



## 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 definition 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 20, 21, 22 and in Class 1, Division 1 and 2 applications.
- Hardware assessed for use in SIL 2 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

Input signals:

For full overview of input connections, refer to manual

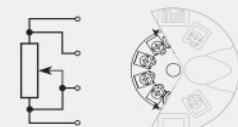
RTD to 4...20 mA



TC to 4...20 mA



Resistance to 4...20 mA



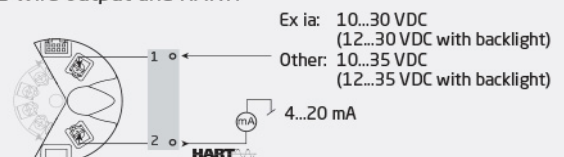
mV to 4...20 mA



Difference or average RTD, TC or mV



2-wire output and HART:



## Order

| Type | Housing                  | Local operator interface |         |     | O-ring | Conduit thread (D1, D2 & D3) | Paint type | Transmitter | Approvals | Cover color          |     |                                  |     |                 |                |       |      |
|------|--------------------------|--------------------------|---------|-----|--------|------------------------------|------------|-------------|-----------|----------------------|-----|----------------------------------|-----|-----------------|----------------|-------|------|
|      |                          | Optical buttons          | Display |     |        |                              |            |             |           |                      |     |                                  |     |                 |                |       |      |
| 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   | : -  |
|      |                          |                          | 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 | : 1             | Hazardous area | : 2   | Gray |
| 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 | : -  |
|      |                          |                          | 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          |

## 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 x 1.5 mm <sup>2</sup> / 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  
EAC..... TR-CU 020/2011

## Approvals

EU RO Mutual Recognition Type Approval..... MRA0000009  
ATEX 2014/34/EU..... DEKRA 15 ATEX 0058 X  
IECEx..... IECEx DEK 15.0039 X  
FM..... FM16US0009X / FM16CA0010X  
CSA..... 70024231  
EAC Ex TR-CU 012/2011..... RU C-DK.GB08.V.01316  
INMETRO..... DEKRA 15.0014 X  
NEPSI..... GYJ15.1336X, GYJ15.1337X and GYJ15.1338X  
SIL..... Hardware assessed for use in SIL applications