



EU Type Examination Certificate CML 16ATEX7322X Issue 3

- 1 Equipment intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU
- 2 Equipment **ABJB High Voltage Junction Boxes**
- 3 Manufacturer **Abtech Ltd**
- 4 Address 199 Newhall Road
Lower Don Valley
Sheffield S9 2QJ
United Kingdom
- 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.

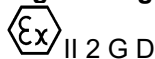
The examination and test results are recorded in the confidential reports listed in Section 12.

- 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 reference to the following documents:

EN 60079-0:2012:A11:2013, Corr3 IEC 60079-33:2012 EN 60079-31:2014
 EN 60079-28:2015 With reference to EN 60079-7:2015

- 10 The equipment shall be marked with the following:

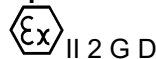
High Voltage Junction Boxes



Ex sb IIC T4 Gb or
 Ex sb IIB T4 Gb
 Ex tb IIIC T70°C/ T80°C Db

Ta= Up to -50°C to +55°C

Optical Enclosure

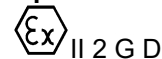


Ex * op is IIC T4 Gb or
 Ex * op is IIB T4 Gb
 Ex op is IIIC T70°C/ T80°C Db

* where enclosure also has an electrical connections, marking will also include Ex eb marking

Ta= Up to -50°C to +55°C

Optical Enclosure



Ex * op pr IIC T4 Gb or
 Ex * op pr IIB T4 Gb
 Ex op pr IIIC T70°C/T80°C Db

Ta= Up to -40°C to +55°C



11 Description

The ABBJ 15kV Range of High Voltage Junction Boxes are available in the following sizes:

Table 1 – Ratings for High Voltage Enclosure				
Junction box reference	Ambient Temperature Range	Maximum power dissipation (W)	T Class	Dust Surface Temperature Marking
ABJB-7*	-20°C to +40°C	259 W	T4	T70°C
	-50°C to +55°C	215 W	T4	T80°C
ABJB-8*	-20°C to +40°C	346 W	T4	T70°C
	-50°C to +55°C	288 W	T4	T80°C
ABJB-125	-20°C to +40°C	346 W	T4	T70°C
	-50°C to +55°C	288 W	T4	T80°C

Note: Where* is either 2 (2 Way), 3 (3 Way) or 4 (4 Way)

Table 2 – Optical Power	
'op pr' applications	'op is' applications
T4/T70°C at a maximum ambient of $\leq 40^\circ\text{C}$ T4/T80°C at a maximum ambient of $\leq 55^\circ\text{C}$	T4/T70°C at a maximum ambient of $\leq 40^\circ\text{C}$ T4/T80°C at a maximum ambient of $\leq 55^\circ\text{C}$
When 'op pr' is used with or without terminals, the splice case is limited to 100mW and a -40°C to 55°C 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 empty enclosures used for the ABBJ Junction Boxes are the Type SX Range of Enclosures, covered under CML 15ATEX3078U and marked Ex e IIC Gb / Ex tb IIIC Db. Alternatively, the terminal and optical arrangements may be fitted inside a Nautilus enclosure.

Inside the enclosure, the ABBJ Range of Junction Boxes has an arrangement of up to four copper busbars to provide connection facilities.

The busbars are supported on insulators and may accommodate up to three cables per phase, a single cable per phase or a combination, depending on the arrangement. The connecting cables are terminated via cable lugs that are fitted between busbars and have insulated partitions to provide creepage and clearance distances between live parts.

The ABBJ Junction Boxes may be fitted with a suitably certified and dimensioned heater and may have an optional isolated earth connection.

Optionally, an additional side terminal compartment may be provided for connection of fibre optic cables and a separate break-out box can be included to aid cable connections at the bottom of the



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main high voltage enclosure. The side terminal enclosure may be fitted with 'op pr' fibre optical splice cases and other 'op is' cable jointing facilities.

Cable entries used for the ABB Junction Box Enclosures shall be Ex eb IIC Gb and/or Ex tb IIIC Db, depending on the explosive atmosphere and shall be suitable for the lower ambient and 30°C above the upper ambient.

Variation 1

This variation introduces the following modifications:

- i. To correct a typographic error to the drawing list

Variation 2

This variation introduces the following modifications:

- i. To allow an alternative ABB-8* bus bar layout arrangement.
- ii. To include an option to allowed the enclosure to be painted with a coating thickness up to 2mm for 'IIB' applications.

Variation 3

This variation introduces the following modifications:

- i. To allow the terminal and optical arrangements to be fitted in an alternative Nautilus enclosure. The description has been modified accordingly. To clarify the minimum distances for the insulator arrangements.

Variation 4

This variation introduces the following modifications:

- i. To clarify the minimum distances for the insulator arrangements.

12 Certificate history and evaluation reports

Issue	Date	Associated report	Notes
0	09 Dec 2016	R1608A/00	Issue of prime certificate
1	12 Jan 2017	R1608A/01	To introduce Variation 1
2	26 May 2017	R2251A/00	To introduce Variation 2
3	04/01/2018	R11513A/00	To introduce Variation 3
4	19/02/2019	R12205A/00	To introduce Variation 4

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



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13 Conditions of manufacture

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

- 13.1 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 may 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, 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 30°C. Appropriate creepage and clearances are still maintained

- 13.2 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.
- 13.3 When fitted with high voltage (15 kV maximum working voltage) terminals, the maximum dissipated power of the Junction Boxes shall be calculated in accordance with EN 60079-7:2015, Annex E.2, and shall not exceed the maximum power rating defined in the Description on this certificate.
- 13.4 When the equipment is marked for 'op pr' the extreme ambient temperature limit marking that can be applied is -40°C to +55°C
- 13.5 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.
- 13.6 The maximum ambient temperature of the equipment is dependent on the model and maximum power dissipation/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.
- 13.7 When optional adjacent non-metallic optical enclosure is fitted, non-carbon loaded enclosures shall be fitted with the static warning label required under its component approval.



14 Special Conditions for Safe Use (Conditions of Certification)

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

- 14.1 For junction boxes used at voltage over 11kV and installed in a location where an explosive atmosphere is considered present under normal circumstances (Zones 1 or 21), the installer/user shall consider and take account of any additional risks posed by the location or the environment which may exacerbate electrical breakdown or corona discharge, such as humidity, condensation, or contaminants such as dusts, oils or greases. Additionally, the installer shall determine that the cables to be installed do not increase the ignition risk, (materials, size and secureness of connections). Cable sleeves and connection covers should be considered as a part of the cable termination.
- 14.2 During installation, the main supply screen (copper shield tape or braid) shall be twisted and crimped to a terminal lug at the end prior to being covered with heat shrink sleeving, and connected to the internal enclosure earth stud or the earth bar (where provided). When provided and used, dedicated insulated earth lead with suitable crimped terminal lugs at each end shall be provided between the earth bar and the enclosure earth stud. If an isolated earth bar is provided, e.g. for the connection of remote screen current monitoring, the main supply screen may be connected to this instead of to the enclosure earth stud.
- 14.3 When one or more isolated earth bars are provided and used for cable screens and/or cable armour, the user must ensure that a dedicated insulated earth lead is provided between the isolated earth bars then exiting the enclosure via a suitably certified IP66 cable gland. The cross section of the earth leads must be at least half that of the main supply conductors. All earth lead connection must include a crimped terminal lug and cables must be secured to the support rails to prevent reduction of the creepage and clearance distances
- 14.4 The following minimum creepage and clearance distances shall be maintained:
- | Location | Creepage | Clearance |
|----------------|----------|-----------|
| Phase to phase | 194 mm | 150 mm |
| Phase to earth | 115 mm | 90 mm |
- 14.5 Under certain extreme circumstances, the non-metallic parts of the optical enclosure (when fitted) of this equipment may generate an ignition-capable level of electrostatic charge. Therefore, the equipment shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on such surfaces. In addition, the equipment shall only be cleaned with a damp cloth.
- 14.6 When marked 'Ex op is', the fibre optic source supplying this equipment shall be suitably certified as compliant with at least 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'.
- 14.7 When marked 'Ex e 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.
- 14.8 The fibre cables entering or exiting the optical enclosure must be suitably protected from damage/breakages and satisfy the requirements of EN 60079-28 'op pr'.



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- 14.9 The ABB Junction Boxes shall be installed in accordance with manufacturer's instructions document ABTQ-80.



Certificate Annex

Certificate Number CML 16ATEX7322X
Equipment ABBJ 15kV High Voltage Junction Boxes
Manufacturer Abtech Ltd

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

Issue 0

Drawing No	Sheets	Rev	Approved date	Title
ABT31255	1 of 1	A	09/12/2016	ABJB-7* General Arrangement
ABT31256	1 of 1	A	09/12/2016	ABJB-8* General Arrangement
ABT31257	1 of 1	A	09/12/2016	ABJB-125 General Arrangement
ABT31263	1 of 1	A	09/12/2016	ABJB 125 Ex OMV
ABT31259	1 of 1	A	09/12/2016	ABJB Rear Insulation Panel
ABT31260	1 of 1	A	09/12/2016	ABJB Acrylic Cover
ABT31261	1 of 1	A	09/12/2016	ABJB Door Insulation Panel
ABT31462	1 of 1	A	09/12/2016	Box Extension Option
ABT31258	1 of 1	A	09/12/2016	ABJB Certification Label

Issue 1

No additional drawing issued, however, the above list has been modified to alter an incorrect drawing number and include a drawing previously omitted in error.

Issue 2

Drawing No	Sheets	Rev	Approved date	Title
ABT32357	1 of 1	A	26/05/2017	ABJB-8* Alternative Internals
ABT32361	1 of 1	A	26/05/2017	ABJB Rear Insulation Panel
ABT31258	1 of 1	B	26/05/2017	ABJB Certification Label

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Drawing No	Sheets	Rev	Approved date	Title
ABT33339	1 of 1	A	04/01/2018	ABNB-7x (IP68) General Arrangement

Issue 4

Drawing No	Sheets	Rev	Approved date	Title
ABT32361	1 of 1	B	??/02/2019	ABJB Rear Insulation Panel