

# EE300Ex-M3

## Temperature Sensor for Intrinsically Safe Applications

The EE300Ex-M3 intrinsically safe sensor reliably measures temperature (T) in explosion hazard areas. It complies with the classifications for Europe (ATEX), International (IECEX), China (NEPSI), USA/Canada (FM) and Korea (KCs) for flammable gas and dust applications.

The entire device can be placed in the explosion endangered area. The remote sensing probe allows for classification up to T6.

### Measurement performance

EE300Ex-M3 stands for highly accurate and long term stable measurement over the full range -70...200 °C (-94...392 °F), with pressure rating up to 20 bar (300 psi).

### Supply and outputs

The device can be powered by any intrinsically safe supply unit or via Zener barriers. The measured data is available on a 4...20 mA, 2-wire output and on the LCD display.

### Robust, functional design

EE300Ex-M3 is available for wall mount and with remote probe up to 10 m (32.8 ft). The stainless steel enclosure and probe are suitable for harsh environment in challenging industrial applications. The EE300Ex-M3 design facilitates the installation as well as the replacement of the measuring section (electronics and probe) without time consuming wiring for both models.

### Easy Configuration and Adjustment

The setup of the analogue outputs and as well as the adjustment of the T reading can be easily performed with the optional EE-PCA Product Configuration Adapter and the free EE-PCS Product Configuration Software.



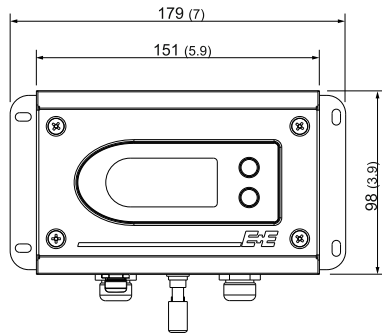
## Typical Applications

Process control  
 Chemical and pharmaceutical industry  
 Hazardous storage rooms  
 Oil and gas industry

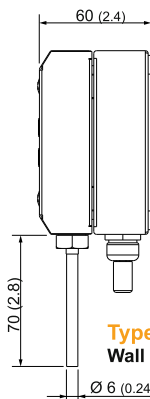
## Features

Approved for gas and dust  
 Installation in zone 0 / 20 and Div. 1  
 Stainless steel enclosure and probe  
 Highest accuracy up to 200 °C (392 °F)  
 Pressure rating 20 bar (300 psi)

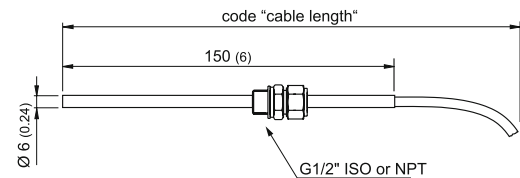
## Dimensions in mm (inch)



**Types: T1 / T24**  
Enclosure



**Type: T1**  
Wall mount



**Type: T24**  
Remote probe 0.1...20 bar (1.5...300 psi) with cut-in fitting

## Technical Data

### Measurand

#### Temperature

Temperature sensor

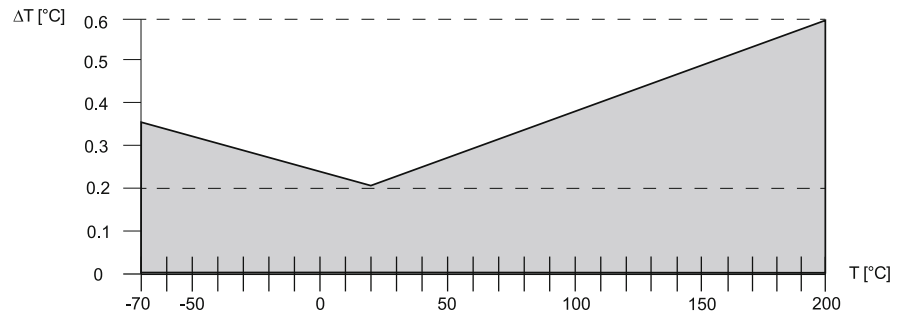
Pt1000 (Tolerance class A, DIN EN 60751)

Measuring range

Wall mount: -40...60 °C (-40...140 °F)

Remote probe: -70...200 °C (-94...392 °F)

Accuracy<sup>1)</sup>



Temperature dependence of electronics, typ. 0.005 °C/°C

### Outputs

Scalable analogue output

4-20 mA (2-wire)  $R_L = (V_{cc} - 9V) / 20mA$

### General

Supply voltage

$V_{cc, min} = (9 + R_L \cdot 0.02) V$  DCV  $V_{cc, max} = 28 V$  DC

$R_L$  load resistor

Current consumption

Max. 20 mA

Temperature range

Probe according measuring range

Electronics -40...60 °C (-40...140 °F)

Electronics with display -20...60 °C (-4...140 °F)

Material

Enclosure stainless steel 1.4404

Probe cable PTFE

Probe stainless steel 1.4541

Protection class of enclosure

IP65 / NEMA 4

Cable gland

M16 for cable diameter 5 - 10 mm (0.2" - 0.4")

M20 for cable diameter 10 - 14 mm (0.4" - 0.6")

Electrical connection

Screw terminals max. 1.5 mm<sup>2</sup> (AWG 16)

Electromagnetic compatibility according

EN 61326-1 EN 61326-2-3 ICES-003 ClassB

Industrial Environment FCC Part15 ClassB

Storage temperature range

Electronics and probe -20...60 °C (22...140 °F)

<sup>1)</sup> The accuracy statement includes the uncertainty of the factory calibration with an enhancement factor k=2 (2-times standard deviation). The accuracy was calculated in accordance with EA-4/02 and with regard to GUM (Guide to the Expression of Uncertainty in Measurement).



## Ex - Classifications

### Europe (ATEX with order code "EX1")

|                             |                                                                                  |
|-----------------------------|----------------------------------------------------------------------------------|
| Certificate:                | TPS 13 ATEX 38892 003 X by TÜV SÜD Product Service GmbH                          |
| Safety factors:             | Ui = 28V; li = 100mA; Pi = 700mW; Ci = 2.2nF; Li ≈ 0mH                           |
| <b>Ex-Designation:</b>      |                                                                                  |
| Transmitter without display | II 1 G Ex ia IIC T4 Ga / II 1 D Ex ia IIIC T <sub>200</sub> 80°C Da              |
| Transmitter with display    | II 2 G Ex ia IIC T4 Gb / II 1 G Ex ia IIB T4 Ga                                  |
| Remote probe                | II 1 G Ex ia IIC T6...T1 Ga / II 1 D Ex ia IIIC T <sub>200</sub> 80°C...220°C Da |

### International (IECEx with order code "EX2")

|                             |                                                                         |
|-----------------------------|-------------------------------------------------------------------------|
| Certificate:                | IECEx FMG 14.0017 X by FM Approvals                                     |
| Safety factors:             | 6.4 Vdc ≤ Ui ≤ 28Vdc; li = 100mA; Pi = 700mW; Ci = 2.2nF; Li = 0mH      |
| <b>Ex-Designation:</b>      |                                                                         |
| Transmitter without display | Ex ia IIC T4 Ta = -40°C to 60°C Ga / Ex ia IIIC T131°C Da               |
| Transmitter with display    | Ex ia IIC T4 Ta = -40°C to 60°C Gb / Ex ia IIB T4 Ta = -40°C to 60°C Ga |
| Remote probe                | Ex ia IIC T6-T1 Ta = -70°C to 200°C Ga / Ex ia IIIC T80°C Da            |

### China (NEPSI with order code "EX4")

|                             |                                                          |
|-----------------------------|----------------------------------------------------------|
| Certificate:                | Cert NO. GYJ16.1417X by NEPSI                            |
| Safety factors:             | Ui = 28Vdc; li = 100mA; Pi = 700mW; Ci = 2.2nF; Li = 0mH |
| <b>Ex-Designation:</b>      |                                                          |
| Transmitter without display | Ex ia IIC T4 Ga, Ex iaD 20 T131                          |
| Transmitter with display    | Ex ia IIC T4 Gb, Ex ia IIB T4 Ga                         |
| Remote probe                | Ex ia IIC T1~T6 Ga, Ex iaD 20 T80                        |

### Korea (KCs with order code "EX5"):

|                               |                                                                                       |
|-------------------------------|---------------------------------------------------------------------------------------|
| Certificate gas:              |                                                                                       |
| Remote probe                  | 20-AV4BO-0253X                                                                        |
| Transmitter without display   | 20-AV4BO-0254X                                                                        |
| Transmitter with display      | 20-AV4BO-0257X (EPL Ga - Zone 0)<br>20-AV4BO-0258X (EPL Gb - Zone 1)                  |
| Certificate dust:             |                                                                                       |
| Remote probe                  | 20-AV4BO-0256X                                                                        |
| Transmitter without display   | 20-AV4BO-0255X                                                                        |
| Safety factors:               | 6.4 V DC ≤ Ui ≤ 28 V DC; li = 100 mA; Pi = 700 mW; Ci = 2.2 nF; Li = 0 mH             |
| <b>Ex-Kennzeichnung:</b>      |                                                                                       |
| Transmitter (without display) | Ex ia IIC T4 -40°C ≤ Tamb ≤ +60°C<br>Ex iaD 20 IP6X T131°C -40°C ≤ Tamb ≤ +60°C       |
| Transmitter (with display)    | Ex ia IIC T4 -40°C ≤ Tamb ≤ +60°C (up to Zone 1)<br>Ex ia IIB T4 -40°C ≤ Tamb ≤ +60°C |
| Remote probe                  | Ex ia IIC T6-T1 / Ex iaD 20 IP6X T80°C -40°C ≤ Tamb ≤ +60°C                           |

### USA (FM with order code "EX3")

Certificate: No. FM17US0302X by FM Approvals  
 Safety factors:  $6.4 \text{ Vdc} \leq V_{\text{max}} \text{ (or } U_i) \leq 28 \text{ Vdc}$ ;  $I_{\text{max}} \text{ (or } I_i) = 100 \text{ mA}$ ;  $P_i = 700 \text{ mW}$ ;  
 $C_i = 2.2 \text{ nF}$ ;  $L_i = 0 \text{ mH}$

#### Ex-Designation:

Equipment Group I: EE300Ex without display

Class I, II, III, Division 1, Groups A, B, C, D, E, F and G; T4 Ta = -40°C to +60°C; Entity – M1\_139080; IP65

Class I, II, III, Division 2, Groups A, B, C, D, E, F and G; T4 Ta = -40°C to +60°C

Class I, Zone 0, AEx ia IIC T4 Ta = -40°C to +60°C Ga; Entity – M1\_139080; IP65

Zone 20, AEx ia IIIC T131°C Ta = -40°C to +60°C Da; Entity – M1\_139080; IP65

Remote Probe:

Class I, II, III, Division 1, Groups A, B, C, D, E, F and G; T6...T1; Entity – M1\_139080; IP65

Class I, II, III, Division 2, Groups A, B, C, D, E, F and G; T6...T1

Class I, Zone 0, AEx ia IIC T6...T1 Ga; Entity – M1\_139080; IP65

Zone 20, AEx ia IIIC T80°C Da; Entity – M1\_139080; IP65

Equipment Group II: EE300Ex with display

Class I, Division 1, Groups C, and D; T4 Ta = -40°C to +60°C; Entity – M1\_139080

Class I, Division 2, Groups A, B, C and D; T4 Ta = -40°C to +60°C; Entity – M1\_139080

Class I, Zone 0, AEx ia IIB T4 Ta = -40°C to +60°C Ga; Entity – M1\_139080

Class I, Zone 1, AEx ia IIC T4°C Ta = -40°C to +60°C Gb; Entity – M1\_139080

Remote Probe:

Class I, II, III, Division 1, Groups A, B, C, D, E, F and G; T6...T1; Entity – M1\_139080; IP65

Class I, II, III, Division 2, Groups A, B, C, D, E, F and G; T6...T1

Class I, Zone 0, AEx ia IIC T6...T1 Ga; Entity – M1\_139080; IP65

Zone 20, AEx ia IIIC T80°C Da; Entity – M1\_139080; IP65

### CANADA (FM with order code "EX9")

Certificate: No. FM17CA0154X by FM Approvals  
 Safety factors:  $6.4 \text{ Vdc} \leq V_{\text{max}} \text{ (or } U_i) \leq 28 \text{ Vdc}$ ;  $I_{\text{max}} \text{ (or } I_i) = 100 \text{ mA}$ ;  $P_i = 700 \text{ mW}$ ;  
 $C_i = 2.2 \text{ nF}$ ;  $L_i = 0 \text{ mH}$

#### Ex-Designation:

Equipment Group I: EE300Ex without display

Class I, II, III, Division 1, Groups A, B, C, D, E, F and G; T4 Ta = -40°C to +60°C; Entity – M1\_139080; IP65

Class I, II, III, Division 2, Groups A, B, C, D, E, F and G; T4 Ta = -40°C to +60°C

Zone 0, Ex ia IIC T4 Ta = -40°C to +60°C Ga; Entity – M1\_139080; IP65

Zone 20, Ex ia IIIC T131°C Ta = -40°C to +60°C Da; Entity – M1\_139080; IP65

Remote Probe:

Class I, II, III, Division 1, Groups A, B, C, D, E, F and G; T6...T1; Entity – M1\_139080; IP65

Class I, II, III, Division 2, Groups A, B, C, D, E, F and G; T6...T1

Zone 0, Ex ia IIC T6...T1 Ga; Entity – M1\_139080; IP65

Zone 20, Ex ia IIIC T80°C Da; Entity – M1\_139080; IP65

Equipment Group II: EE300Ex with display

Class I, Division 1, Groups C, and D; T4 Ta = -40°C to +60°C; Entity – M1\_139080

Class I, Division 2, Groups A, B, C and D; T4 Ta = -40°C to +60°C; Entity – M1\_139080

Zone 0, Ex ia IIB T4 Ta = -40°C to +60°C Ga; Entity – M1\_139080

Zone 1, Ex ia IIB T4 Ta = -40°C to +60°C Gb; Entity – M1\_139080

Remote Probe:

Class I, II, III, Division 1, Groups A, B, C, D, E, F and G; T6...T1; Entity – M1\_139080; IP65

Class I, II, III, Division 2, Groups A, B, C, D, E, F and G; T6...T1

Zone 0, Ex ia IIC T6...T1 Ga; Entity – M1\_139080; IP65

Zone 20, Ex ia IIIC T80°C Da; Entity – M1\_139080; IP65

**The USA and Canada approvals are valid for air and gas measurement only.**

## Ordering Guide

|                        |                                          |                                                                                                                  | EE300Ex-M3A6HS2                        |                       |
|------------------------|------------------------------------------|------------------------------------------------------------------------------------------------------------------|----------------------------------------|-----------------------|
| Hardware Configuration | Type                                     | Wall mount<br>Remote probe, Ø 6 mm (0.24")                                                                       | T1                                     | T24                   |
|                        | Display <sup>1)</sup>                    | Without display<br>With display                                                                                  | D0<br>D1                               |                       |
|                        | Electrical Connection                    | 2 x M16 cable gland<br>1/2" NPT conduit<br>2 x M20 cable gland                                                   | E2<br>E13<br>E15                       |                       |
|                        | Probe Cable                              | Wall mount<br>1 m (3.3 ft)<br>2 m (6.6 ft)<br>5 m (16.4 ft)<br>10 m (32.8 ft)                                    | K0                                     | K1<br>K2<br>K5<br>K10 |
|                        | Probe Length                             | Wall mount, 70 mm (2.76")<br>150 mm (5.9")                                                                       | L70                                    | L150                  |
|                        | Process Connection<br>(Zone Feedthrough) | Without probe fitting<br>G1/2" ISO - cut-in fitting, Ø 6 mm (0.24")<br>1/2" NPT - cut-in fitting, Ø 6 mm (0.24") | PA0                                    | PA0<br>PA26<br>PA27   |
|                        | Ex Approval                              | ATEX (Europe)<br>IECEx (International)<br>FM (USA)<br>NEPSI (China)<br>KCs (Korea)<br>FM (Canada)                | EX1<br>EX2<br>EX3<br>EX4<br>EX5<br>EX9 |                       |
|                        | Setup analogue outputs                   |                                                                                                                  | MA1<br>MA2                             |                       |
| Setup analogue outputs | Output                                   | Temperature [°C]<br>Temperature [°F]                                                                             |                                        |                       |
|                        | Scaling low                              | Value                                                                                                            | SALvalue                               |                       |
|                        | Scaling high                             | Value                                                                                                            | SAHvalue                               |                       |

1) No display possible for environments with combustible dust, fibers and flyings and in gases with EPL Ga IIC (EX1/EX2) / Gas Groups A, B for Division 1 (EX3/EX9) / Zone 0 IIC (EX5)

## Order Examples

Example 1:

**EE300Ex-M3A6HS2**  
**T24D1E2K10L150PA26EX1MA1SAL0SAH100**

Type: Remote probe, 6 mm (0.24")  
 Display: With display  
 Electrical Connection: 2 x M16 cable gland  
 Probe Cable: 10 m (32.8 ft)  
 Probe Length: 150 mm (5.9")  
 Process connection (Zone Feedthrough): G1/2" ISO - cut-in fitting, Ø 6 mm (0.24")  
 Ex Approval: ATEX (Europe)  
 Output: Temperature [°C]  
 Scaling Output: 0...100 °C

Example 2:

**EE300Ex-M3A6HS2**  
**T1D0E2K0L70PA0EX3MA2SAL-40SAH140**

Type: Wall mount  
 Display: Without display  
 Electrical Connection: 2 x M16 cable gland  
 Probe Cable: Wall mount  
 Probe Length: Wall mount, 70 mm (0.24")  
 Process connection (Zone Feedthrough): Without probe fitting  
 Ex Approval: FM (USA)  
 Output: Temperature [°F]  
 Scaling Output: -40...140 °F

## Accessories

Blank cover for housing base  
 Safety barrier, 1-channel, STAHL 9002/13-280-093-001  
 Intrinsically safe supply unit, 1-channel, STAHL 9160/13-11-11  
 Intrinsically safe supply unit, 2-channel, STAHL 9160/23-11-11  
 Sealing plug for unused M16 cable glands  
 Sealing plug for unused M20 cable glands  
 Product Configuration Software  
 Adapter Kit for configuration and adjustment  
 (must be ordered together, see datasheet EE-PCA):  
 Pos. 1: Product Configuration Adapter  
 Pos. 2: Connection cable

HA011401  
 HA011410  
 HA011405  
 HA011406  
 HA011402  
 HA011404  
 EE-PCS (free download: [www.epluse.com/configurator](http://www.epluse.com/configurator))

EE-PCA  
 HA011068