

Level Sensing . . . LEVEL BEST

- **Level Sensing** • **Level Indication** • **Level Controlling**

## Measurement & Control of LEVEL, FLOW, PRESSURE & TEMPERATURE



### Process Control & Measuring Instruments.

**Level Sensing Instruments** Level Switches, Level Indicators & Level Transmitters

**Flow Monitoring Instruments** Rotameters, Flow Meter, Flow Indicators & Flow Switches

**Pressure Measuring Instruments** Manometers, Pressure Gauges, Pressure Switches & Pressure Transmitters

**Temperature Instruments** Thermocouples, RTDs, Thermowell, Temperature Gauges & Temperature Transmitters

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# RF LEVEL SWITCHES

SERIES RFLS 20



**A Reliable Level Switch based on radio frequency principle for Sensing & Control the level of Solids, Liquids & Slurries.**

Levsen RF Level Switch comprises of two separate parts, an Electronic Controller & a Sensing Probe connected to each-other through RF Coaxial Cable.



Sensing Probe

Electronic Controller

## Electronic Controller Model RFLS 20-EC



Electronic Controller Model RFLS20-EC

## SPECIFICATIONS

Solid state, circuitry  
 Power Supply - 230/110 V AC or 24 V AC/DC  
 Output - DPDT relay rated 5 amps @ 230 Volt (Potential free change over contacts.)  
 Local Indication : LEDs for Normal, Alarm & Probe Healthy  
 Fail Safe to high or low level  
 One adjustment for calibration.  
 Ingress protection - IP 65  
 Location - Outdoor heavy dusty area  
 Mounting - Remote from probe (max. 20 mtrs. distance)  
 Temperature - 0°C to 50°C  
 Cable Entry - Three Numbers  
 (1) 3/4" ET for power cable (2) 3/4" ET for Output Signal Cable  
 (3) 1/2" ET for connection of RF Coaxial Cable to Probe

## SENSING PROBE

Levsen RF Sensing probe contains no electronics & no moving part. It is mounted in Hopper/Vessel/Bin of application material.

Levsen provide various Types/Models of sensing probe depending upon the application & requirement. The Electronic Controller is identical for all Types/Models of Sensing Probe.



**Rigid High Temp. Probe Model RFLS 20-HT**

Application Solids (Powder & Granules) for high temperature  
 Insertion Standard 385 mm

**Rigid Probe Model RFLS 20-RD**

Application Solids (Powder & Granules) in particle size finest to max. 12mm  
 Insertion Standard 290 mm (as per requirement 150mm to 1500mm).

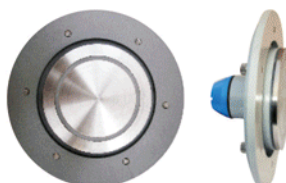
### Specifications

Probe Insertion Length / Range : 0 to 10 mtrs.  
 Process Temperature : 250°C / 600°C (Specify)  
 Protection : IP 65  
 Mounting : Side / Top  
 Precess Connection : 40 NB Thread or Flange (as required)  
 Cable Entry : " 1/2 ET for connection of RF Coaxial Cable  
 Insulation : PTFE / Ceramic  
 Compatible Electronic : Electronic Controller Model RFLS 20-EC  
 Cable to Electronic Controller : RF Coaxial Cable.



**Flexible Probe Model RFLS20-FL**

Application Solids (Powder & Granules)  
 in particle size finest to max. 250mm  
 Insertion 500 mm to 10mtrs. (as per requirement)



**Flushed Probe Model RFLS20-FD**

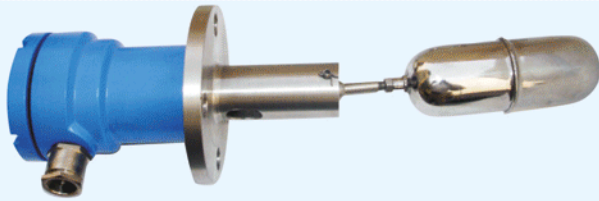
Application Bucket Elevator Boot, Chute Blockage, Air Slide  
 Jam Sensing & Hoppers/Vessels of Solids (Powder & Granules)  
 & large particles upto 400mm.  
 Insertion Zero insertion (flushed with inner surface).



**Insulated Probe Model RFLS20-IN**

Application Liquids & Conductive Materials  
 In particle size finest to max. 50mm  
 Insertion 150 mm to 10mtrs. (as per requirement)

## Side Mounted Magnetic Level Switch Model MLS 10-SM



### Application

High/Low Level Alarm Annunciator  
Automatic Pump Control  
Prevention of tank overflow & Dry running of pump.

### Specification

Wetted part : SS304/SS316/PP/PVC/PTFE Coating  
Process Connection : Flanged/Screwed  
Enclosure : Weather Proof/Flame Proof  
Switch : Micro Switch, rating 5 Amps., 230 V AC  
Contact : NO/NC (Potential Free)  
Temp. : 150°C max.  
Pressure : 20kg/cm<sup>2</sup> max.



## Top Mounted Magnetic Level Switch Model MLS 10-TM

Simple Magnetic Proven design Float moves up and down on probe according to liquid level & fixed limit Switches inside the probe change their contacts by magnetic attraction.

### Application

High & Low Level Alarm Annunciator  
Automatic Pump Control  
Prevention of tank overflow &  
Dry running of pump.

### Specification

Wetted part : SS304/SS316/PP/PVC/PTEE Coating  
Process Connection : Flanged/Screwed  
Enclosure : Weather Proof/Flame Proof  
Switch : Reed Switch, rating 1 Amps., 230 V AC  
Contact : NO/NC (Potential Free)  
Temp. : 150°C max.  
Pressure : 20kg/cm<sup>2</sup> max.

## Displacer Level Switch Series DLS-10

Operation is based on a buoyancy principle where by a spring is loaded with weighted displacers which are heavier than the liquid under control. These displacers are suspended by spring with a suspension rope. Immersion of the displacer in the liquid results in a buoyancy force change, which changes the effective weight of displacers this causes the spring to retract slightly.

As a result of retraction of spring, the attraction sleeve attached to spring move upwards into magnetic field of external magnet to trigger the switching action and vice-versa.

### Application

High & Low Level Alarm Annunciator  
Automatic Pump Control  
Prevention of tank overflow &  
Dry running of pump.

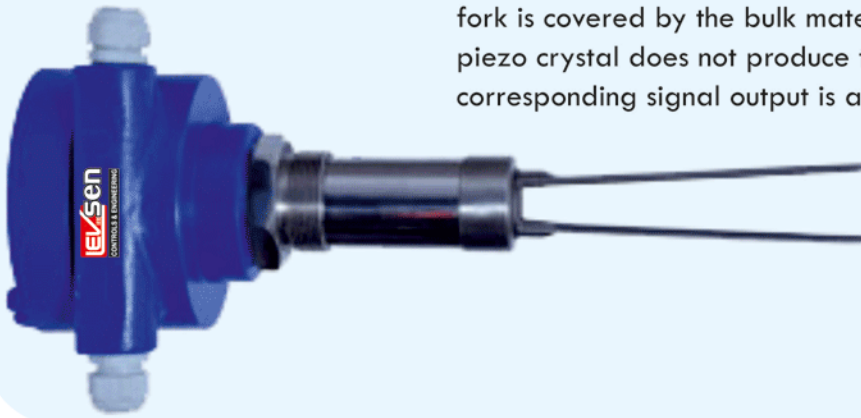
### Specification :

Wetted Part : SS304/SS316 as specified  
Enclosure : Weatherproof / Flame Proof  
Switch - Micro Switch rating : 5 Amps 230V ac  
Numbers of Contacts : 1 or 2 or 3 Switching  
Pressure : 20 Kg/Cm<sup>2</sup>  
Temp. : 150°C  
Conn. : 3" (Min.) Flanged or Screwed



# Vibrating Fork Level Switch

## Series VFLS 30



**FUNCTION:** The electronically stimulated fork vibrates at its mechanically resonance frequency of 125 Hz when the fork is free of the service material. The resonance is caused by the piezoelectric crystals. One of the piezo crystals produces a small voltage which is transmitted to the switching amplifier. If the fork is covered by the bulk material, a damping effect is produced and the piezo crystal does not produce the voltage and the amplifier will switch and a corresponding signal output is actuated.

The vibration of the fork has self-cleaning properties. The light deposit on the container wall does not affect the operation of LEVSEN Vibrating Fork Level Switch

## Technical Specifications

### Switching Unit:

- Housing: Die Cast Aluminum, weather proof, powder coated, Integral with the probe
- Cable entry: 2 nos.
- Ambient temperature: 0 ° C to +60° C
- Power consumption: 2 VA
- Mains Voltage: 230/110 V AC (+/-15%), 50 Hz OR 18-55 V DC or 65-265 VAC
- Output: 2 sets of potential free c/o contacts rated at 5 amps, 230 V AC for non-inductive loads
- Switching delay: Continuously adjustable From 1 to 20 sec. Probe Free or Probe Covered (Optional)
- Safety operation: Field selected switch over for min. or max. (FSL/FSH) switching points
- Switch status display: Green LED shows Normal, Red LED shows alarm

### Fork (Sensing Probe):

- Mounting: Screwed & 1 1/2 BSP (standard) Or Flanged (optional)
- Sensing Fork: Stainless steel SS304/SS316
- Extension: Pipe
- Probe Insertion Length: 250 mm standard, Extension up to 3000 mm .
- Operating Temperature: 150 deg (standard), up to 200°C (on request)

### Salient features

- Vibration of the fork has self cleaning properties
- The light deposit on the container wall does not affect the operation
- Fast and Easy Installation • No Calibration
- No effect of electrical properties of the Service material
- Suitable for the highly dusty environment
- Field selectable operation logic • High Reliability
- Can be configured either for High or Low Level point switching

### Application :

LEVSEN Vibrating Fork Level Switches series VFLS 30 are the most suitable for level detection of Free Flowing Solids across wide density range from fine powders and polymers to granules and grains up to the particle size of Ø12 mm. These are mounted from Side- Horizontally or Top-Vertically in bins, vessels silos and hoppers of application material. It can be used for level sensing & control , blockage detection, high level /overfill and low level protection

### Application Material

Plastics, Powders, Flour, Cement, Coal Powder, Fly ash , Lime Powder, Bulk Solids Handling, Chemical, Pharmaceutical, Food, Paper, and many others in the form of solid powdery, granules

# ▶ Rotary Paddle Level Switch



Series RPLS 40

**OPERATION:** A small electric motor drives the paddle, which rotates freely in the absence of material. Impeded by material the motor will be turned within the housing while loading a spring and triggering two switches. One of them is a dry electric contact for control and alarm functions while the other cuts the power to the motor. When the material level drops, the loaded stretched tension spring returns the motor to its original position and the unit is reactivated

## Technical Specifications

- Housing: Die Cast Aluminium
- Insertion length : 150 mm standard, Extension upto 3 mtrs
- Revolution per minute: 1 RPM
- Ambient temperature  $-40^{\circ}\text{C} \dots +65^{\circ}\text{C}$
- Material of wetted parts: Stainless steel SS304 /SS316
- Material of Vanes: Stainless Steel SS304/SS316,
- Numbers & Type of Vane: 1 to 4, various types available as per application
- Process connection: 1-1/2" BSP ( standard) others on request.
- Medium specific gravity: Min. 0,08 kg / dm<sup>3</sup>
- Medium temperature:  $40^{\circ}\text{C} \dots +80^{\circ}\text{C}$ , special version upto  $200^{\circ}\text{C}$  available.
- Electrical Cable gland: PG -16, 2 nos. ( Polymer)
- Medium pressure max. 2 bar
- Output: SPDT 230 V AC, 10 A,
- Power supply 230 V AC,  $\pm 15\%$  or 110 V AC or 24 V DC

## Salient features

- Level switch for powders and free flowing solids
- Flexible coupling (optional as per application)
- Extension up to 3 m
- Robust, dust and watertight housing
- Extended life by motor shut off design
- Sealed bearings
- Interchangeable paddle assemblies,
- Magnetic Clutch mechanism

## Application :

LEVSEN heavy duty, Rotary Paddle Level Switches Series RPLS 40 are the most suitable for level detection of dust granules and other free flowing solids up to the particle size of  $\varnothing 10$  mm. These are mounted from Side-Horizontally or Top-Vertically in bins, vessels silos and hoppers of application material. It can be applied for control of level during filling and emptying as well as for protection against overfilling

## Application Material

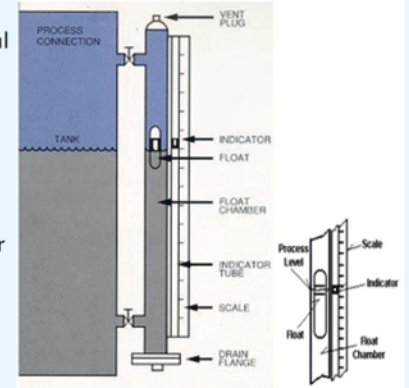
Cement, Dust, Coal Powder, Lime Powder, Fly ash, Sand, Gypsum Calcium Powder, Plastic Powder, Pellets, Chips, Wooden Granules, Sugar, Coffee, Cocoa Powder, Flour, Active Soot, Beet slice, Hard Crop

# ▶ Level Indicator

## Magnetic Level Indicator Series MLI 33

LEVSEN Magnetic Level Indicator Series MLI 33 consists of a float chamber, a float, and an external indication device. The float chamber is basically a column of 2 1/2 inch pipe made stainless steel or any non magnetic material with process connections to match those of the storage tank, reactor, drum, column or other equipment where level is to be measured. These connections may be side couplings or flanges, or top and bottom flanges. The float moves up and down inside the chamber as the process level changes. Contained inside the sealed float is a very strong magnet assembly. The indicator tube and scale assembly is attached to the outside of the float chamber. Inside the transparent, hermetically-sealed indicator tube is a light-weight magnetized indicator. This indicator is magnetically coupled with to the float and moves up and down inside the indicator tube as the float moves up and down with the rising and falling of the liquid level in the vessel.

The indicator is brightly colored and allows the operator to read the level from 100 feet away. The only moving parts are the float and the indicator. An optional Flapper/Roller style indicator is also offered. The basic magnetic level indicator offers simple visual indication. By using the transmitter, a 4-20mA signal can be sent to a remote location for indication or control functions. Additionally, level switches can be added, external to the float chamber, for alarm or control. These switches can easily be moved up or down the chamber while not disturbing the process.



**Levsen Magnetic Level Indicator MLI 33 with Flapper Style Indicator** A magnetic flapper assembly is attached to outside of float chamber. These bi colour flappers are white on one side and red on the other. As the float moves up and down the bunched field of the permanent magnet mounted in its top section pulls the flapper through of 180°, thus changing their colour. As the float rises the flapper are turned from white to red, and as the float falls, they are changed to white again This mean at any given time the amount of liquid in the tank is constantly represented by red column.

## SPECIFICATION

Measuring Range : 3000 mm ( Max.)  
Centre to Centre Distance: 3000 mm ( Max.)  
Float Chamber: SS304/SS316/PP  
Float Material: SS304/SS316/Titanium  
Scale: SS 304  
Process Connection: 1/2"/ 3/4"/1"/1 1/2"/2" Flanged OR Threaded BSP/NPT (M/F )  
Drain & Vent: 1/2" Threaded Plugs/Valves  
Indication Type: Rotating Flapper (Red /White) OR Capsule in Transparent Tube  
Operating Temperature: 300°C (Max.)  
Operating Pressure: 70 Kg/Cm<sup>2</sup>

**Optional :** Level Transmitter: Output 4 to 20 mA, 2 Wire, 24 VDC

Level Switches: Micro switches rated 5A @ 230VAC ,SPDT Read switches rated 1A , SPDT/SPST

**Applications** Level Indication in tank of liquid which attack the glass/ Hazardous/Toxic / Contaminated / Agitated under temperature and pressure

### Application liquids (Service Fluids)

Corrosive Acids - Oleum, H<sub>2</sub>SO<sub>4</sub>, HNO<sub>3</sub>, Acetic.

Solvents -Methanol, Benzene, Toluene, Alcohols, CS<sub>2</sub>.

Vegetable.Oils, Fuel Oils, Lubricants, Water , Poisonous / Toxic Liquids,

### Features:

Rugged glandless construction to provide safety in handling flammable, toxic & high corrosive liquids.

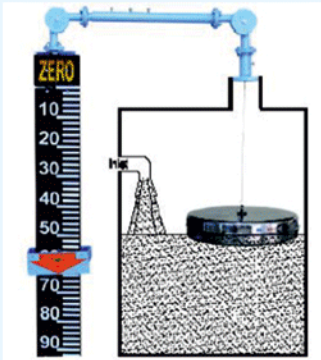
Safe for dangerous and hazardous liquids even under high temperature and pressure.

Bright coloured Indicator provide clear view of level from 100 feet distance

With options of level transmitter for continuous remote level monitoring and adjustable level switches for alarm and controlling of liquid level in tank.



## Float & Board Level Indicator Series FBI 44



LEVSEN Float & Board Level Indicator is suitable for large and non – pressurized liquid storage tanks / vessels. The specific gravity of the fluid should be more than 0.6. Float is available in different material S.S.304/S.S.316 /P.P./Teflon etc.The Float is design as per the specific gravity of the liquid, floating on the liquid levels. This Float is connected to a pointer through Rope via a Sets of Pulleys, Float moves up and down with rise and fall of liquid level in tank, the pointer moves/ slides over a CM marked Board, installed parallel to the tank and indicates the level in tank. For more than 3 metre height of the tank we provide two guide wires firmly anchored to the tank bottom. So that horizontal movement of the float is restricted.

### SPECIFICATION

**Range:** As per tank height ( Max.20 Meters)  
**Float:** SS 304/ SS 316/ PP, PVC/PTFE.  
**Measuring Rope:** SS-304/SS316/Nylon/PP/PTFE.  
**Pulley:** SS-304/SS316/ PP.

**Scale Board:**150 mm wide aluminium channel marked in CM  
**Least Count:** 1 CM  
**Pointer:** Fluorescent red colour

## Tubular Level Gauge Series TLG 11



LEVSEN Tubular Level Gauge Series TLG 11 provide

visual liquid level observation is very common in process industry. It is a simple and reliable device for direct reading in atmospheric or pressurized tank applications It is mounted parallel, along the side of tank. As the process level fluctuates, the level in the transparent glass tube changes accordingly and gives local liquid indication.

### SPECIFICATION

**Connection:** Screwed & Flanged ASA 150#  
**End Fitting:** CS/S.S.304/S.S 316/P.P  
**Protective Channel:** C.S. Rectangle / S.S.304/S.S 316  
**Glass Tube:** Borosilicate 19/16 /25 mm OD  
**Packing:** Teflon  
**Valve :** C.S./S.S.304/S.S. 316/P.P.

**Press. Rating:** Max. 10 Kg/Cm<sup>2</sup>  
**Temp. Rating:** Max. 120 ° C  
**Range :** Max. 3 Meters

### Application:

Chemical, , Pharmaceutical, , Water / Waste Water / Effluent treatment plants, cooling / Lubricating / Filtration systems, Liquid sewerage tanks, , Chemical reactors etc.

## Level Gauge Series LG 22

### Reflex Level Gauge /Transparent Level Gauge



**LEVSEN Reflex Level Gauge RLG 22** is designed for measurement of liquid level in vessels under high pressure & temperature conditions. It is a flat glass gauge, which has precision Moulded prismatic grooves cut on its inner side coming in contact with the medium. Light striking the glass covered by liquid is refracted (absorbed) into the liquid making this portion appear black, whereas light covering the vapor space is reflected back towards the viewers, making it appear silvery-white. Thus, a sharp clear line marks the liquid, eliminating all possibilities of errors in reading.

**LEVSEN Transparent Level Gauge TLG 22** is designed for measurement of liquid level in tanks under high pressure and temperature conditions. It consists of double flat glass mounted opposite to each other on a chamber. The glasses are held together by studs through cover plates. It is used for interface services or when the process is dirty or viscous.

### SPECIFICATION

**MOC** M.S. /S.S.304/S.S.316 /PP  
**Cover plate** C.S/M.S/S.S.  
**Glass** Borosilicate

**Packing** Teflon  
**Valve body** M.S. /S.S. 304/ S.S.316  
**Range** Max. 2 Meters

**Temp** 300° C (Max.)  
**Press rating** 100 kg/cm (Max.)  
 with Non IBR & IBR Certificates

# ▶ Level Transmitter

## RF Level Transmitter SERIES RFLT 100

A Perfect Analogous Level transmitter based on Radio Frequency Principle for continuous monitoring & control the level of Solids, Liquids & Slurries.



## Technical Specifications

### Electronic Transmitter RFLT 100-ET

Range : Upto 50 mtrs.  
Solid state, circuitry  
Power Supply - 230/110 V AC  
Output - 4 to 20 m A. (Isolated), Analogous to Level  
Mounting : Remote from probe (max 25 mtrs.)  
Location - Outdoor heavy dusty area  
Enclosure : Cast Aluminum, Dust/Weather Proof  
Ingress Protection IP 65  
Cable Entry - Three Nos. (1) 3/4" ET for Output Signal Cable  
(2) 1/2" ET for Power Cable (3) 3/4" ET for RF Coaxial Cable to Probe Connection.

Electronic Transmitter contains entire electronics & adjustments housed in a dust / weather proof enclosure & it is mounted separately at a convenient location remote from sensing probe.

#### Application:

Solids (Powder & Granules) in particle size finest to max. 200 mm. Insulated Prov RFLT100-IN For Liquid & Conductive Materials

### Sensing Probe Model RFLT 100-SP

Process Temp. : 250°C / 450° (specify).  
Range/Probe Length - as per requirement (Max 50 mtrs.)  
Process 40 NB Thread/Flange (as required)  
Engross Protection IP 65  
Mounting : Top of the Silo/Bin/Vessel  
Probe Head : Cast Aluminum Dust/Weather Proof  
Insulation : PTFE/Ceramic  
Electronic : remote (no electronic on probe)  
Compatible Electronic : Electronic Transmitter Model RFLT 100-ET  
Cable to Electronic Transmitter : RF Coaxial Cable

## Capacitance Level Transmitter SERIES CLT 200

Capacitance Level Transmitter is a compact, low cost, Loop Power level transmitter with 4-20 mA analogue out-put designed to measure the level Of various liquids, and solid in tanks or storage vessels. Measuring range is 0.2 to 3 m for rod probe version. The probe forms an electrical capacitor with the surrounding metal contained wall, or with auxiliary reference probe. With the vessel empty, an initial capacitances exists between the electrode and the metal wall or the auxiliary reference probe. When the probe become covered with material to be measured the capacitances will increase and the change will be measured and covered into an analogue (4-20 mA) output signal proportional to the change. Rod or flexible cable can be used for various conductive or non conductive Liquids.

### SPECIFICATIONS

Probe Length /Measuring range: 0.25 to3 Meters(Rigid/Rod) & 1 to20Meters(Flexible/Rope)  
Probe Material : Stainless steel rod /Rope (insulated partly or fully with PTFE )  
Medium Temp : -20°C to 100°C, Special Version upto 200°C  
Output : 4-20 m A DC ( 2 wire loop power) , Supply voltage:12-30 V DC  
Mounting connection: 1/2" Standard for Rod probe, others as per request and application.

### APPLICATION

Continuous Level Monitoring, Level Measurement , Sensing and Control in tanks of liquids like Acids, Acetone, Ammonia, Benzene, Water, Chemicals Solvents ,CTC, Diesel, Oils, Fruit Juice, Milk, Wine etc , and in Hoppers/vessels of solids like Cement , Fly ash, Coke, Corn, Quartz, Food Grains, Sand , Powdery and granules.





## Magnetic Float Operated Level Transmitter Series MFLT-300

LEVSEN Top Mounted Magnetic Float Operated Level Transmitter Series MFLT is reliable for continuous level monitoring / measurement of any liquid in a storage tank



### OPERATION:

It consists a magnetic float and a guide stem. A chain of reed switches and resistors are placed inside the guide stem. As per liquid level float moves up or down on the stem, magnet inside the float operates the reed switches inside the stem thereby causing a change in resistance value. Change in the resistance is measured by the electronics unit located in the enclosure and conditioned as a current output of 4 to 20 mA.

### Application

Continuous level monitoring in the storage tank of liquids like water, diesel , oil, fuel, acids, chemical, solvent, milk, juice etc.

### SPECIFICATION

Measuring Range : Min. 200 mm to Max. 3000 MM    Output: 4-20 mA DC, 2 Wire  
Supply Voltage: 24 VDC    Enclosure: Die Cast Aluminous, weather proof/flame proof  
MOC of wetted part (Float & Stem): SS304/SS316/PP    Process Connection: 2"/3" Flanged/Threaded  
Mouthing: Vertically ( Top of the tank)    Process Temperature: 100°C Max.    Process Pressure: 10 Kg/Cm<sup>2</sup>

## Hydrostatic Submersible Level Transmitter Series SBLT-400

LEVSEN's Hydrostatic Submersible Level Transmitters Series SBLT is most suitable for continuous monitoring and measurement of clean liquid level in wells, deep sump , tanks, channels and dam

### OPERATION:

Submersible Level Transmitter is designed for direct submergence in liquid for quick, accurate and reliable level measurements. The Transmitter is suspended through its cable in the liquid. The Transmitter consists of a sensing element encased in 316 SS which measure hydrostatic pressure of liquid medium. It converts the hydrostatic pressure into a current or voltage signal. Level information travels via an electric signal which changes linearly and proportionally to changes of the hydrostatic pressure above the sensor

### Technical Specifications

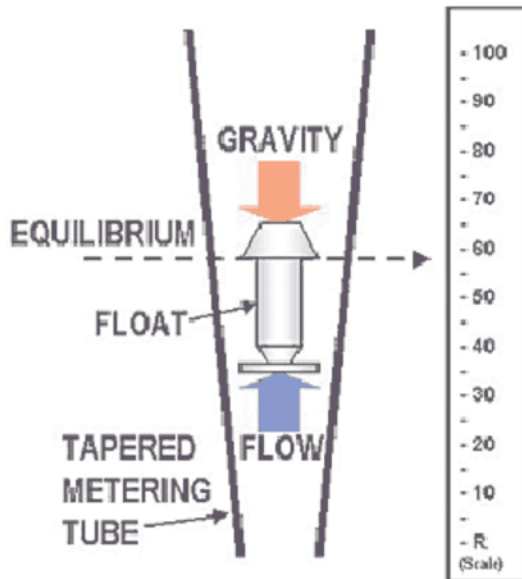
Measuring Range: 5,10,20,50 &100 Meters  
Sensing Element: SS 316L  
Sensor Enclosure: SS 316  
Protection Class IP68  
Suspended Cable Length: Up to 150 Meters (Max)  
Cable: Rubberised -Polyethylene  
Temperature Limit: 80°C (Max.)  
Output: 4-20 mA , 2 Wire  
Supply Voltage 24 VDC  
Accuracy: ±0.25 FS  
Mounting: Top (Cable Suspended)



**Application Examples** • Deep wells • Reservoirs • Sumps • Water remediation systems • Lift stations  
• Cooling towers • Tank level

**Features and Benefits** Easy Installation in any shape of tank or open pit without emptying the tank A small opening of 40 mm is enough on the tank top to insert and hanged it by its cable Can be simply hanged from top of the tank without making any mounting arrangement. Provide very long measuring range for tank and open pit depth up to 100 Meters Sealed SS 316 durable construction for long life in harsh environment

## Working Principle of Rotameter / Flow Meter



LEVSEN Rotameters are useful for measuring the flow of Water, Air, Common Gases, Alkalies, Oil, Organic Chemicals etc.

When fluid or gas flows through a taper tube containing a float, a pressure difference of  $P_1$  and  $P_2$  is created between upper and lower side of the float. The float moves upwards by a force obtained by multiplying the pressure differential by the maximum cross sectional area of the float. Due to taper tube, as the float moves upwards, the fluid passing area increases as a result of which the differential pressure decreases. Upward movement of float stops when the dead load is dynamically balanced by the differential pressure. Tapering of metering tube is so designed that the vertical movement of the float becomes linearly proportional to the rate of flow and the scale is provided to read the position of the float, thus giving birth to flow rate indication.

Based on Bernoulli's theorem, the principle mentioned above can be theoretically expressed as follows.

**FLOW FORMULA :**  $Q = CA \frac{\sqrt{2gV(a\rho v)}}{AF \gamma}$  Where

- $Q$  = Volumetric flow rate, •  $V$  = Volume of Float, •  $C$  = Flow coefficient, •  $A_f$  = Maximum pressure receiving area of float.,
- $A$  = Fluid passing Area, •  $P$  = Float Density, •  $g$  = gravimetric acceleration, •  $\gamma$  = Fluid Density

**LEVSEN CONTROLS & ENGINEERING provides various types of Rotameters / flow meters available namely :**

- GLASS TUBE ROTAMETERS
- METAL TUBE ROTAMETERS
- ACRYLIC BODY ROTAMETERS
- BY-PASS ROTAMETER

## GLASS TUBE ROTAMETER SERIES GTR 100

LEVSEN make high accuracy fully enclosed online direct reading glass tube rotameters are relatively simple and reliable instruments for continuous flow rate indication. This rotameters consists of a vertical mounted, calibrated tapered tube with float inside and a scale directly calibrated as per flow range taking into account operating Sp. Gr. /Density and operating viscosity. Line fluid raises the float in tapered glass Tube, Area increases as float moves upward thereby showing the exact (Increasing) flow.

### SPECIFICATIONS

- Meter Body: M.S. Powder Coated / SS 304
- Float: Ss 316 / PTFE / PVC/ MONEL
- Wetted Part: SS 316 /SS 304 / M.S./PTFE/PVC/P.P./MONEL
- Packing: Neoprene / PTFE/ Silicon
- Tube: Borosilicate Glass
- Scale: SS304/aluminum
- Connection: Flanged / Threaded
- Operating Temperature: 200°C ( Max.)
- Accuracy :  $\pm 2\%$  Of Full Scale
- Range Ability: 10:1
- Repeatability: 0.5%



### Application:

Flow Measurement of liquid like Water, Oil, Alkalies, Organic Chemicals etc., Air and Common Gases.

## ACRYLIC BODY ROTAMETER SERIES ABR 200

LEVSEN make high accuracy, clear acrylic body rotameter uses tapered tube drilled directly in acrylic plastic body itself, acrylic plastic is highly stable, chemical resistant and gives glass like clearness which enables clear visualization of flow. In Acrylic Body rotameter, Flow range is calibrated, engraved and colored body itself for long lasting durability. Acrylic body rotameters are generally used for Air, Water and Gases.

### SPECIFICATIONS

Meter Body: Acrylic  
 Float: SS 316 / PTFE / PVC  
 Wetted Part: SS /PTFE/PVC/P.P  
 O-Rings: Neoprene / PTFE/ Silicon  
 Scale: Engraved on Body  
 Connection: Flanged / Threaded  
 Operating Temperature 70°C (Max.)  
 Accuracy :  $\pm 3\%$  of Full Scale  
 Range Ability: 10:1  
 Repeatability: 0.5%



### Application

Flow Measurement of Liquid like Water, Oil, Alkalies, Organic Chemicals etc., Air and Common Gases.

## METAL TUBE ROTAMETER SERIES MTR-300

LEVSEN Metal Tube Variable Area Flow Meters (Rotameters) are intended for application where high pressure, temperature OR corrosive conditions preclude the use of conventional glass tube. These are all Metal Variable Area type Flowmeter design to measure flow rate of liquids, gases & steam under critical conditions. It consists of a tapered metal tube, an indicating assembly and a float. A magnet encapsulated in float couples with rotating magnets connected to an indicating pointer, thus the movement of the float, is accurately indicated in terms of flowrate.

### SPECIFICATIONS

Meter Body: SS316/SS304  
 Float: SS316/PTFE  
 Indicating Housing: ABS/Aluminum/SS304  
 Operating Temperature: 250°C ( Max.)  
 Operating Pressure: 40 Bar ( Max.)  
 Accuracy :  $\pm 2\%$  of full Scale



### Accessories:

- a) Electronic Transmitter with 4-20 mA O/P
- b) High & low Flow Switches.
- c) Digital Flow rate Indicator & Totaliser .

### Application

Flow Measurement Of Water, Acids, Organic Solvents, Salts, Gases Under High Temp. & Pressure.

## BY PASS ROTAMETER SERIES BPR-400

Most economical solution for flow measurement in large pipe lines and for large rate of flow suitable for measuring flow rate in 50 NB to 500 NB line size and range covered in between 25 to 800 M<sup>3</sup>/Hr water above pipe line size. The Orifice calculation and design is based IS/BS Standards. By Pass systems are available in Flange Tap, Carrying Ring Type OR D and D/2 Type. The differential pressure across the main orifice plate is proportional to the flow rate in the main pipeline. The flow rate indicated in the by pass rotameter is calibrated in terms of flow through the main pipeline, a range orifice is used at the inlet of the Rotameter. By-Pass Rotameter Complete Assemblies are recommended for large flows in 2" & above size pipe lines, where direct on-line Rotameter is not possible for becoming very costly due to non availability of required dia. Tube or large dia. Tube respectively. Rotameter in by pass line measures the bypass flow that is directly proportional to the main flow of main line

### SPECIFICATIONS

Meter Type: Glass tube Rotameter / Metal Tube Rotameter Type of Tapping: Flange/ D & D/2 Corner  
 Accuracy:  $\pm 2\%$  of full flow Range ability: 7 : 1 Or 5 : 1

### Assembly consists of

- a) A pair of orifice flanges
- b) A precisely bored & finished orifice plate
- c) Necessary by-pass piping
- d) 2 Nos. Isolating valves
- e) A rotameter in By- Pass line with range orifice plate.

### Material of Construction

Orifice Flange: SS316/SS304/MS/CS/PP/PVC  
 Orifice Plate: SS316/SS304/Hastelloy 'C'/Monel/PVC/PP  
 Carrier Ring: SS316/SS304/MS/PP  
 By Pass Line: SS316/SS304/MS/PVC  
 Wetted Part Of Rotameter: SS316/SS304/MS/PVC



## Electro Magnetic Flow Transmitter

### TECHNICAL SPECIFICATIONS:

Media : Liquids (Conductive)  
 Line Size : 15 NB to 300 NB  
 Excitation : Pulsed DC  
 Type of Output : 1) 4 to 20 mA DC, Isolated, HART 2) Pulse  
 Display : 16 x 2 LCD - 4 digit for Flow Rate & 8 digit for Totalised Flow  
 Accuracy : +/- 0.5% of F. S.  
 Process Temperature : 75° C max for Rubber Lining & 150°C for PTFE Lining  
 Process Pressure : 10 kg/cm<sup>2</sup> max  
 Power Supply : Option 1 : 24 V DC Option 2 : 90 - 260 V AC, 50 Hz

### Material of construction :

Lining - Rubber / PTFE  
 Flange - CS / MS / SS304/SS316  
 Electrode - SS 316L / Hastalloy C / Platinum  
 Coil Housing - MS / SS 304  
 Transmitter Enclosure : Die cast Aluminum IP 66, Flow Tube IP 68  
 Process Connections : ASA 150 Flanged as Per Table B16.5  
 Mounting: In-Line Horizontal (Vertical on request)  
 Operating Conditions: Temperature 0 to 55°C / Humidity 5 to 95% non condensing



### OPTIONAL Communication Port:

- 1) RS 485 supporting MODBUS RTU Protocol
- 2) GSM Communication
- 3) 4-20mA with HART

## Turbine Flow Meter

### TECHNICAL SPECIFICATION

Media : Liquids (Clear)  
 Line Size : 15 NB to 150 NB  
 Display : 8 x 1 LCD - 4 digit for flow rate & 8 digit for totalized flow  
 Accuracy : +/- 1% of F. S.  
 Linearity : +/- 1%  
 Repeatability : +/- 1%  
 Pressure Drop : Approx. 0.28 kg/cm at max.

Flow Turn down ratio : 10 : 1 to 100 : 1  
 Process Temperature : 0 to 85°C max  
 Process Pressure : 0 to 10 kg/cm<sup>2</sup> max  
 Power Supply : 24 V DC  
 Transmitter Enclosure : Die Cast Aluminum IP 68  
 Process Connections : Flanged ASA 150 As per table B16.5  
 Mounting : In-Line ( Horizontal or Vertical )  
 Operating Conditions : Temperature 0 to 55 °C / Humidity 5 to 95% non condensing



## Flow Switch



Paddle-Type Flow Switches are used in commercial and industrial applications to accurately monitor the flow of liquid in pipelines servicing water systems, heating systems, air conditioning and processing installations for industrial and commercial applications. The flow switches are designed to act as automatic control or safety devices for liquid flow.

Main Hexagonal Body: Brass or Stainless Steel 316. Paddle: Brass or Stainless Steel 316.  
 Bellows: Stainless Steel 316.  
 Flapper: Stainless Steel 316 / 321 / 304.  
 Loading Spring: Stainless Steel.

## Sight Glass Flow Indicators Series Sgfi-20

Sight Glass flow indicator is ideal for use of Liquid flow applications. These are simple, economical & reliable way to verify, see and monitor the flow of fluid in industrial process line.

SPECIFICATION:  
 MOC: CI, CS, MS, SS 304, SS316, PP  
 Window: Toughened Borosilicate Glass  
 Packing: PTFE  
 CC Distance: 150 mm / 200 mm  
 Line Size: 15 NB to 200 NB  
 End Connection: Flanged / Threaded  
 Pressure: up to 20 Kg/Cm<sup>2</sup>  
 Temperature: up to 200°C  
 Option: Flapper, rotary Wheel



Full View



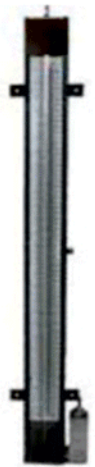
Double Window

# Pressure Instruments

## Manometer Series M 30

A Manometer is a Pressure measuring instrument usually limited to measuring pressure near to atmosphere. Commonly used Liquids in Manometer are Water and Mercury.

### Metallic Body Manometer M 30-MB



Metallic Body SINGLE LIMB MANOMETER



Metallic Body U Tube MANOMETER

Single Limb Manometer Range: 0-100  
To Max. 0-2000mm WC/HG.

U Tube Manometer Ranges: Min. 50-0-50  
To Max. 1000-0-1000 mm WC/HG.

### SPECIFICATIONS

Body : Metallic 'C' section anti corrosive painted  
End Block : SS304/SS316/BRASS/MS/PVC/PTFE/PP  
Connection : 1/8", 1/4", 1/2" 3/8" BSP (M/F), NPT (M/F), Hose nipple and ferrule fitting Enclosure : Dust proof

### Acrylic Body Manometer M 30-AB



Acrylic Body Single Limb Manometer



Acrylic Body U Tube Manometer

### SPECIFICATIONS

Body: Fabricated in 25 mm/32 mm thick  
Transparent Acrylic solid Block  
Connection: 1/8", 1/4", 1/2", 3/8" BSP (M/F),  
NPT (M/F), Hose Nipple And Ferrule Fitting  
Metering Tube: Drilled & Reamed in  
Transparent Acrylic Block.  
Scale: Milky White Acrylic engraved  
Zero adjustment: Provided  
Least Count : 1 mm  
Accuracy :  $\pm 1\%$  of FSD

## PRESSURE GAUGE

LEVSEN stainless steel pressure gauges are designed to meet the requirement of demanding pressure monitoring application. These pressure gauges are commonly used in Chemical Processing, Petroleum Refinery, Petrochemical, Fertilizer, Thermal & Nuclear Power generating industry & process applications.

### INDUSTRIAL PRESSURE GAUGE (SS INTERNAL)

DIAL SIZE : 50 MM, 63 MM, 100 MM, 150 MM, 250 MM  
RANGE : -1 To 1000 KG/CM<sup>2</sup>  
PRECESS CONNECTION: 1/4", 3/8", 1/2", 3/4", 1" BSP/NPT  
ENTRY: BOTTOM/BACK  
ENCLOSURE : IP-65 As Per IS 2147,  
SENSING ELEMENT : BOURDEN,  
ACCURACY :  $\pm 1\%$  F.S.D.,  
AMBIENT TEMP. : 0-20° To 65°C,  
PROCESS TEMP. : Max. 270°C,  
ERATING PRESS. : 75% OF Range Val.,  
OVER RANGE LIMIT : 130% of F.S.D,  
ZERO ADJUSTMENT : Micrometer Adjustment

### LEVSEN offer variety of Pressure Gauges namely

- Commercial Pressure Gauges
- Glycerin Filled Pressure Gauges
- Hydraulic Pressure Gauges
- Industrial Pressure Gauges (Complete SS)
- Pressure Gauges With Electrical Contact
- Compact Capsule Pressure Gauges
- Schaffer Diaphragm Type Pressure Gauges
- Sealed Diaphragm Type Pressure Gauges
- Master Pressure Gauges
- Differential Pressure Gauge
- Duplex Type Pressure Gauges

### MATERIAL OF CONSTRUCTION

Case, Bazel & Movement : SS 304  
Bourden : SS 316, Socket : SS 316,  
Dial & Pointer : Aluminium  
Gasket & Blow of Disc: EPDM,  
Joints : Argon ARC,  
Window: Glass 4 mm Thick



Pressure switch is a form of switch that closes an electrical contact when a certain set pressure has been reached on its input. The switch may be designed to make contact either on pressure rise or on pressure fall.

## Pressure Switch



### Specification

RANGE: -1 to 250 Bar  
 PROCESS CONNECTION: 1/4", 3/8", 1/2", 3/4" BSP/NPT threaded (M/F)  
 SWITCH TYPE: 1SPDT/2SPDT/DPDT  
 CONTACT RATING: 5A, 10A, 15A @ 250/125 VACS  
 ENCLOSURE: Die Cast Aluminum/SS 304/SS316  
 PROTECTION: Weather Proof , IP66 / Flameproof  
 WETTED PART: SS304/SS316/SS316L  
 MAX. WORKING TEMPERATURE: 180°C  
 MOUNTING: On Line/ Field/ Back Panel/Wall  
 SENSING ELEMENT TYPE: Capsule/Bellow/Bourdon/Diaphragm/Piston

## Pressure Transmitter



### Pressure Transmitter - PT Series (Fixed Range Transducer Type)

PRESSURE RANGE : -1 bar...0 bar....600 bar....1000 bar  
 OUTPUT : 0...5 V , 0...10V , 0...20 mA , 4...20 mA  
 POWER SUPPLY : 10-36Vdc  
 ACCURACY : ±0.25 FS  
 MAX. PRESSURE : 1.5 X FS  
 ADJUSTABILITY : Zero/Span using internal potentiometer  
 AMBIENT TEMPERATURE: -20 to 80°C  
 OPERATING TEMPERATURE: -40 to 125°C ( Higher on request)  
 ELECTRICAL CONNECTION: M12 connector, five Pin bendix connector, Hirschman and Direct down-lead.  
 CASE. : Stainless Steel SS304/SS316  
 HOUSING : Stainless Steel, Protection Class IP 65  
 WETTED PART : Stainless Steel SS316L  
 PROCESS CONNECTION : G 1/4", G 1/2", M20 X1.5 , 1/4", 1/2"NPT/BSP Threaded (M/F)

## Pressure Transmitter



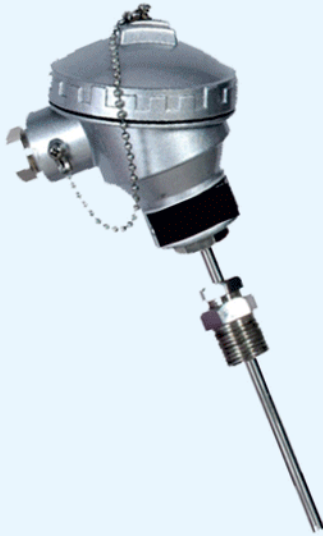
### Pressure Transmitter – Smart Series

(Smart Type HART Programmable with Digital Display)  
 Used to measure liquid, gas, or steam flow as well as liquid level, density and pressure, at the same time, this transmitter accurately measures both differential pressure and line pressure, and displays this information on the multi-function LCD.  
 TYPE: Smart with HART Protocol  
 DISPLAY: Digital LCD 4 digit  
 RANGE : 0 To 600 BAR (adjustable with turn down 1:20)  
 POWER SUPPLY : 12 to 45 Vdc , OUTPUT : 4-20 mA DC – 2 wire, HART  
 ACCURACY : ± 0.1% F.S.D On Full Scale,  
 PROCESS CONNECTION : G 1/2", M20, 1/2" NPT  
 ELECTRICAL CONNECTION : 1/2" NPT (F),  
 TEMPERATURE : -20°C To 85°C,  
 CASE : Polyurethane Covered Aluminum,  
 ENCLOSURE: Weather Proof / Explosion Proof,  
 PROTECTION: IP65/IP67, WETTED PARTS : SS 316L  
 DIAPHRAGM MATERIAL : SS 316L  
 MOUNTING: Directly supported by piping or optionally with mounting bracket for 2" pipes or with direct or remote seats  
 ACCESSORIES: Mounting Bracket Along With Nuts And Bolts,

# Temperature Sensor

## THERMOCOUPLE

A Thermocouple is a sensor used to measure temperature. Thermocouples consist of two wire legs made from different metals. The wires legs are welded together at one end, creating a junction. This junction is where the temperature is measured. When the junction experiences a change in temperature, a voltage is created. The voltage can then be interpreted using thermocouple to calculate the temperature. LEVSEN make offering wide range of Thermocouples, components and assemblies for use in virtually all high temperature industrial requirements. Our thermocouple offer high accuracy of measurement, excellent stability and reproducibility, high sensitivity for narrow measuring span, designed for extreme environmental condition.



ELEMENT TYPE : J, K, R, S, T, E, N, B  
TEMPERATURE RANGE : -200 to + 1800°C  
CONFIGURATION : Simplex - 2 Wire / Duplex -4 Wire  
ACCURACY : Class A  
PROTECTION : IP-67  
INSULATION : Ceramic Beads & MGO Filled / Mineral Insulated  
SHEATH OUTER DIA : 3 MM to 36 MM  
OUTER SHEATH : SS 316, Inconel  
PRODUCTION SHEATH : SS 316, SS 310, HRS 446, Ceramic 610, Inconel 600  
JUNCTION : UN - Grounded  
IMMERSION LENGTH: 25 MM to 10000 MM (Other on request)  
CONNECTION HEAD MATERIAL: Die Cast Aluminum  
NO. OF ENTRY IN HEAD : Single / Double  
TERMINAL BLOCK MATERIAL : Ceramic With S.S. Base Plate  
TERMINAL MATERIAL : Nickel Plated Brass  
CABLE ENTRY : 1/2" ET, 3/4" ET BSP / NPT (F)  
PROCESS CONNECTION : 1/2", 3/8", 3/4" BSP / NPT (M) Adjustable / Flange 25-150MM  
Thermocouple 1500 MM to 10000 MM Length Will Provided In Only Mineral Insulation

## RTD ( Resistance Temperature Detector )

A Resistance Temperature Detectors (RTD), Sensors used to measure temperature by correlating the resistance of the RTD element with

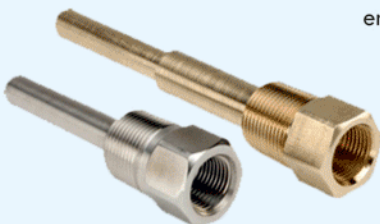
temperature. Most RTD elements consist of a length of fine coiled wire wrapped around a ceramic or glass core. The element is usually quite fragile, so it is often placed inside a sheathed probe to protect it. The RTD element is made from a pure material, typically platinum, nickel or copper. The material has a predictable change in resistance as the temperature changes and it is this predictable change that is used to determine temperature. LEVSEN make offering wide range of RTD for general purpose to demanding Application these are available in 2 wire or 3 wire Configuration, the variety of sheathing makes it Suitable for most critical applications.



ELEMENT TYPE : RTD (PT-100 / 500 / 1000) Copper-50  
TEMPERATURE RANGE : -200 to + 850°C  
CONFIGURATION : Simplex - 2, 3 Wire /Duplex 4, 6 Wire  
ACCURACY : Class A, B  
PROTECTION : IP-67  
INSULATION : Compact MGO Filled / Mineral Insulated  
SHEATH OUTER DIA : 3 MM to 14 MM  
OUTER SHEATH : SS 316 JUNCTION : UN - Grounded  
IMMERSION LENGTH : 25 MM to 10000 MM (Other on request)  
CONNECTION HEAD MATERIAL : Die Cast Aluminium  
NO. OF ENTRY IN HEAD : Single / Double  
TERMINAL BLOCK MATERIAL : Ceramic With S.S. Base Plate  
TERMINAL MATERIAL : Nickel Plated Brass  
CABLE ENTRY : 1/2" ET, 3/4" ET BSP / NPT (F)  
PROCESS CONNECTION: 1/2", 3/8", 3/4" BSP / NPT (M) Adjustable

## THERMOWELL

A Thermowell is a pressure-tight receptacle that protects and extends the life of a temperature sensor in processing applications where the sensor is not mechanically or chemically compatible with the process environment.

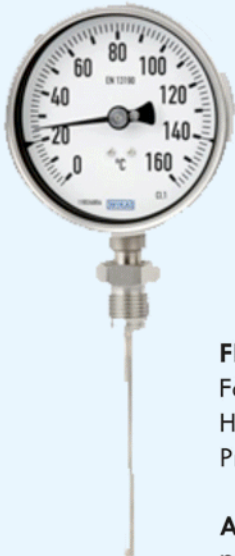


LEVSEN offering complete range of thermowells in various sizes, connection and material  
Material: Ss304, SS316, SS316L, SS321, SS310, HRS446, INCONEL 600/800, 601 Hastalloy, Monel, Titanium etc. Type: Drilled barstock, Fabricated  
Construction: Tapered, Straight Process Connection: Screwed, Flanged

# Temperature Sensor

## Temperature Gauge

LEVSEN temperature gauges are ideal for most the rugged industrial applications, offering bimetal thermometers with hermetically-sealed cases to prevent damage from the weather and dust LEVSEN Bimetal type temperature gauge are made of two cold welded metal strips with different thermal expansion coefficient. They can be used in the following applications: chemical, petro chemical, gas and oil, food and pharmaceutical.



### TECHNICAL SPECIFICATION

TYPE: BIMETAL DIAL SIZE: 3"/4"/6"(75MM/100MM/150MM)  
RANGE: 0-600 °C  
PROCESS CONNECTION: 1/4", 1/2", 3/4", 1" Threaded BSP/NPT  
SENSING: RIGID STEM TYPE/FLEXIBLE CAPILERY TYPE  
STEM/BULB DIA: 6MM/8MM/10MM/12 MM  
LENGTH: STEM UPTO 800 MM/ CAPILERY UPTO 4000 MM  
ENTRY: BOTTOM/ BAC ACCURACY:  $\pm 1\%$  FSD  
OVER RANGE LIMIT: 125% FSD PROTECTION: IP 55 / IP 65

### FEATURES :

Fast Response, Rugged Connection, Bottom /Back Entry, Hermitically Sealed Case, Accuracy:  $\pm 1\%$ FSD, Ingress Protection: IP55/IP65

**APPLICATION** Industrial heating system, hot water boiler, power plant, food & beverage industries.

### MATERIAL OF CONSTRUCTION

CASE: SS 304/SS316/Aluminum  
DIAL: Aluminum  
POINTER: Aluminum  
STEM & BULB: SS304/SS316  
CONNECTION: SS304/SS316  
WINDOW: Glass 4 mm Thick

## Temperature Transmitter



Head Mounted, Field/Wall Mounted, DIN rail

LEVSEN offer excellent and cost-effective 2-Wire Temperature Transmitter. The design is available in Head Mounted , Field/Wall mounted in Weatherproof Housing.& DIN rail type The device generates 4-20mA current signal proportional to temperature. The Transmitter operates on loop power supply. The current signal reduces wiring cost drastically. The effect of electrical noise is minimized & long runs of thermocouple wires is eliminated. The housing is shockproof & hermetically sealed.

- 2 Wire Design
- Accept RTD/Thermocouple/mV Input
- 4-20mA DC current output
- 10V to 36V DC supply
- Zero/Span adjustment on-site calibration
- Temperature range - 100 to +1200 °C
- Accuracy  $\pm 1\%$  of calibration range
- Linearity better than  $\pm 1\%$  ,
- Available in Head Mounted , DIN rail ,Field/Wall Mounted in Weather proof Enclosure

## Digital Temperature Indicator & Controller

LEVSEN offers high quality and low cost microcontroller based

Temperature Indicators and controllers . It accepts input from J, K type thermocouple or RTD (Pt-100). Two independent set points are programmable over the full range. Each set point can also be configured for High Alarm (Internal relay energizes when actual temperature value exceeds the set point), Low Alarm (Internal relay energizes when actual temperature value is below the set point) :



### Specification

- Range : 0-1800,°C.
- Display : 3½ digit / 4digit 7Segment Red LED's.
- Power Supply : 230/ 110 VAC Or 24 VDC.
- Accuracy : .  $\pm 0.2\%$  of specific range.
- Resolution : 0.1/1,°C. subject to specific Input and range
- Input: Thermocouple type J, K, RTD pt-100, 2 wire, 3 wire
- Nos. of set Point : Two ( Configurable for High & Low )
- Control Output : 2 relay ,contacts NO/C/NC , rating 5A @ 230Vac
- Output Indication : Front Panel LED Indication for O/P & Selected set point
- Key Board Setting : Front panel membrane key pad for parameter setting
- Enclosure: ABS
- Size: 96 x 96 standard ( or other on request)