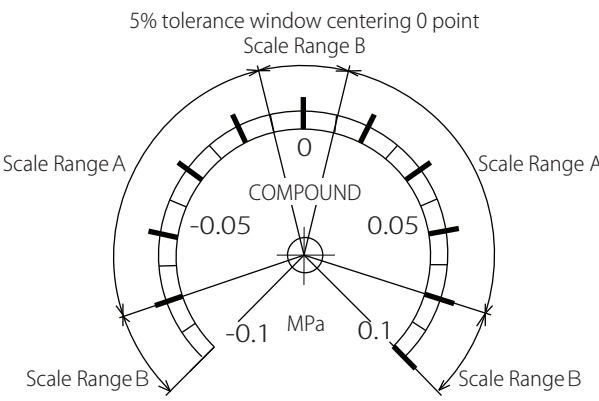
Accuracy Class	※ Tolerance		Unit %
	Scale Range A	Scale Range B	
0.6	± 0.6	± 0.9	
1.0	± 1.0	± 1.5	
1.6	± 1.6	± 2.4	
2.5	± 2.5	± 3.8	
4.0	± 4.0	± 6.0	

※ Tolerance value is defined as a percentage of pressure span (Full scale range)

【Scale range of tolerance】



[Example: Pressure Gauge / Vacuum Gauge]



[Example: Compound Gauge]

Reference Pressure Gauges

3. Scale

Scale of a pressure gauge is defined by followings.

(1) Maximum Scale

Maximum scale of pressure part at pressure and compound gauges are specified by 1.0×10^n , 1.6×10^n , 2.5×10^n , 4.0×10^n , 6.0×10^n while that of vacuum-producing part at vacuum and compound gauges is -1.0×10^n (where n: positive or negative integer, or zero)

(2) Scale interval (Minimum scale value)

Scale interval of a pressure gauge is specified by 1×10^n , 2×10^n , 5×10^n (where n: positive or negative integer, or zero) and its value stays close to tolerance and does not exceed 2-fold of it.

※ Minimum scale value per device is calculated by the formula of Max. Scale divided by division number as shown in the 【Table 3-1】

(3) Division number

The number per device as shown in the 【Table 3-1】 is specified by maximum scale, (1) above, scale interval. (2) also above, and accuracy class.

【Table 3-1】

Device	Max. Scale (MPa 又は kPa)	Accuracy Class				
		0.6 class	1.0 class	1.6 class	2.5 class	4.0 class
Pressure Gauge	1×10^n	100	50	50	20	20
	1.6×10^n	160	80	32	32	16
	2.5×10^n	125	50	50	25	25
	4×10^n	200	80	40	20	20
	6×10^n	120	60	60	30	30
Vacuum Gauge	$-0.1 \sim 0$	100	50	50	20	20
Compound Gauge	$-0.1 \sim 0.1$	100	100	40	20	20
	$-0.1 \sim 0.16$	130	52	52	26	26
	$-0.1 \sim 0.25$	175	70	35	35	14
	$-0.1 \sim 0.4$	100	50	50	25	25
	$-0.1 \sim 0.6$	140	70	35	35	14
	$-0.1 \sim 1$	110	55	55	22	22
	$-0.1 \sim 1.6$	85	85	34	34	17
	$-0.1 \sim 2.5$	130	52	52	26	26

Reference Pressure Gauges

4. Applications

Classification according to use.

Application	Operating conditions																												
Ordinary	1. Conditions at an installation																												
	<table><tr><td></td><td colspan="5">Item</td></tr><tr><td>Type</td><td>Standard</td><td>Zone</td><td>The ambient pressure and temperature</td><td>RH</td><td>Protection against splash such as rain, snow</td></tr><tr><td>General Ordinary</td><td>JIS C 1804 Environmental Class C class C1</td><td>Enclosed area</td><td>-5 ~ 45℃</td><td>5 ~ 95% (No freezing)</td><td>N/A</td></tr><tr><td>Sealed(Closed)</td><td>-</td><td>Outdoors</td><td>//</td><td>//</td><td>A (refer to relevant page)</td></tr></table>						Item					Type	Standard	Zone	The ambient pressure and temperature	RH	Protection against splash such as rain, snow	General Ordinary	JIS C 1804 Environmental Class C class C1	Enclosed area	-5 ~ 45℃	5 ~ 95% (No freezing)	N/A	Sealed(Closed)	-	Outdoors	//	//	A (refer to relevant page)
		Item																											
	Type	Standard	Zone	The ambient pressure and temperature	RH	Protection against splash such as rain, snow																							
	General Ordinary	JIS C 1804 Environmental Class C class C1	Enclosed area	-5 ~ 45℃	5 ~ 95% (No freezing)	N/A																							
	Sealed(Closed)	-	Outdoors	//	//	A (refer to relevant page)																							
	2. Installation position: Pressure gauges should be installed in vertical directions, dial and its indications should be in horizontal direction for the line of sight.																												
	3. Vibration and shock: The pointer must not be exceeded the specified pressure range of the tolerance of measurement accuracy.																												
	4. Pressure medium: Non-corrosive fluids or gasses (for non-corrosive performance should be used SUS316 for wetted parts).																												
	5. Working pressure: The upper limit of normal working pressure range is specified in the table below.																												
<table><tr><td>※ 1 Steady</td><td>Less than 3/4 of the maximum pressure (2/3 if the maximum pressure is 100MPa or more)</td></tr><tr><td>※ 2 Variable</td><td>Less than 2/3 of the maximum pressure (1/2 if the maximum pressure is 100MPa or more)</td></tr><tr><td>Vaccum pressure</td><td>The maximum pressure</td></tr></table>					※ 1 Steady	Less than 3/4 of the maximum pressure (2/3 if the maximum pressure is 100MPa or more)	※ 2 Variable	Less than 2/3 of the maximum pressure (1/2 if the maximum pressure is 100MPa or more)	Vaccum pressure	The maximum pressure																			
※ 1 Steady	Less than 3/4 of the maximum pressure (2/3 if the maximum pressure is 100MPa or more)																												
※ 2 Variable	Less than 2/3 of the maximum pressure (1/2 if the maximum pressure is 100MPa or more)																												
Vaccum pressure	The maximum pressure																												
<input type="checkbox"/> Remark																													
※ 1 Steady pressure: The change rate of pressure per second must be less than 1% of the pressure span and per minute must be less than 5% of the pressure span .																													
※ 2 Variable pressure: It fluctuates 1 to 10% per second of the pressure span.																													
Steam	1. The ambient Temp. : should be within 10 ~ 50℃ , temporarily becomes high temperature like steam at the start of operation.																												
	2. Other conditions: refer to Ordinary conditions 2, 3, 4 and 5.																												
	3. Symbol M : is displayed to indicate the steam type of use .																												
Heatproof	1. Maximum ambient Temp.: 80℃																												
	2. Other conditions: refer to Ordinary conditions 2, 3, 4 and 5.																												
	3. Symbol H : is displayed to indicate the heatproof type of use.																												
Vibration-proof (for Intense vibration)	1. Pulsation or vibration: the degree of pulsation or vibration that causes the pointer to shake beyond the accuracy tolerance , is specifically within the following range in the table below.																												
	【Pulsation range】																												
	After continuously applying pulsation pressure below 1Hz, there shall be no functual abnormality within the accuracy tolerance.																												
	<table><tr><td>Max. Pressure (MPa)</td><td>Pulsation Range (% vs. Mpa)</td><td colspan="3">Frequency</td></tr><tr><td></td><td></td><td>Vibratn-resistant</td><td colspan="2">{Intense vibration-resistant}</td></tr><tr><td>Mpa <= 10</td><td>30 ~ 70</td><td>15 000</td><td colspan="2" rowspan="3">{500 000}</td></tr><tr><td>10 < Mpa =< 60</td><td>40 ~ 60</td><td>10 000</td></tr><tr><td>60 < Mpa =< 160</td><td>40 ~ 60</td><td>5 000</td></tr></table>					Max. Pressure (MPa)	Pulsation Range (% vs. Mpa)	Frequency					Vibratn-resistant	{Intense vibration-resistant}		Mpa <= 10	30 ~ 70	15 000	{500 000}		10 < Mpa =< 60	40 ~ 60	10 000	60 < Mpa =< 160	40 ~ 60	5 000			
	Max. Pressure (MPa)	Pulsation Range (% vs. Mpa)	Frequency																										
			Vibratn-resistant	{Intense vibration-resistant}																									
	Mpa <= 10	30 ~ 70	15 000	{500 000}																									
	10 < Mpa =< 60	40 ~ 60	10 000																										
	60 < Mpa =< 160	40 ~ 60	5 000																										
	【Vibration range】																												
Mount in normal posture and carry out the test in three directions, look for a resonance point with conditions given in table below and then excite for 2 hours and carry out the instrumental error test. When the resonance point cannot be found, apply the vibration of +/- 6.9m/s 30Hz in each of three directions for two hours or longer.																													
<table><tr><td>FRQ</td><td>Amplitude (mm)</td><td>Acceleration (m/s²)</td></tr><tr><td>5 ~ 13.2</td><td>± 1.0</td><td>-</td></tr><tr><td>13.2 ~ 100</td><td>-</td><td>± 6.9</td></tr></table>					FRQ	Amplitude (mm)	Acceleration (m/s ²)	5 ~ 13.2	± 1.0	-	13.2 ~ 100	-	± 6.9																
FRQ	Amplitude (mm)	Acceleration (m/s ²)																											
5 ~ 13.2	± 1.0	-																											
13.2 ~ 100	-	± 6.9																											
2. Other conditions: refer to Ordinary conditions1, 2, 4 and 5 .																													
3. Symbol V : is displayed to indicate the vibration-proof type of use.																													
Steam/ Vibration-proof	1. Conditions: have the characteristics of both steam and vibration-proof.																												
	2. Symbol MV : is displayed to indicate the steam/vibration -proof type of use.																												
Heat-/ Vibration-proof	1. Conditions: have the characteristics of both heat and vibration-proof .																												
	2. Symbol HV : is displayed to indicate the heat-/vibration -proof type of use.																												

{ } : is a standard established by our company to improve performance and does not apply to JIS B 7505.

Reference Pressure Gauges

5. Pressure Media Category and Special Treatment

Pressure medium is diverse, such as water and air, as well as those with properties such as corrosive, flammable and toxic. If a pressure gauge is not applicable to these media, the gauge can not meet performance and even has a potential danger when used. Wet part materials can be hence selectable and special treatment to the part is accommodable.

Category in use		Special Treatment	Indication	Applicable Pressure Medium
	Wet part material			
General	Cu-alloy	-		Non-corrosive liquids, gasses, water, oil and air, etc.
Steam/ Heatproof	Cu-alloy SUS	-	Steam: M Heat- resistant: H (SUS-Ag)	Vapor and 45 to 80°C non-corrosive fluids or gasses. (Cooling fin needed over 80°C and discussion to determine specifications for remote diagram type required.)
	SUS304、316 Silver brazing			Fluid without elusion of Zinc or lead from the material (brass/solder) used Foods, Medical care, Pure water.
Anti-corrosion	SUS304、316 Argon welding	-	SUS304 SUS316	Liquids or gasses not to impede property of stainless as corrosion resistance, chemical resistance, heat resistance and durability. Chemical-and Food-related.
Diaphragm	SUS304、316 Fluorine Resin PVC Others (Discussion needed)	-	(Discussion needed to fix a material)	⁽¹⁾ Corrosive fluid, medium possessing characteristics of high viscosity or potential risk of solidification inside. Chemical-and Food-related.
General Steam/Heatproof Anti-corrosion		Degreasing	USE NO OIL	Liquids or gasses not to contain oil. Oxygen, Foods, Medical device.
		Cleaning-up	USE NO OIL or equivalent	Liquids or gasses that require internal cleaning-up to avoid leakage of substance excluding clean air from wet part. Foods, Pure water, Medical care, Semiconductor-related.
		Gas leakage test	Gas name or equivalent	Liquids or gasses not to permit event less leakage and those with properties such as toxic and flammable. Gasses such as ammonia, ⁽²⁾ acetylene, propane and Freon.

Contact us:

(1) Corrosive fluid: There is no material that can withstand all corrosive fluids. So, please let us know the name of fluid so that you can select the most suitable material.

(2) Acetylene gas: Usage of silver or copper alloy with copper content of 75% or more should be prohibited for wet part material. Thus, please be sure to contact us so that we can provide any appropriate solutions, accordingly.

6. Joint Thread

Joint thread type for pipe of pressure gauge comprises of parallel Class B (JIS B 0202) or tapered (JIS B 0203), and it fabricated depending on the size of pressure gauge as described in the following table.

Gauge Size	50	60	75	100	150
Pipe Thread	G1/4B R1/4				
			G3/8B R3/8		
				G1/2B R1/2	

Reference Pressure Gauges

7. Hooking a wrench

The shape of connection should be parallel faced, square or hexagonal, and the size of width across flat is specified in the table, below.

Width across	12	14	17	19	22	24
Dimension Tolerance	0 -0.43			0 -0.84		

8. Characteristics of Plastic Material

Typical characteristics of plastic parts applied in a pressure gauges are as shown in the table below. Note that applying overload exceeding the characteristic value should be avoided.

Material		Polycarbonate Sheet	Rigid Polyvinyl Chloride Sheet	ABS Resin	POM	PVC	PTFE
Characteristics	Unit	Parts applied					
		Window	Window	Case, Ring	Upper Diaphragm Flange	Bottom Diaphragm Flange	Diaphragm
Tensile strength	kgf/cm ²	560 ~ 670	570	440	620 ~ 700	350 ~ 600	100 ~ 280
Compressive Strength	kgf/cm ²	770	700	700	1300	550 ~ 900	120
Bending Strength	kgf/cm ²	770 ~ 910	940	700	840 ~ 980	700 ~ 1100	110
Impact Strength	kgfcm/cm	50 ~ 70	5 ~ 8	12 ~ 27	5 ~ 17	1.7 ~ 8.6	16.3
Hardness	HR (Rockwell hardness)	M60 ~ 70	R120	R110	M75 ~ 95	Shore 70 ~ 90	Shore D50 ~ 55
Heat Distortion Temperature	°C (18.5kgf/cm ²)	130 ~ 140	76	89	-	50 ~ 75	55
	°C (4.6kgf/cm ²)	-	-	-	125	-	121
Continuous Operating Temperature	°C	-	60	-	-	-	260
Combustibility		Self-extinguishable	Self-extinguishable	Flammable	Flammable	Self-extinguishable	Nonflammable
Weatherability		○	○	○	○	○	○
Acidulous		○	○	○	○	○	○
Strong Acid		△	△	△	△	△	○
Weak Alkaline		○	○	○	○	○	○
Strong Alkaline		△	○	○	△	○	○
Organic Solvent Resistance		×	×	×	○	×	○

9. Instrumental error test

As the instrument error test is performed based on JIS B7505-1, please note the following points.

- (1) In the case where the best pressure does not indicate the maximum vacuum scale due to low atmospheric pressure in the test shall be carried out under the pressure closer to the maximum as far as possible.
- (2) In the case of compound pressure gauge that the maximum scales of pressure part and vacuum part are in the ratio of four or more, for the scalar part, its operation has only to be confirmed.

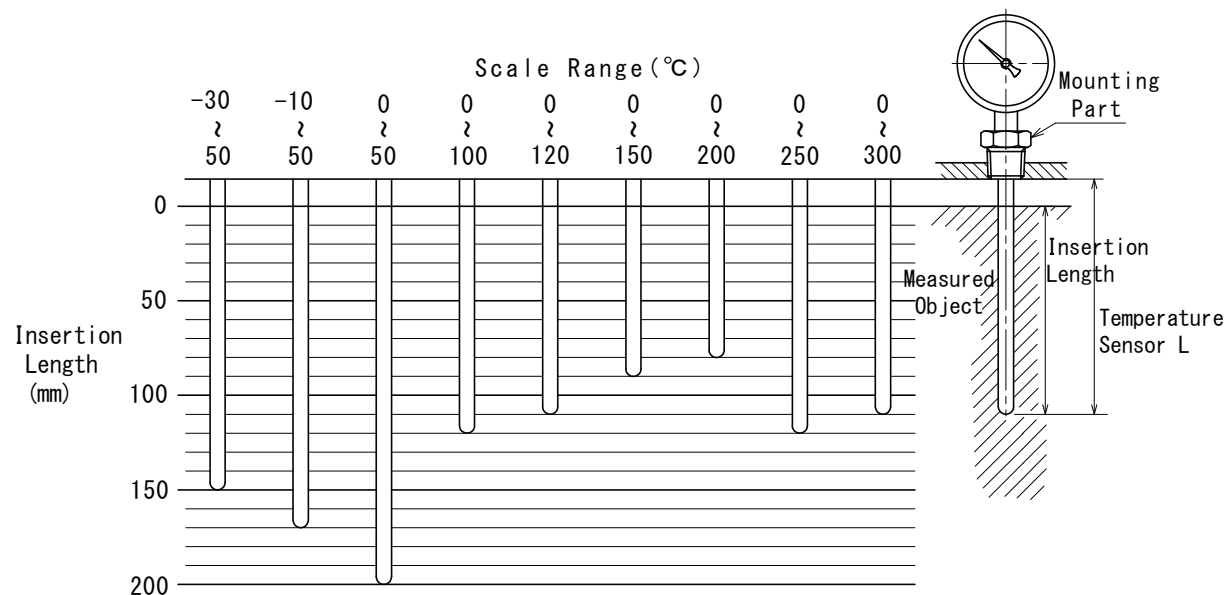
Reference Thermometer

1. Insertion Length of Temperature Sensor

The insertion depth of the temperature measuring part is the most important factor for measurement. The deeper the insertion depth is, the greater the thermal coupling with measured object is secured. Besides, the outer interference becomes small since the bimetal is located at the tip of the part. Accordingly, an accurate measurement can be ensured.

An example of insertion length of the part is illustrated in the figure below.

【Insertion Length of Temperature Sensor】

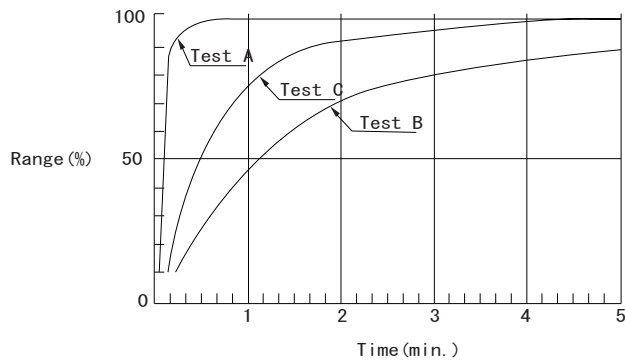


- ◆ This value (Y-axis) is the smallest dimension to be inserted in the measured object.
- ◆ The dimension (L) of the temperature sensor should be more than this dimension.
Please place an order every 10 mm interval.
- ◆ When applying thermowell, please make it 20 mm or more longer than the insertion length. (Y-axis)
- ◆ The measurement with lower value may be carried out regardless of insertion depth when the heat transmitted from the mounting part is large and the temperature of the mounting part is dominant.
In such a case, it is necessary for the mounting part and the whole lower part to be redesigned.
Thus, please specify its details.
- ◆ This value may vary depending on the installation environment, dimensions, etc., and it is not ensured.

2. Response Time

The response time for the temperature change (TC) of the thermometer totally depends on installation conditions (whether the measured object is liquid, gas or shape, dimensions and material of the temperature measuring part, etc.) Especially when applying thermowell, TC becomes bigger and an appropriate care hence should be taken. As one of a countermeasures it is effective to seal it with silicone grease featuring good heat conductivity. Here below is an example.

【Responsiveness】



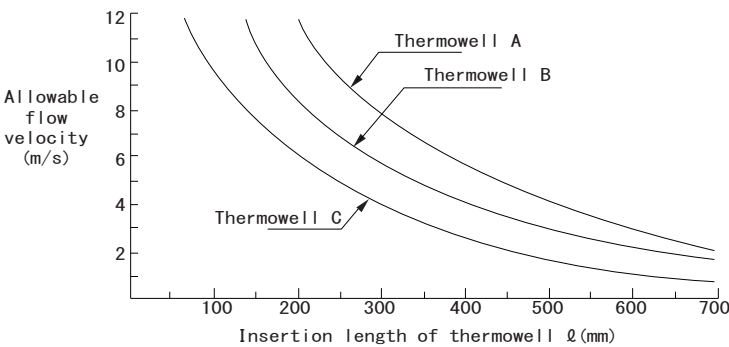
Test A : Temperature sensor
Test B : w/thermowell
Test C : Thermowell sealed by silicon grease

3. Thermowell

Care should be taken since a thermowell employed to protect the temperature measuring part may cause measurement errors and breakage accidents unless allowable flow velocity or working pressure, and corrosion resistance, etc. are taken into account.

- (1) Allowable flow velocity and working pressure
Allowable flow velocity and working pressure are determined by the size (outer and inner diameters, length) and material of thermowell. An example is shown below.

【Thermowell length and allowable flow velocity】



【Thermowell length and allowable flow velocity】

	Diameter		※Allowable pressure (Mpa)
	Outer	Inner	
Thermowell A	15	9	5
Thermowell B	20		14
Thermowell C	Tapered pipe: Min. small diameter 20		16

※ If the hollowed stainless steel material is not used, please note that the value becomes lower greatly.

Reference Warnings in use

□ Pressure gauge and Thermometer in common

Malfunctions or poor accuracy can be happened when mishandled. Be sure to comply with followings.

- (1) Do not drop or give a shock since product is a precision device.
- (2) Hook a wrench when the joint thread is tightened or loosened.
Do not put excessive force on the main body such as twisting by grabbing its housing.
- (3) Maintenance and inspection per year recommended.

■ Pressure gauge

- (1) Both performance and life cycle strongly depend on operating conditions. (temperature, humidity, installing position, vibration, working pressure) Follow details described in "Applications" in Documents.
- (2) Be sure to use the pressure range below the maximum value on the scale, as this may lead to instrument malfunction.
When using, be sure to use a normal pressure of 2/3 or less of the maximum scale value.
- (3) Pressure medium is diverse like toxic, flammable and corrosive as well as things that require cleanliness. Follow details described in "Pressure Media Category and Special Treatment" in Documents so as to avoid any potential accidents by using a applicable pressure gauge. Thus, be sure to specify the name of the fluid when ordering if a media excepting non-corrosive liquids or gasses such as water, oil and air is used.
- (4) High-rigidity piping should be required at a mounting area of the gauge to be supported by stocks alone for avoiding resonance.
- (5) The gauge which is installed at an area generating intense vibration should be placed on a shock absorber and implement piping with low rigidity like flexible tube.
- (6) A throttle screw or dampener for reducing vibration should be used when a pointer's indication of a pressure gauge is shaky.
- (7) Siphon pipe, cooler or heater should be used for high and low temperature media.
- (8) When a gauge covering safety window is installed, a space wider than 20 mm and more space around wall behind the gauge should be needed for releasing inner over pressure due to an accident of burst, and its window must be faced an appropriate direction to prevent an operator from any dangers.
- (9) Vibration-proof pressure gauge should be used if indication of pointer is shaking even though there is no vibration in the equipment itself.
If this is the case, possible cause is that piping is vibrating or resonating, most likely to be 40 to 60Hz as resonance point of a pressure gauge.
- (10) A pressure gauge with zero adjuster is installed, following zero adjustment is implemented.

■ Thermometer

- (1) Do not deforming such as bending the pipe at the temperature measuring part since malfunction or poor measurement accuracy can be detecte.
- (2) Install away from direct rain and vapor to prevent from pouring those on an indicator. Either hermetic or outdoor type device should be used in outside.
- (3) Either hermetic or outdoor type device should be used when measuring temperature lower than zero-deg C for a long period of time even indoors.
- (4) Install away from intensive vibration.
- (5) Temperature measuring part should be entirely immersed in the measured objects taking its pressure, velocity, vibration and causticity into consideration and usage of thermowell covering the part is recommended referring to "Thermowell" in Documents for confirming conditions on velocity, vibration and so forth.
- (6) Stainless steel temperature measuring part and thermowell should be used for stainless steel piping and tanks.
- (7) Stainless steel thermowell for preventing from vibration should be used in case that measured fluid is placed in faster or greatly changing velocity.
- (8) Stainless steel thermowell should be used in case that its length is 150 mm and longer.
- (9) If a pointer is shaking even though there is no vibration in the equipment itself, possible cause can be the resistance of fluid. If this is the case, mechanical strength of thermowell should be fortified.
- (10) Measurement of air-conditioning cold/hot water is feasible even when thermowell with thicker diameter is inserted 50 to 100 mm from the inner wall since there is few variation in temperature inside a pipe. If a thermowell is made longer than necessary, it can cause vibration.
- (11) Keep the conduit of remote measuring thermometer not to bend less than R150 and firmly fix it to avoid shaking due to vibration.