



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.:6

Status: **Current**

Date of Issue: **2014-03-25** Page 1 of 4

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

Certificate history:
Issue No. 6 (2014-3-25)
Issue No. 5 (2014-3-20)
Issue No. 4 (2013-6-19)
Issue No. 3 (2013-5-14)
Issue No. 2 (2012-10-11)
Issue No. 1 (2010-9-22)
Issue No. 0 (2010-6-22)

Electrical Apparatus: **EX-*-13***, EX-*-15***, EX-*-17***, EX-18***, 'Starline' EX Range of Connectors and Panel Mounted Receptacle Connectors**
Optional accessory:

Type of Protection: **Flameproof, Increased Safety and Dust**


Marking: Plug and receptacles:
Ex d IIC T* Gb
Ex tb IIIC T*°C Db
Ta = -40°C to +*°C
Plugs and panel-mounted receptacles:
Ex de IIC T* Gb
Ex tb IIIC T*°C Db IP6X
Ta = -40°C to +*°C
* For appropriate temperature classifications, maximum surface temperatures for dust and maximum upper ambient temperature limit, see Details of Certificate Changes, Issue 4.

Approved for issue on behalf of the IECEx Certification Body: C Ellaby

Position: Deputy Certification Manager

Signature:
(for printed version)

Date:


2014-03-25

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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](http://www.iecex.com).

Certificate issued by:
SIRA Certification Service
Rake Lane
Eccleston
Chester
CH4 9JN
United Kingdom

sira
CERTIFICATION



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Manufacturer: **Amphenol Industrial Operations**
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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 electrical 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 : 2007-04 Edition: 6	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
IEC 60079-31 : 2013 Edition: 2	Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"
IEC 60079-7 : 2006-07 Edition: 4	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/ExTR13.0064/00
GB/SIR/ExTR14.0073/00

GB/SIR/ExTR10.0201/00
GB/SIR/ExTR13.0144/00

GB/SIR/ExTR12.0248/00
GB/SIR/ExTR14.0061/00

Quality Assessment Report:

GB/SIR/QAR08.0010/00
GB/SIR/QAR08.0010/03

GB/SIR/QAR08.0010/01

GB/SIR/QAR08.0010/02



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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.

CONDITIONS OF CERTIFICATION: 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

Annexe to: IECEx SIR 10.0064X Issue 6
Applicant: Amphenol Industrial Operations
Apparatus: EX-*-13***, EX-*-15***, EX-*-17***,
EX-18***, 'Starline' EX Range of
Connectors and Panel Mounted
Receptacle Connectors



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.

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Applicant: Amphenol Industrial Operations

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



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.

Conditions Of Certification

- 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.
- 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 EN 60079-7:2007 and IEC 60079-7:2007 Clause 7.1 will be performed on each unit after installation of the epoxy resin.
- 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)

- These devices shall only be used where the maximum temperature at the point of entry on the associated enclosure does not exceed the values stated in Details of Certificate Changes 4, sub-para 4.
- 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.

Annexe to: IECEx SIR 10.0064X Issue 6

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



vi. 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.

Details of Certificate Changes (for issues 1 and above):

Issue 1 – this Issue introduced the following change:

1. 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:

1. 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.
2. Minor drawing modifications, which include mating thread and panel gasket details for reference purposes.

Issue 3 – this Issue introduced the following change:

1. 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 change:

1. 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.
2. 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.
3. The table of Electrical Ratings in the description was amended to recognise corrections and the new rating for the 777MCM pin size.
4. The Condition of Certification dealing with maximum temperatures at the entry point was revised.
5. 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 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

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 5 – this Issue introduced the following change:

1. 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.

Issue 6 – this Issue introduced the following change:

1. 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.