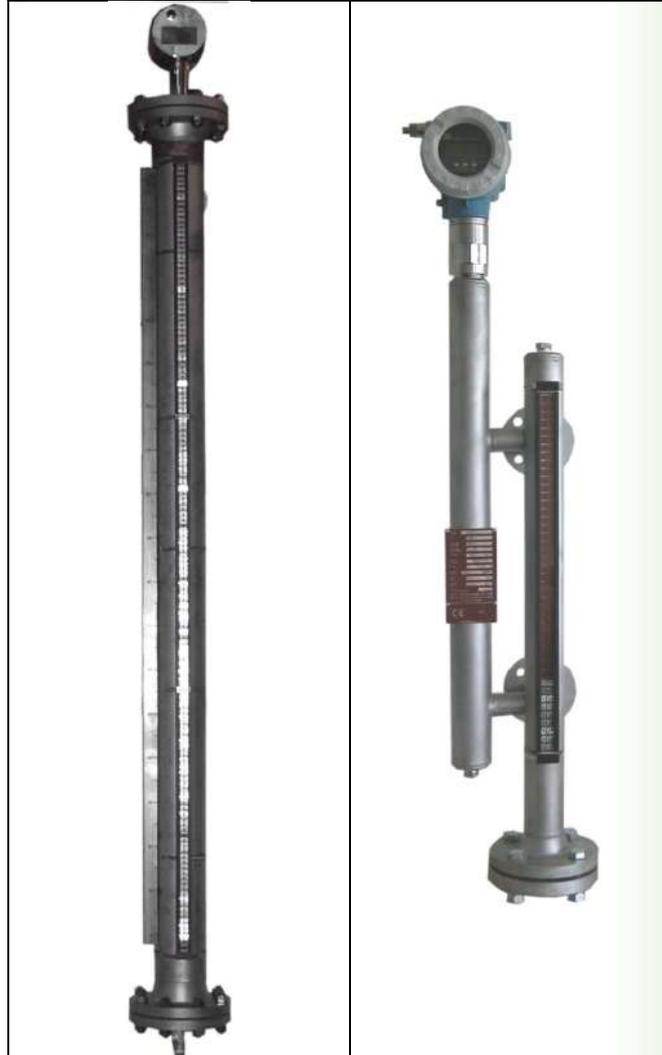
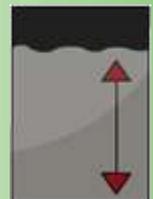


## Mag. level indicator Type ITA combined with guided radar measurement



Technical Information

01/2018



Intra-Automation  
Combination ITA-GWR  
Technical Information  
Last printed: 01/2018

Typing errors and technical changes reserved.

Subject to change service.

## Magnetically controlled level indicator combined with guided radar

### Description:

The instrument consists of a combination of conventional magnetic level indicator and guided radar with Smart Transmitter for continuous level measurement in liquids.

Both instruments are housed in a single reference vessel and operate completely independently of each other.

The measuring principle of the mag. Level indicator is based on the principle of communicating vessels. The change of the level in the tank causes a direct change of the level in the float chamber of the level indicator.

The magnetic coupling between the float and the magnetized indicator flaps causes the indicator flaps to rotate so that the level can be read directly.

The guided level radar has a rod probe and operates according to the transit time method (TOF = time of flight). The distance from the reference point (process connection of the measuring instrument) to the product surface is measured. High-frequency pulses are coupled to a probe and guided along the probe. The pulses are reflected by the product surface, received by the evaluation electronics and converted into the level surface. This method is also known as TDR (Time Domain Reflectometry).

The evaluation unit requires a supply voltage and provides an electrical signal.

The instrument can be connected to the product tank via various connections. Depending on pressure and temperature, metallic blank or PA-coated probes are available.

The complete system works redundantly, i.e. the guided radar can be connected to a process control system and monitored from a measuring stand while the mag. Level indicator provides a reliable local indication that remains readable even in the event of a power failure.

### Features:

- ◆ max. pressure: up to PN320 (from PN100: dual-chamber-design)
- ◆ Measuring range: up to 5500 mm
- ◆ Operating temperature: up to 400 °C
- ◆ Materials: 1.4404, 1.4571, 1.4435, 1.4539, Hastelloy C4 (2.4610), Inconel 625 (2.4865), Inconel 825 (2.4858), Titan (3.7035) [other on request]

**Application area:**

Liquefied Gases, Water, Hydrocarbons, Solvents, Ammonia, Alcohols, Frigen/Freon, Mineral Oils, Nitro Varnishes etc.

**Functional principle:**

The radar probe is decentralized in the reference vessel of the mag. Level indicator mounted. There is so much space in the reference vessel that the float can lift and lower the level despite the probe. The impulses are transmitted and reflected inside the probe. It is not affected by the float or its magnetic field. The magnet system in the float controls the magnetic flaps in the display rail, possibly a magnetic switch and/or a reed chain level transmitter.

(refer also schematic diagram on the following pages).

**Schematic diagram:**

Single Chamber Design:

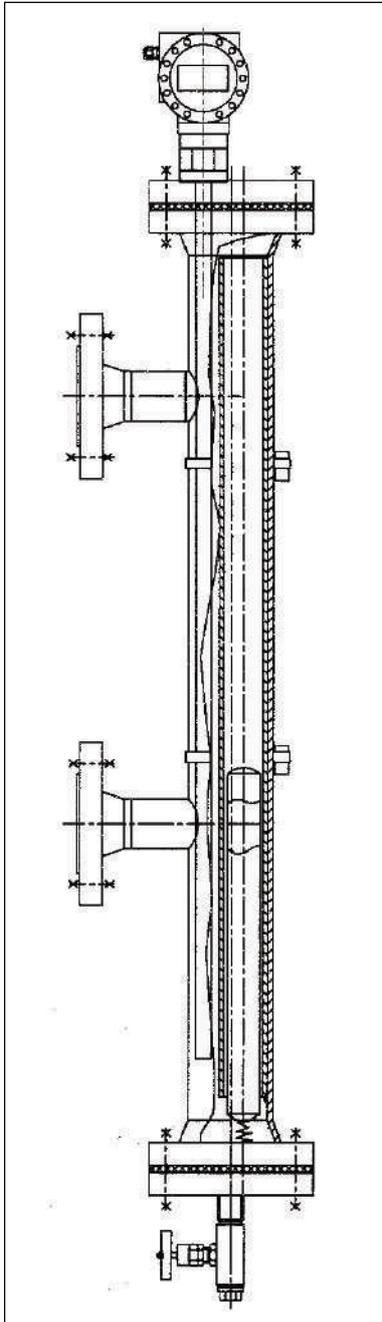


Abb. 1. Side view ITA-FMP

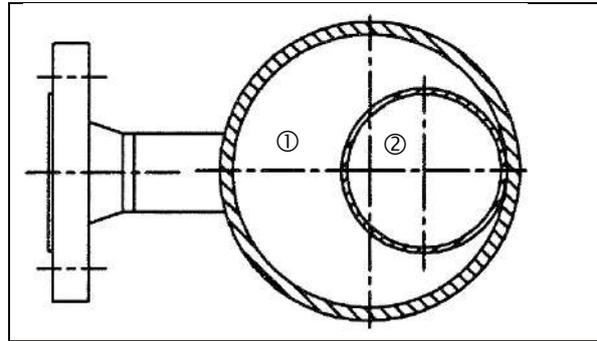


Abb. 2: pipe cross section ITA-TDR /  
Standardkonfiguration  
① pipe for TDR-probe  
② guide pipe for float

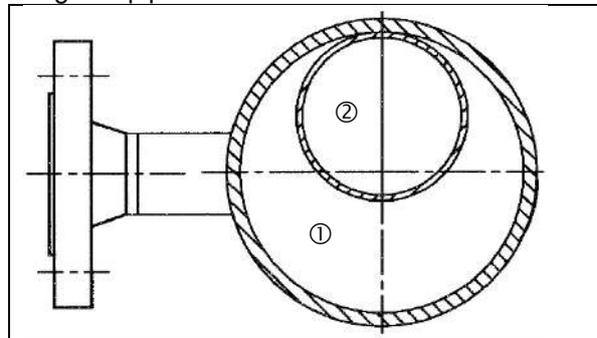


Abb. 2a: option 1

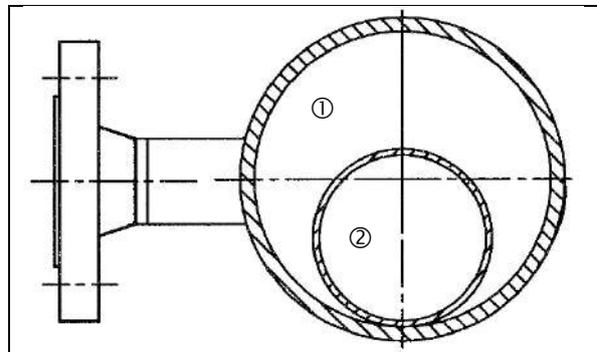


Abb. 2b: option 2

## Dual Chamber Design:

Reason for dual chamber design:

- ◆ from PN100, the accumulated wall thicknesses of the reference vessel and float guide tube become so thick that the magnetic signal can no longer reliably maintain the coupling to the indicator rail.
- ◆ If, in addition to the indication rail, switches and a further level transmitter (reed chain or magnetostrictive transducer etc...) are to be mounted, the single-chamber design reaches physical limits which can be overcome with the two-chamber design.

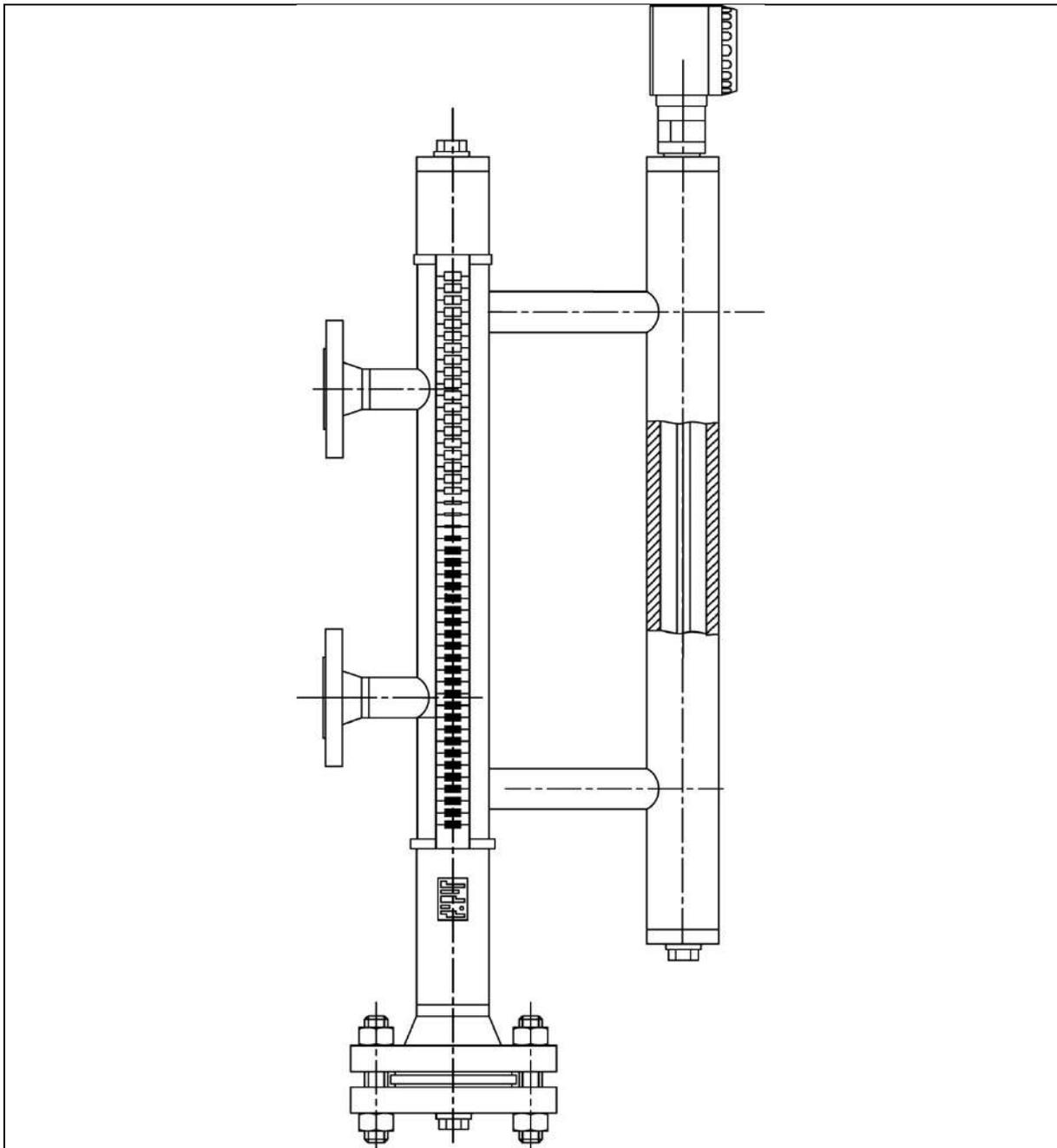


Abb. 3: ITA-TDR dual chamber design

**Technical data:****Bypass vessel:**

The technical data for the bypass can be found in the catalogue: "ITA Level Indicators (sold separately)".

**Radar:**

Basically every guided radar is suitable for combination.

You will find the technical data in the respective product data sheets.

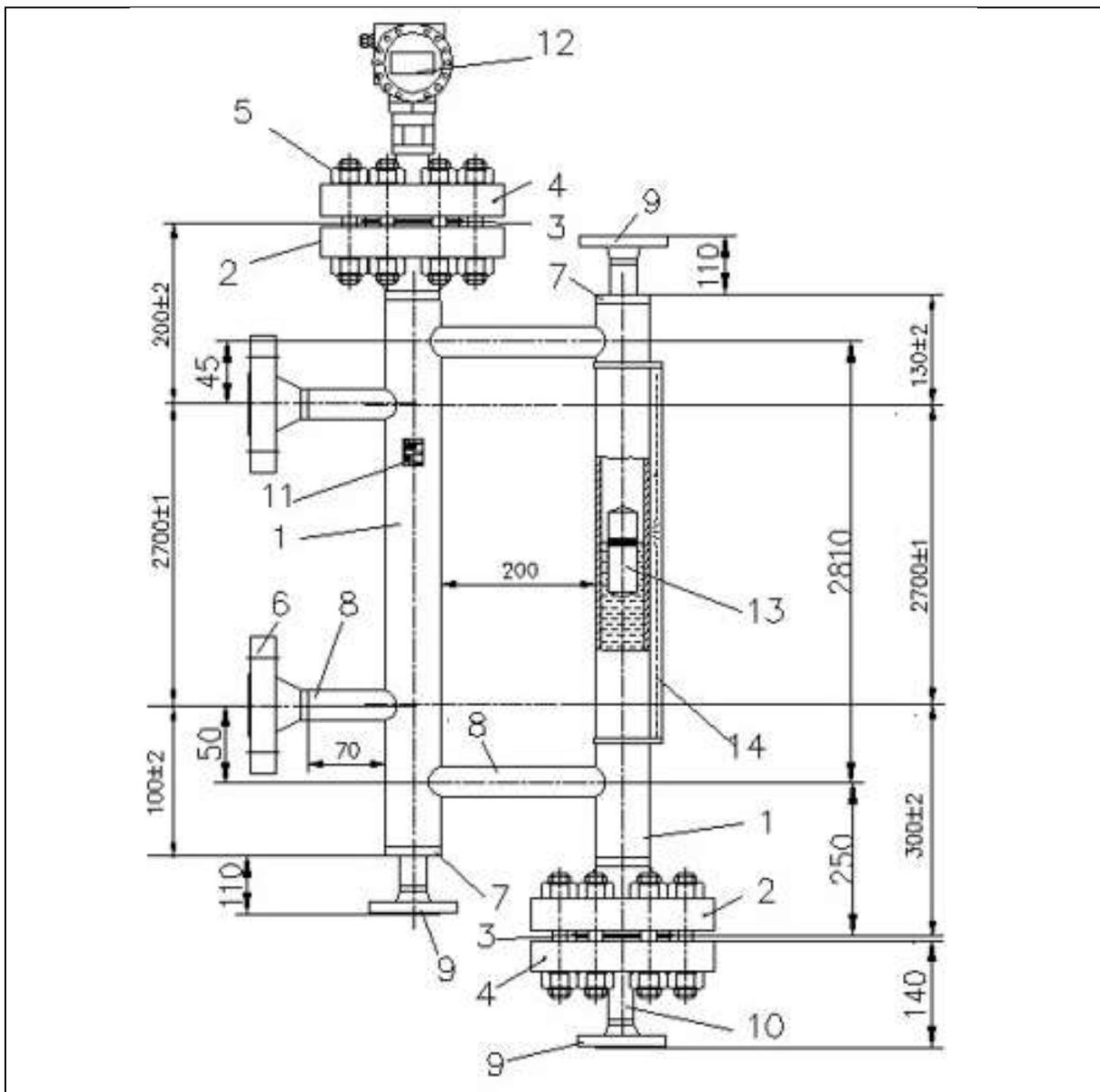
**Design sample:**

Abb. 4: ITA mag. Level indicator in combination with a guided radar in a two-chamber design in accordance with the specifications of the Pressure Equipment Directive.

In addition to the products described in this brochure, Intra-Automation manufactures other high-quality products in the field of measurement and control instruments. Please contact us for further information (contact information on the back).

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**Level measurement**



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