1 **EU-TYPE EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU

3 Certificate Number: **Sira 14ATEX3015X** Issue: **8**

4 Equipment: **Type E-100-L-A & E-100-L-E Lighted End Seals**

5 Applicant: **nVent Thermal LLC**

6 Address: 899 Broadway Street, Redwood City, California 94063-3104, United States of America

7 This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 CSA Group Netherlands B.V., notified body number 2813 in accordance with Articles 17 and 21 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential reports listed in Section 14.2.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

EN IEC 60079-0:2018 EN IEC 60079-7:2015/A1:2018 EN 60079-18:2015/A1:2017
EN 60079-31:2014

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to Specific Conditions of Use identified in the schedule to this certificate.

11 This EU-Type Examination Certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:

II 2GD
Ex eb mb IIC T* Gb
Ex tb IIIC T***°C Db
Ta = -40°C to +40°C

* The temperature class/maximum surface temperature is directly related to the associated process temperature and trace heating cable with which it is assembled, refer to Conditions of Manufacture for the appropriate equipment marking.

Signed: M Halliwell

Title: Senior Director of Operations

PRODUCTS RvA C 652

Project Number 80231316

SCHEDULE

EU-TYPE EXAMINATION CERTIFICATE

Sira 14ATEX3015X
Issue 8

13 **DESCRIPTION OF EQUIPMENT**

The Lighted End Seals, Type E-100-L-A and Type E-100-L-E, are designed for pipe mounting and the termination of specified trace heating cable. They are rated at 100-277 V AC and incorporate encapsulated electronics, within an Ex e enclosure, that includes encapsulated LED lights for indication. The Lighted End Seals are designed for use with the following range of Raychem Industrial Parallel Heating Cables: BTV, QTVR, XTV, KTV and VPL as per the table below.

Heater type	Permitted Voltages (V)	Maximum process temperature (°C)	ATEX Certificate
BTV	Up to 277V AC	65°C	Baseefa 06ATEX0183X
QTVR	Up to 277V AC	110°C	Baseefa 06ATEX1085X
XTV	Up to 277V AC	121°C	Baseefa 06ATEX0184X
KTV	Up to 277V AC	150°C	Baseefa 06ATEX0186X
VPL	Up to 110V AC (VPL1) Up to 277V AC (VPL2)	150°C	Baseefa 06ATEX0188X

The main body of the equipment is manufactured from moulded plastic; the upper sub assembly consists of the same moulded plastic material and a clear plastic lens through which the indicating light is visible. Internally, the electronics within the upper sub-assembly are fully encapsulated using a clear, setting gel. Both the lens sub-assembly and the main body sub assembly are coupled via threaded joints and O-seal. The O-seal is retained in a groove and is required to maintain degree of protection IP66.

Entry of the associated heating cable into the main body of the end seal is via a sealing mechanism located inside the main body. The heating cable is connected to the end seal electronics via insulated crimps, which are further insulated using core sealer which leaves no bare conductors exposed. The conductors connected to the heating cable pass through the main body into the sub assembly, where they enter the encapsulating material and connect to the end seal electronics. The electronics in the sub-assembly are fully encapsulated.

Variation 1 - This variation introduced the following changes:

i. Minor administrative drawing changes, these have no effect on compliance.
ii. The introduction of an alternative green LED for E-100-L-E.
iii. Drawing number 021815-3 was replaced with 9P000001920.
iv. Drawing number 50-322-0001-S was replaced with 3500-1501.
v. Drawing number 50-322-0002-S was replaced with 3500-2501.

Variation 2 - This variation introduced the following changes:

i. The company address has changed from 307 Constitution Drive, Menlo Park, California, 94025 to 899 Broadway Street, Redwood City, California 94063-3104.
ii. The introduction of issue H of drawing 908080, which includes the following modifications:
   - Note 7 was removed from this drawing and transferred to drawing 908075.
   - Note 6 was added to state routine dielectric strength test requirements.
iii. The introduction of issue G of drawing 908075, which includes the following modifications:
   - Note 16 was transferred to this drawing from drawing 908080.
   - Notes were renumbered.
iv. The introduction of issue F of drawing 9P000001920, which includes the following modifications:
   - Address of manufacturer was changed from 'Menlo Park' to 'Redwood City'.
   - IECEx and EAC mark and certificate numbers were added to the label.

Variation 3 - This variation introduced the following changes:

i. Drawing 9P000001920 has been updated with the following administrative changes:
   - The addition of an alternative certified label manufacturer
   - The addition of a qualified supplier of the label.

Variation 4 - This variation introduced the following changes:

i. Recognition of name change, from Pentair Thermal Management LLC to nVent Thermal LLC.
ii. The recognition of minor administrative modifications within the drawings.
   - The addition of a qualified supplier of the label.

Variation 5 - This variation introduced the following changes:

i. Following appropriate assessment to demonstrate compliance with the latest technical knowledge, EN 60079-0:2012, EN 60079-7:2007, EN 60079-18:2009 and EN 60079-31:2009, were replaced by EN 60079-0:2018, EN 60079-7:2015/A1:2018, EN 60079-18:2015 and EN 60079-31:2014, the markings were amended to recognise the new standards.
ii. Update to ratings listed for clarity, no change to the heating cables.

Variation 6 - This variation introduced the following changes:

i. The introduction of an alternate thermal fuse for Type E-100-L Lighted End Seals; alternates LEDs for Type E-100-L-E Lighted End Seals.
ii. Manufacturer's drawings updates.

Variation 7 - This variation introduced the following changes:

i. Manufacturer's drawings updates.
ii. Update correct Manufacturer's Name & Address.

14 DESCRIPTIVE DOCUMENTS

14.1 Drawings

Refer to Certificate Annexe.

14.2 Associated Reports and Certificate History

Issue	Date	Report no.	Comment
0	02 March 2015	R70004711B	The release of the prime certificate.
1	27 August 2015	R70038849B	The introduction of Variation 1.
2	24 June 2016	R70065948A	This Issue covers the following changes: • EC Type-Examination Certificate in accordance with 94/9/EC updated to EU Type-Examination Certificate in accordance with Directive 2014/34/EU. *(In accordance with Article 41 of Directive 2014/34/EU, EC Type-Examination Certificates referring to 94/9/EC that were in existence prior to the date of application of 2014/34/EU (20 April 2016) may be referenced as if they were issued in accordance with Directive 2014/34/EU. Variations to such EC Type-Examination Certificates may continue to bear the original certificate number issued prior to 20 April 2016.)* • The introduction of Variation 2.

SCHEDULE

EU-TYPE EXAMINATION CERTIFICATE

Sira 14ATEX3015X
Issue 8

Issue	Date	Report no.	Comment
3	02 August 2017	R70144517A	The introduction of Variation 3.
4	15 October 2019	R70193105A	The introduction of Variation 4.
5	15 October 2019	0833	Transfer of certificate Sira 14ATEX3015X from Sira Certification Service to CSA Group Netherlands B.V.
6	21 May 2020	R80017913A	The introduction of Variation 5.
7	29 September 2021	R80082987A	The introduction of Variation 6.
8	24 February 2025	R80231315A	The introduction of Variation 7.

15 **SPECIFIC CONDITIONS OF USE** (denoted by X after the certificate number)

15.1. Some external parts of the system are non-conducting and may generate an ignition-capable level of electrostatic charges under certain extreme conditions. The user should ensure that the equipment is not installed in a location where it may be subjected to external conditions (such as high-pressure steam) which might cause a build-up of electrostatic charges on non-conducting surfaces. Additionally, cleaning of the equipment should be done with a damp cloth.

15.2. The maximum process temperature of the Lighted End Seals is limited to 150°C; this may be further limited by the type of heating cable that is being used, therefore. When fitting the Lighted End Seals, the user/installer shall take into account any restrictions that are applicable to the cable.

15.3. The supply circuit shall be protected by a fuse capable of withstanding a prospective short current of 1500A.

15.4. The Lighted End Seals must be pipe mounted in a single orientation, with the gland entry adjacent to the process pipe, as per the manufacturer's installation instructions.

16 **ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF ANNEX II** (EHSRs)

The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed in the reports listed in Section 14.2.

17 **CONDITIONS OF MANUFACTURE**

17.1 The use of this certificate is subject to the Regulations Applicable to Holders of CSA Group Netherlands B.V. certificates.

17.2 Holders of EU-Type Examination Certificates are required to comply with the conformity to type requirements defined in Article 13 of Directive 2014/34/EU.

17.3 Each unit of the Lighted End Seals shall be subjected to a visual inspection. No damage shall be evident, such as cracks in the compound, exposure of the encapsulated parts, flaking, inadmissible shrinkage, swelling, decomposition or failure of adhesion or softening.

17.4 The equipment shall be subjected to routine dielectric strength tests in accordance with the requirements of EN 60079-7 Clause 6.1 and EN 60079-18 Clause 8.2.4. The test shall be deemed as passed if no breakdown or arcing occurs during testing.

17.5 The equipment shall be marked with the temperature class/maximum surface temperature identical to the trace heating cable with which it is assembled.

17.6 The equipment is assembled with previously certified devices, it is the manufacturer's responsibility to monitor the original certification of these components and ensure that they continue to comply with the requirements of the latest editions of the standards; the manufacturer shall inform Sira of any modifications to the devices that may impinge upon the explosion safety design of their products. Additionally, any special conditions and routine testing should be applied as per the original certification.

17.7 Heating cables used with the Lighted End Seals, E-100-L-A and E-100-L-E shall not exceed the following dimensions.

Cable	Width NOM-MAX (in./mm)	Thickness NOM-MAX (in./mm)
XTV	0.460-0.490 / 11.7-12.5	0.285-0.305 / 7.2-7.7
VPL	0.458 (nom) / 11.6 (nom)	0.322 (nom) / 8.17 (nom)
QTVR	0.550-0.610 / 14.0-15.5	0.200-0.245 / 5.1-6.2
KTV	0.550-0.610 / 14.0-15.5	0.300-0.335 / 7.6-8.5
BTV	0.605-0.645 / 15.37-16.38	0.215-0.255 / 5.47-6.47

Certificate Annexe

Certificate Number: Sira 14ATEX3015X

Equipment: Type E-100-L-A & E-100-L-E Lighted End Seals

Applicant: nVent Thermal LLC

Issue 0

Drawing	Sheets	Rev.	Date (Sira Stamp)	Title
908080	1 of 2	F	19 Jan 15	SUB-E-100-L-X
908081	1 of 4	E	19 Jan 15	SUB-E-100-L-X-PCB-ASSY
908083-A	1 of 2	B	19 Jan 15	E-100-L & E-100-LR Approval Drawing
908087-A	1 of 1	B	19 Jan 15	E-100-L Gel Fill Level
50-322-0001-S	1 of 2	2	19 Jan 15	E-100-L-A Main Board Circuit Diagram
50-322-0002-S	1 of 2	2	19 Jan 15	E-100-L-A LED Board Circuit Diagram
3500-3001	1 to 2	E	19 Jan 15	E-100-L-A BOM
3500-4001	1 to 2	E	19 Jan 15	E-100-L-E BOM
021815-3	1 of 2	B	19 Feb 15	Label E-100-L-STAND-H59140
906533-A	1 of 1	B	19 Jan 15	SFP-E-100-Strain Relief
906588	1 of 1	K	19 Jan 15	SFP-CACS-RING
908075	1 to 2	F	19 Jan 15	SFP-E-100-L-Lens

Issue 1

Drawing	Sheets	Rev.	Date (Sira Stamp)	Title
908083-A	1 to 2	C	12 Aug 15	E-100-L & E-100-LR
3500-4001	1 of 1	F	14 Aug 15	SUB-E-100-L-E-PCB-ASSY
906533-A	1 of 1	A	12 Aug 15	SFP-E-100-Strain Relief
3500-2001	1 to 8	A	12 Aug 15	E-100-L Light Module – LED PCB
9P000001920	1 to 2	D	12 Aug 15	Label-E-100-L-Stand-H59140
3500-1501	1 of 1	A	12 Aug 15	E-100-L Main Board
3500-2501	1 of 1	A	12 Aug 15	E-100-L

*The following drawings were replaced as detailed in Variation 1:

Drawing	Sheets	Rev.	Date (Sira Stamp)	Title
*021815-3	1 to 2	B	19 Jan 15	Label E-100-L Stand-H59140
*50-322-0001-S	1 to 2	2	19 Jan 15	E-100-L-A Main Board Circuit Diagram
*50-322-0002-S	1 to 2	2	19 Jan 15	E-100-L-A LED Board Circuit Diagram

Issue 2

Drawing	Sheets	Rev.	Date (Sira stamp)	Title
9P000001920	1 to 2	F	19 May 16	LABL-E-100-L-STAND-H59140
908080	1 to 2	H	19 May 16	SUB-E-100-L-X
908075	1 to 2	G	19 May 16	SFP-E-100-L-LENS

Issue 3

Drawing	Sheets	Rev.	Date (Sira stamp)	Title
9P000001920	1 to 2	G	21 Jul 17	LABL-E-100-L-STAND-H59140

Issue 4

Drawing	Sheets	Rev.	Date (Sira stamp)	Title
908079	1 of 1	F	20 Nov 18	SUB-JBL-L-X-PCB-Assy
908084	1 of 1	G	20 Nov 18	JBL-100-X
908085-A	1 of 1	B	20 Nov 18	JBL-100-X Agency Approval Drawing
908088-A	1 of 1	C	20 Nov 18	JBL-100 Potting Fill Level
3500-3002	1 of 1	D	08 Apr 19	JBL-100-R BOM
3500-4002	1 of 1	D	08 Apr 19	JBL-100-G BOM

Certificate Annexe

Certificate Number: **Sira 14ATEX3015X**

Equipment: **Type E-100-L-A & E-100-L-E Lighted End Seals**

Applicant: **nVent Thermal LLC**

Drawing	Sheets	Rev.	Date (Sira stamp)	Title
9194149	1 of 4	M	08 Mar 18	Equipment Marking Label – JBL-100-G
9728939	1 of 4	M	08 Mar 18	Equipment Marking Label – JBL-100-R
3500-3501	1 of 1	A	20 Nov 18	SCHEMATIC: JBL-100-LIGHT MODULE
3500-1002	1 of 8	B	20 Nov 18	JBL-100-LIGHT MODULE Artwork and drill drawing

The following drawing is removed as part of this variation:

Drawing	Sheets	Rev.	Date (Sira stamp)	Title
50-322-0004-S	1 to 2	2	08 Jan 15	JBL-100 Circuit Diagram

Issue 5 - No new drawings were introduced.

Issue 6

Drawing	Sheets	Rev.	Date (Sira stamp)	Title
9P000001920	1 to 2	M	11 May 20	LABEL-E-100-L-STAND-H59140

Issue 7

Drawing	Sheets	Rev.	Date (Stamp)	Title
3500-3001	1 to 1	H	09 Sep 21	E-100-L-A BOM
3500-4001	1 of 1	I	09 Sep 21	SUB-E-100-L-E-PCB-ASSY
906533-A	1 of 1	D	09 Sep 21	SFP-E-100-Strain Relief
3500-1501	1 of 1	C	09 Sep 21	E-100-L Main Board
3500-2001	1 to 8	C	09 Sep 21	E-100-LLight Module – LED PCB
3500-1001	1 to 8	D	09 Sep 21	E-100-L Light Module – Main PCB
908075	1 to 2	H	09 Sep 21	SFP-E-100-L-Lens
908080	1 to 2	I	09 Sep 21	SUB-E-100-L-X
908081	1 to 5	H	09 Sep 21	SUB-E-100-L-X-PCB-ASSY
908083-A	1 to 2	G	09 Sep 21	E-100-L & E-100-LR
908087-A	1 of 1	C	09 Sep 21	E-100-L Gel Fill Level
9P000001920	1 to 2	P	09 Sep 21	LABEL-E-100-L-STAND-H59140

Issue 8

Drawing	Sheets	Rev.	Date (Stamp)	Title
908081	1 to 5	J	11 Dec 24	SUB-E-100-L-X-PCB-ASSY
3500-3001	1 to 2	I	11 Dec 24	E-100-L-A BOM
3500-4001	1 to 3	K	11 Dec 24	SUB-E-100-L-E-PCB ASSY-BOM
906588	1 to 1	L	11 Dec 24	SFP-CACS-RING
3500-2501	1 to 1	C	11 Dec 24	E-100-L
908079	1 to 2	J	11 Dec 24	SUB-JBL-L-X-PCB-Assy
3500-3002	1 to 2	G	11 Dec 24	JBL-100-R BOM
3500-4002	1 to 2	G	11 Dec 24	JBL-100-G BOM
9194149	1 to 7	S	11 Dec 24	Equipment Marking Label – JBL-100-G
9728939	1 to 7	T	11 Dec 24	Equipment Marking Label – JBL-100-R
3500-3501	1 of 1	B	11 Dec 24	SCHEMATIC: JBL-100-LIGHT MODULE
3500-1002	1 to 8	C	11 Dec 24	JBL-100-LIGHT MODULE Artwork and drill drawing
9P000001920	1 to 2	S	11 Dec 24	LABEL-E-100-L-STAND-H59140