Sistemas de Controlo e Medida

Flow Measurement BROCHURE

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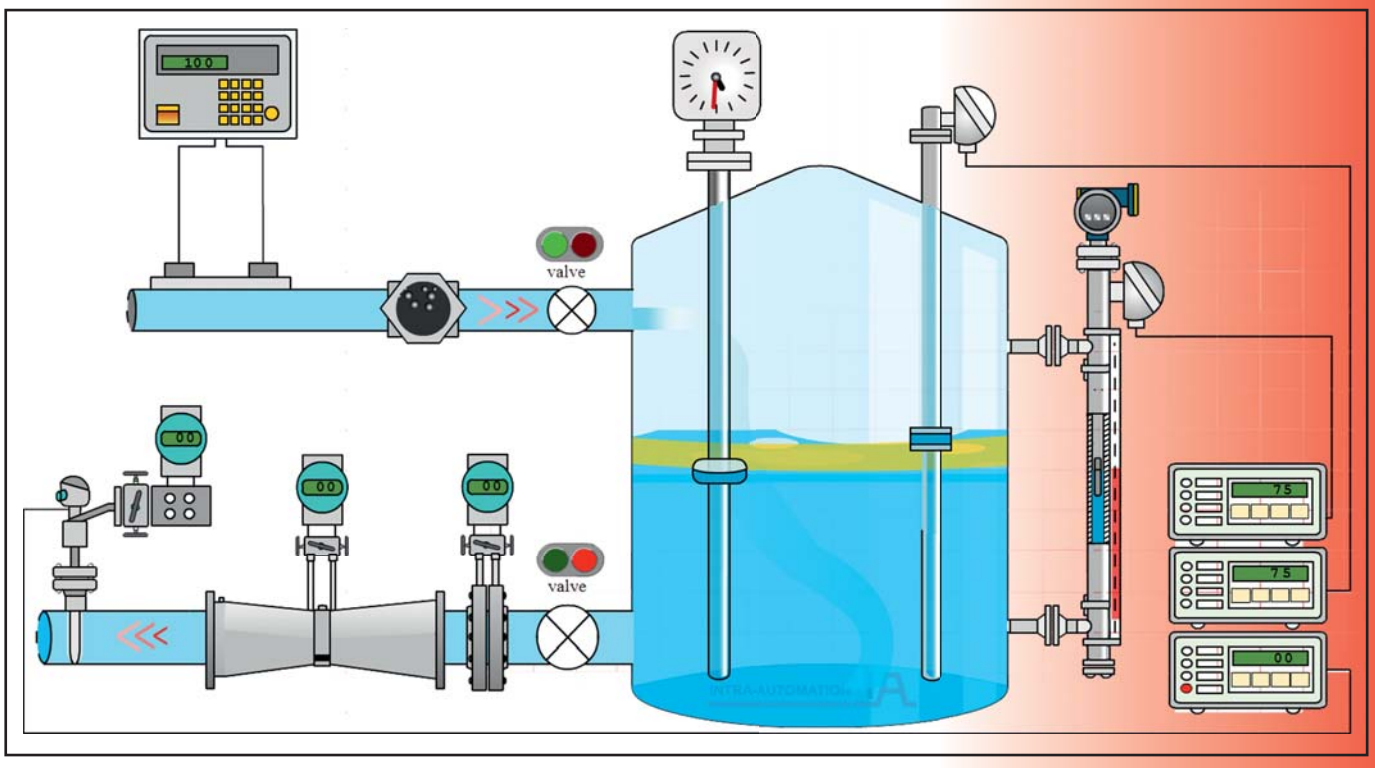
INTRA-AUTOMATION

The Expert in Level and Flow



Measuring instruments successfully in use in 55 countries
Quality and reliability since 1977

Intra-Automation
General Overview Catalogue
Printed 2013

Itabar-Flow-Sensors

The Itabar flow sensors make it possible to measure the movement of gases, steam and liquids.

The sensor is distinguished by the following major engineering and applications features:

- Suitable for measuring the flow of liquid and gaseous media
- Pipe diameters from 15 (1/2") to 12000 mm (40')
- Materials: 316L / TP317LN / Hastelloy / Inconel / Titanium / Monel / Duplex / 314 / PVDF / A335 Gr. P1 / A335 Gr. P91
- Low assembly cost due to simple installation concept
- Excellent long-term accuracy
- Tested for suitability and approved for use in plants requiring certification as per editions 13 and 17 of the Federal Pollution Protection Act and German Federal Air Quality Maintenance Standards; Inspection report no. 936/808008 + 936/8060114, issued by "TÜV Rheinland" technical inspectorate
- All pressure ranges
- Low pressure losses in comparison with orifice plates (energy savings)
- No moving parts
- Existing pipe does not need to be cut
- Accuracy ± 1 % of measured value
- The measurement transmitter can be mounted directly, eliminating threaded fittings and pressure tap piping
- FloTap designs can be installed and removed under pressure (i.e. for cleaning)
- Insensitively to water condensation and contamination
- Bi-directional measurement possible
- Operation temperatures: -100°C to +1200°C (-148°F to +2192°F)
- Operating pressure: 0 to 420 bar (up to 6091 psi)
- Volumetric flue gas measurement for stack gas scrubber plants; type IBF-100 sensors do not need to be removed from the stack for cleaning; stack diameter up to 12000 mm (472,44")
- Pipe can be round or rectangular

Itabar-Flow-Sensors type: IBF-100 Stack Gas Measurement

Special design for stack gas volumetric measurement.

The IBF-100 flow sensor was developed especially for stack gas measurements. This flow sensor is engineered to be accessible from both ends so that mechanical cleaning can be undertaken if necessary without having to withdraw the sensor from the sleeve or the stack. This design offers major benefits at pipe diameters of 600 mm (23,62 inch) and more.

German Federal Air Quality Maintenance Standards
Tested for suitability and approved for use in plants requiring certification as per Ed. 13 and 17 of the Federal Pollution Protection Act, Inspection Report No. 936/808008, issued by the TUV Rheinland Technical Inspectorate.

Itabar-Flow-Sensors type: IBFD

Version for saturated and superheated steam

ITABAR type: IBFD flow sensors for saturated steam and superheated steam have proven their qualities in all areas of power generation and industrial and process technologies. In order to guarantee the greatest possible operational safety, ITABAR sensors are manufactured and tested in accordance with the pressure-device guidelines and/or the ASME Boiler & Pressure Vessels Code.

Special features:

- Simple assembly; existing pipe needs not to be cut.
- With local differential pressure display or electr. differential pressure transmitter for tele-monitoring the flow values
- Extremely low persistent pressure loss / lower energy cost (appr. 10 % of differential pressure)
- High long-term accuracy as the models are almost wear-free
- Insensitive against pollutions
- TÜV Cert HP0 (TRB200), TRD 110
- PED 97/23/EG

Technical specifications:

- Standard materials: 316L / A335 Gr. P1 / A335 Gr. P11 / A335 Gr. P22 / A335 Gr. P31
- Pipe diameters:
  - 40…100 mm (IBFD-20/-21)
  - 100…600 mm (IBFD-26/26/35/36, HT / IBFD-HTG
- Operating conditions: IBFD-HT / HTG: 160 bar @ 590 °C (2320 psi @ 1094°F)
- Accuracy: ± 1 % of meas. value
- Repeatability: ± 0,1 %
- flanged design: IBFD/IBFD-HT
- welded design: IBFD-HTG
- Flange mounted condensate pots are available with a combination shut-off-valve and condensate pot.

Air Purge Unit LSP compact type EJG

The Air Purge Unit is distinguished by the following major engineering and applications features:

- easy handling, mounting
- easy installation (small number of components)
- easy triggering

In order to achieve an optimal measurement result in the case of flow measurement of impure media, until now, the flow sensor had to be pulled out and cleaned in repeated time intervals or as a second option a more complicated air purge unit had to be installed.

The Air Purge Unit EJG-compact is very trouble-free and easy to install because of its compact construction (small number of components – see picture).
Rendering possible the avoidance of complicated control panel assembly and the reduction of possible stock keeping of spare parts.

The EJG-compact basically is a 2/2-way directly controlled valve type. That is why the EJG-compact can be triggered by the customer through relays or SPS.

Furthermore, the EJG triggering can be realized through the according option of the Digiflow (page20). Then the purge cycle time, clean time and settle time can be freely programmed according to the process. Simultaneously the Digiflow saves the last measured value prior to the air purging.

Orifice Assemblies

With an orifice, the flow in a pipe can be measured according to the differential pressure principle. To measure, a differential pressure measurement device is needed, as well as knowledge of the fluid properties (Viscosity, density, and isentropic exponent).

Orifice Plate BLS-100

- Applicable for universal flow conditions
- Low cost and high reliability

Orifice Plate with Integral Block BLS-200

- For high temperature and high pressure
- Easy to remove and to replace
- Calibrated burr with sharp edge, free from burrs

Orifice Plate with Ring BLS-250

- For flow measurement in small and medium sized pipes
- For low pressure

Orifice Flange Assembly BLS-300

- Used in combination with orifice plates
- Applicable for almost all fluids

Measuring Section with Orifice MBL-500

- Factory calibration
- Simple installation

All presented orifice instruments are available in C.S., SUS etc.
Other materials on request!

Sight Glass

Sight glasses find their application where flow has to be observed directly. Different designs fulfil different functions und are made for different operational conditions.

Flapper Sight Glass

♦ Used for observing the state of fluid flow depending on opening & closing of the flapper on fluid flow.

Ball Sight Glass

♦ Used for observing the fluid flow with common flow velocity by the motion of balls within the screen

Ring Ball Sight Glass

♦ Used for observing the fluid flow with rapid flow velocity by the motion of balls within the screen.

Lantern Sight Glass

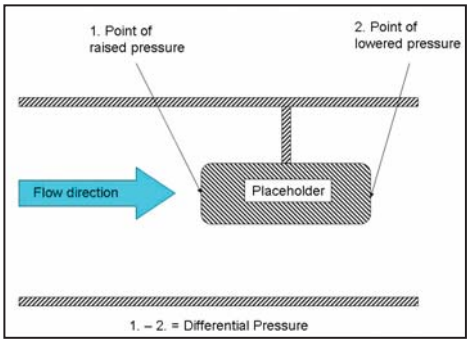
♦ Used for observing the state of fluid flow regarding flow direction. It can be used as a calibration port.

High Pressure Sight Glass

♦ Used for high pressure and high temperature.

All Sight Glasses are available in C.S., SUS, etc.
Other materials on request.

Flow Sensors working acc. to the differential pressure principle



Once an object is brought into a laminar flowing fluid inside a pipe, the fluid will dam up in front of the object, which generates a raise of pressure. Passing the object the fluid gets accelerated due to the smaller pipe cross section. This acceleration generates a pressure drop on the backside of the object. As all operational conditions at the place of measurement are known, the volume of flow can be calculated by using the difference of the two pressures. D.P. flow elements are Itabar-Flow-Sensors, Orifices and:

Integral Orifice

- ♦ Small pipe diameters
- ♦ High precision
- ♦ With differential pressure transmitter
- ♦ Easy installation / simple maintenance

Wedge Meter

♦ Suitable for a wide Reynolds range of flow measurement, for measuring clean and non-clean fluids such as slurries. With shorter lengths of straight pipe for upstream & downstream compared to other fluid meter with excellent repeatability and accuracy. Wedge tube can be manufactured according to end user's specification.

Venturi with flanged process connection

- ♦ Slurry fluids, viscous fluids, low temperature
- ♦ Saturated or superheated steam

Cone Flow Meter

♦ A new concept of flow measurement by differential pressure principle. It eliminates the weak points of orifice plate & Vortex flow meter.
♦ Turn down ratio 1 : 10

Venturi

♦ Used for flow measurement when the most important point is to keep the permanent pressure loss on a minimum. Known for a long life span.

Flow Nozzle

All differential pressure instruments are available in C.S., Stainless Steel, Alloy Steel and Titanium. Other materials on request.

IS210 Clamp-on Ultrasonic Flow Meters

IS210 transit time flow meter utilizes two transducers that function as both ultrasonic transmitters and receivers. The transducers are clamped on the outside of a closed pipe at a specific distance from each other. When the flow meter works, the two transducers transmits and receives ultrasonic signals amplified by multi beam which travels firstly downstream and then upstream. Because ultra sound travels faster downstream than upstream, there will be a difference of time of flight. When the flow is still, the time difference is zero. Therefore, as long as know the time of flight both downstream and upstream, we can work out the time difference, and then the flow velocity (V) and flow volume (Q) can be calculated.

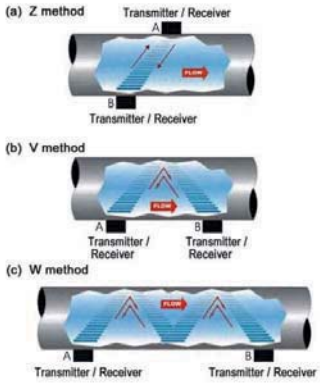


Figure 1

Intra-Automation offers Ultrasonic Flow Meters of different versions:

IS210-S: Version for fixed installation

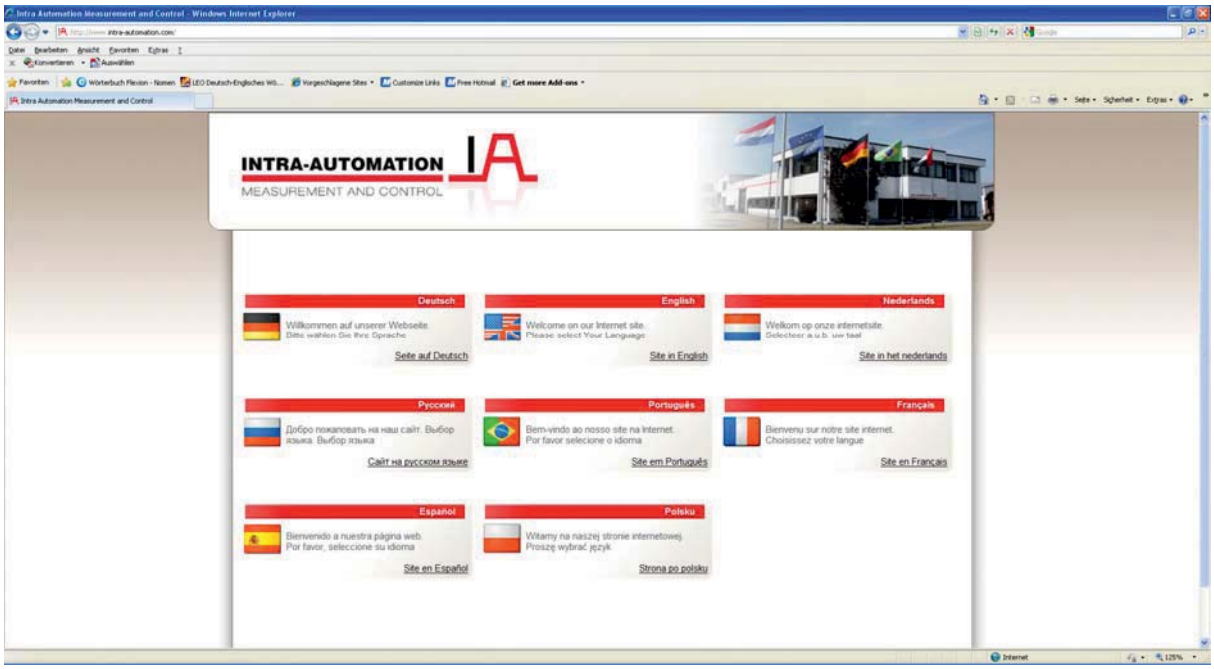
- Non-invasive clamp-on transducers
- Bi-directional flow metering possible
- Positive, negative and cumulating flow metering possible
- Ex-Version available
- Pipe sizes: 12…4570 mm
- Temperature range: -40…+250 °C
- Up to 8 GB Meas. value memory possible (SD-card)
- Simple use and fast installation

IS210-P: Portable version

- Advanced DSP and Multipuls-Technology
- 40-hours-Battery (rechargeable)
- Backlit 4-line display integrated into a rugged, water tight housing
- Cost-effective and versatile applicable
- Supports SD-Card-Memory. (Capacity up to 8 GB)
- Works reliably with clean and low contaminated fluids.
- Light-weight and easy to handle housing.
- 4…20 mA, OCT Impulse (Flow velocity or total flow)-output as standard-output
- Optional heat flow BTU-function, two temperature-transmitters 4…20 mA for up- und downstream-temperature indication and thermal flow-, total thermal flow indication.

For the products presented in this brochure, we provide more and additional information on our homepage www.intra-automation.com.

Just try and visit us in the Internet. You will be surprised.



Or contact us directly. Our Contact data is provided on the backside of this catalogue.

We look forward to hearing from you soon.

INTRA-AUTOMATION GmbH

MESS- UND REGELINSTRUMENTE

Since it's founding in 1977, Intra-Automation GmbH focused its corporate activities on measurement and control systems for flow, level, pressure, absolute pressure and differential pressure. Our mag. level gauges ITA and our flow sensors Itabar were the locomotives for the successful development of Intra-Automation GmbH.

Over the years, our product range has been extended by devices for flow correction and ultrasonic measurement as well as auxiliary equipment for flow and level. In a further step, the core competences "differential pressure flow measurement" and "bypass level measurement" have been strengthened by broadening the product line.

Today, Intra-products enjoy a good reputation in more than 55 countries and many industries all around the world, including chemical and pharmaceutical industry, the oil an gas sector, shipbuilding, machinery and plant construction, the food and beverage industry, water treatment as well as environmental engineering.

Our product range includes instruments for level measurement and control for temperatures up to 400°C and a pressure range up to PN320 as well as differential pressure measuring instruments up to 1200°C and up to PN400.

A continuous quality management according to DIN EN ISO 9001 and constant development guarantee recognized quality and reliability as well as reproducible parameters for all products.

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