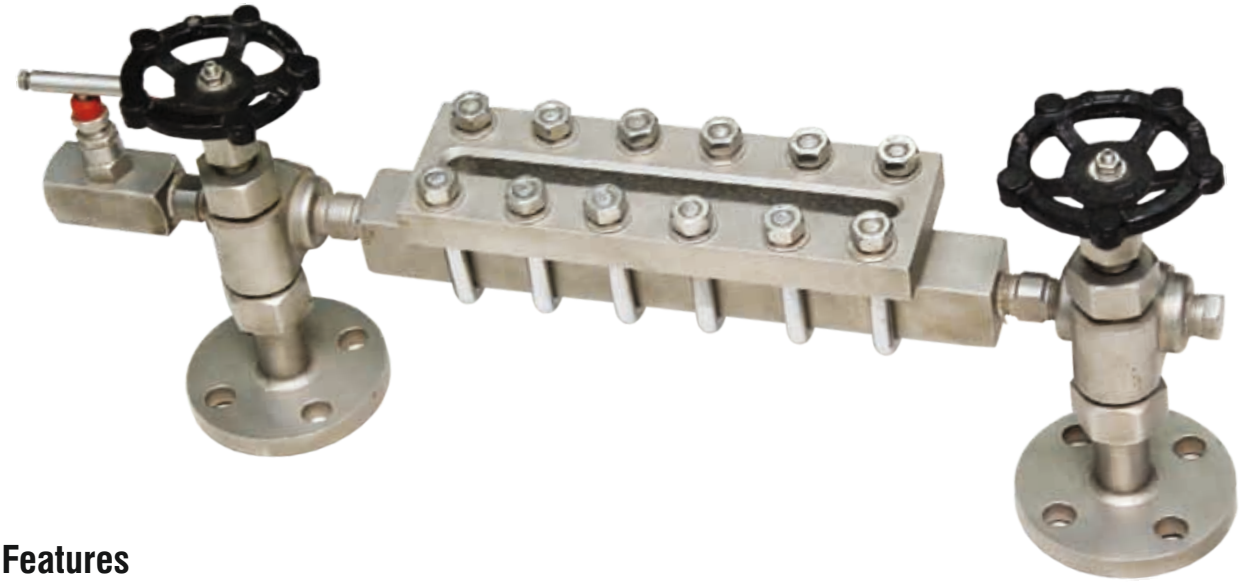
General
LEVEL DIVISION

TDSRLG2010
Reflex Level Gauges



Features

- Reflex level guage applicable upto 200 kg and upto 400 deg cent
- Cryo applications upto -196deg cent
- Toughened borosilicate glass with serrations
- For applicability in critical, acidic, cryo and temperature zone
- IBR certified device available
- NACE, H2S service compatibility applicable
- Non frost extension
- Heat tracing available
- Level 1 radiographed body available
- Helium leak test proved design @ 10(-7) mbarlt/sec
- Viscous media (max upto 380 cst and upto 100 deg cent) besides other acidic, non acidic, steam water media
- CE applicability
- Applicable for refinery, petrochemical, chemical, power, radioactive, fertilizer, food, pharma, metal industry applications

Concept and Principle of operation

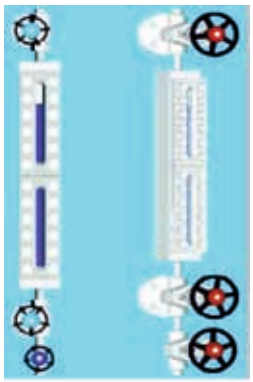
Liquid Level Gauge provides direct observation of liquid level in a tank/vessel rising and falling level of the liquid inside the tank/vessel can be observed through the glass assembled in the gauge.

Reflex Liquid Level Gauges use the R-form sight glasses. One side surface of Reflex Glass to use flat glass has several grooves for reflecting prism. The principle of the Reflex Glass is based on the difference in the refractive indices of liquid and gas or in particular of water and steam. Liquid level shows conspicuously dark hard color fro liquid space and light white color for empty space. These Reflex series are not used with a mica shield. The Reflex Gauge is assembled firmly with gasket, reflex glass, cushion gasket and gauge cover on the body by U-bolts.

Reflex Liquid Level Gauges, designed and built for a wide range of high temperature and high pressure applications. Our reflex level gauge is used to make, besides other applications include observation of the level of corrosion-proof and chromatic liquids. The most advantage of this type is for easy level reading of boiling liquids. When liquids are boiling, their bubbles make the surface level indistinct. The manual adjustment of isolation valve at the input of the media entering the chamber reduces the bubbling. Therefore the level gauge ease to read the level or bubbling liquids. It also provides advantages for highly dense and viscous liquids, as the body is made of forged construction only.

This level gauge is designed and manufactured for easy and accurate reading the liquid level of highly foamy liquids. The gauge has a relatively spacious internal area where foamy liquid is held from forming foams.

Sealing gaskets, Cushions and Glasses

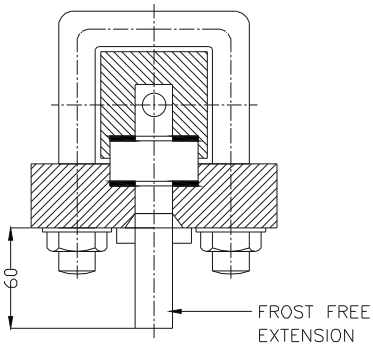


Sealing gaskets and cushions for tight sealing at rated pressure and temperature. Tight sealing PTFE with glass inserted, GFT and SS316 impregnated in graphite are the special features of the gaskets General Instruments Consortium provides.

Special Application

If a conventional level gauge is used for extreme low temperature applications, it becomes difficult to observe the level of liquid as the gauge front tends to freeze. To get rid of this problem, an acrylic non-frosting plate is mounted in front of the gauge. So the observation of the liquid level is much easier this way.

Our Non-Frosting Reflex Level Gauges are classified depending on the process temperature, the height of the non-frosting plate window may be selected from 80 to 250 mm.



Reflex

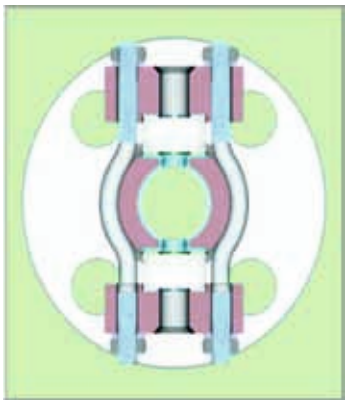
Special Application

For a jacket type requirement application . This gauge is used to read the level of high congealable or ebullient liquids. The principle is to inflow a steam for congealable liquids and a cold water for enbullient liquids through the inside of the jacket to ensure accurate and reliable level observation.

This type is used for observing the fluid by changing it into state of liquid after heating or cooling it through jacket according to fluid's features. Our standard is that the inlet of the jacket for steam or cold water is ½" NPT(M) and or 15 NB flange . Others are available on request.

Special Application

More severe demands may often be required on liquid level gauges in terms of resistance to corrosion, and this is accomplished by lining or coating all wetted parts. The most important aspect of this process is the preparation of the metal substrate.



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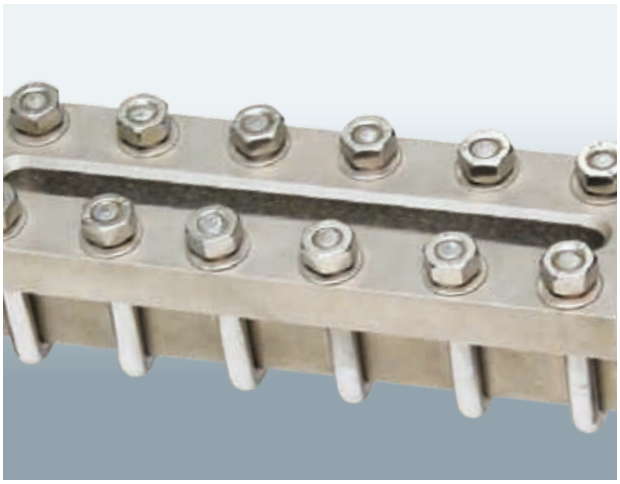
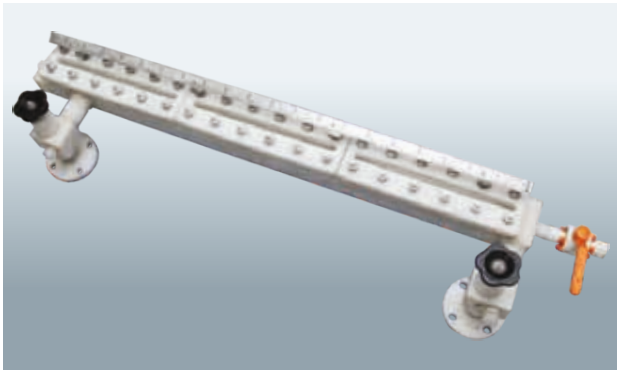
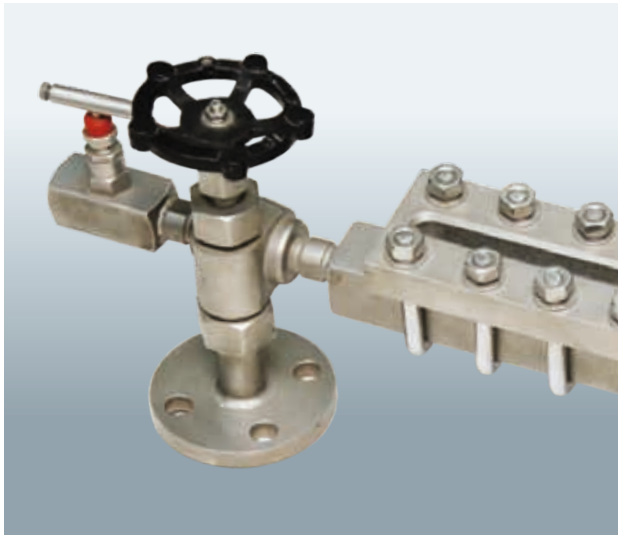


High tensile U Bolts to handle high pressure upto 200kg working pressure and high temperature upto 320 deg cent application



Reflex level gauge at 150# rating at 125 deg cent and FF end connection with auto ball check valve and drain valves in Polypropylene material



Needle, ball and globe valves upto 1500# at various applicable material suitable to pressure and temperature and media all in forged construction and IBR approved

Technical Specifications: Table-1 Material of Construction

Type	Reflex
Liquid Chamber	Carbon steel, SS304, SS304L, SS316, SS316L, Monel, Titanium, Inconnel 600, Hastealloy C, PolyPropylene, others on request, subject to Pressure and temperature condition
Cover plate	Carbon steel, SS304, SS304L, SS316, SS316L, Monel, Titanium, Inconnel 600, Hastealloy C, PolyPropylene
Cushion	CAF, PTFE
Gasket	CAF, PTFE, Grafoil
Fastners	SS, ASTM A 193 Gr B7
Scale	Alluminium and SS engraved in mm
Glass	Klinger/Illmadur applicable till 320 deg cent as per DIN 7080/7081, BS 3463, JIS B 8211, Toughened Borosilicate glass

Technical Specifications: Table-2 Technical data

Borosilicate glass	Upto 400 deg cent
Toughened glass	Upto 150 deg cent
Glass thickness	17 mm
Glass width	30 mm
Glass dimensions type	250 mm and 340 mm
Operating pressure applicable as input	100 kg, higher depending on temp
Shell test applicable, pressure	200 kg at 20 deg cent
Shell test applicable, temperature	Max 400 deg cent depending on selected MOC
Cryo applicability applicable (non frost at the glass)	Max upto 200 kg and upto -194 deg cent
Cushion and gasket thickness	1.5 mm applicable for -194 deg cent to upto 400 deg cent against suitable MOC
Centre to centre distance	Max upto 3000 mm applicable with desired accuracy and visibility
Vent /drain	½" plugged / ½" needle valve / ½" ball valve /1/2" globe valve
Process connection	15 to 50 mm flanged / upto 25mm screwed / socket weld and others on request

Technical Specifications: Table-3 Temp rating and dimensions of non-frosting plates

Temperature °C	0…-20	-21…-45	-46…-100	-101…-160	-161…-200
Recommended Materials	LTCS	LTCS	304SS	316SS	316LSS
Acrylic Height mm	80	100	150	200	250

Technical Specifications: Table-4 Visible Length According to Sections

Sr. No.	Visible Length (of level gauge) in mm	No. of Sections VI (glass length = 250 mm)	No. of Sections IX (glass length = 340 mm)
1	230	1	0
2	320	0	1
3	495	2	0
4	585	1	1
5	675	0	2
6	760	3	0
7	850	2	1
8	940	1	2
9	1030	0	3
10	1115	3	1
11	1205	2	2
12	1295	1	3
13	1385	0	4
14	1470	3	2
15	1560	2	3
16	1650	1	4
17	1740	0	5
18	1825	3	3
19	1915	2	4
20	2005	1	5
21	2095	0	6
22	2180	3	4
23	2270	2	5
24	2355	5	3
25	2445	4	4
26	2535	3	5
27	2625	2	6
28	2715	1	7
29	2805	0	8
30	2890	3	6
31	2980	2	7

Technical Specifications: Table-5 Indicative weights in kgs

Transparent level guage visible length in mm	With isolation valve (upto 1" RF flange) and with handle with drain and vent plug (upto 300# body)	With isolation valve (upto 1" RF flange) and with handle with drain and vent plug (600# body)	With isolation valve (upto 1" input) and with handle with drain and vent plug (900# & 1500# body)	Add on for heating jacket	Add on for frost extension	Add on for ball valve replacing the drain & vent plug
320	13	20	38	1	0.5	2
585	23	35	63	2	1	2
1030	48	72	120	3	1.5	2
1915	70	110	On request	5	2.5	2
2980	120	On request	On request	9	4.5	2

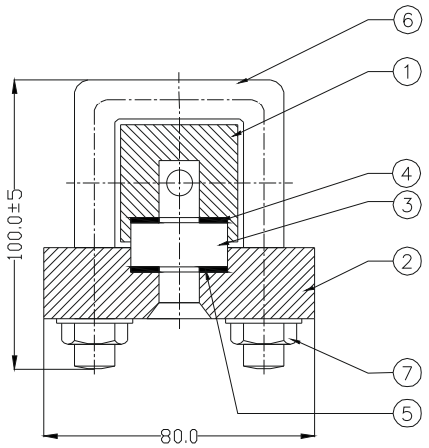
Construction and dimensional cross sectional overview

The gauge consists of a body having machined to have a liquid where high temperature are liable to occur, the glass is toughened borosilicate glasses are used. These reflex gauges preferably used for reservoir tanks that require a relatively long visible length by constructing the supporter.

The reflex level gauge is assembled firmly with gasket, reflex glass, cushion gasket and gauge cover on the body by U bolts.

The most advantage of this type is that it has no invisible sections (dead band). Our standard overlapped section is 10 mm as minimum and the gauge is so designed that supporting brackets can be equipped to protect a long multiple connected gauge from distortion of fall down. The scale plate to mount alongside the gauge may be available on request by customers to observe the liquid level more accurately.

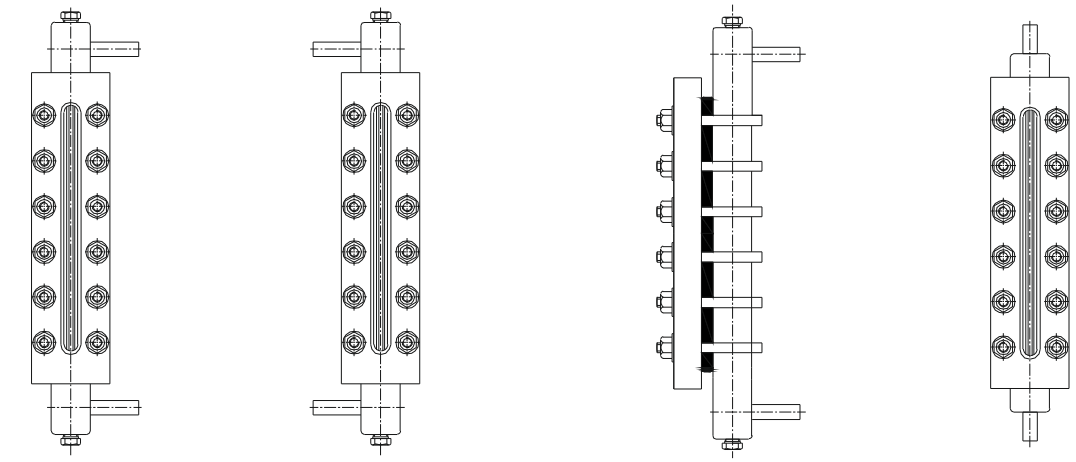
The gauge is used with a special reflex type gauge glass which has wider V-shaped refractive grove and red coating on the outside of the glass. It provides a clear observation of liquid level because of made refracting red colour on th V-groove for steam or beyond portion of the level and it's colour of fluid itself for liquid portions.



1 LIQUID CHAMBER
2 COVER PLATE
3 REFLEX GLASS
4 GASKET
5 CUSHION
6 "U" BOLT
7 NUTS & WASHER

Reflex

Process Orientation



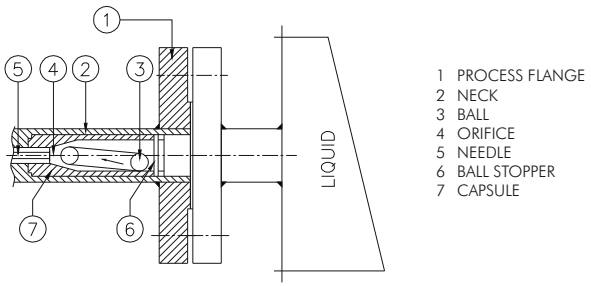
Side/Side (Left) | Side/Side (Right) | Side/Side (Back) | Top/Bottom

Orientation of Process Connection

Process Orientation

Transparent Gauges manufactured by GIC will provide at ease the orientation as per your convenience to have the maximum visibility with respect to process changes i.e. level, isolation valve settings, whether any kind of leakages, leakages through plugs for vent and drain, settings for needle/ball valves.

All orientations at your process suitability with optimum results



Auto Ball check arrangement for suitability on level optimization/leakage

Isolation Valve

Bolted and screwed bonnet offset construction to attain device durability, high stability, low hysteresis, high leakage class, bolted bonnet construction for high temperature and pressure, all construction in forged only with the best level 1 radiographed and attain high leakage class of 10(-5) mbar lt/sec.

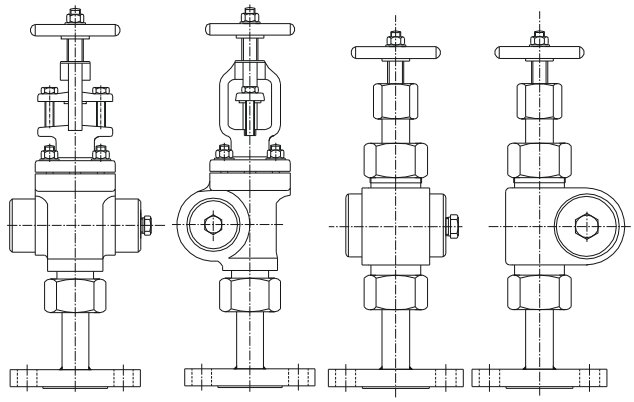
Screwed connection for low temperature and pressure with full forged construction and with best of level 1 radiography and attain high leakage sealing class of 10(-4) mbar lt/sec.

Ordering information

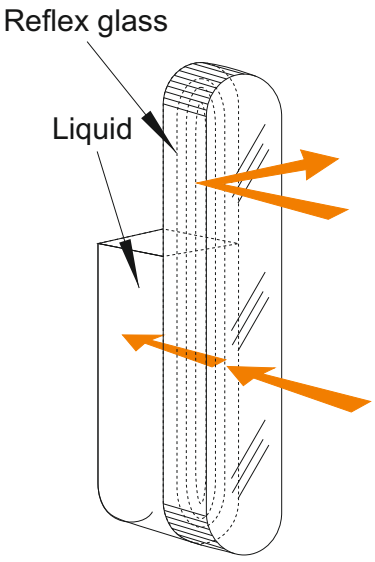
We require for a complete level solution the following data:

- The pressure
- The temperature
- The density
- The viscosity
- The level that you need to measure
- The media name
- The media colour in normal eye

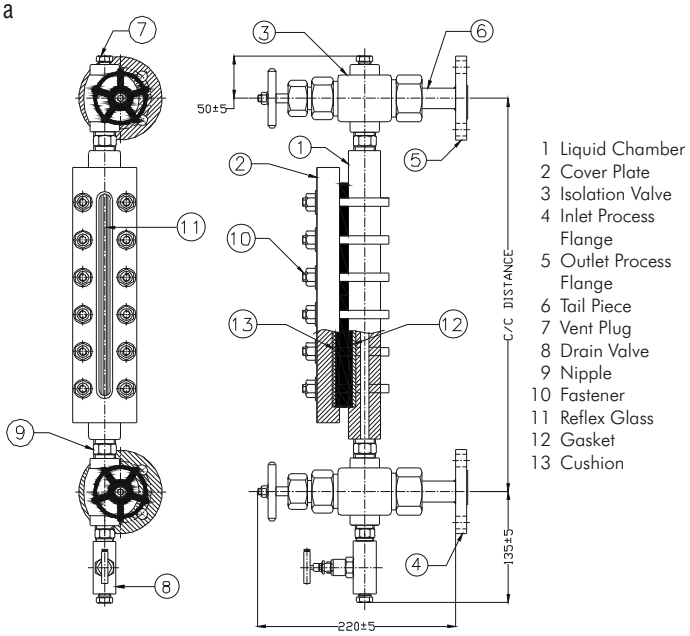
Rest leave it us for an engineering sizing and selection to provide a optimum level gauge.



Isolation Valve



Principle of reflex level glass



Reflex

Basic GA drawing indicating the top bottom design with CCD interface with visible length. The distance between coverplate and bolted bonnet offset construction is 70mm and that of screwed bonnet is 80 mm. The glass edge is approx 8mm more in each case against the isolation valve in top bottom design

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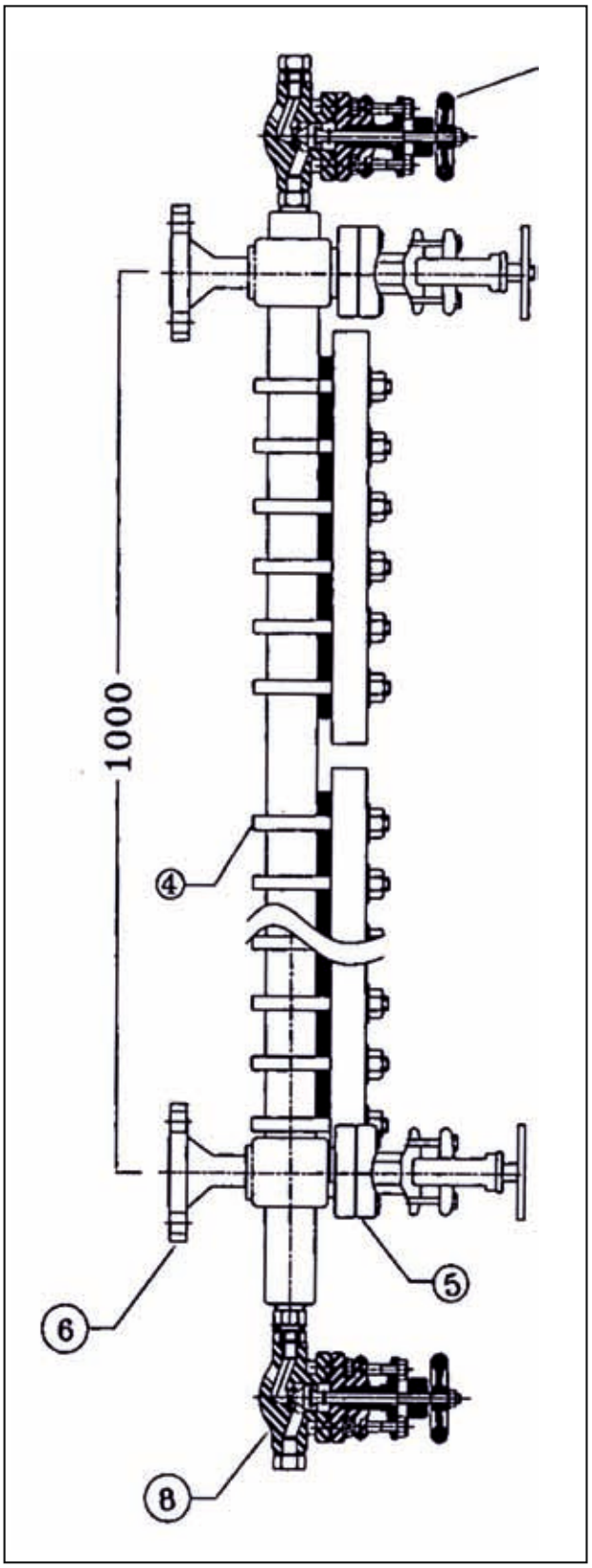

Level gauge for SS316 forged construction at 600# rating for oil and gas application with PTFE with glass sealing arrangement with forged vent and drain valves

Hydro test bench and calibration test bench applicable with helium leak test for gauges for perfect tight sealing feature

Ordering Information

RLG-TBV-1000-25F150-CCC-LCC-SPP-AL-NA-Z

	-		-		-		-				-				-	Z

Type of Level Gauge	
RLG	Reflex Level Gauge

Orientation of Process Connection	
TBV	Top - Bottom Vertical (Partial Visibility)
SSR	Side - Side Right (Full Visibility)
SSL	Side - Side Left (Full Visibility)
SSB	Side - Side Back (Full Visibility) Applicable only for RLG

Centre to Centre Distance	
1000	Indicate the required Centre to Centre Distance in mm.

Process Connection				
Flanged Connection				
Code	Size	Code	Code	Size
15	½”	F	150	150#RF
20	¾”		300	300#RF
25	1”		600	600#RF
40	1½		900	900#RF
50	2”		1500	1500#RF
Screwed Connection				
Code	Size	Code	Threading Type	
½”	½”	S	NPTM	
¾”	¾”		BSPM	
1”	1”		NPTF	
1½”	1½”		BSPF	

MOC of Liquid Chamber			
C	CS	PP	Polypropylene
S4	SS 304	M	Monel
S4L	SS 304L	T	Titanium
S6	SS 316	I	Inconel 600
S6L	SS 316L	H	Hastelloy ‘C’

MOC of Cover Plate			
C	CS	PP	Polypropylene
S4	SS 304	M	Monel
S4L	SS 304L	T	Titanium
S6	SS 316	I	Inconel 600
S6L	SS 316L	H	Hastelloy ‘C’

Special Features	
NF	Non – Frost Extension
HJ	Heating Jacket
MS	Mica Shield (For TLG only)
IW5	Illuminator-Weatherproof IP - 65
IW7	Illuminator-Weatherproof IP - 67
IFA	Illuminator-Flameproof Gr. IIA/IIB
IFC	Illuminator-Flameproof Gr. IIC
IC	IBR Certification
NA	Not Applicable

Calibrated Scale	
AL	Aluminium
SS	SS

Drain	
P	½” NPT F, ¾” NPT F
N	½” Needle Valve
B	½” Ball Valve

Vent	
P	½” NPT F, ¾” NPT F
N	½” Needle Valve
B	½” Ball Valve

Isolation Valves	
S	Screwed Bonnet Offset Construction
B	Bolted Bonnet Offset Construction
N	Without Isolation Valves

Gasket	
C	C.A.F.
P	P.T.F.E.
G	Graphoil

Cushion	
C	C.A.F.
P	P.T.F.E.
G	Graphoil

Toughened Borosilicate Glass	
L	Indigenous
F	Klinger / Illmadur make or equivalent

Fasteners	
C	ASTM A 193 Gr. B7 / ASTM A 194 Gr. 2H
S	SS