

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.



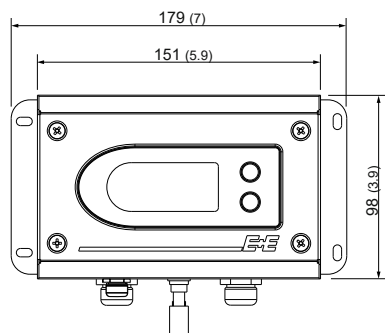
Typical Applications

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

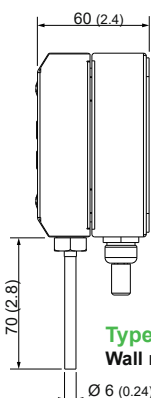
Features

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)

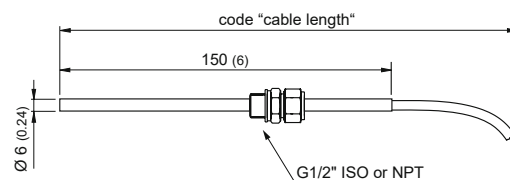
Dimensions in mm (inch)



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

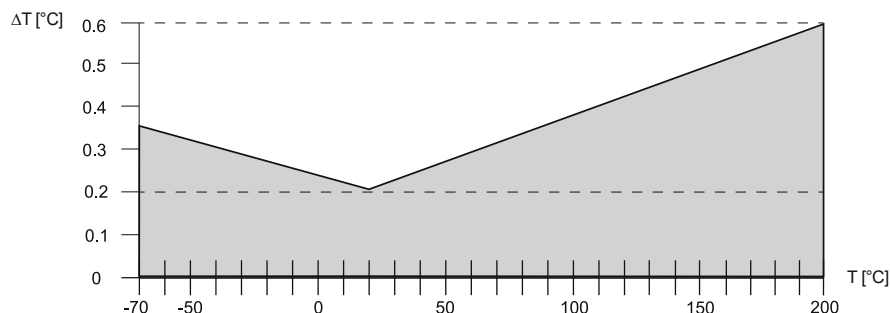
Pt1000 (Tolerance class A, DIN EN 60751)

Measuring range

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

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

Accuracy¹⁾



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

$V_{cc, min} = (9 + R_L * 0.02) V$ 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 mm² (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)

1) 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
Ex-Designation:	
Transmitter without display	II 1 G Ex ia IIC T4 Ga / II 1 D Ex ia IIIC T ₂₀₀ 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 ₂₀₀ 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
Ex-Designation:	
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
Ex-Designation:	
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) 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
Ex-Kennzeichnung:	
Transmitter (without display)	Ex ia IIC T4 -40°C ≤ Tamb ≤ +60°C 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) 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: $6.4 V_{dc} \leq V_{max}$ (or U_i) $\leq 28V_{dc}$; I_{max} (or I_i) = 100mA; $P_i = 700mW$;
 $C_i = 2.2nF$; $L_i = 0mH$

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: $6.4 V_{dc} \leq V_{max}$ (or U_i) $\leq 28V_{dc}$; I_{max} (or I_i) = 100mA; $P_i = 700mW$;
 $C_i = 2.2nF$; $L_i = 0mH$

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

EE-PCA
 HA011068