EC Type Examination Certificate CML 15ATEX1093X Issue 0

1 Equipment intended for use in Potentially Explosive Atmospheres Directive 94/9/EC

2 Equipment **Type TX4789 Slip Ring Unit**

3 Manufacturer **T.E.L. Engineering Limited (Trading as Trolex Engineering)**

4 Address Newby Road
Hazel Grove
Stockport
SK7 5DA
UK

5 The equipment is specified in the description of this certificate and the documents to which it refers.

6 Certification Management Limited, Unit 1 Newport Business Park, New Port Road, Ellesmere Port CH65 4LZ, UK, Notified Body Number 2503, in accordance with Article 9 of Directive 94/9/EC, 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 12.

7 If an 'X' suffix appears after the certificate number, it indicates that the equipment is subject to conditions of safe use (affecting correct installation or safe use). These are specified in Section 14.

8 This EC Type Examination certificate relates only to the design and construction of the specified equipment or component. Further requirements of Directive 94/9/EC Article 8 apply to the manufacture of the equipment or component and are separately certified.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the confidential report, has been demonstrated through compliance with the following documents:

EN 60079-0:2012 EN 60079-1:2014 EN 60079-7:2007

10 The equipment shall be marked with the following:

II 2 G

Ex db eb IIA T6 Gb

Ta= -20°C to +50°C

11 Description

The Type TX4789 Slip Ring Unit is rated at up to 500 Vac, and 250 A, with a 10 A maximum current on an individual ring circuit.

The unit is fabricated from stainless steel and comprises of a rotating cylindrical enclosure and a static inner cylindrical wall. The unit pivots on two rolling element bearings with separate seals, mounted at each end. The unit is provided with six M16 threaded holes for fitting to a mounting stool at the bottom end.

The top end bearing cap is mounted by sixteen M8 screws and forms a flanged flamepath against the cylindrical enclosure. The inner cylindrical wall forms a cylindrical flamepath against the top end bearing cap and has a retaining ring secured by sixteen M6 bolts.

At the bottom end of the unit, the bearing housing is fitted to the cylindrical enclosure by twenty M8 screws entering from the top side of the unit, and forming a flanged flamepath. The bottom end bearing cap is fitted to the bearing housing by twenty M8 screws, also forming a flanged flamepath. A cylindrical flamepath is formed between the bottom end bearing cap and the inner cylindrical wall.

The area in the centre of the inner cylindrical wall/stator is outside the flameproof enclosure on these units.

A maximum of eight M20 and one M32 threaded entries into the flameproof enclosure are provided on the bottom face of the inner cylindrical wall/stator.

Four stainless steel bolt-on access covers are fitted to rectangular facings welded to the cylindrical surface. The two smaller covers are bolted with ten M8 screws and the two larger covers a bolted with fourteen M8 screws. O-ring seals are incorporated in all of the cover and component joints of the flameproof enclosure.

All screws securing flameproof joints are made of A2 stainless steel with a yield strength of 70 Kg/cm.

The inner cylindrical wall (stator) has forty slip ring assemblies attached and the outer cylindrical wall (rotor) has the brush contact assemblies attached. A self-regulating anti-condensation heater rated at 30 W, 230 V is also fitted.

Internal termination facilities are provided for the various incoming and outgoing cables.

An increased safety terminal enclosure is mounted to the side of the flameproof rotor enclosure. This enclosure comprises of steel sheets bolted to a frame via M6 screws and rivet nuts. All joints are sealed with white silicone gaskets.
This enclosure contains a row of Ex component approved increased safety terminals and plane holes are provided in the enclosure wall to allow field wiring to these terminals by the end user.

The increased safety enclosure is mounted to a plate which is welded to the rotor enclosure. This part has five feed-through bosses which are welded to the mounting plate on one side and welded to the flameproof rotor enclosure on the other side. The feed-through bosses have a threaded flamepath to which certified cable glands are fitted, segregating the flameproof and increased safety compartments.

12 Certificate history and evaluation reports

Issue	Date	Associated report	Notes
0	27 Aug 2015	R516A/00	First issue of certificate.

Note: Drawings that describe the equipment or component are listed in the Annex.

13 Conditions of manufacture

The following conditions are required of the manufacturing process for compliance with the certification.

13.1 The flameproof compartment of each unit shall be subjected to a routine overpressure test in accordance with EN 60079-1:2014, clause 16. A pressure of 13.5 bar shall be applied for a period of at least 10 seconds. There shall be no permanent deformation or damage to the enclosure or leakage via the enclosure walls or any welded joints.

13.2 The increased safety compartment of each unit shall be subjected to a routine dielectric strength test in accordance with EN 60079-7:2007, clause 7.1. A test voltage of 2000 V r.m.s. shall be applied for 1 minute. Alternatively, a test voltage of 2400 V r.m.s. shall be maintained for 100 ms. No dielectric breakdown or flashover shall occur.

13.3 The equipment covered by this certificate includes previously certified devices. It is the manufacturer's responsibility to continually monitor the status of these certified devices. These devices shall be installed in accordance with their certificates and instructions. The manufacturer shall also inform Certification Management Limited of any changes to these devices that may impact upon the explosion safety aspects of their equipment. A copy of the appropriate certification documentation for these devices shall be provided to the end user.

13.4 Regarding to the cable glands which segregate the flameproof and increased safety compartments, and those which may be installed by the manufacturer into the entries on the flameproof enclosure; these shall be installed in accordance with their ATEX certificate, their instruction manual, and with EN 60079-14. A suitable cable shall be selected.

14 Special Conditions for Safe Use (Conditions of Certification)

The following conditions relate to safe installation and/or use of the equipment.

14.1 In some cases, the flamepath dimensions are other than the relevant minimum or maximum defined in EN 60079-1. The flamepath dimensions are specified below:

Flamepath	Type of joint	Width (L), (mm)	Gap (i_C), (mm)
Top end bearing cap to stator	Cylindrical	28.6	0.52
Bottom end bearing cap to stator	Cylindrical	28.0	0.44
Top end bearing cap to enclosure	Flanged	28.2	0.4
Bottom end bearing cap to bearing housing	Flanged	31	0.4
Bearing housing to enclosure	Flanged	40.5	0.4
Access cover plates	Flanged	25.0	0.3

The flamepath gaps, i_C, shall not be modified to be greater than those specified above and the flamepath widths, L, shall not be modified to be shorter than those specified above.

Certificate Annex

Certificate Number CML 15ATEX1093X

Equipment Type TX4789 Slip Ring Unit

Manufacturer T.E.L. Engineering Limited (Trading as Trolex Engineering)

The following documents describe the equipment or component defined in this certificate:

Issue 0

Drawing No	Sheets	Rev	Approved date	Title
1/4789/1	1 of 5	B	27 Aug 2015	Schedule Dwg – GA
1/4789/1	2 of 5	B	27 Aug 2015	Schedule Dwg – GA
1/4789/1	3 of 5	B	27 Aug 2015	Schedule Dwg – GA
1/4789/1	4 of 5	B	27 Aug 2015	Schedule Dwg – GA
3/4789/1	5 of 5	B	27 Aug 2015	Schedule Dwg – GA
IECEx 1/466/412	1 of 3	F	27 Aug 2015	Certification G A

EU Type Examination Certificate CML 15ATEX1093X Issue 1

1 Equipment intended for use in Potentially Explosive Atmospheres Directive 94/9/EC

2 Equipment **Type TX4789 Slip Ring Unit**

3 Manufacturer **T.E.L. Engineering Limited (Trading as Trolex Engineering)**

4 Address Unit 2 Levens Road
Newby Road Industrial Estate
Hazel Grove
Stockport
Cheshire
SK7 5DL
UK

5 The equipment is specified in the description of this certificate and the documents to which it refers.

6 Certification Management Limited, Unit 1 Newport Business Park, New Port Road, Ellesmere Port CH65 4LZ, UK, Notified Body Number 2503, in accordance with Article 17 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 12.

7 If an 'X' suffix appears after the certificate number, it indicates that the equipment is subject to conditions of safe use (affecting correct installation or safe use). These are specified in Section 14.

8 This EC Type Examination certificate relates only to the design and construction of the specified equipment or component. Further requirements of Directive 2014/34/EU Article 13 apply to the manufacture of the equipment or component and are separately certified.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the confidential report, has been demonstrated through compliance with the following documents:

EN 60079-0:2012 EN 60079-1:2014 EN 60079-7:2007

10 The equipment shall be marked with the following:

II 2 G

Ex db eb IIA T6 Gb

Ta= -20°C to +50°C

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11 Description

The Type TX4789 Slip Ring Unit is rated at up to 500 Vac, and 250 A, with a 10 A maximum current on an individual ring circuit.

The unit is fabricated from stainless steel and comprises of a rotating cylindrical enclosure and a static inner cylindrical wall. The unit pivots on two rolling element bearings with separate seals, mounted at each end. The unit is provided with six M16 threaded holes for fitting to a mounting stool at the bottom end.

The top end bearing cap is mounted by sixteen M8 screws and forms a flanged flamepath against the cylindrical enclosure. The inner cylindrical wall forms a cylindrical flamepath against the top end bearing cap and has a retaining ring secured by sixteen M6 bolts.

At the bottom end of the unit, the bearing housing is fitted to the cylindrical enclosure by twenty M8 screws entering from the top side of the unit, and forming a flanged flamepath. The bottom end bearing cap is fitted to the bearing housing by twenty M8 screws, also forming a flanged flamepath. A cylindrical flamepath is formed between the bottom end bearing cap and the inner cylindrical wall.

The area in the centre of the inner cylindrical wall/stator is outside the flameproof enclosure on these units.

A maximum of eight M20 and one M32 threaded entries into the flameproof enclosure are provided on the bottom face of the inner cylindrical wall/stator.

Four stainless steel bolt-on access covers are fitted to rectangular facings welded to the cylindrical surface. The two smaller covers are bolted with ten M8 screws and the two larger covers a bolted with fourteen M8 screws. O-ring seals are incorporated in all of the cover and component joints of the flameproof enclosure.

All screws securing flameproof joints are made of A2 stainless steel with a yield strength of 70 Kg/cm.

The inner cylindrical wall (stator) has forty slip ring assemblies attached and the outer cylindrical wall (rotor) has the brush contact assemblies attached. A self-regulating anti-condensation heater rated at 30 W, 230 V is also fitted.

Internal termination facilities are provided for the various incoming and outgoing cables.

An increased safety terminal enclosure is mounted to the side of the flameproof rotor enclosure. This enclosure comprises of steel sheets bolted to a frame via M6 screws and rivet nuts. All joints are sealed with white silicone gaskets.
This enclosure contains a row of Ex component approved increased safety terminals and plane holes are provided in the enclosure wall to allow field wiring to these terminals by the end user.

The increased safety enclosure is mounted to a plate which is welded to the rotor enclosure. This part has five feed-through bosses which are welded to the mounting plate on one side and welded to the flameproof rotor enclosure on the other side. The feed-through bosses have a threaded flamepath to which certified cable glands are fitted, segregating the flameproof and increased safety compartments.

Variation 1

Variation 1 introduces the following modifications

i. Update of the manufacturer's address.

ii. Update to the latest edition of the ATEX directive.

12 Certificate history and evaluation reports

Issue	Date	Associated report	Notes
0	27 Aug 2015	R516A/00	First issue of certificate.
2	25 Jul 2018	R11317A/00	Introduction of Variation 1

Note: Drawings that describe the equipment or component are listed in the Annex.

13 Conditions of manufacture

The following conditions are required of the manufacturing process for compliance with the certification.

13.1 The flameproof compartment of each unit shall be subjected to a routine overpressure test in accordance with EN 60079-1:2014, clause 16. A pressure of 13.5 bar shall be applied for a period of at least 10 seconds. There shall be no permanent deformation or damage to the enclosure or leakage via the enclosure walls or any welded joints.

13.2 The increased safety compartment of each unit shall be subjected to a routine dielectric strength test in accordance with EN 60079-7:2007, clause 7.1. A test voltage of 2000 V r.m.s. shall be applied for 1 minute. Alternatively, a test voltage of 2400 V r.m.s. shall be maintained for 100 ms. No dielectric breakdown or flashover shall occur.

13.3 The equipment covered by this certificate includes previously certified devices. It is the manufacturer's responsibility to continually monitor the status of these certified devices. These devices shall be installed in accordance with their certificates and instructions. The manufacturer shall also inform Certification Management Limited of any changes to these devices that may impact upon the explosion safety aspects of their equipment. A copy of the appropriate certification documentation for these devices shall be provided to the end user.

13.4 Regarding to the cable glands which segregate the flameproof and increased safety compartments, and those which may be installed by the manufacturer into the entries on the flameproof enclosure; these shall be installed in accordance with their ATEX certificate, their instruction manual, and with EN 60079-14. A suitable cable shall be selected.

14 Special Conditions for Safe Use (Conditions of Certification)

The following conditions relate to safe installation and/or use of the equipment.

14.1 In some cases, the flamepath dimensions are other than the relevant minimum or maximum defined in EN 60079-1. The flamepath dimensions are specified below:

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Bottom end bearing cap to bearing housing	Flanged	31	0.4
Bearing housing to enclosure	Flanged	40.5	0.4
Access cover plates	Flanged	25.0	0.3

The flamepath gaps, i_C, shall not be modified to be greater than those specified above and the flamepath widths, L, shall not be modified to be shorter than those specified above.

Certificate Annex

Certificate Number	CML 15ATEX1093X
Equipment	Type TX4789 Slip Ring Unit
Manufacturer	T.E.L. Engineering Limited (Trading as Trolex Engineering)

The following documents describe the equipment or component defined in this certificate:

Issue 0

Drawing No	Sheets	Rev	Approved date	Title
1/4789/1	1 of 5	B	27 Aug 2015	Schedule Dwg – GA
1/4789/1	2 of 5	B	27 Aug 2015	Schedule Dwg – GA
1/4789/1	3 of 5	B	27 Aug 2015	Schedule Dwg – GA
1/4789/1	4 of 5	B	27 Aug 2015	Schedule Dwg – GA
3/4789/1	5 of 5	B	27 Aug 2015	Schedule Dwg – GA
IECEx 1/466/412	1 of 3	F	27 Aug 2015	Certification G A

Issue 1

None