

**INTRA-AUTOMATION**

MEASUREMENT AND CONTROL



# Electrode Type Level Gauge, Level Transmitter & Level Switch

Boiler Steam Water Level Gauge

SEL Series



## Technical Information

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## Electrode Type Level System SEL Series

Electrode type level system SEL series by Intra-Automation GmbH is an electrode type level gauging developed based on long experience and accumulated technology in the field of level gauging. As an improved version from existing products, this item is the next generation electrode type level systems for high temperature and high pressure applications that offers multiple capabilities digital including complex functions by integrating modern and software application technologies.

Electrode type level gauge indicates level status from the display equipment by identifying electric resistance of water and steam by electrode sensors.

The level of water portion displays each level in green and the steam portion displays it in red on the indicator of the micro processor controller unit (MPU) installed at site and the remote indicator unit (RIU) in control room etc.

## Features

- Useful for observing levels of water and detecting signals in high temperature and high pressure boiler drums or steam generators in power plants.
- Possible to select and install electrode sensors in quantity and position as per user's demand. (max. 32 ports)
- Electrode sensors may be installed on water columns at 15...25 mm minimum intervals.
- Transmits information on detection level and status to the communication signal (RS485).
- Indicates detection levels and statuses on site and remote indicators by level points or percentage in letters and figures of red, green and amber LED.
- Indicates and sets alarm points up to maximum of 10 points and produces relevant contact output (SPDT)
- Possible to change alarm points without wiring work, by a software solution.
- Capable of executing level gauge, level transmitter and level switch functions with one device.
- Support man-machine interface (MMI) system for computer monitoring.
- Simple replacement of existing level gauges and level switches
- Competitive pricing
- Possible to view minimum level information with battery backup systems during power interception or power interruption.

## Applications

### SEL-G series Electrode type Level Gauge

- Possible to use level information and contact points necessary in each electrode.
- Useful for observing water levels and detecting signals of boilers and etc. in high temperature /pressure thermal power plants
- Used for observing water levels in high temperature/pressure equipment.
- Adopts static voltage/frequency device that can be used anywhere in the world. (Free voltage 86...265 V AC / 48...65 Hz)
- Indicates water levels and alarm, input/output board, on indicator or MPU and remote indicator.
- Capable of providing transmitter functions using level gauge. (0/4...20 mA output)
- Compatible to 4...20 mA analogue input (max. 3 inputs)
- Capable of supporting remote indicator units

### SEL-S series Electrode type Level Switch

- Use for level alarm contact and control of level
- It is possible to output a max. of 10 alarm relay contacts
- Adopts constant voltage/frequency that can be used anywhere in the world. (Free voltage 86...265 V AC / 48...65 Hz)
- Capable of supporting remote indicator units.

**Electrode Type Level Gauge****SEL-G series****Composition of Electrode Type Level Gauge SEL-G series:**

- Detection part
- Micro processor controller unit (MPU)
- Remote indicator unit RIU – optional
- Computer monitoring – Man Machine Interface (MMI) System – optional

**Water Column**

Installed at the side of boiler  
steam drum

**MPU**

Installed at local

**RIU (optional)**

Installed at central control  
room, etc.



**MMI system**  
(optional)



**Detection Part:**

The detection part of SEL-G-series electrode type level gauge is composed of a water column and some electrode sensors.

The electrode sensor is installed to a water column, a device connected to a high temperature/pressure vessel with different thermal conductivity in fluids.

The protection case is installed in order to avoid damage generated due to pressure eruption and etc.

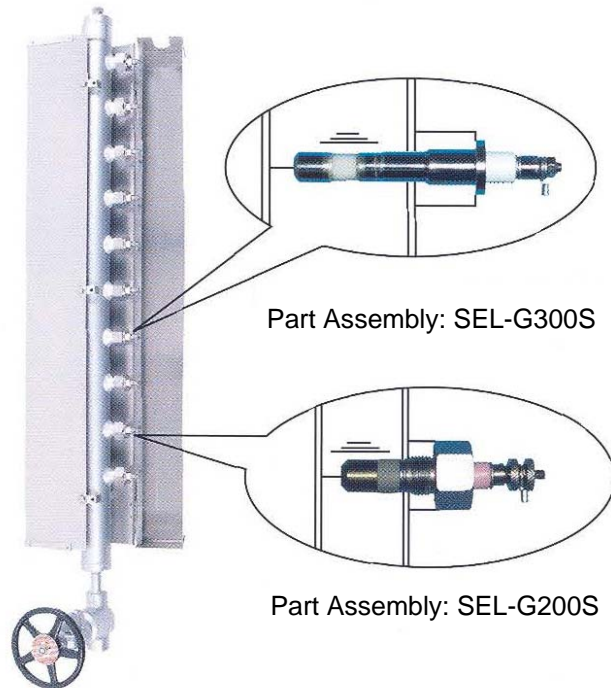
Max. pressure: 300 kgf/cm<sup>2</sup>

Max. temperature: 560 °C

Reference:

Critical pressure: 22,1 MPa

Saturation temperature: 374 °C



**Specification:**

		Medium/low temperature & medium/low pressure use	High temperature/pressure use
Water column		SEL-G200W	SEL-G300W
Electrode sensor		SEL-G200S	SEL-G300S
Pressure kg/cm <sup>2</sup>		50	300
Temperature °C		180	5 60
Material:	Water column	A106 Gr.B / Sch 80 or customer specification	A106 Gr.B / Sch 160 or customer specification (A335P11, P22, P91)
	Electrode sensor	316SS + PTFE	316SS+Ceramic
Connection		acc. customer specification	acc. customer specification



## Control Panel & Control System – Micro Processor controller Unit (MPU)

The electrode sensor and detections portions' control panel are connected by electric wire, and the level signal detected at an electrode sensor is sent to a Micro Processor control unit (MPU) of the MPU panel.

Length of the cable between detection portion and control panel is to be within 30 m.

The MPU panel is equipped with a Micro Processor control Unit.

The MPU panel consists of a level indicator, a CPU module, a power supply module, an input module, an output module, a terminal board etc.

Level indicator - The part with water is displayed in green and the part with steam is displayed in red. And, abnormality or defect status are indicated in amber and relevant LED flickers.

CPU module - Equipped with control defect detection and self diagnosis function of by each signal.  
 - Can select and indicate level point (LP) or percentage (P) of level status using a simple function key  
 - Can change and set time, date and operation mode by means of a function key.  
 - Can detect and diagnose LED abnormality, electrode disconnection, short circuit and etc. of each module.

Power supply module  
 - Constant voltage, constant frequency circuit, and internal voltage supply. (Dual Power System)

Input Module - A maximum of 32 point electrode inputs and am maximum of 3 sets of 4...20 mA signal inputs

Output Module - A maximum of 10 relay contacts, analogue output, RS485 communication signal, and man-machine-interface (MMI) output

Terminal board - All external wires are connected.

### Specification for the micro processor controller unit:

#### Controller:

Medium/low temperature and low pressure: SEL-G200C

High temperature/pressure: SELG300C

Size (WxDxH) in mm: 222 x 180 x 316

Working voltage: Free voltage – constant voltage and constant frequency (86..265V AC / 48..65 Hz)

Dual Power: DC 12 V (for recharging)

Operation temperature: -20...+75 °C

#### Enclosure

Standard size (WxDxH) in mm: 400 x 250 x 400

17 points or more size in mm: 400 x 250 x 550

Material: SS 304 / wall mounting/IP65 / NEMA 4

#### Features:

Electrode input: Max. 32 points

Alarm indication: Amber

Alarm relay contacts: Max. 10 sets (AC 250 V 1 A)

Can support communication signal for remote indicator unit (RIU)

Can support Man-Machine-Interface (MMI)

#### Display example:

LP08 Level Point indication

P60,5 Percentage indication



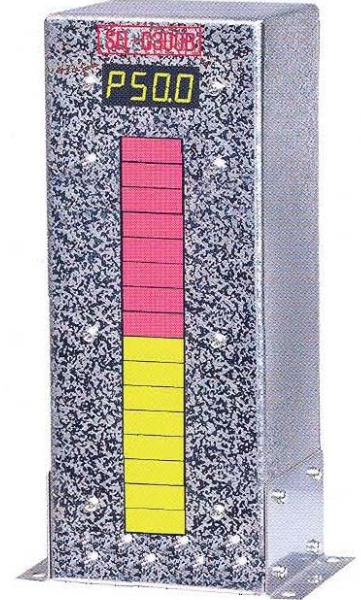
## Electrode type level gauge remote indicator unit (RIU) – optional

This is an indicator unit for remotely monitoring operation status of level gauge, installed at the control room and being connected with MPU panel (max. 1,6 km).

Water level part is indicated on LED in green colour, steam part is indicated in red colour and warning part is indicated in amber colour. Also indication in numerical figures (Level point or percentage)

### Specification for the Remote Indicator Unit

Medium/Low temperature/pressure:	SEL-G200R
High temperature/pressure:	SEL-G300R
Enclosure material:	SS 304
Size (WxDxH) in mm:	160x100x300 – Standard 160x100x500 – 17 points or more
Display:	Red/Green/Amber
Power:	DC 12 V (Standard) Free voltage 86..265 V AC / 48..65 Hz)



## Computer Monitoring MMI (Man-Machine-Interface) System – optional

It is possible to adopt the Man-Machine-Interface system on a PC and etc. using communication signals transmitted from the micro processor unit in order to view and control site situations for status of SEL-G series electrode level gauge.

It is possible to look at operational status and site situation of level gauge through a computer and etc. at specific positions.

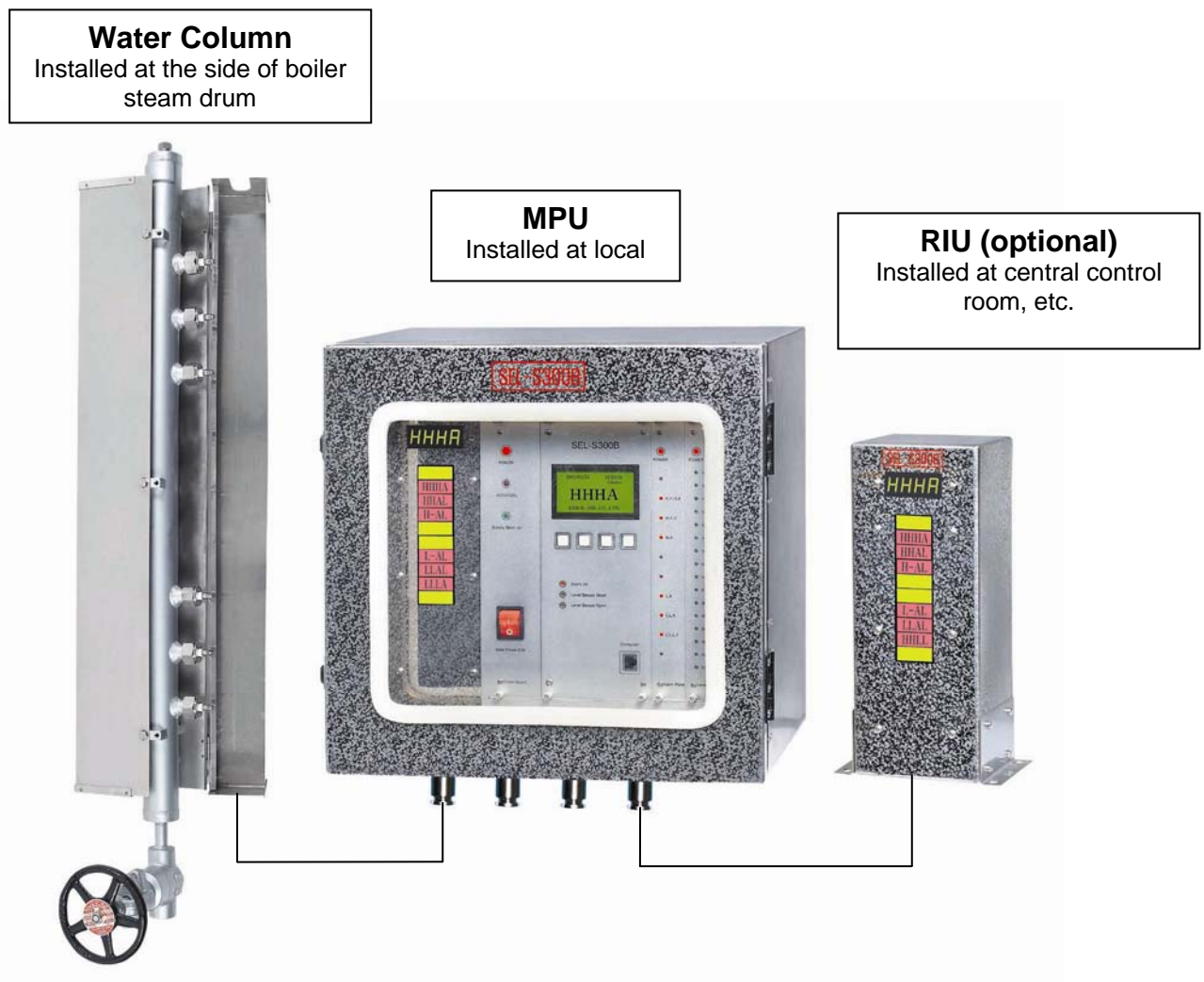
Part: SEL-G200M / SEL-G300M

**Electrode Type Level Switch****SEL-S series**

This is installed at high temperature / pressure boiler drums and steam generators to be used in observing or controlling water level statuses.

**Composition:**

- Detection Part
- Control system – Micro Processor controller Unit (MPU)
- Remote Indicator Unit (RIU) - optional



Contact points for level switch can be outputted up to maximum of 10 sets.

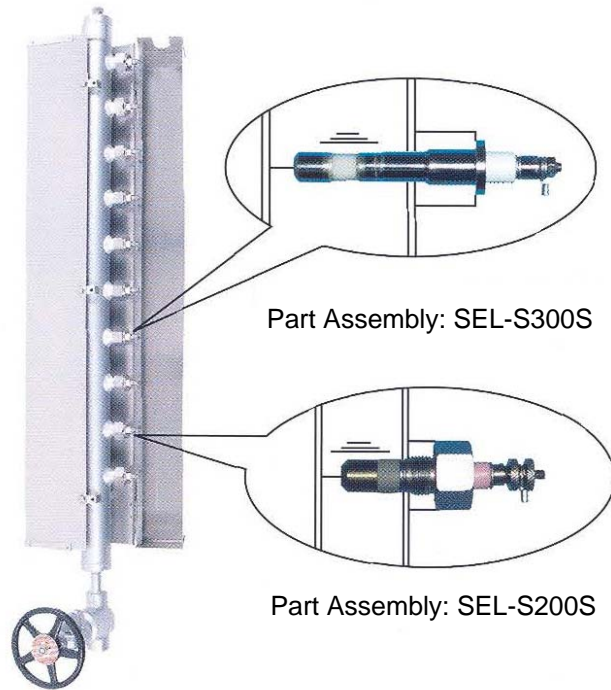


**Detection Part:**

Electrode sensors of SEL-S series electrode type level switch must be appliance on process lines with desired quantity and position suitable for use by identifying it into low pressure and high temperature/pressure.

The appliance electrode sensor functions as a detector that detects liquid level and alarm.

Max. pressure: 300 kgf/cm<sup>2</sup>  
 Max. temperature: 560 °C



**Specification:**

		Medium/low temperature & medium/low pressure use	High temperature/pressure use
Water column		SEL-S200W	SEL-S300W
Electrode sensor		SEL-S200S	SEL-S300S
Pressure kg/cm <sup>2</sup>		50	300
Temperature °C		180	5 60
Material:	Water column	A106 Gr.B / Sch 80 or customer specification	A106 Gr.B / Sch 160 or customer specification (A335P11, P22, P91)
	Electrode sensor	316SS + PTFE	316SS+Ceramic
Connection		acc. customer specification	acc. customer specification

## Control Panel & Control System – Micro Processor controller Unit (MPU)

This receives and handles liquid level and other signals received from the electronic sensor at relevant position sets or installed position of the SEL-S series electrode type level switch through the micro processor unit (MPU)

This displays relevant alarm points on the MPU's display window, together the color red on relevant LED's on indicator.

This can output a maximum of up to 10 contacts for established alarm points.

### Specification for the micro processor controller unit:

#### Controller:

Medium/low temperature and low pressure:	SEL-S200C
High temperature/pressure:	SELS300C
Size (WxDxH) in mm:	222 x 180 x 316
Working voltage:	Free voltage – constant voltage and constant frequency (86..265V AC / 48..65 Hz)
Dual Power:	DC 12 V (for recharging)
Operation temperature:	-20...+75 °C

#### Enclosure

Standard size (WxDxH) in mm:	400 x 250 x 400
Material:	SS 304 / wall mounting/IP65 / NEMA 4

#### Features:

Electrode input:	Max. 10 points
Alarm indication:	Red
Alarm relay contacts:	Max. 10 sets (AC 250 V 1 A)
Can support communication signal for remote indicator unit (RIU)	

#### Examples of alarm indication:

HHHA	High high high alarm
HHAL	High high alarm
H-AL	High alarm
L-AL	Low alarm
LLAL	Low low alarm
LLLA	Low low low alarm



## Electrode type level gauge remote indicator unit (RIU) – optional

The remote indicator unit of SEL-S series electrode type switch must be installed at a place requested by the user to make it interlock with the indicator system of micro processor unit.

Adopts static voltage/frequency device that can be used anywhere in the world.

Installation distance of the remote indicator unit can be a maximum of up to 1,6 km away from the micro processor controller unit.

### Specification for the Remote Indicator Unit

Medium/Low temperature/pressure:	SEL-S200R
High temperature/pressure:	SEL-S300R
Enclosure material:	SS 304
Size (WxDxH) in mm:	160x100x300 – Standard
Display:	Red
Power:	DC 12 V (Standard) Free voltage 86..265 V AC / 48..65 Hz)



## Typical Applications of Electrode type Level Switch

Turbine water induction prevention.  
Steam line drain control.  
Boiler water high level protection.  
Feedheater boiler low level protection.  
Dearator level protection.

A SEL-S series Level Switch installed on the drain port in the superheated steam line will detect the level of condensed water in the port.

A single electrode sensor can be used, but for better protection a two electrode sensor ensures trouble-free, fault-tolerant water detection.

**Ordering Codes****SEL series**

<b>SEL</b>	<b>Electrode type Level Observation system</b>	
	<b>Implemented type:</b>	
<b>G</b>	Level gauge	
<b>S</b>	Level switch	
<b>T</b>	Level transmitter	
	<b>Rating</b>	
<b>200</b>	Low temperature & pressure	
<b>300</b>	High temperature & pressure	
	<b>Number of Electrodes</b>	
<b>00</b>	01 to 32	
	<b>C to C length</b>	
<b>A</b>	100...500 mm	
<b>B</b>	501...1000 mm	
<b>C</b>	1001...1500 mm	
<b>D</b>	1501...2000 mm	
<b>E</b>	> 2000 mm	
	<b>Outputs (relay contacts)</b>	
<b>00</b>	Please fill in 00...10 (00 stands for non)	
	<b>Connection type</b>	
<b>F</b>	Flange	
<b>S</b>	Socket welding	
<b>B</b>	Butt welding	
<b>O</b>	Option	
	<b>Special option</b>	
<b>0</b>	non	
<b>1</b>	Remote indicator unit (RIU)	
<b>2</b>	Man-machine-interface (MMI)	
<b>3</b>	Analogue inputs	

<b>SEL</b>							
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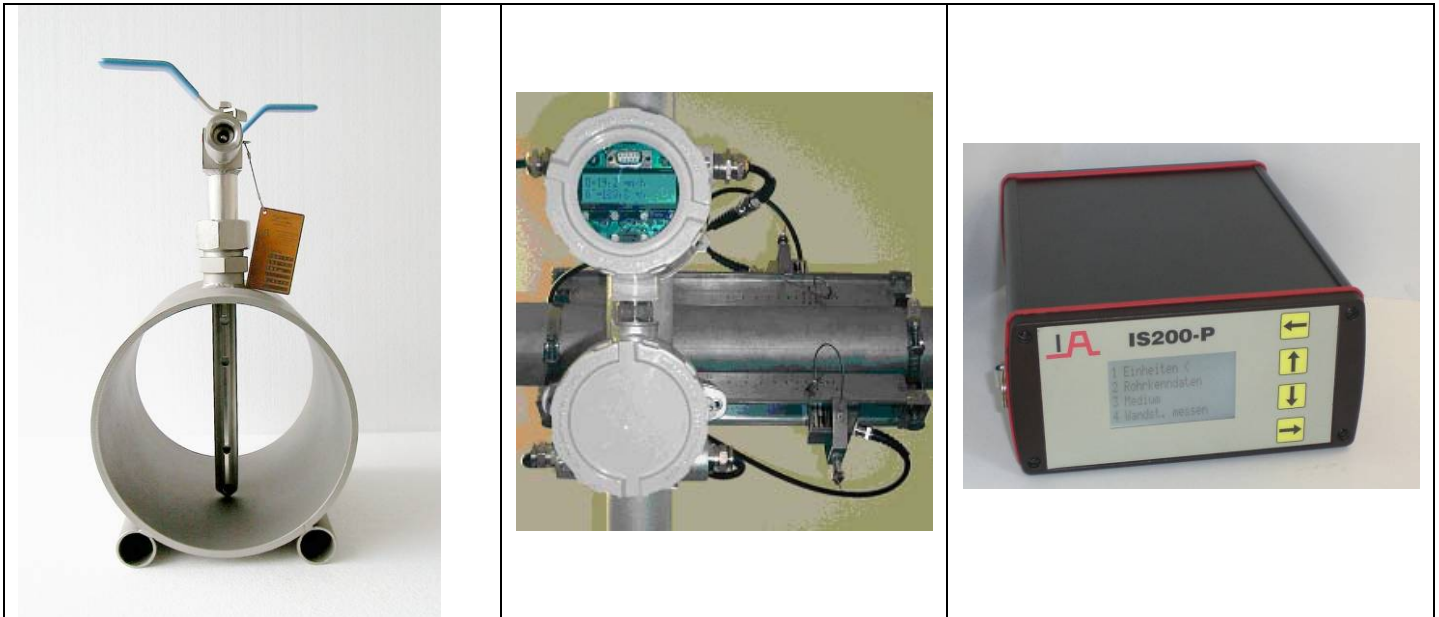






Besides the products covered by this brochure, Intra-Automation GmbH also manufactures other high-quality and high precision instruments for industrial measurement tasks. For more information, please contact us (contact details on the backside of this brochure).

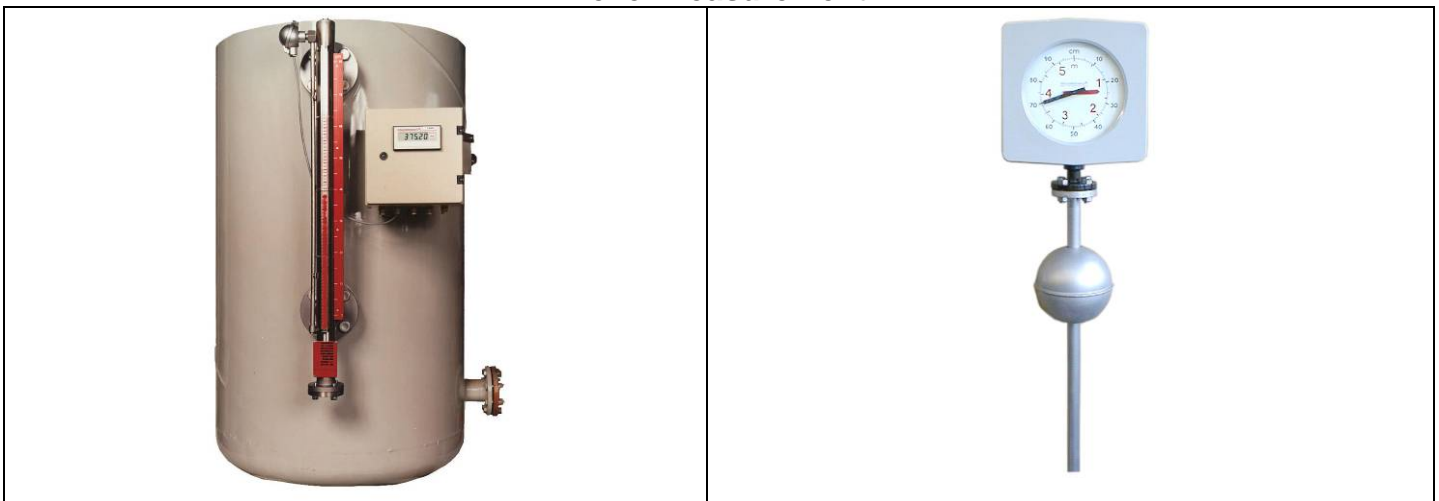
### Flow Measurement



Itabar®-Flow-Sensors

IntraSonic IS200 Ultrasonic Flow Meters

### Level Measurement



ITA-mag. level gauges

MAGLINK level indicators

### Other measurement tasks:



DigiFlow Flow and Level Computers

IntraCont digital Controllers

IntraDigit digital indicators



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