

# INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

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Certificate No.: IECEx BAS 20.0008X

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Certificate history:

Status: Current

Issue No: 1

Issue 0 (2020-10-20)

Date of Issue: 2021-02-16

Applicant: nVent Thermal LLC

899 Broadway Street

CA

94063-3104

**United States of America** 

Equipment: VPL Range of Power-Limiting Trace Heating Systems

Optional accessory:

Type of Protection: Electrical resistance – Trace Heating, Increased Safety, Encapsulation, Dust Ingress Protection

Marking: Ex 60079-30-1 eb IIC T\* Gb Ex 60079-30-1 tb IIIC IP66 T\*\*°C Db

or

Ex 60079-30-1 eb mb IIC T\* Gb Ex 60079-30-1 mb tb IIIC IP66 T\*\*°C Db

Tmin -60°C

(\*see schedule)

Approved for issue on behalf of the IECEx

Certification Body:

Position:

Date:

Signature: (for printed version)

(for printed version)

Mr R S Sinclair

**Technical Manager** 

16.2.2021

RSS- Qui

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3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.



Certificate issued by:

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





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Date of issue: 2021-02-16 Issue No: 1

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 60079-0:2017 Explosive atmospheres - Part 0: Equipment - General requirements

Edition:7.0

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

EE Explosive atmospheres - Part 30-1: Electrical resistance trace heating - General and testing requirements

IEC/IEEE 60079-30-1:2015 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 Reports:

GB/BAS/ExTR20.0028/00 GB/BAS/ExTR21.0007/00

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 Power-Limiting Trace Heating Systems 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. The systems are designed for use as part of a stabilised design. The limiting temperatures of the end seals, splices and power connections must be observed as part of the stabilised design.

Each trace heating system 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.

For full description please see Annex.

#### 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 JBU-100

165°C for the E-100, E-100-L and JBS-100

155°C for the JBM-100 and T-100

150°C for the C-150-E and E-150

110°C for the C25-21 and C25-100

180°C for the C25-100-Metal / C3/4-100-Metal

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 ambient temperatures:

-60°C to +56°C for the E-40 and S-40

-55°C to +56°C for the T-100, JBM-100, JBS-100, JBU-100 and E-100

-55°C to +55°C for the C-150-E and E-150

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

-40°C to +40°C for the E-100-L

-55°C to +110°C for the C25-21 and C25-100

-60°C to +180°C for the C25-100-Metal / C3/4-100-Metal

- 3. The assembly of glands, splices and end terminations shall be carried out in accordance with the manufacturer's instructions.
- 4. The heating element supply circuit must include an electrical protection device in conformity with Clause 4.4 of IEC 60079-30-1.
- 5. 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.
- 6. The supply to the heating unit must be terminated in a suitably certified terminal enclosure.
- 7. The installer is to carry out a dielectric strength test on Ex equipment in which the C25-21, C25-100 and C25-100-Metal / C3/4-100-Metal connection kit is fitted. No dielectric breakdown shall occur. (Alternatively, an insulation resistance test may be undertaken in accordance with IEC 60079-30-2).



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

#### Variation 1.1

To assess the VPL Range of Power-Limiting Trace Heating Systems against IEC 60079-0:2017 Edition 7.0.

#### Variation 1.2

To introduce the low profile power connection and end seal kits, types C-150-E and E-150 afforded IECEx DEK 20.0005U.

#### Variation 1.3

To amend the wording in the product description.

#### Variation 1.4

To change the product name to "VPL Range of Power-Limiting Trace Heating Systems".

#### Variation 1.5

To update the Specific Conditions of Use.

ExTR: GB/BAS/ExTR21.0007/00 File Reference: 20/0676

#### Annex:

IECEx BAS 20.0008X Annex Issue 1.pdf

## **SGS** Baseefa Limited

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



ANNEX to IECEx BAS 20.0008X

Issue No. 1

Date: 10 February 2021

The heating cables consist of two fluoropolymer insulated nickel-plated copper 3.3 mm<sup>2</sup> conductors. Both bus wires are further contained within a fluoropolymer pairing jacket. A helical heating element is wound evenly around the pairing jacket. Alternating, a short length of insulation is removed from the pairing jacket and the bus wire to establish the electrical connection between the heating element and the conductor. An extruded layer of fluoropolymer covers the heating element which itself is covered by a conductive covering. A protective anti corrosion fluoropolymer sheath may be extruded over the conductive covering.

A primary 0.5mm thick fluoropolymer jacket covers the heating element which itself is covered by a steel or copper braid equivalent to a 3.31mm<sup>2</sup> conductor. The final outer jacket is another 0.5mm thick 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.

| Heating Cable | Maximum maintair | n 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 certificates IECEx SIR 14.0007X and 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-40 heat shrink end seal kit.

Type E-150 mechanical end seals, covered by certificate IECEx DEK 20.0005U.

### SPLICES AND JOINTS

The following splicing and jointing arrangements are provided:

A Raychem T-100 tee connection system, certificate IECEx PTB 20.0014U, for connecting up to three heater cables.

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

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# **SGS Baseefa Limited**

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



ANNEX to IECEx BAS 20.0008X

Issue No. 1

Date: 10 February 2021

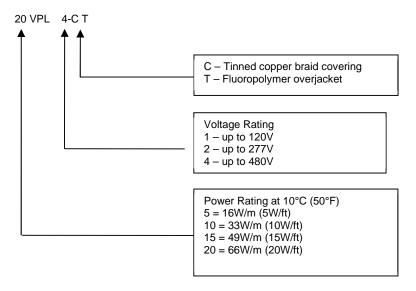
### POWER CONNECTIONS

Power connection may be achieved by the following means:

| Connection Type   | IECEx Certificate  |
|-------------------|--------------------|
| T-100             | IECEx PTB 20.0014U |
| JBM-100           | IECEx PTB 20.0014U |
| JBS-100           | IECEx PTB 20.0014U |
| E-100             | IECEx PTB 09.0038U |
| E-100-L           | IECEx SIR 14.0007X |
| JBU-100           | IECEx PTB 20.0014U |
| C-150-E           | IECEx DEK 20.0005U |
| C25-21            | IECEx BAS 16.0040U |
| C25-100           | IECEx BAS 16.0041U |
| C25-100-Metal     | IECEx BAS 16.0042U |
| C3/4-100-Metal    |                    |
| C25-100-Metal-NP  |                    |
| C3/4-100-Metal-NP |                    |
| C25-100-Metal-SS  |                    |

The C25-100-Metal / C3/4-100-Metal / C25-100-Metal-NP / C3/4-100-Metal-NP / C25-100-Metal-SS Kits include M25 or  $\frac{3}{4}$  NPT gland to IECEx SIR 05.0020X and core sealer to IECEx BAS 15.0137U.

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



### 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 nVent proprietary software Trace calc Pro. The algorithm defined in this software 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 ≤ T < -20       | 19                          |
| -20 ≤ T < +10       | 15                          |
| T ≥ +10             | 12                          |

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