No. 2000-19E

HITROL

General Information

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# HT-100PT(S)

## Hydrostatic Pressure Level Transmitter

HITROL HITROL CO., LTD.

## General

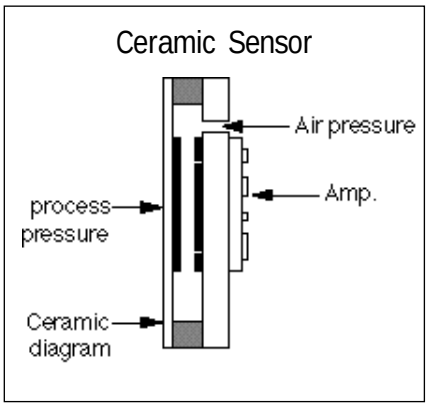
Pressure level transmitter is installed in the tanks of explosion-proof area or other general area, can continuously measure the column length of liquid in the tank by measuring the pressure of liquid at a certain level, multiply the density of liquid to the level of liquid, and continuously convert it into the electric signal(4-20 mA DC).

## Operating Principle

Ceramic capacitive sensing detector is a sensor to measure the pressure of liquid according to thle certain height of liquid column. Pressure is calculated using the equation given below.

$$P = \rho \cdot g \cdot h$$

$P$ : pressure
$\rho$ : density of liquid
$g$ : gravity of acceleration
$h$ : height of liquid column

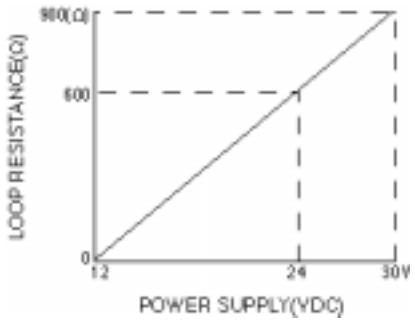



As seen in the above equation, if density of liquid does not change, measured pressure is detected as a electric signal proportional to the height of liquid column, since the height of liquid column, since the height of liquid column is the only variable.

## Specifications

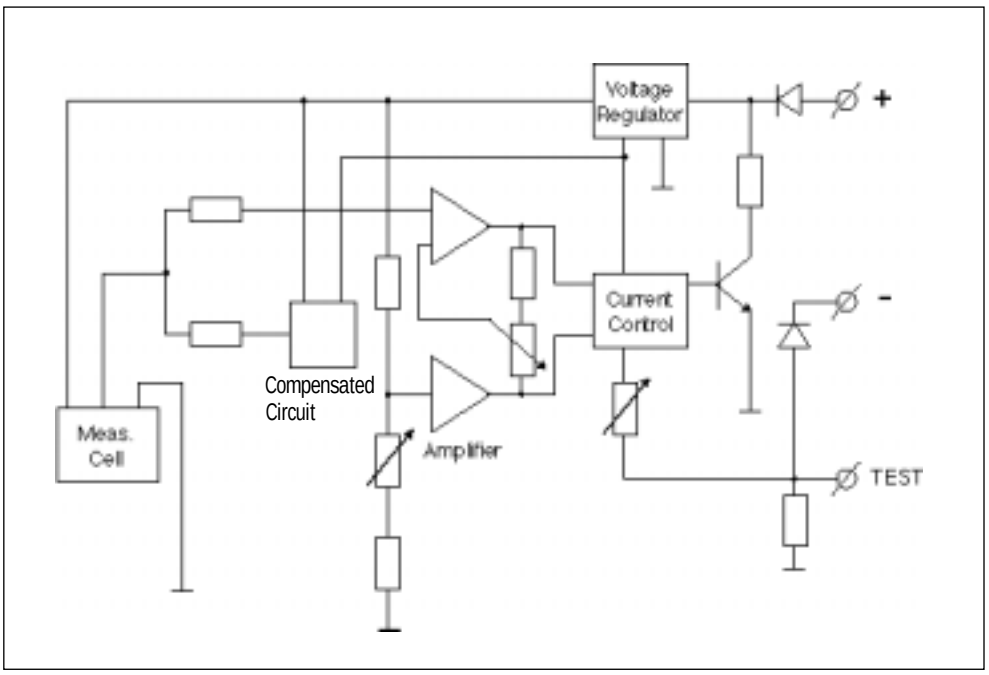
| Item \ Type | General | Explosion - proof |
|---|---|---|
| Model | HT-100PS, T | HPT-100PS, T |
| Power Supply | DC 12~30 V | DC 12 ~ 30 V |
| Accuracy | ± 0.3 % (Full Span) | ± 0.3 % (Full Span) |
| Linearity | ± 0.25 % | ± 0.25 % |
| Hysteresis | ± 0.03 % | ± 0.03 % |
| Repeatability | ± 0.03 % | ± 0.03 % |
| Stability | ± 0.5 % (One year) | 0.5 % (One year) |
| Response Time | 15 ms (63 % full scale) | 15 ms (63 % full scale) |
| Operating Temp. | -30 ℃ ~ + 100 ℃ | -30 ℃ ~ + 100 ℃ |
| Storage Temp. | -40 ℃ ~ + 125 ℃ | -40 ℃ ~ + 125 ℃ |
| Over-Range Protection | 300 % + | 300 % + |
| Range | Max. 20 m | Max. 20 m |
| Wetted Materials | 98 % ALUMINA CERAMIC | 98 % ALUMINA CERAMIC |
| Cable Gland | 2 - 1/2 PT | 2 - 3/4 PT |
| Explosion Proof | | EX d II C T4 IP65 |

Power Supply and Loop Resistance




$$\text{Max Loop } R = \frac{Vw - 12}{0.02} \text{ (OHMS)}$$

## Block Diagram




## Application

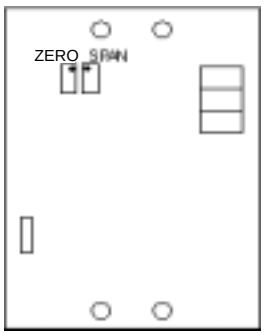
It is possible to apply for tank, water reservoir, level gauge, city water and waste water treatment facility, underground water, paper and pulp industry, food and beverage industry, and other industries, and it is not affected by electric conducitivity, composition changes, however, it is affected by change of liquid density.

## Installation and Cautions for Installation

Pressure level transmitter can be used to continuously measure the level variations by installing it top or side of the tank.

1) When the probe is installed at an extended nozzle or a long pipe, liquid should not be crystalized or congealed on the pipe.
2) Sensor should not be installed at the drainage of tank or a place that liqid is flowing.
3) When the sensor is installed at the top of the tank, and material in the tank behaves like fluid, a guide pipe should be installed.
4) When the sensor is installed at the side of the tank, a valve should be installed between the nozzle and sensor.
5) Sensor should be installed and used at the open tank atmospheric pressure compensated.

## Method of Adjustment

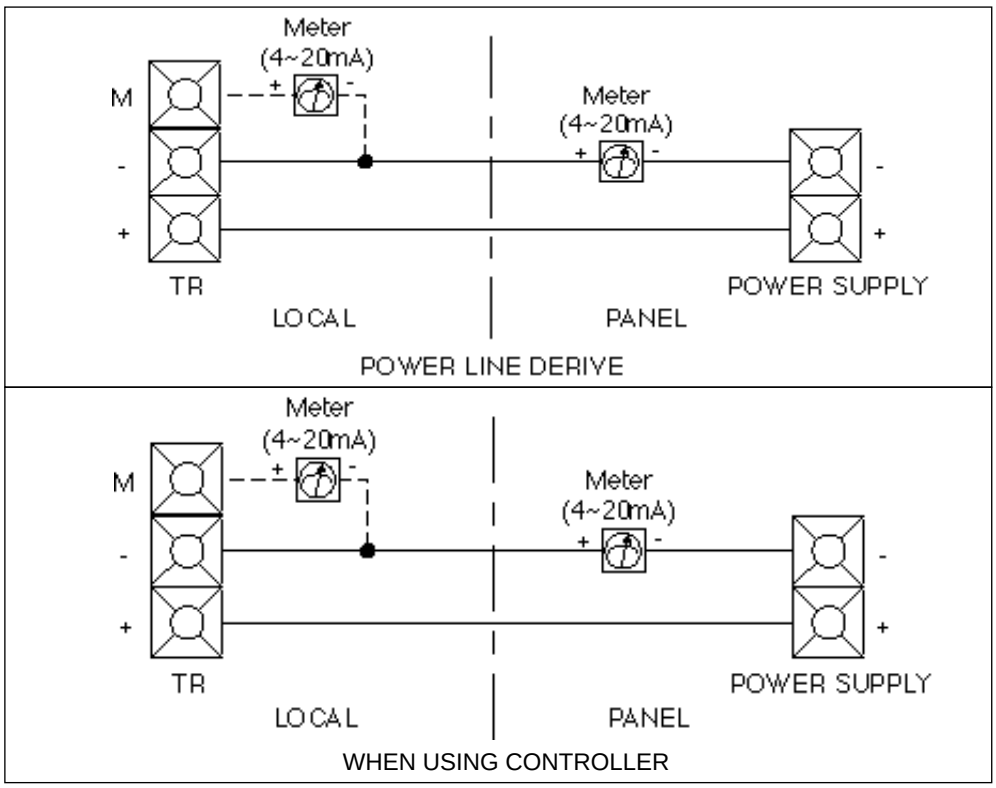



It is not needed to adjust zero and span(It is factory set according to range and density of liquid) for this pressure level transmitter provided that there is no change in density of medium or range.

If there are changes in range and density of medium according to changes of process conditions, it is possible to adjust zero and span within ± 10 % of full scale.

For 0 % adjustment, ampere meter is adjusted to 4 mA by turning the zero variable resistor placed at the top-left side of the amplifier placing the pressure sensor in the atomosphere, for 100 % adjustment, ampere meter is adjusted to 20 mA by turnign the span variable resistor after filling the tank to a desired height of liquid column when the pressure sensor is installed at the tank.

## Wiring Diagram




## Precautions

1) Diaphragm part to which the pressure is transferred should not be pressed by a sharp stuff such as a drill.
2) Signal transmission wire should be shielded.
3) Case of transmitter should not be opened except adjustment work, since the transmitter is a local instrument.

## Maintenance

Pressure sensor should be cleaned periodically(every 2 or 3 months) using clean water so that the pressure sensor should not be plugged by sludge.

## Troubleshooting

1) There is no output of 4 mA
   → Power(DC 24 V) is not supplied or change of polarity.
2) Output displays over 20 mA suddenly from normal display.
   → Problem of insert amplifier or pressure sensor(impossible to fix onsite, return it to HITROL for A/S)
3) Range of custom-ordered level transmitter is required to reduce(increase) according to change of process condition.
   → It is possible to readjust within ±10 % of full scale using zero and span of amplifier. For over ±10 % of full scale, it should be readjusted at HITROL.

**HITROL CO., LTD.**

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