PERFORMANCE MADE SMARTER

# Field mounted HART temperature transmitter

## 7501

- RTD, TC, Ohm, and bipolar mV input and analog output
- High definition local operator interface (LOI) with 3 optical buttons
- Selectable red or white backlight
- Ex d explosion proof / flame proof in aluminum or 316 stainless steel version
- HART 7 functionality with HART 5 compatibility

**High defintion display**
- 0, 90, 180, & 270 degree position adjustments.
- Monitoring, programming and diagnostics view.
- Extensive diagnostics with flashing red or white backlight
- Supports 7 languages.

**Local operator interface (LOI)**
- 3 optical buttons; up, down and enter.
- Dynamically adaptive to wear or accumulation of dirt.
- Immune to interference from ambient light sources.
- Useable with or without gloves.

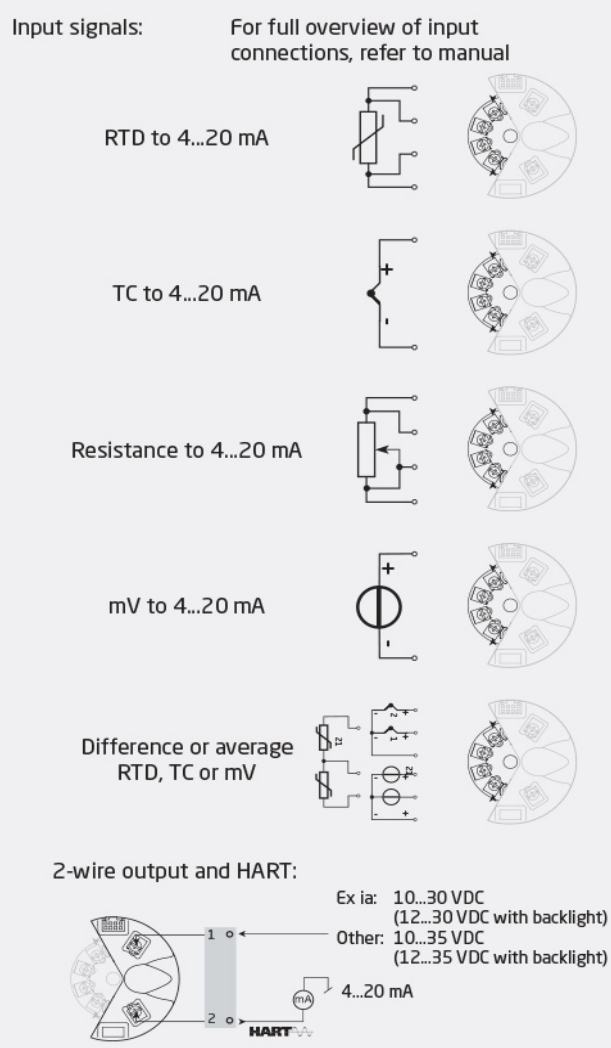
**Configuration**
- From the LOI through PR guided menu.
- PReset and HART modem.
- HHC, DCS or AMS via HART.

**Mounting / installation**
- For installation in zone 0, 1, 2 and zone 21, 22 and in Class 1, Division 1 and 2 applications.
- Hardware assessed for use in SIL applications.
- Mounting on 1.5”–2” pipe bracket or on wall / bulkhead.

**Application**
- Linearized temperature measurement with TC and RTD sensors e.g. Pt100 and Ni100.
- HART communication and 4...20 mA analog PV output for individual, difference or average temperature measurement of up to two RTD or TC input sensors.
- Conversion of linear resistance to a standard analog current signal, e.g from valves or Ohmic level sensors.
- Amplification of bipolar mV signals to standard 4...20 mA current signals.
- Up to 63 transmitters (HART 7) can be connected in a multidrop communication setup.

**Technical characteristics**
- NAMUR NE43 and NE89.
- HART protocol revision can be changed by user configuration to either HART 5 or HART 7 protocol.

## Applications

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## Order

| Type | Housing | Local operator interface: Optical buttons | Local operator interface: Display | O-ring | Conduit thread (D1, D2 & D3) | Paint type | Transmitter | Approvals | Cover color | Additional approvals | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 7501 | Low copper aluminum (AL) : A | No | No : 1 | -40 to +85°C silicone rubber : A | M20x1.5 6H : 1 | Epoxy : A | Yes : 1 | General purpose : 1 | Red : - | Marine | : M |
| | | No | Yes : 2 | -20 to +85°C FKM rubber : B | ½ NPT mod. : 2 | Epoxy + polyurethane : B | No (comes with a connection kit) : 2 | Hazardous area : 2 | | | |
| | | Yes | Yes : 3 | | | | | | | | |
| | | Yes | Yes : 3 | | | | Yes : 1 | Hazardous area : 2 | Gray : GY | | |
| 7501 | 316 Stainless steel (RF) : B | No | Yes : 2 | -40 to +85°C silicone rubber : A | M20x1.5 6H : 1 | None : N | Yes : 1 | General purpose : 1 | Steel : - | Marine | : M |
| | | Yes | Yes : 3 | -20 to +85°C FKM rubber : B | ½ NPT mod. : 2 | | No (comes with a connection kit) : 2 | Hazardous area : 2 | | | |

## Environmental Conditions

Operating temperature..... -40°C to +85°C (with silicone O-ring)
Operating temperature..... -20°C to +85°C (with FKM O-ring)
Storage temperature..... -40°C to +85°C
Calibration temperature..... 20...28°C
Relative humidity..... 0...100% RH (condensing)
Protection degree..... IP54 / IP66 / IP68 / type 4X
Corrosion class 7501AxxxBxxxx / durability..... C5-I/M / 5...15 years

## Mechanical specifications

Dimensions..... Ø 110 mm
Dimensions (HxWxD), aluminum..... 109.3 x 145 x 126 mm
Dimensions (HxWxD), stainless steel..... 107.4 x 145 x 124 mm
Weight approx., aluminum / stainless steel..... 1.3 / 2.8 kg
Wire size..... 0.13 x1.5 $mm^2$ / AWG 26...16 stranded wire
Screw terminal torque..... 0.4 Nm
Vibration..... IEC 60068-2-6
2...25 Hz..... ±1.6 mm
25...100 Hz..... ±4 g
Display resolution..... 96 x 64 pixels
Number of digits..... 5
Backlight..... Selectable ON/OFF
Backlight color..... Selectable white or red

## Common specifications

### Supply

Supply voltage, DC: Ex ia, intrinsically safe..... 10 (12 - with backlight)...30 VDC
Supply voltage, DC: Other..... 10 (12 - with backlight)...35 VDC

### Isolation voltage

Isolation voltage, test / working..... 1.5 kVAC / 50 VAC

### Response time

Response time (programmable)..... 1...60 s
Signal / noise ratio..... > 60 dB
Programming..... HART
Start-up time, transmitter to display..... Max. 5 s
Long-term stability, better than..... ±0.1% of span / year
Accuracy..... Better than 0.05% of selected range
Signal dynamics, input..... 22 bit
Signal dynamics, output..... 16 bit
EMC immunity influence..... < ±0.1% of span
Extended EMC immunity: NAMUR NE21, A criterion, burst..... < ±1% of span

## Input specifications

### Common input specifications

Max. offset..... 50% of selected max. value

### RTD input

RTD type..... Pt50/100/200/500/1000; Ni50/100/120/1000
Cable resistance per wire..... 5 Ω (up to 50 Ω per wire is possible with reduced measurement accuracy)
Sensor current..... Nom. 0.2 mA

### Linear resistance input

Linear resistance min....max..... 0 Ω...7000 Ω

### TC input

Thermocouple type..... B, E, J, K, L, N, R, S, T, U, W3, W5, LR
Cold junction compensation (CJC)..... Constant, internal or external via a Pt100 or Ni100 sensor

### Voltage input

Measurement range..... -800...+800 mV
Min. measurement range (span)..... 2.5 mV
Input resistance..... 10 MΩ

## Output specifications

### Current output

Signal range..... 4…20 mA
Min. signal range..... 16 mA
Load (@ current output)..... ≤ (Vsupply - 10) / 0.023 [Ω]
Load resistance, with backlight..... ≤ (Vsupply - 12) / 0.023 [Ω]
Sensor error indication..... Programmable 3.5…23 mA
NAMUR NE43 Upscale/Downscale..... 23 mA / 3.5 mA

### Common output specifications

Updating time..... 440 ms
HART protocol revisions..... HART 7 and HART 5

## Observed authority requirements

EMC..... 2014/30/EU & UK SI 2016/1091
ATEX..... 2014/34/EU & UK SI 2016/1107
RoHS..... 2011/65/EU & UK SI 2012/3032
EAC..... TR-CU 020/2011
EAC Ex..... TR-CU 012/2011

## Approvals

ATEX..... DEKRA 15ATEX0058X
IECEx..... IECEx DEK 15.0039 X
c FM us..... FM16US0009X / FM16CA0010X
CSA..... 70024231
INMETRO..... DEKRA 15.0014 X
NEPSI..... GYJ20.1630X
EU RO MR Type Approval..... MRA0000009
EAC Ex..... RU C-DK.HA65.B.00355/19
SIL..... Hardware assessed for use in SIL applications