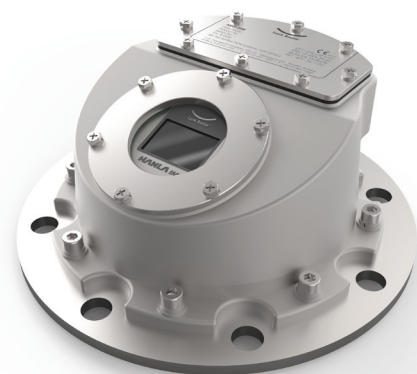


# Cargo Tank Measuring System

## FMCW RADAR TRANSMITTER



### GENERAL

The radar type level, pressure and temperature transmitter(HRD-28R, HRD-28P, HRD-28T) of radar type cargo monitoring system(HRD-28 system) are intrinsically safe apparatus that are applied in hazardous area, which are used for measurement of level, pressure and temperature in cargo tanks.

The radar type level transmitter (HRD-28R) measures level by using FMCW(Frequency Modulation /Continuous Wave) radar.

The pressure transmitter (HRD-28P) measures pressure by using a pressure sensor.

The temperature transmitter (HRD-28T) measures temperature by using RTD sensors.

### APPLICATIONS

The HRD-28 system is specially developed for tanker applications such as chemical, products and etc. It also covers temperature measuring and pressure measuring in cargo tanks.

HRD-28 system is consist of the HRD-28R, HRD-28P, HRD-28T, HRD-28B and the HRD-28C.

HRD-28R is FMCW RADAR level transmitter for measurement of the cargo tank level, measurable product is gasoline, diesel oil, heavy oil, kerosene and etc.. HRD-28P is pressure transmitter for measurement of the pressure of the inert gas in the cargo tank, HRD-28P is installed various place demand on the buyers.

HRD-28T is temperature transmitter for measurement of the product temperature in the cargo tank, generally maximum measurement point is 3(tank top, tank middle, tank bottom). HRD-28B is safety module for power supply and communication to the sensor in hazardous area. HRD-28C is communication unit for receive and display tank value of the level, pressure, temperature from HRD-28R and it transfers to the tank value at monitoring computer or loading computer.

The energy supplied to HRD-28R shall be limited within maximum permissible entity parameters (Ui, Ii, Pi) and shall be connected to certified intrinsically safe circuits(barriers) to satisfy with the conditions.

The energy supplied to HRD-28P/HRD-28T shall be limited within maximum permissible voltage (Ui) to each port and maximum permissible total current( $\Sigma I_i$ )/power( $\Sigma P_i$ ) to all ports of each transmitter and shall be connected to HRD-28R or certified intrinsically safe circuits(barriers) to satisfy with the conditions.

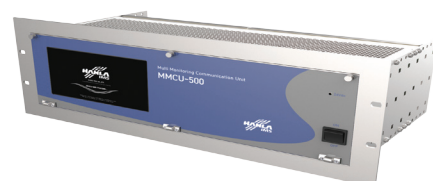
## TECHNICAL SPECIFICATION

### HRD-28R FMCW RADAR LEVEL TRANSMITTER

- Range : Up to 35m.
- Display Resolution : 0.1mm.
- Sensor Accuracy : Up to  $\pm 3$ mm.
- Antenna Beam Angle(HPBW) : 12°.

- LCD Indicator : 2.5 inches Graphic LCD
- Operating Temperature : -35 °C to +70 °C
- Storage Temperature : -40 °C to +85 °C
- Communication : RS-485 Modbus RTU

## COMMUNICATION AND SAFETY UNIT



### SPECIFICATIONS

- Power Supply : 24VDC
- Cargo Tank : Up to 24 (Radar)
- Ballast & Other Tank : Up to 31
- Communication : 1 X RS232 / 485 / 422 (Input)  
3 X RS232 / 485 / 422 (Output)
- Relay output : 4 X NO / NC
- Protocol : Modbus RTU
- Operating temperature : 0~60°C

## DECK MOUNTING METHOD FOR RADAR, TEMPERATURE AND PRESSURE SENSOR



## LOCAL INDICATOR (LEVEL, TEMP. & PRESSURE)



## OUTLINE SYSTEM DIAGRAM

