IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx SIR 10.0064X

Issue No: 14

Status: **Current**

Date of Issue: **2019-09-13**

Applicant: **Amphenol Industrial Operations**
40-60 Delaware Avenue
Sidney
New York
13838-1395
United States of America

Equipment: **EX-*-13***, EX-*-15***, EX-*-17***, EX-18***, 'Starline' EX Range of Connectors and Panel Mounted Receptacle Connectors**

Optional accessory:

Type of Protection: **Flameproof, op pr, op is, increased safety and dust protection by enclosure**

Marking:
Refer to the Marking in the Annexe.

Certificate history:
Issue No. 14 (2019-09-13)
Issue No. 13 (2017-11-22)
Issue No. 12 (2017-06-23)
Issue No. 11 (2016-11-21)
Issue No. 10 (2015-10-12)
Issue No. 9 (2015-06-30)
Issue No. 8 (2015-03-18)
Issue No. 7 (2014-10-31)
Issue No. 6 (2014-03-25)
Issue No. 5 (2014-03-20)

Approved for issue on behalf of the IECEx Certification Body: N Jones

Position: Certification Manager

Signature:
(for printed version)

Date:

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

SIRA Certification Service
CSA Group
Unit 6, Hawarden Industrial Park
Hawarden, Deeside, CH5 3US
United Kingdom

IECEx Certificate of Conformity

Certificate No: IECEx SIR 10.0064X Issue No: 14

Date of Issue: 2019-09-13

Manufacturer: **Amphenol Industrial Operations**
40-60 Delaware Avenue
Sidney
New York
13838-1395
United States of America

Additional Manufacturing location(s):

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 apparatus 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 : 2011 Edition:6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-1 : 2014-06 Edition:7.0	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
IEC 60079-28 : 2015 Edition:2	Explosive atmospheres - Part 28: Protection of equipment and transmission systems using optical radiation
IEC 60079-31 : 2013 Edition:2	Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"
IEC 60079-7 : 2015 Edition:5.0	Explosive atmospheres – Part 7: Equipment protection by increased safety "e"

*This Certificate **does not** indicate compliance with electrical 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:

GB/SIR/ExTR10.0143/00
GB/SIR/ExTR10.0201/00
GB/SIR/ExTR12.0248/00
GB/SIR/ExTR13.0064/00
GB/SIR/ExTR13.0144/01
GB/SIR/ExTR14.0061/00
GB/SIR/ExTR14.0073/00
GB/SIR/ExTR15.0073/00
GB/SIR/ExTR15.0117/00
GB/SIR/ExTR15.0282/00
GB/SIR/ExTR17.0130/00
GB/SIR/ExTR17.0241/00
GB/SIR/ExTR19.0239/00

Quality Assessment Report:

GB/SIR/QAR08.0010/06

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Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

EX-*-13*, EX-*-15***, EX-*-17***, EX-18***, 'Starline' EX Range of Connectors and Panel Mounted Receptacle Connectors**

These connectors comprise an aluminium alloy bodied plug and socket to form in-line cable connections.

EX-*-18* 'Starline' EX Range of Panel Mounted Receptacle Connectors**

These connectors form a plain spigoted joint with their associated flameproof apparatus.

For a full Description, Ratings, Design Options and Conditions of Certification Refer to the Annexe.

SPECIFIC CONDITIONS OF USE: YES as shown below:

Refer to the Annexe

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

Refer to the Annexe

Annex:

IECEx SIR 10.0064X Annexe Issue 14.pdf

Marking

Ex db IIC T◇ Gb
Ex db eb IIC T◇ Gb
Ex op pr IIC T◇ Gb
Ex op is IIC T4 Gb
Ex db op is IIC T◇ Gb
Ex db op pr IIC T◇ Gb
Ex db eb op is IIC T◇ Gb
Ex db eb op pr IIC T◇ Gb
Ex tb IIIC T◇°C Db
Ta = -◇°C to +◇°C

◇ This is a list of marking options that can be applied dependent upon the Connector type, see relevant tables for appropriate temperature classifications, maximum surface temperatures for dust and maximum upper ambient temperature limit.

EX-*-13***, EX-*-15***, EX-*-17***, EX-18***, 'Starline' EX Range of Connectors and Panel Mounted Receptacle Connectors

These connectors comprise an aluminium alloy bodied plug and socket to form in-line cable connections. The bodies each contain an insulator and contact pins/tubes at one end and a certified cable gland at the other. The plug and socket, when connected together, form a flamepath and are mechanically interlocked by means of a threaded nut retained by a grub screw. The range comprises five body (shell) sizes, each with a number of pin/tube size combinations. The connector shell size, pin configuration and rating are reflected in the individual type designations. The current ratings, at 1000 V maximum, are detailed in the tables below.

Design Options:

- Alternative body materials - stainless steel or brass.
- Alternative panel mounted socket forming a threaded flamepath with the associated flameproof equipment; the socket is retained by means of four screws and the cable is terminated within the equipment.
- Alternative association with a screw-on blanking cap when in-line connection is not required.
- Alternative filling of the internal free volume with epoxy resin after assembly.
- The replacement of the cable gland by an auxiliary cable clamp assembly, the connector body being completely filled with epoxy resin 50-3150FR/Cat 190 cement.
- Panel mounted receptacles may be marked Ex de IIC T6 Gb indicating they are suitable for fitting to increased safety (Ex e) enclosures when the internal free volume of the receptacle is filled with epoxy resin.

EX-*-18*** 'Starline' Range of Panel Mounted Receptacle Connectors

These connectors form a plain spigoted joint with their associated flameproof apparatus. They provide an electrical supply outlet to the 'Starline' range of plug connectors. The receptacle comprises an aluminium alloy body containing an insulator and contact pins/tubes at one end and an epoxy potted adaptor component at the other. Externally, the circular mounting flange of the receptacle assembly component provides six mounting holes to allow it to be retained to its associated enclosure with appropriate fasteners. Cable or conductors to the receptacle contact pins/tubes are terminated within the device. The plug and socket, when connected together, form a flamepath and are mechanically interlocked by means of a threaded nut retained by a grub screw. The range comprises five body (shell) sizes each with a number of pin/tube size combinations. The connector shell size, pin configuration and rating are reflected in the individual type designations. When used at 1000 V, the Ex-*-18*** connectors attain a maximum surface temperature of 59.2°C and have the same current ratings as the 'Starline' connectors, as detailed in tables below.

Design Options:

- Alternative body material - stainless steel or brass.
- Alternative association with a screw-on blanking cap when in-line connection is not required.

Sira Certification Service
Unit 6 Hawarden Industrial Park,
Hawarden, CH5 3US, United Kingdom
Tel: +44 (0) 1244 670900
Email: ukinfo@csagroup.org
Web: www.csagroupuk.org

Electrical Ratings of the 'Starline' and EX-*-18* 'Starline' Connectors**

Shell Size	Max. total current
12	210 A
16	570 A
20	1110 A
24	1740 A
28	1420 A

Pin Size	Max. current
18 AWG	3 A
16 AWG	16 A
12 AWG	30 A
10 AWG	40 A
8 AWG	50 A
4 AWG	90 A
1/0 AWG	155 A
4/0 AWG	225 A
350 MCM	325 A
500 MCM	750 A
646 MCM	940 A
777 MCM	1135 A (Alternatively >1135 A to 1490 A – See Details of Certificate Changes, Issue 4)

Ingress Protection Ratings of the 'Starline' and EX-*-18* 'Starline' Connectors independently tested according to the requirements of IEC 60529:**

The devices are suitable for:

- an ingress protection rating of IP68, tested to 10 m for a duration of 30 minutes.
- an ingress protection rating of IP66.

Specific Conditions of Use

i. The panel mounted variants may be installed in suitably certified and dimensioned flameproof equipment providing that the certification of this flameproof equipment will allow such installation.

ii. The panel mounted variants may be fitted in an increased safety enclosure when the free internal space is filled with epoxy resin and providing the certification of the enclosure will allow such installation. An electric strength test in accordance with IEC 60079-7:2007 Clause 7.1 will be performed on each unit after installation of the epoxy resin.

iii. The Ex-18 range of panel-mounted variants may be installed in a suitably certified and dimensioned flameproof equipment providing that the certification of this flameproof equipment will allow such installation. They have the following dimensioned spigot joints and are suitable for Group IIA, IIB or IIC, dependent upon the associated apparatus entry dimensions.

Shell Size	Spigot diameter (mm)	Spigot length (mm)
12	39.90/39.85	46 (+/-1)
16	49.90/49.85	46 (+/-1)
20	62.90/62.85	46 (+/-1)
24	74.90/74.85	46 (+/-1)
28	89.90/89.85	46 (+/-1)

iv. The Ex-18 range connector does not incorporate an external earth facility. It is the responsibility of the user or installer to ensure adequate earth continuity by means of guidance given within the manufacturer's installation instructions.

v. If an application requires special, continuity features, within certain connector components, seek factory opinion regarding conductive hardware options. Final configurations are the electrical system designers responsibility, as they best understand the intricacies that make up their particular electrical system, and the environment in which they exist.

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vi. When connectors to this certificate marked as Ex 'op is' are used, the source of the fibre optic radiation shall be suitably certified as compliant with EN 60079-28:2007/IEC 60079-28:2006 and shall provide an optical source in compliance with the following parameters:

T6 & T80°C (T_{amb} +40°C)	T4 & T130°C (T_{amb} +55°C)
Fibre optic source limited to a maximum signal power of 15 mW and a maximum irradiance of 5 mW/mm^2 (surface area not exceeding 400 mm^2).	Fibre optic source limited to a maximum signal power of 35 mW and a maximum irradiance of 5 mW/mm^2 (surface area not exceeding 400 mm^2).

vii. When connectors to this certificate marked as Ex 'op pr' are used, the connectors are only to be attached to an Ex d IIC Gb certified enclosure, suitable for the assigned ambient temperatures.

viii. In the case where Ex 'op pr' EPL 'Gb' certified connectors are attached to certified Ex 'd' enclosures, the Ex 'op is' power limitations for optical sources do not apply.

ix. In the case where two Ex 'op pr' EPL 'Gb' certified connectors are connected together as an inline mated pair, the Ex 'op is' power limitations for optical sources do not apply.

x. Connectors certified as Ex 'tb' EPL 'Db' must in all cases comply with the power limitations for Ex 'op is' optical sources.

Conditions Of Manufacture

i. The connectors shall be marked as detailed in the following table based upon the cement compound and type of sealing devices.

Cement compound	Sealing devices	Minimum ambient temperature
Resin 50-3150FR/Cat 190	Fluorosilicone O-rings and Silicone gaskets	-60°C
Resin 50-3150FR/Cat 190	Buna (nitrile) rubber O-rings and gaskets	-40°C
Hysol ES1002	Buna (nitrile) rubber O-rings and gaskets	-20°C

ii. The manufacturer shall provide the user with a copy of drawing no. AOGT-2T01 in order to install the cables as permitted by this certificate.

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Details of Certificate Changes:

Issue 1 – this Issue introduced the following change:

i. The Ex-133, Ex-153 and Ex-173 products in the range are authorised to be used in a +55°C ambient, the marking is amended to reflect this.

Issue 2 – this Issue introduced the following changes:

i. The introduction of a new panel mount model, Type Ex 17-1, which is identical in construction to existing models, the only difference being single pin 'Radsock technology' is used and the potting adapter length is increased by 20mm.

ii. Minor drawing modifications, which include mating thread and panel gasket details for reference purposes.

Issue 3 – this Issue introduced the following change:

i. The Product Description is amended to add the following statement:
The 'Starline' Range of Connectors and EX-*-18*** 'Starline' Range of Panel Mounted Receptacle Connectors, are fitted with O-rings for the prevention of water and dust ingress and have been independently tested according to the requirements of IEC 60529 to meet IP X6.

Issue 4 – this Issue introduced the following changes:

i. The appropriate markings for the glands were clarified in the following tables (note these tables also include revised values the maximum temperatures to be considered at the entry):

Connector style	Gas marking (See Note B)	Dust marking	Ambient temp. (°C)	Amperage restriction	Max. temp. at the point of entry (°C)	Min. cable/cond. rating (°C)
13-2, 15-2, 17-2, 13-4, 15-4, 17-4	Ex d IIC T6 Gb	Ex tb IIIC T80°C Db	-40 to +40	See note A	70	90
	Ex d IIC T5 Gb	Ex tb IIIC T95°C Db	-40 to +55	See note A	70	90
	Ex d IIC T4 Gb	Ex tb IIIC T130°C Db	-40 to +55	>1135-1490 A	135	135
13-3, 15-3, 17-3	Ex d IIC T6 Gb	Ex tb IIIC T80°C Db	-40 to +40	See note A	70	90
	Ex d IIC T5 Gb	Ex tb IIIC T95°C Db	-40 to +55	See note A	70	90
	Ex d IIC T4 Gb	Ex tb IIIC T130°C Db	-40 to +55	>1135-1490 A	135	135
17-1, 18-1	Ex de IIC T6 Gb	Ex tb IIIC T80°C Db	-40 to +40	See note A	70	90
	Ex de IIC T5 Gb	Ex tb IIIC T95°C Db	-40 to +55	See note A	70	90
	Ex de IIC T4 Gb	Ex tb IIIC T130°C Db	-40 to +55	>1135-1490 A	135	135

Note A: Amperage always limited by shell size and never greater than 1135 A in any case.

Connector style	Description
13-2, 15-2, 17-2, 13-4, 15-4, 17-4	Mech. clamp w/ cement or basketweave cable grips w/ cement
13-3, 15-3, 17-3	Ex gland no cement
17-1	Panel mt. sq. flange w/ potting adapter and cement
18-1	Circular flange w/ potting adapter and cement

ii. The existing epoxy cement, Hysol Type ES1002 was replaced by Resin 50-3150FR/Cat 190, this allows the products to be used in an ambient temperature range of -40°C to +55°C (or +40°C when marked T6), the description was amended to reflect this change.

iii. The 777MCM pin size was allowed to have a maximum current of between >1135 A to 1490 A, for this application, the temperature classification is T4 and the maximum surface temperature for dust is T130°C.

iv. The table of Electrical Ratings in the description was amended to recognise corrections and the new rating for the 777MCM pin size.

v. The Condition of Certification dealing with maximum temperatures at the entry point was revised.

Issue 5 – this Issue introduced the following change:

i. The option to use of Henkel Loctite® 242 was recognised, this may be used at the threaded joint between the following: plug shell and cable adapter; receptacle shell and cable adapter; cable adapter and certified gland.

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Issue 6 – this Issue introduced the following change:

i. Following appropriate assessment to demonstrate compliance with the latest technical knowledge, the document previously listed, IEC 60079-0:2007 Ed 5 was replaced by that currently listed, and the Condition of Certification was amended to recognise the new standard.

Issue 7 – this Issue introduced the following change:

i. Issued to allow ExTR GB/SIR/ExTR13.0144/01 to replace GB/SIR/ExTR13.0144/00

Issue 8 – this Issue introduced the following change:

i. The introduction of new model types, the Fibre Optic variants; these have been assessed and are appropriately marked in accordance with IEC 60079-28:2006 Ed 1. As a result of this change new Special Conditions for Safe Use have been applied. The full range of currently available Styles is detailed in the Tables below, which replaces that in Issue 4, together with their marking, ratings etc. that are applicable:

Connector Style	Previous Marking	Fibre Optic Marking	Ambient Temp (°C)	Amperage Restriction	Max. Temp at entry point (°C)	Min. Cable Rating (°C)
13-2, 15-2, 17-2, 13-4, 15-4, 17-4	Ex d IIC T6 Gb Ex tb IIIC T80°C Db	Ex op pr IIC T6 Gb Ex op is IIC T6 Gb	-40 to +40	See note A	70	90
	Ex d IIC T5 Gb Ex tb IIIC T95°C Db	Ex op pr IIC T5 Gb Ex op is IIC T4 Gb	-40 to +55	See note A	70	90
	Ex d IIC T4 Gb Ex tb IIIC T130°C Db	----	-40 to +55	1135-1490 A	135	135
13-3, 15-3, 17-3	Ex d IIC T6 Gb Ex tb IIIC T80°C Db	Ex op pr IIC T6 Gb Ex op is IIC T6 Gb	-40 to +40	See note A	70	90
	Ex d IIC T5 Gb Ex tb IIIC T95°C Db	Ex op pr IIC T5 Gb Ex op is IIC T4 Gb	-40 to +55	See note A	70	90
	Ex d IIC T4 Gb Ex tb IIIC T130°C Db	----	-40 to +55	1135-1490 A	135	135
17-1, 18-1	Ex de IIC T6 Gb Ex tb IIIC T80°C Db	Ex op pr IIC T6 Gb Ex op is IIC T6 Gb	-40 to +40	See note A	70	90
	Ex de IIC T5 Gb Ex tb IIIC T95°C Db	Ex op pr IIC T5 Gb Ex op is IIC T4 Gb	-40 to +55	See note A	70	90
	Ex de IIC T4 Gb Ex tb IIIC T130°C Db	----	-40 to +55	1135-1490 A	135	135

Note A: Amperage always limited by shell size and never greater than 1135 A in any case.

Connector style	Description
13-2, 15-2, 17-2, 13-4, 15-4, 17-4	Mech. clamp w/ cement or basketweave cable grips w/ cement
13-3, 15-3, 17-3	Ex gland no cement
17-1	Panel mt. sq. flange w/ potting adapter and cement
18-1	Circular flange w/ potting adapter and cement

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Issue 9 - this Issue introduced the following change:

i. To permit within the 18-1 style connectors the use of alternative Hysol Type ES1002 potting compound, restricting the ambient temperature range to -20°C to +40°C when this material is used. The full range of currently available Styles is detailed in the Tables below, which replaces that in Issue 8, together with the marking, ratings etc. that are applicable:

Connector Style	Standard Marking	Fibre Optic Marking	Ambient Temp (°C)	Amperage Restriction	Max. Temp at entry point (°C)	Min. Cable Rating (°C)
13-2, 15-2, 17-2, 13-4, 15-4, 17-4	Ex d IIC T6 Gb Ex tb IIIC T80°C Db	Ex op pr IIC T6 Gb Ex op is IIC T6 Gb	-40 to +40	See note A	70	90
	Ex d IIC T5 Gb Ex tb IIIC T95°C Db	Ex op pr IIC T5 Gb Ex op is IIC T4 Gb	-40 to +55	See note A	70	90
	Ex d IIC T4 Gb Ex tb IIIC T130°C Db	----	-40 to +55	1135-1490 A	135	135
13-3, 15-3, 17-3	Ex d IIC T6 Gb Ex tb IIIC T80°C Db	Ex op pr IIC T6 Gb Ex op is IIC T6 Gb	-40 to +40	See note A	70	90
	Ex d IIC T5 Gb Ex tb IIIC T95°C Db	Ex op pr IIC T5 Gb Ex op is IIC T4 Gb	-40 to +55	See note A	70	90
	Ex d IIC T4 Gb Ex tb IIIC T130°C Db	----	-40 to +55	1135-1490 A	135	135
17-1	Ex de IIC T6 Gb Ex tb IIIC T80°C Db	Ex op pr IIC T6 Gb Ex op is IIC T6 Gb	-40 to +40	See note A	70	90
	Ex de IIC T5 Gb Ex tb IIIC T95°C Db	Ex op pr IIC T5 Gb Ex op is IIC T4 Gb	-40 to +55	See note A	70	90
	Ex de IIC T4 Gb Ex tb IIIC T130°C Db	----	-40 to +55	1135-1490 A	135	135
18-1	Ex de IIC T6 Gb Ex tb IIIC T80°C Db	----	-20 to +40	See note A	70	90
	Ex de IIC T6 Gb Ex tb IIIC T80°C Db	Ex op pr IIC T6 Gb Ex op is IIC T6 Gb	-40 to +40	See note A	70	90
	Ex de IIC T5 Gb Ex tb IIIC T95°C Db	Ex op pr IIC T5 Gb Ex op is IIC T4 Gb	-40 to +55	See note A	70	90
	Ex de IIC T4 Gb Ex tb IIIC T130°C Db	----	-40 to +55	1135-1490 A	135	135

Note A: Amperage always limited by shell size and never greater than 1135 A in any case.

Connector style	Description
13-2, 15-2, 17-2, 13-4, 15-4, 17-4	Mech. clamp w/ cement or basket weave cable grips w/ cement
13-3, 15-3, 17-3	Ex gland no cement
17-1	Panel mt. sq. flange w/ potting adapter and cement
18-1	Circular flange w/ potting adapter and cement

ii. Clarification of the Conditions of and Manufacture relating to the thermal limits of the connectors.

Sira Certification Service
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Issue 10 - this Issue introduced the following change:

i. The following connector styles were allowed to be fitted with Fluorosilicone o-rings and Silicone gaskets. In this form they are marked for a low ambient temperature of -60°C and are known as "AR" - Arctic Range Product, the part number configuration being unchanged. The table below was added and accompanies that already in the certificate for the existing -40°C low ambient option; in addition, a Special Condition for Safe Use was replaced by a modified Condition of Manufacture:

Connector Style	Standard Marking	Fibre Optic Marking	Ambient Temp. (°C)	Amperage Restriction	Max. Temp. at entry point (°C)	Min. Cable Rating (°C)
13-2, 15-2, 17-2, 13-4, 15-4, 17-4	Ex d IIC T6 Gb Ex tb IIIC T80°C Db	Ex op pr IIC T6 Gb Ex op is IIC T6 Gb	-60 to +40	See note A	70	90
	Ex d IIC T5 Gb Ex tb IIIC T95°C Db	Ex op pr IIC T5 Gb Ex op is IIC T4 Gb	-60 to +55	See note A	70	90
	Ex d IIC T4 Gb Ex tb IIIC T130°C Db	----	-60 to +55	1135-1490 A	135	135
13-3, 15-3, 17-3	Ex d IIC T6 Gb Ex tb IIIC T80°C Db	Ex op pr IIC T6 Gb Ex op is IIC T6 Gb	-60 to +40	See note A	70	90
	Ex d IIC T5 Gb Ex tb IIIC T95°C Db	Ex op pr IIC T5 Gb Ex op is IIC T4 Gb	-60 to +55	See note A	70	90
	Ex d IIC T4 Gb Ex tb IIIC T130°C Db	----	-60 to +55	1135-1490 A	135	135
17-1	Ex de IIC T6 Gb Ex tb IIIC T80°C Db	Ex op pr IIC T6 Gb Ex op is IIC T6 Gb	-60 to +40	See note A	70	90
	Ex de IIC T5 Gb Ex tb IIIC T95°C Db	Ex op pr IIC T5 Gb Ex op is IIC T4 Gb	-60 to +55	See note A	70	90
	Ex de IIC T4 Gb Ex tb IIIC T130°C Db	----	-60 to +55	1135-1490 A	135	135
18-1	Ex de IIC T6 Gb Ex tb IIIC T80°C Db	Ex op pr IIC T6 Gb Ex op is IIC T6 Gb	---- -60 to +40	---- See note A	---- 70	---- 90
	Ex de IIC T5 Gb Ex tb IIIC T95°C Db	Ex op pr IIC T5 Gb Ex op is IIC T4 Gb	-60 to +55	See note A	70	90
	Ex de IIC T4 Gb Ex tb IIIC T130°C Db	----	-60 to +55	1135-1490 A	135	135

Note A: Amperage always limited by shell size and never greater than 1135 A in any case.

ii. It was confirmed that the O-ring and gasket used in the -40°C version are made from Buna (nitrile) rubber and not EPDM rubber, drawing 10-83857 Rev G was therefore retrospectively modified.

iii. The product label was modified to add information which is out of the scope of this certificate.

iv. The amperage restrictions applied in Issues 8 and 9 were corrected.

Issue 11 - this Issue introduced the following changes:

i. Following appropriate assessment to demonstrate compliance with the latest technical knowledge, IEC 60079-0:2011 Ed.6, IEC 60079-1:2007 Ed.6, IEC 60079-7:2006 Ed.4, IEC 60079-28:2006 Ed.6 and IEC 60079-31:2013 Ed.2 were replaced by IEC 60079-0:2011 Ed.6, IEC 60079-1:2014 Ed.7, IEC 60079-7:2015 Ed.5, IEC 60079-28:2015 Ed.2 and IEC 60079-31:2013 Ed.2, the markings were updated accordingly to recognise the new standards;

ii. Permit modifications to the manufacturer's drawings raised in revision since the last variation;

iii. Inclusion of new O-ring and gasket drawings as scheduled drawings.

Issue 12 - this Issue introduced the following changes:

i. The addition of twenty five fibre optic and current-carrying variants and a modification to variant ZP-16-4F06.

ii. The marking drawing is clarified by the removal of the temperature classification column.

iii. Addition of combined marking options to the certificate according to the previously controlled marking drawing.

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Tel: +44 (0) 1244 670900
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Issue 13 - this Issue introduced the following change:

i. The introduction of a two x 373 MCN, Type P cable configurations (two conductors per contact, in an already certified 777MCM insert), between a Panel Mount Receptacle, P/N EX-17-1-C24-386SN and In-Line Plug, P/N EX-13-2-24-C24-386PN, which is fitted with a mechanical clamp (part no. ZP-W-5324-H412). A Condition of Manufacture was added The configuration has been independently tested to IP 66/IP68 (10m for 30 minutes) and is limited to the following certification coding and ambient temperature range:

Certification code:	Ex db IIC T4 Gb Ex db eb IIC T4 Gb Ex tb IIIC T130°C Db
Ambient temperature range:	Ta = -40°C to +55°C
Rating:	1135A (562.5A through each cable)

Issue 14 - this Issue introduced the following changes:

v. Update to certified label drawing 10-838356, to include the below changes:
- Addition of build site name and address on label.
- Notified Body Number on CE mark has been replaced with "XXXX".
- Russian Ex logo removed from label.
- CofC number removed from label.
- Update to "Amperage Restriction" information shown on tables 1, 2 and 3.

vi. The full range of currently available Styles is detailed in the Tables below, which replaces that in Variation 14, together with their marking, ratings, etc. that are applicable:

a. Table 1 – Standard Connector Style:

Connector Style	Standard Marking	Fibre Optic Marking	Ambient Temp (°C)	Amperage Restriction	Max. Temp at entry point (°C)	Min. Cable Rating (°C)
13-2, 15-2, 17-2, 13-4, 15-4, 17-4	Ex d IIC T6 Gb Ex tb IIIC T80°C Db	Ex op pr IIC T6 Gb Ex op is IIC T6 Gb	-40 to +40	See note A	70	90
	Ex d IIC T5 Gb Ex tb IIIC T95°C Db	Ex op pr IIC T5 Gb Ex op is IIC T4 Gb	-40 to +55	See note A	70	90
	Ex d IIC T4 Gb Ex tb IIIC T130°C Db	----	-40 to +55	1135A	135	135
13-3, 15-3, 17-3	Ex d IIC T6 Gb Ex tb IIIC T80°C Db	Ex op pr IIC T6 Gb Ex op is IIC T6 Gb	-40 to +40	See note A	70	90
	Ex d IIC T5 Gb Ex tb IIIC T95°C Db	Ex op pr IIC T5 Gb Ex op is IIC T4 Gb	-40 to +55	See note A	70	90
	Ex d IIC T4 Gb Ex tb IIIC T130°C Db	----	-40 to +55	1135A	135	135
17-1	Ex de IIC T6 Gb Ex tb IIIC T80°C Db	Ex op pr IIC T6 Gb Ex op is IIC T6 Gb	-40 to +40	See note A	70	90
	Ex de IIC T5 Gb Ex tb IIIC T95°C Db	Ex op pr IIC T5 Gb Ex op is IIC T4 Gb	-40 to +55	See note A	70	90
	Ex de IIC T4 Gb Ex tb IIIC T130°C Db	----	-40 to +55	1135A	135	135
18-1	Ex de IIC T6 Gb Ex tb IIIC T80°C Db	----	-20 to +40	See note A	70	90
	Ex de IIC T6 Gb Ex tb IIIC T80°C Db	Ex op pr IIC T6 Gb Ex op is IIC T6 Gb	-40 to +40	See note A	70	90
	Ex de IIC T5 Gb Ex tb IIIC T95°C Db	Ex op pr IIC T5 Gb Ex op is IIC T4 Gb	-40 to +55	See note A	70	90
	Ex de IIC T4 Gb Ex tb IIIC T130°C Db	----	-40 to +55	1135A	135	135

Sira Certification Service
Unit 6 Hawarden Industrial Park,
Hawarden, CH5 3US, United Kingdom
Tel: +44 (0) 1244 670900
Email: ukinfo@csagroup.org
Web: www.csagroupuk.org

Note A: Amperage always limited by shell size and never greater than 1135 A in any case.

Connector style	Description
13-2, 15-2, 17-2, 13-4, 15-4, 17-4	Mech. clamp w/ cement or basket weave cable grips w/ cement
13-3, 15-3, 17-3	Ex gland no cement
17-1	Panel mt. sq. flange w/ potting adapter and cement
18-1	Circular flange w/ potting adapter and cement

b. Table 2 – 'AR' (Arctic Range) Connector Style:

Connector Style	Standard Marking	Fibre Optic Marking	Ambient Temp. (°C)	Amperage Restriction	Max. Temp. at entry point (°C)	Min. Cable Rating (°C)
13-2, 15-2, 17-2, 13-4, 15-4, 17-4	Ex d IIC T6 Gb Ex tb IIIC T80°C Db	Ex op pr IIC T6 Gb Ex op is IIC T6 Gb	-60 to +40	See note A	70	90
	Ex d IIC T5 Gb Ex tb IIIC T95°C Db	Ex op pr IIC T5 Gb Ex op is IIC T4 Gb	-60 to +55	See note A	70	90
	Ex d IIC T4 Gb Ex tb IIIC T130°C Db	----	-60 to +55	1135A	135	135
13-3, 15-3, 17-3	Ex d IIC T6 Gb Ex tb IIIC T80°C Db	Ex op pr IIC T6 Gb Ex op is IIC T6 Gb	-60 to +40	See note A	70	90
	Ex d IIC T5 Gb Ex tb IIIC T95°C Db	Ex op pr IIC T5 Gb Ex op is IIC T4 Gb	-60 to +55	See note A	70	90
	Ex d IIC T4 Gb Ex tb IIIC T130°C Db	----	-60 to +55	1135A	135	135
17-1	Ex de IIC T6 Gb Ex tb IIIC T80°C Db	Ex op pr IIC T6 Gb Ex op is IIC T6 Gb	-60 to +40	See note A	70	90
	Ex de IIC T5 Gb Ex tb IIIC T95°C Db	Ex op pr IIC T5 Gb Ex op is IIC T4 Gb	-60 to +55	See note A	70	90
	Ex de IIC T4 Gb Ex tb IIIC T130°C Db	----	-60 to +55	1135A	135	135
18-1	---	----	----	----	----	----
	Ex de IIC T6 Gb Ex tb IIIC T80°C Db	Ex op pr IIC T6 Gb Ex op is IIC T6 Gb	-60 to +40	See note A	70	90
	Ex de IIC T5 Gb Ex tb IIIC T95°C Db	Ex op pr IIC T5 Gb Ex op is IIC T4 Gb	-60 to +55	See note A	70	90
	Ex de IIC T4 Gb Ex tb IIIC T130°C Db	----	-60 to +55	1135A	135	135

Note A: Amperage always limited by shell size and never greater than 1135 A in any case.

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