



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

Certificate No.: **IECEX BAS 06.0048X**

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Certificate history:

Status: **Current**

Issue No: 16

Issue 15 (2019-01-16)
Issue 14 (2017-02-21)
Issue 13 (2016-04-21)
Issue 12 (2015-11-20)
Issue 11 (2015-06-12)
Issue 10 (2014-02-03)
Issue 9 (2013-02-21)
Issue 8 (2012-12-19)
Issue 7 (2012-01-17)
Issue 6 (2010-06-25)

Date of Issue: 2020-05-05

Applicant: **nVent Thermal LLC**
899 Broadway Street
CA
94063-3104
United States of America

Equipment: **VPL Range of Trace Heating Units**

Optional accessory:

Type of Protection: **Increased Safety, Dust Ingress Protection**

Marking: **Ex e IIC T* Gb Ex td A21 IP66 T** °C or
Ex e mb IIC T* Gb Ex td mbD A21 IP66 T** °C**

***see schedule**

Approved for issue on behalf of the IECEx
Certification Body:

R S Sinclair

Position:

Technical Manager

Signature:
(for printed version)

Date:

11/5/2020

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Certificate issued by:

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Rockhead Business Park
Staden Lane
Buxton, Derbyshire, SK17 9RZ
United Kingdom





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Date of issue: 2020-05-05

Issue No: 16

Manufacturer: **nVent Thermal LLC**
899 Broadway Street
CA
94063-3104
United States of America

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 60079-0:2007-10 Explosive atmospheres - Part 0: Equipment - General requirements
Edition:5

IEC 60079-18:2004 Electrical apparatus for explosive gas atmospheres - Part 18: Construction, test and marking of type of protection encapsulation 'm' electrical apparatus
Edition:2.0

IEC 60079-30-1:2007-01 Explosive atmospheres - Part 30-1: Electrical resistance trace heating - General and testing requirements
Edition:1

IEC 60079-7:2006-07 Explosive atmospheres - Part 7: Equipment protection by increased safety "e"
Edition:4

IEC 61241-0:2004 Electrical apparatus for use in the presence of combustible dust - Part 0: General requirements
Edition:1

IEC 61241-1:2004 Electrical apparatus for use in the presence of combustible dust - Part 1: Protection by enclosures "tD"
Edition:1

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 Reports:

GB/BAS/ExTR06.0067/00
GB/BAS/ExTR08.0266/00
GB/BAS/ExTR12.0289/00
GB/BAS/ExTR15.0263/00
GB/BAS/ExTR20.0061/00

GB/BAS/ExTR08.0031/00
GB/BAS/ExTR10.0024/00
GB/BAS/ExTR14.0026/00
GB/BAS/ExTR17.0055/00

GB/BAS/ExTR08.0186/00
GB/BAS/ExTR11.0270/00
GB/BAS/ExTR15.0035/00
GB/BAS/ExTR18.0101/00

Quality Assessment Report:

GB/BAS/QAR06.0030/08



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EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

The VPL Range of Trace Heating Units is of the parallel circuit power limiting type, rated at up to 480V; with a nominal power output from 16 W/m to 66 W/m at 10°C and a maximum maintain temperature of 150°C.

Each trace heating unit comprises:

- the active heating cable
- an end seal for terminating the remote end of the unit
- a cable gland for connecting the powered end of the unit to a suitable terminal enclosure, or alternative integrated power connection systems.

The heating cables consist of two stranded copper conductors insulated with fluoropolymer. Both bus wires are further contained within a fluoropolymer pairing jacket. A helical heating element is wound evenly around the pairing jacket to form heating zones.

A primary fluoropolymer jacket covers the heating element which itself is covered by a steel or copper braid. The final outer jacket is another layer of fluoropolymer. The resistance of the heating element changes as its surrounding temperature changes resulting in the power output of the heating cable reducing with increasing temperature.

The declared maximum withstand temperature for the range is 260°C and the minimum installation temperature is -60°C.

The heating units may be provided with end seals, splices and power connections. See Annex for further details.

SPECIFIC CONDITIONS OF USE: YES as shown below:

1. The following limiting temperatures for the end seals, splices and power connections shall not be exceeded:

- 260°C for the E-40 and S-40
- 250°C for the E-50 and JBU-100
- 165°C for the E-100, E-100-L and JBS-100
- 155°C for the JBM-100 and T-100
- 110°C for the GHG 960 923 P... cable gland and CCON
- 180°C for the Type E8XF cable gland

The E-100, E-100-L, JBM-100, JBS-100 and T-100 have limiting temperatures based on an internal component in these accessories. When located on a pipe or other work piece surface, a maximum pipe temperature of 250°C will not cause the limiting temperatures of 165°C or 155°C to be exceeded.

2. The end seals, splices and power connections have the following associated minimum ambient temperatures:

- 60°C for the E-50, E-40 and S-40
- 55°C for the CCON
- 50°C for the E-100, T-100, JBS-100, JBM-100 and JBM-100
- 40°C for the JBS-100-L, JBM-100-L, JBU-100-L and E-100-L
- 55°C for the GHG 960 923 P... cable gland with silicon rubber seals.
- 60°C for the Type E8XF cable gland

3. The end seals, splices and power connections have the following associated ambient temperatures:

- 50°C to +40°C for the C..-100
- 50°C to +56°C for the T-100, JBM-100, JBS-100, JBU-100 and E-100
- 40°C to +40°C for the JBM-100-L, JBS-100-L, JBU-100-L and E-100-L

4. The assembly of glands, splices and end terminations shall be carried out in accordance with the manufacturer's instructions.

5. The heating element supply circuit must include an electrical protection device in conformity with Clause 4.3 of IEC 60079-30 1.

6. The minimum installation temperature is -60°C. The minimum bending radii at specific temperatures for the Type VPL units are shown in the table in the equipment description.

7. The supply to the heating unit must be terminated in a suitably certified terminal enclosure.



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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)

Variation 16.1

To introduce the E-40 Heat Shrink End Seal kit as an integral component to the VPL Range of Trace Heating Units.

Variation 16.2

To introduce the S-40 Heat Shrink Splice kit as an integral component to the VPL Range of Trace Heating Units.

Variation 16.3

To amend existing errors to the VPL 'Specific Conditions of Use' relating to the minimum ambient temperature listed for the E-100-L and T-100, which has been corrected from -50°C to -40°C for the E-100-L and corrected from -40°C to -50°C for the T-100.

ExTR: **GB/BAS/ExTR00.0061/00**

File Reference: **20/0212**

Annex:

[IECEX BAS 06.0048X Annex Issue 3.pdf](#)

The VPL Range of Trace Heating Units is of the parallel circuit power limiting type, rated at up to 480V; with a nominal power output from 16 W/m to 66 W/m at 10°C and a maximum maintain temperature as detailed in the tables below.

Each trace heating unit comprises:

- the active heating cable
- an end seal for terminating the remote end of the unit
- a cable gland for connecting the powered end of the unit to a suitable terminal enclosure, or alternative integrated power connection systems.

The heating cables consist of two stranded nickel plated copper 3.31mm² conductors insulated with 0.38mm minimum thickness fluoropolymer. Both bus wires are further contained within a 0.125mm fluoropolymer pairing jacket. A helical heating element is wound evenly around the pairing jacket. A short length of insulation sufficient for 5 to 10 turns of the heating element to contact the bus wire is removed from the pairing jacket and the bus wire. The insulation is removed from only one bus wire at each location and different bus wires at each adjacent location to form a heating zone.

A primary 0.5mm thick fluoropolymer jacket covers the heating element which itself is covered by a steel or copper braid equivalent to a 3.31mm² conductor. The final outer jacket is another 0.5mm thick layer of fluoropolymer.

There may optionally be a layer of fibreglass braid between the heating element and the primary fluoropolymer jacket.

The resistance of the heating element changes as its surrounding temperature changes resulting in the power output of the heating cable reducing with increasing temperature.

The declared maximum withstand temperature for the range is 260°C and the minimum installation temperature is -60°C.

Heating Cable	Maximum maintain temperature (°C)	
	110V	220V
5VPL1 -CT	235	235
10VPL1 -CT	215	210
15VPL1 -CT	190	165
20VPL1 -CT	150	150

Heating Cable	Maximum maintain temperature (°C)			
	208V	230V	254V	277V
5VPL2 -CT	235	230	225	225
10VPL2 -CT	220	210	200	195
15VPL2 -CT	200	180	145	105
20VPL2 -CT	150	150	-	-

Heating Cable	Maximum maintain temperature (°C)	
	400V	480V
5VPL4 -CT	230	230
10VPL4 -CT	215	205
15VPL4 -CT	195	160
20VPL4 -CT	150	150

CABLE ACCESSORIES

END SEALS

The end seals for terminating the remote end of the unit may be the following types:

Types E-100-L or E-100, which are mechanical end seals incorporating an end cap which is filled with silicone grease sealant, covered by certificate IECEx PTB 09.0038U.

Types E-100-L-A or E-100-A, which are mechanical end seals incorporating an end cap which is filled with silicone grease sealant.

A Raychem Type E-50 end seal kit, which comprises heat shrink sleeves lined with hot melt adhesive.

A Raychem Type E-40 heat shrink end seal kit.

SPLICES AND JOINTS

The following splicing and jointing arrangements are provided:

A Raychem T-100 tee connection system, certificate IECEx PTB 09.0023U, for connecting up to three heater cables.

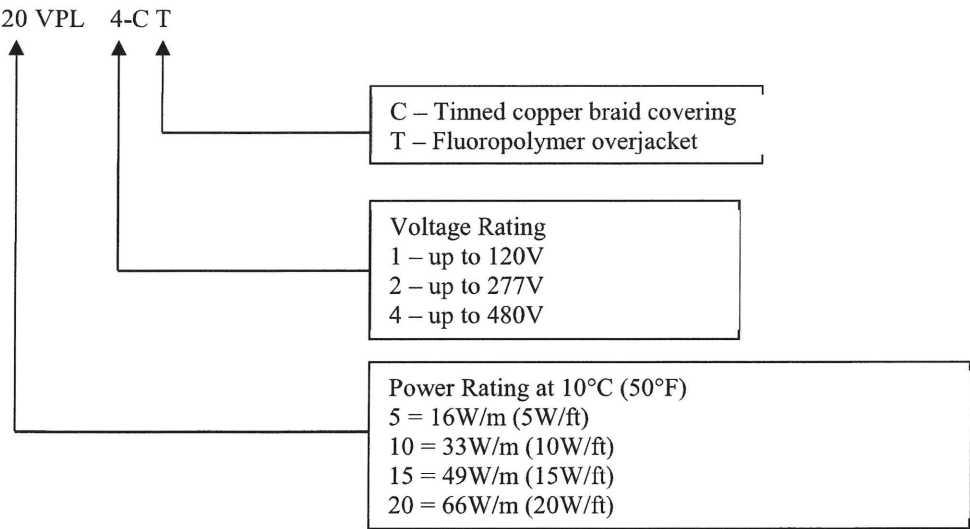
A Raychem Type S-40 heat shrink splice kit for connecting lengths of active heating cable.

POWER CONNECTIONS

Power connection may be achieved by the following means:

Connection Type	IECEx Certificate
T-100	IECEx PTB 09.0023U
JBM-100	IECEx PTB 09.0027U
JBS-100	IECEx PTB 09.0037U
E-100	IECEx PTB 09.0038U
JBU-100	IECEx PTB 09.0039U
C..-100	IECEx PTB 09.0040U
C25-100 Metal C3/4-100 Metal	IECEx SIR 05.0020X

A number of power levels and voltages, up to the maximum specified, are included in the range. They are identified in the following manner:



SGS Baseefa Limited
Rockhead Business Park
Staden lane, Buxton, Derbyshire
SK17 9RZ
United Kingdom



ANNEX to IECEx BAS 06.0048X

Issue No. 3

Date: 05/05/2020

TEMPERATURE CLASS

Any of the products in the range may be considered as part of a stabilised design system. In such a system the design is based upon the use of Pentair Thermal Management LLC design software such as Trace Calc. The algorithm defined in this software and reported in Report No. CXDE 9603-510 may be used in additional design software. These designs may carry temperature classes of T6 to T2 and are marked with the actual maximum temperature and the appropriate T class in parenthesis.

The minimum bending radii for VPL trace heating cable at specific temperatures are shown in the table below:

Temperature, T (°C)	Minimum Bending Radius (mm)
$-60 \leq T < -20$	19
$-20 \leq T < +10$	15
$T \geq +10$	12