EC Type Examination Certificate CML 15ATEX1013X Issue 0

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

2 Equipment **Type TX470* Range of Slip Ring Units**

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:A11:2013	EN 60079-1:2007	EN 60079-7:2007
EN 60079-11:2012	EN 60079-28:2007	EN 60079-31:2014

10 The equipment shall be marked with the following:

Ⓔx II 2 G D (or II 2 G when a TX370* connector is installed)

Ex d* IIB T6 or T4** Gb
Ex tb IIIC T85°C or T135** Db
Ta= -20°C or -40°C up to +60°C**

*Code may include Ex e, [ia], [op is], depending on model
**Temperature class, assigned maximum surface temperature and ambient range depend on option selected. The manufacturer's drawings show all marking options.

11 Description

Description of Units TX4701, TX4702, TX4703 and TX4704:

This range of slip ring units comprise of a cast base and cover manufactured from a number of specified materials. The unit base houses two rolling element bearings which support a slip ring shaft which has a maximum operating speed of up to 200 rev/min. The base unit and the end of the slip ring may be machined to accept cable glands or specific component approved sockets, with or without a right angled adaptor fitted.

The number of slip rings and the height of the cover can vary to form the alternative type designations. The slip rings can be provided with between two and eight brushes per ring and the maximum rating per brush is 6 A and per slip ring is 24 A.

The maximum voltage and number of slip rings are indicated in the table below:

Type	Maximum Number of Slip Rings	Maximum Voltage*	Maximum Total Current (A)
TX4701	3	1500 Va.c., 1800 Vd.c.	18
TX4702 & TX4702X	8	1500 Va.c., 1800 Vd.c.	48
TX4703	16	1000 Va.c., 1200 Vd.c.	96
TX4704	24	1000 Va.c., 1200 Vd.c.	144
TX4704F	24	1000 Va.c., 1200 Vd.c.	144
TX4702i	4 I.S. & 3 non I.S.	60 V I.S. & 240 Va.c. non I.S.	18

* When the angled adaptor and the component approved sockets are fitted, the voltage is reduced depending upon the quantity of contacts, as specified in the component certificates of the sockets.

Options include the installation of a shaft encoder with a reduction in the number of rings for the TX4703 and TX4704 units, a longer cover for the TX4702 unit (TX4702X), installation of a receiver/converter (TX4704F), and a combination of intrinsically safe and non-intrinsically safe circuits without the right angled adapter fitted (TX4702i).

The enclosure may be provided with a potentiometer or a shaft encoder. Internal and external earth facilities are provided.

Cable entry holes are provided, for the accommodation of suitably certified flameproof entry devices. Unused entries are to be fitted with suitably approved flameproof stopping plugs.

Suitable flameproof entry devices, thread adapters and stopping plugs which are suitably certified as equipment may also be used in the manner specified above.

Description of Units TX4705 and TX4706:

The Type TX4705 Slip Ring Unit comprises a machined housing incorporating a bearing and a flange manufactured from aluminium or stainless steel with a stainless steel fabricated/welded cover of various lengths from 70 mm to 335 mm enclosing slip rings and associated brush gear. Cable entries are provided in the housing and the flange.

The slip rings are individually rated up to 2000 V, 16 A and may be used for power, signal and intrinsically safe circuits, with a maximum throughput of 268 A. The maximum voltage is reduced to 60 V for intrinsically safe circuits.

Options include:

- Provision of a cable entry in the end of the cover, in lieu of an entry in the housing; this is provided with a permanently attached cable to form a TX4706 unit.
- A reduced rating with an increased ambient temperature to +60°C to form a TX4705P unit

Model numbers are suffixed with an "i" when used with intrinsically safe circuits.

The following marking options apply:

Equipment Marking Variations				
Type	**Ambient Range**	**Temperature Class**	**Assigned Maximum surface Temperature**	**Maximum Current**
TX4705 & TX4706	-20°C to +40°C	T6	T85°C	268 A
TX4705P	-40°C to +60°C	T4	T135°C	128 A
TX4705LT & TX4706LT	-40°C to +40°C	T6	T85°C	268 A
TX4705FO (Ex op is)	-40°C to +40°C	T6	T85°C	134 A
TX4705 & TX4706	-20°C to +50°C	T6	T85°C	134 A

Cable entry holes are provided, for the accommodation of suitably certified flameproof entry devices. Unused entries are to be fitted with suitably approved flameproof stopping plugs.

Suitable flameproof entry devices, thread adapters and stopping plugs which are suitably certified as equipment may also be used in the manner specified above

Description of Unit TX4707:

The Type TX4707 Slip Ring Unit is similar in construction to the TX4705 unit, but is of a more compact design.

The Type TX4707 Slip Ring Unit comprises a machined housing incorporating two rolling element bearings and a flange manufactured from aluminium or stainless steel with a stainless steel fabricated/welded cover of length 53 mm, enclosing two slip rings and associated brush gear. Cable entries are provided in the housing and the flange.

The slip rings are individually rated up to 2000 V, with a maximum throughput of 16 A. The following marking applies to this model:

Type	Ambient Range	Temperature Class	Assigned Maximum surface Temperature	Maximum Current
TX4707	-40°C to +60°C	T6	T85°C	16 A

12 Certificate history and evaluation reports

Issue	Date	Associated report	Notes
0	19 Feb 2015	R287/00	Prime report for CML ATEX certification based on previous Baseefa certification.

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 Where the product incorporates certified parts or safety critical components the manufacturer shall ensure that any changes to those parts or components do not affect the compliance of the certified product that is the subject of this certificate.

13.2 Each unit shall be subjected to a routine overpressure test in accordance with EN 60079-1, clause 16, at the following pressures:

Model	Pressure
TX4701 to TX4704 when marked -20°C	8.7 bar
TX4701 to TX4704 when marked -40°C All units TX4705, TX4706 & TX4707	39.3 bar

The pressure shall be held for at least 10 seconds. There shall be no permanent deformation or damage to the enclosure.

13.3 When the component approved plug/socket arrangements are used as entry devices, the marked maximum electrical ratings of the equipment shall not exceed the limits defined on the component certificates for the plugs/sockets.

13.4 Factory fitted cable glands and cable shall be installed in accordance with EN 60079-14 and shall be suitable for the service temperature range.

14 Special Conditions for Safe Use (Conditions of Certification)

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

14.1 The integral cables, when fitted, must be protected against impact and be terminated in a suitable junction facility.

14.2 For slip ring units carrying intrinsically safe circuits:

- The voltage of each intrinsically safe circuit and between separate intrinsically safe circuits shall not exceed 60 V
- The sum of the maximum peak voltages of intrinsically safe and non-intrinsically safe circuits shall not exceed 1575 V
- Each intrinsically safe circuit shall be separately screened

14.3 Units fitted with a connector certified under Baseefa 06ATEX0305U or Baseefa 06ATEX0306U shall also be fitted with either the associated plug or blanking cover.

14.4 For slip ring units incorporating the fibre optic rotary joint; the optical power is to be limited to a radiated power of less than 35mW and a peak power density of less than 5 mW/mm2, as defined by EN 60079-28.

Certificate Annex

Certificate Number CML 15ATEX1013X

Equipment Type TX470* Range of Slip Ring Units

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
1/475/1	1 of 3	A	19 Feb 2015	Approval General Arrangement
1/475/1	2 of 3	A	19 Feb 2015	Approval General Arrangement
1/475/1	3 of 3	A	19 Feb 2015	Approval GA
1/475/295	1 of 1	A	19 Feb 2015	Approval GA
1/475/365	1 of 1	A	19 Feb 2015	Approval GA
1/475/465	1 of 1	A	19 Feb 2015	Approval Information
1/475/497	1 of 1	A	19 Feb 2015	Approval information
1/475/520	1 of 1	C	19 Feb 2015	Namplate update of standards
1/475/420	1 of 1	A	19 Feb 2015	Approval G.A.
1/4705/220	1 of 1	A	19 Feb 2015	Approval Drawing
1/4705/245	1 of 1	A	19 Feb 2015	Approval Information
1/4705/293	1 of 1	A	19 Feb 2015	General Arrangement
1/4705/565	1 of 1	B	19 Feb 2015	TX4705 Name Plates
1/4705/012	1 of 3	A	19 Feb 2015	Approval GA
1/4705/012	2 of 3	G	19 Feb 2015	Approval GA
1/4705/012	3 of 3	G	19 Feb 2015	Approval GA
1/4707/100	1 of 2	B	19 Feb 2015	Schedule Drawing
1/4707/100	2 of 2	C	19 Feb 2015	Schedule Drawing

EU Type Examination Certificate CML 15ATEX1013X Issue 1

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

2 Equipment **Type TX470* Range of Slip Ring Units**

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 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 EU 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:A11:2013	EN 60079-1:2007	EN 60079-7:2007
EN 60079-11:2012	EN 60079-28:2007	EN 60079-31:2014

10 The equipment shall be marked with the following:

Ⓔx II 2 G D (or II 2 G when a TX370* connector is installed)

Ex d* IIB T6 or T4** Gb
Ex tb IIIC T85°C or T135** Db
Ta= -20°C or -40°C up to +60°C**

*Code may include Ex e, [ia], [op is], depending on model
**Temperature class, assigned maximum surface temperature and ambient range depend on option selected. The manufacturer's drawings show all marking options.
Note: Dust marking does not apply to the TX4705X-FCS

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Technical Manager

11 Description

Description of Units TX4701, TX4702, TX4703 and TX4704:

This range of slip ring units comprise of a cast base and cover manufactured from a number of specified materials. The unit base houses two rolling element bearings which support a slip ring shaft which has a maximum operating speed of up to 200 rev/min. The base unit and the end of the slip ring may be machined to accept cable glands or specific component approved sockets, with or without a right angled adaptor fitted.

The number of slip rings and the height of the cover can vary to form the alternative type designations. The slip rings can be provided with between two and eight brushes per ring and the maximum rating per brush is 6 A and per slip ring is 24 A.

The maximum voltage and number of slip rings are indicated in the table below:

Type	Maximum Number of Slip Rings	Maximum Voltage*	Maximum Total Current (A)
TX4701	3	1500 Va.c., 1800 Vd.c.	18
TX4702 & TX4702X	8	1500 Va.c., 1800 Vd.c.	48
TX4703	16	1000 Va.c., 1200 Vd.c.	96
TX4704	24	1000 Va.c., 1200 Vd.c.	144
TX4704F	24	1000 Va.c., 1200 Vd.c.	144
TX4702i	4 I.S. & 3 non I.S.	60 V I.S. & 240 Va.c. non I.S.	18

* When the angled adaptor and the component approved sockets are fitted, the voltage is reduced depending upon the quantity of contacts, as specified in the component certificates of the sockets.

Options include the installation of a shaft encoder with a reduction in the number of rings for the TX4703 and TX4704 units, a longer cover for the TX4702 unit (TX4702X), installation of a receiver/converter (TX4704F), and a combination of intrinsically safe and non-intrinsically safe circuits without the right angled adapter fitted (TX4702i).

The enclosure may be provided with a potentiometer or a shaft encoder. Internal and external earth facilities are provided.

Cable entry holes are provided, for the accommodation of suitably certified flameproof entry devices. Unused entries are to be fitted with suitably approved flameproof stopping plugs.

Suitable flameproof entry devices, thread adapters and stopping plugs which are suitably certified as equipment may also be used in the manner specified above.

Description of Units TX4705 and TX4706:

The Type TX4705 Slip Ring Unit comprises a machined housing incorporating a bearing and a flange manufactured from aluminium or stainless steel with a stainless steel fabricated/welded cover of various lengths from 70 mm to 335 mm enclosing slip rings and associated brush gear. Cable entries are provided in the housing and the flange.

The slip rings are individually rated up to 2000 V, 16 A and may be used for power, signal and intrinsically safe circuits, with a maximum throughput of 268 A. The maximum voltage is reduced to 60 V for intrinsically safe circuits.

Options include:

- Provision of a cable entry in the end of the cover, in lieu of an entry in the housing; this is provided with a permanently attached cable to form a TX4706 unit.
- A reduced rating with an increased ambient temperature to +60°C to form a TX4705P unit

Model numbers are suffixed with an "i" when used with intrinsically safe circuits.

The following marking options apply:

Equipment Marking Variations				
Type	**Ambient Range**	**Temperature Class**	**Assigned Maximum surface Temperature**	**Maximum Current**
TX4705 & TX4706	-20°C to +40°C	T6	T85°C	268 A
TX4705P	-40°C to +60°C	T4	T135°C	128 A
TX4705LT & TX4706LT	-40°C to +40°C	T6	T85°C	268 A
TX4705FO (Ex op is)	-40°C to +40°C	T6	T85°C	134 A
TX4705 & TX4706	-20°C to +50°C	T6	T85°C	134 A

Cable entry holes are provided, for the accommodation of suitably certified flameproof entry devices. Unused entries are to be fitted with suitably approved flameproof stopping plugs.

Suitable flameproof entry devices, thread adapters and stopping plugs which are suitably certified as equipment may also be used in the manner specified above

Description of Unit TX4707:

The Type TX4707 Slip Ring Unit is similar in construction to the TX4705 unit, but is of a more compact design.

The Type TX4707 Slip Ring Unit comprises a machined housing incorporating two rolling element bearings and a flange manufactured from aluminium or stainless steel with a stainless steel fabricated/welded cover of length 53 mm, enclosing two slip rings and associated brush gear. Cable entries are provided in the housing and the flange.

The slip rings are individually rated up to 2000 V, with a maximum throughput of 16 A. The following marking applies to this model:

Type	Ambient Range	Temperature Class	Assigned Maximum surface Temperature	Maximum Current
TX4707	-40°C to +60°C	T6	T85°C	16 A

Variation 1

Variation 1 introduces the following modifications

i. Introduction of model TX4705X-FCS.

The TX4705X-FCS is similar in construction to the existing TX4701 to TX4704, except it has a shorter cover and differing flamepath dimensions on the shaft/bore arrangement.

The maximum voltage, current and number of slip rings of the TX4705X-FCS are specified in the table below:

Type	Maximum number of Slip Rings	Maximum Voltage	Maximum Total Current (A)
TX4705X-FCS	8	1500 Va.c., 2200 Vd.c.	35 A

ii. Update of the routine overpressure test requirements (Condition of Manufacture) to account for the introduction of the TX4705X-FCS.

iii. Update of references to the ATEX Directive from 94/9/EC to 2014/34/EU.

12 Certificate history and evaluation reports

Issue	Date	Associated report	Notes
0	19 Feb 2015	R287/00	Prime report for CML ATEX certification based on previous Baseefa certification.
1	01 July 2016	R1207A/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 Where the product incorporates certified parts or safety critical components the manufacturer shall ensure that any changes to those parts or components do not affect the compliance of the certified product that is the subject of this certificate.

13.2 Each unit shall be subjected to a routine overpressure test in accordance with EN 60079-1, clause 16, at the following pressures:

Model	Pressure
TX4701 to TX4704 and TX4705X-FCS when marked -20°C	8.7 bar
TX4701 to TX4704 and TX4705X-FCS when marked -40°C	39.3 bar
TX4705, TX4706 & TX4707	39.3 bar

The pressure shall be held for at least 10 seconds. There shall be no permanent deformation or damage to the enclosure.

13.3 When the component approved plug/socket arrangements are used as entry devices, the marked maximum electrical ratings of the equipment shall not exceed the limits defined on the component certificates for the plugs/sockets.

13.4 Factory fitted cable glands and cable shall be installed in accordance with EN 60079-14 and shall be suitable for the service temperature range.

14 Special Conditions for Safe Use (Conditions of Certification)

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

14.1 The integral cables, when fitted, must be protected against impact and be terminated in a suitable junction facility.

14.2 For slip ring units carrying intrinsically safe circuits:

- The voltage of each intrinsically safe circuit and between separate intrinsically safe circuits shall not exceed 60 V
- The sum of the maximum peak voltages of intrinsically safe and non-intrinsically safe circuits shall not exceed 1575 V
- Each intrinsically safe circuit shall be separately screened

14.3 Units fitted with a connector certified under Baseefa 06ATEX0305U or Baseefa 06ATEX0306U shall also be fitted with either the associated plug or blanking cover.

14.4 For slip ring units incorporating the fibre optic rotary joint; the optical power is to be limited to a radiated power of less than 35 mW and a peak power density of less than 5 mW/mm2, as defined by EN 60079-28.

Certificate Annex

Certificate Number CML 15ATEX1013X

Equipment Type TX470* Range of Slip Ring Units

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
1/475/1	1 of 3	A	19 Feb 2015	Approval General Arrangement
1/475/1	2 of 3	A	19 Feb 2015	Approval General Arrangement
1/475/1	3 of 3	A	19 Feb 2015	Approval GA
1/475/295	1 of 1	A	19 Feb 2015	Approval GA
1/475/365	1 of 1	A	19 Feb 2015	Approval GA
1/475/465	1 of 1	A	19 Feb 2015	Approval Information
1/475/497	1 of 1	A	19 Feb 2015	Approval information
1/475/520	1 of 1	C	19 Feb 2015	Namplate update of standards
1/475/420	1 of 1	A	19 Feb 2015	Approval G.A.
1/4705/220	1 of 1	A	19 Feb 2015	Approval Drawing
1/4705/245	1 of 1	A	19 Feb 2015	Approval Information
1/4705/293	1 of 1	A	19 Feb 2015	General Arrangement
1/4705/565	1 of 1	B	19 Feb 2015	TX4705 Name Plates
1/4705/012	1 of 3	A	19 Feb 2015	Approval GA
1/4705/012	2 of 3	G	19 Feb 2015	Approval GA
1/4705/012	3 of 3	G	19 Feb 2015	Approval GA
1/4707/100	1 of 2	B	19 Feb 2015	Schedule Drawing
1/4707/100	2 of 2	C	19 Feb 2015	Schedule Drawing

Issue 1

Drawing No	Sheets	Rev	Approved date	Title
1/4705/665	1 of 1	C	01 July 2016	General Arrangement

EU Type Examination Certificate CML 15ATEX1013X Issue 2

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

2 Equipment **Type TX470* Range of Slip Ring Units**

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 EU 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:A11:2013	EN 60079-1:2007	EN 60079-7:2007
EN 60079-11:2012	EN 60079-28:2007	EN 60079-31:2014

10 The equipment shall be marked with the following:

II 2 G D (or II 2 G when a TX370* connector is installed)

Ex d* IIB T6 or T4** Gb
Ex tb IIIC T85°C or T135** Db
Ta= -20°C or -40°C up to +60°C**

*Code may include Ex e, [ia], [op is], depending on model
**Temperature class, assigned maximum surface temperature and ambient range depend on option selected. The manufacturer's drawings show all marking options.
Note: Dust marking does not apply to the TX4705X-FCS

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11 Description

Description of Units TX4701, TX4702, TX4703 and TX4704:

This range of slip ring units comprise of a cast base and cover manufactured from a number of specified materials. The unit base houses two rolling element bearings which support a slip ring shaft which has a maximum operating speed of up to 200 rev/min. The base unit and the end of the slip ring may be machined to accept cable glands or specific component approved sockets, with or without a right angled adaptor fitted.

The number of slip rings and the height of the cover can vary to form the alternative type designations. The slip rings can be provided with between two and eight brushes per ring and the maximum rating per brush is 6 A and per slip ring is 24 A.

The maximum voltage and number of slip rings are indicated in the table below:

Type	Maximum Number of Slip Rings	Maximum Voltage*	Maximum Total Current (A)
TX4701	3	1500 Va.c., 1800 Vd.c.	18
TX4702 & TX4702X	8	1500 Va.c., 1800 Vd.c.	48
TX4703	16	1000 Va.c., 1200 Vd.c.	96
TX4704	24	1000 Va.c., 1200 Vd.c.	144
TX4704F	24	1000 Va.c., 1200 Vd.c.	144
TX4702i	4 I.S. & 3 non I.S.	60 V I.S. & 240 Va.c. non I.S.	18

* When the angled adaptor and the component approved sockets are fitted, the voltage is reduced depending upon the quantity of contacts, as specified in the component certificates of the sockets.

Options include the installation of a shaft encoder with a reduction in the number of rings for the TX4703 and TX4704 units, a longer cover for the TX4702 unit (TX4702X), installation of a receiver/converter (TX4704F), and a combination of intrinsically safe and non-intrinsically safe circuits without the right angled adapter fitted (TX4702i).

The enclosure may be provided with a potentiometer or a shaft encoder. Internal and external earth facilities are provided.

Cable entry holes are provided, for the accommodation of suitably certified flameproof entry devices. Unused entries are to be fitted with suitably approved flameproof stopping plugs.

Suitable flameproof entry devices, thread adapters and stopping plugs which are suitably certified as equipment may also be used in the manner specified above.

Description of Units TX4705 and TX4706:

The Type TX4705 Slip Ring Unit comprises a machined housing incorporating a bearing and a flange manufactured from aluminium or stainless steel with a stainless steel fabricated/welded cover of various lengths from 70 mm to 335 mm enclosing slip rings and associated brush gear. Cable entries are provided in the housing and the flange.

The slip rings are individually rated up to 2000 V, 16 A and may be used for power, signal and intrinsically safe circuits, with a maximum throughput of 268 A. The maximum voltage is reduced to 60 V for intrinsically safe circuits.

Options include:

- Provision of a cable entry in the end of the cover, in lieu of an entry in the housing; this is provided with a permanently attached cable to form a TX4706 unit.
- A reduced rating with an increased ambient temperature to +60°C to form a TX4705P unit

Model numbers are suffixed with an “i" when used with intrinsically safe circuits.

The following marking options apply:

Equipment Marking Variations				
Type	**Ambient Range**	**Temperature Class**	**Assigned Maximum surface Temperature**	**Maximum Current**
TX4705 & TX4706	-20°C to +40°C	T6	T85°C	268 A
TX4705P	-40°C to +60°C	T4	T135°C	128 A
TX4705LT & TX4706LT	-40°C to +40°C	T6	T85°C	268 A
TX4705FO (Ex op is)	-40°C to +40°C	T6	T85°C	134 A
TX4705 & TX4706	-20°C to +50°C	T6	T85°C	134 A

Cable entry holes are provided, for the accommodation of suitably certified flameproof entry devices. Unused entries are to be fitted with suitably approved flameproof stopping plugs.

Suitable flameproof entry devices, thread adapters and stopping plugs which are suitably certified as equipment may also be used in the manner specified above

Description of Unit TX4707:

The Type TX4707 Slip Ring Unit is similar in construction to the TX4705 unit, but is of a more compact design.

The Type TX4707 Slip Ring Unit comprises a machined housing incorporating two rolling element bearings and a flange manufactured from aluminium or stainless steel with a stainless steel fabricated/welded cover of length 53 mm, enclosing two slip rings and associated brush gear. Cable entries are provided in the housing and the flange.

The slip rings are individually rated up to 2000 V, with a maximum throughput of 16 A. The following marking applies to this model:

Type	Ambient Range	Temperature Class	Assigned Maximum surface Temperature	Maximum Current
TX4707	-40°C to +60°C	T6	T85°C	16 A

Variation 1

Variation 1 introduces the following modifications

i. Introduction of model TX4705X-FCS.

The TX4705X-FCS is similar in construction to the existing TX4701 to TX4704, except it has a shorter cover and differing flamepath dimensions on the shaft/bore arrangement.

The maximum voltage, current and number of slip rings of the TX4705X-FCS are specified in the table below:

Type	Maximum number of Slip Rings	Maximum Voltage	Maximum Total Current (A)
TX4705X-FCS	8	1500 Va.c., 2200 Vd.c.	35 A

ii. Update of the routine overpressure test requirements (Condition of Manufacture) to account for the introduction of the TX4705X-FCS.

iii. Update of references to the ATEX Directive from 94/9/EC to 2014/34/EU.

Variation 2

Variation 2 introduces the following modification:

i. Update of the manufacturer's address.

12 Certificate history and evaluation reports

Issue	Date	Associated report	Notes
0	19 Feb 2015	R287/00	Prime report for CML ATEX certification based on previous Baseefa certification.
1	01 July 2016	R1207A/00	Introduction of Variation 1
2	25 Jul. 2018	R11317A/00	Introduction of Variation 2

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 Where the product incorporates certified parts or safety critical components the manufacturer shall ensure that any changes to those parts or components do not affect the compliance of the certified product that is the subject of this certificate.

13.2 Each unit shall be subjected to a routine overpressure test in accordance with EN 60079-1, clause 16, at the following pressures:

Model	Pressure
TX4701 to TX4704 and TX4705X-FCS when marked -20°C	8.7 bar
TX4701 to TX4704 and TX4705X-FCS when marked -40°C	39.3 bar
TX4705, TX4706 & TX4707	39.3 bar

The pressure shall be held for at least 10 seconds. There shall be no permanent deformation or damage to the enclosure.

13.3 When the component approved plug/socket arrangements are used as entry devices, the marked maximum electrical ratings of the equipment shall not exceed the limits defined on the component certificates for the plugs/sockets.

13.4 Factory fitted cable glands and cable shall be installed in accordance with EN 60079-14 and shall be suitable for the service temperature range.

14 Special Conditions for Safe Use (Conditions of Certification)

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

14.1 The integral cables, when fitted, shall be protected against impact and be terminated in a suitable junction facility.

14.2 For slip ring units carrying intrinsically safe circuits:

- The voltage of each intrinsically safe circuit and between separate intrinsically safe circuits shall not exceed 60 V
- The sum of the maximum peak voltages of intrinsically safe and non-intrinsically safe circuits shall not exceed 1575 V
- Each intrinsically safe circuit shall be separately screened

14.3 Units fitted with a connector certified under Baseefa 06ATEX0305U or Baseefa 06ATEX0306U shall also be fitted with either the associated plug or blanking cover.

14.4 For slip ring units incorporating the fibre optic rotary joint; the optical power is to be limited to a radiated power of less than 35 mW and a peak power density of less than 5 mW/mm2, as defined by EN 60079-28.

Certificate Annex

Certificate Number	CML 15ATEX1013X
Equipment	Type TX470* Range of Slip Ring Units
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**
1/475/1	1 of 3	A	19 Feb 2015	Approval General Arrangement
1/475/1	2 of 3	A	19 Feb 2015	Approval General Arrangement
1/475/1	3 of 3	A	19 Feb 2015	Approval GA
1/475/295	1 of 1	A	19 Feb 2015	Approval GA
1/475/365	1 of 1	A	19 Feb 2015	Approval GA
1/475/465	1 of 1	A	19 Feb 2015	Approval Information
1/475/497	1 of 1	A	19 Feb 2015	Approval information
1/475/520	1 of 1	C	19 Feb 2015	Namplate update of standards
1/475/420	1 of 1	A	19 Feb 2015	Approval G.A.
1/4705/220	1 of 1	A	19 Feb 2015	Approval Drawing
1/4705/245	1 of 1	A	19 Feb 2015	Approval Information
1/4705/293	1 of 1	A	19 Feb 2015	General Arrangement
1/4705/565	1 of 1	B	19 Feb 2015	TX4705 Name Plates
1/4705/012	1 of 3	A	19 Feb 2015	Approval GA
1/4705/012	2 of 3	G	19 Feb 2015	Approval GA
1/4705/012	3 of 3	G	19 Feb 2015	Approval GA
1/4707/100	1 of 2	B	19 Feb 2015	Schedule Drawing
1/4707/100	2 of 2	C	19 Feb 2015	Schedule Drawing

Issue 1

Drawing No	Sheets	Rev	Approved date	**Title**
1/4705/665	1 of 1	C	01 July 2016	General Arrangement

Issue 2

None

EU Type Examination Certificate CML 15ATEX1013X Issue 3

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

2 Equipment **Type TX470* Range of Slip Ring Units**

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 EU 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:A11:2013	EN 60079-1:2007	EN 60079-7:2007
EN 60079-11:2012	EN 60079-28:2007	EN 60079-31:2014

10 The equipment shall be marked with the following:

II 2 G D (or II 2 G when a TX370* connector is installed)

Ex d* IIB T6 or T4** Gb
Ex tb IIIC T85°C or T135** Db
Ta= -20°C or -40°C up to +60°C**

*Code may include Ex e, [ia], [op is], depending on model
**Temperature class, assigned maximum surface temperature and ambient range depend on option selected. The manufacturer's drawings show all marking options.
Note: Dust marking does not apply to the TX4705X-FCS

H M Amos MIET
Technical Manager

11 Description

Description of Units TX4701, TX4702, TX4703 and TX4704:

This range of slip ring units comprise of a cast base and cover manufactured from a number of specified materials. The unit base houses two rolling element bearings which support a slip ring shaft which has a maximum operating speed of up to 200 rev/min. The base unit and the end of the slip ring may be machined to accept cable glands or specific component approved sockets, with or without a right-angled adaptor fitted.

The number of slip rings and the height of the cover can vary to form the alternative type designations. The slip rings can be provided with between two and eight brushes per ring and the maximum rating per brush is 6 A and per slip ring is 24 A.

The maximum voltage and number of slip rings are indicated in the table below:

Type	Maximum Number of Slip Rings	Maximum Voltage*	Maximum Total Current (A)
TX4701	3	1500 Va.c., 1800 Vd.c.	18
TX4702 & TX4702X	8	1500 Va.c., 1800 Vd.c.	48
TX4703	16	1000 Va.c., 1200 Vd.c.	96
TX4704	24	1000 Va.c., 1200 Vd.c.	144
TX4704F	24	1000 Va.c., 1200 Vd.c.	144
TX4702i	4 I.S. & 3 non I.S.	60 V I.S. & 240 Va.c. non I.S.	18

* When the angled adaptor and the component approved sockets are fitted, the voltage is reduced depending upon the quantity of contacts, as specified in the component certificates of the sockets.

Options include the installation of a shaft encoder with a reduction in the number of rings for the TX4703 and TX4704 units, a longer cover for the TX4702 unit (TX4702X), installation of a receiver/converter (TX4704F), and a combination of intrinsically safe and non-intrinsically safe circuits without the right-angled adapter fitted (TX4702i).

The enclosure may be provided with a potentiometer or a shaft encoder. Internal and external earth facilities are provided.

Cable entry holes are provided, for the accommodation of suitably certified flameproof entry devices. Unused entries are to be fitted with suitably approved flameproof stopping plugs.

Suitable flameproof entry devices, thread adapters and stopping plugs which are suitably certified as equipment may also be used in the manner specified above.

Description of Units TX4705 and TX4706:

The Type TX4705 Slip Ring Unit comprises a machined housing incorporating a bearing and a flange manufactured from aluminium or stainless steel with a stainless steel fabricated/welded cover of various lengths from 70 mm to 335 mm enclosing slip rings and associated brush gear. Cable entries are provided in the housing and the flange.

The slip rings are individually rated up to 2000 V, 16 A and may be used for power, signal and intrinsically safe circuits, with a maximum throughput of 268 A. The maximum voltage is reduced to 60 V for intrinsically safe circuits.

Options include:

- Provision of a cable entry in the end of the cover, in lieu of an entry in the housing; this is provided with a permanently attached cable to form a TX4706 unit.
- A reduced rating with an increased ambient temperature to +60°C to form a TX4705P unit

Model numbers are suffixed with an “i" when used with intrinsically safe circuits.

The following marking options apply:

Equipment Marking Variations				
Type	**Ambient Range***	**Temperature Class**	**Assigned Maximum surface Temperature**	**Maximum Current**
TX4705 & TX4706	-20°C to +40°C	T6	T85°C	268 A
TX4705P	-40°C to +60°C	T4	T135°C	128 A
TX4705LT & TX4706LT	-40°C to +40°C	T6	T85°C	268 A
TX4705FO (Ex op is)	-40°C to +40°C	T6	T85°C	134 A
TX4705 & TX4706	-20°C to +50°C	T6	T85°C	134 A

* When the component approved connector and adapter arrangements are used, the minimum ambient temperature shall be no lower than -20°C, and the maximum ambient temperatures are as defined above, but shall be no greater than +55°C

Cable entry holes are provided, for the accommodation of suitably certified flameproof entry devices. Unused entries are to be fitted with suitably approved flameproof stopping plugs.

Suitable flameproof entry devices, thread adapters and stopping plugs which are suitably certified as equipment may also be used in the manner specified above. On the TX4705, as an alternative to cable gland entries, an adapter and connector arrangement may be used.

Description of Unit TX4707:

The Type TX4707 Slip Ring Unit is similar in construction to the TX4705 unit, but is of a more compact design.

The Type TX4707 Slip Ring Unit comprises a machined housing incorporating two rolling element bearings and a flange manufactured from aluminium or stainless steel with a stainless steel fabricated/welded cover of length 53 mm, enclosing two slip rings and associated brush gear. Cable gland entries are provided in the housing and the flange. As an alternative to cable gland entries, an adapter and connector arrangement may be used.

The slip rings are individually rated up to 2000 V, with a maximum throughput of 16 A. The following marking applies to this model:

Type	Ambient Range*	Temperature Class	Assigned Maximum surface Temperature	Maximum Current
TX4707	-40°C to +60°C	T6	T85°C	16 A

* When the component approved connector and adapter arrangements are used, the ambient temperature range shall be limited to -20°C to +55°C.

Variation 1

Variation 1 introduces the following modifications

i. Introduction of model TX4705X-FCS.

The TX4705X-FCS is similar in construction to the existing TX4701 to TX4704, except it has a shorter cover and differing flamepath dimensions on the shaft/bore arrangement.

The maximum voltage, current and number of slip rings of the TX4705X-FCS are specified in the table below:

Type	Maximum number of Slip Rings	Maximum Voltage	Maximum Total Current (A)
TX4705X-FCS	8	1500 Va.c., 2200 Vd.c.	35 A

ii. Update of the routine overpressure test requirements (Condition of Manufacture) to account for the introduction of the TX4705X-FCS.

iii. Update of references to the ATEX Directive from 94/9/EC to 2014/34/EU.

Variation 2

Variation 2 introduces the following modification:

i. Update of the manufacturer's address.

Variation 3

Variation 3 introduces the following modifications:

i. Introduction of the option to use a component approved connector and adapter arrangement as an alternative to the cable gland entry arrangements on the TX4705 and TX4707.
ii. The certificate description and Conditions of Manufacture have been updated to account for the above modification.
iii. Minor change to the enclosure diameter of the TX4707.

12 Certificate history and evaluation reports

Issue	Date	Associated report	Notes
0	19 Feb 2015	R287/00	Prime report for CML ATEX certification based on previous Baseefa certification.
1	01 July 2016	R1207A/00	Introduction of Variation 1
2	25 Jul. 2018	R11317A/00	Introduction of Variation 2
3	31 July 2018	R11879A/00	Introduction of Variation 3

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 Where the product incorporates certified parts or safety critical components the manufacturer shall ensure that any changes to those parts or components do not affect the compliance of the certified product that is the subject of this certificate.

13.2 Each unit shall be subjected to a routine overpressure test in accordance with EN 60079-1, clause 16, at the following pressures:

Model	Pressure
TX4701 to TX4704 and TX4705X-FCS when marked -20°C	8.7 bar
TX4701 to TX4704 and TX4705X-FCS when marked -40°C	39.3 bar
TX4705*, TX4706 & TX4707* * Without component approved plug/socket arrangement fitted)	39.3 bar
TX4705 & TX4707 (with component approved plug/socket arrangement fitted)	7.8 bar

The pressure shall be held for at least 10 seconds. There shall be no permanent deformation or damage to the enclosure.

13.3 When the component approved plug/socket arrangements are used as entry devices, the marked maximum electrical ratings of the equipment shall not exceed the limits defined on the component certificates for the plugs/sockets.

13.4 Factory fitted cable glands and cable shall be installed in accordance with EN 60079-14 and shall be suitable for the service temperature range.

13.5 The length of the enclosure of the TX4705 shall be no greater than 100 mm when the component approved plug/socket arrangements are fitted.

14 Special Conditions for Safe Use (Conditions of Certification)

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

14.1 The integral cables, when fitted, shall be protected against impact and be terminated in a suitable junction facility.

14.2 For slip ring units carrying intrinsically safe circuits:

- The voltage of each intrinsically safe circuit and between separate intrinsically safe circuits shall not exceed 60 V
- The sum of the maximum peak voltages of intrinsically safe and non-intrinsically safe circuits shall not exceed 1575 V
- Each intrinsically safe circuit shall be separately screened

14.3 Units fitted with a connector certified under Baseefa 06ATEX0305U or Baseefa 06ATEX0306U shall also be fitted with either the associated plug or blanking cover.

14.4 For slip ring units incorporating the fibre optic rotary joint; the optical power is to be limited to a radiated power of less than 35 mW and a peak power density of less than 5 mW/mm2, as defined by EN 60079-28.

Certificate Annex

Certificate Number	CML 15ATEX1013X
Equipment	Type TX470* Range of Slip Ring Units
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**
1/475/1	1 of 3	A	19 Feb 2015	Approval General Arrangement
1/475/1	2 of 3	A	19 Feb 2015	Approval General Arrangement
1/475/1	3 of 3	A	19 Feb 2015	Approval GA
1/475/295	1 of 1	A	19 Feb 2015	Approval GA
1/475/365	1 of 1	A	19 Feb 2015	Approval GA
1/475/465	1 of 1	A	19 Feb 2015	Approval Information
1/475/497	1 of 1	A	19 Feb 2015	Approval information
1/475/520	1 of 1	C	19 Feb 2015	Namplate update of standards
1/475/420	1 of 1	A	19 Feb 2015	Approval G.A.
1/4705/220	1 of 1	A	19 Feb 2015	Approval Drawing
1/4705/245	1 of 1	A	19 Feb 2015	Approval Information
1/4705/293	1 of 1	A	19 Feb 2015	General Arrangement
1/4705/565	1 of 1	B	19 Feb 2015	TX4705 Name Plates
1/4705/012	1 of 3	A	19 Feb 2015	Approval GA
1/4705/012	2 of 3	G	19 Feb 2015	Approval GA
1/4705/012	3 of 3	G	19 Feb 2015	Approval GA
1/4707/100	1 of 2	B	19 Feb 2015	Schedule Drawing
1/4707/100	2 of 2	C	19 Feb 2015	Schedule Drawing

Issue 1

Drawing No	Sheets	Rev	Approved date	**Title**
1/4705/665	1 of 1	C	01 July 2016	General Arrangement

Issue 2

None

Issue 3

Drawing No	Sheets	Rev	Approved date	**Title**
1/4707/100	3 of 3	B	31/07/2018	Schedule drawing, sheet 3

EU Type Examination Certificate CML 15ATEX1013X Issue 4

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

2 Equipment **Type TX470* Range of Slip Ring Units**

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 CML B.V., Chamber of Commerce No 6738671, Koopvaardijweg 32, 4906CV Oosterhout, The Netherlands, Notified Body Number 2776, 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 EU 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 IEC 60079-0:2018	EN 60079-1:2014	EN 60079-7:2015+A1:2018
EN 60079-11:2012	EN 60079-28:2015	EN 60079-31:2014

10 The equipment shall be marked with the following:

 II 2 G D(or II 2 G when a TX370* connector is installed)

Ex Ex db* IIB T6 or T4** Gb

Ex tb IIIC T85°C or T135** Db

Ta= -20°C or -40°C up to +60°C**

*Code may include Ex eb, [ia], [op is], depending on model

**Temperature class, assigned maximum surface temperature and ambient range depend on option selected. The manufacturer's drawings show all marking options.

Note: Dust marking does not apply to the TX4705X-FCS

11 Description

Description of Units TX4701, TX4702, TX4703 and TX4704:

This range of slip ring units comprise of a cast base and cover manufactured from a number of specified materials. The unit base houses two rolling element bearings which support a slip ring shaft which has a maximum operating speed of up to 200 rev/min. The base unit and the end of the slip ring may be machined to accept cable glands or specific component approved sockets, with or without a right-angled adaptor fitted.

The number of slip rings and the height of the cover can vary to form the alternative type designations. The slip rings can be provided with between two and eight brushes per ring and the maximum rating per brush is 6 A and per slip ring is 24 A.

The maximum voltage and number of slip rings are indicated in the table below:

Type	Maximum Number of Slip Rings	Maximum Voltage*	Maximum Total Current (A)
TX4701	3	1500 Va.c., 1800 Vd.c.	18
TX4702 & TX4702X	8	1500 Va.c., 1800 Vd.c.	48
TX4703	16	1000 Va.c., 1200 Vd.c.	96
TX4704	24	1000 Va.c., 1200 Vd.c.	144
TX4704F	24	1000 Va.c., 1200 Vd.c.	144
TX4702i	4 I.S. & 3 non I.S.	60 V I.S. & 240 Va.c. non I.S.	18

* When the angled adaptor and the component approved sockets are fitted, the voltage is reduced depending upon the quantity of contacts, as specified in the component certificates of the sockets.

Options include the installation of a shaft encoder with a reduction in the number of rings for the TX4703 and TX4704 units, a longer cover for the TX4702 unit (TX4702X), installation of a receiver/converter (TX4704F), and a combination of intrinsically safe and non-intrinsically safe circuits without the right-angled adapter fitted (TX4702i).

The enclosure may be provided with a potentiometer or a shaft encoder. Internal and external earth facilities are provided.

Cable entry holes are provided, for the accommodation of suitably certified flameproof entry devices. Unused entries are to be fitted with suitably approved flameproof stopping plugs.

Suitable flameproof entry devices, thread adapters and stopping plugs which are suitably certified as equipment may also be used in the manner specified above.

Description of Units TX4705 and TX4706:

The Type TX4705 Slip Ring Unit comprises a machined housing incorporating a bearing and a flange manufactured from aluminium or stainless steel with a stainless steel fabricated/welded cover of various lengths from 70 mm to 335 mm enclosing slip rings and associated brush gear. Cable entries are provided in the housing and the flange.

The slip rings are individually rated up to 2000 V, 16 A and may be used for power, signal and intrinsically safe circuits, with a maximum throughput of 268 A. The maximum voltage is reduced to 60 V for intrinsically safe circuits.

Options include:

- Provision of a cable entry in the end of the cover, in lieu of an entry in the housing; this is provided with a permanently attached cable to form a TX4706 unit.
- A reduced rating with an increased ambient temperature to +60°C to form a TX4705P unit

Model numbers are suffixed with an “i" when used with intrinsically safe circuits.

The following marking options apply:

Equipment Marking Variations				
Type	**Ambient Range***	**Temperature Class**	**Assigned Maximum surface Temperature**	**Maximum Current**
TX4705 & TX4706	-20°C to +40°C	T6	T85°C	268 A
TX4705P	-40°C to +60°C	T4	T135°C	128 A
TX4705LT & TX4706LT	-40°C to +40°C	T6	T85°C	268 A
TX4705FO (Ex op is)	-40°C to +40°C	T6	T85°C	134 A
TX4705 & TX4706	-20°C to +50°C	T6	T85°C	134 A

* When the component approved connector and adapter arrangements are used, the minimum ambient temperature shall be no lower than -20°C, and the maximum ambient temperatures are as defined above, but shall be no greater than +55°C

Cable entry holes are provided, for the accommodation of suitably certified flameproof entry devices. Unused entries are to be fitted with suitably approved flameproof stopping plugs.

Suitable flameproof entry devices, thread adapters and stopping plugs which are suitably certified as equipment may also be used in the manner specified above. On the TX4705, as an alternative to cable gland entries, an adapter and connector arrangement may be used.

Description of Unit TX4707:

The Type TX4707 Slip Ring Unit is similar in construction to the TX4705 unit, but is of a more compact design.

The Type TX4707 Slip Ring Unit comprises a machined housing incorporating two rolling element bearings and a flange manufactured from aluminium or stainless steel with a stainless steel fabricated/welded cover of length 53 mm, enclosing two slip rings and associated brush gear. Cable gland entries are provided in the housing and the flange. As an alternative to cable gland entries, an adapter and connector arrangement may be used.

The slip rings are individually rated up to 2000 V, with a maximum throughput of 16 A. The following marking applies to this model:

Type	Ambient Range*	Temperature Class	Assigned Maximum surface Temperature	Maximum Current
TX4707	-40°C to +60°C	T6	T85°C	16 A

* When the component approved connector and adapter arrangements are used, the ambient temperature range shall be limited to -20°C to +55°C.

Variation 1

This variation introduces the following modifications:

i. Introduction of model TX4705X-FCS.

The TX4705X-FCS is similar in construction to the existing TX4701 to TX4704, except it has a shorter cover and differing flamepath dimensions on the shaft/bore arrangement.

The maximum voltage, current and number of slip rings of the TX4705X-FCS are specified in the table below:

Type	Maximum number of Slip Rings	Maximum Voltage	Maximum Total Current (A)
TX4705X-FCS	8	1500 Va.c., 2200 Vd.c.	35 A

ii. Update of the routine overpressure test requirements (Condition of Manufacture) to account for the introduction of the TX4705X-FCS.

iii. Update of references to the ATEX Directive from 94/9/EC to 2014/34/EU.

Variation 2

This variation introduces the following modification:

i. Update of the manufacturer's address.

Variation 3

This variation introduces the following modifications:

i. Introduction of the option to use a component approved connector and adapter arrangement as an alternative to the cable gland entry arrangements on the TX4705 and TX4707.
ii. The certificate description and Conditions of Manufacture have been updated to account for the above modification.
iii. Minor change to the enclosure diameter of the TX4707.

Variation 4

This variation introduces the following modifications:

i. Updating EN 60079-0:2012:A11:2013 to EN IEC 60079-0:2018
ii. Updating EN 60079-1:2007 to EN 60079-1:2014
iii. Updating EN 60079-7 to EN IEC 60079-7:2015+A1:2018
iv. Updating EN 60079-28:2007 to EN 60079-28:2015

12 Certificate history and evaluation reports

Issue	Date	Associated report	Notes
0	19 Feb 2015	R287/00	Prime report for CML ATEX certification based on previous Baseefa certification.
1	01 July 2016	R1207A/00	Introduction of Variation 1
2	25 Jul. 2018	R11317A/00	Introduction of Variation 2
3	31 July 2018	R11879A/00	Introduction of Variation 3
4	27 May 2022	R15325E/00	Introduction of Variation 4

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.

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

i. Where the product incorporates certified parts or safety critical components the manufacturer shall ensure that any changes to those parts or components do not affect the compliance of the certified product that is the subject of this certificate.

ii. Each unit shall be subjected to a routine overpressure test in accordance with EN 60079-1, clause 16, at the following pressures:

Model	Pressure
TX4701 to TX4704 and TX4705X-FCS when marked -20°C	8.7 bar

TX4701 to TX4704 and TX4705X-FCS when marked -40°C	39.3 bar
TX4705*, TX4706 & TX4707* * Without component approved plug/socket arrangement fitted)	39.3 bar
TX4705 & TX4707 (with component approved plug/socket arrangement fitted)	7.8 bar

The pressure shall be held for at least 10 seconds. There shall be no permanent deformation or damage to the enclosure.

iii. When the component approved plug/socket arrangements are used as entry devices, the marked maximum electrical ratings of the equipment shall not exceed the limits defined on the component certificates for the plugs/sockets.

iv. Factory fitted cable glands and cable shall be installed in accordance with EN 60079-14 and shall be suitable for the service temperature range.

v. The length of the enclosure of the TX4705 shall be no greater than 100 mm when the component approved plug/socket arrangements are fitted.

14 Specific Conditions of Use (Special Conditions)

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

i. The integral cables, when fitted, shall be protected against impact and be terminated in a suitable junction facility.

ii. For slip ring units carrying intrinsically safe circuits:
- The voltage of each intrinsically safe circuit and between separate intrinsically safe circuits shall not exceed 60 V
- The sum of the maximum peak voltages of intrinsically safe and non-intrinsically safe circuits shall not exceed 1575 V
- Each intrinsically safe circuit shall be separately screened

iii. Units fitted with a connector certified under Baseefa 06ATEX0305U or Baseefa 06ATEX0306U shall also be fitted with either the associated plug or blanking cover.

iv. For slip ring units incorporating the fibre optic rotary joint; the optical power is to be limited to a radiated power of less than 35 mW and a peak power density of less than 5 mW/mm2, as defined by EN 60079-28.

Certificate Annex

Certificate Number	**CML 15ATEX1013X**
Equipment	**Type TX470* Range of Slip Ring Units**
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
1/475/1	1 of 3	A	19 Feb 2015	Approval General Arrangement
1/475/1	2 of 3	A	19 Feb 2015	Approval General Arrangement
1/475/1	3 of 3	A	19 Feb 2015	Approval GA
1/475/295	1 of 1	A	19 Feb 2015	Approval GA
1/475/365	1 of 1	A	19 Feb 2015	Approval GA
1/475/465	1 of 1	A	19 Feb 2015	Approval Information
1/475/497	1 of 1	A	19 Feb 2015	Approval information
1/475/520	1 of 1	C	19 Feb 2015	Namplate update of standards
1/475/420	1 of 1	A	19 Feb 2015	Approval G.A.
1/4705/220	1 of 1	A	19 Feb 2015	Approval Drawing
1/4705/245	1 of 1	A	19 Feb 2015	Approval Information
1/4705/293	1 of 1	A	19 Feb 2015	General Arrangement
1/4705/565	1 of 1	B	19 Feb 2015	TX4705 Name Plates
1/4705/012	1 of 3	A	19 Feb 2015	Approval GA
1/4705/012	2 of 3	G	19 Feb 2015	Approval GA
1/4705/012	3 of 3	G	19 Feb 2015	Approval GA
1/4707/100	1 of 2	B	19 Feb 2015	Schedule Drawing
1/4707/100	2 of 2	C	19 Feb 2015	Schedule Drawing

Issue 1

Drawing No	Sheets	Rev	Approved date	Title
1/4705/665	1 of 1	C	01 July 2016	General Arrangement

Issue 2

None

Issue 3

Drawing No	Sheets	Rev	Approved date	**Title**
1/4707/100	3 of 3	B	31/07/2018	Schedule drawing, sheet 3

Certificate Annex

Certificate Number	**CML 15ATEX1013X**
Equipment	**Type TX470* Range of Slip Ring Units**
Manufacturer	**T.E.L Engineering Limited (Trading as Trolex Engineering)**

Issue 4

Drawing No.	Sheets	Rev	Approved date	Title
1/4707/100	1 of 1	D	May	Schedule Drawing Sheet 2
1/4707/100	1 of 1	C	May	Schedule Drawing Sheet 3
1/4705/565	1 of 1	C	May	TX4705-6 NAMEPLATES
1/475/520	1 of 1	D	May	NAMEPLATE UPDATE OF STANDARDS