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OBK



OBK LEVEL GAUGE

SAWADA SEISAKUSHO CO.,LTD.

Sawada Is Committed to Contributing to Society by Ensuring Reliability and Safety.

Management Philosophy

With the goal of providing our customers with complete confidence in our products, we strive to pursue the highest quality in everything we make, to respond quickly to all customer inquiries, and to direct our spirit of challenge toward excelling in the three important business fields of technology, sales and manufacturing.



Commitment to Our Customers

Sawada Seisakusho designs, manufactures and sells direct-viewing liquid level gauges of various configurations. Our activities are focused on delivering high-quality products that customers can use with complete confidence, responding quickly to a wide range of inquiries and requests, and constructing a rational and efficient framework that isn't constrained by conventional rules and practices. We believe one of our most important missions is to ensure full customer confidence through these efforts while enabling our customers to carry out their work in the field anxiety-free thanks to the quality of our products.

Our Quality Policy

Providing total confidence by quickly responding to customer demand with products that meet the highest standards of quality.

1. To attain our quality objectives, we set our managerial goals high and review them regularly.
2. To meet legal and regulatory requirements associated with our products, as well as changing customers needs, we strictly follow procedures set down in our quality manual.
3. To cope with changes in legal and regulatory requirements associated with our products, as well as to maintain and raise customer satisfaction, we continue to improve our quality management systems.

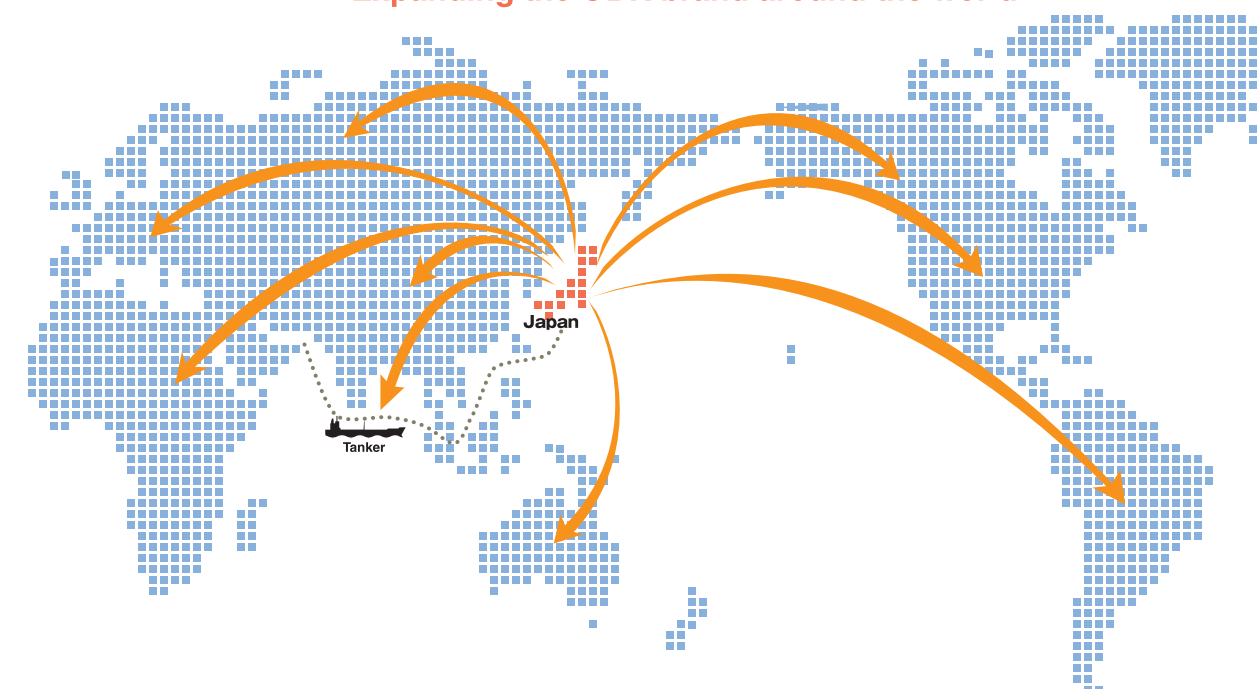
About Our Company and Products

Since our foundation in 1950, Sawada Seisakusho has achieved high levels of expertise and business achievement as a specialized liquid level gauge manufacturer. As a result, our OBK brand currently enjoys a strong reputation among customers in many countries for products that are synonymous with reliability and confidence. Our unique custom manufacturing system has earned wide customer acceptance (Due Date Performance 99.8%), and we continue to actively pursue product development based on new concepts and technologies.

We bring you
reliability and
confidence.



Expanding the OBK brand around the world



A leading Japanese manufacturer, we take pride in our wide range of liquid level gauges.

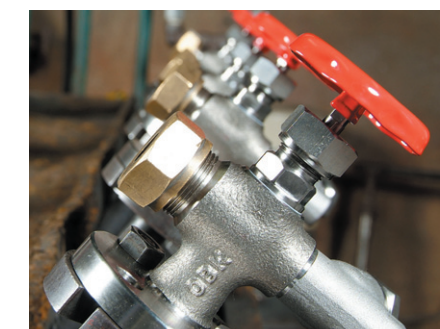
Sawada is one of Japan's few level gauge manufacturers offering a full lineup ranging from low-pressure to high-pressure (up to 21MPa) liquid level gauges. For boiler and tank applications, we can meet any specifications. Enquiries about other manufacturers' products are also welcome.



The OBK mark of reliability

Instant support for the diverse specifications of Japanese leading boiler manufacturers.

Since our foundation in 1950, we have expanded sales by installing our products in many of the boilers produced by Japanese manufacturers, with the result that we can now pride ourselves on such a degree of popularity that Sawada's OBK products are now immediately associated with water level gauges for boiler drums.

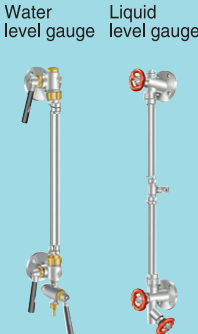
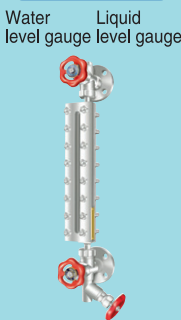
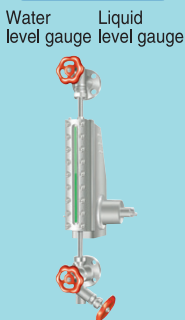


Striving to develop new tech and products that meet changing market needs.

Capitalizing on our accumulated sales and R&D expertise, Sawada Seisakusho is committed to meeting every detailed specification. Our factory, sales and R&D departments strive to develop new and improved products that reduce costs while upgrading function, employing cutting-edge, IT tech in keeping with the various themes they set.



Quick Product Reference List & Table of Contents

Level Gauge Types Product View (examples)	Float-Type Magnetic Liquid Level Gauges  P07-P08	Tubular Types Liquid level gauges featuring simplest construction.  P09-P10	Reflex Types Indicate liquid portion in black and steam portion in white (when colorless, transparent liquids are used). K Series  P11-P12 U Series  P13-P14	Transparent Types Mounting an illuminator on the back of the level gauge lights the entire viewing window in green, causing the water surface to shine white. Low- and Medium-Pressure Type  P15-P16 High-Pressure Type  P17-P18	
	Water Level Gauge When the liquid is of the water type (steam or water used in boilers, etc.):	Tubular type water level gauges Gauge cock ABS Type 1.0 MPa	Reflex type water level gauges K2 Type 1.6 MPa K Type 2.0 MPa	Reflex type water level gauges UZ Type 1.0 MPa U-20 Type 2.0 MPa	Transparent types water level gauges T-10 Type 1.0 MPa T-20 Type 2.0 MPa TVB Type 3.0 MPa TVC Type 4.0 MPa TVD Type 5.0 MPa
	Liquid Level Gauge When the liquid is of the chemical type (oil, diluted hydrochloric acid, etc.):	Tubular type liquid level gauges Gauge valve KS10-N Type 1.0 MPa Simple Holder H-10 Type 1.0 MPa	Reflex type liquid level gauges UZ Type 1.0 MPa U-20 Type 2.0 MPa	Transparent types liquid level gauges T-10 Type 1.0 MPa T-20 Type 2.0 MPa	

Max. operating pressure value

Gauge Cock and Valve	Gauge Cocks		Gauge Valves		Gauge Valves	
	 • ABS Series • KD Series • KD-2 Series • KU Series P35		 • KS20 Series • KS10-N Series P36		 • KS9 Series • KS4 Series • KS-N Series P37	

General Information	Introduction of Corporate Management Philosophy and Business Fields		Table of Contents		Inquiries		Combination Table	
	P01-P02		P03-P04		P05		P06	

Bicolor Types			
Differences in light refraction cause the steam portion to be visible in red and the water portion in blue.			
Low- and Medium-Pressure Type	Medium-Pressure Type	High-Pressure Type	Multi-Port Type
Water level gauge	Water level gauge	Water level gauge	Water level gauge
			
Bicolor types water level gauges	Bicolor types water level gauges	Bicolor types water level gauges	Bicolor types water level gauges
RGB Type ⊕ 2.0 MPa	RGC-2 Type ⊕ 4.0 MPa	RGD-HL Type ⊕ 8.0 MPa	RG-200N Type ⊕ 15.0 MPa
RGC Type ⊕ 3.0 MPa	RGD Type ⊕ 5.0 MPa		RG-200NH Type ⊕ 21.0 MPa
▶ P19-P20	▶ P21-P22	▶ P23-P24	▶ P25-P26

Other Types of Liquid Level Gauges

Special Liquid Level Gauges

(reflex and transparent types)

- Anti-Frosting type
- Heating / Cooling type
- Wide-Chamber type
- High-Pressure Special type
- Back-Coated type

► P29-P30

Weld-Mount Liquid Level Gauges

J-Series

- J-3 type — 1.0 MPa
- J-3 Special type — 1.0 MPa
- J-30 type — 1.0 MPa
- J-50 type — 1.0 MPa

► P31-P32

Weld-Mount Liquid Level Gauges

SG-Series

SG-B type
SG-R type
SG-P type

► P33

Flow Sight

► P34

Related Products	LED Illuminator		OBK Piston Valve		Parts	
	Used when switching the level gauge light source from conventional light bulbs to LEDs. • Enhanced viewing ease. • Longer service life. • Space-saving. P38		P39-P40		P41-P42	

Boilers and Water Level Gauges

Boilers are used in many applications, such as the power generating facilities of electric utilities and factories, commercial buildings, hospitals, refuse incineration plants, sewage works and sea vessels. Although they play important roles in our lives, they are seldom seen. Mainly, water is used in boilers to generate steam, but its volume must be kept at an appropriate level; too much or too little water can result in accidents in either case. For this reason, boilers have an operating threshold that must not be lowered or exceeded. To keep the volume of water consistently at this threshold position, an accurate reading of its level in the boiler is needed, and level gauges are used for this purpose. The level gauge is designed to permit direct observation of the water level in the boiler or water-supply tank from the outside.

Level Gauge Dimensions Table

In-Line and Staggered Assembly Configurations

P27-P28

Water(Liquid) Level Gauge	Inquiries
	Combination Table
	Magnetic Float Type LEVEL KEEPER
	Tubular Types Water & Liquid Level Gauge
	Reflex Types K Series
	Reflex Types U Series
	Transparent Types Low- and Medium-Pressure Type
	Transparent Types High-Pressure Type
	Bicolor Types Low- and Medium-Pressure Type
	Bicolor Types High-Pressure Type
Liquid Level Gauge	Bicolor Types Multi Port Type
	Dimensional Table In-Line & Staggered Assembly
	Special Type
Cock and Valve	Weld-Mount Type J-Series
	Weld-Mount Type SG-Series Flow Sight
	Gauge Cock Gauge Valve
Related Products	Gauge Valve LED Illuminator
	OBK Piston Valve
	Parts

Please see this section to confirm parts.

Inquiry Details

When inquiring about OBK level gauges, please provide the following information:

- Water Level Gauge:** Suitable for observation of steam and water levels in boilers, etc.
- Liquid Level Gauge:** Suitable for observation of oil, diluted hydrochloric acid or other chemical liquid levels.

For first-time installations

About Usage Conditions

Water Level Gauge

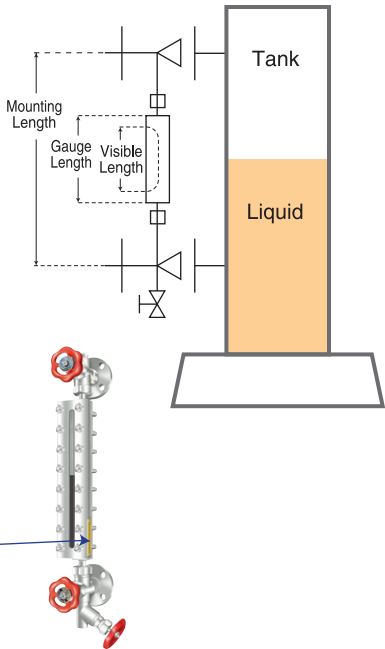
- Operating pressure and temperature.
- Desired level gauge model, etc. (if already decided.)

Liquid Level Gauge

- Liquid name or type, and operating pressure and temperature.
- Desired level gauge model, etc. (if already decided.)
- Desired gauge material.

About Level Gauge Mounting

- Total mounting length (distance between upper and lower cores, nozzle distance, etc.) or
- Desired viewing range length.
Note: For reference, please see diagrams shown elsewhere in this catalog.
- Type and size of mounting hardware
 - Flange mounting (JIS, ANSI, etc.)
 - Screw mounting (PF or PT)**Note:** Please consult your Sawada dealer regarding about other mounting methods.



For existing gauge replacements

- Production number (MANF No.) or
- Drawing number

The serial number is visible on the nameplate attached to the side of the gauge. (Tubular types have no nameplates.)

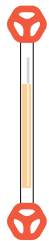


Level Gauges Types and Inquiry Notes

Tubular Level Gauges

Constructed of a clear glass tube connecting upper and lower valves, which allows the liquid level to be viewed directly.

This gauge comes with a glass tube and protective cover. **If the protective cover is not needed, please provide instructions to this effect.**



Reflex Level Gauges

Grooves cut in the back surface of the gauge glass show the liquid portion in black and the air portion in white due to prismatic reflection on the grooves (when the liquid is colorless and transparent).

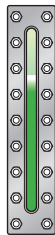
This type of gauge can support operating pressures of up to approximately 2MPa and is widely used in boilers and tanks.



Transparent Level Gauges

Transparent gauges, designed for wide-range pressure applications, feature dual-glass construction with front and back gauge glasses held by their respective covers. For boiler applications, a transparent mica plate is installed between the liquid and the glass to protect against erosion by steam and water.

When the liquid is colorless and transparent, a sunshade can be installed on the front of the level gauge, or an illuminator on the rear, to facilitate viewing ease.



Bicolor Water Level Gauges

These are similar to transparent gauges in basic construction except that their two internal gauge glasses form an angle that permits light refraction. Steam portion is indicated in red and water portion in blue. Since colors are separated by means of refraction, **an illuminator must be installed at the back of the gauge.**



Float-type Magnetic Liquid Level Gauges

Since these models use buoyancy to operate, **information on the specific gravity of the fluid to be measured is required.**

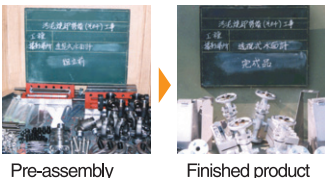
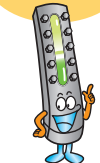
Welded Type Water Level Gauges

When the mating surface needs to be rounded to conform with the shape of tank, **please provide the tank radius. A protective splash cover can also be installed on the front surface of the level gauge.**

Overhaul

All OBK level gauges can be overhauled. Overhauls can also be performed on equivalent products made by other manufacturers. Upon return, we normally provide maintenance records in the form of a simple service report, however more detailed reports can be prepared, including photos, etc.

Leave all your level gauge overhauls to us.



Combination Table

Water Level Gauges for Boilers

			Tubular		Reflex				Transparent					Bicolor					Multi-Port		
		Gauge model	φ 19	φ 25	K2	K	UZ	U-20	T-10	T-20	TVB	TVC	TVD	TVD -HL	RGB	RGC	RGC -2	RGD	RGC -HL	RG-200N	RG-200NH
Valve model		Max. pressure guide (MPa)	1	1	1.6	2	1	2	1	2	3	4	5	8	2	3	4	5	8	15	21
Cock	ABS	1.6	○		○	△	○	△	○	△					△						
	KD				○	△	○	△	○	△					△						
	KD-2				○	△	○	△	○	△					△						
	KU				○	△	○	△	○	△					△						
Valve	KS10-N	1	○																		
	KS10-NV	Vacuum type	○																		
	KS35	1		○																	
	KS15	3			○	○	○	○	○	○					○	○					
	KS20	3			○	○	○	○	○	○					○	○					
	KS20-V	Vacuum type			○	○	○	○	○	○					○	○					
	KS9S	5									○	○	○			○	○	○			
	KS4-L	13											○	○				○	○	○	
	KS-N	21																		○	○

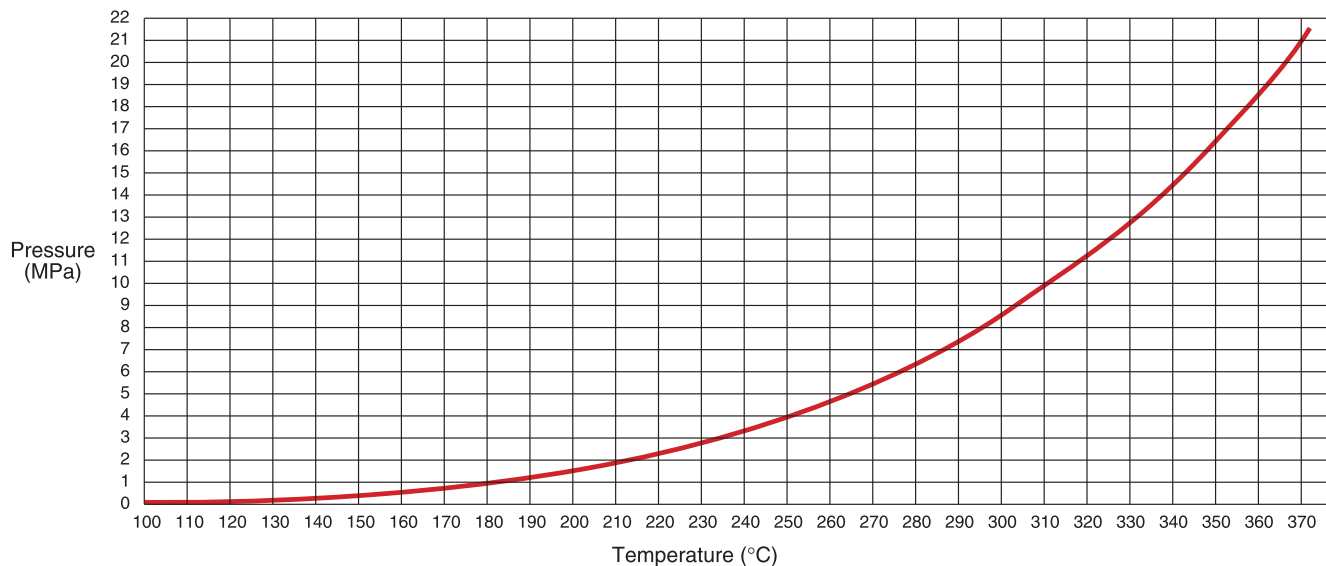
△:Non-asbestos cock: 1.6 MPa

Liquid Level Gauges for Tanks (Plants)

			Tubular		Reflex			Transparent		
		Gauge model	φ 19	φ 25	UZ	U-20	U-P	T-10	T-20	T-P
Valve model		Max. pressure guide (MPa)	1	1	1	2	1	1	2	1
Valve	PP-19 PV-19	1	○							
	H-10	1	○							
	KS10-N	1	○							
	KS10-NV	Vacuum type	○							
	KS35	1		○						
	KS20	3			○	○		○	○	
	KS20-V	Vacuum type			○	○		○	○	
	KS-Z	1	○				○			○

Special-Purpose Gauges
Since models vary depending on conditions of use, please consult your Sawada dealer.

Saturated Steam Pressure Table



Liquid Level Gauges

Float-Type Magnetic Level Gauges

Models
ALK-25A, ALK-50A
and ALK-65A



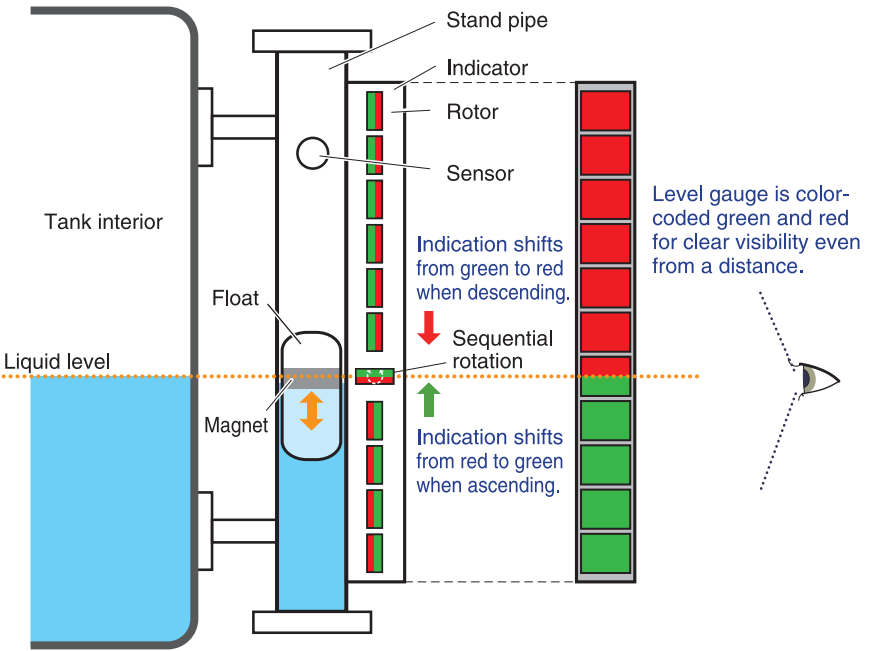
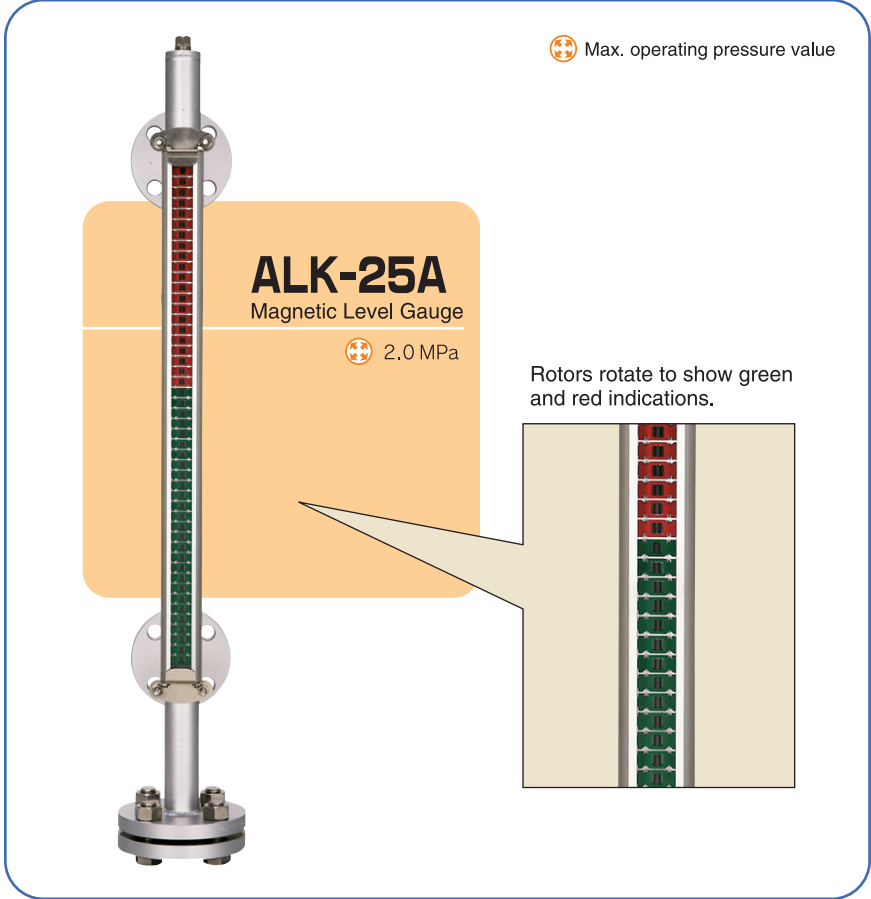
The magnetic level gauge indicates fluid level by actuating a row of revolving red/green indicators with a magnet built into a float that rests at fluid level inside a stand pipe attached to the outside of a tank. Recently, this type of gauge has come to be widely used for the feed water heaters of power plants and for tanks designated as dangerous by the Fire Services Act in Japan.

Product Features

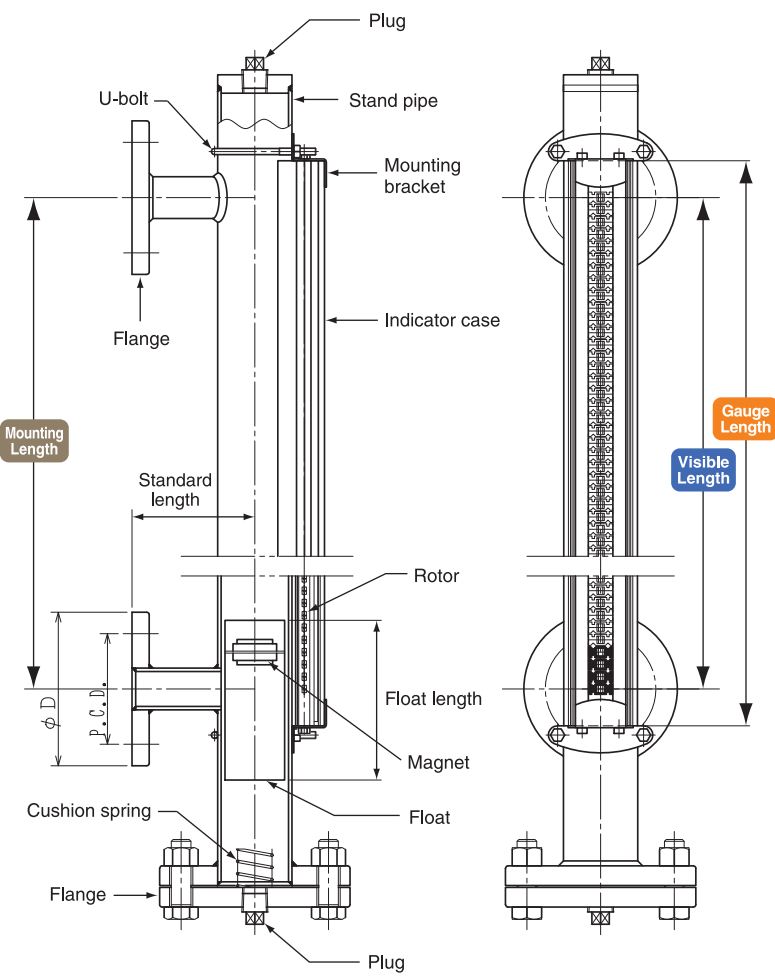
- Since no glass is used, there is no danger of liquid leakage due to breakage or glass corrosion.
- No glass to replace, weather-resistant indicators eliminate glass maintenance for highly economical operation.
- No power supply required, as indicators are magnetically actuated by the float.
- Indicators are brightly color-coded, allowing clear liquid level confirmation even from a distance.
- Lighter in weight than conventional reflex-type level gauges, even when viewing length is extended.
- Superb heat-, corrosion- and weather-resistant properties make the Level Keeper ideal for tanks designated as dangerous by the Fire Services Act in Japan.
- Permits installation of an optional memory sensor or analog sensor. Sensors are available in both explosion-proof and waterproof/splash-proof types.
- Construction material can be selected depending on the usage conditions.
Example: SUS304, SUS316, SUS316L, PP, titanium
- Optional terminal block can be attached to the magnetic memory sensor.

Usage Guidelines

ALK-25A	
Max. operating pressure:	2.0 MPa
ALK-50A	
Max. operating pressure:	8.0 MPa
ALK-65A	
Max. operating pressure:	30.0 MPa



Cross-Section and Nomenclature (ALK-50A)



▲ Optional drain and air escape valves can also be installed.

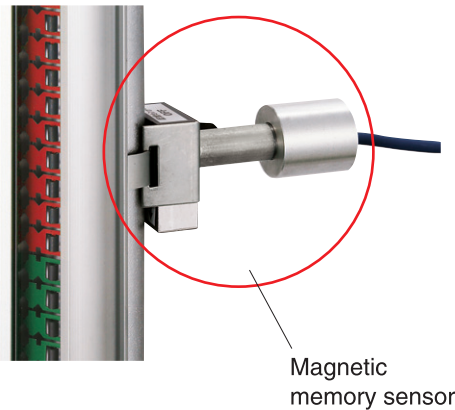
Optional Equipment

Optional Sensor Models		
	General Type	Explosion-Proof Type (Exd II BT4)
Memory sensor (Magnetic memory sensor)	ALK-MES	ALK-EXMES
Analog sensor (Output: 4 – 40 mA)	ALK-GY Visible length type	ALK-EXGY Visible length type

A GYHC controller is required if the length of the analog sensor exceeds 2 meters.
General types can meet intrinsic explosion-proof requirements.

Optional sensor installation example
Magnetic Memory Sensor (ALK-MES type)

Designed for use with magnetic level gauges, this sensor can function as a controller to stop overflow in a tank and enable an overflow alarm when set at the upper limit position, or a low level alarm when set to the lower limit position. (External alarm devices must be connected to sound an alarm tone.)



Level Keeper Specifications

Model	ALK-25A	ALK-50A	ALK-65A
Application	General use	For fluids of low specific gravity, high viscosity or corrosive properties	For high pressure applications
Stand Pipe	SUS304, SUS316, SUS316L	SUS304, SUS316, SUS316L FRP, PVC, Hastelloy	SUS304, SUS316, SUS316L
Float	Titan	SUS304, SUS316, SUS316L Titan, Hastelloy, PP, PFA	Titan
Indicator Width	20mm (aluminum rotor)	20mm (aluminum rotor)	20mm (aluminum rotor)
Pressure Range	2.0 MPa	8.0 MPa	30.0 MPa
Temperature Range	–50°C to +150°C	–50°C to +300°C	–50°C to +370°C
Applicable Viscosity	0 – approx. 500 cst (tomato juice and olive oil)	0 – approx. 1,500 cst (moderately thick sauce and syrup)	0 – approx. 1,500 cst (moderately thick sauce and syrup)
Applicable Liquid Specific Gravity	Over 0.8	Over 0.5	Over 0.5
Optional Equipment	Memory sensor Analog sensor	Stand pipe internally lined Memory sensor Analog sensor	

Features

- Automatic alarm and liquid level control circuitries can be installed more easily than conventional pulse signal sensors.
- No power reset required, even when a power failure occurs, since the condition is stored in memory.
- Reversing the mounting orientation reverses signal ON/OFF switching after the float has passed.

Max. switching capacity	10W (0.5A or less)
Operating voltage	AC/DC: 1 – 100V

Water/Liquid Level Gauges

Tubular Level Gauges

Tubular level gauges feature simple construction using a gauge glass tube. They include the valve-type KS10-N series and holder-type H-10 series. The cock-type ABS series is also available. To prevent gauge glass tube breakage, these gauges are standard-equipped with a protective metal tube.

Product Features

- Check balls are installed in the upper and lower valve assemblies to prevent tank fluid leakage if the gauge glass tube should break.
KS10-N series: both upper and lower valve assemblies
ABS series: lower valve assembly only
H-10 series: optional
- Three different types of gauge glasses are available: hard glass, Pyrex glass, and resin tube. Lined glass tubes (red/white) use liquid refraction to expand indication for increased visibility.
- Cock and valve lineups offer FCD450, SF440A, SUS304, SUS316, and SUS316L material construction.
- Flange connected models offer a selection of diameters.
- Tailpiece-type models available in 10A – 25A (except resin-made valve models).

Intermediate couplings are recommended for use if distance between mounting centers exceeds 1.8 meters.

H-10
The H-10 gauge holder features a simple design with an emphasis on cost competitiveness. If fitted with a flange-type root valve, the level gauge can be removed for maintenance even when fluid is left in the tank.

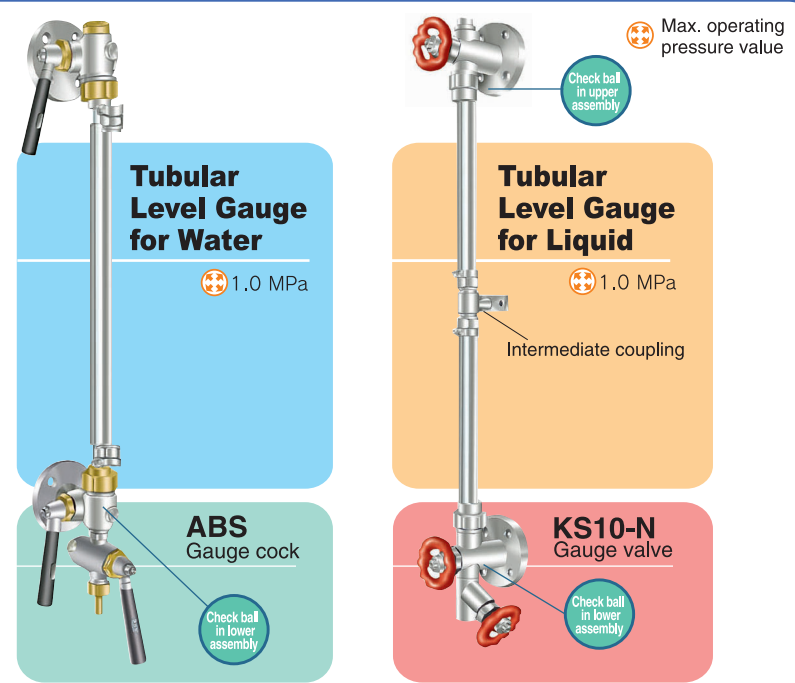
KS35
The Model KS35 is a wide liquid chamber type valve intended for use with 25mm diameter gauge glasses, and is frequently used when the fluid viscosity is high or when the fluid level is unstable.

Special Fluids
Valves made of such resin as PVC or back-coated valves (KS-Z) are also available for special fluids that steel materials cannot support.

Usage Guidelines

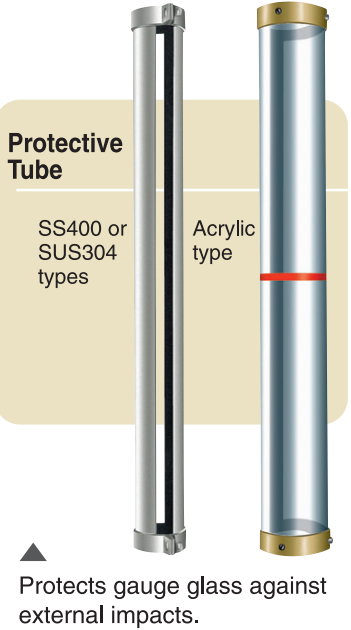
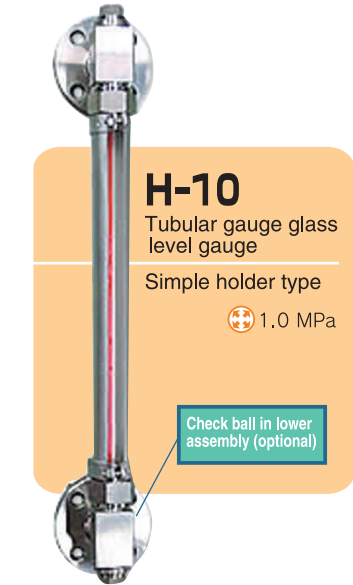
Max. operating pressure: Under 1.0MPa

Note: Please contact your Sawada dealer with the maximum temperature and type of fluid for which the gauge is to be used.

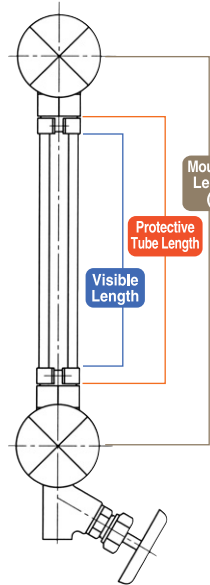


Cost Effective!!

This level gauge is developed to be as simple as possible while ensuring safety.



Dimensions



In the table below, “L” refers to the mounting length of the figure at left. Assuming that L = 500mm, if the gauge glass tube length is “L - 55mm,” then its actual length is 445mm (500 - 55 = 445).

Model	ABS	KS10-N	H-10	KS10-NV	PP-19 PV-19	KS-35	KS-Z
Gauge Glass Tube Length	L-30mm	L-55mm	L-55mm	L-65mm	L-80mm	L-30mm	L-100mm
Protective Tube Length	L-110mm	L-120mm	L-120mm	L-120mm	L-150mm	L-110mm	L-170mm
Visible Length	L-140mm	L-150mm	L-150mm	L-150mm	L-180mm	L-140mm	L-200mm

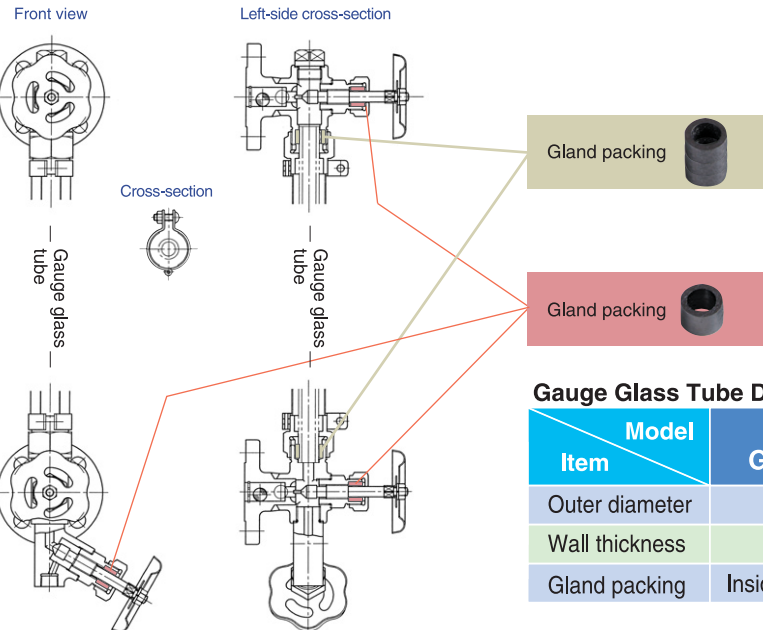
Valve (Cock) Models and Materials Table

Model	Gauge Glass Tube Outside Diameter	Gauge Material					Mounting Method
		SF	SUS	FCD	CAC	PP/PVC	
ABS	φ 19	○	○	○	○	—	Flange or screw-in
KS10-N	φ 19	○	○	—	○	—	Flange or screw-in
H-10	φ 19	S25C	○	—	—	—	Flange or screw-in
KS10-NV	φ 19	○	○	—	○	—	Flange or screw-in
PP-19/PV-19	φ 19	—	—	—	—	○	Flange
KS-Z	φ19 & φ25	○	—	—	—	—	Flange
KS35	φ 25	○	○	—	—	—	Flange

Replacement Parts

Refer to the following diagram to confirm replacement parts.

Tubular Level Gauge
KS10-N Gauge Valve (with protective tube)



Gauge Glass Tube Dimensions

Model	KS10-N Gauge Valve	KS35 Gauge Valve
Item		
Outer diameter	φ 19	φ 25
Wall thickness	3t	3t
Gland packing	Inside diameter: φ 19	Inside diameter: φ 25

Tubular
Water & Liquid level gauge

Water Level Gauges

K-Series Reflex-Type Level Gauges

Models
K and K2

Low- and Medium
Pressure Type

Unlike U-series gauges, K-series reflex-type level gauges feature simplified construction with centerpieces secured by rear-mounted bolts for maximum ease of maintenance or repair. K-series gauges are used widely with general-use, low-pressure boilers.

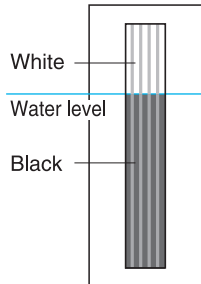
Product Features

- Periodic gauge glass replacement easily performed by simply loosening the rear-mounted tap bolts and sliding out the back cover.
- 3mm wider viewing range width than U-series gauges.
- Freely variable gauge viewing orientation.

Note: Orientation of mounted cocks and valves cannot be changed, however drain valve handle orientation can be changed.

Water Level Viewing

Light reflected in the grooves cut into the back of the gauge glass cause the water portion to be seen in black and the steam portion in white. Although simple in construction, K-series gauges provide a clear indication of water level.



Usage Guidelines

K2

- Max. operating pressure: 1.6 MPa
- Max. operating temperature: 200°C (see saturated steam pressure table on page 6.)

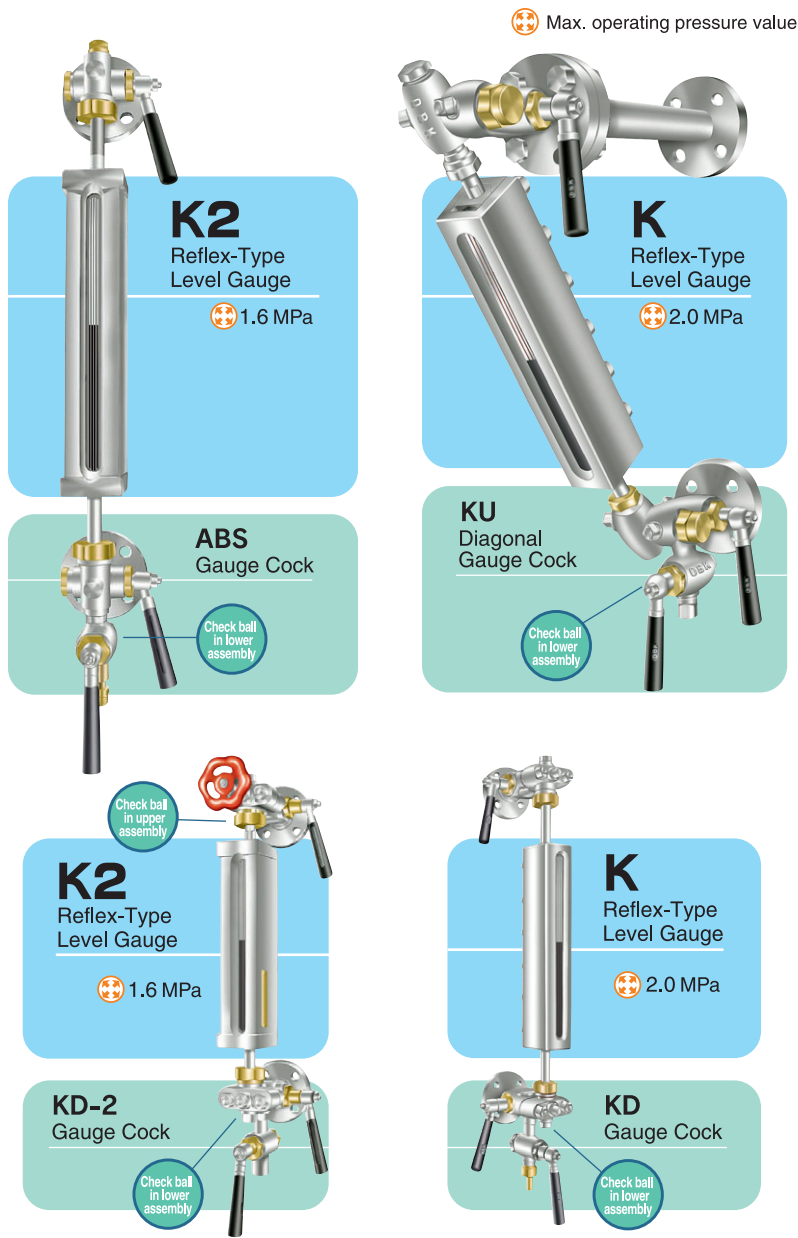
K

- Max. operating pressure: 2.0 MPa
- Max. operating temperature: 210°C (see saturated steam pressure table on page 6.)

Frequently-used upper and lower cock and valve types

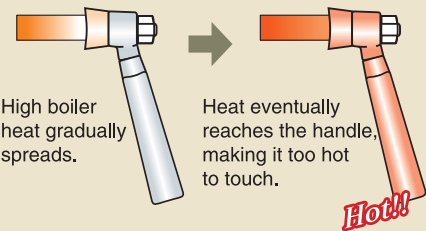
K2 and K

- Cock: ABS, KD, KD-2, KU

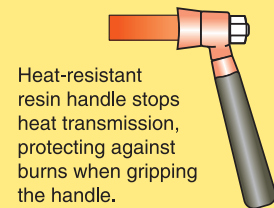


Sawada's Unique Gauge Cock Handle Construction

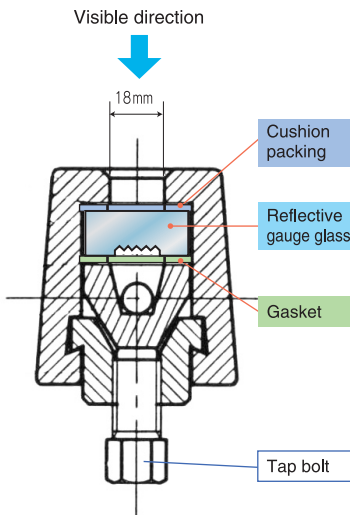
Other makers' handles



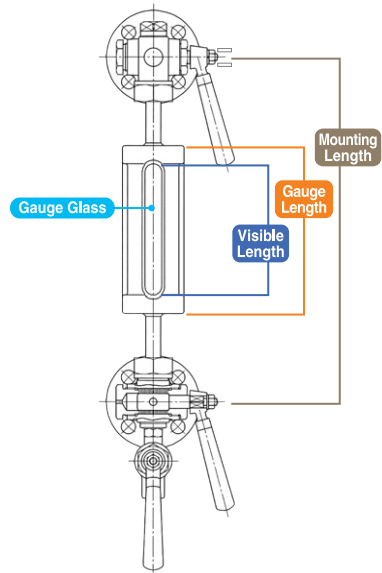
Sawada handles



Cross-Section



K and K2 Gauge Dimensions



Unit: mm

Gauge Glass No.	Length	Visible Length	Gauge Length	Mounting Length	
				ABS-type	KD / KD 2
1	115	95	130	300	270
2	140	120	155	320	300
3	165	141	180	350	320
4	190	166	205	370	350
5	220	196	235	400	370
6	250	226	265	430	400
7	280	256	295	460	430
8	320	296	335	500	470
9	340	316	355	520	500

Note: • Model K2 available for Nos. 3 – 9.
• Gauge glass dimensions conform with Japanese JIS B8211 safety standards.



Note that the gauge glass is susceptible to erosion by steam and water, and thus requires periodic maintenance.

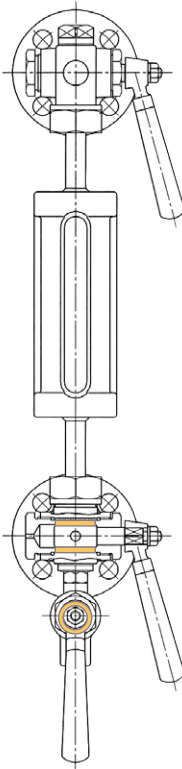
Replacement Parts

Refer to the following diagram to confirm replacement parts.

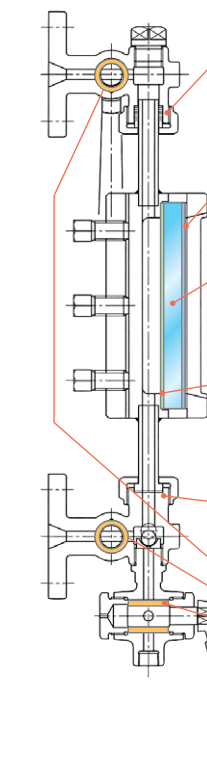
K2 Reflex-type Level Gauge

ABS Gauge Cock

Front view



Left side cross-sectional view



Gland packing

Cushion packing

Gauge glass

Gasket

Copper packing

Sleeve packing

Gauge Glass Dimensions

Unit: mm

No.	Length	JIS No.	Width & Thickness
1	115	—	34mm (W) x 17mm (T)
2	140	—	
3	165	B-165	
4	190	B-190	
5	220	B-220	
6	250	B-250	
7	280	B-280	
8	320	B-320	
9	340	B-340	



Refer to pages 41 and 42 for other parts.

Water/Liquid Level Gauges

U-Series
Reflex-Type Level Gauges

Models
UZ and U-20

Low- and Medium
Pressure Type

Also functions as
a liquid level gauge.

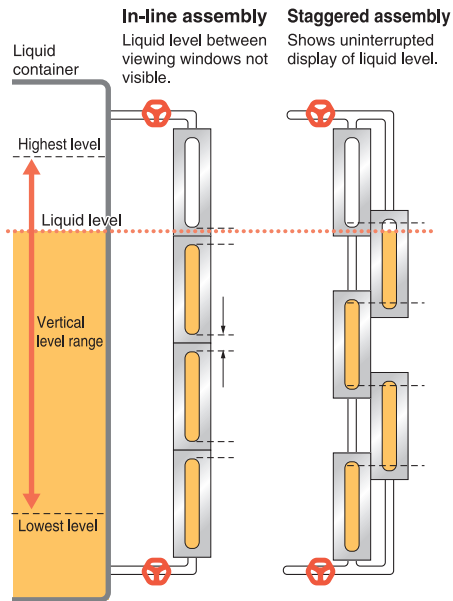
U-series level gauges are general-purpose gauges widely used with low-pressure tanks and boilers. The gauge's interior seal can be kept airtight by tightening the U-bolts holding center piece.

Product Features

- Like K-series gauges, the prismatic reflection of the grooves in the back surface of the gauge glass shows the liquid portion in black and the gas portion in white (only when the liquid is transparent). These level gauges are widely used for low-pressure boilers and other facilities.
- If a longer viewing area is required, multiple U-series gauges can be vertically connected in either in-line or staggered configurations (see illustration below).
- Body material can be selected to match intended use.
Example: S25C, SF440A, SUS304, SUS316, SUS316L
Note: Vacuum applications also supported.
- The level gauge's viewing orientation can be freely adjusted.
Note: Orientation of mounted cocks and valves cannot be changed, however drain valve handle orientation can be changed.

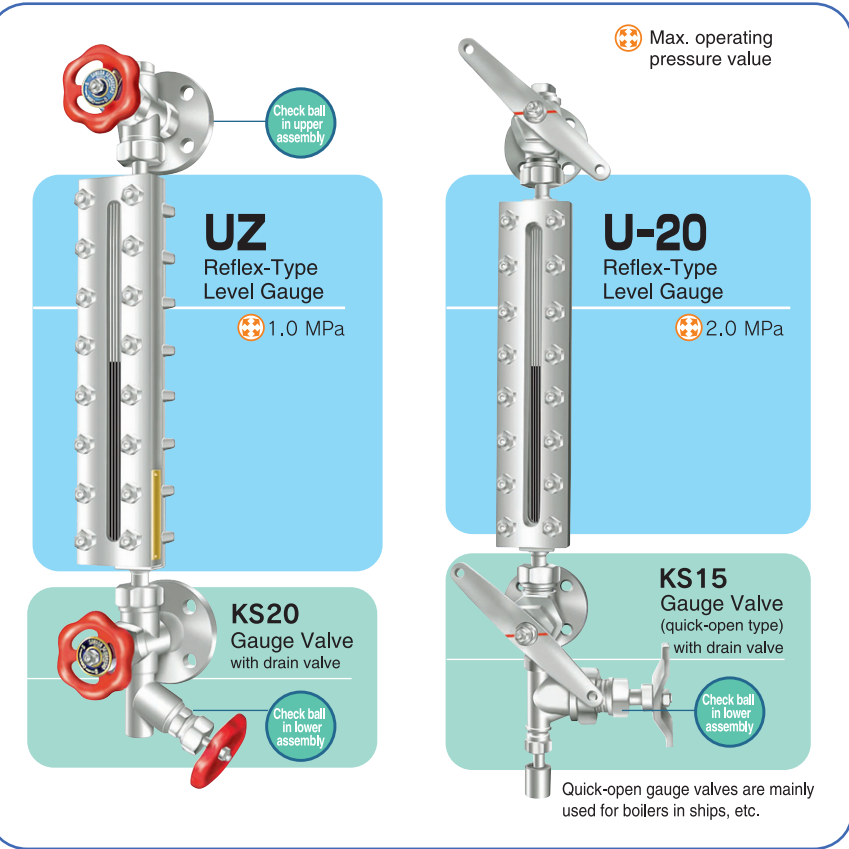
Assembly Configurations

When the liquid level in a boiler or tank fluctuates over an extended range and the viewing window of a single liquid level gauge is not long enough to cover the entire range, multiple gauges can be connected as shown below for complete range coverage.
When connecting several gauges in a staggered configuration, the units are fixed using supporting hardware.



Note: These are conceptual drawings, so valve positions differ from actual layout.

Please see pages 27 and 28 for dimensional table.



Usage Guidelines

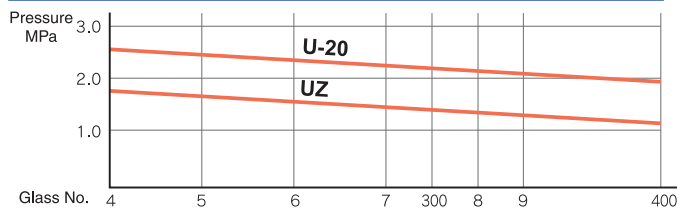
UZ	U-20
Max. operating pressure: 1.0 MPa	Max. operating pressure: 2.0 MPa

Note: These guidelines are based on the pressure. When the temperature condition is especially different, please consult your Sawada dealer.

Frequently-used upper and lower cock and valve types

For water level gauge		* Please see the combination table.	For liquid level gauge	
UZ and U-20			UZ and U-20	
Cock	ABS, KD, KD-2, KU		Valve	KS20, KS20-V
Valve	KS20		Staggered assembly	
Quick-open valve	KS10, (Quick open/shut-type) KS15 (Quick open/shut-type)		Valve	KS20-W, KS20-WV

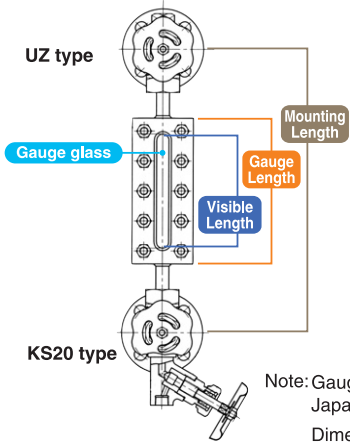
Pressure Rating



UZ and U-20 Gauge Dimensions

Unit: mm

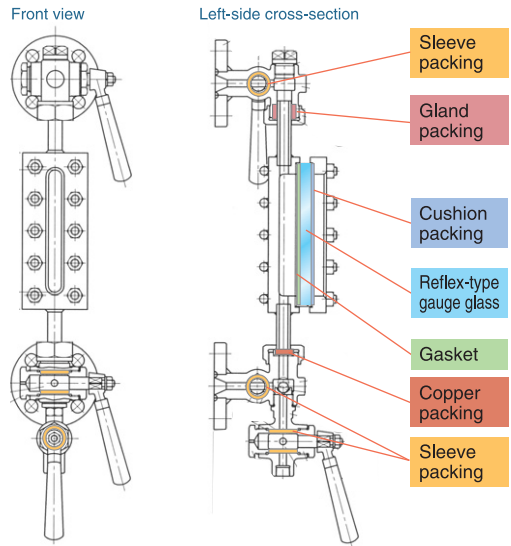
Gauge Glass		UZ-type			U-20-type		
No.	Length	Visible	Gauge	Mounting	Visible	Gauge	Mounting
0	90	70	105	270	70	125	290
1	115	95	130	295	95	150	315
2	140	120	155	320	120	175	340
3	165	141	180	345	141	200	365
4	190	166	205	370	166	225	390
5	220	196	235	400	196	255	420
6	250	226	265	430	226	285	450
7	280	256	295	460	256	315	480
300	300	276	315	480	276	335	500
8	320	296	335	500	296	355	520
9	340	316	355	520	316	375	540
400	400	376	415	580	376	435	600



Replacement Parts

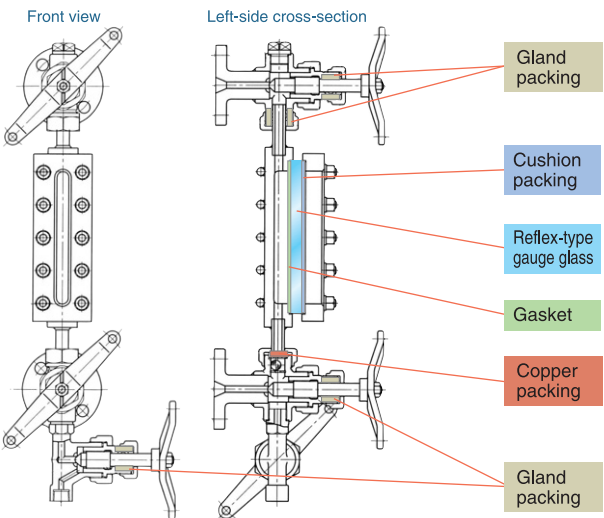
UZ Reflex-type Level Gauge

ABS Gauge Cock (Check ball in lower assembly)



U-20 Reflex-type Level Gauge

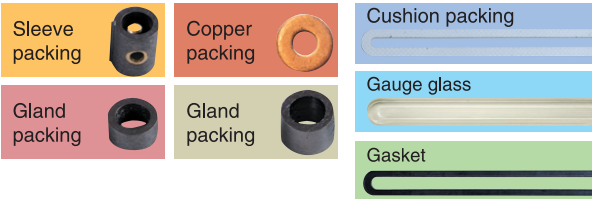
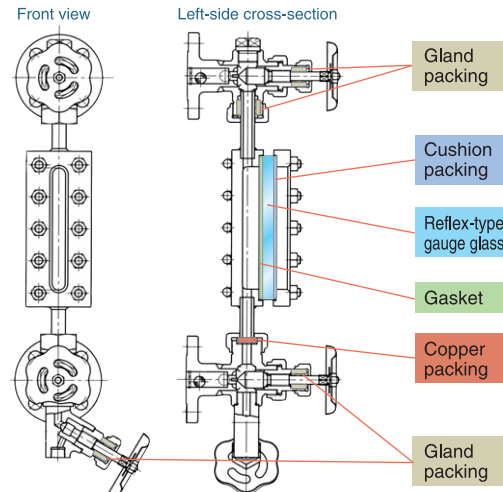
KS15 Gauge Valve (Check ball in lower assembly)



Refer to pages 41 and 42 for other parts.

UZ Reflex-type Level Gauge

KS-20 Gauge Valve (Check ball in lower and upper assemblies)



Gauge Glass Dimensions

Unit: mm

No.	Length	JIS No.	Width & Thickness
0	90	—	34mm (W) x 17mm (T)
1	115	—	
2	140	—	
3	165	B-165	
4	190	B-190	
5	220	B-220	
6	250	B-250	
7	280	B-260	
300	300	—	
8	320	B-320	
9	340	B-340	
400	400	—	

Water &
Liquid
level
gauge

Reflex
U Series

Water/Liquid Level Gauges

Transparent Type Level Gauges (Medium-Pressure Type)

Models
T-10, T-20, TVB, TVC and TVD

Low- and Medium Pressure Type

Also functions as a liquid level gauge.

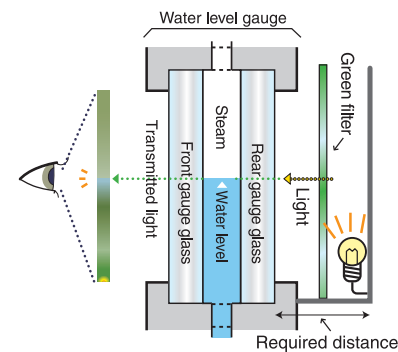
Transparent-type water level gauges feature a hollow structure that sandwiches the liquid chamber between two plates of gauge glass, thus permitting the water level to be directly monitored through the gauge glasses. This type of level gauge is used on many low- and medium-pressure boilers.

Product Features

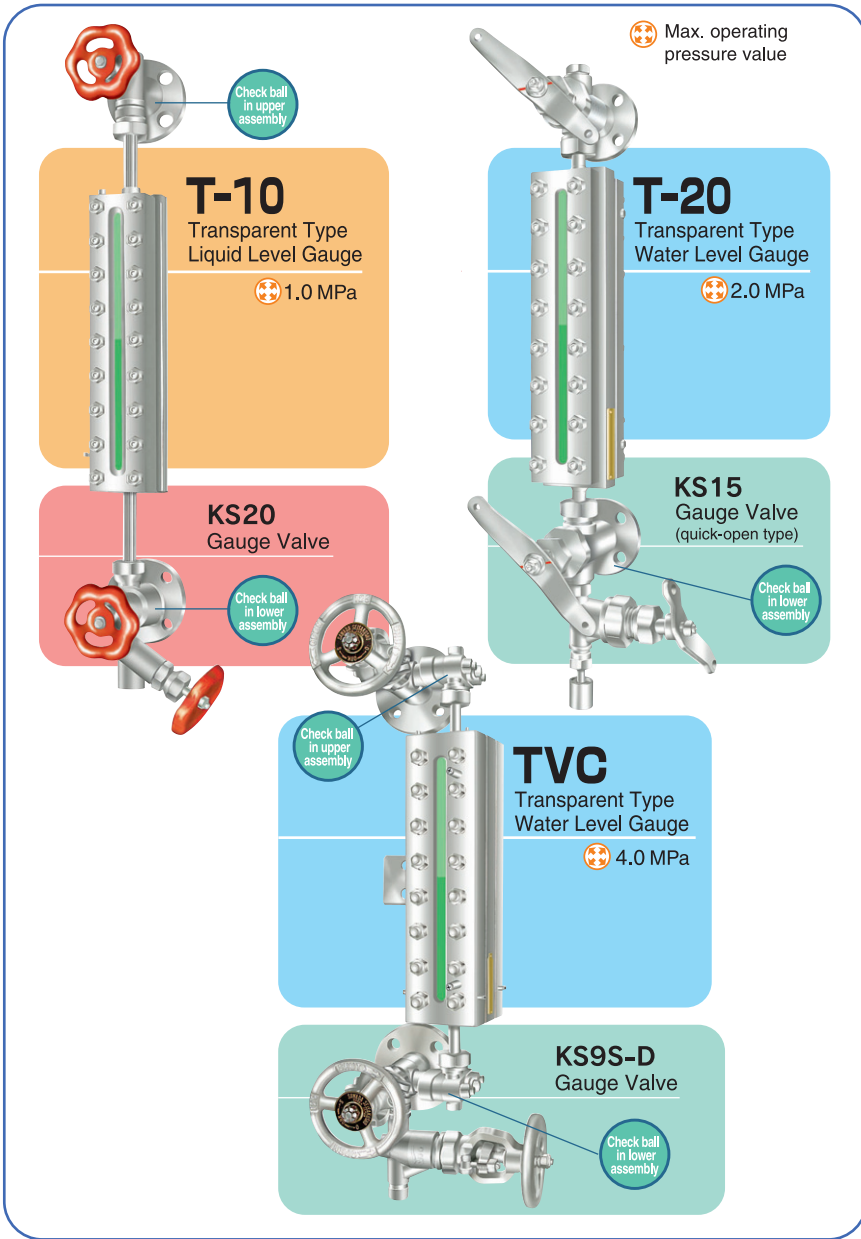
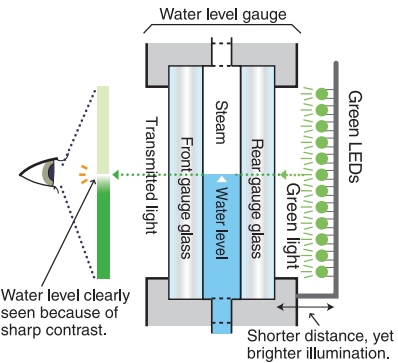
- Protective mica plates are used in water level gauges for boilers, but other liquid level gauges do not normally use them (in some cases mica plates are used depending on gauge usage conditions).
- Anti-corrosion mica plates are usually installed on the inside of each gauge glass to prevent corrosion by steam or water.
- Body material can be selected to match intended use.
Example: S25C, SF440A, SUS304, SUS316, SUS316L
*Parts also available for vacuum applications.
- If a longer viewing area is required, multiple gauges can be vertically connected in either in-line or staggered configurations.
- The level gauge's viewing orientation can be freely adjusted.
Note: Orientation of mounted cocks and valves cannot be changed, however drain valve handle orientation can be changed.
- When a fluid is transparent and colorless, the use of a lighting device equipped with a filter illuminates the entire viewing window in green with the water line visible in white.

Water Level Viewing

Bulb illumination



LED illumination



Frequently-used upper and lower cock and valve types

For Water Level Gauge

T-10 and T-20		
Cock	KD, KD-2, KU	
Valve	KS20	
Quick-open valve	KS15 (Quick open/shut-type)	
TVB		
Valve	KS20	
Valve	KS9S	

TVC and TVD

Valve KS9S

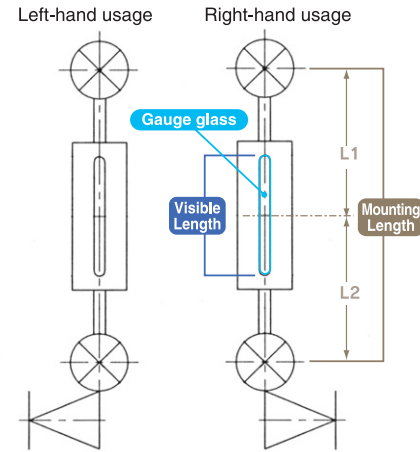
For Liquid Level Gauge

T-10 and T-20		
Valve	KS20, KS20-V	
Staggered assembly		
Valve	KS20-W, KS20-WV	

Usage Guidelines

T-10	
Max. operating pressure:	1.0 MPa
T-20	
Max. operating pressure:	2.0 MPa
TVB	
Max. operating pressure:	3.0 MPa
TVC	
Max. operating pressure:	4.0 MPa
TVD	
Max. operating pressure:	5.0 MPa

T-10 and T-20 Gauge Dimensions

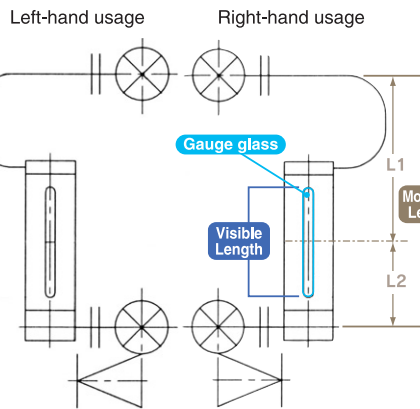
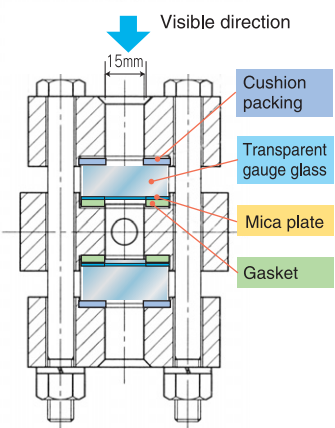


Water gauge orientation: Freely variable

Glass No.	Standard Mounting Length (mm)			
	Visible	Mounting	L1	L2
6	226	500	250	250
7	256	530	265	265
8	296	570	285	285
9	316	600	300	300

Note: Gauge glass dimensions conform with Japanese JIS B8211 safety standards.

Cross-Section T-20



Water gauge orientation: Front

Glass No.	Standard Mounting Length (mm)			
	Visible	Mounting	L1	L2
6	226	550	375	175
7	256	580	390	190
8	296	620	410	210
9	316	650	425	225

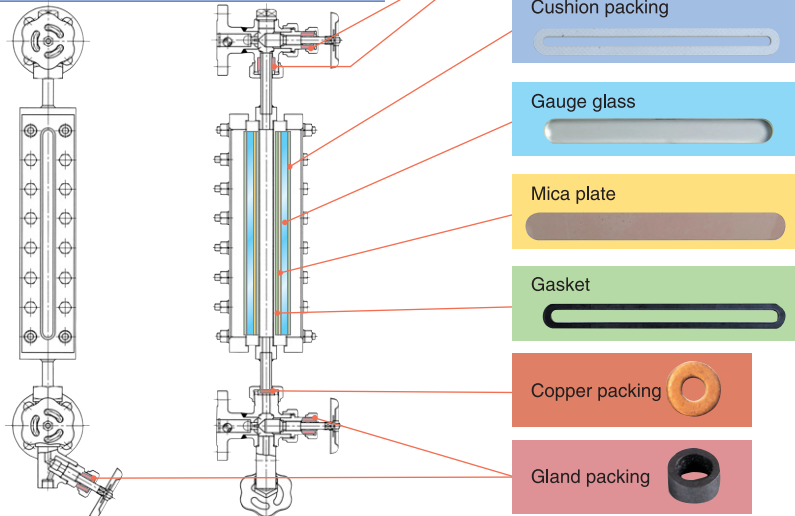
Note: Gauge glass dimensions conform with Japanese JIS B8211 safety standards.

Please see pages 27 and 28 for in-line and staggered assembly configurations.

Replacement Parts

Refer to the following diagram to confirm replacement parts.

T-20 Transparent-type Water Gauge Low- and medium-pressure type
KS-20 Gauge Valve
(Check ball in lower and upper assemblies)



Gauge Glass Dimensions

No.	Length	JIS No.	Width & Thickness
6	250	PA250	34mm (W) x 17mm (T)
7	280	PA280	
8	320	PA320	
9	340	PA340	

Unit: mm

Refer to pages 41 and 42 for other parts.

Water Level Gauges

Transparent Type Water Level Gauges (High-pressure type)

Models
TVD-HL

High
Pressure Type

The TVD-HL is our highest grade transparent-type water level gauge, and its stable performance has earned it high popularity. A large number of TVD-HL level gauges have been employed in the main boilers of sea vessels and power plant turbines as water level gauges for feed water heaters.

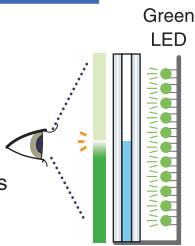
Product Features

- Gauge glasses are firmly held by their front and rear covers. The gauge is constructed so that tightening forces are not applied directly to the gauge glasses and the reduced load in even high-temperature, high-pressure conditions minimizes the risk of gauge glass breakage.
- In addition, special graphite gaskets are used for sealing to more effectively prevent gauge glass breakage and leakage.
- Like low-pressure gauges, the TVD-HL also features an anti-corrosion mica plate installed on the inside surface of each gauge glass to protect it against corrosion due to steam or water.
- If longer viewing areas are required, the TVD-HL can easily meet such requirements by connecting several units in a staggered configuration.

LED lighting recommended for ship applications

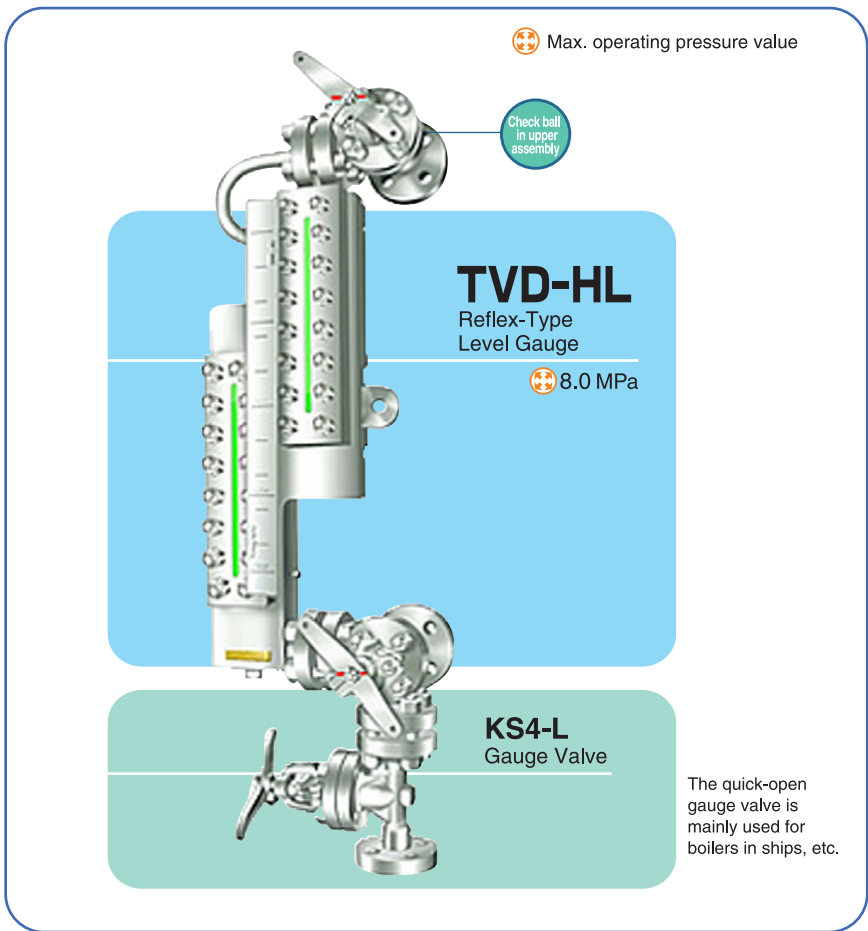
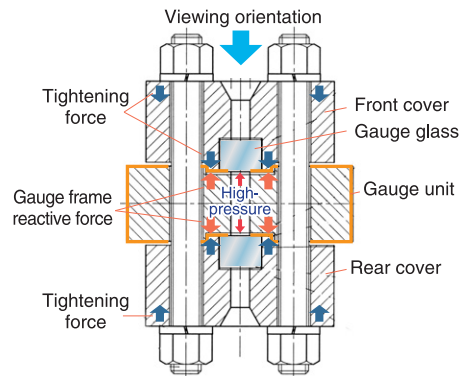
The TVD-HL is identical to our low- and medium-pressure type transparent water level gauges in viewing.
*Please see page 15

Our LED illuminator offers longer service life and higher energy savings than conventional light bulbs. The LED illuminator system will certainly become mainstream in sea vessel applications in the future, as it eliminates the chance of lightbulb failure due to ship vibration.



Gauge Glass Protection

Assembly bolt tightening forces are absorbed by the front and rear covers and the gauge frame itself. As a result, gauge glasses are more securely fixed, but protected against breakage caused by tightening forces.



Usage Guidelines

TVD-HL

Max. operating pressure: 8.0 MPa

Max. operating temperature: 300°C
(see the saturated steam pressure table on page 6.)

Usage conditions can differ greatly depending on visible distance, etc. Please contact your Sawada dealer for more information.

Frequently-used upper and lower cock and valve types

TVD-HL

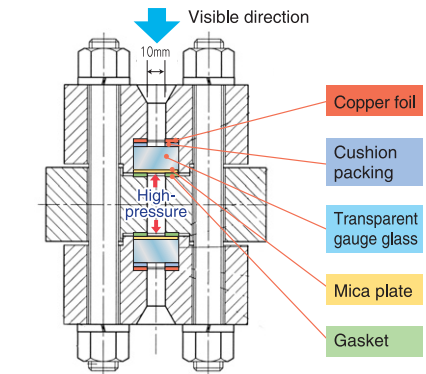
Quick-open valve

Valve

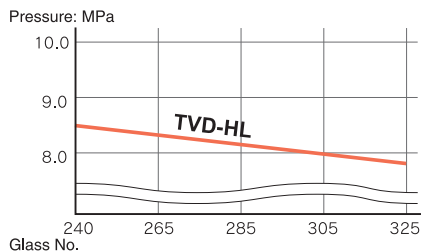
KS4-L

KS4-L

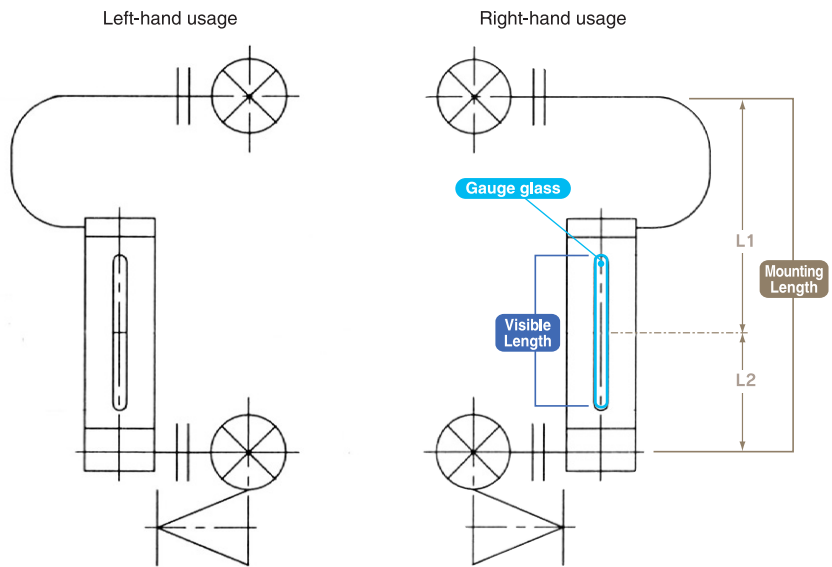
Cross-Section TVD-HL



Pressure Rating



TVD-HL Gauge Dimensions



Water gauge orientation: Front

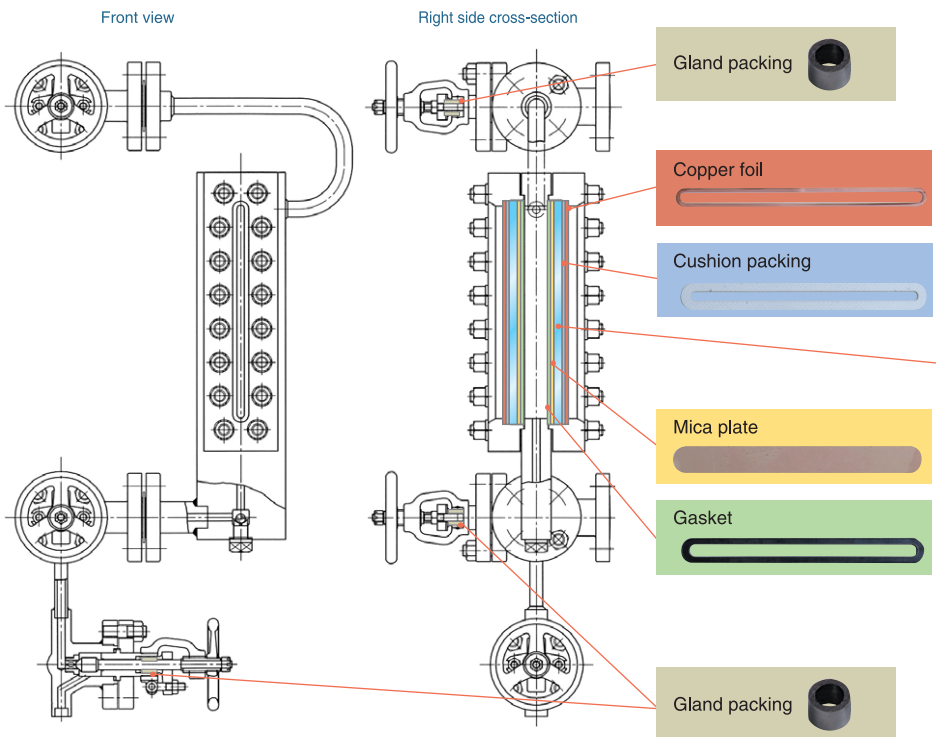
Glass No.	Standard Mounting Length (mm)			
	Visible	Mounting	L1	L2
240	225	550	375	175
265	250	580	390	190
285	270	600	400	200
305	290	620	410	210
325	310	650	430	220

Note: Gauge glass dimensions conform with Japanese JIS B8211 safety standards.

Replacement Parts

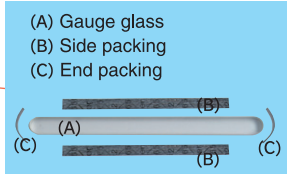
Refer to the following diagram to confirm replacement parts.

TVD-HL Transparent-type Water Gauge
High-pressure type (check ball in lower assembly)
KS4-L Gauge Valve (check ball in upper assembly)



Gauge Glass Dimensions Unit: mm

No.	Length	JIS No.	Width & Thickness
240	240	—	22mm (W) x 17mm (T)
265	265	PB265	
285	285	—	
305	305	PB305	
325	325	PB325	



Rear illuminator for transparent type

Light bulb type

Note: LED illuminator also available. Please consult your Sawada dealer.

Refer to pages 41 and 42 for other parts.

Water Level Gauges

Bicolor Water Gauges (Low- and Medium-Pressure Type)

Models
RGB and RGC

Low- and Medium-
Pressure Type

Both the RGB and RGC gauges are identical to transparent types in basic component configuration. Because they use the refraction of light to indicate the water level in two different colors, two internal gauge glasses are arranged to form an angle relative to each other. The parallelogram-shaped cross-section of the gauge area makes it unnecessary to form an angle on the water gauge itself.

Product Features

- Used widely domestically and abroad as a standard water gauge for low-and medium-pressure boilers.
- Since both the RGB and RGC models indicate the water level in two colors, unlike other water gauge types, an illuminator must be mounted at the back of the gauge.
- Since the illuminator separately indicates the steam portion in red and the water portion in blue, the water level can be confirmed with extreme clarity, even from remote locations.
- Ideal for remote monitoring since the water level can be seen clearly on a color monitor.
- The two-color separation is produced by the principle of optical refraction, allowing the correct water level to be constantly indicated even for instantaneous fluctuations in water level.
- The latest LED illuminator mounted at the back of the gauge features a longer life span and higher energy-saving efficiency compared to conventional light bulbs. With no light bulb to burn out, it eliminates the need for troublesome light bulb replacement. In addition, since the LED illuminator lights in red and blue without the use of filters, the water level can be seen more clearly than with a standard white light bulb using red and blue filters.

Usage Guidelines

RGB

- Max. operating pressure: 2.0 MPa
- Max. operating temperature: 210°C (see the saturated steam pressure table on page 6.)

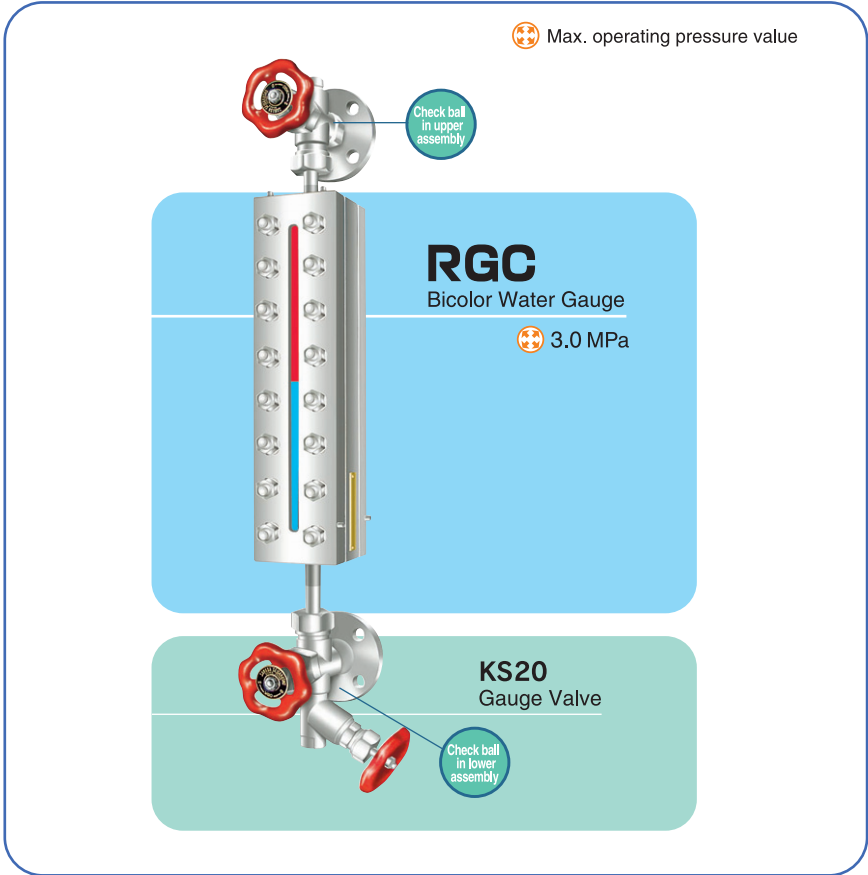
RGC

- Max. operating pressure: 3.0 MPa
- Max. operating temperature: 240°C (see the saturated steam pressure table on page 6.)

Frequently-used upper and lower cock and valve types

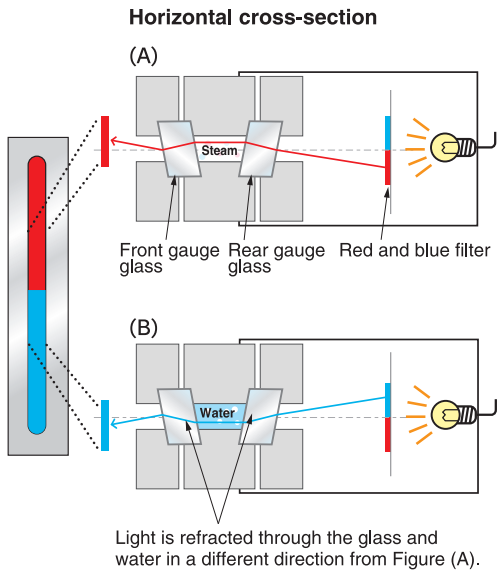
RGB and RGC

- Cock **KD, KD-2**
- Valve **KS20** Valve **KS9S**

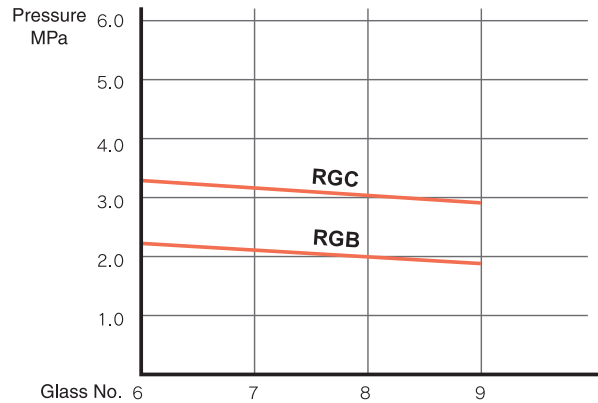


How the water level indicator works

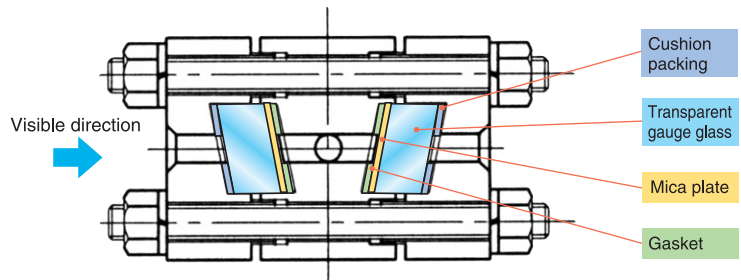
When light passes through different transparent materials, it is refracted at the surfaces before it travels further. However, the refractive index differs depending on the composition of the material's surface. When only air or steam separates the gauge glasses, the red portion is seen. When water fills the space between the glasses, refraction between the glass and water is small and the light travels straight, allowing the blue-filtered light to be seen. Thus, the two gauge glasses are arranged to form an angle with respect to each other in order to increase the prismatic effect of the light.



Pressure Rating



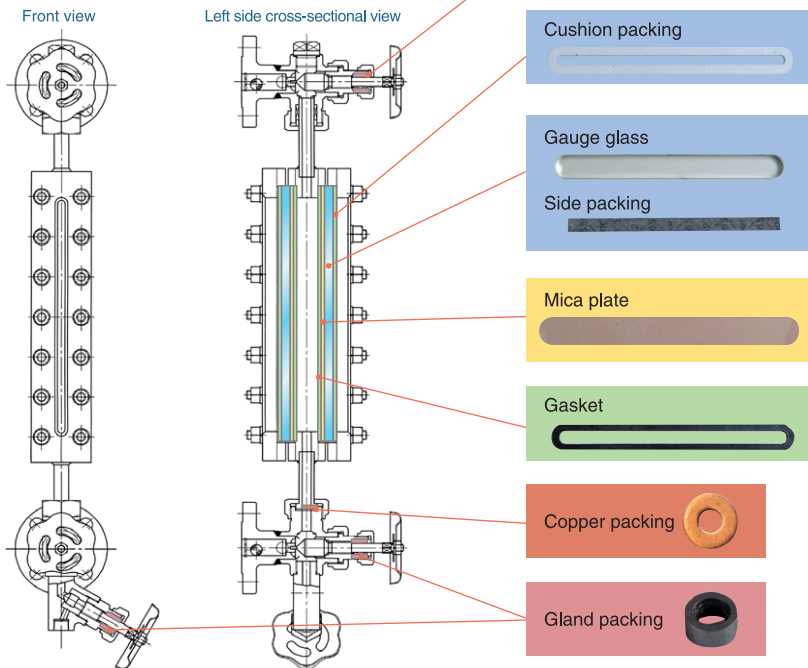
Cross-Section RGB



Replacement Parts

Refer to the following diagram to confirm replacement parts.

RGB Bicolor Water Gauge
Low- and medium-pressure type
KS20 Gauge Valve
(check ball in upper and lower assemblies)



Gauge Glass Dimensions

Unit: mm

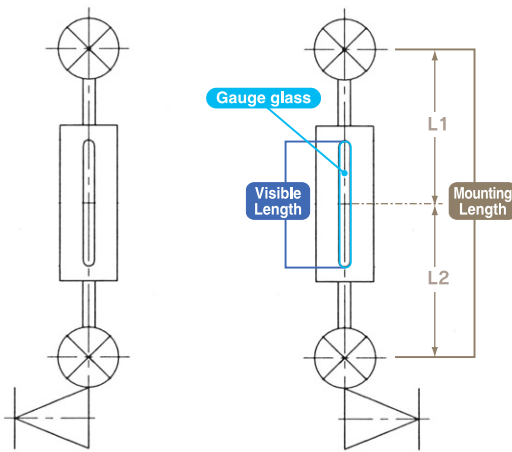
No.	Length	Width x Thickness
6Pc	250	25mm (W) x 17mm (T)
7Pc	280	
8Pc	320	
9Pc	340	

Refer to pages 41 and 42 for other parts.

RGB and RGC Gauge Dimensions

Left-hand usage

Right-hand usage



Water gauge orientation: Freely variable

Glass No.	Standard Mounting Length (mm)			
	Visible	Mounting	L1	L2
6Pc	226	500	250	250
7Pc	256	530	265	265
8Pc	296	570	285	285
9Pc	316	600	300	300

Note: Gauge glass dimensions conform with Japanese JIS B8211 safety standards.

Water & Liquid level gauge

Bicolor Low- and Medium-Pressure Type

Water Level Gauges

Bicolor Water Gauges
(Medium-Pressure Type)

Models
RGC-2 and RGD

Medium
Pressure Type

Product Features

- Used widely domestically and abroad as a standard water gauge for medium-pressure boilers.
- Since both the RGC-2 and RGD models indicate the water level in two colors, unlike other water gauge types, an illuminator must be mounted at the back of the gauge.
- Since the illuminator separately indicates the steam portion in red and the water portion in blue, the water level can be confirmed with extreme clarity, even from remote locations.
- Ideal for remote monitoring since the water level can be seen clearly on a color monitor.
- The two-color separation is produced by the principle of optical refraction, allowing the correct water level to be constantly indicated even for instantaneous fluctuations in water level.
- The latest LED illuminator mounted at the back of the gauge features a longer life span and higher energy-saving efficiency compared to conventional light bulbs. With no light bulb to burn out, it eliminates the need for troublesome light bulb replacement. In addition, since the LED illuminator lights in red and blue without the use of filters, the water level can be seen more clearly than with a standard white light bulb using red and blue filters.

Usage Guidelines

RGC-2	
Max. operating pressure:	4.0 MPa
Max. operating temperature:	250°C
(see the saturated steam pressure table on page 6.)	
RGD	
Max. operating pressure:	5.0 MPa
Max. operating temperature:	260°C
(see the saturated steam pressure table on page 6.)	

Frequently-used upper and lower cock and valve types

RGC-2 and RGD	
Valve	KS9S

The RGC-2 and RGD gauges are identical to transparent types in basic component configuration with the exception that their two internal gauge glasses are arranged to form an angle relative to each other to allow the utilization of light refraction. Both models feature angled body structure in contrast to the RGB and RGC models which use parallelogram-shaped gauge glasses.

Max. operating pressure value

Check ball in upper assembly

RGC-2
Bicolor Water Gauge

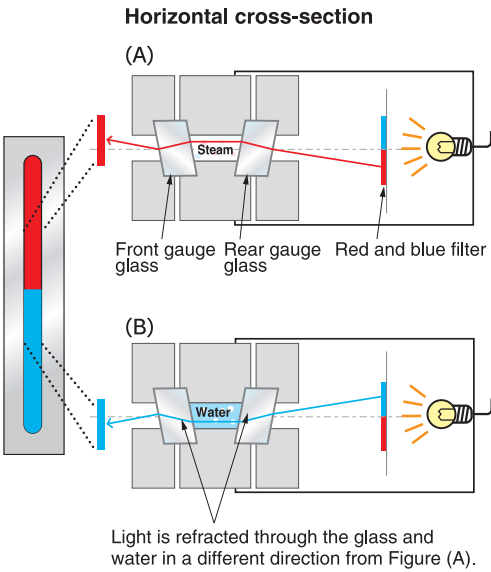
4.0 MPa

KS9S
Gauge Valve

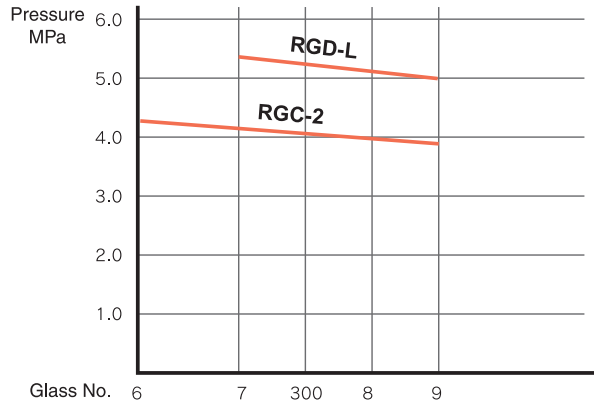
Check ball in lower assembly

How the water level indicator works

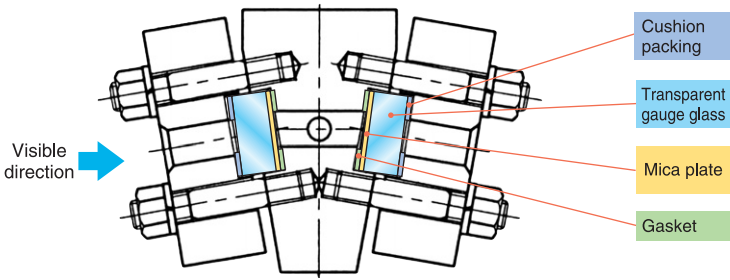
When light passes through different transparent materials, it is refracted at the surfaces before it travels further. However, the refractive index differs depending on the composition of the material's surface. When only air or steam separates the gauge glasses, the red portion is seen. When water fills the space between the glasses, refraction between the glass and water is small and the light travels straight, allowing the blue-filtered light to be seen. Thus, the two gauge glasses are arranged to form an angle with respect to each other in order to increase the prismatic effect of the light.



Pressure Rating



Cross-Section RGC-2

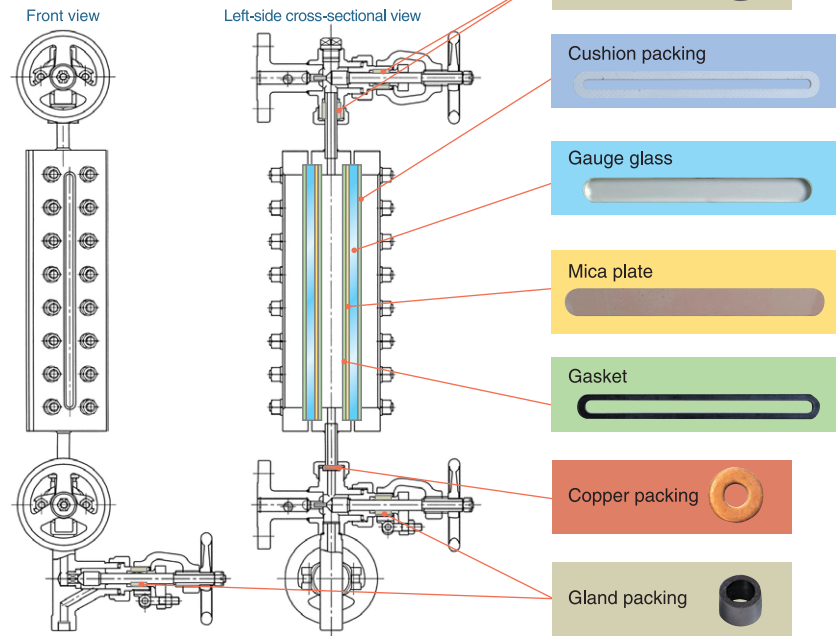


Replacement Parts

Refer to the following diagram to confirm replacement parts.

RGC-2 Bicolor Water Gauge
Medium-pressure type

KS9S Gauge Valve
(check ball in upper and lower assemblies)

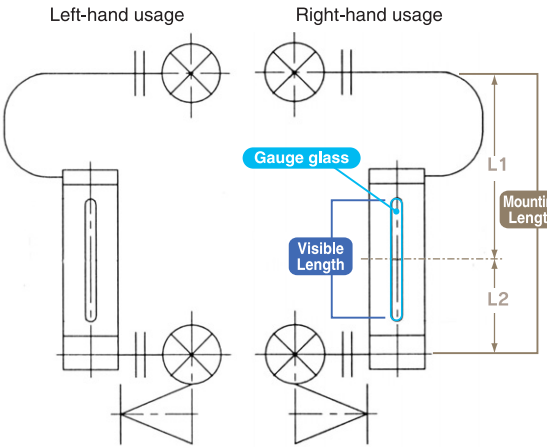


Gauge Glass Dimensions

No.	Length	JIS No.	Width & Thickness
6	250	PA250	34mm (W) x 17mm (T)
7	280	PA280	
300	300	—	
8	320	PA320	
9	340	PA340	

Refer to pages 41 and 42 for other parts.

RGC-2 and RGD-L Gauge Dimensions



Water gauge orientation: Front

Glass No.	Standard Mounting Length (mm)			
	Visible	L1	L2	Mounting
6	226	375	175	550
7	256	390	190	580
300	276	400	200	600
8	296	410	210	620
9	316	425	225	650

Note: Gauge glass dimensions conform with Japanese JIS B8211 safety standards.

Water Level Gauges

Bicolor Water Gauges
(High-pressure type)

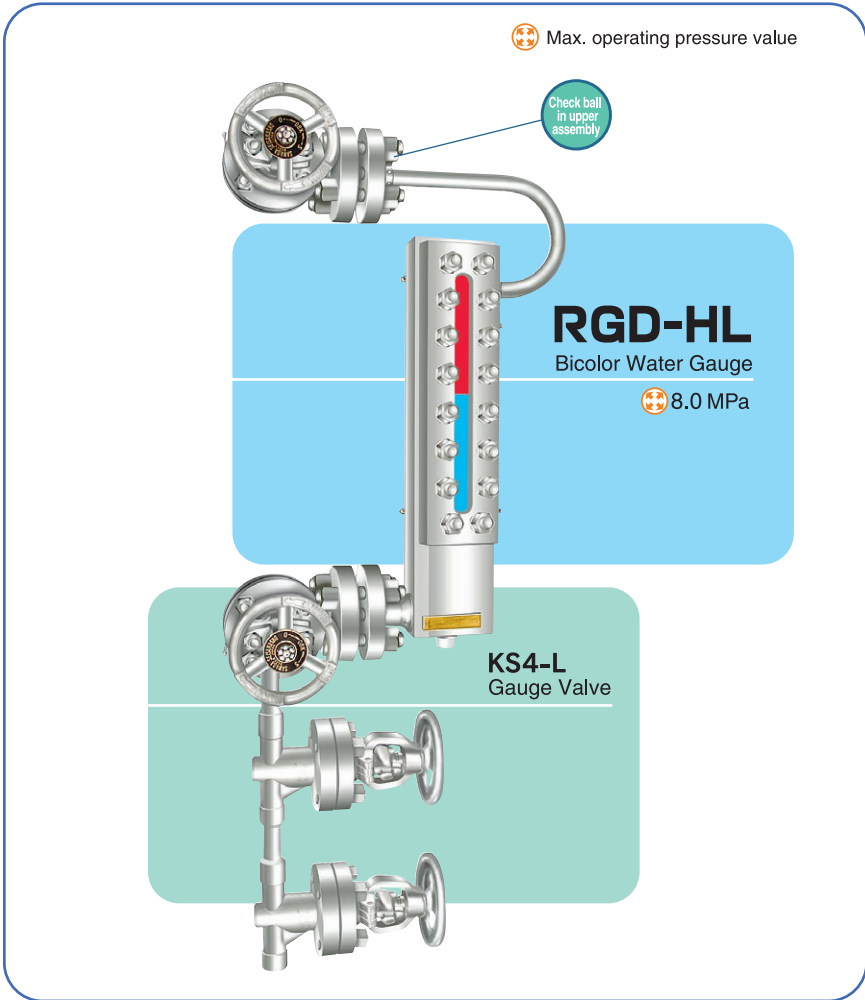
Model
RGD-HL

High
Pressure Type

The RGD-HL water gauge is identical to transparent types in basic component configuration with the exception that its two internal gauge glasses are arranged to form an angle relative to each other to allow the utilization of light refraction. A large number of RGD-HL gauges are used in boilers for independent electrical power generation.

Product Features

- Only internal pressure is applied to the gauge glass, with no external tightening pressure applied.
- Since the cover and body only clamp the gasket, the gauge can be easily tightened and hermetically sealed.
- The above features significantly reduce the risk of damage to the gauge glass, minimizing the need for maintenance and repairs.
- Since the illuminator separately indicates the steam portion in red and the water portion in blue, the water level can be confirmed with extreme clarity, even from remote locations, making it ideal for remote monitoring on a color monitor.
- The latest LED illuminator mounted at the back of the gauge features a longer life span and higher energy-saving efficiency compared to conventional light bulbs. With no light bulb to burn out, it eliminates the need for troublesome light bulb replacement. In addition, since the LED illuminator lights in red and blue without the use of filters, the water level can be seen more clearly than with a standard white light bulb using red and blue filters.



Usage Guidelines

RGD-HL

Max. operating pressure: 8.0 MPa

Max. operating temperature: 300°C
(see the saturated steam pressure table on page 6.)

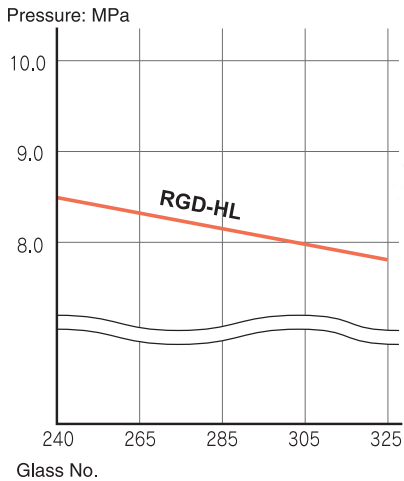
Note: Usage conditions can differ greatly depending on visible distance, etc. Please contact your Sawada dealer for more information.

Frequently-used upper and lower cock and valve types

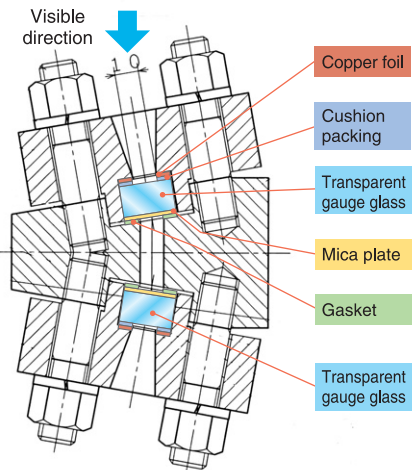
RGD-HL

Valve KS4-L

Pressure Rating

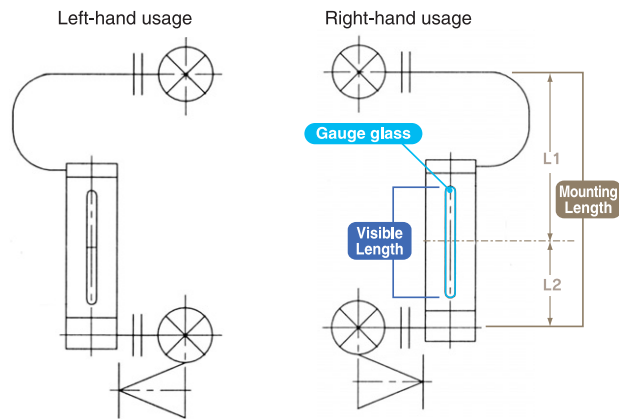


Cross-Section RGD-HL



Structural design prevents bolt tightening pressure from being applied directly to the gauge glass.

RGD-HL Gauge Dimensions

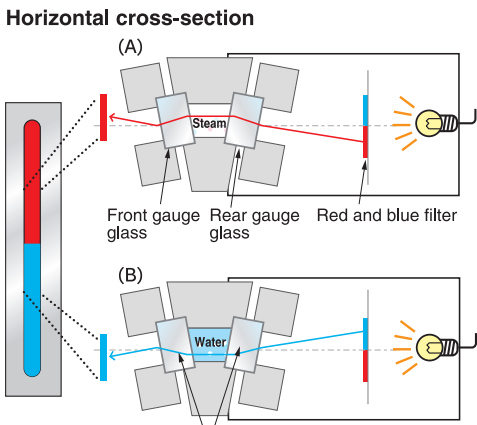


Water gauge orientation: Front

Glass No.	Standard Mounting Length (mm)			
	Visible	Mounting	L1	L2
240	225	550	375	175
265	250	580	390	190
285	270	600	400	200
305	290	620	410	210
325	310	650	430	220

Note: Gauge glass dimensions conform with Japanese JIS B8211 safety standards.

How the water level indicator works

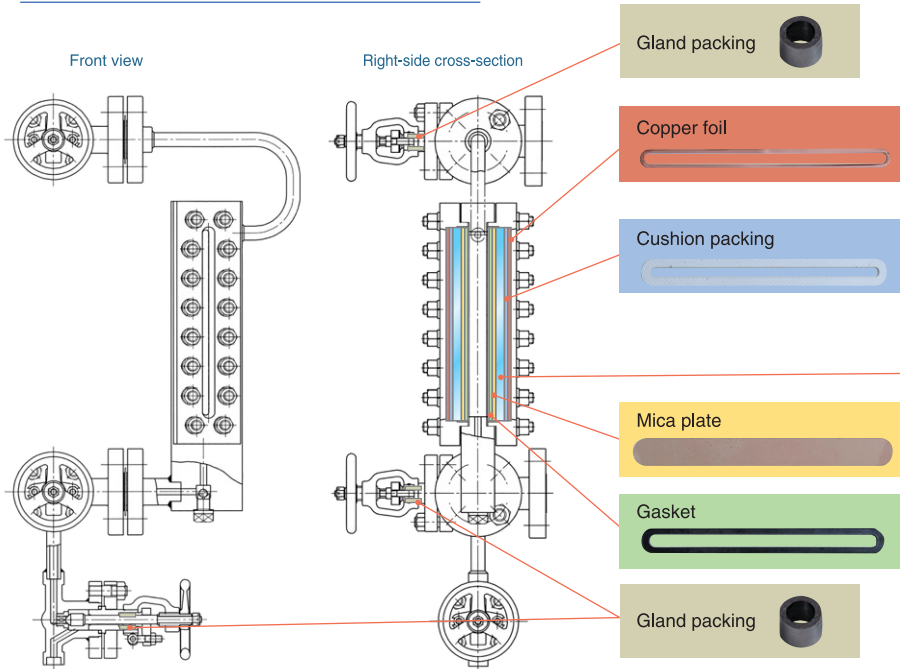


Light is refracted through the glass and water in a different direction from Figure (A).
When light passes through different transparent materials, it is refracted at the surfaces before it travels further. However, the refractive index differs depending on the composition of the material's surface. When only air or steam separates the gauge glasses, the red portion is seen. When water fills the space between the glasses, refraction between the glass and water is small and the light travels straight, allowing the blue-filtered light to be seen. Thus, the two gauge glasses are arranged to form an angle with respect to each other in order to increase the prismatic effect of the light.

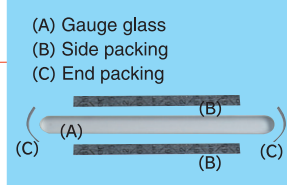
Parts Replacement

Refer to the following diagram to confirm replacement parts.

RGD-HL Bicolor Water Gauge
High-pressure type (check ball in lower assembly)
KS4-L Gauge Valve
(check ball in upper assembly)



Gauge Glass Dimensions				Unit: mm
No.	Length	JIS No.	Width & Thickness	
240	240	—	22mm (W) x 17mm (T)	
265	265	PB265		
285	285	—		
305	305	PB305		
325	325	PB325		



Refer to pages 41 and 42 for other parts.

Water Level Gauges

Bicolor Water Gauges
(Multi-port type)

Models
RG-200N and
RG-200NH

Extreme High
Pressure Type

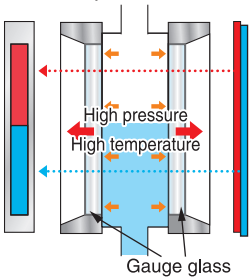
Both the RG-200N and RG-200NH are multi-port water gauges designed for use with extreme high-pressure boilers.

Product Features

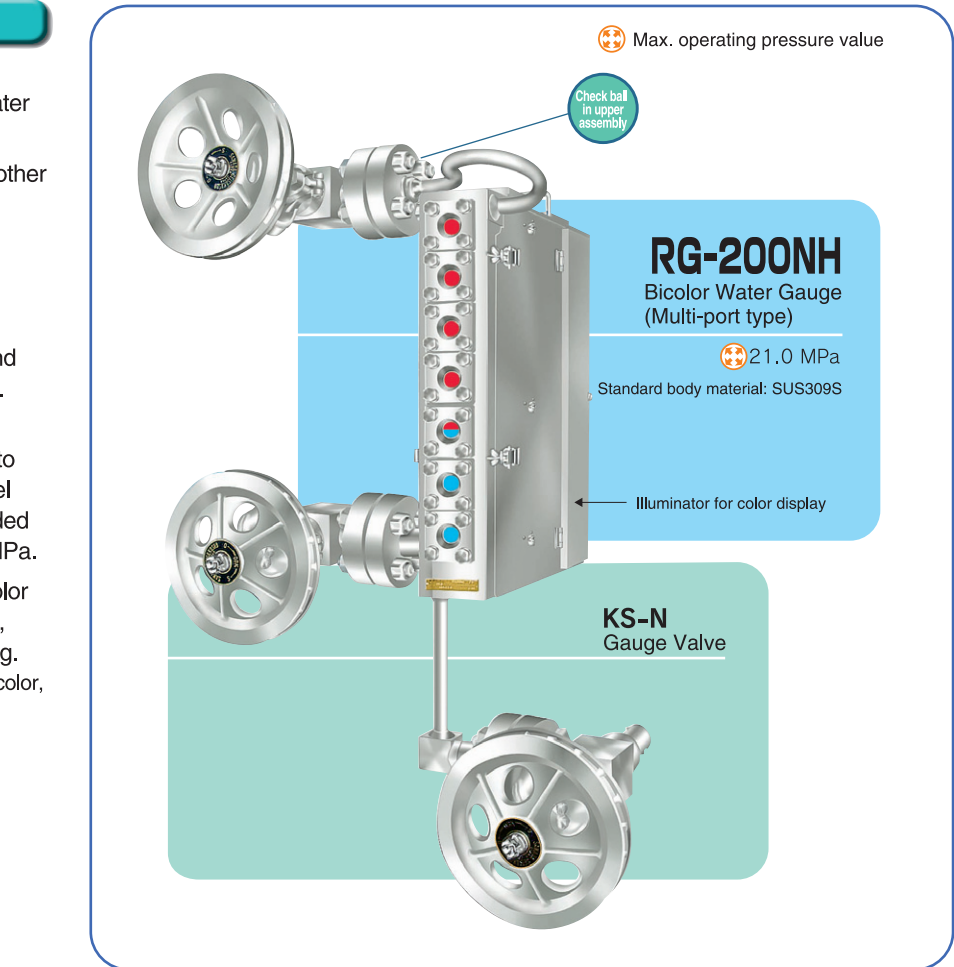
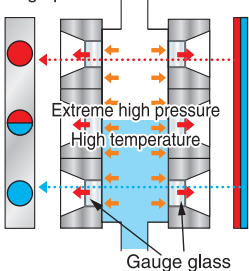
- Indicates steam portion in red and water portion in blue, like conventional bicolor water gauges.
- The RG-200N and RG-200NH differ from other bicolor water gauges in that they feature separate circular liquid level viewing 'ports' instead of the single conventional vertical window. This rugged design makes both models more suitable for use in harsh environments exposed to high pressure and high temperature than the RGD-HL gauge.
- Uniform temperature device keeps the temperature inside the water gauge close to that inside the boiler to minimize water level error. This device is especially recommended for high-pressure applications of over 15 MPa.
- Since the level can be clearly seen on a color monitor, as with conventional bicolor types, both models are ideal for remote monitoring.
Note: Since all bicolor gauges display levels in color, an illuminator must be installed inside them.
- Both models employ heavy-duty gaskets designed to withstand use in locations exposed to high pressure.

Gauge Glass Characteristics

Other bicolor water gauges for low-medium and high-pressure applications
Since glass transforms under high pressure, there are limits to its durability.



Multi-port water gauges
Round glass viewing 'ports' allows the unit to withstand high pressure.



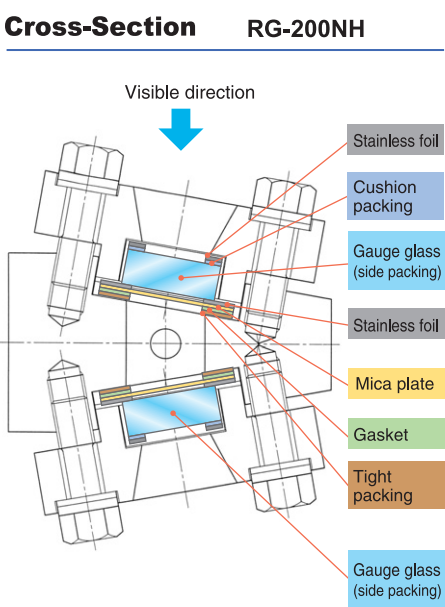
Frequently-used upper and lower cock and valve types

- RG-200N and RG-200NH**
- Valve **KS4-L, KS-N**
 - Valve **KS-N (chain operation)**

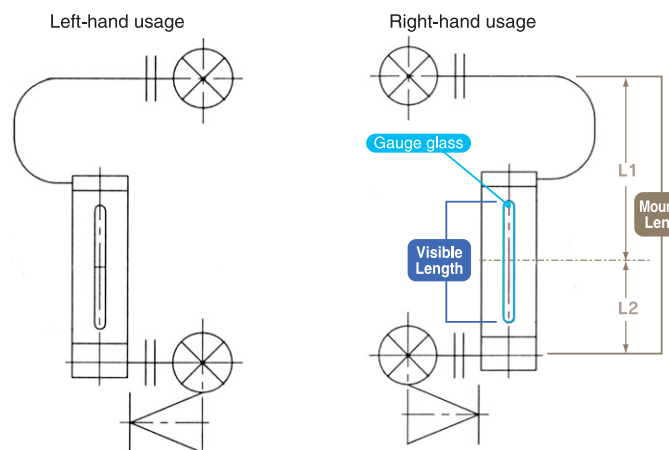
Usage Guidelines

- RG-200N**
- Max. operating pressure: 15.0 MPa
 - Max. operating temperature: 350°C (see the saturated steam pressure table on page 6.)
- RG-200NH**
- Max. operating pressure: 21.0 MPa
 - Max. operating temperature: 370°C (see the saturated steam pressure table on page 6.)

Note: Usage conditions can differ greatly depending on visible distance, etc. Please contact your Sawada dealer for more information.



RG-200N and RG-200NH Gauge Dimensions



Water gauge orientation: Front

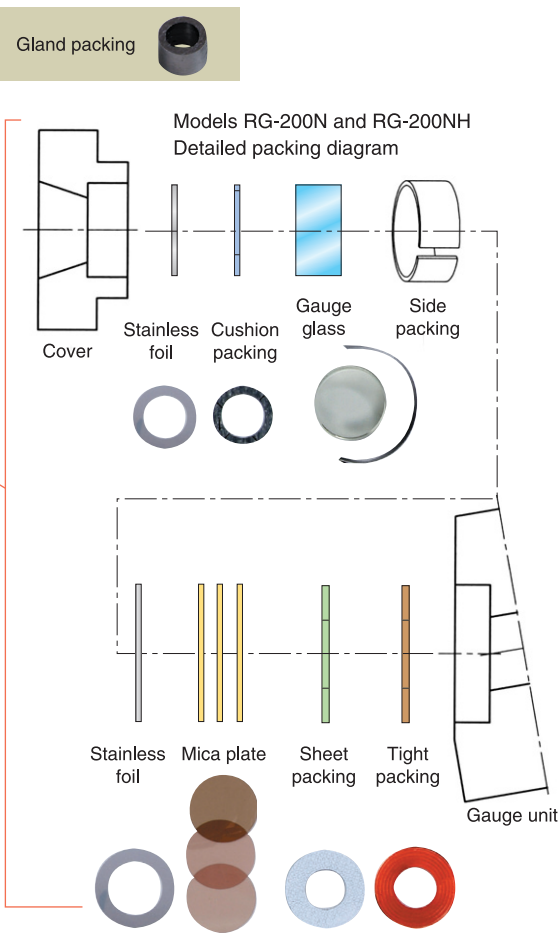
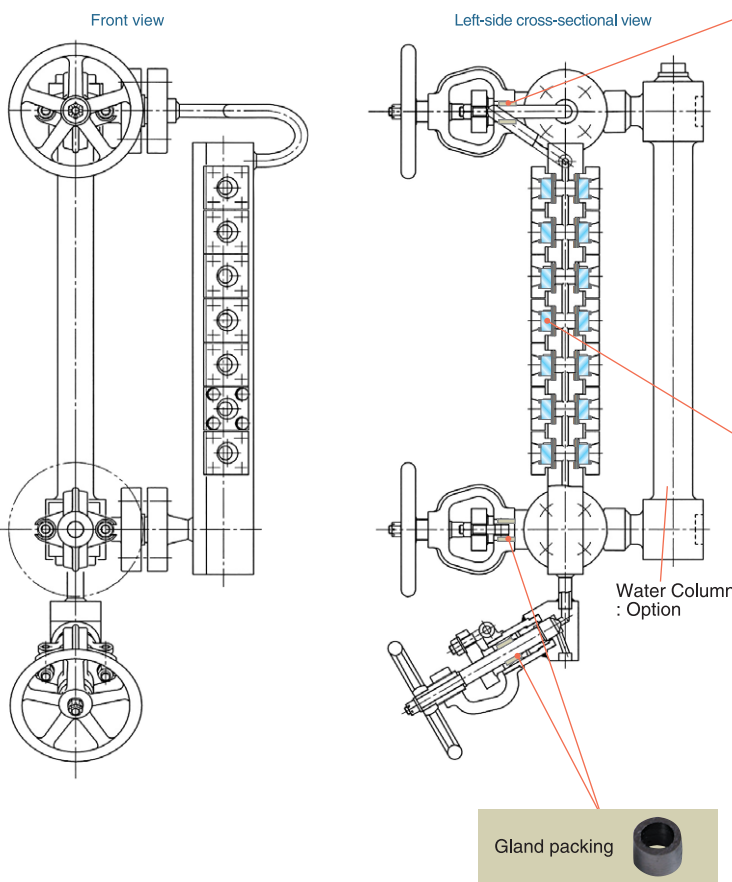
No. of Ports	Standard Mounting Length (mm)			
	Visible	Mounting	L1	L2
5 P	319	550	340	210
7 P	467	700	420	280
9 P	615	850	500	350

Note: Gauge glass dimensions conform with Japanese JIS B8211 safety standards.

Parts Replacement

Refer to the following diagram to confirm replacement parts.

RG-200NH Bicolor Water Gauge Multi-port type
KS-N Gauge Valve
(check ball in upper and lower assemblies)



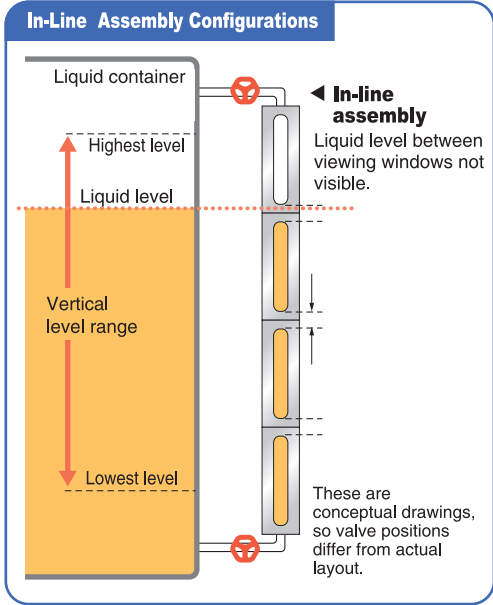
Refer to pages 41 and 42 for other parts.

Water/Liquid Level Gauges

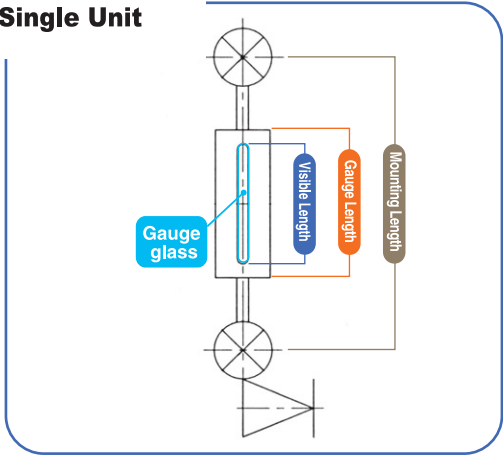
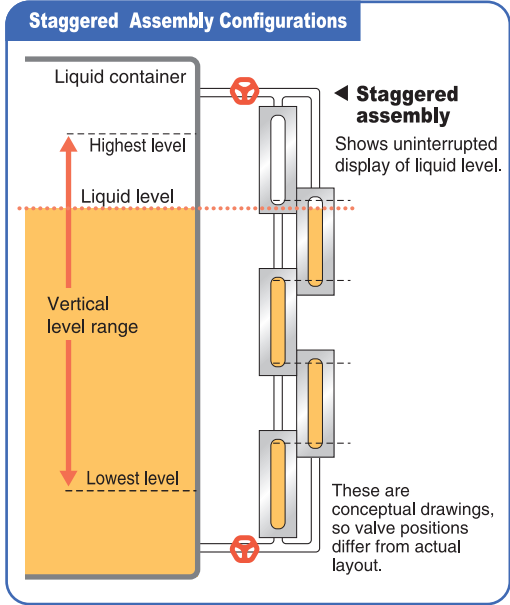
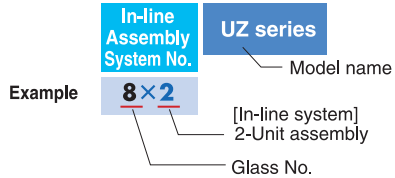
Dimensional Table for In-Line & Staggered Assembly

When the liquid level in a boiler or tank moves up and down over an extended range and the viewing window of a single liquid level gauge is not long enough to cover the entire range, multiple gauges can be connected as shown below for complete range coverage.

When connecting several gauges in a staggered configuration, the units are fixed using supporting hardware.



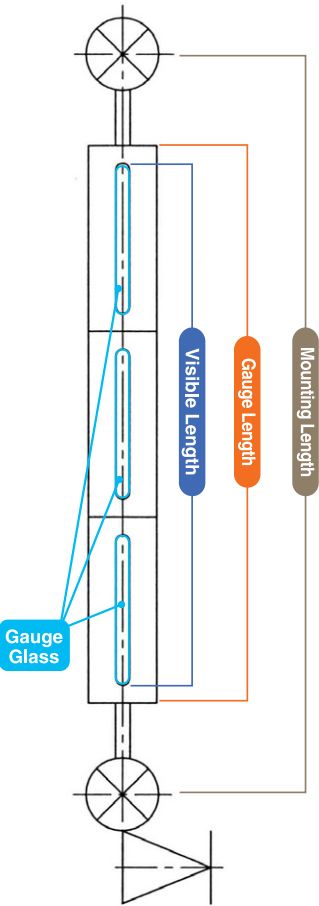
About The Dimension Table



In-line Assembly System

Standard Dimension Table (in-line assembly type)

Unit: mm

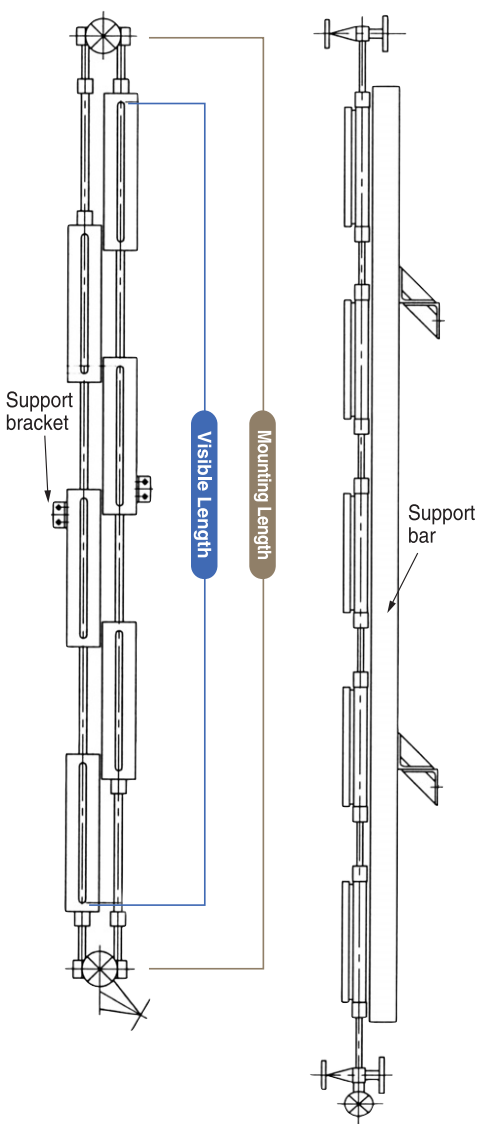


Note:

- Dimensions when KS20 valve is used.
- Invisible range length (UZ=40mm U-20=45mm)
- Support bars are supplied if the number of gauges to be connected in in-line or staggered assembly formats increases.

In-line Assembly System No.	UZ series			U-20 series			T-10 series			T-20 series		
	Visible Length	Gauge Length	Mounting Length	Visible Length	Gauge Length	Mounting Length	Visible Length	Gauge Length	Mounting Length	Visible Length	Gauge Length	Mounting Length
5×2	432	471	630	437	496	660	432	471	630	437	501	660
6×2	492	531	690	497	556	720	492	531	690	497	561	720
7×2	552	591	750	557	616	780	552	591	750	557	621	780
300×2	592	631	790	597	656	820	592	631	790	597	661	820
8×2	632	671	830	637	696	860	632	671	830	637	701	860
9×2	672	711	870	677	736	900	672	711	870	677	741	900
6×3	758	797	960	768	827	990	758	797	960	768	832	990
7×3	848	887	1050	858	917	1080	848	887	1050	858	922	1080
300×3	908	947	1110	918	977	1140	908	947	1110	918	982	1140
8×3	968	1007	1170	978	1037	1200	968	1007	1170	978	1042	1200
9×3	1028	1067	1230	1038	1097	1260	1028	1067	1230	1038	1102	1260
7×4	1144	1183	1350	1159	1218	1380	1144	1183	1350	1159	1223	1390
300×4	1224	1263	1430	1239	1298	1460	1224	1263	1430	1239	1303	1470
8×4	1304	1343	1510	1319	1378	1540	1304	1343	1510	1319	1383	1550
9×4	1384	1423	1590	1399	1458	1620	1384	1423	1590	1399	1463	1630
7×5	1440	1479	1650	1460	1519	1680	1440	1479	1650	1460	1524	1690
300×5	1540	1579	1750	1560	1619	1780	1540	1579	1750	1560	1624	1790
8×5	1640	1679	1850	1660	1719	1880	1640	1679	1850	1660	1724	1890
9×5	1740	1779	1950	1760	1819	1980	1740	1779	1950	1760	1824	1990
300×6	1856	1895	2070	1881	1940	2100	1856	1895	2070	1881	1945	2110
8×6	1976	2015	2200	2001	2060	2220	1976	2015	2200	2001	2065	2230
9×6	2096	2135	2300	2121	2180	2340	2096	2135	2300	2121	2185	2350
300×7	2172	2211	2380	2202	2261	2430	2172	2211	2380	2202	2266	2430
8×7	2312	2351	2530	2342	2401	2570	2312	2351	2530	2342	2406	2570
9×7	2452	2491	2660	2482	2541	2700	2452	2491	2660	2482	2546	2710

Staggered assembly system



Standard Dimension Table (staggered assembly type) for UZ, U-20, T-10 and T-20

Unit: mm

No. of Units	No.9B		No.8B		No.300B		No.7B	
	Visible Length	Mounting Length	Visible Length	Mounting Length	Visible Length	Mounting Length	Visible Length	Mounting Length
2	608	950	568	920	528	880	488	840
3	900	1250	840	1200	780	1130	720	1070
4	1192	1550	1112	1470	1032	1380	952	1300
5	1484	1850	1384	1750	1284	1650	1184	1550
6	1776	2130	1656	2000	1536	1900	1416	1770
7	2068	2420	1928	2280	1788	2150	1648	2000
8	2360	2700	2200	2550	2040	2400	1880	2230
9	2652	3000	2472	2830	2292	2650	2112	2470
10	2944	3300	2744	3100	2544	2900	2344	2700
11	3236	3600	3016	3370	2796	3150	2576	2930
12	3528	3880	3288	3650	3048	3400	2808	3150
13	3820	4170	3560	3900	3300	3650	3040	3400
14	4112	4470	3832	4200	3552	3900	3272	3630
15	4404	4750	4104	4450	3804	4150	3504	3850
16	4696	5050	4376	4730	4056	4420	3736	4100
17	4988	5350	4648	5000	4308	4650	3968	4320
18	5280	5630	4920	5270	4560	4900	4200	4550
19	5572	5930	5192	5550	4812	5180	4432	4800
20	5864	6220	5464	5820	5064	5420	4664	5020

Note: Dimensions when KS20 valve is used.
For details, please contact your Sawada dealer .

Liquid Level Gauges

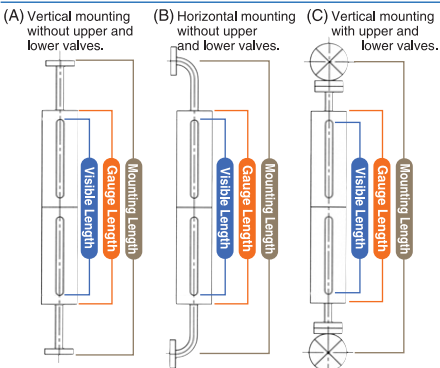
Special Liquid Level Gauges

Models Wide-chamber type, High-Pressure Special type, Anti-Frosting type, Heating/Cooling type and Back-Coated type

Wide-Chamber Level Gauge (reflex and transparent types)

Designed for use with liquids that can boil or create bubbles, this level gauge allows easy confirmation of the liquid level by stabilizing the surface with its wider liquid chamber diameter. An anti-frosting extension can also be mounted to the viewing window to permit level viewing even if the level gauge freezes and is covered in ice.

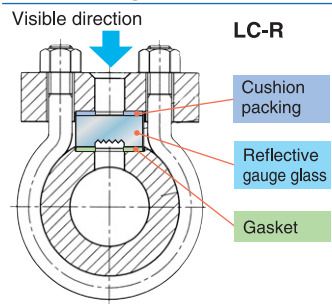
Dimension Table



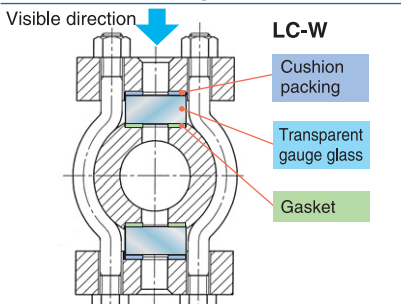
Unit: mm

LC-R and LC-NF Reflex Gauge Dimensions					
LC-W and LC-W-NF Transparent Gauge Dimensions					
Glass No.	Visible Length	Gauge Length	Vertical mounting w/o upper and lower valves	Horizontal mounting w/o upper and lower valves	Vertical mounting with upper and lower valves
6×1	226	290	440	490	700
7×1	256	320	470	520	720
300×1	276	340	490	540	740
8×1	296	360	510	560	760
9×1	316	380	530	580	780
6×2	517	581	730	780	980
7×2	577	641	790	840	1040
300×2	617	681	830	880	1080
8×2	657	721	870	920	1120
9×2	697	761	910	960	1160
6×3	808	872	1020	1070	1270
7×3	898	962	1110	1160	1360
300×3	958	1022	1170	1220	1420
8×3	1018	1082	1230	1280	1480
9×3	1078	1142	1290	1340	1540
7×4	1219	1283	1430	1480	1680
300×4	1299	1363	1510	1560	1760
8×4	1379	1443	1590	1640	1840
9×4	1479	1523	1670	1720	1920
7×5	1540	1604	1750	1800	2000
300×5	1640	1704	1850	1900	2100
8×5	1740	1804	1950	2000	2200
9×5	1840	1904	2050	2100	2300

Reflex Gauge Cross-Section



Transparent Gauge Cross-Section



Standard Materials for Low-Temperature Applications

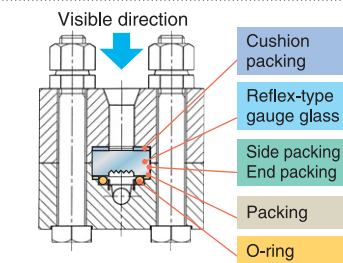
Operating temperature (°C)	Over -10	-10 - -40	-40 - -70	-70 - -100	-100 - -150
Material	STPG370	STPL380	STPL450	SUS304	SUS304
Anti-frosting extension height	-	50	70	100	150

High-Pressure Special Liquid Level Gauge

Designed specially for high-pressure applications, this level gauge uses O-rings as an air-tight packing to prevent excessive tightening forces from being applied directly to the gauge glass while being robust enough to withstand high pressure.

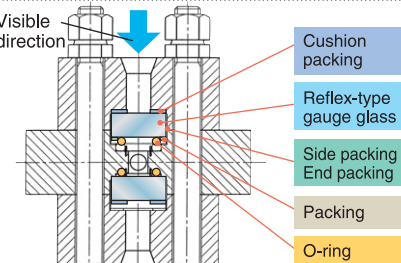
Reflex Gauge Cross-Section

Model JH Max. operating pressure: 15 MPa
Max. operating temperature: 100°C
Model JH-2 Max. operating pressure: 35 MPa
Max. operating temperature: 100°C

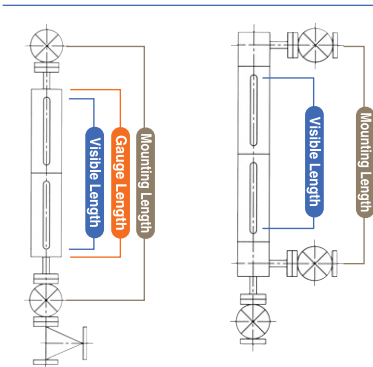


Transparent Gauge Cross-Section

Model TVH Max. operating pressure: 15 MPa
Max. operating temperature: 100°C
Model TVH-2 Max. operating pressure: 35 MPa
Max. operating temperature: 100°C



Dimensions Table



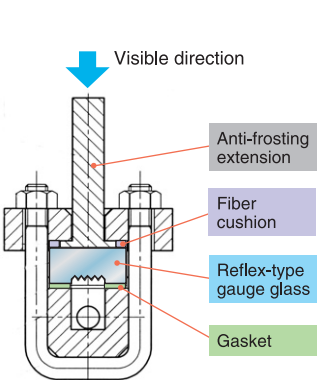
Unit: mm

Glass Symbol & No. of Connected In-Line Units	JH Reflex Gauge Dimensions				JH-2 Reflex Gauge Dimensions			
	TVH Transparent Gauge Dimensions				TVH-2 Transparent Gauge Dimensions			
	Visible Length	Gauge Length	Mounting Length	Virtual	Visible Length	Gauge Length	Mounting Length	Virtual
No.3×1	141	225	625	325	141	245	640	340
8×1	296	380	780	780	296	400	800	500
3×2	367	451	850	850	387	491	890	590
3×3	593	677	1080	1080	633	737	1140	840
8×2	677	761	1160	1160	697	801	1200	900
3×4	819	903	1300	1300	879	983	1380	1080
8×3	1058	1142	1550	1550	1098	1202	1600	1300
3×5	1045	1129	1530	1530	1125	1229	1630	1330
8×4	1439	1523	1920	1920	1499	1603	2000	1700
8×5	1820	1904	2300	2000	1900	2004	2400	2100

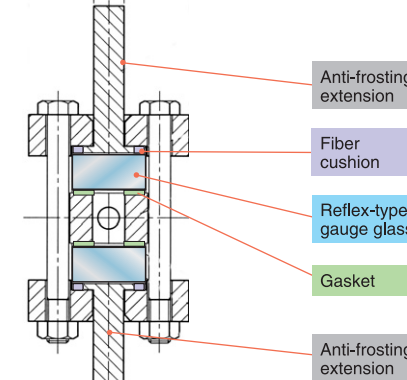
Anti-Frosting Liquid Level Gauge (reflex and transparent types)

When monitoring sub-freezing temperature fluids through the level gauge, the surface of the gauge viewing window can become frozen, obscuring level visibility. To avoid this, an acrylic anti-frosting extension can be mounted to the glass surface of the gauge, which allows the liquid level to be easily seen through the edge of the extension.

UZ-NF Anti-Frosting Reflex Gauge Cross-Section



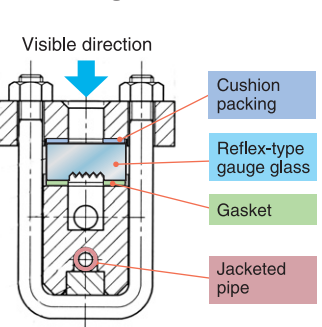
TVZ-NF Anti-Frosting Transparent Gauge Cross-Section



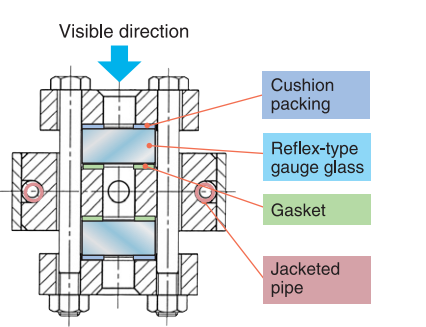
Heating/Cooling Type Liquid Level Gauge (reflex and transparent types)

This gauge is used for boiling or congealing liquids. By sending steam or cooling water through a jacketed pipe to control the liquid, the liquid level can be monitored with ease.

UZ-J (jacket type) Reflex Gauge Cross-Section



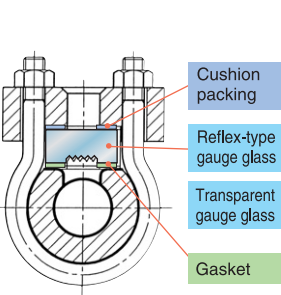
TVZ-J (jacket type) Transparent Gauge Cross-Section



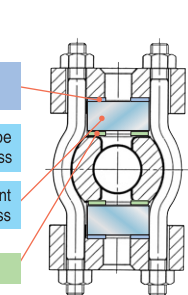
Back-Coated Liquid Level Gauges (reflex and transparent types)

We manufacture a variety of tubular, reflex and transparent level gauges lined with rubber or Teflon. Please be sure to consult with Sawada dealer regarding level gauges for corrosive liquids.

U-P Reflex Gauge Cross-Section

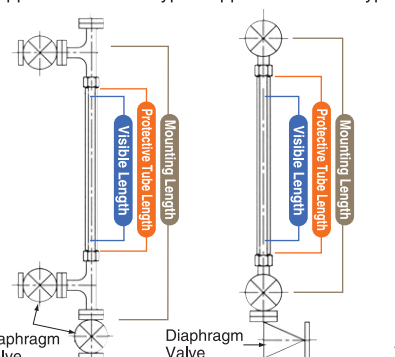


T-P Transparent Gauge Cross-Section



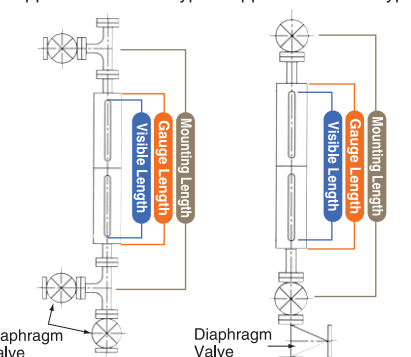
Tubular gauges

Upper/lower holder type Upper/lower valve type



Reflex/Transparent gauges

Upper/lower holder type Upper/lower valve type



Unit: mm

Glass No.	Single unit assembly			2-unit assembly			3-unit assembly			4-unit assembly		
	Visible Length	Gauge Length	Mounting Length	Visible Length	Gauge Length	Mounting Length	Visible Length	Gauge Length	Mounting Length	Visible Length	Gauge Length	Mounting Length
6B	226	265	510	492	531	780	758	797	1050	-	-	-
7B	256	295	540	552	591	840	848	887	1140	1144	1183	1440
300B	276	315	560	592	631	880	908	947	1200	1224	1263	1520
8B	296	335	580	632	671	920	968	1007	1260	1304	1343	1600
9B	316	355	600	672	711	960	1028	1067	1320	1384	1423	1680
400B	376	415	670	792	831	1080	1208	1247	1500	1624	1663	1910

Liquid Level Gauges

Weld-Mount Level Gauges

Models
J-3, Special J-3,
J-30 and J-50

Weld-mount series gauges are designed to be welded directly to tanks or pressure vessels to allow direct monitoring of their interior conditions. Their construction makes the gauge glass the only part that is sealed by gaskets, rendering the gauge extremely reliable against fluid leakage.

Product Features

- Allows fluctuations in tank fluid to be monitored directly without time lag.
- Since gasket packing is only used to hold the gauge glass, safety and reliability against fluid leakage can be enhanced to a greater degree.
- When replacing fluid in the tank, less fluid remains in the gauge than in the valves and plumbing of other level gauge configurations.
- More effective monitoring of even high-viscosity fluids or congealed liquids.
- Easier cleaning than with liquid level gauges mounted on flange connections.
- Wide viewing range enables the gauge to monitor the inside of tank as well as to function as a window for the tank.
- Can be attached to rounded surfaces, depending on the shape of the tank's mounting area.
- Both rectangular and oblong styles available, depending on intended purpose of use. (J-3 only.)
- Both reflex and transparent gauge glasses available. (J-3 only.)
- Body material can be selected to match intended use.
Example: S25C, SUS304, SUS 316, SUS316L

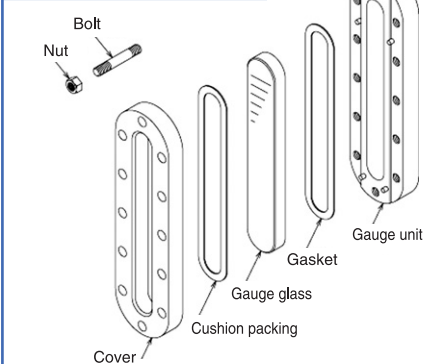
Usage Guidelines

All Weld-Mount Gauge Series

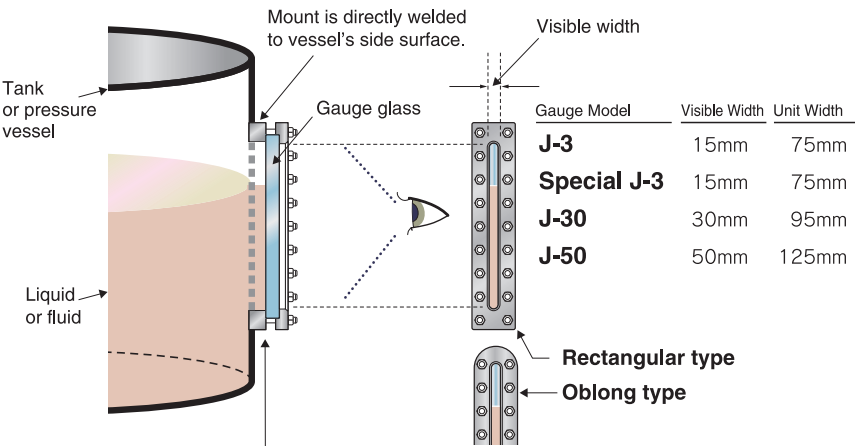
Max. operating pressure: 1.0 MPa

Note: For applications that exceed this maximum pressure specification, please contact your Sawada dealer.

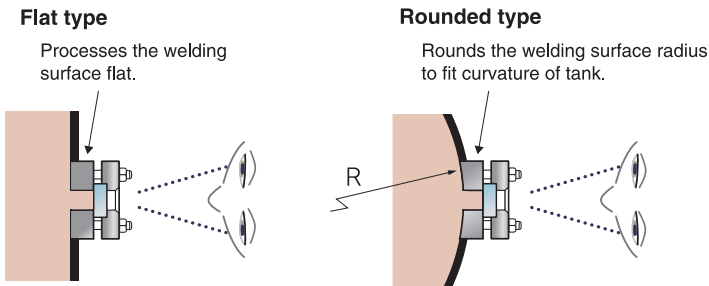
Disassembled View



Weld-Mount Gauge Product Lineup and Mounting Illustration

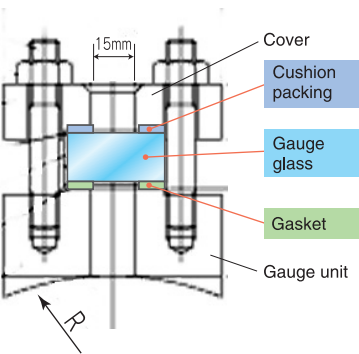


Types of Tank Mounts

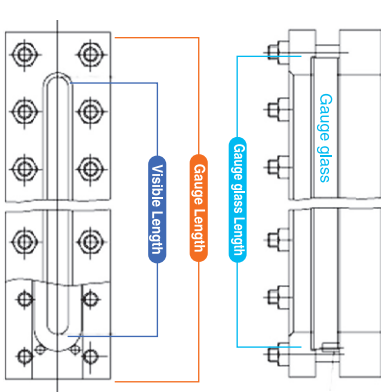


J-3 type

Cross-Section



Top View

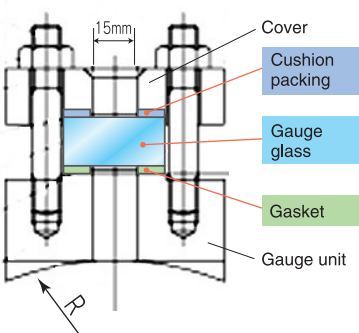


Dimensions Table

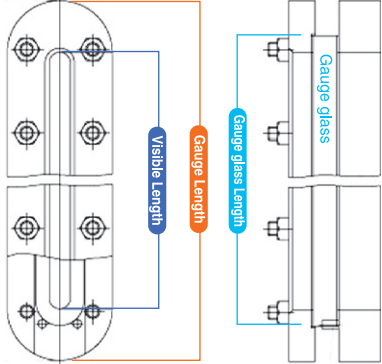
Glass No.	Visible Length	Gauge Glass Length	Gauge Length
1B	95	115	155
2B	120	140	180
3B	141	165	205
4B	166	190	230
5B	196	220	260
6B	226	250	290
7B	256	280	320
300B	276	300	340
8B	296	320	360
9B	316	340	380
400B	376	400	440
500B	476	500	540

Special J-3 type

Cross-Section



Top View

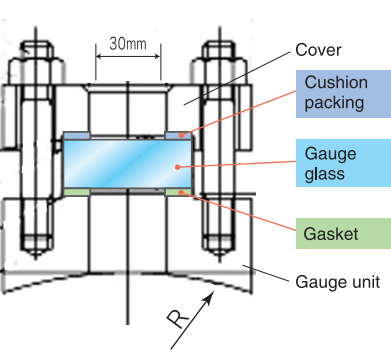


Dimensions Table

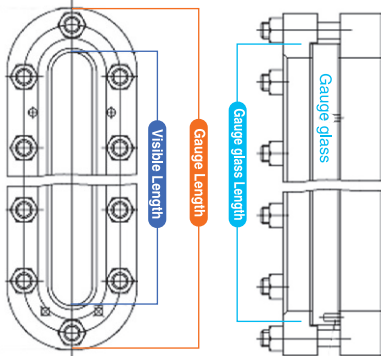
Glass No.	Visible Length	Gauge Glass Length	Gauge Length
6B	226	250	300
7B	256	280	330
300B	276	300	350
8B	296	320	370
9B	316	340	390
400B	376	400	450
450B	426	450	500
500B	476	500	550

J-30 type

Cross-Section



Top View

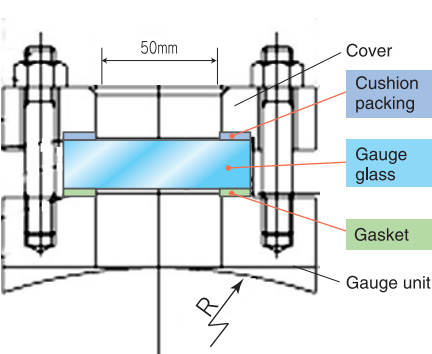


Dimensions Table

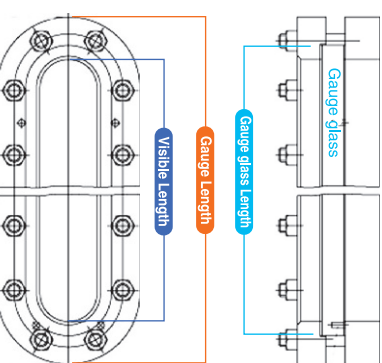
Visible Length	Gauge Glass Length	Gauge Length
250	270	315
300	320	365
350	370	415
400	420	465
450	470	515
500	520	565

J-50 type

Cross-Section



Top View



Dimensions Table

Visible Length	Gauge glass Length	Gauge Length
260	285	335
275	300	350
325	350	400
340	365	415
375	400	450
425	450	500
450	475	525
475	500	550

Liquid Level Gauge

Weld-Mount J-Series

Liquid Level Gauges

Round Weld-Mount Liquid Level Gauges

Models
SG-R, SG-B and
SG-P

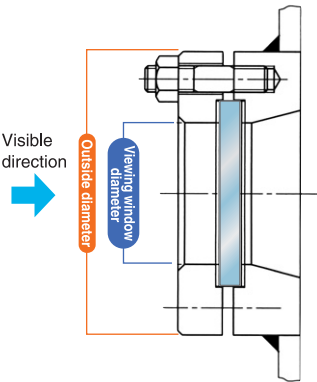
Like the oblong J-series weld-mount gauges, this round window is welded to tanks or pressure vessels for direct confirmation of internal conditions.

Product Features

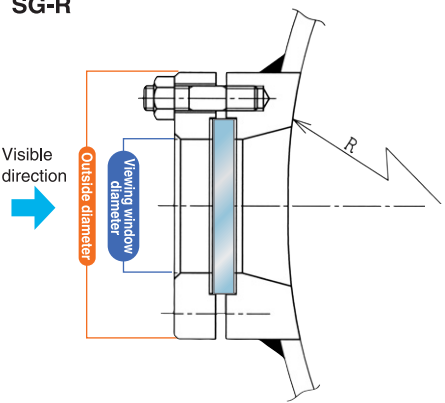
- Offers features similar to J-series weld-mount gauges.
- Can be used as a port for viewing the inside of tanks or pressure vessels.
- Specially designed and manufactured to customer-specified design conditions.

Standard dimensional diagram

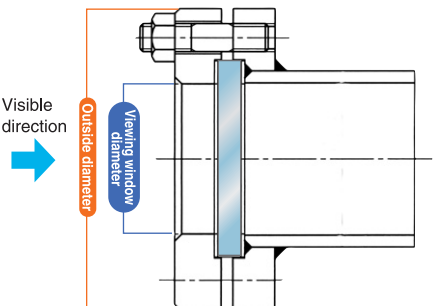
SG-B



SG-R



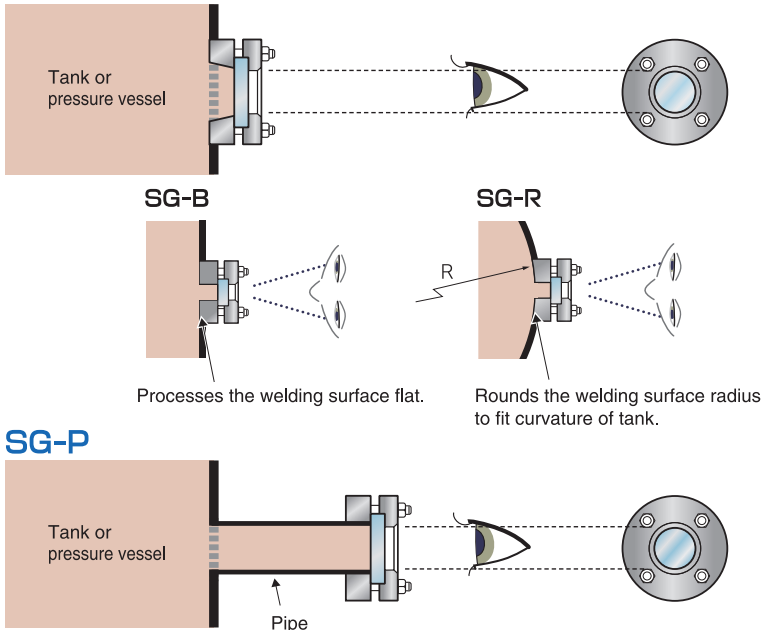
SG-P



Round Weld-Mount Liquid Level Gauge



SG



Nominal diameter	Model	Viewing window diameter (mm)	Glass dimensions	Outside diameter (mm)
1 1/2"	SG-R/B/P-40A	40	φ 55×10 t	90
2"	SG-R/B/P-50A	55	φ 70×10 t	115
2 1/2"	SG-R/B/P-65A	65	φ 85×10 t	130
3"	SG-R/B/P-80A	80	φ 100×12 t	150
4"	SG-R/B/P-100A	100	φ 125×15 t	175
5"	SG-R/B/P-125A	130	φ 160×19 t	225
6"	SG-R/B/P-150A	150	φ 180×19 t	245
8"	SG-R/B/P-200A	200	φ 240×25 t	310

Standard material

• SS400 • SUS

Liquid Level Gauges

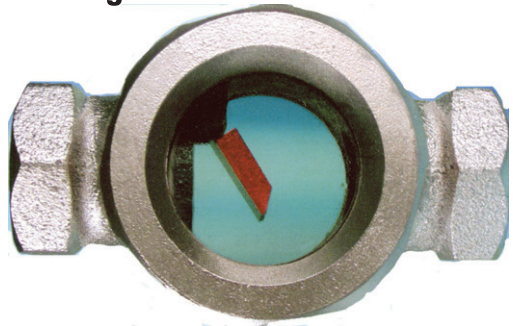
Flow Sight

Installed at some midpoint of piping, the flow sight (sight glass) is used to monitor the inside of piping by directly viewing the flow, stop or flowing speed of a fluid flowing in the piping.

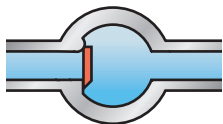
Product Features

- Simple yet robust construction, clear viewing, and high reliability.
- Many different installation options available to match conditions.

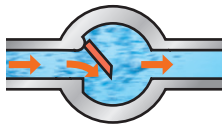
Threaded Flow Sight



Fluid flow stopped

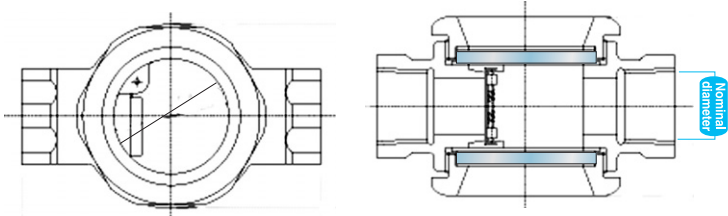


Fluid flowing



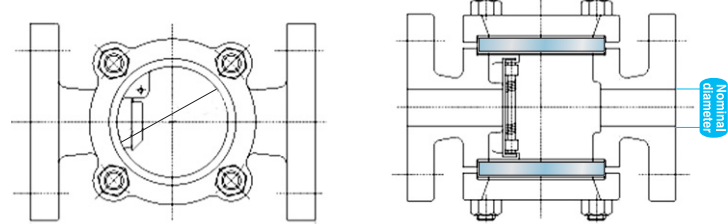
Standard dimensional diagram

Threaded type



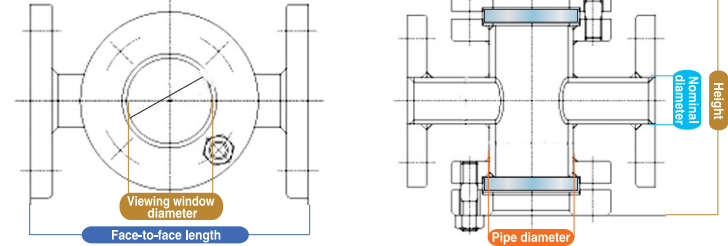
Nominal diameter
PT 1/2"
PT 3/4"
PT 1"
PT 1 1/4"
PT 1 1/2"

Flange type



Nominal diameter
1/2"
3/4"
1"
1 1/4"
1 1/2"
2"
2 1/2"
3"
4"

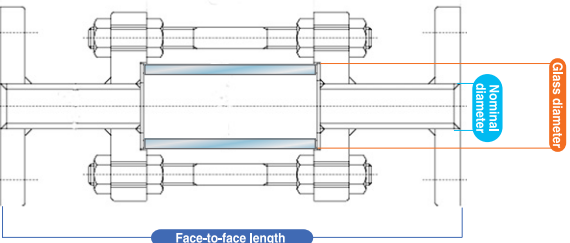
Pipe-type (SG series)



Nominal diameter	Model	Face-to-face length (mm)	Height (mm)	Viewing window diameter (mm)	Glass dimensions	Pipe diameter
1/2"	SG-15A	160	130	40	φ 55×10 t	1 1/2"
3/4"	SG-20A	160	130	40	φ 55×10 t	1 1/2"
1"	SG-25A	180	166	55	φ 70×10 t	2"
1 1/4"	SG-32A	180	190	65	φ 85×10 t	2 1/2"
1 1/2"	SG-40A	210	190	65	φ 85×10 t	2 1/2"
2"	SG-50A	250	214	80	φ 100×12 t	3"
2 1/2"	SG-65A	260	256	100	φ 125×15 t	4"
3"	SG-80A	280	276	100	φ 125×15 t	4"
4"	SG-100A	340	316	130	φ 160×19 t	5"
5"	SG-125A	380	352	150	φ 180×19 t	6"
6"	SG-150A	420	412	200	φ 240×25 t	8"
8"	SG-200A	500	480	250	φ 290×25 t	10"

Note: Jacketed types also available.

Lantern-type (LT series)



Nominal diameter	Model	Face-to-face length (mm)	Glass diameter (mm)
1/2"	LT-15A	220	40
3/4"	LT-20A	220	45
1"	LT-25A	220	55
1 1/2"	LT-40A	220	70
2"	LT-50A	240	80
2 1/2"	LT-65A	240	100
3"	LT-80A	240	110
4"	LT-100A	260	140
5"	LT-125A	280	165
6"	LT-150A	280	190
8"	LT-200A	280	245

Liquid Level Gauge

Weld-Mount SG-Series Flow Sight

Cocks and Valves

Gauge Cocks

Models
ABS, KD, KD-2
and **KU**

Low
Pressure Type

These gauge cocks are mainly designed to be used with water or liquid level gauges for low-pressure applications. Because various combinations are possible depending on usage conditions, please contact your Sawada dealer as to the combination most suited to your use.

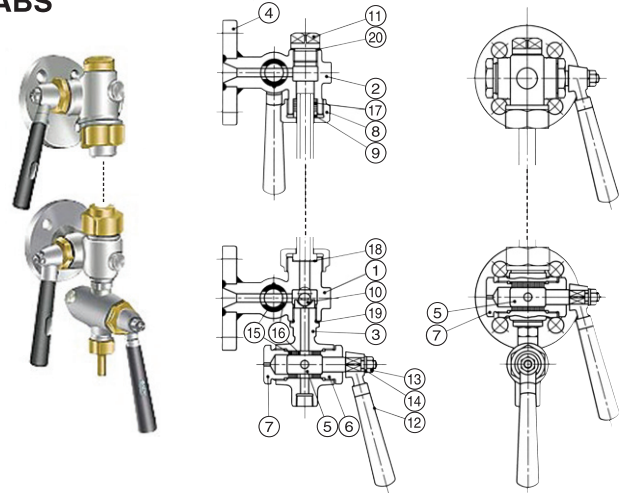
ABS Series

For use with water/liquid level gauges, these cocks feature durable sleeve packings molded from laminated seat packings that stand up well to long-term use. Leaks, if they occur, can be stopped by tightening a nut. A check ball built into the lower valve prevents major liquid loss in the event of glass breakage.

Base Connection	Flange, screw-in
Construction	FCD450, SF440A, SUS
Check Ball	Built into lower valve
Max. Pressure	2.0MPa (guideline)

Used with Glass tube (φ19mm), K-Series, U-Series, T-10, T-20 and RGB

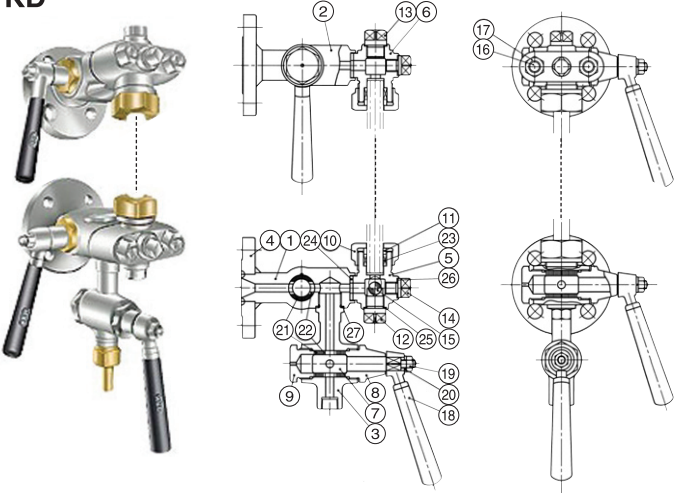
ABS



Part Name

- 20 ... Copper packing
- 19 ... Copper packing
- 18 ... Copper packing
- 17 ... Gland packing
- 16 ... Eyelet
- 15 ... Sleeve packing
- 14 ... Spring lock washer
- 13 ... Nut
- 12 ... Handle
- 11 ... Plug
- 10 ... Check ball
- 9 ... Packing gland
- 8 ... Gland nut
- 7 ... Tightening nut
- 6 ... Cover nut
- 5 ... Cock center plug
- 4 ... Flange
- 3 ... Drain cock body
- 2 ... Upper cock body
- 1 ... Lower cock body

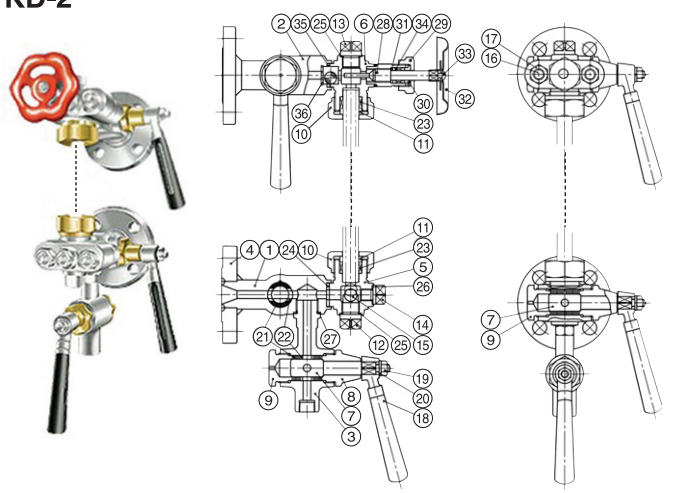
KD



Part Name

- 27 ... Copper packing
- 26 ... Copper packing
- 25 ... Copper packing
- 24 ... Copper packing
- 23 ... Gland packing
- 22 ... Eyelet
- 21 ... Sleeve packing
- 20 ... Spring lock washer
- 19 ... Nut
- 18 ... Handle
- 17 ... Nut
- 16 ... Stud bolt
- 15 ... Check ball
- 14 ... Plug
- 13 ... Plug
- 12 ... Plug
- 11 ... Packing gland
- 10 ... Gland nut
- 9 ... Tightening nut
- 8 ... Cover nut
- 7 ... Cock center plug
- 6 ... Upper gauge holder
- 5 ... Lower gauge holder
- 4 ... Flange
- 3 ... Drain cock body
- 2 ... Upper cock body
- 1 ... Lower cock body

KD-2



Part Name

- 36 ... Ball seat
- 35 ... Copper packing
- 34 ... Gland packing
- 33 ... Machine screw
- 32 ... Handle
- 31 ... Packing washer
- 30 ... Packing gland
- 29 ... Gland nut
- 28 ... Spindle
- 27 ... Copper packing
- 26 ... Copper packing
- 25 ... Copper packing
- 24 ... Copper packing
- 23 ... Gland packing
- 22 ... Eyelet
- 21 ... Sleeve packing
- 20 ... Spring lock washer
- 19 ... Nut
- 18 ... Handle
- 17 ... Nut
- 16 ... Stud Bolt
- 15 ... Check Ball
- 14 ... Plug
- 13 ... Plug
- 12 ... Plug
- 11 ... Packing gland
- 10 ... Gland nut
- 9 ... Tightening nut
- 8 ... Cover nut
- 7 ... Cock center plug
- 6 ... Upper gauge holder
- 5 ... Lower gauge holder
- 4 ... Flange
- 3 ... Drain cock body
- 2 ... Upper cock body
- 1 ... Lower cock body

Cocks and Valves

Gauge Valves (Low-Pressure Type)

Models
KS20 and **KS10-N**

Low
Pressure Type

The KS-20 and KS10-N Series gauge valves are mainly designed to be used with water or liquid level gauges for low-pressure applications.

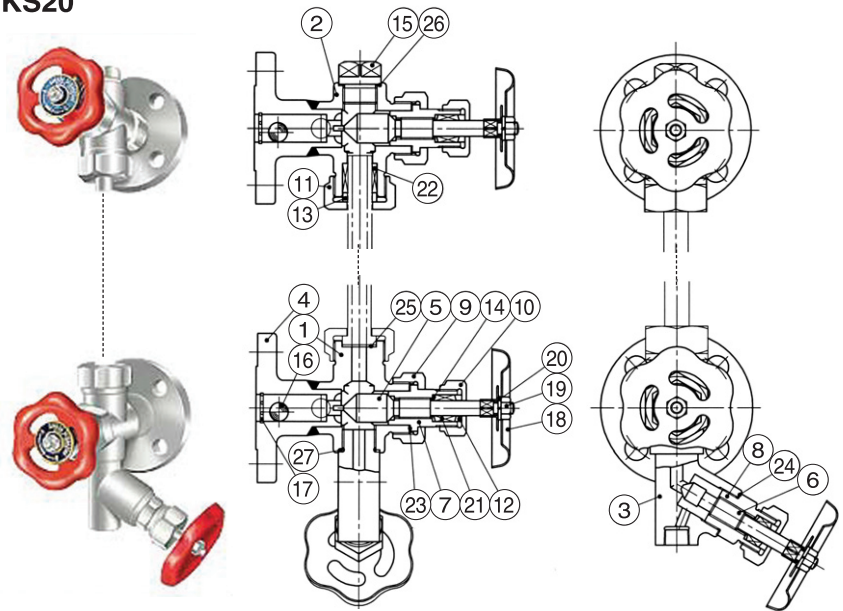
KS20 Series

The **KS20** series features a pair of gauge valves of the inside screw and union bonnet types designed for low-pressure applications. Check balls built into both upper and lower valves prevent major liquid loss in the event of glass breakage. The **KS20-W** is also made available for use as upper and lower valves for water level gauges assembled in a staggered format.

Base Connection	Flange, screw-in
Construction	SF440A, SUS
Check Ball	Built into upper & lower valves
Max. Pressure	3.0MPa (guideline)

Used with U-Series, T-10, T-20, TVB, RGB, and RGC

KS20



Part Name

- 27 ... Copper packing
- 26 ... Copper packing
- 25 ... Copper packing
- 24 ... Copper packing
- 23 ... Gland packing
- 22 ... Eyelet
- 21 ... Sleeve packing
- 20 ... Spring lock washer
- 19 ... Nut
- 18 ... Handle
- 17 ... Ball seat
- 16 ... Check ball
- 15 ... Plug
- 14 ... Packing washer
- 13 ... Packing gland
- 12 ... Packing gland
- 11 ... Gland nut
- 10 ... Gland nut
- 9 ... Cover nut
- 8 ... Valve cover
- 7 ... Valve cover
- 6 ... Spindle
- 5 ... Spindle
- 4 ... Flange
- 3 ... Drain valve body
- 2 ... Upper valve body
- 1 ... Lower valve body

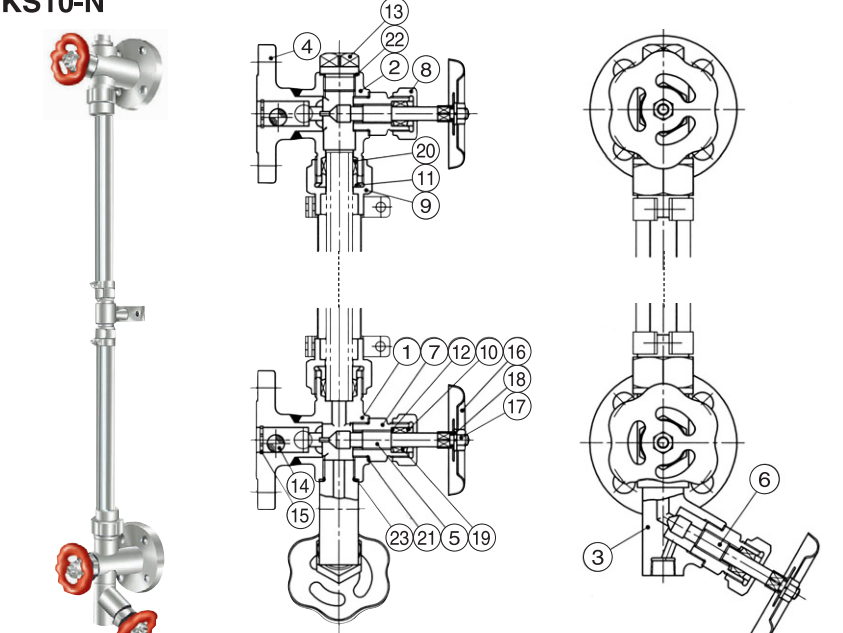
KS10-N Series

The **KS10-N** series features inside screw and union bonnet valves and is designed for use with φ16mm or φ19mm tubular water/liquid level gauges. The **KS10-NV** is designed for use in negative pressure applications, and the KS10-NB features a backseat.

Base Connection	Flange, screw-in
Construction	SF440A, SUS, CAC
Check Ball	Built into upper & lower valves
Max. Pressure	1.0MPa (guideline)

Used with Tubular Types

KS10-N



Part Name

- 23 ... Gasket
- 22 ... Gasket
- 21 ... Gasket
- 20 ... Gland packing
- 19 ... Gland packing
- 18 ... Spring lock washer
- 17 ... Nut
- 16 ... Handle
- 15 ... Ball seat
- 14 ... Check ball
- 13 ... Plug
- 12 ... Packing washer
- 11 ... Packing gland
- 10 ... Packing gland
- 9 ... Gland nut
- 8 ... Gland nut
- 7 ... Valve cover
- 6 ... Spindle
- 5 ... Spindle
- 4 ... Flange
- 3 ... Drain valve body
- 2 ... Upper valve body
- 1 ... Lower valve body

Cocks and Valves

Gauge Valves

Models
**KS9, KS4,
KS4-L and KS-N**

Medium
Pressure Type

Medium and High
Pressure Type

High
Pressure Type

These gauge valves are designed to be used with water or liquid level gauges for medium- and high-pressure applications. Since their spindles do not turn when closed or opened, these valves can stand up well to high temperature.

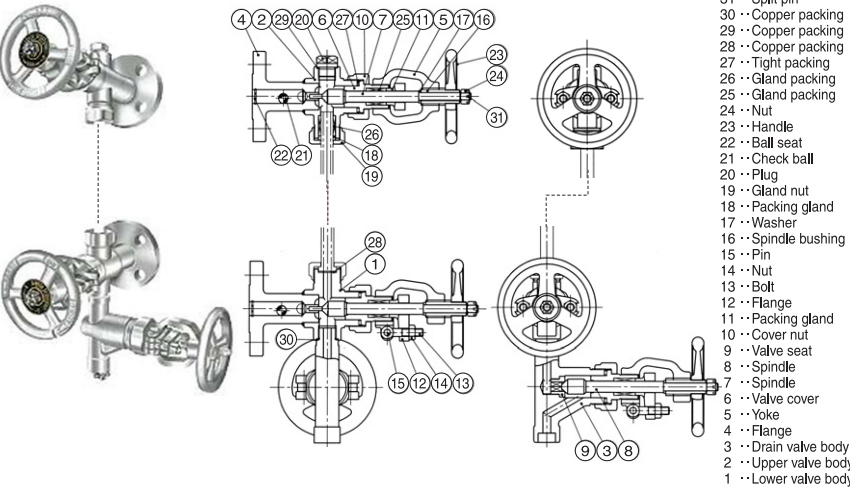
KS9 Series

Medium

The **KS9** series features outside screw-and-yoke and union bonnet valves. The spindle is fitted with a backseat and does not turn when closed or opened, facilitating handle operation and preventing seizure.

Base Connection	Flange, SW
Construction	SF440A
Check Ball	Built into upper & lower valves
Max. Pressure	5.0MPa (guideline)
Used with TVB, TVC, TVD, RGC, RGC-2 and RGD	

KS9



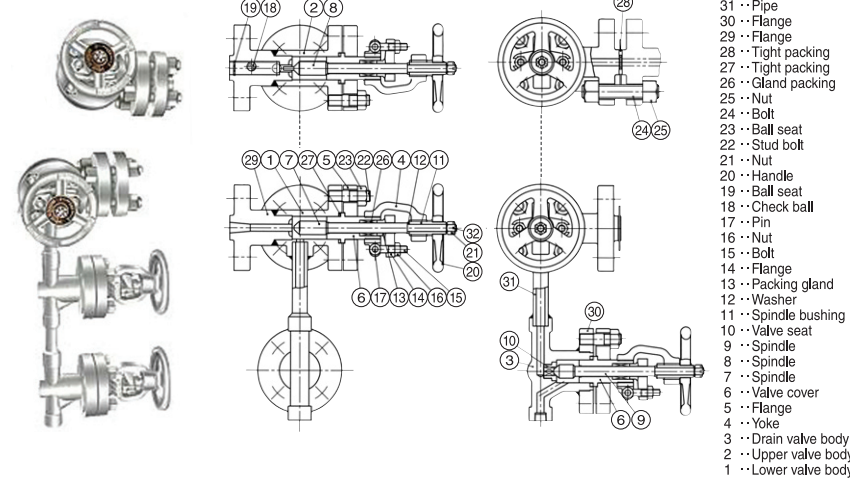
KS4 Series

Medium & High

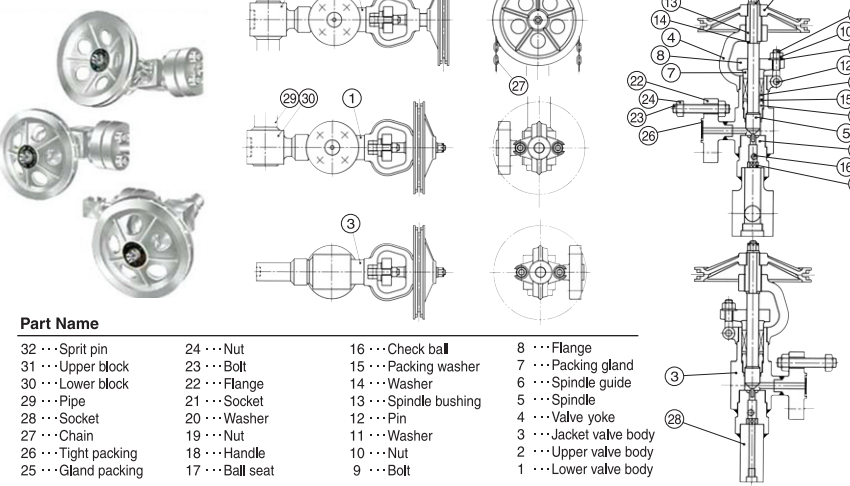
The **KS4** series features outside screw-and-yoke and union bonnet valves. The spindle is fitted with a backseat and does not turn when closed or opened, facilitating handle operation and preventing seizure.

Base Connection	Flange, SW
Construction	SF440A
Check Ball	Built into upper & lower valves
Max. Pressure	5.0MPa (guideline)
Used with TVB, TVC, TVD, RGC, RGC-2 and RGD	

KS4-L



KS-N



KS-N Series

High

The **KS-N** series features outside screw-and-yoke and union bonnet valves. The spindle is fitted with a backseat and does not turn when closed or opened, facilitating handle operation and preventing seizure.

Base Connection	SW
Construction	SF440A, A105
Check Ball	Built into upper & lower valves
Max. Pressure	21MPa (guideline)
Used with RG-200N and RG-200NH	

Related Products

LED illuminator for Water Level Gauges

Sawada's light source for illuminating water level gauges has been changed from conventional light bulbs to LEDs. This eliminates the need for troublesome bulb replacement intervals, as well as the risk of monitoring failure due to a dead bulb.

Product Features

Remarkably improved viewing ease!!

Gauge glass surface shows water level clearly and free of color distortion.

Transparent type illuminator



Bicolor illuminator



Specifications of the LED illuminator for transparent type water level gauges

LED Service Life	50,000 hours (estimated)
Power Consumption	5W
Ambient Temperature	Usable at 60°C or lower
Anti-Shock Capability	Strong
Heating Value	Zero
Indication Color	Green (unchanged from earlier color)
Materials	Steel plate (SECC) (unchanged)

Note: The LED illuminator supports all types of water level gauges.

Long service life!!

Approximately 25-times longer service life than conventional light bulb types.

PREVIOUS MODEL	3 months (approx. 2,000 hours)
NEW MODEL	New model More than 5 years (approx. 50,000 hours)

Power saving!!

Power consumption approximately 1/20 that of conventional light bulb types.

PREVIOUS MODEL	100W (clear type)
NEW MODEL	Power consumption reduced to less than 5W

Space saving!!

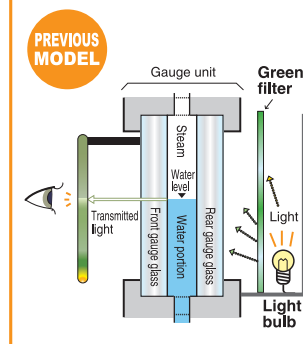
Compact configuration (depth reduced by up to 50%), lets new gauge be installed virtually anywhere.

PREVIOUS MODEL	100W (clear type)
NEW MODEL	New model: Bulb sockets eliminated.

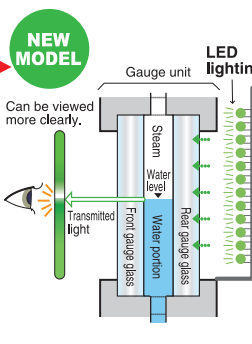
Illuminator

Transparent type illuminator

Conventional Bulb Type

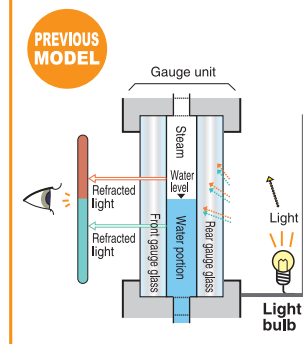


New LED Type

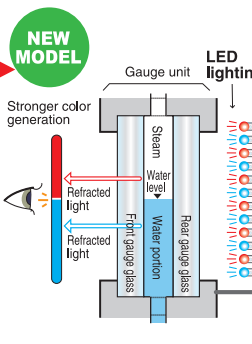


Bicolor illuminator

Conventional Bulb Type



New LED Type



Cook and Valve

Gauge Valves
LED Illuminator

Related Products

OBK Piston Valves
(Y-shaped blow valve)

Models
SCPH-2-made unit,
FCD-made unit and
FC200-made unit

The Y-shaped blow valve’s simple “valve ring” construction resists leakage while ensuring maximum maintenance ease. These are used by a great many customers as blow valves for boilers.

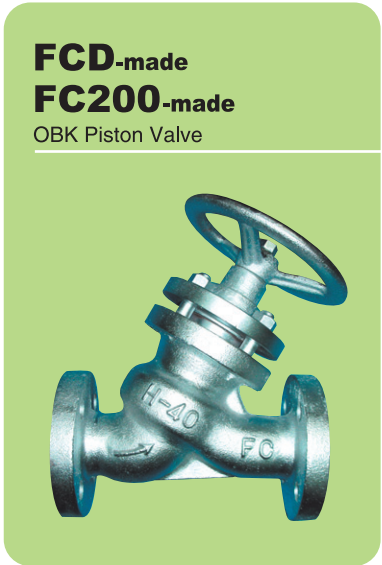
Product Features

- No valve disks or seats used that are prone to wear**
In conventional valves, such important parts as valve discs and seats tend to easily sustain damage and require refitting or replacement. Sawada’s Y-shaped blow valve features “valve ring” construction that frees it from of such troubles.
- Economical, as valves can be used for long periods of time.**
When the valve ring loses its elasticity, it must be replaced. This is the only service part. In addition, since the valve itself features superb durability and long service life, besides minimizing fluid loss, it is highly economical.
- Excellent sealing construction**
The Y-shaped blow valve’s straight stainless steel piston corresponds to a conventional valve’s valve disk, and is highly resistant to corrosion and wear for stable operation over long term use. Its upper valve ring corresponds to a “gland packing,” while its lower valve ring corresponds to a valve seat. The wide cylindrical contact area of this piston and rings design helps maintain excellent sealing properties.
- Leakage can be stopped instantly with additional tightening**
Valve rings may leak after long periods of use or if damaged. In this case, upper and lower sealing can be restored by slightly tightening the stud bolt nuts holding the valve together, thus stopping the leakage. These nuts can be tightened several times.

SCPH-2-made
OBK Piston Valve



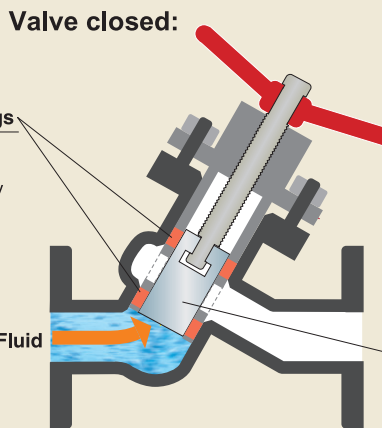
FCD-made
FC200-made
OBK Piston Valve



Valve operation illustration

Note!!
Only one service part

Valve closed:



Valve rings

- Since valve rings are the only service parts, the valve itself provides high durability and longer service life.
- Maintenance requires little time, assuring economical use.
- Wide cylindrical contact area ensures excellent sealing properties.

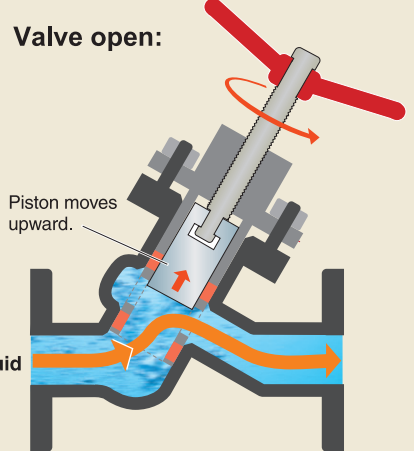
Fluid

Note!!
Long life

Nut tightening
Even in the case of corrosion or damage, additional tightening of the assembly nuts restores the conditions of both the upper and lower packing rings.

Piston
Stainless steel construction resists corrosion and damage.

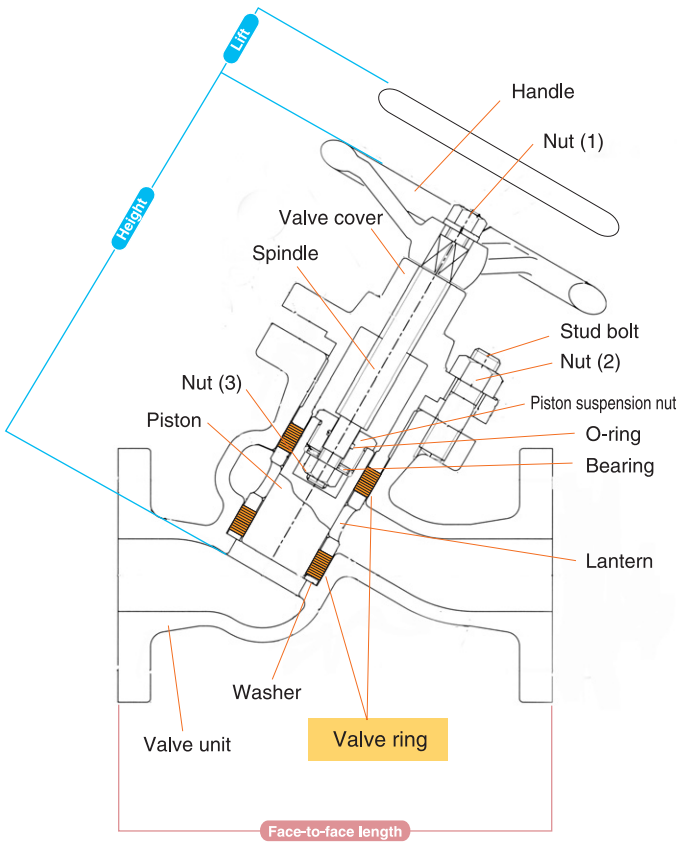
Valve open:



Piston moves upward.

Fluid

Cross-Section



Flange Size

Material	Flange size	
	Rating	Size
FC200	JIS10K	20~50A
FCD450	JIS20K	25A/40A
SCPH-2	JIS20K JIS30K	25~50A

Piston Valve Dimensions

Unit: mm

Nominal diameter	Face-to-face length*				Height	Lift
	FC200	FCD450	SCPH-2			
			20K	30K		
20A	140	-	-	-	150	30
25A	160	160	160	165	172	30
32A	220	-	220	220	185	38
40A	240	240	240	250	230	50
50A	250(280)	-	250	260	345	55

Note: Face-to-face length can be changed depending on the purpose of use. Please contact your Sawada dealer.

Replacement Parts

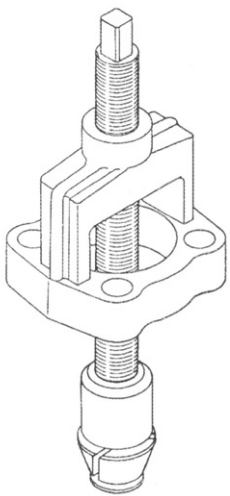
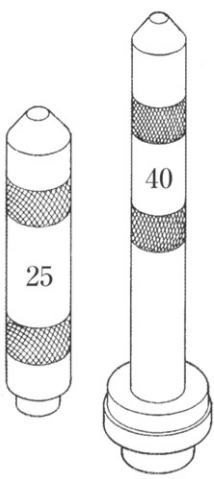
Valve Ring



Valve Ring Replacement Tools

Valve ring insertion tool

Valve ring extraction tool



Related Products

Parts

Gauge Glass

Water Level Gauge Compatible Type

Reflex Gauge

Used mainly for low-pressure water level gauges.

Used for relatively high pressure water level gauges.

Gauge Glass Types and Accessories

Gauge glass product name

SAWA DYLEX KG-100

SAWA DYLEX KG-300



Cushion packing
Gauge glass
Gasket

Unit: mm

Glass No.	0B	1B	2B	3B	4B	5B	6B	7B	300B	8B	9B	400B	500B
Length	90	115	140	165	190	220	250	280	300	320	340	400	500
JIS No.	-	-	-	B165	B190	B220	B250	B280	-	B320	B340	-	-
W x T	34mm × 17mm												

Note: Gauge glass dimensions conform with Japanese JIS B8211 safety standards.



OBK gauge glass comes packaged as shown at right.

Bicolor gauge glass

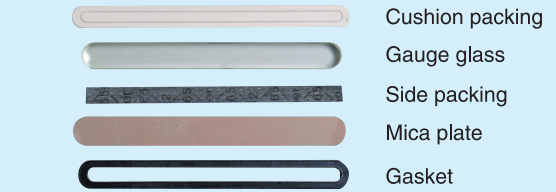
Low-pressure type

Exclusively used for RGB, RGC

Gauge glass cross-sectional shape: Parallelogram

Gauge glass product name

SAWA DYLEX WG-100



Cushion packing
Gauge glass
Side packing
Mica plate
Gasket

Unit: mm

Glass No.	5Pc	6Pc	7Pc	8Pc	9Pc
Length	220	250	280	320	340
W x T	25mm × 17mm				

Transparent gauge glass

Low- and Medium-Pressure Type

T-10, T-20, TVB

TVC, TVD

Bicolor gauge glass

Low- and Medium-Pressure Type

RGC-2, RGD

Gauge glass product name

SAWA DYLEX WG-100

SAWA DYLEX WG-300



Cushion packing
Gauge glass
Mica plate
Gasket

Unit: mm

Glass No.	3B	4B	5B	6B	7B	300B	8B	9B	400B
Length	165	190	220	250	280	300	320	340	400
JIS No.	PA165	PA190	PA220	PA250	PA280	-	PA320	PA340	-
W x T	34mm × 17mm								

Note: Gauge glass dimensions conform with Japanese JIS B8211 safety standards.

Transparent gauge glass

High-pressure type

TVD-HL

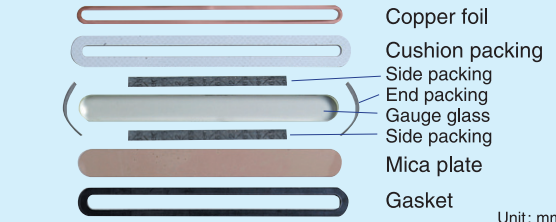
Bicolor gauge glass

High-pressure type

RGD-HL

Gauge glass product name

SAWA DYLEX WG-300



Copper foil
Cushion packing
Side packing
End packing
Gauge glass
Side packing
Mica plate
Gasket

Unit: mm

Glass No.	HL-5	HL-6	HL-7	HL-8	HL-9
Length	240	265	285	305	325
JIS No.	-	Pa265	-	Pa305	Pa325
W x T	22mm × 17mm				

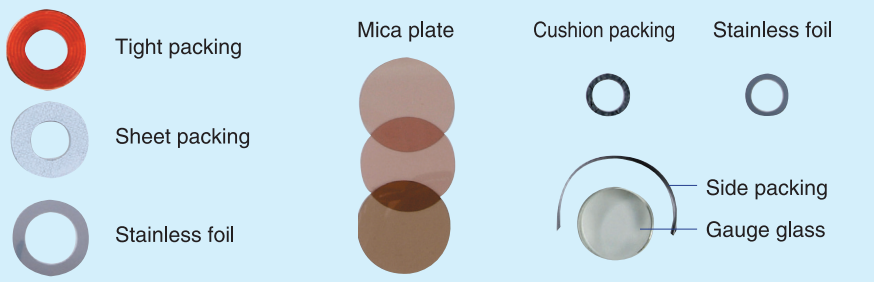
Note: Gauge glass dimensions conform with Japanese JIS B8211 safety standards.

Bicolor gauge glass

Extreme high-pressure type

Multi-port type

RG-200N, RG-200NH



Tight packing
Sheet packing
Stainless foil
Mica plate
Cushion packing
Stainless foil
Side packing
Gauge glass

Gauge Glass Tube

Water Level Gauge Compatible Type

Tubular Gauge

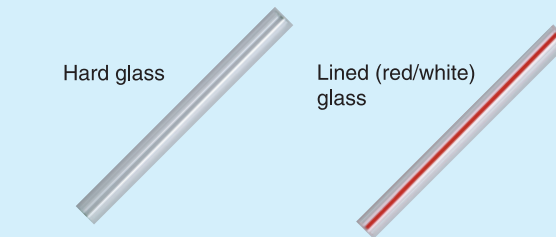
Gauge Cock & Gauge Valve Types

KS10-N, KS10-NV, KS35, H-10, PV-19, and PP-19

Gauge Glass Tube Types and Accessories

Gauge Glass Tube Material

Hard glass
Pyrex glass
Lined (red/white) glass
Resin tube



Hard glass
Lined (red/white) glass

Model	Gauge Valve KS10-N	Gauge Valve KS35
External Dimensions	φ 19	φ 25
Wall Thickness	3t	3t
Gland Packing	Inside diameter: φ 19	Inside diameter: φ 25

Other Parts

Gland packing and Sleeve packing



Gland packing
Sleeve packing

	KS15	KS20	KS9S	KS4-L	KS-N
For lead pipe	Inside dia.: φ 16	Inside dia.: φ 16	Inside dia.: φ 16	-	-
For Spindle	Inside dia.: φ 16	Inside dia.: φ 10	Inside dia.: φ 14	Inside dia.: φ 14	Inside dia.: φ 25

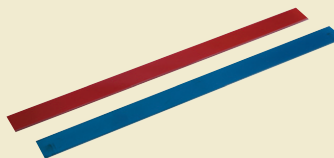
Sleeve packing AB/18
Inside dia.: φ 18

Transparent Water Level Gauge Filter Glass (For Illuminator)



	T-10, TVZ				T-20				TVB, TVC, TVD				TVD-HL				
Glass No.	6B	7B	8B	9B	6B	7B	8B	9B	6B	7B	8B	9B	240	265	285	305	325
Filter Glass Length	245	275	315	335	250	280	320	340	270	300	340	360	280	300	320	340	360
Filter Glass Width	30				30				45(TVB) / 55(TVC) / 65(TVD)				55				

Bicolor Water Gauge Filter Glass (For Illuminator)



	RGB, RGC				RGC-2, RGD				RGD-HL				
Glass No.	6PC	7PC	8PC	9PC	6B	7B	8B	9B	240	265	285	305	325
Filter Glass Length	260	290	330	350	260	290	310	350	260	290	310	330	350