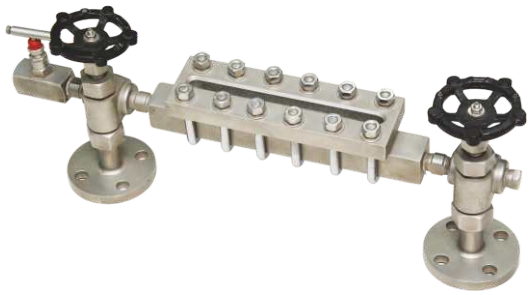
Reflex Level Gauges

Features

- Reflex level guage applicable upto 200 kg/cm^2 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^{0}C
CCD	Max. upto 3000mm
Liquid Chamber	In forged construction: Carbon steel, SS304, SS304L, SS316, SS316L, Monel, Titanium, Inconnel 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, Inconnel 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

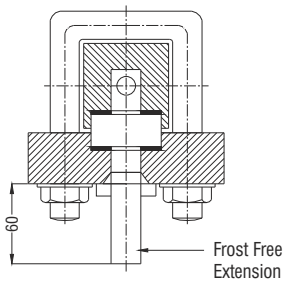
Scale	Aluminium anticorossion powder coated and SS engraved in mm
Glass	Applicable till 320°C as per DIN 708 / 7081, BS 3463, JS B 8211, Toughened Borosilicate glass
Process Connection	Screwed / Flanged / Socket Weld and other on request.
Isolation Valve	Auto Ball Check Valve a) Screwed Bonnet offset 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	½" Plugged / ½" Needle Valve / ½" Ball Valve / ½" Globe Valve / ½" Gate Valve
Drain	½" Plugged / ½" Needle Valve / ½" Ball Valve / ½" Globe Valve / ½" 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.



Reflex

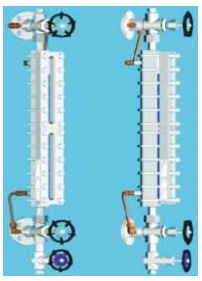
Technical Specifications: Temp rating and dimensions of non-frosting plates

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

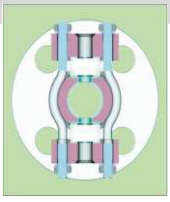
For a jacket type requirement application. This gauge is used to read the level of high congeal able or ebullient liquids. The principle is to inflow a steam for congeal able liquids and a cold water for enbullient liquids through the inside of the jacket to ensure accurate and reliable level observation.

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.



Corrossion 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.



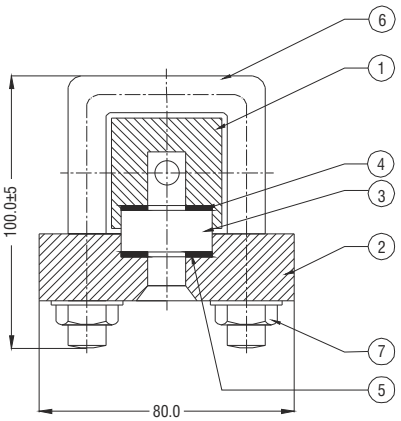
Construction and dimensional cross sectional overview

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.

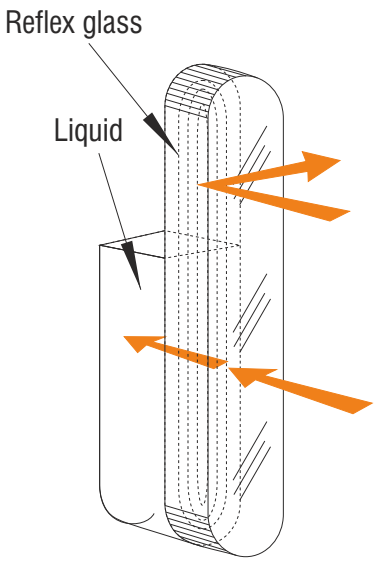
The most advantage of this type is that it has no invisible sections (dead band). Our standard overlapped section is 10 mm as minimum and the gauge is so designed that supporting brackets can be equipped to protect a long multiple connected gauge from distortion of fall down. The scale plate to mount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

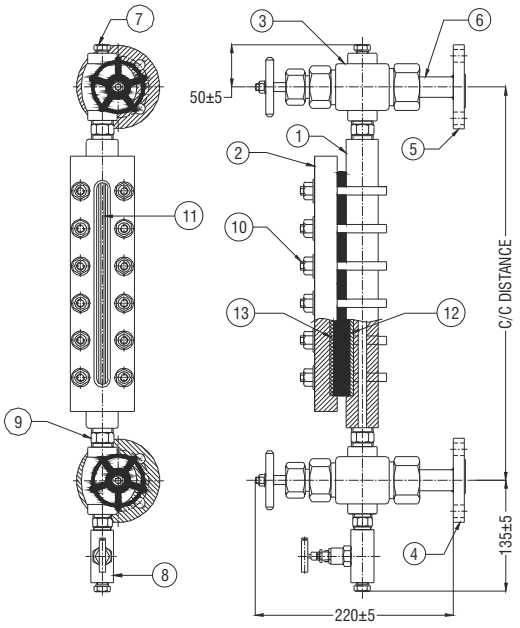


Reflex

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



Principle of reflex level glass

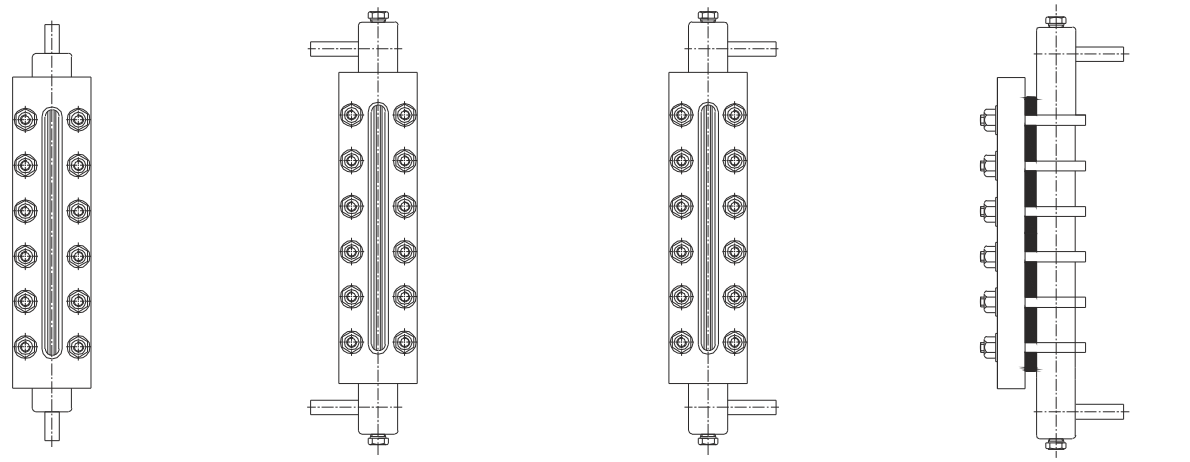


Reflex

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

Process Orientation



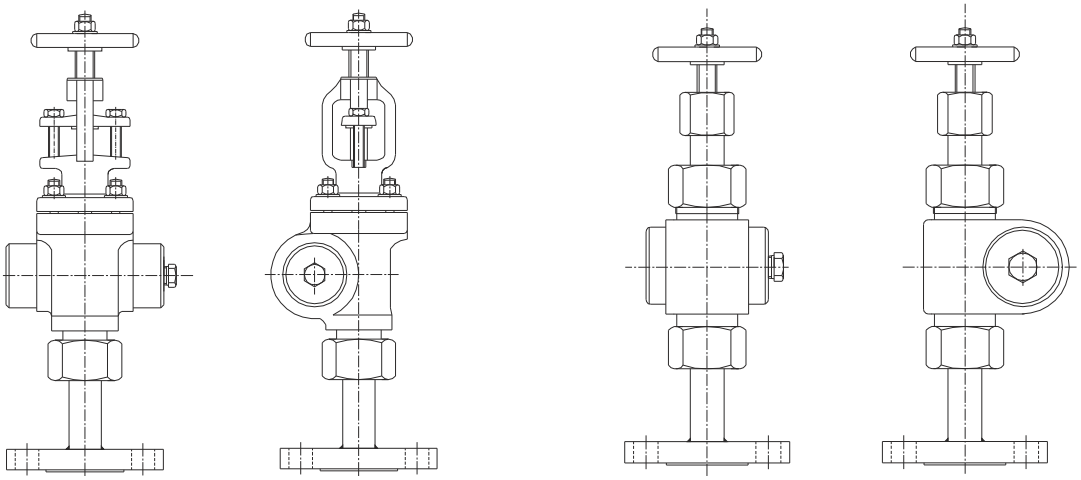
Top/Bottom | Side/Side (Right) | Side/Side-Left | Side/Side-Back (Left/Right)

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

Sight Flow Indicators

Features

Sight flow Indicator is the simplest instrument for viewing flow of different type of fluids in the process line.

General Instruments Consortium offers sight flow indicators of following types:

- **Double Window - Plain**
- **Double Window - Rotary Wheel**
- **Double Window - Flapper**
- **Double Window - Drip Tube**
- **Double Window - Ball**
- **Full View**

Double Window - Plain

This type of sight flow indicator is recommended where flow is turbulent. This flow indicator is used to monitor vertical or horizontal flow.

Double Window - Rotary Wheel

This type of sight flow indicator is best suited for the lines carrying dark solutions where rotary movement can be easily detected.

Double Window - Flapper

This type of sight flow indicator is recommended for vertical upward as well as horizontal flow. This flow indicator is suitable for colourless and transparent fluids.

Double Window - Drip Tube

This type of sight flow indicator is particularly recommended for vertically downwards flow lines having intermittent flow e.g. flow lines in distillation columns.

Double Window - Ball

This type of sight flow indicator is suitable for colourless gas flow. Usually recommended for vertically upwards and horizontal flow.

Full View

This type of sight flow indicator is used for viewing the process flow to assure that the flow is continuous or to note the process turbidity, colour etc.

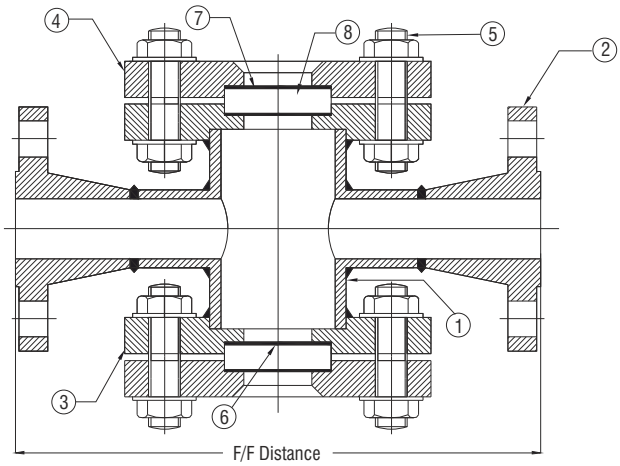
Technical Specifications: Table-1 Material of Construction

Type	Double Window - Plain / Rotary Wheel / Flapper / Drip Tube / Ball, Full View
Body	CS, SS 304, SS 304L, SS 316, SS 316L, others on request
Retainer Flange	CS, SS 304, SS 304L, SS 316, SS 316L, others on request
Cushion / Gasket	C.A.F. / P.T.F.E. / Graphoil
Glass	Toughened Borosilicate
Process Connection	Flanged / Screwed
Fasteners	SS, ASTM A193 Gr. B7 / A 194 Gr. 2H

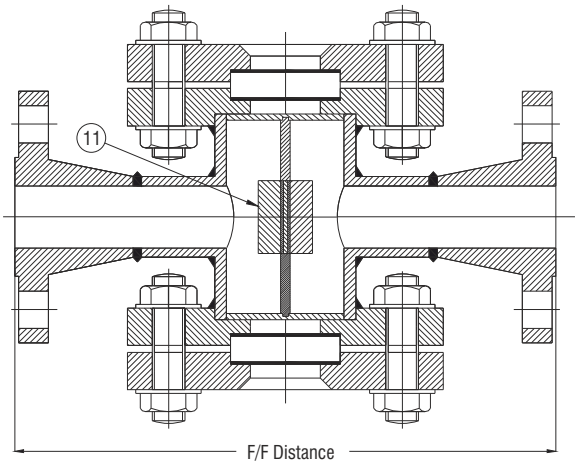
Face to face distance for all designs

½" process connection	FFD = 160mm
¾" process connection	FFD = 160mm
1" process connection	FFD = 160mm
1½" process connection	FFD = 190mm
2" process connection	FFD = 225mm
3" process connection	FFD = 275mm
4" process connection	FFD = 360mm
6" process connection	FFD = 450mm
8" process connection	FFD = 630mm
10" process connection	FFD = 750mm

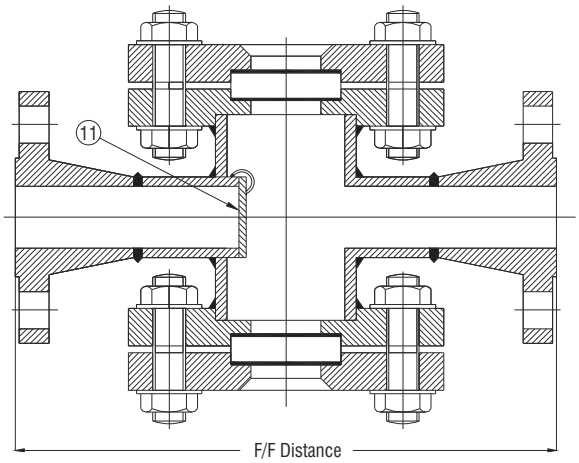
1 Body
2 Process Flange
3 Glass Holder
4 Cover Plate
5 Fastener
6 Gasket
7 Cushion
8 Glass
9 Flapper
10 Drip Tube
11 Rotary Wheel



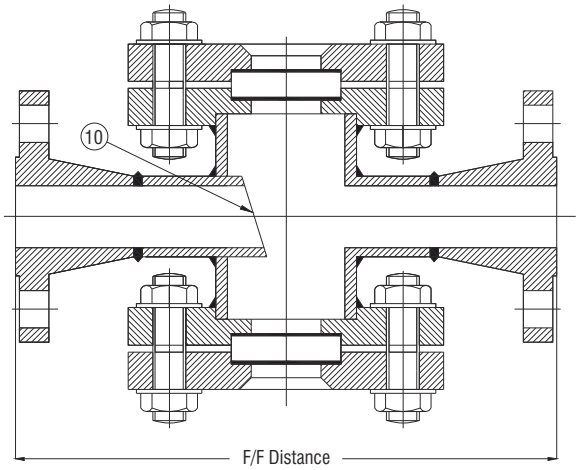
Double Window - Plain



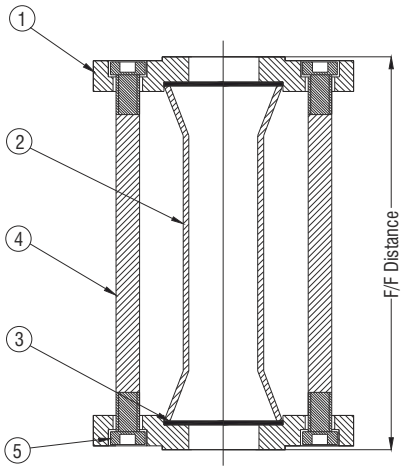
Double Window - Rotary Wheel



Double Window - Flapper



Double Window - Drip Tube



1 Process Flange
2 Glass
3 Gasket
4 Supporting Rod
5 Fastener

Full View

G A Drawing for assembly and mounting

Ordering Information

SFI DWP-F01-WA-VA-VV-WW-XW

Model	
Sight Flow Indicator	SFI

Type of Sight Flow Indicator	
DWP	Double Window - Plain
DWR	Double Window - Rotary Wheel
DWF	Double Window - Flapper
DWD	Double Window - Drip Tube
DWB	Double Window - Ball
FW	Full View

Process Connection			
F01	1/2", 150# RF	F13	2", 300# RF
F02	3/4", 150# RF	F14	2.5", 300# RF
F03	1", 150# RF	F15	3", 300# RF
F04	1.5", 150# RF	F16	4", 300# RF
F05	2", 150# RF	F17	1/2", 600# RF
F06	2.5", 150# RF	F18	3/4", 600# RF
F07	3", 150# RF	F19	1", 600# RF
F08	4", 150# RF	F20	1.5", 600# RF
F09	1/2", 300# RF	F21	2", 600# RF
F10	3/4", 300# RF	F22	2.5", 600# RF
F11	1", 300# RF	F23	3", 600# RF
F12	1.5", 300# RF		

Gasket	
XW	C.A.F.
XX	P.T.F.E.
XY	Graphoil

Cushion	
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

Body	
VA	CS
VB	SS 304
VC	SS 304L
VD	SS 316
VE	SS 316L

Cover Plate	
WA	CS
WB	SS 304
WC	SS 304L
WD	SS 316

Technical Specifications: Technical Data

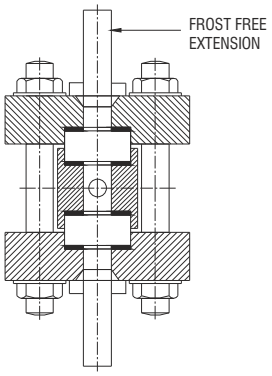
Isolation Valve	Auto Ball Check Valve a) Screwed bonnet offset construction suitable upto 50 kg/cm^2 b) Bolted bonnet offset construction suitable above 50 kg/cm^2 c) Material construction as per wetted part
Vent	½" Plugged / ½" Needle Valve / ½" Ball Valve / ½" Globe Valve / ½" Gate Valve, other on request
Drain	½" Plugged / ½" Needle Valve / ½" Ball Valve / ½" Globe Valve / ½" Gate Valve, other on request
Optional	a) Protection Shield for temperature upto 550°C - Mica Shield b) Illuminator - Weatherproof IP 67 c) Illuminator - Flameproof Gr.IIA/IIB d) Illuminator - Flameproof Gr.IIC e) Non-Frost Extension for extreme low temperature application f) Heating Jacket - to read the level of high congelable or ebullient liquid g) 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 Transparent 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.



Transparent

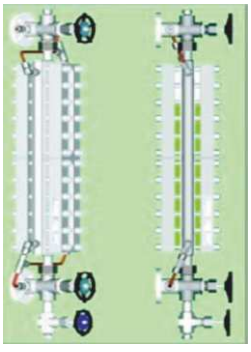
Technical Specifications: Temp. rating and dimensions of non-frosting plates

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 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.

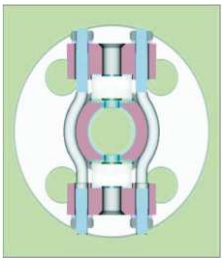


Transparent Level Gauges

Special Application

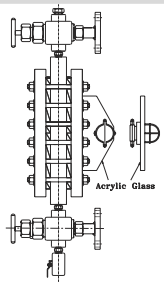
Corrosion Application

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.



Illuminator

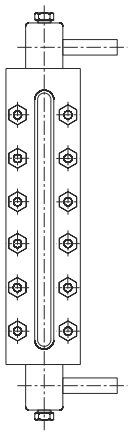
Transparent level gauges with illuminator are useful for observing the fluid level in a dim place or at night by using an explosion-proof and weather-proof. The illuminator can be mounted on all types of transparent level gauges.



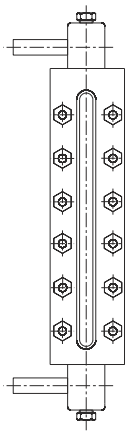
Technical Specifications: Illuminator Specifications

Rating	Upto 15 W / 25W GLS Lamp or 15W LED Lamp with or without Flashing 240 VAC
Construction	In cast alloy LM6
Gas Group	IIA, IIB, IIC as per IS 2148 / 2004
Deg of protection	IP66 as per IS : 12063 /1987
CCE Certificate	A/P/HQ/MH/104/1817
Earthing	2 Nos. External & 1 No. Internal
Paint	Epoxy Powder Coated Light Grey shade 631 of IS:5
Cable Entry	2 Nos. 3/4" ET With cable glands
Mounting	Transparent acrylic sheet with mounting bracket

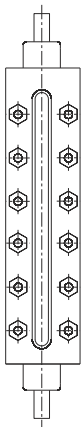
Process Orientation



Side-Side (Left)



Side-Side (Right)



Top Bottom

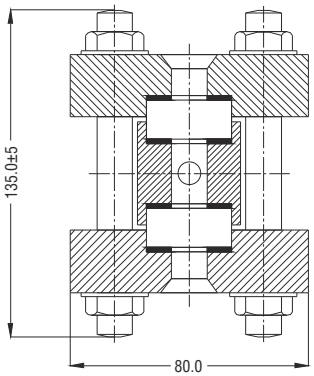
Transparent Level Gauges

Construction and dimensional cross sectional overview

The gauge consists of a body having machined to have a liquid where high temperature and corrosions are liable to occur, it can be furnished with a mica shield to prevent it from being corroded. There types are preferably used for reservoir tanks that require a relatively long visible length by constructing the supporter.

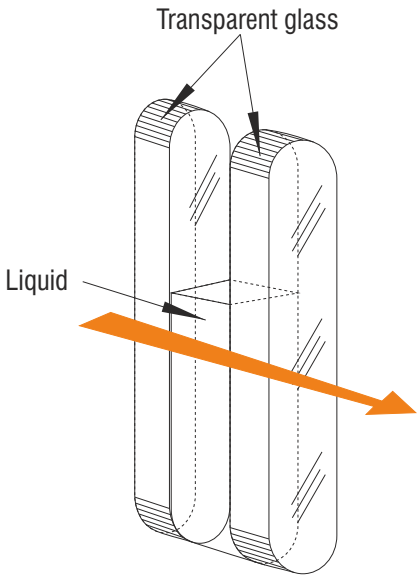
The transparent level gauge is assembled firmly with gasket, transparent glass, cushion gasket and gauge cover on the body by stud-bolts. The most advantage of this type is that it has no invisible sections (dead band). Our standard overlapped section is 10 mm as minimum and the gauge is so designed 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.

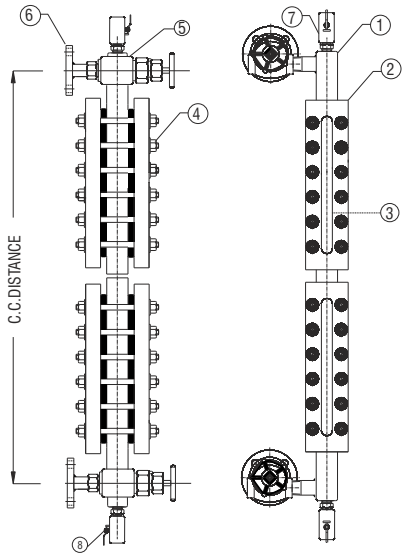


Transparent

Construction (Sectional View)



Principle of transparent level glass



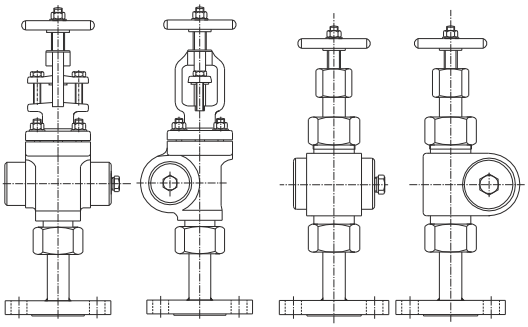
Specification

1 Main Chamber
2 Cover plate
3 Transparent Glass
4 Bolt & Nuts
5 Isolation Valve
6 Process Connection
7 Vent Ball Valve
8 Drain Ball Valve

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

10/17 REV.: 00

Ordering Information

TLG AA-TL-1000-F03-ZE-VD-WD-VW-WW-XW-UW-QV-RV-SO-Z

Type	
AA	Low Pressure - 30kg/cm^2
AB	Medium Pressure - 100kg/cm^2
AC	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)

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	IQ	Illuminator -FlameProof Gr. IIA/ IIB
HJ	Heating Jacket	IR	Illuminator -FlameProof Gr. IIC
SX	Mica Shield	IB	IBR
IP	Illuminator -WeatherProof	XX	Any other*
Z	NIL		

Calibration Scale			
SO	Aluminium with Powder Coat	SQ	SS304
SP	Aluminium	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
XX	Any Other*		

Note: * Please consult factory

Tubular Level Gauges

Features

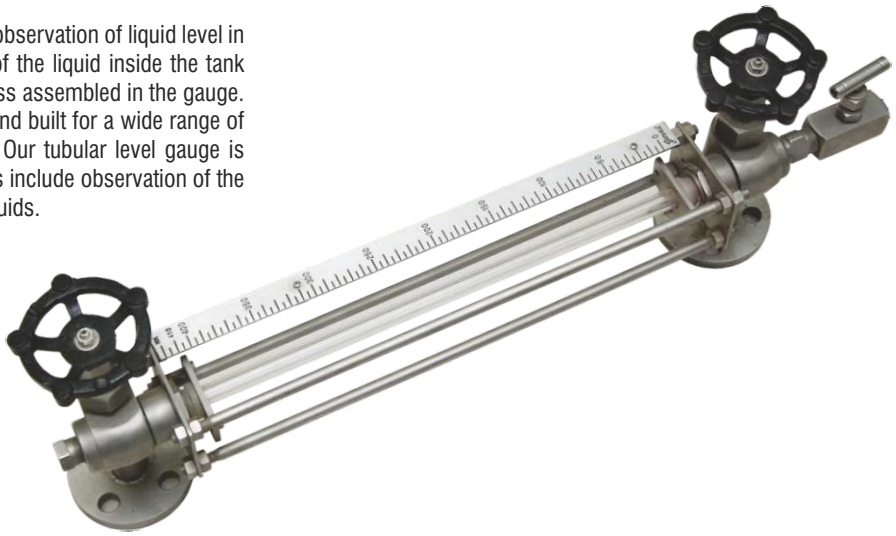
- Tubular level gauge applicable upto 10 kg/cm^2 and upto 150 deg cent
- Forged bodies
- Toughened borosilicate glass with designs to suit pressure and temperature rating
- For applicability in critical acidic, non acidic, and in high temperature zone
- Available with C Channel options with SS, CS, MS with anticorrosion powder coat, MS
- NACE, H2S service compatibility applicable
- CE applicability
- Also available with 1.6 to 4 mm lining PTFE / PFA with SS
- Applicable for refinery, petrochemical, chemical, power, radioactive, fertilizer, food, pharma, metal industry applications

Concept and Principle of operation

The tubular type level gauge is the simplest shape of direct reading level apparatus for maximum pressure up to 10 bar and maximum temperature of 150°C. The gauge glass is built in the protective tube. Check balls inserted in the upper and lower valve to stop flow instantaneously when the glass is broken. The protector having a circular form is constructed to prevent glass breakage from external sources. For glass tube gauges only of center to center dimensions in excess of 2.000 mm, it is possible to manufacture any required c to c by using coupling in the middle of the gauge. Depending on the nature of the liquid, tubes made from various PFA, Acrylic or Vinyl tube are also available. Tubular glass with a linear red coating on the back is available to make level observation more clear.

This 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. Tubular Liquid Level Gauges, designed and built for a wide range of temperature and pressure applications. Our tubular 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 restricting in temperature application rating. 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 seamless pipe. 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.



Tubular Level Gauges

Technical Specifications: Technical Data

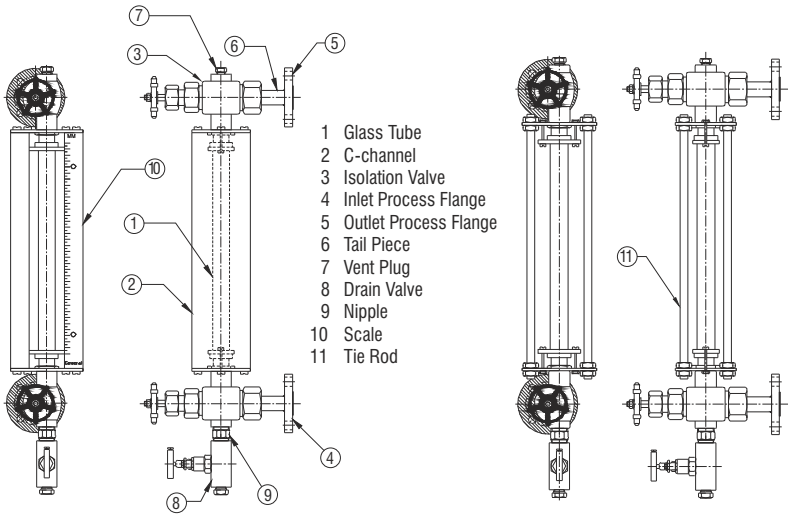
Type of Gauge	Tubular Level Gauge - TULG
Mounting	Top-Bottom
Pressure	Upto 10 kg/cm^2
Temperature	Upto 150^{0}C
CCD	Max. upto 2000mm
MOC of Wetted Parts	CS, SS304, SS304L, SS316, SS316L, PP and other on request
Glass Tube	OD 16mm or 19mm
Glass Protection	a) M.S. Tie Rods b) SS Tie Rod c) MS powder Coated 'C' Channel d) SS 'C' Channel
Process Connection	Screwed / Flanged / Socket Weld and other on request
Isolation Valve	Auto Ball Check Valve a) Screwed Bonnet offset construction b) Material Construction as per wetted part
Vent	½" Plugged / ½" Needle Valve / ½" Ball Valve / ½" Gate Valve / ½" Globe Valve
Drain	½" Plugged / ½" Needle Valve / ½" Ball Valve / ½" Gate Valve / ½" Globe Valve
Calibration Scale	Aluminium, Aluminium with powder coated, SS304, SS316, Acrylic
Special	P.T.F.E. lined on wetted part - Flange orientation

Construction and Dimensional Cross Sectional Overview

The guage consists of a body having machined to have a liquid where high temperature are liable to occur, the glass is heavy borosilicate glasses are used. These tubular gauges preferably used for all applications with the simplest solution keeping the temperature and pressure rating known.

The tubular level gauge is assembled firmly with heavy toughened borosilicate glass with tie rods or C Channel, special packing arrangement is made to ship larger CCD with tie rods and or with C Channel , as the delicacy with glass oriented design is subjected to damage in transit.

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.



With 'C' Channel | With Tie Rods

With 'C' Channel | With Tie Rods

10/17 REV.: 00

Ordering Information

Ordering Information

TULG 1000-F03-ZE-VD-16-YZ-UW-QU-RU-SO-XX-Z

	-		-		-		-		-		- Z

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)
ZB	CS (A106)
ZC	SS 304
ZD	SS 304L
ZE	SS 316
ZF	SS 316L
ZI	PP
XX	Any Other*

MOC of Wetted Parts	
VA	CS
VB	SS 304
VC	SS 304L
VD	SS 316
VE	SS 316L
VF	PP
XX	Any Other*

Special Features	
PE	PTFE Lined, CS Flange
PF	PTFE Lined, SS304 Flange
PG	PTFE Lined, SS304L Flange
PH	PTFE Lined, SS316 Flange
PI	PTFE Lined, SS316L Flange
XX	Any Other*
Z	NIL

Calibrated Scale	
SO	Aluminium with power 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 Valves	
UW	Screwed Bonnet Offset Construction
N	Needle Valves

Glass Protection	
VZ	M.S. Tie Rods
WZ	SS Tie Rods
XZ	MS Powder Coated 'C' Channels
YZ	SS 'C' Channels

Glass Tube	
16	16 mm O.D.
19	19 mm O.D.

Note: * Please consult factory

Float & Board Level Gauges

Features

- Float and Board gauge applicable upto 50 kg and upto 400 deg cent
- NACE, H2S service compatibility applicable
- Applicable for refinery, petrochemical, chemical, power, radioactive, fertilizer, food, pharma, metal industry applications
- Options with switch version available

Concept and Principle of operation

General Float and Board Type level Indicator is the version applicable for level indication system in Water, Furnace oil, Chemicals, Acids storage tank level measurement.

Available in two types:

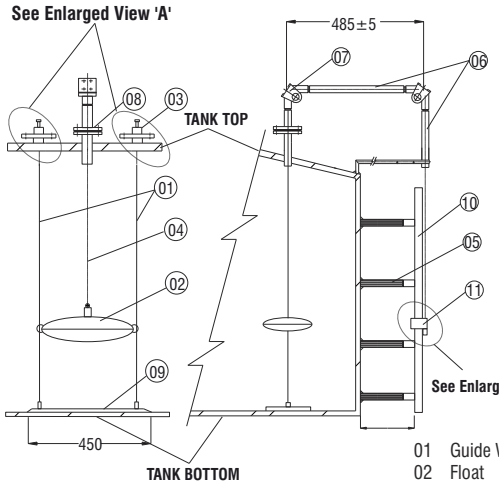
- Guided Type
- Unguided Type

Technical Specifications:

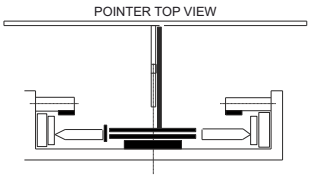
Type of Gauge	"Guided type ------- FBI/G
	Unguided type ------ FBI/U"
Mounting	Top
Pressure	Upto 50 kg/cm^2
Temperature	Upto 400^{0}C
Measuring range	Max. upto 15000mm ----- For Guided type
	Max. upto 5000mm ----- For Unguided type
MOC of Float	SS316, SS316L, PP, PTFE, Monel, Titanium, Alloy 20
MOC of Wire	SS316, SS316L, SS304L, PTFE, PP
Accuracy	5%
Calibrated Gauge Board	6" wide, Aluminium white powder coating with black graduation
Least Count	10-25mm
Process Connection	Flanged
Optional	With switch version available

Float & Board Level Gauges

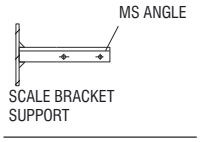
G A Drawing Applicable

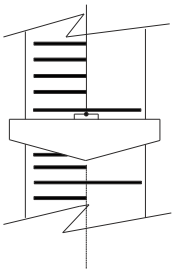


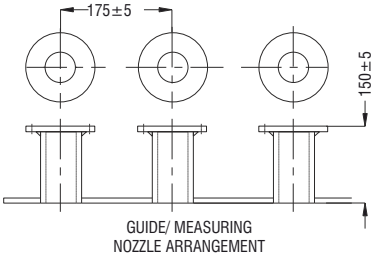
01 Guide Wire
02 Float
03 Guide Rope Tension Assembly
04 Float Rope
05 Scale Bracket
06 Protection Limb
07 Pulleys
08 Flange
09 Anchor Plate
10 Scale Board
11 Pointer



Enlarged View 'B'







ENLARGED VIEW A

Ordering Information

FBLG GT-XD-WS-F03-ZE-Z

Type	
GT	Guided Type
UT	Unguided Type

MOC of Float	
XD	SS316
XE	SS316L
XF	PP
XH	Monel 500
XI	Titanium
XK	Hastelloy C

MOC of Wire	
WQ	SS304
WR	SS304L
WS	SS316
WT	SS316L
WU	PP

Range	
XX	Please Specify
Z	NIL

MOC of Connection	
ZA	CS (A105)
ZB	CS (A106)
ZC	SS 304
ZD	SS 304L
ZE	SS 316
ZF	SS 316L

Process Connection	
Flanged Connection	
F01	1/2", 150# RF
F02	3/4", 150# RF
F03	1", 150# RF
F04	1.5", 150# RF
F05	2", 150# RF
F09	1/2", 300# RF
F10	3/4", 300# RF
F11	1", 300# RF
F12	1.5", 300# RF
F13	2", 300# RF

Float & Tape Level Gauges

Features

- Float and tape gauge are applicable for upto 50 bar pressure and upto 400 deg cent
- NACE, H2S service compatibility applicable
- Applicable for refinery, petrochemical, chemical, power, radioactive, fertilizer, food, pharma, metal industry applications
- Options with switch version available

General Float and tape Type level Indicator is the version applicable for level indication system in Water, Furnace oil, Chemicals, Acids storage tank level measurement.

Available in two types:
- Guided Type
- Unguided Type

Tank Gauge Installation:

Float and tape gauging is suitable for almost all product applications and tank types

- Accuracy ±2 mm with 400 mm
- diameter float
- Least Count 1 mm
- Measuring range 0 to 20 meters
- with dial / counter (Optional: 0 to 30 meters with counter)
- Suitable for for upto 50 kg/cm^2 pressure
- Suitable for upto 400 deg cent temperature
- Dial size max upto 500mm and other on special accuracy and demand

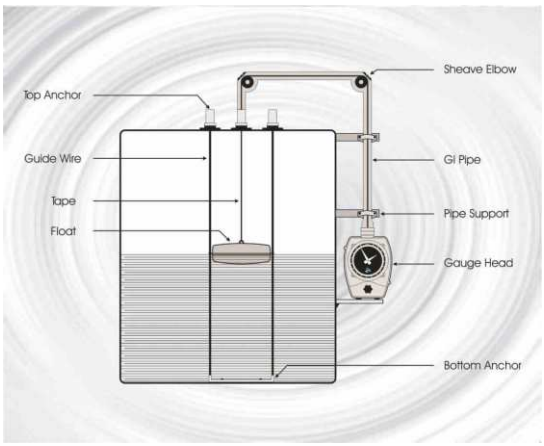
It is an economical mechanical gauge provides high accuracy in mm. Largely used in Refineries, Oil Depots, Chemical and Fertilizer Industries. Useful for medium and large size charged or empty tanks. It may be cone roof, floating roof, underground or gas holding tank. It covers critical applications like corrosive & aggressive acids (using non-metallic wetted parts) & liquids with fumes (using vapor seal).

Less Maintenance:

Once carefully installed gives trouble free operations for a number of years (with periodic maintenance). A specially designed cylindrical body floats on liquid surface on account of its buoyancy. The liquid level is transmitted by means of a tape connected to float on one side and gear mechanism on the other side. Gears rotate the pointer on a dial or counter mechanism to display readings. A drum and spring mechanism provides constant tension on tape to keep it straight and thus balancing the force due to apparent float weight on one side and spring tension on other side.

Float Guide wires:

Guide wires provide stability for the float during turbulent conditions and increased accuracy by reducing the horizontal movement of the float across the surface of the product. Accessories are available to allow in-service installations, such as weighted anchors that maintain tension in the guide wires without the need for welding inside the tank.



Float & Tape Level Gauges

Technical Specifications:

Type of Gauge	Guided type ------- FBI/G Unguided type ------ FBI/U
Mounting	Top
Pressure	Upto 50 kg/cm^2
Temperature	Upto 40^{0}C
Measuring range	Max. upto 25000mm
Accuracy	1%
MOC Of Float	SS316, SS316L, PP, PTFE, Monel, Titanium, Alloy 20
MOC Of Wire (Float & Guide)	SS316, SS316L, SS304L, PTFE
MOC Of Flange	SS316, SS316L, PP, PTFE, Monel, Titanium, Alloy 20, PVDF
Dial Counter	150mm up to 500mm
MOC Of Dial Counter	Die cast aluminium with anticorrosion powder coat
Dial Enclosure	IP 65
Dial Counter holder	SS316, GI, A106, SS316L
Anchor plate for Guide & Float Wire	SS304, A106, SS316, SS316L, SS304L, Monel, hastelloy, Alloy 20
Process Connection	Flanged

Special Materials

Standard, moderate, severe and extreme service kits are available for applications involving extreme temperatures, pressures or aggressive products. There kits include material options for specific parts that make contact with the product in the tank, tape piping or gauge head, such as:

- Steel
- Aluminium
- Stainless steel

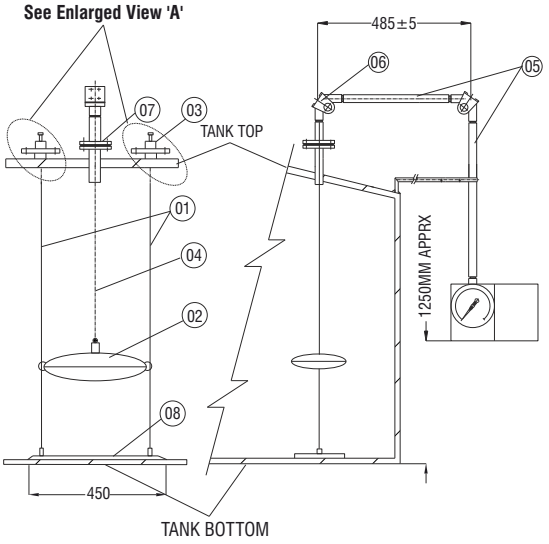
Product Type

Due to the float and tape measurement technique, the following are just some of the products suitable for level measurement using a float and tape device:

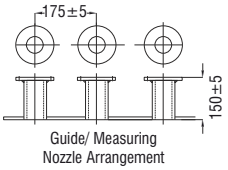
- Crudes
- Gasoline
- Jet fuel
- AV (Aviation) gas - high octane gas for small aircraft
- Diesel
- Chemicals
- Additives
- Solvents
- Water

G A Drawing Applicable

Indicator system with scale board for long distance viewing and metric dial counter for ground reading purpose



01 Guide Wire
02 Float
03 Guide Rope Tension Assembly
04 Float Rope
05 Protection Limb
06 Pulleys
07 Flange
08 Anchor Plate
09 Scale Board
10 Pointer



Enlarged View A

10/17 REV.: 00

Ordering Information

FTLG GT-XD-WQ-F01-ZA-XX-Z

Type	
GT	Guided Type
UT	Unguided Type

MOC of Float	
XD	SS316
XE	SS316L
XF	PP
XH	Monel 500
XI	Titanium
XK	Hastelloy C

MOC of Wire	
WQ	SS304
WR	SS304L
WS	SS316
WT	SS316L
WU	PP

Process Connection	
Flanged Connection	
F01	1/2", 150# RF
F02	3/4", 150# RF
F03	1", 150# RF
F04	1.5", 150# RF
F05	2", 150# RF
F09	1/2", 300# RF
F10	3/4", 300# RF
F11	1", 300# RF
F12	1.5", 300# RF
F13	2", 300# RF

Range	
XX	Please Specify
Z	NIL

MOC of Connection	
ZA	CS (A105)
ZB	CS (A106)
ZC	SS 304
ZD	SS 304L
ZE	SS 316
ZF	SS 316L

Magnetic Level Gauges & Level Transmitters

Magnetic Level Gauges provides clear, high clarity indication of liquid level. Magnetic Level Gauges are principally designed as an alternative to glass level gauges. MLGs are now widely used in all industries as they avoid direct contact with indicator system; it eliminates need of glass for direct level indication and prevents chemical spillage due to breakage of glass.

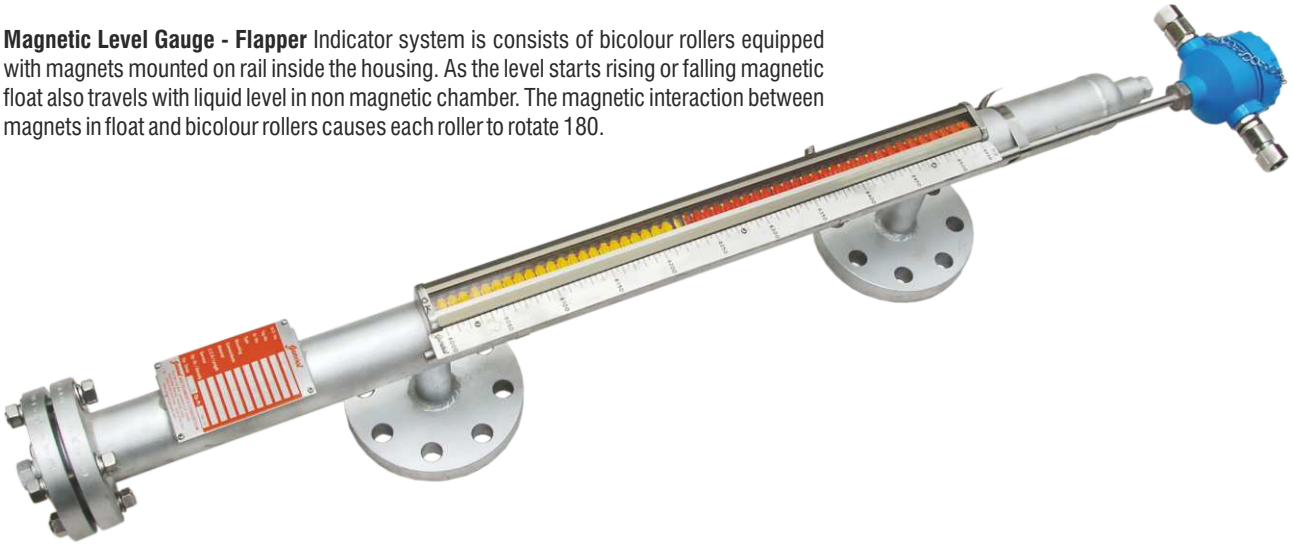
Features

- Magnetic level gauge applicable upto 100 kg/cm^2 and upto 300 deg cent
- Cryo applications upto -196 deg cent
- Jacketed design applicable
- For applicability in critical, acidic, cryo and high temperature zone
- IBR certified device available
- NACE, H2S service compatibility applicable
- Heat tracing available
- Viscous media (max upto 380 cst and upto 100 deg cent) besides other acidic, non acidic, steam water media
- CE applicability
- Device fully compatible for conductive and non conductive media
- Special float design to enable to meet low critical specific gravity
- Design applicability test with special media available
- Applicable for refinery, petrochemical, chemical, power, radioactive, fertilizer, food, pharma, metal industry applications
- CCOE approved switches available, ATEX, FM certified available on demand
- Versions available with analog and digital (HART) and FIELDBUS transmitters fully integrated with the system for level gauge and transmitter
- CCOE approved and ATEX and FM versions applicable for HART and analog transmitters available

Concept and Principle of operation

Magnetic Level Gauges operates on the principle of magnetic field coupling to provide fluid level information. Float chamber is typically constructed having process connections that matches to the vessel connections. Float size and weight is determined by the process fluid, pressure, temperature and the specific gravity of the process fluid. Float contains magnets to provide 360 magnetic flux field.

Magnetic Level Gauge - Flapper Indicator system is consists of bicolour rollers equipped with magnets mounted on rail inside the housing. As the level starts rising or falling magnetic float also travels with liquid level in non magnetic chamber. The magnetic interaction between magnets in float and bicolour rollers causes each roller to rotate 180.

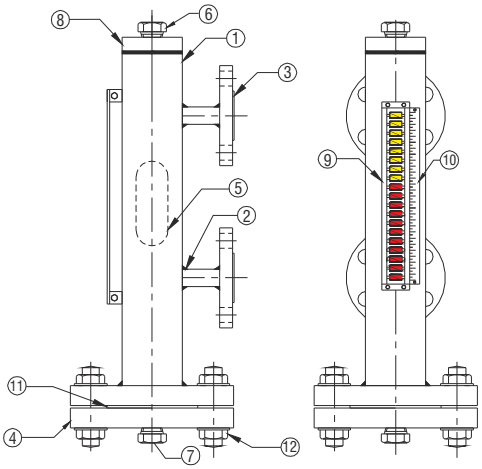


10/17 REV.: 00

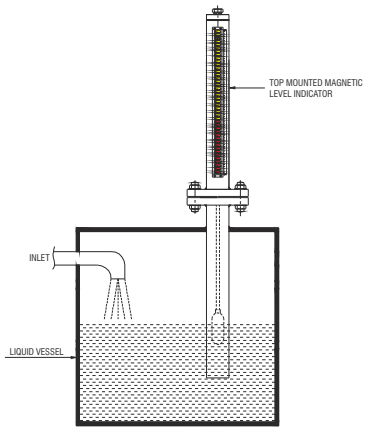
Technical Specifications: Table-1 Technical Data

Type of Gauge	Magnetic Level Gauge - MLG
Mounting Orientation	Top Mounted Side Mounted
Pressure	Upto 100 kg/cm^2
Temperature	Upto 300^{0}C
CCD	Max. upto 7000mm
Liquid Chamber	In forged construction: SS304, SS304L, SS316, SS316L, PP, Titanium, Inconnel 600, Hastelloy C, Other on request subject to pressure & temperature condition
MOC of Float	In forged construction: SS304, SS304L, SS316, SS316L, PP, Titanium, Inconnel 600, Hastelloy C
Gasket	CAF, PTFE, Grafoil with SS pregnated
Fastner	CS Plated, SS
Scale	Aluminium, Aluminium anticorossion powder coated and SS engraved in mm
Indicating System	Bicolour flapper in ABS/ Aluminium/ SS with 4mm length & 0.25mm thickness with aligned magnets
Protection box for bicolour flapper & follower type	In mild steel, Aluminium, SS304, SS316 base on the requirements of atmospheric condition
Process Connection	Flanged
Vent	½" Plugged / ½" Needle Valve / ½" Ball Valve / ½" Globe Valve / ½" Gate Valve
Drain	½" Plugged / ½" Needle Valve / ½" Ball Valve / ½" Globe Valve / ½" Gate Valve
Specific gravity	Please specify
Limit Switch Assembly	Snap acting 1 SPDT Microswitch, 5A,230VAC
Switch Housing	Die Cast Aluminium Weatherproof to IP-67
	Die Cast Aluminium Explosionproof suitable for Gr. IIA, IIB
	Die Cast Aluminium Explosionproof suitable for Gr. IIC
Cable Entry	1 no / 2 nos. of 3/4"ET(F)
Optional	Still well for top mounted construction

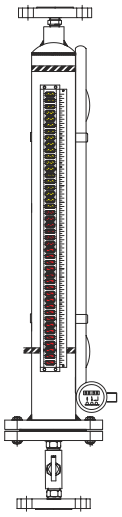
Construction and Dimensional Cross Sectional Overview



1 Liquid Chamber
2 Nozzle
3 Process Flange
4 Bottom Flange
5 Magnetic Float
6 Vent Plug
7 Drain Valve
8 Top Cap
9 Indicating System
11 Scale
12 Gasket
13 Fastener



G A drawing for mounting and assembly



Front View

With HART transmitter mounted on a 900# application gauge at CCD of 4000 mm with magnetostrictive principle for chemical plant application.

Ordering Information

MLG SM-1000-F03-ZE-VD-XD-VW-XW-QU-RU-SO-LX-Z

Orientation of Process Connection	
MT	Top Mounted
SM	Side Mounted

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

Process Connection			
Flanged Connection			
F01	1/2", 150# RF	F13	2", 300# RF
F02	3/4", 150# RF	F17	1/2", 600# RF
F03	1", 150# RF	F19	1", 600# RF
F04	1.5", 150# RF	F20	1.5", 600# RF
F05	2", 150# RF	F21	2", 600# RF
F09	1/2", 300# RF	F48	1", 900# RTJ
F10	3/4", 300# RF	F49	1.5", 900# RTJ
F11	1", 300# RF	F50	2", 900# RTJ
F12	1.5", 300# RF	XX	Any Other*

MOC of Connection			
ZC	SS 304	ZK	Monel 500
ZD	SS 304L	ZL	Titanium
ZE	SS 316	ZM	Hastelloy B
ZF	SS 316L	ZN	Hastelloy C
ZI	PP	ZO	Inconel 600
XX	Any Other*		

MOC of Chamber			
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*		

MOC of Float			
XB	SS 304	XH	Monel 500
XC	SS 304L	XI	Titanium
XD	SS 316	XJ	Hastelloy 'B'
XE	SS 316L	XK	Hastelloy 'C'
XF	PP	XL	Inconel 600
XX	Any Other*		

Optional	
LX	Limit Switch with Die cast Aluminium Weatherproof IP-67
LY	Limit Switch with Die cast Aluminium Flameproof suitable to Gr. IIA/ IIB
LZ	Limit Switch with Die cast Aluminium Flameproof suitable to Gr. IIC
IB	IBR
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

Gasket	
XW	C.A.F.
XX	P.T.F.E.
XY	Graphoil

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

Note: * Please consult factory