DATASHEET

KSS Glass Level Gauge

KSS Data Sheet - DS - LM - 007 - 00

Product Overview

Reflex / Transparent Glass Level Gauges are designed for safe & positive visual indication of liquid level in vesselsunder high pressure & temperature conditions.

Reflex Flat Glass has precision molded prismatic grooves cut on inner surface, which comes in contact with liquid.Light striking on glass position covered by liquid is refracted (absorbed) making this portion appear BLACK, whereas glass portion covering vapor space reflects light making it appear SILVERY-WHITE. Thus, a sharp clearline marks the liquid level, eliminating all possibilities of errors in reading.

Transparent Flat Glass is clear glass with smooth finish, used for visual level indication of dirty, viscous liquids orliquid /liquid interface.

Fig.1: REFLEX

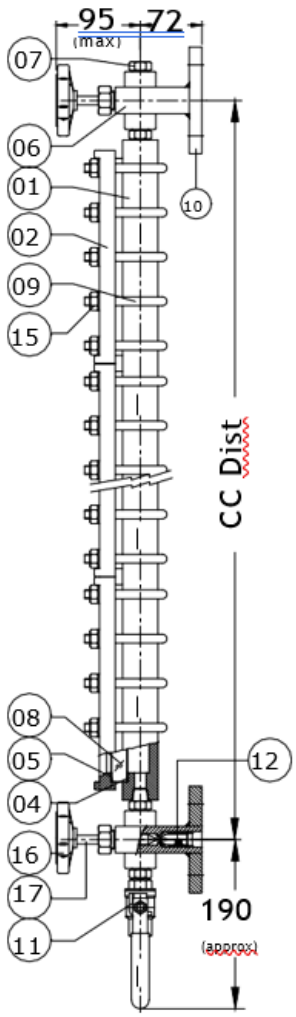
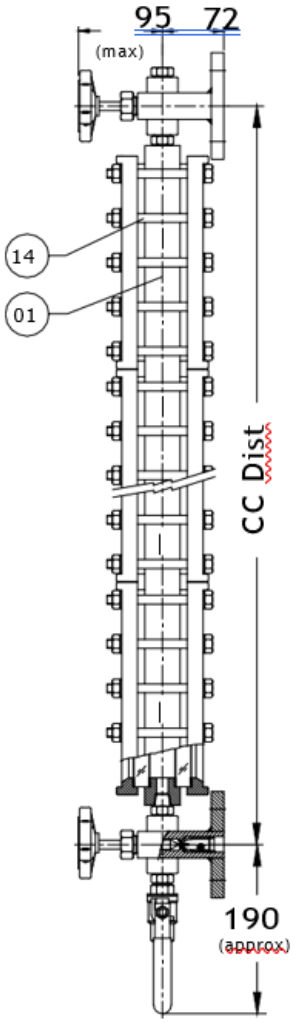


Fig.2: TRANSPARENT



1)	Liquid Chamber
2)	Cover Plate
3)	Gauge (Transparent)
4)	Gasket
5)	Cushion
6)	Isolating Valve
7)	Vent Plug
8)	Gauge (Reflex)
9)	`U' Bolts
10)	Process Connection
11)	Drain Valve (B.V.)
12)	Auto Ball Check
13)	Adapter
14)	Studs
15)	Nuts & Bolts
16)	Hand Wheel
17)	Valve Needle
18)	Cal Scale

Reflex (fig.1): The liquid chamber is formed by one piece body (1), reflex gauge glass (8), sealing gasket (4), cushion (5) & cover plate (2) all held together by `U'-bolts & nuts (9). The gauge glass sandwiched between the gasket & cushion is placed on front side for viewing of liquid level & held in the process machine in the body andcover plate. This ensures leak proof assembly, which prevents gasket / cushion slippage and avoids glass to metal contact. This glass sections can be fitted in a single gauge assembly. The glass section comes in lengths from 190 mm to 340 mm and as many as 5 can be fitted in a single gauge assembly. Longer CC distance can be provided by coupling two-gauge assemblies through a flanged coupler or the level gauges can be installed instaggered manner. The level gauge is provided with shut-off valves at either ends, to isolate the gauge during glass breakage or replacement.

Transparent (fig.2): The construction is similar to Reflex except that the liquid chamber (01) is formed by onepiece metal body and a pair of transparent gauge glass on its front & rear side.

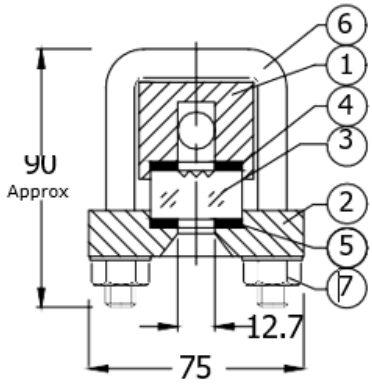
Construction

Gauge classification x Test pressure	Low pressure x 30Kg/cm2, Medium pressure x 85Kg/cm2 High pressure x165Kg/cm2, Very high pressure x 210Kg/cm2
Gauge glass	Tempered soda ash/ Borosilicate (30W x 17mm Thk in 250, Tempered borosilicate (34W x 17 mm Thk)
Cushion / Gasket	CAF, CNAF, PTFE & Graphoil SS316 reinforced & Graphoil SS304 reinforced
Body (liquid chamber)	CS, ASTM A -105, SS304, SS316,SS316L, PP (CS Reinforced),or Rubber lined CS
Cover plate	CS, ASTM A -105, SS304, SS316 or FRP
Chamber connection	1/2"NPT(F)
Bolts & Nuts	CS, A193 Gr. B7 /A194 Gr. 2H ; A93 B8, A94 B8M
Gauge connection	Hook up (side-side chamber conn) or Straight thru`(top-bottom chamber conn)
Process (vessel) connections	Flanged or Screwed (male shank, union or spherical union)
Process conn orientation	Rear/Rear , Left / Left , Right / Right , Vertical/ Vertical
Isolating valves	Offset Needle valve x auto ball check x Screwed bonnet (85Kg/cm2)/ Bolted bonnet (OS & Y)`(210Kg/cm2)
Vent/Drain Metalic	1/2" NPT Plug / valve (Ball, Globe, Gate as reqd.)
PP	1/2" BSP Plugs or ball valves
Calibrated scale	SS304
Special features	a) Frost free extn:- An extended perspex plate fitted on gauge glass b) Jacketing :- 1/4" SS pipe with condensate drain valve c) Illuminator:-Cast Al. enclosure IP65 or Exd Gr. IIB or IIC holding LED bulb (80 - 250 VAC)
CC Distance (mm)	Metallic: a) 170 to 2120 (hook up) b) 330 to 2280 (straight thru)
PP:	320 to 1600 (straight thru`)
NB	: MOC of isolation valves and process connections will be same as that of liquid

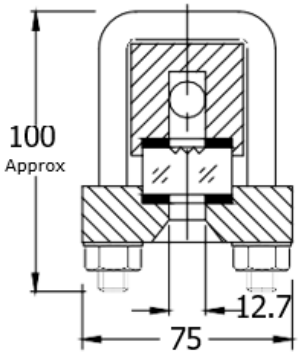
Gauge Type with Classification (Sectional view)

Reflex:

Low Pressure

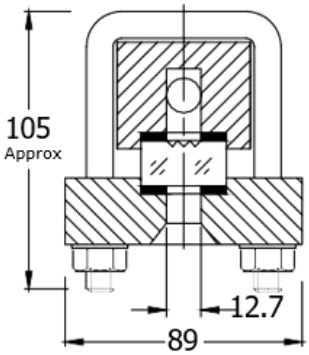


Medium Pressure

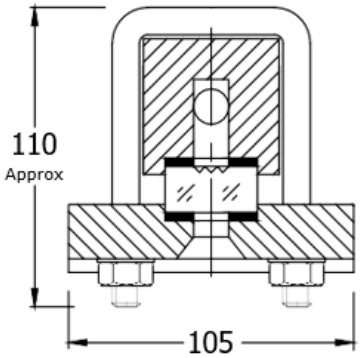


1) Liquid chamber
2) Cover plate
3) Gauge glass
4) Gasket
5) Cushion
6) `U' bolt
7) Nuts & washers
8) Stud bolt
9) CS reinforced

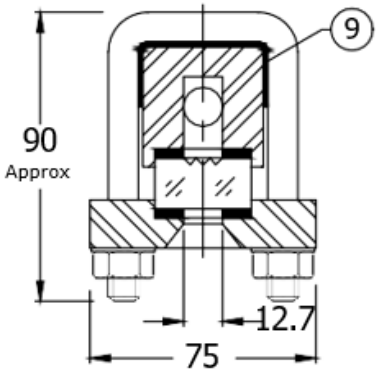
High Pressure



V. High Pressure

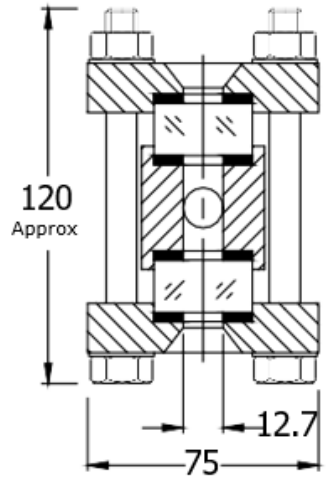


PP Chamber & FRP Cover plate

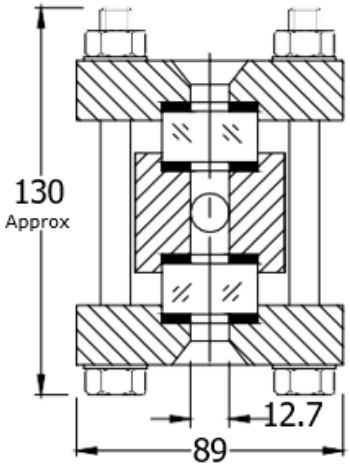


Transparent:

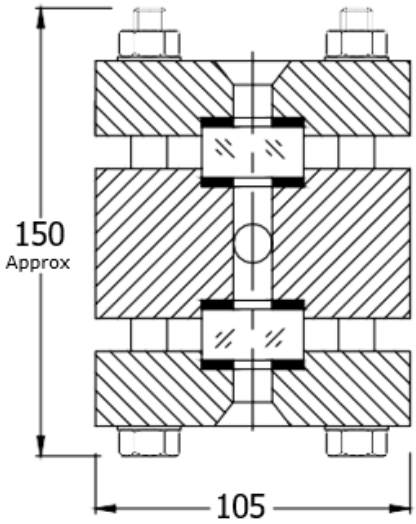
Low Pressure



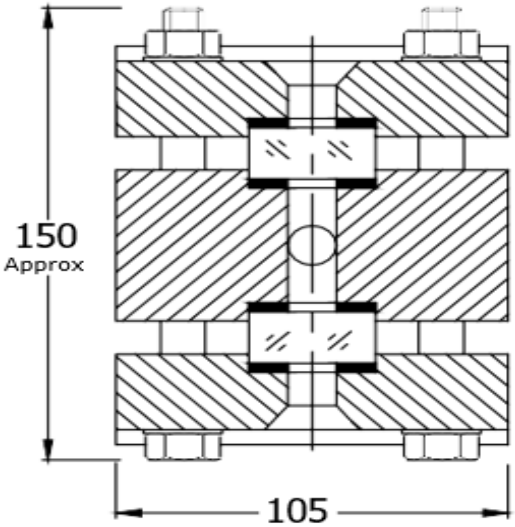
Medium Pressure



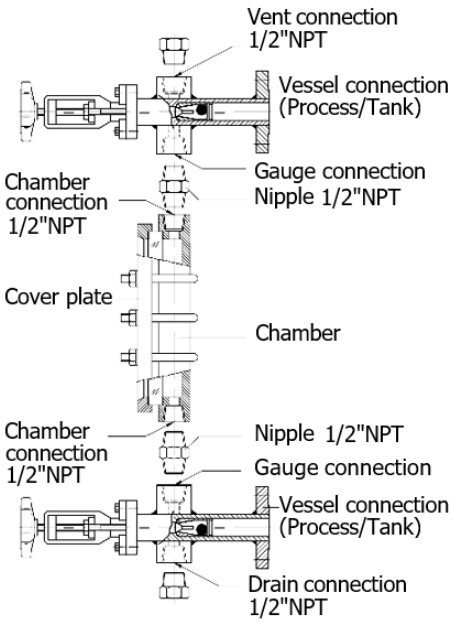
High Pressure



V. High Pressure



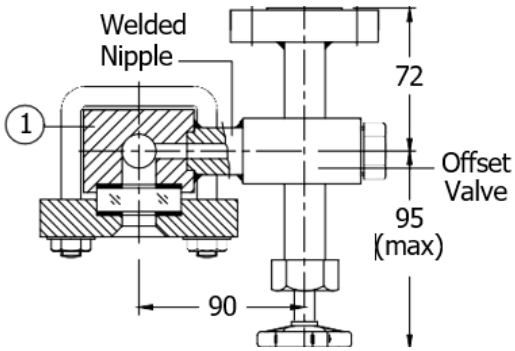
Exploded view



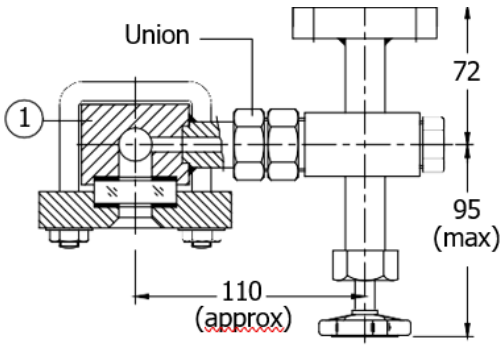
Gauge Connection & Isolating Valve

Hook-up:

Welded Nipple x Offset NV

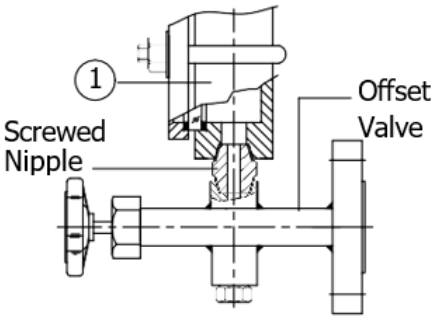


Union x Offset NV

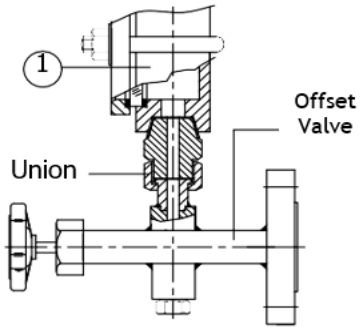


St-thru`:

Screwed Nipple x Offset NV



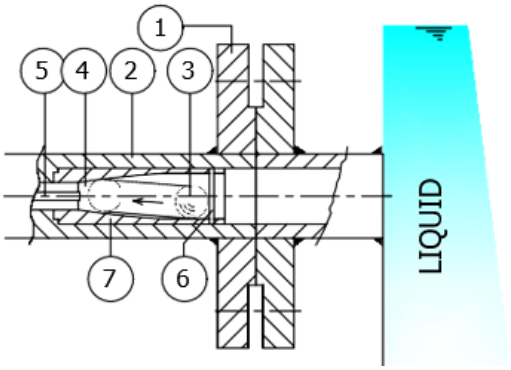
Union x Offset NV



Function of Auto Ball Check

Auto ball check facility is provided to prevent "liquid loss" from vessel during breakage of gauge glass. It consists of a capsule located within the gauge ` neck' and contains a ` ball ' which moves freely along its inner race between the stopper & orifice.

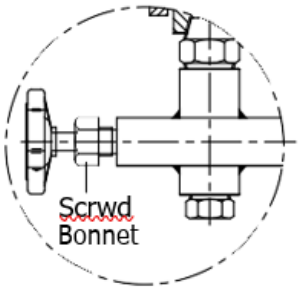
During breakage, the pressure on ` ball ' from gauge side will be atmospheric, whereas higher pressure from vessel side (" opt pr + liquid column") will cause the ball to move and block the orifice, to minimize liquid loss.



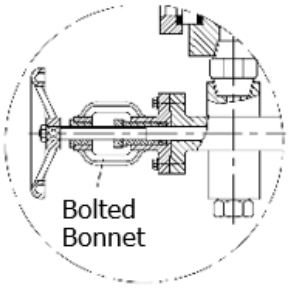
1) PROCESS FLANGE
2) NECK
3) BALL
4) ORIFICE
5) NEEDLE
6) BALL STOPPER
7) CAPSULE

Isolating Valve Bonnet

Screwed Bonnet

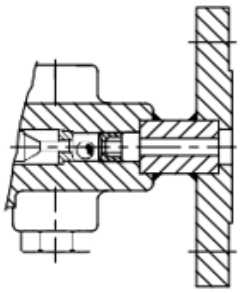


Bolted Bonnet outside screw

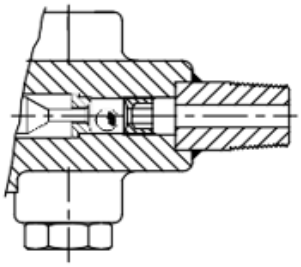


Process (Vessel) Connections

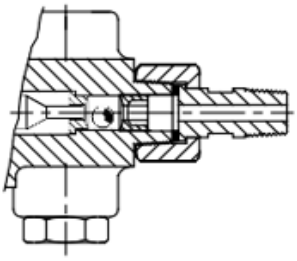
Flanged



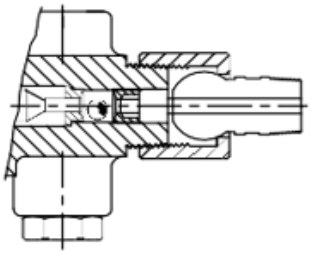
Male Screwed Shank



Male Screwed Union

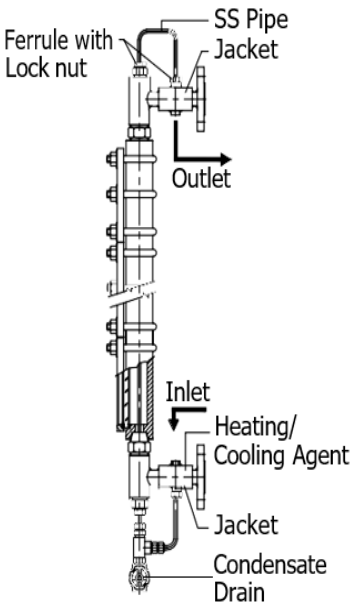


Male Sph. Union

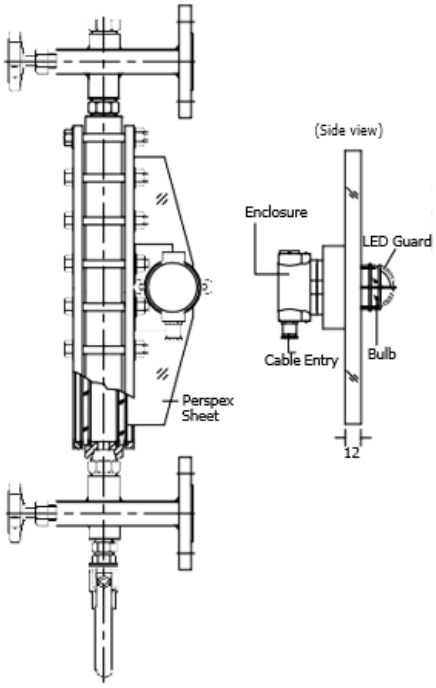


Jacketing

Is employed for heating / cooling of Process liquid at temperature other than amb temperature, to prevent its solidification. Heating is done thru hot water / steam and Cooling thru a refrigerant like freon, propane or ammonia, which pass internally thru a SS pipe, gauge chamber to come in direct contact with process liquid.



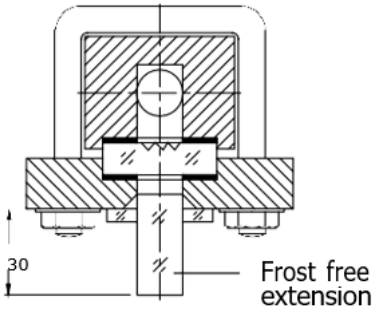
Illuminator



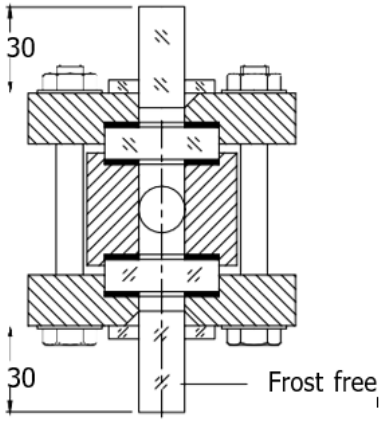
Illuminates poorly lit areas for proper visual indication.

Frost Free Extension (Sectional view)

Is employed for visual indication of liquid at low temperature. Perspex plate extension is fitted on the gauge glass to prevent frost formation on the outer surface of gauge glass to improve clarity of visual indication of liquid.

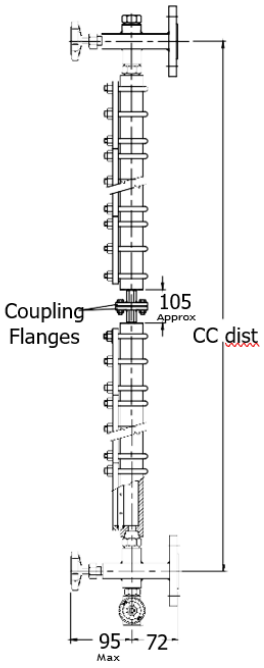


Reflex

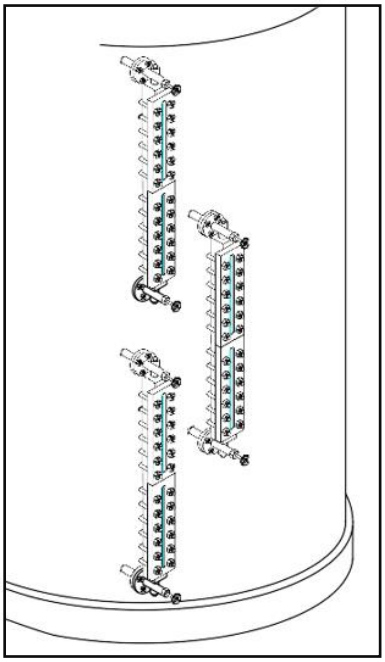


Transparent

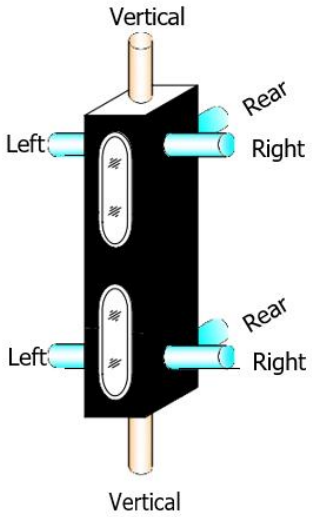
Long CC- Distance with 2-Chembers



Staggered Installation



Orientation of process connection

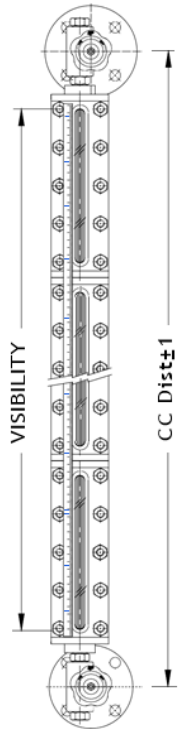


Gauge Classification

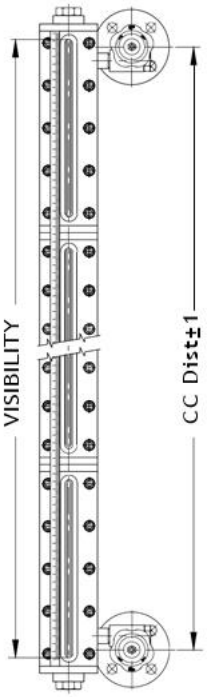
				NON STEAM SERVICES					
				REFLEX			TRANSPARENT		
Gauge Classification	Body MOC	Gauge Glass MOC	Gauge Glass size (Mm)	Max Temp (°C)	Max Optq. Pressure (Kg/cm2)	Max Test pressure (Kg/cm2) at amb Temp	Max Temp (°C)	Max Optq. Pressure (Kg/cm2)	Max Test pressure (Kg/cm2) at amb Temp
Low pressure	PP	Soda ash	30W x 17 Thk	80	1.5	3	NA	NA	NA
	Metallic	Soda ash	30W x 17 Thk	100	20	30	100	20	30
	Metallic	Borosilicate	30W x 17 Thk	400	20	30	400	20	30
Medium pressure	Metallic	Borosilicate	30W x 17 Thk	400	56	85	400	56	85
High pressure	Metallic	Borosilicate	30W x 17 Thk	400	110	165	400	110	165
Very High pressure	Metallic	Borosilicate	30W x 17 Thk	400	140	210	-	-	-

				STEAM SERVICES					
				REFLEX			TRANSPARENT		
Gauge Classification	Body MOC	Gauge Glass MOC	Gauge Glass (Mm)	Max Temp (°C)	Max Optq. Pressure (Kg/cm2)	Max Test pressure (Kg/cm2) at amb Temp	Max Temp (°C)	Max Optq. Pressure (Kg/cm2)	Max Test pressure (Kg/cm2) at amb Temp
Low pressure	PP	Soda ash	30W x 17	-	-	-	-	-	-
	Metallic	Soda ash	30W x 17	-	-	-	-	-	-
	Metallic	Borosilicate	30W x 17	-	-	-	-	-	-
Medium pressure	Metallic	Borosilicate	30W x 17	243	32	64	243	35	70
High pressure	Metallic	Borosilicate	30W x 17	-	-	-	300	70	140
Very High pressure	Metallic	Borosilicate	30W x 17 Thk	-	-	-	300	80	160

ST-THRU



Hook-up



Ordering Information

Reflex Level Gauge	RLG																		
Transparent Level Gauge	TLG																		
1 Gauge Classification																			
Low Pressure (30Kg/cm ^{2})		L																	
Medium Pressure (85Kg/cm2)		M																	
High Pressure (165Kg/cm2)		H																	
Very High Pressure (210Kg/cm2)		V																	
Others		O																	
2 Body (Liquid chamber)																			
CS			M																
ASTM A-105			A																
SS304			N																
SS316			S																
SS316L			L																
PP (CS Reinforced, 2kg/cm2) only for RFG			P																
Others			O																
3 Cover Plate																			
CS				M															
ASTM A-105				A															
SS304				N															
SS316				S															
SS316L				L															
FRP (with PP liquid chamber, only for RFG)				F															
Others				O															
4 Gauge Glass																			
Tempered Soda Ash (30W) (Low pressure only)					1														
Tempered Borosilicate (30W)					2														
Tempered Borosilicate (34W)					3														
Tempered Borosilicate (30W) x Mica Shield (For TFG)					4														
Tempered Borosilicate (34W) x Mica Shield (For TFG)					5														
5 Sealing Gasket/Cushion																			
CAF						1													
CNAF						2													
PTFE						3													
Graph oil SS316 re-enforced						4													
Graph oil SS304 re-enforced						5													
Other						O													
6 Isolating Valves																			
Without							W												
Integral Offset NV x Screwed Bonnet (Metallic)							1												
Integral Offset NV x screwed Bonnet x Ball check (Metalic)							2												
Integral Offset NV x Bolted Bonnet (OS & Y) (Matalic)							3												
Integral Offset NV x Bolted Bonnet (OS & Y) x Ball check (Metalic)							4												
Inline Flanged Ball Valve (Low Pressure)							5												
Spring-Loaded Push-Button Needle Valve (Marin)							6												
Other							O												

7 Vent x Drain Size										
1/2" BSPx 1/2" BSP (PP)		1								
1/2" NPT x 1/2" NPT		2								
3/4" NPTx 3/4" NPT		3								
1/2" NB ASME x 1/2" NB ASME (flange)		4								
3/4" NB ASME x 3/4" NB ASME (flange)		5								
1" NB ASME x 1" NB ASME (flange)		6								
Others		O								
8 Vent x Drain type										
Plug x Plug			1							
Plug x Ball valve (upto 200o c, medium pressure)			2							
Ball Valve x Ball Valve			3							
Plug x Globe valve (upto 400o c, high pressure)			4							
Globe Valve x Globe Valve			5							
Plug x Gate valve (upto 400o c, high pressure)			6							
Gate Valve x Gate Valve			7							
Flange x Flange			8							
Flange with Blind Flanges x Flange with Blind Flanges			9							
Other			O							
9 Gauge Connection										
Hook-up (Side - Side) x Welded Nipple (Metalic)				1						
Hook-up (Side - Side) x Union (Metalic)				2						
Straight Through (Top - Bottom) x Scrwd Nipple				3						
Straight Through (Top - Bottom) x Union (Metalic)				4						
Others				O						
10. Process Connection Size										
1/2" (flange only)					1					
3/4"					2					
1"					3					
1-1/2" (flange only)					4					
2" (flange only)					5					
Others					O					

11. Process Connection Type						
ASME 150 # FF Flange (PP)		A				
ASME 150 # RF Flange		B				
ASME 300 # RF Flange		C				
ASME 600 # RF Flange		D				
ASME 150 # WNRF Flange		E				
ASME 300 # WNRF Flange		F				
ASME 600 # WNRF Flange		G				
Screwd shank (M) 3000 # (Metalic)		H				
Screwed NPT (M) with Plain Union 3000# (Metalic)		I				
Screwed NPT (M) with Spherical Union 3000# (upto high Preessure) (Mtalic)		J				
Screwed NPT (f) 3000# (Metalic)		K				
Socket Weld 3000# (Metalic)		L				
ASME 150 # RF Flange with Screwed Union		M				
ASME 300 # RF Flange with Screwed Union		N				
ASME 600 # RF Flange with Screwed Union		P				
ASME 150 # RF Flange with Spherical Union (upto high pressure)		Q				
ASME 300 # RF Flange with Spherical Union (upto high pressure)		R				
ASME 600 # RF Flange with Spherical Union (upto high pressure)		S				
Others		O				
12. Process Connection Orientation						
Rear x Rear			B			
Left x Left (RFG, with Straight Thru Conn. in TFG)			L			
Right x Right (RFG, with Straight THru Conn. in TFG)			R			
Other			O			
13. Bolts x Nuts						
CS x CS (upto medium pressure)				1		
A 193 Gr. B7 x A 194 Gr. 2H (upto very high pressure)				2		
A 193 Gr. B8, A 194 Gr. 8 (SS304) (upto medium pressure)				3		
A 193 B8M, A 194 Gr. 8M (SS316) (upto medium pressure)				4		
Other				O		

14. Special Features		
Without		W
Frost Free Extension		F
Jacketing		J
Illuminator IP65 (recommended for TFG)		X
Illuminator EX d Gr IIB (recommended for TFG)		Y
Illuminatore EX d Gr IIC (recommended for TFG)		Z
15. Calibrated Scale MOC		
Without		W
SS304 Scale in mm (LC=5mm)		1
SS304 Scale in cm (LC=0.5cm)		2
SS304 Scale in inches (LC=1/4")		3
Others		O

For inquiries contact us at:

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