



# IECEX Certificate of Conformity

## INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit [www.iecex.com](http://www.iecex.com)

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Issue 0 (2019-01-11)

Status: **Current** Issue No: 1

Date of Issue: 2021-04-29

Applicant: **BARTEC GmbH**  
Max-Eyth-Straße 16  
97980 Bad Mergentheim  
Germany

Equipment: **Temperature Controller, types ESTM / ESTM-L, 17-88C1-\*22H\*\*\*\***

Optional accessory:

Type of Protection: **Ex eb, ib, mb, tb, 60079-30-1**

Marking: **Ex eb mb [ib] [60079-30-1] IIC T6...T5 Gb**  
**Ex tb [ib] [60079-30-1] IIIC T80 °C Db**

Approved for issue on behalf of the IECEx  
Certification Body:

**L.G. van Schie**

Position:

**Certification Manager**

Signature:  
(for printed version)

2021-04-29

Date:

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Manufacturer: **BARTEC GmbH**  
Max-Eyth-Straße 16  
97980 Bad Mergentheim  
Germany

Additional  
manufacturing  
locations:

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEX Quality system requirements. This certificate is granted subject to the conditions as set out in IECEX Scheme Rules, IECEX 02 and Operational Documents as amended

## STANDARDS :

The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

**IEC 60079-0:2017** Explosive atmospheres - Part 0: Equipment - General requirements  
Edition:7.0

**IEC 60079-11:2011** Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"  
Edition:6.0

**IEC 60079-18:2017** Explosive atmospheres - Part 18: Protection by encapsulation "m"  
Edition:4.1

**IEC 60079-31:2013** Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"  
Edition:2

**IEC 60079-7:2017** Explosive atmospheres - Part 7: Equipment protection by increased safety "e"  
Edition:5.1

**IEC/IEEE  
60079-30-1:2015** Explosive atmospheres - Part 30-1: Electrical resistance trace heating - General and testing requirements  
Edition:1.0

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

## TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Report:

[NL/DEK/ExTR18.0015/01](#)

Quality Assessment Report:

[DE/TUN/QAR06.0017/13](#)



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## **EQUIPMENT:**

Equipment and systems covered by this Certificate are as follows:

The Temperature Controller, type ESTM / ESTM-L, 17-88C1-\*22H\*\*\*\* is suitable for use with remotely installed heaters and trace heating. The enclosure is designed to allow connection of cold lead cables for heaters or series resistance trace heaters and additionally for the direct connection of parallel trace heaters.

The enclosure of the Temperature Controller is non metallic in type of protection Ex eb and Ex tb. It comprises terminals for single phase to neutral power supply, single or two phase supply with neutral for the load and output to the load in type of protection Ex eb. The electronics are encapsulated providing type of protection Ex mb. For temperature sensing up to three terminals for three-wire RTD temperature sensors are provided in type of protection Ex ib.

The optional Limiter of ESTM-L, 17-88C1-\*22H\*\*\*\* complies with the requirements for limiters as specified in IEC 60079-30-1.

For setting up key features of the Temperature Controller an Ex eb terminal is provided inside the enclosure to connect a proprietary temperature limiter set module that prevents changing the set point. Another Ex eb terminal with bridges is provided for selecting single (L1-N) or two phase (L1-L2) power supply to the load.

For programming and monitoring purpose, the local user interface comprises a Bluetooth wireless communication port and a display in type of protection Ex mb with a transparent window in the cover of the Ex eb enclosure. This allows local regular configuration of the equipment without the need to open the enclosure. Provided, the compatible Bluetooth programming device is approved and suitable for use in the environment where the temperature controller is being located at that time.

Remote programming and monitoring is possible utilizing the MODBUS RTU or optional Ethernet TCP/IP data communication terminals in type of protection Ex eb. An end of line MODBUS termination resistor is configurable using a bridge on the Modbus terminal in type of protection Ex eb.

## **SPECIFIC CONDITIONS OF USE: YES as shown below:**

Cable glands shall be used that are certified for the applicable type of protection and with suitable ratings. For EPL Db only cable glands with integrated seal or gasket may be used.

In order to ensure safe operation of the Ex ib circuits the ground or earth connections of all electrical circuits connected to the Temperature Controller shall be installed using potential equalization between the hazardous area and the non-hazardous area.

The user of the optional Limiter ESTM-L, 17-88C1-\*22H\*\*\*\* shall demonstrate his ability to predict the the offset ( $\Delta T_{\text{offset}}$ ) between the trace heating sheath temperature and the temperature control device's set point in accordance with clause 4.5.3.1 of IEC 60079-30-1 : 2017.

For the electrical data that are not marked, see Annex 1 to this certificate.



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**Equipment (continued):**

The enclosure provides a degree of protection of at least IP65 in accordance with IEC 60079-0 and IEC 60529.

The entry to the enclosure shall be provided with IP65 rated Ex eb IIC or Ex tb IIIC approved glands or blind plugs suitable for the size of entry, the cable size and shape, the environment and the application.

For the type designation, thermal and electrical data see Annex 1 to this certificate.



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**DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)**

Update of IEC 60079 0, Ed. 6 to IEC 60079 0, Ed. 7.

**Annex:**

[222113100-Annex 1 to ExTR18.0015.01.pdf](#)

## Annex 1 to Report No. NL/DEK/ExTR18.0015/01

Note: In this document [.] is used as decimal separator.

### Type designation

17 - 8 8 C 1 - F 2 2 H / 1 R 0 \*  
 A B C D E F G H I J K L M

Designation	Explanation	Value	Explanation
A	Product group	<b>17</b>	Trace heating
B	Product identifier	<b>8</b>	Temperature Controller
C	Design	<b>8</b>	Installation Enclosures
D	Subtype	<b>C</b>	Electronic thermostat
E	Rated voltage	<b>1</b>	≤ 277 V
F	Function	<b>F</b> <b>V</b>	ESTM Temperature Controller ESTM-L High Temperatre Limiter
G	Supply voltage	<b>2</b>	230 Vac
H	Load voltage	<b>2</b>	230 / 400 V
I	Load contactors	<b>H</b>	Max. 230 / 400 V, see Thermal and electrical data table below
J	Entries	<b>1</b> <b>2...9</b>	1xM25, 2xM20, 6xM16 (Standard) Special (within limitations of applied enclosure)
K	Data communication interface	<b>R</b> <b>T</b>	Bluetooth with MODBUS RTU Bluetooth with Ethernet TCP/IP
L	Display	<b>0</b> <b>1</b>	Remote via Bluetooth 3 digit 7 segment + status LED's
M	Extensions		Not relevant for certification

## Annex 1 to Report No. NL/DEK/ExTR18.0015/01

### Thermal and electrical data

Trace heating circuit or resistive heater, connected with power cable

Ambient Temperature [°C]	U <sub>load</sub> [Vac]	I <sub>max load</sub> [A]	T-Class	Maximum surface temperature "T"
-55 to +45	230 / 400	27	T6	+80°C
-55 to +45	230 / 400	30	T5	
-55 to +55	230 / 400	22	T5	

Constant watt trace heating circuit, connected with cold lead

Cold lead [mm <sup>2</sup> ]	Ambient Temperature [°C]	U <sub>load</sub> [Vac]	I <sub>max load</sub> [A]	T-Class	Maximum surface temperature "T"
2.5	-55 to +45	230 / 400	22	T6	+80°C
		230 / 400	25	T5	
6	-55 to +55	230 / 400	30		
2.5		230 / 400	25		

Self limiting trace heating circuit, connected directly in the enclosure of 17-88C1-\*22H/\*\*\*\*

Trace Heater	Ambient Temperature [°C]	U <sub>load</sub> [Vac]	Max load	T-Class	Maximum surface temperature "T"
PSB MSB HSB	-55 to +55	230	The T-classes and requirements of the separately certified BARTEC trace heating systems shall be observed in accordance with the system design details and installation instructions. The maximum trace heating circuit length and the max circuit breaker (max Load) shall be observed.		

For details such as cable cross-sections, see installation instructions.

Supply circuit (terminals L1 - N) in type of protection Ex eb:

Rated voltage U <sub>supply</sub> :	230 Vac
U <sub>m</sub> :	250 Vac
Rated power without load:	15 VA
Prospective short circuit current:	200 A

Load circuit primary side (terminals and bridges L1 - N / L2) in type of protection Ex eb:

Rated load voltage U <sub>load</sub> (L1 - N):	230 Vac
Rated load voltage U <sub>load</sub> (L1 - L2):	400 Vac (phase-phase)
U <sub>m</sub> :	250 Vac (phase-neutral)
Prospective short circuit current:	200 A
For use with trace heating (resistive load):	
Maximum breaker size:	32A

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### Electrical data (continued)

Load circuit secondary side (terminals H1 and H2) in type of protection Ex eb:

Rated voltage: equal to  $U_{load}$ , mentioned above

Rated load current: see tables above

TL SET circuit in type of protection Ex eb:

$U_m$ : 250 Vac

Rated voltage: 5 Vdc

For use with proprietary temperature limiter set module.

Fault / alarm, potential free contacts in type of protection Ex eb:

$U_m$ : 250 Vac

Rated voltage: 230 Vac or 30 Vdc

Rated switch current, resistive load: 2 A

MODBUS RTU In (terminals A – B) and

MODBUS RTU Out (terminals A – B) in type of protection Ex eb:

$U_m$ : 250 Vac

Rated voltage: 5 Vdc

Ext. BUS Ethernet TCP/IP circuit in type of protection Ex eb:

$U_m$ : 250 Vac

Rated voltage: 5 Vdc

Sensor circuits (terminals TC 1, TC2 and TL):

In types of protection intrinsic safety Ex ib IIB, Ex ib IIC, Ex ib IIIB and Ex ib IIIC with the following maximum values per circuit:

$U_o = 5.0$  V;  $I_o = 84$  mA;  $P_o = 105$  mW; linear characteristic;  $C_o =$  see table below;  $L_o =$  see table below.

Ex ib IIC	$L_o$ [mH]	5.0	2.0	1.0	0.5	0.2
	$C_o$ [ $\mu$ F]	1.9	2.7	3.4	4.1	5.4
Ex ib IIB Ex ib IIIB Ex ib IIIC	$L_o$ [mH]	20	10	5.0	1.0	0.2
	$C_o$ [ $\mu$ F]	7.9	10	13	20	33

The Ex ib sensor circuits are not infallibly galvanically separated from each other, nor from the non-intrinsically safe circuits. Therefore the earth connection of the equipment shall be connected to the potential equalizing (P.E.) system in accordance with the applicable installation standard.