

INTRA-AUTOMATION



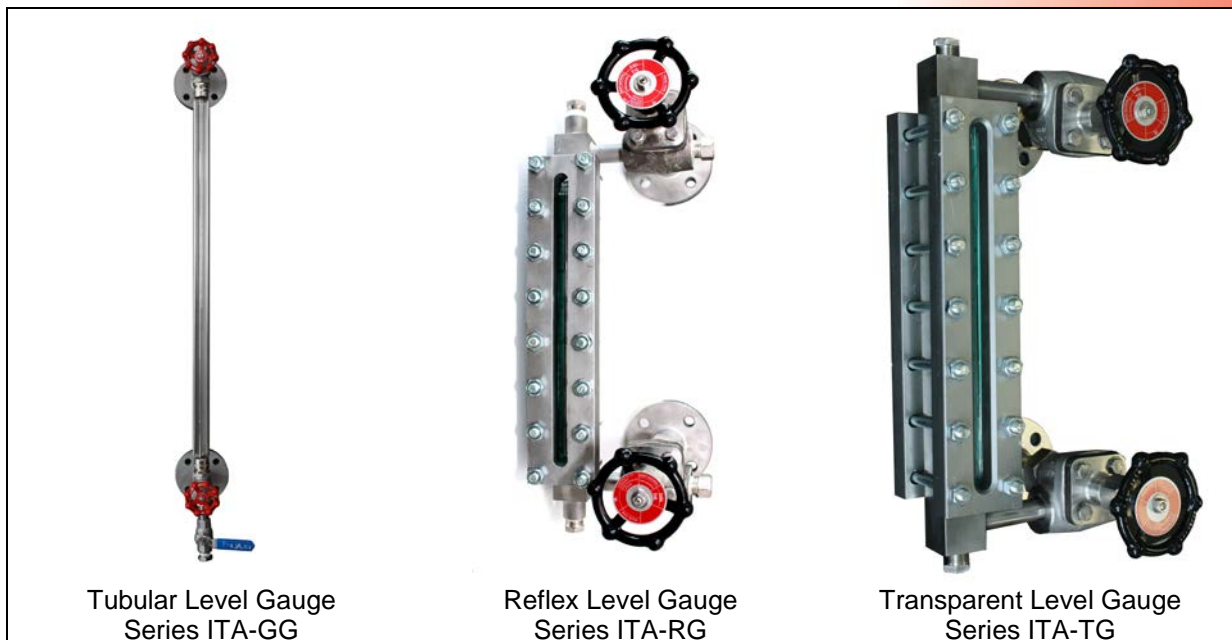
MESS- UND REGELINSTRUMENTE / MEASUREMENT AND CONTROL

Certified according to ISO 9001; PED 97/23/EC; ATEX 2014/34/EU

LEVEL GAUGES WITH DIRECT LIQUID VISIBILITY

Tubular/Reflex/Transparent types

Series: ITA-GG / ITA-RG / ITA-TG



Tubular Level Gauge
Series ITA-GG

Reflex Level Gauge
Series ITA-RG

Transparent Level Gauge
Series ITA-TG

Technical Information

03/2013



LEVEL

THE EXPERT IN LEVEL AND FLOW

Intra-Automation
Technical Information
03/2013

Technical details subject to be changed without notice.

For comments regarding this brochure, please contact
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1. Introduction

Due to some reasons (obligations by law, practical reasons or similar) it can be necessary, that a fluid level can be observed directly. For that kind of applications, Intra-Automation has developed its own series of Tubular Level Gauges (ITA-GG), Reflex Level Gauges (ITA-RG) and Transparent Level Gauges (ITA-TG). Together with our Magnetically Controlled Level Gauge (ITA) and several electronic transmitters, we now have a complete product line for level monitoring. In this brochure, the devices for direct visibility of levels are to be described.

ITA Level Gauges are coded as follows:

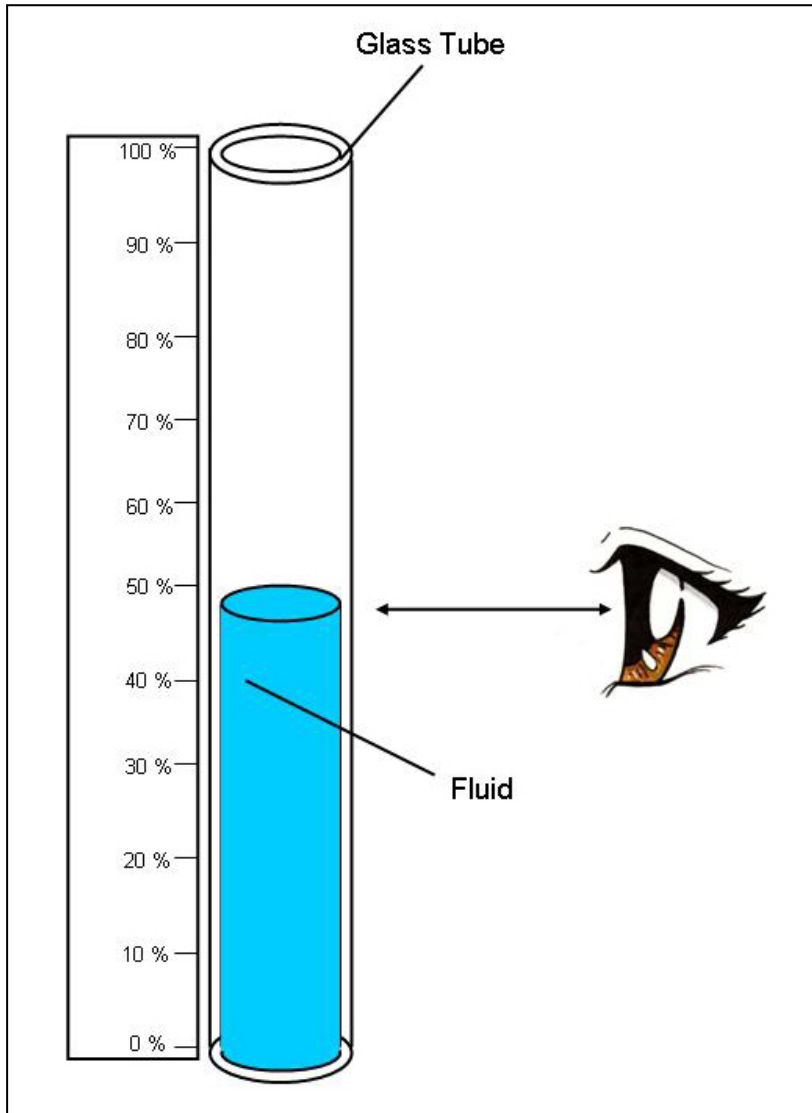
| ITA- | Device for level measurement | |
|-------------|------------------------------|---|
| 3 | | up to PN16 / 150 lbs, material: stainless steel |
| 3.0 | | up to PN16 / 150 lbs, material: carbon steel |
| 6 | | up to PN40 / 300 lbs, material: stainless steel |
| 6.0 | | up to PN40 / 300 lbs, material: carbon steel |
| 7 | | up to PN63 / 300 lbs, material: stainless steel |
| 7.0 | | up to PN63 / 300 lbs, material: carbon steel |
| 10 | | up to PN100 / 600 lbs, material: stainless steel |
| 10.0 | | up to PN100 / 600 lbs, material: carbon steel |
| 11 | | up to PN160 / 900 lbs, material: stainless steel |
| 11.0 | | up to PN160 / 900 lbs, material: carbon steel |
| 12 | | up to PN250 / 1500 lbs, material: stainless steel |
| 12.0 | | up to PN250 / 1500 lbs, material: carbon steel |
| 13 | | up to PN320 / 2500 lbs, material: stainless steel |
| 13.0 | | up to PN320 / 2500 lbs, material: carbon steel |
| | -GG | Tubular type |
| | -RG | Reflex type |
| | -TG | Transparent type |

Please note that not all level gauge types are suitable for all pressure ratings!

2. Tubular Level Gauges

2.1 Description / Functional Principle

A tubular level gauge consists of a glass tube between two shut-off-safety-valves. The valves also serve as process connection via flange, thread or welding end.



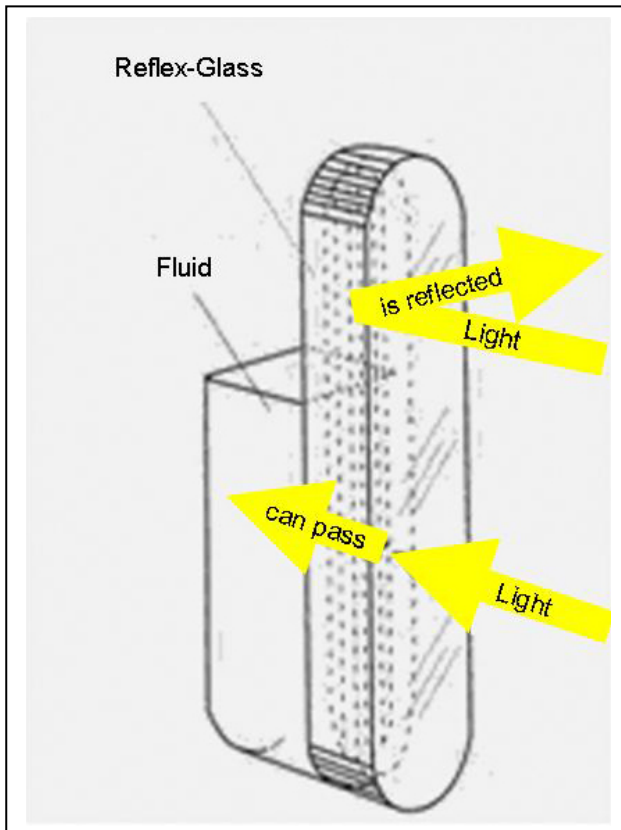
The level gauge is mounted to the tank as a bypass chamber. It works according to the law of communicating tubes. The level in the glass tube is identical to the level in the tank and can be monitored directly.



3. Reflex Level Gauges

3.1 Description / Functional Principle

Reflex Level Gauges are designed to be connected sideways to the tank as a bypass tube. They are customized to the client's requirements. They fit exactly to the application, provided the client's information is exact. The tank connections are equipped with safety valves to avoid letting flow out the liquid in case of a glass break. For a safe shut-off, the needed pressure is 2 bar (min.). The gauge body itself consists of a stand pipe, which contains the fluid to be measured, of Reflex-glass segments (DIN glasses) and of a cover, which fixes the Reflex glass at the cut-out of the stand pipe. Intra-Reflex Level Gauges are made from stainless steel 316L (1.4404) or from carbon steel. The glass is borosilicate. For higher temperatures the gauges are equipped with a heat protection.

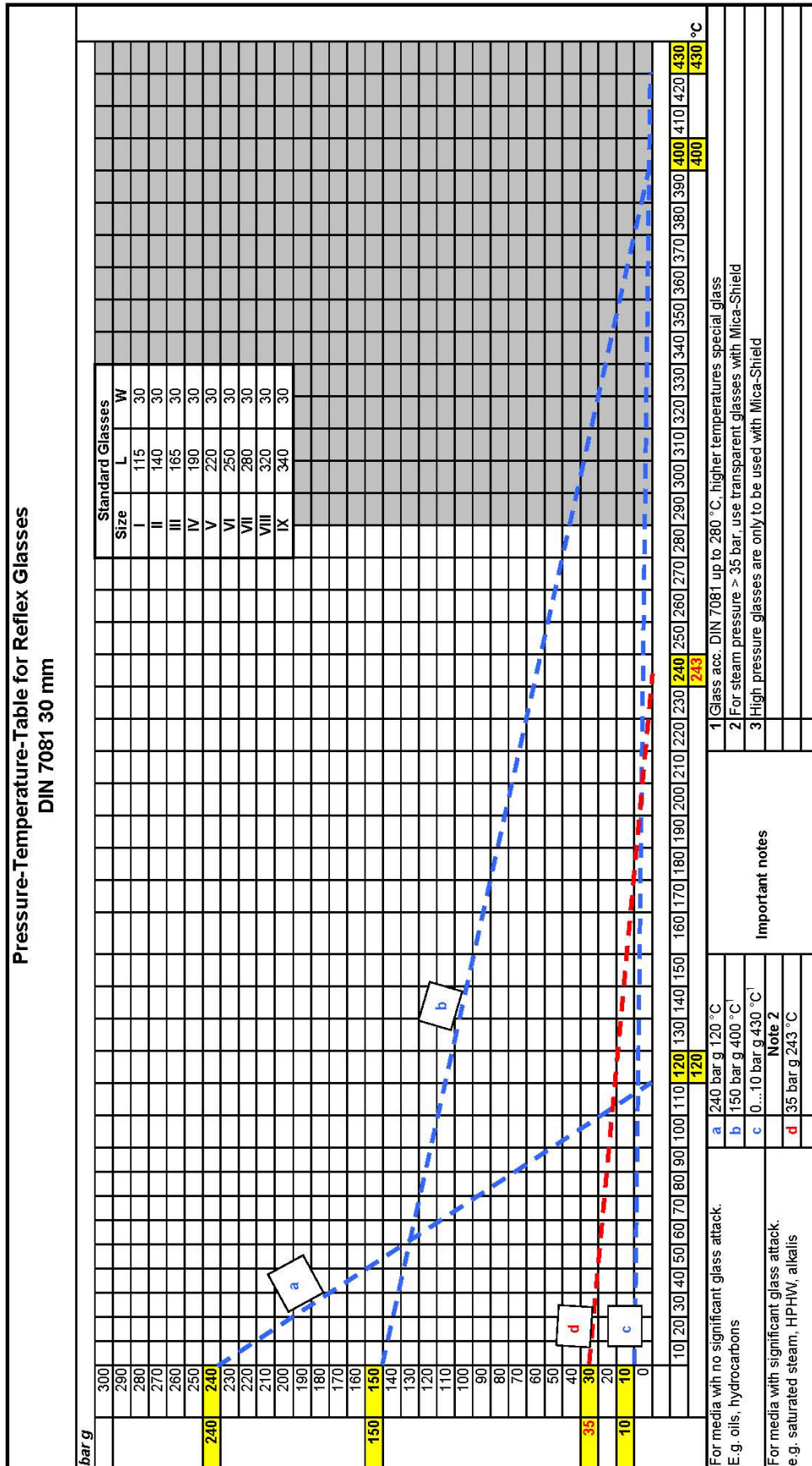


The glass of a Reflex Level Gauge is ground in a way to enable it to refract light like a prism. At the zone of liquid to measure, the light gets almost absorbed. That makes this zone very much darker than the zone of gas. By this contrast the liquid level can be observed clearly.

The Reflex Level Gauge is connected to the tank by two process connections, one at the upper end of the gauge and one at the lower end. So the tank and the gauge act as "communicating" tubes. So the liquid level in the gauge always corresponds exactly to the liquid level in the tank.

3.2 Technical Data

1. Temperature-pressure relation:

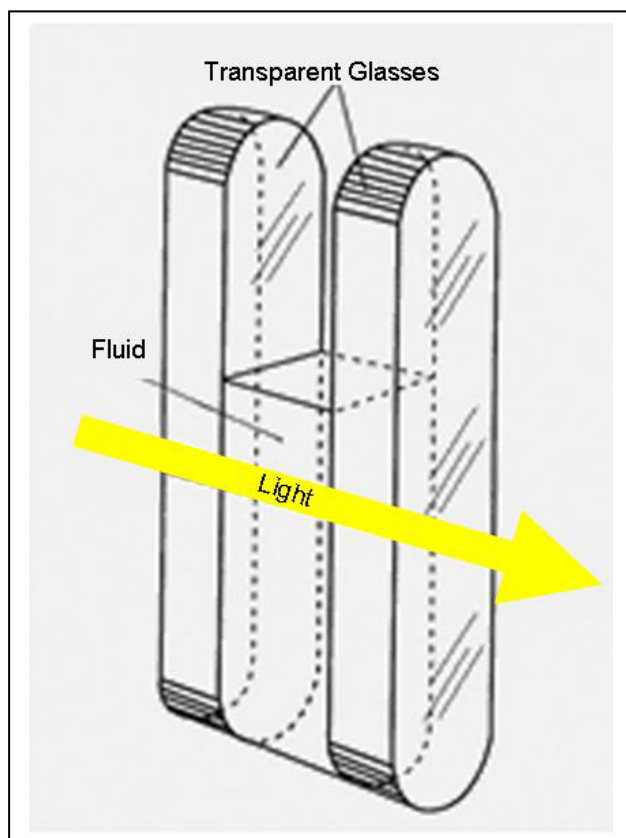


4. Transparent Level Gauges

4.1 Description / Functional Principle

Transparent Level Gauges are designed to be connected sideways to the tank as a bypass tube. They are customized to the client's requirements. They fit exactly to the application, provided the client's information is exact. The tank connections are equipped with safety valves to avoid to let flow out the liquid in case of a glass break. For a safe shut-off, the needed pressure is 2 bar (min.). The gauge body itself consists of a stand pipe, which contains the fluid to be measured, of Transparent-glass segments (DIN glasses) and of covers, which fix the Transparent glasses at the cut-outs of the stand pipe.

Intra-Transparent Level Gauges are made from stainless steel 316L (1.4404) or from carbon steel. The glasses are borosilicate. For higher temperatures the gauges are equipped with a heat protection.

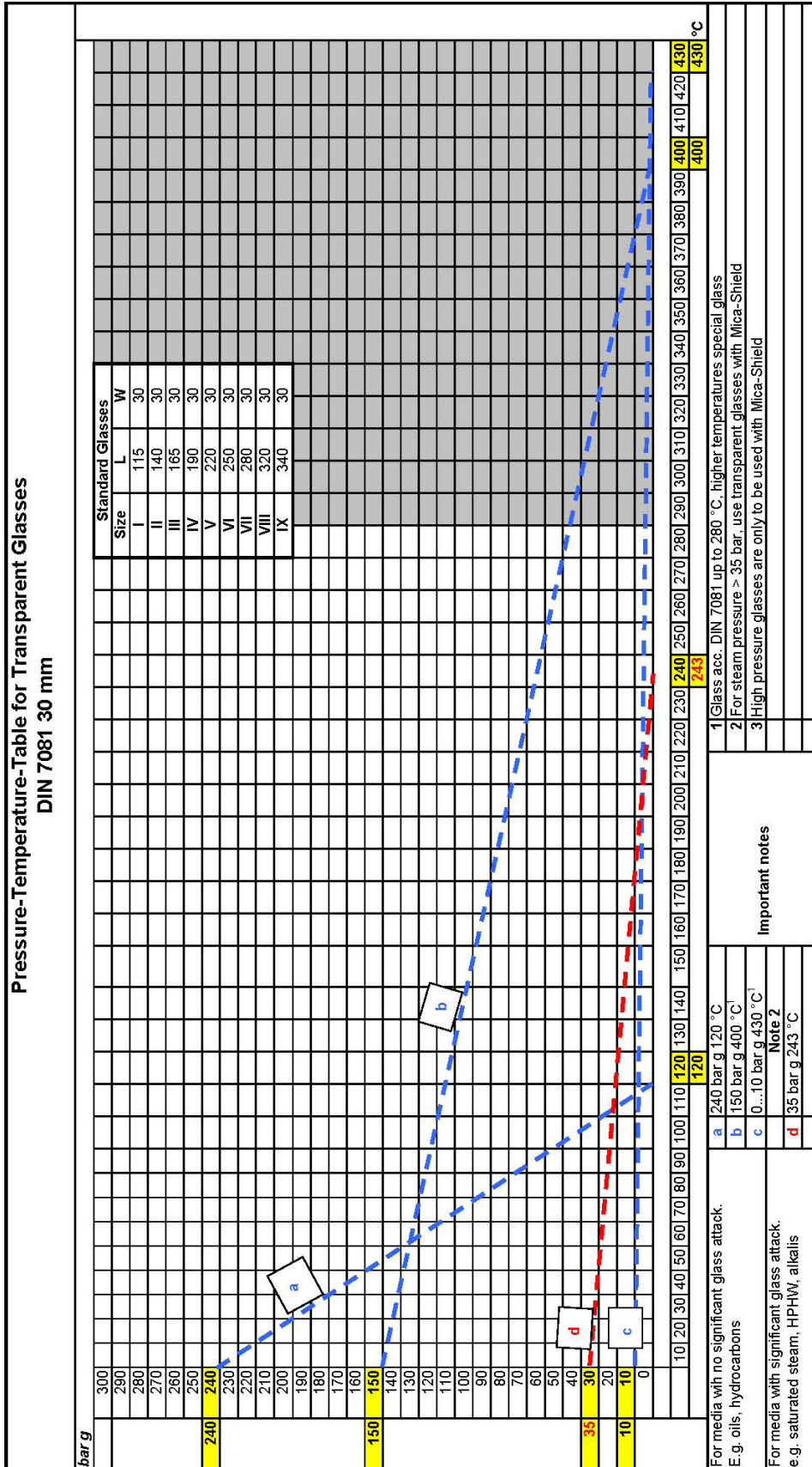


Inside the stand pipe of a Transparent Level Gauge, the liquid column is placed between two glass panels, which enable to see through. This transparency makes observation of the liquid level easily possible.

The Transparent Level Gauge is connected to the tank by two process connections, one at the upper end of the gauge and one at the lower end. So the tank and the gauge act as "communicating" tubes. So the liquid level in the gauge always corresponds exactly to the liquid level in the tank.

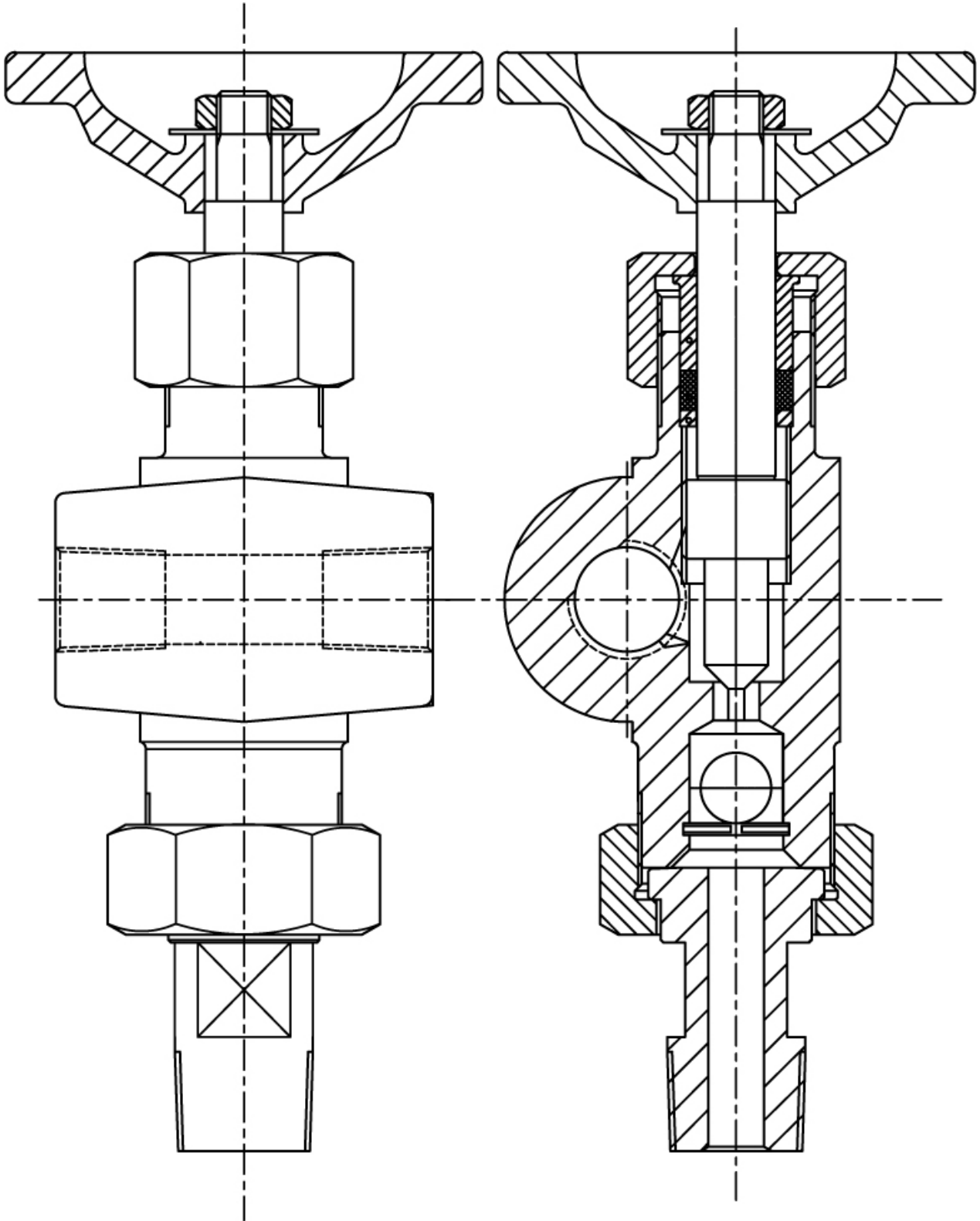
4.2 Technical Data

1. Temperature-pressure relation:



5. Ball Check Valve

The level gauges are protected by ball check valves:



Constructional drawing ball check valve.

6. Glasses (Reflex & Transparent)



Reflex Glass



Transparent Glass

Intra-Automation GmbH uses toughened Borosilicate glasses according to DIN 7081 for its Reflex Level Gauges (ITA-⁴-RG) and Transparent Level Gauges (ITA-^{*}-TG). This standard is engraved in the glasses.

The capabilities of the glasses are as follows:

- 1.) Unprotected reflective or transparent panes designed for continuous exposure to saturated steam or hot water pressure **up to 35 bar** and a temperature **up to 243°C**.
- 2.) Mica-film protected reflective or transparent panes designed for continuous exposure to saturated steam or hot water pressure **up to 70 bar** and a temperature **up to 300°C**¹.
- 3.) Panes designed for continuous exposure to non-aggressive media at a temperature **up to 280°C** (under special conditions, panes may be used at temperatures **up to 300°C**¹).

¹: Panes designed for continuous service shall resist temperatures up to 280°C. Temperatures exceeding 280°C may cause the induced compressive stress to be relieved, reducing it to approximately 90 % of its initial value following a service of 300 hours at 300°C. Panes may be used at temperatures between 280°C and 300°C provided the pane is protected using a Mica-film, and the service hours above 280°C total no more than 300.

Dimensions of glass panes:

| Type of Gauge | Glass no. | | | | | | | | |
|---------------|------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | Dimension in mm: | | | | | | | | |
| Reflex | 115 | 140 | 165 | 190 | 220 | 250 | 280 | 320 | 340 |
| Transparent | 115 | 140 | 165 | 190 | 220 | 250 | 280 | 320 | 340 |

Besides the products covered by this brochure, Intra-Automation GmbH also manufactures other high-quality and high precision instruments for industrial measurement tasks. For more information, please contact us (contact details on the backside of this brochure).

Flow measurement



Itabar®-Flow Sensor



IntraSonic IS210 Ultrasonic Flow Meter

Level measurement



ITA-mag. Level Gauge



MAGLINK Level Indicator

Other Measurement Tasks:



DigiFlow Flow and Level Computers



IntraCon Digital Controllers



IntraDigit Digital Indicators / Meters



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