EU Type Examination Certificate CML 14ATEX3025X Issue 5

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

2 Equipment **4TJB Terminal Boxes**

3 Manufacturer **Abtech Limited**

4 Address **199 Newhall Road,**
Lower Don Valley,
Sheffield,
S9 2QJ, 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, Hoogoorddreef 15, Amsterdam, 1101 BA, 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 60079-0:2012+A11:2013	EN 60079-28:2015	EN 60079-31:2014
EN 60079-33:2012	Reference to: EN 60079-7:2015	

10 The equipment shall be marked with the following:

High Voltage Enclosure	**Optical Enclosure**	**Optical Enclosure**
II 2 GD	II 2 GD	II 2 GD
Ex sb IIC/IIB T4 Gb	Ex * op is IIC/IIB T4 Gb	Ex * op pr IIC/IIB T4 Gb
Ex tb IIIC T135°C Db	Ex op is IIIC T70/80°C Db	Ex op pr IIIC T70/80°C Db
Ta= -50°C to +55°C	Ta= -50°C to +55°C	Ta= -40°C to +55°C

"" Where enclosure also has electrical connections, marking will also include Ex eb marking.*

11 Description

The 4TJB Junction Boxes are high voltage 3 Phase junction boxes, which are rated up to a maximum of 45kV and 346W, depending on the ambient temperature.

Table 1 – Ratings for High Voltage Enclosure

Ambient temperature range (°C)	Maximum Voltage rating (Volts)	Maximum Current rating (A)	Maximum Power Dissipation (Watts)	Temperature class
-50°C to +40°C	45kV	980A	346W	T4 / T135°C
-50°C to +55°C	45kV	882A	288W	T4 / T135°C

Table 2 – Optical Power

'op pr' applications	**'op is' applications**
T4/T70ºC at a maximum ambient of ≤40ºC T4/T80ºC at a maximum ambient of ≤55ºC	T4/T70ºC at a maximum ambient of ≤40ºC T4/T80ºC at a maximum ambient of ≤55ºC
When 'op pr' is used with or without terminals, the splice case is limited to 100mW and a -40ºC to 55ºC ambient temperature.	When 'op is' is used with or without terminals. Fibre optic source is limited to a maximum irradiance of 5 mW/mm^2 (surface area not exceeding 400mm^2) Signal power is limited to 35 mW@T4.

The 4TJB Junction Boxes use the Abtech Ltd, SX225 enclosures, which are component approved 'CML 15ATEX3078U / IECEx CML 15.0039U and marked Ex eb IIC Gb / Ex tb IIIC Db.. Typical dimensions are 1300mm x 1500 mm x 500mm, but may be up to 2000mm x 2000mm x 500mm.

There are three bus bars available, one per phase, each providing connections for either two, three or four conductors per phase. Each bus bar is supported by two insulators and each phase is separated by an insulated base and cover partitions, as well as partitions on both sides to ensure adequate creepage and clearance distances are met.

The terminals can be sized either M10 or M20, the manufacturer supplies the cable lugs for use by the end user. The cable lugs are not part of this approval.

The 4TJB Junction Boxes can also be supplied with appropriately Ex e approved ATEX/ IECEx anti-condensation heater and thermostat.

The 4TJB option consists of a main HV enclosure as above, but additionally includes a separate signal enclosure fitted to the side, covered under CML 14ATEX3123X.

Variation 1

This variation introduces the following changes:

i. To update the certificate to refer to the 2014/34/EU Directive.
ii. To update EN 60079-7:2007 standard reference to the latest edition, EN 60079-7:2015
iii. Update of a Special Condition for Safe Use to refer to standard EN 60079-7:2015

Variation 2

This variation introduces the following changes:

i. To include a 4TJB-125 option, which consists of an additional separate signal enclosure fitted to the side of the main high voltage enclosure.
ii. To replace current approval drawings in line with other certification.
iii. To include assessment against IEC 60079-33:2012, Special Measures to the approval.
iv. To include an option to allowed the enclosure to be painted with a coating thickness up to 2mm for 'IIB' applications.
v. To allow option to lower the marked ambient temperature from -20°C to -50°C.
vi. The description, drawing list, as well as the Conditions of Manufacture and Special Conditions of Safe Use have been amended in accordance with the above modifications.

Variation 3

This variation introduces the following change:

i. To recognise clarifications in the documentation with regards to the enclosure sizes and types of connection facilities that are permitted.

Variation 4

This variation introduces the following change:

i. To allow a description change to reflect the clarification modification listed in variation 3 above.

Variation 5

This variation introduces the following changes:

i. To transfer the CML UK ATEX Certificate to CML BV
ii. Correction of typographical errors.

12 Certificate history and evaluation reports

Issue	Date	Associated report	Notes
0	27 May 2014	R154A/00	Issue of prime certificate
1	22 Aug 2016	R976C/00	Introduction of Variation 1
2	31 May 2017	R1328A/00	Introduction of Variation 2
3	02 Mar 2018	R11596A/00	Introduction of Variation 3
4	28 Mar 2018	R11596A/01	Introduction of Variation 4
5	13 Sep 2019	R12524A/00	Introduction of Variation 5

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.

i. The products covered by this certificate incorporate separately certified devices, it is therefore the responsibility of the manufacturer to continually monitor the status of the certification associated with these devices. The manufacturer shall inform CML of any modifications of the devices that many impinge upon the explosion safety of their design.
In addition, this certificate relies on the following previously certified products. When the Junction Box is fitted with anti-condensation heater that includes a thermostat; the key attributes listed in the table below shall still be maintained by their original certificate.

Description	Certificate No.	Key Attributes
Anti-Condensation heater fitted with a thermostat	As appropriate	Suitably certified by a notified/certification body as a piece of equipment Ex e or Ex eb, with a T6 temperature class and suitable for the exposed ambient temperature. The integral thermostat of the incorporated heater shall have a limiting temperature set to no higher than 25°C. Appropriate creepage and clearances are still maintained

ii. If the terminals are fitted with cables/wiring by the manufacturer; then a routine dielectric strength test shall be carried out on each unit in accordance with EN 60079-7:2015, clause 7.1.
The test voltage shall be determined on the basis of the marked maximum rated voltage, with the appropriate safety factor and test duration applied in accordance with
EN 60079-7:2015, clause 6.1.
No flashover or breakdown shall occur.

iii. When the equipment is marked for ‘op pr’ the extreme ambient temperature limit marking that can be applied is -40°C to +55°C.

iv. Junction Boxes that are marked with the ambient range -50°C to +55°C shall only be constructed using an SX component enclosure with a minimum depth of 300 mm, without windows and fitted with silicone gaskets, as approved by CML15ATEX3078U.

v. The maximum Power of the equipment is dependent on the ambient and current rating. The maximum ambient, power and voltage ratings shall be marked in accordance with the Description on this certificate and with the approved drawings listed on this certificate.

14 Specific Conditions of Use (Special Conditions)

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

i. For junction boxes used at voltages over 11kV (Zone 1) or 15kV (Zone 2) and installed in a location where an explosive atmosphere is considered present under normal operation or fault conditions (Zones either 1, 2, 21 or 22), the installer/user shall take into account any additional risks the location/environmental conditions and installation may pose to electrical breakdown or corona discharge, such as moisture/condensation and contaminates (dust, oils/greases, etc). Additionally, the installer shall consider the cables installed to ensure they do not increase any ignition risks, (materials, size and secureness of connections, it is

additionally considered that the high voltage cables should be armoured and screened, as well as used with appropriate connection sleeves) Although above points should be adhered to, a responsible site engineer shall be consulted to address these risks within each installation application.

ii. When fitted with high voltage (45 kV maximum working voltage) terminals, the maximum dissipated power of the Junction Boxes shall be calculated in accordance with IEC/EN 60079-7:2015, Annex E.2, and shall not exceed the maximum power rating defined in the Description on this certificate.

iii. An electric strength test shall be carried out on the 4TJB Junction Boxes after it has been installed. The test shall be carried out at a value of 91 kVac r.m.s. in accordance with IEC / EN 60079-7:2015, clause 7.1.

iv. Moisture and condensation may reduce the effectiveness of the creepage distances, to reduce the risk, the environmental conditions during installation and maintenance activities shall be observed. The enclosure shall only be opened when the local ambient temperature is between 5°C and 40°C with a maximum relative humidity of 80% to temperatures up to 31°C, decreasing linearly to 50% at 40°C.

v. The following minimum creepage and clearance distances shall be maintained:

Location	Creepage	Clearance
Phase to phase	828	534
Phase to earth	564	454

vi. When the separate optical signal enclosure is marked ‘Ex op is’, the fibre optic source supplying this equipment shall be suitably certified as compliant with at least IEC / EN 60079-28:2006 or later and provide an inherently safe optical source (op is), EPL Gb, subsequently the parameters in Table 2 in the description apply. Additionally, the optical supply shall provide over-power fault protection suitable for an ELP level ‘Gb’.

vii. When the separate optical signal enclosure is marked ‘Ex eb op pr’, the fibre ST connectors contained within the optical enclosure must not be separated whilst energised if an explosive atmosphere may be present. Any fibre ST connectors within the optical enclosure which are not used must have dust covers fitted.

viii. The fibre cables entering or exiting the separate optical enclosure must be suitably protected from damage/breakages and satisfy the requirements of EN 60079-28 ‘op pr’.

ix. When anti-condensation heaters and thermostats are fitted, the user/installer shall ensure the local ambient inside the junction box does not exceed the upper ambient temperature limit.

x. The 4TJB Junction Boxes shall be installed in accordance with manufacturer’s instructions document ABTQ-120.

Certificate Annex

Certificate Number	**CML 14ATEX3025X**
Equipment	**4TJB Terminal Boxes**
Manufacturer	**Abtech Limited**

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

Issue 0

Drawing No	Sheets	Rev	Approved date	Title
ABT24705	1 of 1	A	27 May 2014	HV45 Junction Box
ABT24707	1 of 1	A	27 May 2014	40Kv Phase Barriers
ABT24708	1 of 1	A	27 May 2014	Insulator Support Plate (HV45)
ABT24709	1 of 1	A	27 May 2014	Rear Insulator
ABT24710	1 of 1	A	27 May 2014	side Insulator
ABT24711	1 of 1	A	27 May 2014	Phase Covers
ABT24712	1 of 1	A	27 May 2014	Transparent Acrylic Cover
ABT24713	1 of 1	A	27 May 2014	Cooper Bus Bars
ABT27187	1 of 1	A	27 May 2014	Certification Label 4TJB

Issue 1

None.

Issue 2

Drawing No	Sheets	Rev	Approved date	Title
ABT31885	1 of 1	A	31 May 2017	4TJB Junction Box
ABT31886	1 of 1	A	31 May 2017	45 kV Phase Barrier
ABT31887	1 of 1	A	31 May 2017	Insulator Support Plate (4TJB)
ABT31888	1 of 1	A	31 May 2017	Rear Insulator (45kV)
ABT31889	1 of 1	A	31 May 2017	Side Insulator (45kV)
ABT31890	1 of 1	A	31 May 2017	Phase Covers (4TJB)
ABT31891	1 of 1	A	31 May 2017	Transparent Acrylic Cover
ABT31892	1 of 1	A	31 May 2017	Copper Bus Bars
ABT31893	1 of 1	A	31 May 2017	Certification Label 4TJB
ATB32242	1 of 1	A	31 May 2017	4TJB-125 Junction Box

Certificate Annex

Certificate Number	**CML 14ATEX3025X**
Equipment	**4TJB Terminal Boxes**
Manufacturer	**Abtech Limited**

Issue 3

Drawing No	Sheets	Rev	Approved date	Title
ABT31885	1 of 1	B	02 Mar 2018	4TJB Junction Box
ABT31887	1 of 1	B	02 Mar 2018	Insulator Support Plate (4TJB)
ABT31892	1 of 1	B	02 Mar 2018	Copper Bus Bars
ATB32242	1 of 1	B	02 Mar 2018	4TJB-125 Junction Box

Issue 4

None.

Issue 5

None.