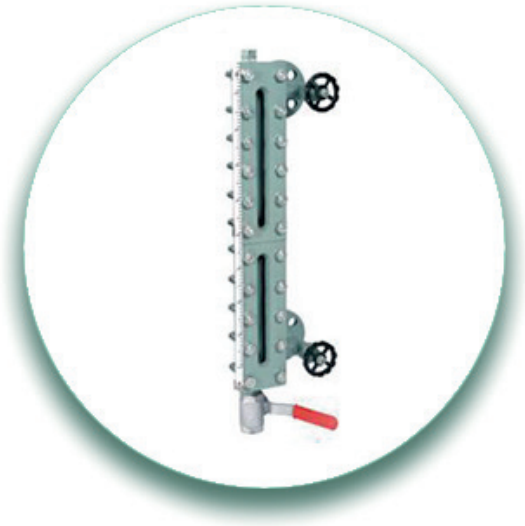
Techtrol
Innovating Level Controls Since 1984

Pune Techtrol Private Limited



Reflex Flat Glass Level Gauge - RFG

INSTRUCTION AND MAINTENANCE MANUAL

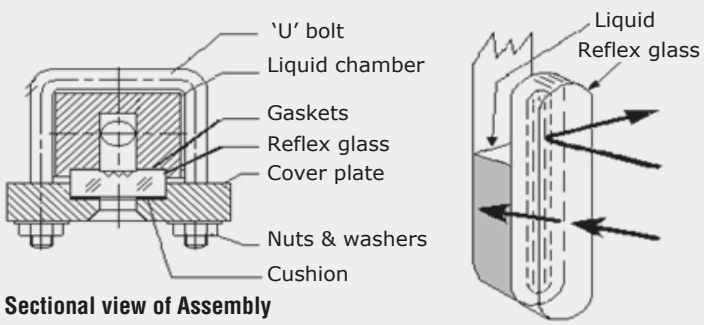
Every Techtrol product should be installed properly, maintained regularly and used within its specified limits to ensure accurate & troublefree performance with extended working life.

1. INTRODUCTION & WORKING

This gauge is used for safe and positive indication of liquid levels in vessels under high temperatures and pressures. It consists of thick, flat glass (Reflex Type) having prismatic grooves on inside.

The refraction of light due to the prismatic grooves results in to showing the liquid portion as dark and balance portion as silvery white. Reflex gauge glass, gaskets, cover plates and liquid chamber are held together with ' U ' bolts. Gauge glass is sandwiched between recesses provided in the body and cover plate.

Fig. 1



Sectional view of Assembly

2. UNPACKING

We are glad to know that you are using a reliable ' Techtrol ' product. This product contains fragile parts like glass tube and hence we suggest that you go through this manual carefully before installation.

1) Unpack carefully & ensure that the product has not been damaged in transit.
2) Ensure that the fasteners / screws have not loosened in transit. Tighten them adequately, if found loose.
3) Identify that the product received is in line with approved drawing.
4) If the material is found damaged in transit, take further action as per transit insurance clause

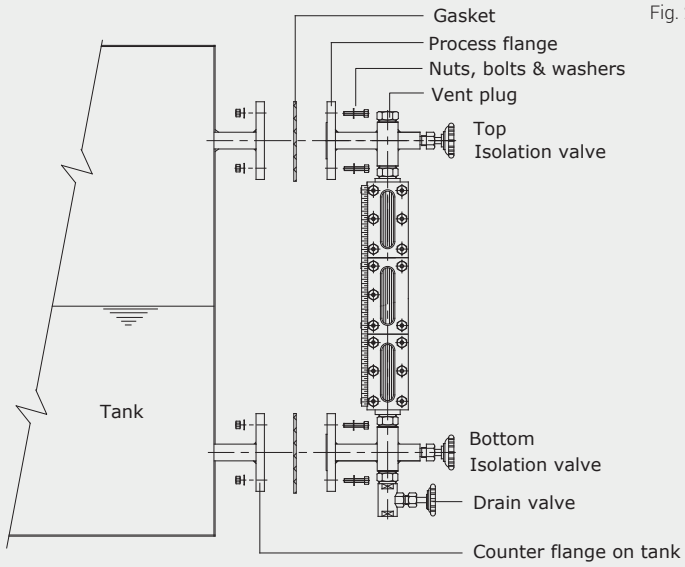
CAUTION: Fragile Material. Please take care while unpacking

3. INSTALLATION

1) Select a suitable location on tank, where vibrations if any, are minimal.
2) Ensure that the Process connections of the level gauge, match the counter connections provided on tank.

   Flange connection - Flanges on the level gauge should match the counter flanges on the tank & their PCD orientation should be identical.Screwed / SMS Union - The threads and size should match.
3) The level gauge is installed vertically, parallel to the tank side. Ensure its vertical positioning through a plumb line. Also ensure that Vent is at the Top and Drain is at the Bottom
4) Provide suitable gaskets between the flanges or appropriate thread sealant between threads before bolting, to ensure zero leakage through the joint.
5) Ensure that vent / drain plug / valve are closed Properly.

Fig. 2



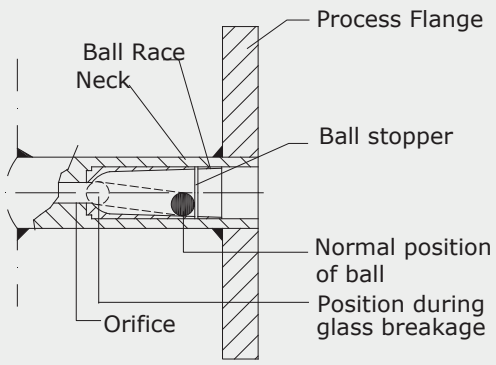
Note: * Counter flange should match Process flange

***Please ensure that operating conditions are within limits as per TECHTROL Test Report**

4. OPERATION

1) Open " Top isolation valve" gradually to equalise the pressure in the tank and gauge
2) Now open bottom isolation valve gradually to allow tank liquid to enter the gauge glass and seek its level.
3) Allow liquid level in gauge glass to stabilize. This visual indication will be the liquid level in the tank.

Fig. 3



5. FUNCTION OF BALL CHECK

Auto ball check facility is provided to prevent "Liquid loss' from the vessel and safety during breakage of gauge glass.

It consists of a capsule located along the ' neck ' of the gauge and contains a ball which moves freely along its inner race, between the stopper and orifice.

During breakage, the pressure on the ball from gauge side will be atmospheric, whereas higher pressure from the vessel side (Operating Pressure + Liquid Column) will cause the ball to move and block the orifice where by liquid loss will be minimized.

6. MAINTENANCE

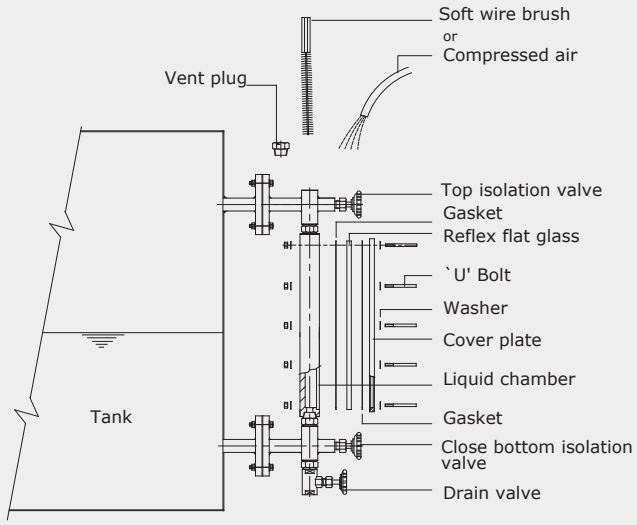
Normally `Reflex Level Gauge requires no maintenance. However, gauge glass may become dirty and require an occasional cleaning with a soft brush, trichloroethylene or compressed air. It is advisable to replace the gaskets at least once in a year

Cleaning of gauge glass (Fig - 4) :

The gauge glass can be cleaned without its removal as follows,

1) Close both isolation valves.
2) Open the drain plug / valve and drain the liquid from the liquid chamber.
3) Open vent plug / valve.
4) Clean the gauge glass with a soft wire brush or by passing compressed air or water from top (vent). If dirt still persists, then employ trichloroethylene

Fig. 4



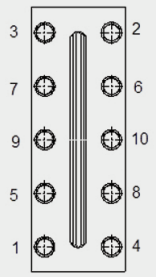
Gauge glass removal :

1) Close both isolation valves.
2) Open the drain plug / valve and drain the liquid from the liquid chamber.
3) Open vent plug / valve. Now close bottom isolation valve.
4) Unscrew the nuts over U-bolts on cover plate. Follow the bolt loosening sequence as shown in fig 5
5) Remove mid-section U-bolts initially and there after remove U-bolts on upper and lower side and separate the cover plate carefully.
6) Remove gauge glass, gasket and cushion and clean the gauge glass &nd liquid chamber

Gauge glass refitting :

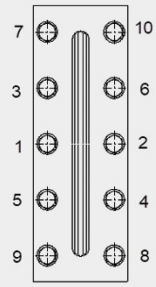
1) Replace old gaskets with new. Locate the gasket in the recess.
2) Place the gauge glass over the gasket.
3) Fit the U-bolts on the cover plate and tighten the nuts on them, follow the bolt tightening sequence as shown in fig 6
4) Ensure that U-bolts and nuts are tightened uniformly with appropriate torque.

Fig. 5



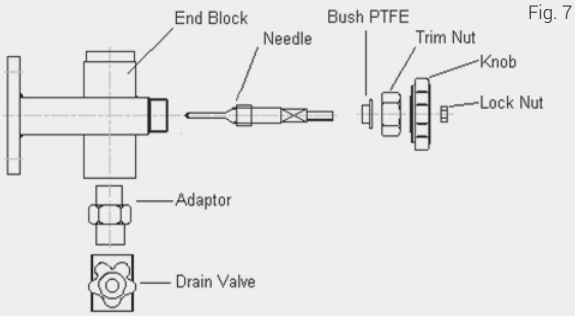
Bolt Loosening Sequence

Fig. 6



Bolt Tightening Sequence

Fig. 7



7. TROUBLESHOOTING

SL	PROBLEM	CAUSE	SOLUTION
1	**Leakage through gasket**	U-bolts not tightened uniformly Gasket damaged or hardened	Tighten uniformly Replace gasket
2	**Shows correct reading initially and faulty readings after some period**	Gases entrapped within the liquid Deposition of dirt inside the liquid chamber, gauge glass, orifice of ball check	Effect venting Clean glass & orifice
3	**Auto ball check is not working**	Deposition of dirt on orifice of ball check Auto ball damaged	Clean the orifice Replace auto ball check capsule
4	**Leakage through isolation valve**	Wear out of packing bush in Isolation valve assembly due to frequent operations.	Replace packing bush (Teflon)
5	**Breakage of glass**	High operating pressure / temp Excessive / Uneven tightening of 'U' bolts.	Maintain rated temp & pressure Replace glass & tighten with Uniformly with appropriate torque.

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