

## X62T-HART Tank Thermometer Interface

Average liquid and vapor temperature

Temperature stratification profiles

Complies with API and PTB-A 14.7 for tank thermometers

No maintenance required

Upgrades your current temperature transmitter

Fully compatible with existing HART temperature transmitters

Upgradeable software protects your investment

Ex ia powered from the HART® bus

### Connect

The X62T-HART Universal Tank Thermometer Interface connects to virtually any Tank Thermometer probe that you may have installed in the field.

The X62T-HART connects:

- Enraf® 864 MTT, 864 MRT, 764 VITO MTT
- Whessoe Varec 1700 and 9909
- Saab MST

The X62T-HART supports 3 capacitive inputs so Water Bottom or combined probes are also supported:

- Enraf® 765 VITO Water bottom probe, 766 VITO combined probe
- Weed Beacon NW & NWR
- Siemens Milltronics Mercap

### Protect your investment

You won't have to worry about compatibility to your level gauge or host since the X62T supports the open HART® protocol to most advance tank gauges and hosts.

### Applications

- Upgrade your temperature accuracy to 0.1 °C accuracy.
- Connect foreign sensors to you current level gauge.
- Combine multiple interfaces to measure even more temperature spots in your LNG application.
- Connect Tank Temperature Probes directly to the DCS
- Floating roof immersion compensation
- Watercut (water-in-oil) measurements

Ex ia input channels from Zone 0

Galvanic separation between HART® bus and input channels



# Measurement and Installation

## Temperature

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Measuring principle	The X62T temperature inputs consists of a large multiplexer, a stable current source, A/D converter, and precision reference and test sources for voltage and resistance. The configuration of multiplexers and measurement sequences is completely handled by the X62T and depends only on firmware and the setup.
2-, 3- or 4-wire resistance	This setup allows for 2-, 3- and 4-wire measurements of multiple resistors, which may or may not share a common wire. The current is forced through the selected terminal to the RTD and the resulting input voltage is measured through the selected sense terminal. The same current is then internally directed through a high precision resistor and its voltage is measured. Following that another measurement is performed to eliminate the A/D conversion chain's offset.
Thermocouple voltage measurement	This setup allows for 15 multiple type T (CuNi - Cu) thermocouples with an additional 4w Pt100 measurement in for cold junction compensation (MTT mode).
HART Configuration	All measured sensor values are stored in HART device variables. These can be mapped to the well know dynamic variables PV, SV, TV and QV. To support more than 4 variables or to accommodate hosts that only support PV the X62T can be configured to respond to multiple addresses. The measured values can be output as respectively Resistance or Voltage, or converted to Temperature.

## Water bottom level

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Capacitance measurement	This setup allows for the measurement of 3 capacitances with a common ground electrode and active guard (cable shield).
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## Installation features

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Galvanic separation	All transmitter inputs are galvanically separated from the HART host connection.
Lightning protection	The sensors connected to the X62T-HART may be installed into Zone 0. When the wires connecting the X62T-HART and the boundary of Zone 0 are shorter than 1 m, no additional surge protection is required. An internal 90V surge protection device connected to the local structure protects the host connection wires. When testing the isolation from ground of the host wires using voltages above 70 V, it will be necessary to temporarily disconnect the surge protection device's ground wire.
Molded module	The internal X62U module is molded in Silicone rubber to protect the circuitry from corrosion so that it's lifetime is maximized. Naturally as for all transmitters regardless of Ingress Protection rating in high humidity environments build-up of water inside the enclosure may occur over time. If this is the case regular inspection and if necessary draining is recommended for error free operation.
Enclosure	The enclosure of the X62T-HART is IP65 depending on proper installation.

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## Mechanical

Cable entry	Suitable for M16x15 EMC CABLE GLANDS (not part of delivery)
Thermometer connection	G1/2 (other connections contact factory)
Dimensions (X62 enclosure)	160 x 130 x 70 mm (l x w x h)

## Environmental

Operating temperature	-40 °C ... +70 °C
Ingres Protection	IP65 with proper installation
Loop voltage	15V ... 20V (@ 5-15mA)
Safety	II 2(1) G EEx ia IIB T4 according to ATEX for connection to an ATEX certified power supply with Ex d [ia] or [Ex ia] only
Input parameters	Supply/Output circuit: $U_i = 30V$ , $i_i = 270\text{ mA}$ , $P_i = 1.2W$ , $C_i = 5nF$ Sensor/Input circuit: $U_o = 5.9V$ , $I_o = 62mA$ , $P_o = 92mW$ , $C_o = 900\mu F$ , $L_o = 30mH$
Lightning protection	According to NEN-EN-IEC 60079-25
Galvanic separation	60V according to NEN-EN-IEC §6.3.3 and Table 5 Withstands 500 V isolation test.

## Configuration

Resistance measurement	4 wire - Up to 6 resistors with 1 common connected to ground 3 wire with common sense - Up to 16 resistors with 1 common connected to ground 3 wire with individual sense - Up to 9 resistors with 1 common connected to ground 2 wire - Up to 16 resistors with 1 common connected to ground
Thermocouple measurement	1 x RTD 4 wire cold junction compensation with 15 input voltage channels (MTT mode)
Configuration capacitance measurement	3 capacitances with common grounded electrode and common active guard

## Electrical

Force current	0.3 mA
Input voltage range	-10 mV ... +50 mV
Input resistance range	0 - 300 $\Omega$
Input voltage noise	1 $\mu V_{p-p}$ (0.1 - 10 Hz)
Inputs force/sense	18
Linearization	Pt100 resistance to temperature acc. to IEC751 Cu100 @ 25 °C (Weston, Solartron, Nulectrohms) Cu100 @ 25 °C (Beacon) Thermocouple voltage type T acc. to IEC584-2 User selectable polynomials
Capacitive Inputs	3
Input capacitance range	0 - 1.5 nF
Active guard capacitive load	5 nF (100 kHz effective measuring frequency) 20 nF (25 kHz effective measuring frequency)

## Temperature (excluding sensor)

Range	-200 °C / +250 °C
Accuracy	$\pm 0.1$ °C (typical, reference conditions)
Resolution	$\pm 0.05$ °C