

Reflex Level Gauges

General

Features

- Reflex level gauge applicable upto 200 kg/cm² and upto 400 deg cent
- Cryo applications upto -196 deg 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
- 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 colour for liquid space and light white colour 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.

Technical Specifications: Technical Data

Type of Gauge	a) Low Pressure - 30kg/cm ² b) Medium Pressure - 100kg/cm ² c) High Pressure - 200kg/cm ²
Mounting Orientation	Top - Bottom Vertical Side - Side Right Side - Side Left Side - Side Back (Right/Left)
Temperature	Upto 400°C
CCD	Max. upto 3000mm
Liquid Chamber	In forged construction: Carbon steel, SS304, SS304L, SS316, SS316L, Monel, Titanium, Inconel 600, Hastelloy C, PolyPropylene, Other on request (Subject to pressure & Temperature Condition)
Cover Plate	In forged construction: Carbon steel, SS304, SS304L, SS316, SS316L, Monel, Titanium, Inconel 600, Hastelloy C, PolyPropylene
Cushion	CAF, PTFE, Grafoil with SS prignated
Gasket	CAF, PTFE, Grafoil with SS prignated
Fastner	SS, ASTM A 193 Gr B7 / A194 Gr 2H / Anodized Aluminium (for PP moc)

Reflex Level Gauges



Technical Specifications: Table-1 Technical Data

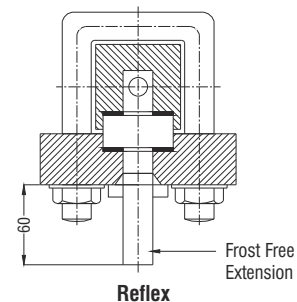
Scale	Aluminium anticorrosion powder coated and SS engraved in mm
Glass	Applicable till 320°C as per DIN 708 / 7081, BS 3463, JS B 8211, Toughened Borosilicate glass
Process Connection	Screwed / Flanged / Socket Weld and other on request.
Isolation Valve	Auto Ball Check Valve a) Screwed Bonnet offset construction suitable upto 50 kg/cm ² b) Bolted Bonnet offset construction suitable above 50 kg/cm ² c) Material Construction as per wetted part
Vent	1/2" Plugged / 1/2" Needle Valve / 1/2" Ball Valve / 1/2" Globe Valve / 1/2" Gate Valve
Drain	1/2" Plugged / 1/2" Needle Valve / 1/2" Ball Valve / 1/2" Globe Valve / 1/2" Gate Valve
Optional	a) Non-Frost Extension for extreme low temperature application b) Heating Jacket - to read the level of high congelable or ebullient liquid c) IBR Certification

Special Application

Cryo 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, they height of the non-frosting plate window may be selected from 80 to 250 mm.



Technical Specifications: 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

Jacket Type

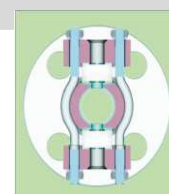
For a jacket type requirement application. This gauge is used to read the level of high congelable or ebullient liquids. The principle is to inflow a steam for congelable liquids and a cold water for ebullient liquids through the inside of the jacket to ensure accurate and reliable level observation.

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 1/2" NPT(M) and or 15 NB flange. Others are available on request.



Corrosion 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.



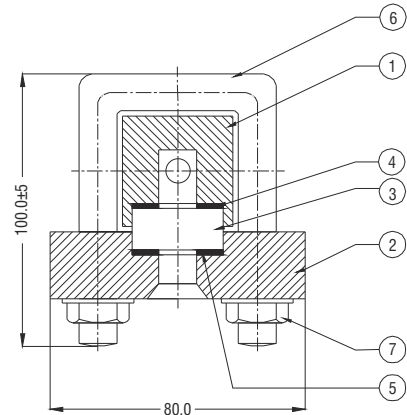
Construction and dimensional cross sectional overview

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.

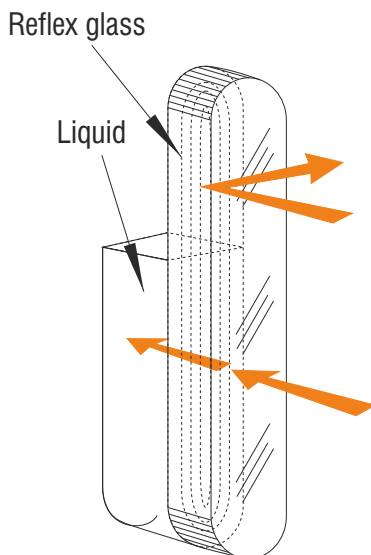
The most advantage of this type is that it has no invisible sections (dead band). Our standard overlapped section is 10 mm as minimum and the gauge is so designed that supporting brackets can be equipped to protect a long multiple connected gauge from distortion or fall down. The scale plate to mount 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 groove 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.

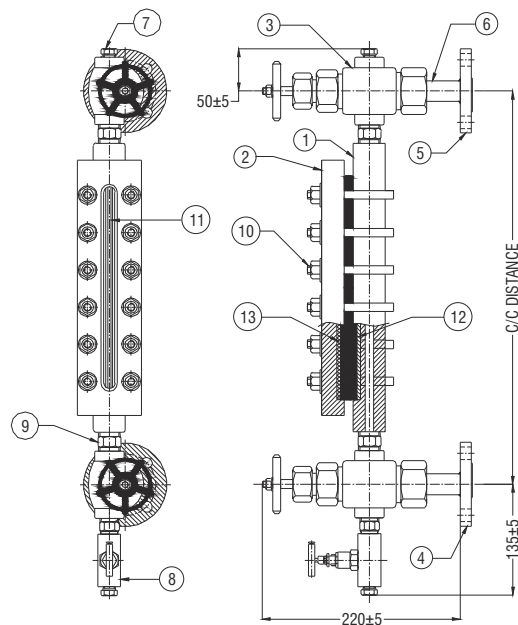


Reflex

- 1 Liquid Chamber
- 2 Cover Plate
- 3 Reflex Glass
- 4 Gasket
- 5 Cushion
- 6 "u" Bolt
- 7 Nuts & Washer



Principle of reflex level glass



Reflex

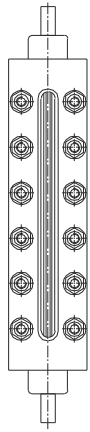
- 1 Liquid Chamber
- 2 Cover Plate
- 3 Isolation Valve
- 4 Inlet Process Flange
- 5 Outlet Process Flange
- 6 Tail Piece
- 7 Vent Plug
- 8 Drain Valve
- 9 Nipple
- 10 Fastener
- 11 Reflex Glass
- 12 Gasket
- 13 Cushion

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

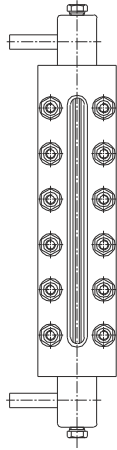
Reflex Level Gauges



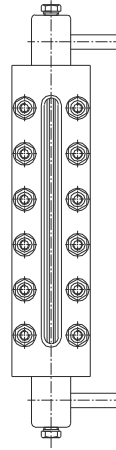
Process Orientation



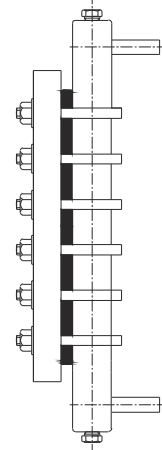
Top/Bottom



Side/Side (Right)



Side/Side-Left



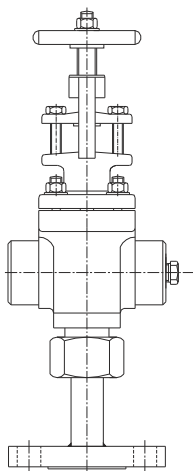
Side/Side-Back (Left/Right)

Orientation of Process Connection

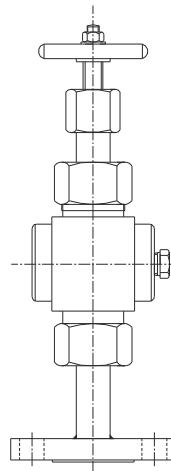
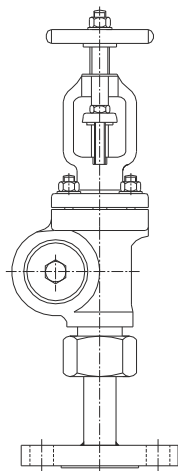
Isolation Valve

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.

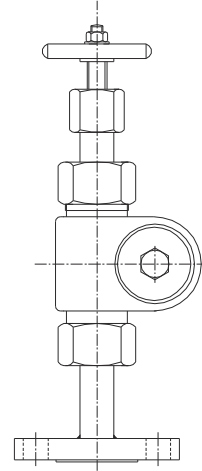
Screwed connection for low temperature and pressure with full forged construction and with best of level 1 radiography and attain high leakage sealing class of 10(-4) mbar lt/sec.



Bolted Bonnet



Screwed Bonnet



Isolation Valve

Ordering Information

RLG AA-TL-1000-F03-ZE-VD-WD-VW-WW-XW-UW-QU-RU-SO-Z



Type	
AA	Low Pressure - 30kg/cm ²
AB	Medium Pressure - 85kg/cm ²
AC	High Pressure - 165kg/cm ²
AD	Very High Pressure - 200kg/cm ²

Orientation of Process Connection	
TK	Top-Bottom Vertical (Partial Visibility)
TL	Side-Side Right (Full Visibility)
TM	Side-Side Left (Full Visibility)
TN	Side-Side Back (Right/Left)

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

Process Connection			
Flanged Connection			
F01	1/2", 150# RF	F11	1", 300# RF
F02	3/4", 150# RF	F12	1.5", 300# RF
F03	1", 150# RF	F13	2", 300# RF
F04	1.5", 150# RF	F19	1", 600# RF
F05	2", 150# RF	F20	1.5", 600# RF
F09	1/2", 300# RF	F21	2", 600# RF
F10	3/4", 300# RF	XX	Any Other*
Threaded Connection			
B04	1/2"BSP (M)	N04	1/2"NPT (M)
B05	3/4"BSP (M)	N05	3/4"NPT (M)
B06	1"BSP (M)	N06	1"NPT (M)
B07	1.5"BSP (M)	N07	1.5"NPT (M)
B08	2"BSP (M)	N08	2"NPT (M)
XX	Any Other*		

MOC of Connection			
ZA	CS (A105)	ZJ	Monel 400
ZB	CS (A106)	ZK	Monel 500
ZC	SS 304	ZL	Titanium
ZD	SS 304L	ZM	Hastelloy 'B'
ZE	SS 316	ZN	Hastelloy 'C'
ZF	SS 316L	ZO	Inconel 600
ZI	PP	XX	Any Other*

MOC of Chamber			
VA	CS	VG	Monel 400
VB	SS 304	VH	Monel 500
VC	SS 304L	VI	Titanium
VD	SS 316	VJ	Hastelloy 'B'
VE	SS 316L	VK	Hastelloy 'C'
VF	PP	VL	Inconel 600
XX	Any Other*		

Optional	
NF	Non-frost Extension
HJ	Heating Jacket
XX	Any Other*
Z	NIL

Calibration Scale	
SO	Aluminium with Powder coat
SP	Aluminium
SQ	SS304
SR	SS316
SS	Acrylic

Drain			
RU	1/2" NPT (F), Plug	RX	1/2" Ball Valve
RV	3/4" NPT (F), Plug	RY	1/2" Gate Valve
RW	1/2" Needle Valve	RZ	1/2" Globe Valve

Vent			
QU	1/2" NPT (F), Plug	WX	1/2" Ball Valve
QV	3/4" NPT (F), Plug	QY	1/2" Gate Valve
QW	1/2" Needle Valve	QZ	1/2" Globe Valve

Isolation Valve	
UW	Screwed Bonnet Offset Construction
UX	Bolted Bonnet Offset Construction
UY	Nipple
UZ	Needle Valve

Gasket	
XW	C.A.F.
XX	P.T.F.E.
XY	Graphoil
Cusion	
WW	C.A.F.
WX	P.T.F.E.
WY	Graphoil

Fasteners	
VV	ASTM A 193 Gr. B7 / ASTM A 194 Gr. 2H
VW	SS
VX	Anodized Aluminium
VY	CS Plated

MOC of Cover Plate			
WA	CS	WG	Monel 400
WB	SS 304	WH	Monel 500
WC	SS 304L	WI	Titanium
WD	SS 316	WJ	Hastelloy 'B'
WE	SS 316L	WK	Hastelloy 'C'
WF	PP	WL	Inconel 600

Note: * Please consult factory