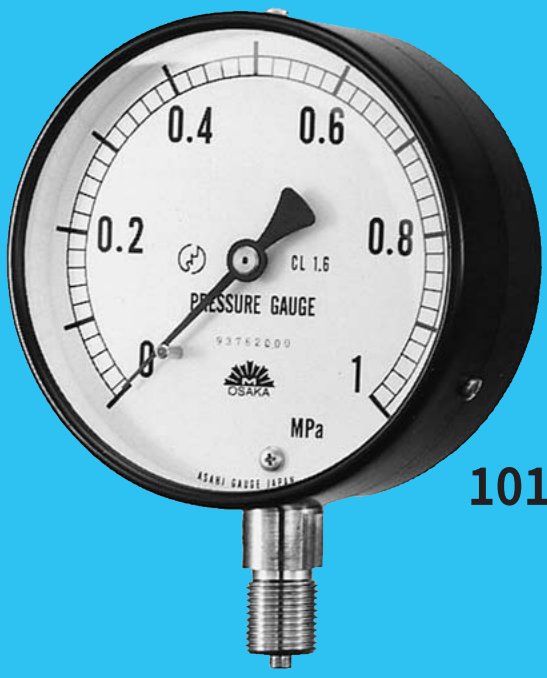
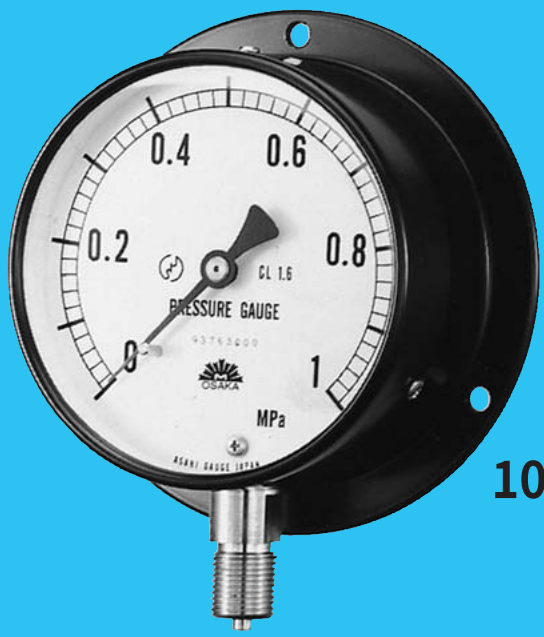
CATALOG No. 1010
MODEL 101

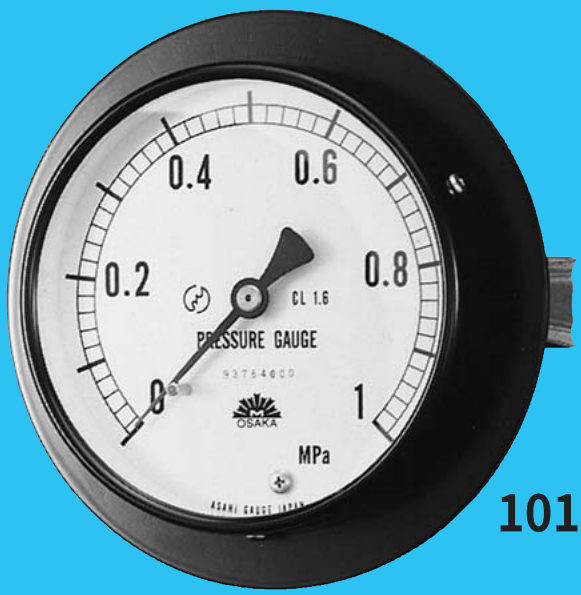
BOURDON TUBE PRESSURE GAUGES



101-A



101-B



101-D

OSAKA
ASAHI GAUGE MFG. CO.,LTD.
JAPAN

JIS B7505

Application

These standards apply to a round concentric single-needle gauge, such as the pressure, vacuum and compound gauges, which measures gauge pressures by directly indicating the quantity of displacement transferred from a Bourdon tube and mechanically magnified.

Pressure Units

Name	Symbol	JIS	Remarks
Megapascal	MPa	○	
Kilopascal	kPa	○	Option
Bar	bar	×	

Pressure range and scale graduation

Note:
- Gauge of 0.6 and 1.0 precision classes and in sizes 75 and smaller are not available.
- Available pressure ranges may vary depending on gauge size.
- JIS-qualified gauges of 1.6 class and in sizes 60 to 200 have the same scale graduations.
- Non-JIS gauges in sizes 60 and 75 are available with graduations half those of the gauges listed on the table.

Pressure Gauges

	Size(mm)	150•200	100•150•200	60•75•100•150•200	
	Accuracy	0.6	1.0	1.6	JIS
MPa	0 ～ 0.04	200	80	40	○
	0.05	100	50		×
	0.06	120	60		○
	0.07	140	70	35	×
	0.1	100	50		○
	0.16	160	80	32	○
	0.2	100	100	40	×
	0.25	125	50		○
	0.3	60	60		×
	0.35	175	70	35	×
	0.4	200	80	40	○
	0.5	100	50		×
	0.6	120	60		○
	0.7	140	70	35	×
	1	100	50		○
	1.6	160	80	32	○
	2	100	100	40	×
	2.5	125	50		○
	3	150	60		×
	3.5	175	70	35	×
	4	200	80	40	○
	5	100	50		×
	6	120	60		○
	7	175	70	35	×
	10	100	50		○
	16	160	80	32	○
	20	100	100	40	×
	25	125	50		○
	30	60	60		×
	35	175	70	35	×
	40	200	80	40	○
	50	100	50		×
	60	120	60		○
	70	140	70	35	×
	100	—	50		○
	200	—	40		×

Vacuum Gauges

	Size(mm)	150•200	100•150•200	60•75•100•150•200	
	Accuracy	0.6	1.0	1.6	JIS
MPa	− 0.04 ～ 0	200	80	40	×
	− 0.05	100	50		×
	− 0.06	120	60		×
	− 0.07	70	35		×
	− 0.1	100	50		○

Compound Gauges

	Size(mm)	150•200	100•150•200	60•75•100•150•200	
	Accuracy	0.6	1.0	1.6	JIS
MPa	− 0.1 ～ 0.1	100	100	40	○
	0.15	—	50		×
	0.16	130	52		○
	0.2	—	30		×
	0.25	175	70	35	○
	0.3	—	40		×
	0.35	—	45		×
	0.4	100	50		○
	0.5	—	60		×
	0.6	140	70	35	○
	0.7	—	40		×
	1	110	55		○
	1.5	—	32		×
	1.6	85	85	34	○
	2	—	42		×
	2.5	130	52		○
	3.5	—	35		×
	4	—	82	41	○

Size, Kind, Symbol

Item		Accuracy Grade	Ambient Temp	Symbol	Size 60	75	100	150	200
Kind	Pressure gauge Vacuum gauge Compound gauge				○ ○ ○	○ ○ ○	○ ○ ○	○ ○ ○	○ ○ ○
Application	Application								
	Ordinary Type	0.6 (CL 0.6) 1.0 (CL 1.0) 1.6 (CL 1.6) 2.5 (CL 2.5)	−5 ～ +45°C	—— —— —— ——	– – ○ ○	– – ○ –	– ○ ○ –	○ ○ ○ –	○ ○ ○ –
	Ordinary Type for Steam Heat-Proof Type Vibration-Proof Type Vibration-Proof Type for Steam Heat Proof Vibration-Proof Type	1.6 (CL 1.6)	10 ～ 50°C −5 ～ +80°C −5 ～ +45°C 10 ～ 50°C −5 ～ +80°C	M H V MV HV	○ – ○ ○ –	○ – ○ ○ –	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ – – – –
External Shape	Stem Mounting Surface Mounting Flush Mounting			A B D	○ ○ ○	○ ○ ○	○ ○ ○	○ ○ ○	– ○ ○
Shape of Connection	Square Parallel Faced Hexagonal			T U S	○ ○ –	○ ○ –	○ ○ ○	– ○ ○	– ○ ○

Model Coding

General pressure gauges

Model	101−	□	□	□	□
Type of casing	A Type B Type D Type	A B D			
Connection screw	1/4 G 3/8 G 1/2 G 1/4 R 3/8 R 1/2 R Other		2 3 4 6 7 8 X		
Size	60 75 100 150 200			3 4 5 8 9	
Material	BRASS SUS316				0 1

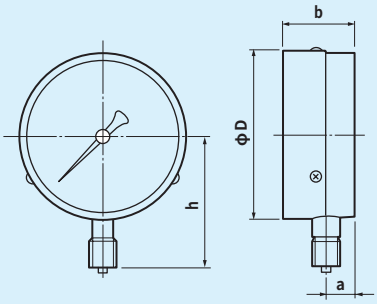
Note: SUS316 gauges in sizes 75 and up with 101-model coding are not available.
Closed pressure gauges in our Catalog No.1002 are recommended as alternatives.

Bourdon Tube Pressure Gauges

Appearance and Dimensions

Stem Moutning (Type A) 101-A

Unit: mm



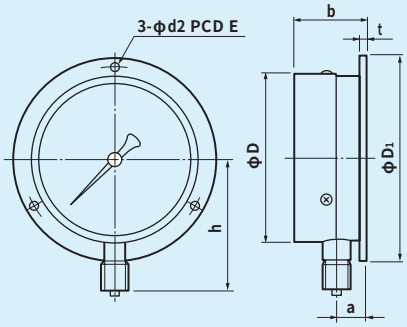
Model	Screws	Connector	Size	D	a±1	b±2	f	g, k	L1, L2 L×M	h±2	Weight
101-A230	G	T 1/4	60	63	14	32.5	16	10	17	59.5	170
-A630	R										
-A240	G	T 1/4	75	78	13	34.0	16	12	17	68	250
-A640	R										
-A340	G	T 3/8					18	12	17	70	260
-A740	R										
-A350	G	U 3/8	100	103	18	42.5	18	12	14	82	300
-A750	R										
-A450	G	S 1/2					20	12	24×28	96	400
-A850	R										
-A380	G	U 3/8	150	153	19	51.5	18	12	14	110	730
-A780	R										
-A480	G	S 1/2					20	12	24×28	125	810
-A880	R										

Size 50ϕ not included.

Common Specifications for Type A, B, and D
Finish : Black
Wet Part Materials : Stock C3604 C3771
Bourdon Tube / 7MPa or under C2700T, C6872T(ϕ60, 5MPa or under)
8MPa or over SNCM, SUS316
Screws NPT screws made to order
Zero Ajustment Needle:
Available for ϕ100 or over models
Blowout : Standard equipment for 10 MPa or over models
Case Materials SS, ADC, ZDC

Surface Moutning (Type B) 101-B

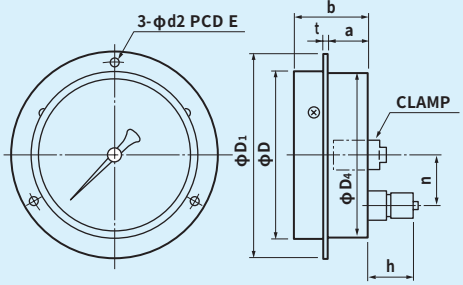
Unit : mm



Model	Screws	Connector	Size	D	D1	a±1	b±2	t	d2	E	f	g, k	L1, L2 L×M	h±2	Weight
101-B230	G	T 1/4	60	63	80	13.0	31.0	1.5	4.5	72	16	10	17	59.5	180
-B630	R														
-B240	G	T 1/4	75	78	98	13.5	35.5	2.5	4.5	88	16	12	17	68	370
-B640	R														
-B340	G	T 3/8									18	12	17	70	380
-B740	R														
-B350	G	U 3/8	100	103	128	20.5	44.5	2.5	5.5	115	18	12	14	82	650
-B750	R														
-B450	G	S 1/2									20	12	24×28	96	750
-B850	R														
-B380	G	U 3/8	150	153	178	23.0	54.5	3.0	5.5	165	18	12	14	110	760
-B780	R														
-B480	G	S 1/2									20	12	24×28	125	860
-B880	R														

Flush Moutning (Type D) 101-D

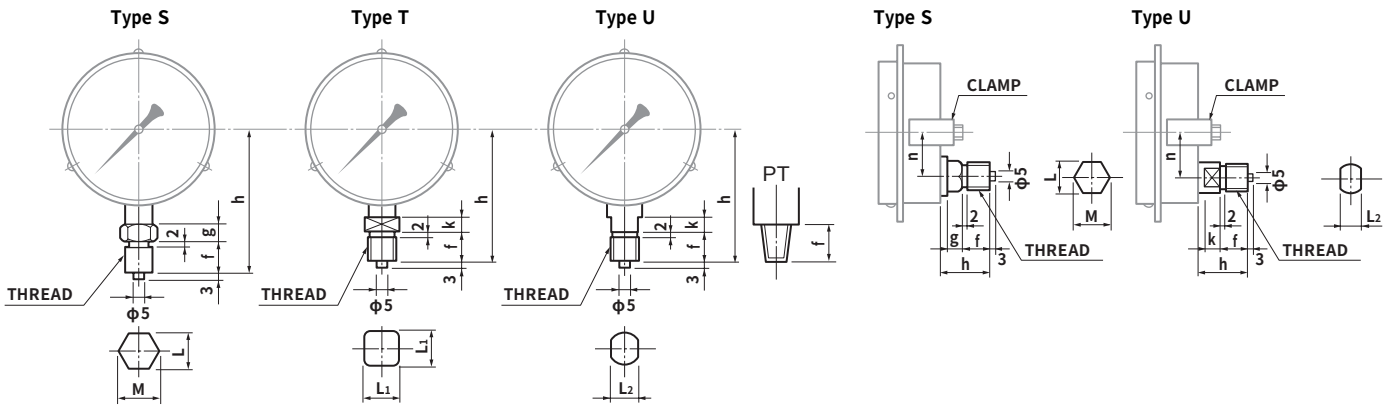
Unit : mm



Model	Screws	Connector	Size	D	D1	D4	a	b±2	t	d2	E	n	f	g, k	L2 L×M	h±2	Weight
101-D230	G	U 1/4	60	65	80	62	17.5	31	2.0	4.5	72	18	16	10	14	28	280
-D630	R																
-D240	G	U 1/4	75	78	98	77	18.0	38	2.5	4.5	88	25	16	11	14	28	390
-D640	R																
-D340	G	U 3/8											18	12	14	30	400
-D740	R																
-D350	G	U 3/8	100	103	128	102	25.0	46	2.5	5.5	115	32	18	11	14	30	330
-D750	R																
-D450	G	S 1/2											20	12	24×28	35	400
-D850	R																

Specify so, when mounting brackets are required.

Type of Shank



Remakes : Screw bores and fixtures are custom-made. NPT screws also available.

How to Choose Pressure Gauge Specifications

Which pressure gauge to use will be determined first by the purpose of measurement; for the safety of a factory or for obtaining accurate data. They will also be chosen by the function; indication only or recording as well, or equipped with an electric contact for controlling systems.

Choose pressure gauges on the following conditions:

1. Application

Variation	Description
General Pressure Gauges	Most-widely-used, JIS-designated industrial gauges.
Differential Pressure Gauges	Indicate pressure differences at 2 points to measure flow rates and fluid levels.
Compound Pressure Gauges	2 pressure sensors and pointers show each value on the same indicator.
Pressure Gauges with Electric Contacts	Control systems; vary by contact method, capacity.
Pressure Gauges for Plants (incl. Medium-Sealed Type)	Measure/record pressures of corrocive fluids and fuluids with high viscosity or temperature or pulsation pressure.
Recorders	Record time changes of pressure.
Pressure Transmitters	Send pressure values from the sensor to a remote indicator.

2. Environments

2-1. Pulsation, Vibration

Subject to strong pulsation or vibration, pressure gauges installed at pump outlets or on vehicles often wear off in about a month, and the bourdon tube broken very quickly. The gauges must have a damper or other shock-absorbing devices. JIS conditions that those gages have higher vibration resistance than other pressure gauges.

Our line includes steam and genelal-use vibrationproof gauges and heat- & vibrationproof gauges, all meeting JIS.

Even those JIS products are often insufficient for the places with severe vibration. We have devised the movement to provide pressure gauges with super-high vibration resistance. Yet, equip these gauges with a damper or, instead, use an oil-sealed super vibrationproof gauge under still high pulsation pressures.

2-2. Fluids

Usually SU316 and, in rare instances, Monel are used to make corrosionproof Bourdon tubes. Diaphragm pressure gauges are recommended for measuring highly corrosive fluids; wet part materials are available to order.

2-2-1. Chlorine

Use diaphragm pressure gauges for measuring chlorine, as it combines with the moisture on brass and steel to produce hydrochloric acid which corrodes wet parts.

2-2-2. Acetylene

The gas parts of a gauge for acetylene measurement must not contain more than 60% of copper, for combined acetylene and copper produces explosive substances.
(Our standard pressure gauges have safe gas parts.)

2-2-3. Viscous Fluids

For viscous fluid measurement, use diaphragm pressure gauges with a large inlet to prevent sticking and wrong reading.

2-2-4. Atmosphere

Use sealed gauges in the atmosphere containing dust, rain water, salt, ammonia, and/or corrosive gases. Choose case materials from plastic, stainless steel, aluminum alloys, and zinc alloys to protect the case from corrosive gases.

2-2-5. Temperature

Temperature changes the elastic coefficient of a Bourdon tube made mostly with brass, phosphor bronze, or steel.
This, coupled with the expansion/contraction of inside parts, produces +/− 0.6 to 0.8% of reading error when ambient temperatures change +/− 20 deg.

JIS Class 1.6 gauges, except the heatproof version, are supposed to maintain designed accuracy in an ambient temperature range of 20+/−15 and Class 0.6 gauges, 20+/−5℃. Use heatproof gauges when the temperature is out of the above ranges. Insulate heat when installing the gauge near a boiler, or install it elsewhere. Operating temperature ranges for our pressure gauges are as follows:

Standard −5℃ to 45℃
Heatproof −5℃ to 80℃
Steam 10℃ to 50℃

If fluid temperature exceeds 80℃, siphon or capillary tubes must be used.

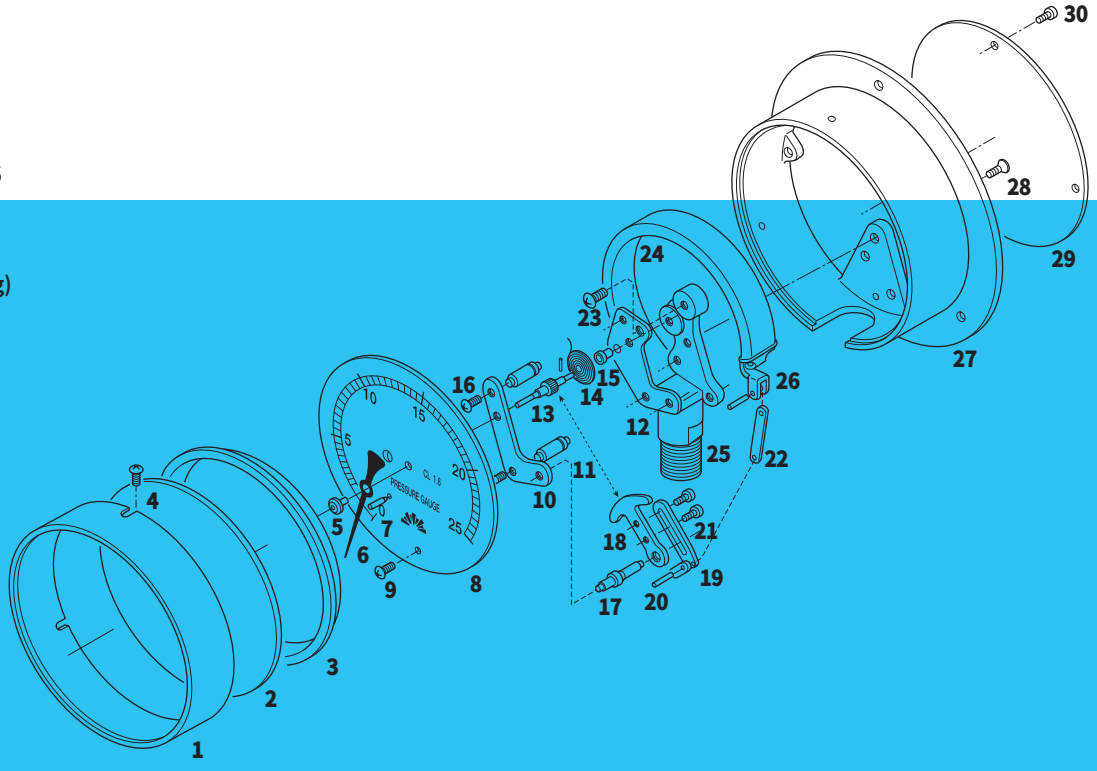
3. Working Pressures and Calibration

JIS B7505 specifies maximum operational pressures for pressure gauges, as follows:

Static Pressure 3/4 F.S.
Fluctuating Pressure 2/3 F.S.

Component Names

1. Other Frame (Bezel)
2. Glass
3. Transparent Plate (Spacer Ring)
4. Stop Screw (Bezel Screw)
5. Pointer Pin
6. Pointer
7. Pointer Stopper
8. Scale (Dial)
9. Dial Screw
10. Movement Upper Plate



11. Movement Pole
12. Lower Bearing Plate
13. Pinion
14. Hair Spring
15. Movement Bushing
16. Movement Screw
17. Sector Gear Shaft
18. Sector Gear
19. Adjuster
20. Rod Pin
21. Adjuster Screw
22. Rod
23. Movement Screw
24. Bourdon Tube
25. Stock
26. Tube end Piece
27. Case
28. Stem Screw
29. Back Plate
30. Back Plate Screw

Conversion Table for Pressure Units

MPa	kgf/cm^2	bar	atm	lb/in^2	kPa	Hg		H_2O(Aq)	
						m	in	m	ft
0.0981	1	0.9807	0.9678	14.22	98.07	0.7356	28.96	10.000	32.81
0.1	1.0197	1	0.9869	14.50	100.00	0.7501	29.53	10.197	33.43
0.1013	1.0332	1.0133	1	14.70	101.32	0.760	29.92	10.33	33.90
0.0069	0.0703	0.0689	0.0680	1	6.894	0.0517	2.036	0.703	2.03
0.0010	0.0102	0.0100	0.0099	0.0680	1	0.0075	0.2959	0.1020	0.3343
0.1233	1.3595	1.3332	1.3158	0.1451	133.32	1	39.37	13.6	44.60
0.0034	0.0345	0.0338	0.0334	19.34	3.383	0.0254	1	0.345	1.133
0.0098	0.1000	0.0981	0.0967	0.491	9.807	0.0735	2.896	1	3.281
0.0030	0.0305	0.0299	0.0295	1.422	2.991	0.0224	0.88	0.305	1

Specifications subject to change without notice.