

Technical Specification
for
Double Plate type Liquid Level Gauge

1.0 Description

Mica faced double plate High Pressure Liquid Level Gauge with flanged process connections and with forged type top & bottom integral isolating valves. Salient requirements of level gauge are as follow:

- i. Mica sheet to be placed on inner face of each glass plate as protection against high temperature condensate/steam.
- ii. LLG should have deep stuffing box arrangement to give leak proof joint at the specified working conditions.
- iii. Top & bottom isolating valves should have ball check type S.S. stop valve.
- iv. Top isolating valve should have a plugged vent connection with SS-plug.
- v. Bottom isolating valve should have a S.S. drain valve fitted.
- vi. Valve handles to be right hand.
- vii. Process connection should be off-set type with provision to isolate the LLG & carryout desired maintenance on gauge portion.

2.0 Design Particulars

- | | |
|--|---|
| a. Design Pressure | 51.0 Kg/sq.cm.g & Full Internal Vacuum |
| b. Temperature | 270 °C |
| c. Working fluid | Condensate/Steam |
| d. Hydrostatic test Pressure (minimum) | 76.5 kg/sq. cm.g. |
| e. Process Connection | 20 NB |
| f. Centre-to-centre distance | 800 mm |
| g. Visibility approx. | 680 mm |

3.0 Code of Construction

As per **ASME** sec. VIII Div.1; latest & **IBR-1950**

4.0 Process Connection:

Type : Weld Neck Raised Face Flanges

Compliance : As per **ANSI-B-16.5** class 600 psi.

Bolting details shall be as follow:

- | | |
|---------------------|-----------------------|
| a. Nominal size | 20 NB |
| b. Outside dia | 118.0 mm |
| c. Flange thickness | 18.0 mm |
| d. Raised face dia | 43.0 mm |
| e. No. of holes | 4 (off-center) |
| f. Size of holes | 19.0 mm |
| g. Pitch circle dia | 82.5 mm |

5.0 Material of Construction for Major parts.

a. Gauge body	: C.S. Forging(single Piece)	: SA105
b. Gaskets	: Graffoil (Non-asbestos)	
c. Transparent Glass	: Melded Borosilicate (Imported)	
d. End Covers	: C.S. Forging	: SA105
e. Fasteners	: H.T. Steel	: SA193 Gr.B7/SA194 Gr.2H
f. Valve Body Seat Nipple	: Stainless Steel	:SS-304
Union, Bonnet etc.		
g. Yoke, Bush, Gland & Gland Follower	: Stainless Steel	:SS-304
h. Balls	: Stainless Steel	:SS-316
i. Spindle with Tip	: Stainless Steel	:SS-410
j. Vent Plug	: Stainless Steel	:SS-304
g. Process connection Flange	: Stainless Steel	:SS-304
h. Drain (needle) Valve	: Stainless Steel	:SS-316

6.0 Inspection

These LLGs are required for high pressure feed water heaters, which are under the purview of Indian Boiler Regulation, 1950. Hence these are to be inspected by **Inspecting Authority/Inspecting officer as per IBR** in addition to the inspection by BHEL-CQS or its authorized representative at vendors works.

7.0 Hydrostatic Testing

After completing fabrication & assembly activities, each finished liquid level gauge shall be subjected to hydrostatic pressure test at the pressure indicated under the heading Design Particulars for a duration of 30 minutes minimum.

8.0 Test Certificates

All the Liquid Level Gauges shall be certified in **IBR form III** & shall be duly signed by Inspecting Officer & Inspecting authority as per IBR. In addition six(6) copies of following test certificates, duly cleared by inspecting officer, shall be furnished.

- Hydrostatic test.
- Visual examination.
- Dimensional measurement report
- Certificate on IBR from III C.

These test certificates should have the reference of BHEL approved drawing and Purchase Order Number.

9.0 **Drawings**

Vendor to furnish following documents for review & approval after placement of order.

- a. Four (4) copies of Level Gauge drawing indicating the material of construction of each part with references to National & International standards, overall & major dimensions, quantities, Design & test conditions, Weights etc.
- b. After placement of order, soft copy of drawing & datasheet shall be sent by mail to mltaurani@bhelbpl.co.in

10.0 **Quality Assurance**

To enable the Inspecting authority to fix up stages of inspection, vendor to furnish quality plan along with the offer. ***Manufacturing shall be carried out as per approved drawings & QA Plan.***

11.0 **Installation & Operating Instruction Manual**

Six(6) copies of installation, operation & maintenance instruction manual shall be furnished alongwith the gage test certificates & IBR certification.

12.0 **Identification Tag**

Instrument identification tag to be fitted on each of the Liquid Level Gauge for identification & correlation with its certificates/records. Metallic nameplate with inscription as indicated below and shall be provided on hand wheel/body of valves, duly co-related with test certificates.

"LLG for H.P. Heaters" ; "BHEL PO No. xxxxxx" ;
& "Code No. HE-4xxxxxxxxx"

13.0 **Packing**

Each Liquid level Gauge should be suitably packed to avoid any kind of damage during Handling & transportation.