18ECO133T

Sensors and Transducers

UNIT V

Session 6: SLO – 1

LIQUID LEVEL MEASUREMENT

LIQUID LEVEL MEASUREMENT

- Generally, there are two methods used in industries for measuring liquid level.

These are

1. Direct Method
2. Indirect Method

- Direct method use the varying level of the liquid as a mean of obtaining the measurement and the indirect method use a variable that changes with the liquid level to accurate the measuring mechanism.

1. DIRECT METHOD

This is the simplest method of measuring liquid level. In this method, the level of the liquid is measured directly by means of the following level indicators

i. Sight Glass / Gauge Glass

ii. Float Type / Float - Operated Level Gauges

iii. Torque Tube Displacer / Float Displacement Type Level Gauges

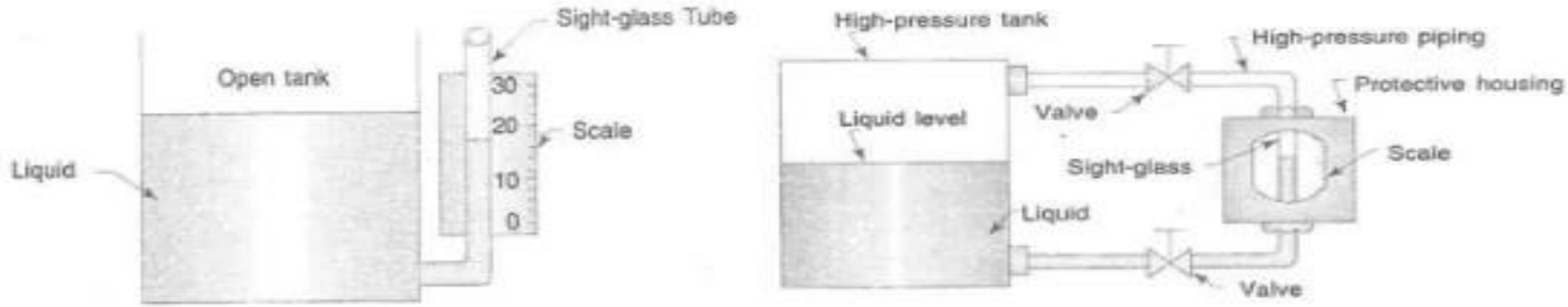
2. INDIRECT METHODS

Following are the indirect methods of liquid level measurement generally used in industries.

i. Hydrostatic pressure type
ii. Electrical methods
iii. Ultrasonic level sensor

SIGHT GLASS / GAUGE GLASS

•Sight glass is used for the continuous indication of liquid level within a tank or vessel. A sight glass instrument consists of a graduated tube of toughened glass which is connected to the interior of the tank at the bottom in which the water level is required.



- Fig.1 shows a simple sight glass for an open tank in which the liquid level in the sight glass matches the level of liquid in the tank. As the level of liquid in the tank rises and falls, the level in the sight glass also rises and falls accordingly. Thus, by measuring the level in the sight glass, the level of liquid in the tank is measured. In sight glass, it is not necessary to use the same liquid as in the tank. Any other desired liquid also can be used.

- Fig.2 shows a high pressure sight glass in which measurement is made by reading the position of the liquid level on the calibrated scale. This type of sight glass in high pressure tanks is used with appropriate safety precautions. The glass tube must have a small inside diameter and a thick wall.

Advantages

- Direct reading is possible –
- Special designs are available for use up to 316°C and 10000 psi.
- Glassless designs are available in numerous materials for corrosion resistance.

Disadvantages

- It is read only where the tank is located, which is not always convenient.
- Overlapping gauges are needed for long level spans
- Accuracy and readability depend on the cleanliness of glass and fluid