



FEATURES

- ❑ Precise Level and Temperature transmission.
- ❑ Automatic selection of temperature points / element for Average Temperature Measurement.
- ❑ Two-way, two-wire, digital transmission on RS 485 bus, allows looping of 16 transmitters, reduces cabling.
- ❑ Level and Temperature transmission on a common signal cable.
- ❑ RS 232C output for Tank Side Indicator.
- ❑ Flameproof Housing and Intrinsically Safe terminals for Temperature Sensor.
- ❑ Local (field) Level, Temperature indication and Alarm status capability.
- ❑ Microprocessor based, intelligent circuitry with self-diagnostics.

INTRODUCTION

The 133-35 Smart Tank Data Transmitter (STDT) is an intelligent, microprocessor based instrument and uses the most sophisticated digital technology presently available for accurate conversion and transmission of product Level and Temperature of large storage tanks.

STDT is designed to fit / retrofit on SBEM Automatic Tank Level Gauge or any other make of float and tape type gauge using a suitable adaptor provided by us.

Level data is taken from Tank Level Gauge (mechanical float and tape type) and Temperature data is taken from spot/multipoint/multielement temperature sensor.

Remote indication of the measured data is available using the SBEM **Communication Interface Unit (CIU)** which also interface with a standard **computer** and/or a standard **Dot Matrix Printer** (with RS 232C serial port).

Transmission is on two wire RS 485 bus which allows looping of 16 transmitters.

Signal from SBEM Servo Gauge can also be looped with STDT signal on the same RS 485 bus.

CONSTRUCTION

Housed in a flameproof and weatherproof cast aluminium enclosure, it consists of a optical shaft encoder and following circuits-

1. Power supply and RS 485 interface
2. CPU and tank side indicator interface



3. Temperature card (optional - required only for temperature transmission)
4. Built in display card (optional - required only when level, temperature and alarm status is to be displayed at tank bottom)

These circuits are modular to ease installation, upgration and maintenance.

Two terminal compartments are provided - one for connecting power and signal. The other compartment has intrinsically safe terminals for connecting temperature sensor.

OPERATION

Level data is picked up from the main shaft of float and tape type level gauge by the main shaft of STDT. This data is encoded in binary gray code by an optical encoder. Temperature data from temperature sensor (spot/multipoint/multielement) is converted to binary from by A/D convertor. For multipoint sensor, all sensors immersed in the liquid are averaged. For multielement averaging sensor, the longest element fully immersed in the liquid is selected to give average temperature.

The microcontroller takes gray coded level data from encoder and binary temperature data converts to BCD and stores in memory. Alarm status is also generated and stored in memory. This data and alarm status is displayed on inbuilt display, converted to ASCII and transmitted on RS 485 bus to Communication Interface Unit on demand and on RS 232C bus to Tank Side Indicator.

ACCESSORIES

JUNCTION BOX WITH SWITCH

Flameproof and weatherproof cast aluminium junction box supplied with mounting plates, U bolts, nuts, etc. It is mounted at tank side on 2 1/2" (40 NB) pipe & has 4 to 8 cable entries & 15 terminals suitable for 2.5 mm² cables.

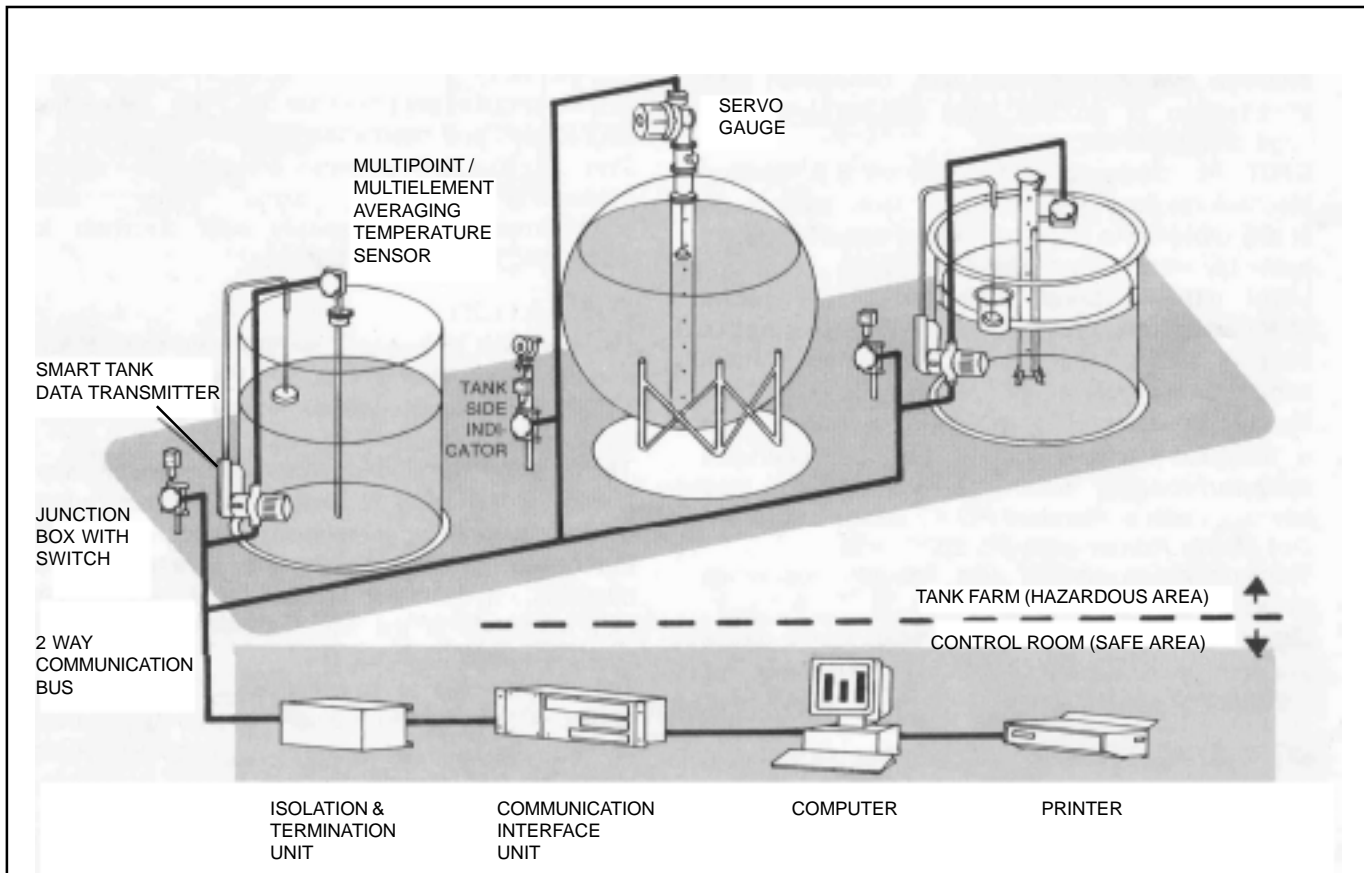
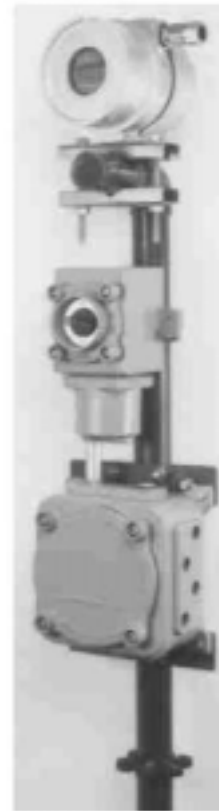
It enables looping of power and signal cables. Switch enables switching off power to a particular transmitter in the loop.

MOUNTING PIPE FOR JUNCTION BOX

1 1/2" (40 NB) pipe MS painted with holdfast for grouting at tank side. Suitable for mounting junction box also has cable guides (supports).

MOUNTING PIPE FOR JUNCTION BOX AND TANK SIDE INDICATOR

Same as above with arrangement to mount tank side indicator also.



TYPICAL TANK INVENTORY MANAGEMENT SYSTEM

SPECIFICATIONS

CIRCUITRY

Microprocessor based
CPU : Microcontroller 80C31, 8MHz
RAM : 2K

LEVEL MEASUREMENT AND TRANSMISSION

Range : 0-19999 mm
Accuracy : ± 2 mm *
Input : From sprocket shaft of SBEM or any other make of tank level gauge.
Conversion : Through optical encoder with gray coded discs.

* This error is due to mechanical coupling between transmitter and level gauge.
Transmission error is zero.

TEMPERATURE MEASUREMENT AND TRANSMISSION (OPTIONAL)

(using external temperature sensor)
Range : - 100.0 to + 100.0 °C
Accuracy : ± 0.2 °C
Resolution : ± 0.2 °C
Sensor type : Pt-100 Spot / Pt-100 Multipoint / Multielement averaging
Conversion : Through solid state multiplexer

DATA TRANSMISSION, DISPLAY AND DIAGNOSTICS

Transmission to -
Communication : 2 Way / 2 wire RS 485 ASCII coded.
Interface Unit
Tank Side : Serial RS 232C
Indicator
Baud rate : 1200 (standard)
2400 (optional)
Data protection : Longitudinal and vertical parity check
Inbuilt display (optional) : 4 1/2 digit, 1/2" high, 7 segment LCD to display sequentially
- Level in mm
- Temperature in °C
- Alarm status and diagnostics
Diagnostics : Inbuilt

POWER SUPPLY

110 VAC, 50 Hz, 1 Phase mains isolated 4 VA

CABLING

From STDT in field to CIU in control room. Upto 16 transmitters can be looped on a same cable.

Power (110 VAC) : 2 core, 1.5 mm² copper
Signal (RS 485) : 2 core (1 twisted pair)
1 mm² copper
Rmax \leq 200 Ω
Cmax \leq 1 μ f

Distance : Upto 1200 Mtrs.

From STDT to TSI : 3 core, 1.5 mm² copper (50 Mtrs max.)

From temperature sensor to STDT : (n+2) core, 1.5 mm² copper
n = no. of points / elements in temperature sensor

TERMINAL COMPARTMENTS

Two compartments
Terminals can accommodate 2.5 mm² cables
Compartment 1 : 2 cable entries for power and signal
Compartment 2 : 2 cable entries for intrinsically safe terminals for temperature sensor

SAFETY

Transmitter enclosure : Flameproof to IS 2148-1981
Gr. IIA and IIB, Weatherproof
IP 65 to IS 2147-1962
Terminals for temperature sensor : Intrinsically safe to IS 5780-1980
Ex ia IIA and IIB T6

PROTECTION

Opto isolators provide galvanic isolation between transmitter circuit and communication bus.
Metal oxide varistors provided protection against surges due to supply voltage and lightning

ENVIRONMENT

Ambient operating temperature : 0 to + 50 °C
Relative humidity : 95% max. non condensing

MATERIALS OF CONSTRUCTION

Transmitter housing : Cast aluminium LM6

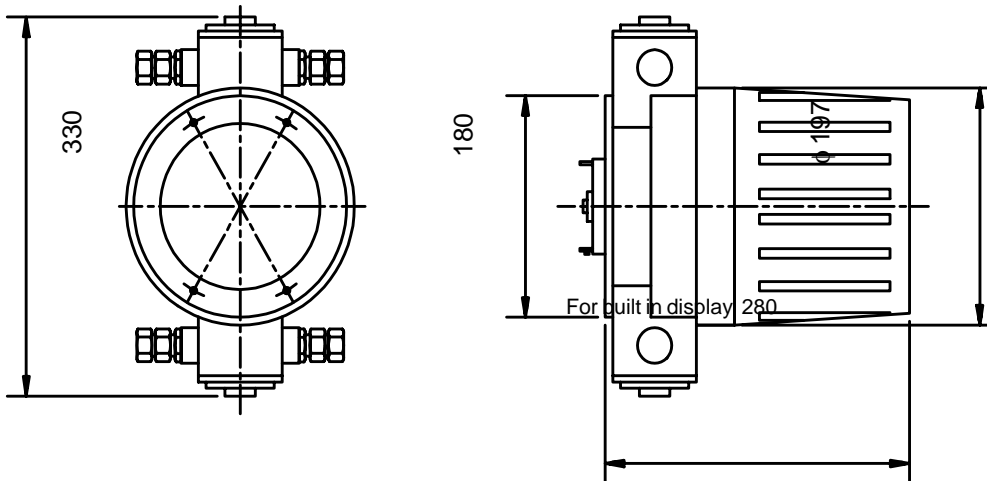
MOUNTING

On SBEM Automatic Tank Level Gauge or any other make gauge with suitable adaptor.

ORDERING INFORMATION

MODEL																													
133-35 SMART TANK DATA TRANSMITTER																													
CODE INBUILT DISPLAY																													
0	Without display																												
1	With inbuilt display																												
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MECHANICALS DIMENSIONS



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