

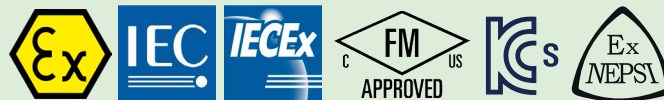


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Datasheet EE300Ex-M3

Temperature Sensor
for Intrinsically Safe Applications



www.epluse.com

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 $-70...+200\text{ }^{\circ}\text{C}$ ($-94...+392\text{ }^{\circ}\text{F}$), with pressure rating up to 20 bar (300 psi).

Supply and Outputs

The device can be powered by an intrinsically safe supply unit or via Zener barriers. The measured data is available on a 4...20 mA 2-wire output and on the LC 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 as well as the adjustment of the T reading can be easily performed with the optional EE-PCA Product Configuration Adapter and the free PCS10 Product Configuration Software.



EE300Ex-M3 wall mount without display



EE300Ex-M3 with display and remote probe

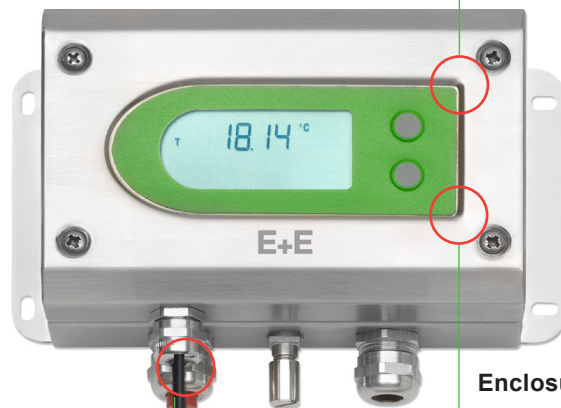
Features

Measurement performance

- Highest T accuracy
- Working ranges -70 up to +200 °C (-94...+392 °F) and up to 20 bar (300 psi)

Classifications

- Europe (ATEX)
- International (IECEX)
- China (NEPSI)
- USA / Canada (FM)
- Korea (KCs)



Outputs and Configuration

- Freely scalable analogue 4 - 20 mA, 2-wire output
- Supply with intrinsically safe supply unit or via Zener barriers
- Full configuration and adjustment using free PCS10 Software

Enclosure

- Stainless steel
- IP65 / NEMA 4 protection rating
- Robust design
- Easy mounting and cleaning
- Versatile connection options
- Optional LC Display



Remote Probe

- Rugged construction
- Outstanding long term stability
- Various cable lengths and process connections

Inspection certificate

According to DIN EN 10204-3.1

Features

Types

Type		Pressure Range	Working Range	Probe Ø
T1	Wall mount		-40...+60 °C (-40...+140 °F)	6 mm (0.24")
T24	Remote probe	0.01...20 bar (0.15...300 psi)	-70...+200 °C (-94...+392 °F)	6 mm (0.24")

Accredited Traceable Calibration Certificate



Internationally recognised certificates for the calibration of measuring instruments from accredited laboratories document the traceability of the measurements to the International System of Units (SI). The E+E Elektronik calibration laboratory offers two levels of traceable calibrations.

- As a Designated Institute (DI) of the Republic of Austria, the E+E calibration laboratory maintains Austria's national measurement standards for humidity, dew point temperature, air velocity and CO₂. This authorises the E+E calibration laboratory to issue calibration certificates at the level of a National Metrological Institute (NMI).
- The E+E calibration laboratory is accredited by Akkreditierung Austria in accordance with DIN EN ISO/IEC 17025 with the identification number 0608. This allows the laboratory to issue ISO 17025 certificates for the measurands humidity, temperature, dew point temperature, air velocity, flow, pressure and CO₂.

Visit www.eplusecal.com for detailed information on calibration and to enquire a certificate of accredited traceable calibration for the EE300Ex from the Designated Institute.

ISO 9001 Calibration Certificate

An ISO 9001 calibration certificate documents the comparative measurement of a device against high quality reference equipment (factory level standard). The comparison is performed in accordance with internal procedures that comply with ISO 9001 and provides information on the specimen's measuring accuracy. The reference equipment is traceable to national standards, however, the calibration process is not accredited. Therefore, an ISO 9001 calibration is neither traceable nor internationally comparable.

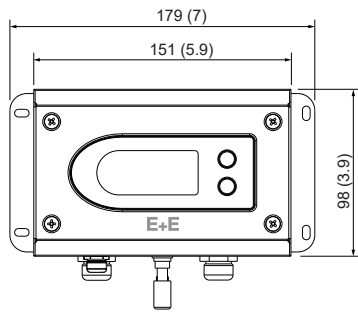
Visit www.epluse.com for detailed information on calibration and to enquire an ISO 9001 calibration certificate.

Dimensions

Values in mm (inch)

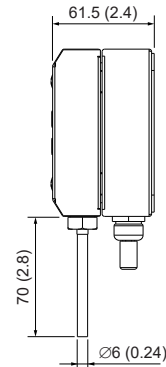
Enclosure

Types: T1/T24



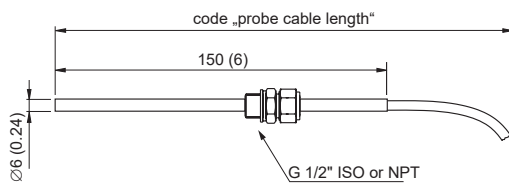
Type

T1: Wall mount



Type

T24: Remote probe 0.01...20 bar (0.15...300 psi) with cut-in fitting



Technical Data

Measurand

Temperature (T)

Measuring range	Wall mount Remote probe	-40...+60 °C (-40...+140 °F) -70...+200 °C (-94...+392 °F)
Accuracy¹⁾		
Factory calibration uncertainty²⁾ @23 °C (73 °F)		±0.1 °C
Temperature dependence of electronics, typ.		±0.005 °C/°C

1) Defined against E+E calibration reference. For model T1, the accuracy data is valid only for air speed higher than 0.2 m/s.

2) Defined at 23 °C with an coverage factor of k=2, corresponding to a confidence level of 95 %.

Technical Data


Outputs

Analogue

Freely selectable and scalable analogue output	4 - 20 mA (2-wire)	$R_L (V_{CC}-9V)/20 \text{ mA}$	$R_L = \text{load resistance}$
Accuracy @ 23 °C (68 °F)	±0.06 %FS		FS = full scale (20 mA)
Temperature dependency¹⁾	±0.008 %FS/°C (±0.0044 %FS/°F)		FS = full scale (20 mA)

1) Deviating from 23 °C (68 °F), defined at 12 mA.

General

Supply Voltage	$V_{CC \text{ min}} = (9+R_L \cdot 0.02) \text{ V DC}$	$V_{CC \text{ max}} = 28 \text{ V DC}$	$R_L = \text{load resistance}$
Current consumption max.	20 mA		
Electrical connection	Screw terminals max. 1.5 mm ² (AWG 16)		
Cable glands	M16	Cable Ø5...10 mm (0.2...0.4")	
	M20	Cable Ø10...14 mm (0.4...0.6")	
Pressure working range for remote probe with cut-in fitting	0.01...20 bar (0.15...300 psi)		
Working temperature range	Probe Electronics	According measuring range -40...+60 °C (-40...+140 °F)	
	Electronics with display	-20...+60 °C (-4...+140 °F)	
Storage temperature range	Electronics and probe	-20...+60 °C (-4...+140 °F)	
Material	Enclosure	Stainless steel 1.4404	
	Temperature probe	Stainless steel 1.4541	
	Probe cable	PFA (Perfluoralkoxy)	
Protection rating	Enclosure	IP65/NEMA 4	
Electromagnetic compatibility	EN 61326-1 FCC Part15 Class B	EN 61326-2-3 ICES-003 Class B	Industrial Environment
Conformity			

Ex - Classifications

Europe (ATEX with order code "EX1")

Certificate	TPS 13 ATEX 38892 003 X by TÜV SÜD Product Service GmbH
Safety factors	Ui = 28 V; li = 100 mA; Pi = 700 mW; Ci = 2.2 nF; Li ≈ 0 mH
Ex-Designation Transmitter without display Transmitter with display Remote probe	II 1 G Ex ia IIC T4 Ga / II 1 D Ex ia IIIC T ₂₀₀ 80°C Da II 2 G Ex ia IIC T4 Gb / II 1 G Ex ia IIB T4 Ga 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 ≤ 28 Vdc; li = 100 mA; Pi = 700 mW; Ci = 2.2 nF; Li = 0 mH
Ex-Designation Transmitter without display Transmitter with display Remote probe	Ex ia IIC T4 Ta = -40°C to 60°C Ga / Ex ia IIIC T131°C Da Ex ia IIC T4 Ta = -40°C to 60°C Gb / Ex ia IIB T4 Ta = -40°C to 60°C Ga 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 = 28 Vdc; li = 100 mA; Pi = 700 mW; Ci = 2.2 nF; Li = 0 mH
Ex-Designation Transmitter without display Transmitter with display Remote probe	Ex ia IIC T4 Ga, Ex iaD 20 T131 Ex ia IIC T4 Gb, Ex ia IIB T4 Ga Ex ia IIC T1~T6 Ga, Ex iaD 20 T80

Korea (KCs with order code "EX5")

Certificate gas Remote probe Transmitter without display Transmitter with display	20-AV4BO-0253X 20-AV4BO-0254X 20-AV4BO-0257X (EPL Ga - Zone 0) 20-AV4BO-0258X (EPL Gb - Zone 1)
Certificate dust Remote probe Transmitter without display	20-AV4BO-0256X 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-Designation Transmitter without display Transmitter with display Remote probe	Ex ia IIC T4 -40°C ≤ Tamb ≤ +60°C Ex iaD 20 IP6X T131°C -40°C ≤ Tamb ≤ +60°C Ex ia IIC T4 -40°C ≤ Tamb ≤ +60°C (up to Zone 1) Ex ia IIB T4 -40°C ≤ Tamb ≤ +60°C (up to Zone 0) Ex ia IIC T6-T1 / Ex iaD 20 IP6X T80°C -40°C ≤ Tamb ≤ +60°C

Ex - Classifications

USA (FM with order code “EX3”)

Certificate	No. FM17US0302X by FM Approvals
Safety factors	6.4 Vdc ≤ Vmax (or Ui) ≤ 28 Vdc; I _{max} (or I _i) = 100 mA; Pi = 700 mW; Ci = 2.2 nF; Li = 0 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 Vdc ≤ Vmax (or Ui) ≤ 28 Vdc; I _{max} (or I _i) = 100 mA; Pi = 700 mW; Ci = 2.2 nF; Li = 0 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

Feature	Description	Code		
		EE300Ex-M3A6HS2		
Hardware Configuration	Type	Wall mount	T1	
		Remote probe, Ø6 mm (0.24")		T24
	Display ¹⁾	Without display	D0	
		Display	D1	
	Electrical connection	2x M16 cable gland	E2	
		1/2" NPT conduit	E13	
		2x M20 cable gland	E15	
	Probe cable length	Wall mount	K0	
		1 m (3.3 ft)		K1
		2 m (6.6 ft)		K2
		5 m (16.4 ft)		K5
		10 m (32.8 ft)		K10
	Probe length	Wall mount, 70 mm (2.76")	L70	
		150 mm (5.9")		L150
	Process connection (Zone feed-through)	Without probe fitting	PA0	PA0
		G1/2" ISO - cut-in fitting, Ø6 mm (0.24")		PA26
		1/2" NPT - cut-in fitting, Ø6 mm (0.24")		PA27
	Ex-approval	ATEX (Europe)	EX1	
		IECEX (International)	EX2	
FM (USA)		EX3		
NEPSI (China)		EX4		
KCs (Korea)		EX5		
FM (Canada)		EX9		
Setup Analog Outp.	Output measurand	Temperature [°C]	MA1	
		Temperature [°F]	MA2	
	Output scaling low	Value	SALValue	
	Output scaling high	Value	SAHValue	

1) No display possible for environments with EPL Ga IIC (EX1/EX2/EX3/EX9) / Gas Groups A, B for Division 1 (EX3/EX9) / Zone 0 IIC (EX5).

Order Examples

EE300Ex-M3A6HS2T24D1E2K10L150PA26EX1MA1SAL0SAH100

Feature	Code	Description
Type	T24	Remote probe, Ø6 mm (0.24")
Display	D1	Display
Electrical connection	E2	2x M16 cable gland
Probe cable length	K10	10 m (32.8 ft)
Probe length	L150	150 mm (5.9")
Process connection (Zone feed-through)	PA26	G1/2" ISO - cut-in fitting, Ø 6 mm (0.24")
Ex-approval	EX1	ATEX (Europe)
Output measurand	MA1	Temperature T [°C]
Output scaling low	SAL0	0
Output scaling high	SAH100	100

EE300Ex-M3A6HS2T1D0E2K0L70PA0EX3MA2SAL-40SAH140

Feature	Code	Description
Type	T1	Wall mount
Display	D0	Without display
Electrical connection	E2	2x M16 cable gland
Probe cable length	K0	Wall mount
Probe length	L70	Wall mount, 70 mm (0.24")
Process connection (Zone feed-through)	PA0	Without probe fitting
Ex-approval	EX3	FM (USA)
Output measurand	MA2	Temperature T [°F]
Output scaling low	SAL-40	-40
Output scaling high	SAH140	140

Accessories

For further information see datasheet [Accessories](#).

Description	Code
Blind front cover for EE300Ex	HA011401
Safety barrier, 1-channel, STAHL 9002/13-280-093-001	HA011410
Intrinsically safe supply unit, 1-channel, STAHL 9160/13-11-11	HA011405
Intrinsically safe supply unit , 2-channel, STAHL 9160/23-11-11	HA011406
Sealing plug for unused M16 cable glands	HA011402
Sealing plug for unused M20 cable glands	HA011404
Intrinsically safe supply unit, 1-channel, PC MACX MCR-EX-SL-RPSSI-I	HA011411*)
Intrinsically safe supply unit, 2-channel, PC MACX MCR-EX-SL-RPSS-2I-2I	HA011412*)
PCS10 Product Configuration Software (Free download: www.epluse.com/pcs10)	PCS10
Adapter Kit for configuration and adjustment (must be ordered together, see datasheet EE-PCA at www.epluse.com/ee-pca) Pos. 1: Product Configuration Adapter Pos. 2: Connection cable	EE-PCA HA011068

*) Only for ATEX and IECEx



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