

UK Type Examination Certificate CML 21UKEX31093X Issue 0

United Kingdom Conformity Assessment

- 1 Product or Protective System Intended for use in Potentially Explosive Atmospheres UKSI 2016:1107 (as amended) – Schedule 3A, Part 1
- 2 Equipment **SX Range of Junction Boxes**
- 3 Manufacturer **Abtech Limited**
- 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 Eurofins E&E CML Limited, Newport Business Park, New Port Road, Ellesmere Port, CH65 4LZ, United Kingdom, Approved Body Number 2503, in accordance with Regulation 43 of the Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016, UKSI 2016:1107 (as amended), 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 Schedule 1 of the Regulations.

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

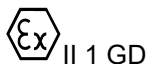
7 If an 'X' suffix appears after the certificate number, it indicates that the equipment is subject to specific conditions of use (affecting correct installation or safe use). These are specified in Section 14.

8 This UK Type Examination certificate relates only to the design and construction of the specified equipment. Further requirements of the Regulations apply to the manufacturing process and supply of the product. These are not covered by this certificate.

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:

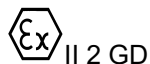
EN IEC 60079-0:2018	EN IEC 60079-7:2015+A1:2018	EN 60079-11:2012
EN 60079-28:2015	EN 60079-31:2014	

10 The equipment shall be marked with the following:



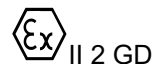
Ex ia IIB/IIC T# Ga
Ex ia op is IIB/IIC T# Ga
Ex op is IIB/IIC T# Ga
Ex ta IIIC T#°C Da

Ta = -#°C to +#°C



Ex eb IIB/IIC T# Gb
Ex ib IIB/IIC T# Gb
Ex eb op is IIB/IIC T# Gb
Ex ib op is IIB/IIC T# Gb
Ex tb IIIC T#°C Db

Ta = -#°C to +#°C



Ex eb op pr IIB/IIC T# Gb
Ex ib op pr IIB/IIC T# Gb
Ex ia op pr IIB/IIC T# Gb
Ex op pr IIB/IIC T# Gb
Ex tb IIIC T#°C Db

Ta = -40°C to +#°C

– The temperature classes and ambient temperature range is related to the type of terminal fitted, EPL and power as indicated in Table 1. For optical power applications refer to Table 2





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11 Description

The SX range of junction boxes are fitted with an arrangement of suitably certified terminals. Before the junction box is installed, its total power for particular application will be calculated in accordance with EN IEC 60079-7, Annex E, E.2 and will not exceed the values given in the table below:

Table 1. Ratings for all Junction Boxes options					
SX Ref.	EPL	Max. Power Dissipation (W), Temperature Class, Max. Surface Temp. & Ta Max. (See Table 2 below for power limits applied to equipment marked 'op is').			
		(a) T6/T85°C @40°C (b) T5/T100°C @55°C (c) T4/T135°C @80°C	(a) T6/T85°C @55°C (b) T5/T100°C @70°C (a) T4/T135°C @60°C (e) T3/T200°C @80°C	(a) T6/T85°C @60°C (b) T5/T100°C @75°C (b) T4/T135°C @80°C (b) T3/T200°C @80°C	(a) T6/T85°C @65°C (b) T5/T100°C @80°C (a) T4/T135°C @60°C (d) T3/T200°C @175°C
SX0	Ga, Gb, Db	19	3.34	2.23	1.84
	Da	9.5	1.67	1.115	0.92
SX0.5	Ga, Gb, Db	22	3.9	2.8	2.1
	Da	11	1.95	1.4	1.05
SX1	Ga, Gb, Db	29	4.97	3.86	2.7
	Da	14.5	2.485	1.93	1.35
SX1.5	Ga, Gb, Db	32	5	4	2.8
	Da	16	2.5	2	1.4
SX2	Ga, Gb, Db	36	5.64	4.23	2.88
	Da	18	2.82	2.115	1.44
SX3	Ga, Gb, Db	42	5.9	4.1	3
	Da	21	2.95	2.05	1.5
SX4	Ga, Gb, Db	44	6.1	4.36	3.19
	Da	22	3.05	2.18	1.595
SX5	Ga, Gb, Db	50	9.35	6.19	4.2
	Da	25	4.675	3.095	2.1
SX6	Ga, Gb, Db	57	10.1	7.97	5.6
	Da	28.5	5.05	3.985	2.8
SX7	Ga, Gb, Db	68	17.14	9.36	6.67
	Da	34	8.57	4.68	3.335
SX8	Ga, Gb, Db	119	15.95	15.17	10.74
	Da	59.5	7.975	7.585	5.37
SX225	Ga, Gb	359	-	103	-
SX45	Ga, Gb, Db	8	1.65	1.57	1.28
	Da	4	0.825	0.785	0.64
SX64	Ga, Gb, Db	10	0.7	0.5	0.3
	Da	5	0.35	0.25	0.15
SX66	Ga, Gb, Db	14	2	1.9	1.5
	Da	7	1	0.95	0.75

Table 2 – Optical Power	
'op pr' applications	'op is' applications
T6/T85°C at a maximum ambient of ≤ 60°C	T6/T85°C at a maximum ambient of ≤ 65°C or T4/T100°C at a maximum ambient of ≤ 80°C
When 'op pr' is used with or without terminals, the splice case is limited to 100mW and a -40°C to 60°C ambient temperature.	When 'op is' is used with or without terminals. Fibre optic source is limited for all T classes to a maximum irradiance of 5 mW/mm ² (surface area not exceeding 400 mm ²) Signal power is limited to 15 mW @T6 and 35 mW @T4.
Notes: (a), (b), (c), (d) & (e) indicated in the table above relate to the limiting temperature of the terminal insulation, refer to the 'Conditions of Manufacture'.	



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Table 3

Busbar size (Width x Thickness) (mm)	Max. current (A) for a $\Delta 30K$ rise	Max. current (A) for a $\Delta 40K$ rise	Max. current (A) for a $\Delta 50K$ rise	Max. current (A) for a $\Delta 60K$ rise	Max. current (A) for a $\Delta 70K$ rise	Max. current (A) for a $\Delta 80K$ rise
25 x 6.3	372	438	496	548	601	655
50 x 4	515	607	687	763	830	904
50 x 6.3	654	771	874	971	1057	1150
63 x 6.3	791	933	1057	1173	1277	1390
80 x 6.3	975	1151	1305	1447	1576	1715
63 x 10	1017	1173	1364	1512	1649	1795
80 x 10	1216	1436	1631	1806	1969	2143
100 x 10	1443	1705	1936	2143	2336	2541
125 x 10	1710	2021	2294	2538	2767	3008
Max. allowable ambient	Up to 90°C	Up to 80°C	Up to 70°C	Up to 60°C	Up to 50°C	40°C
Temperature Class and Max. ambient	T4@90°C T5@60°C T6@50°C	T4@80°C T5@50°C T6@40°C	T4@70°C T5@40°C	T4@60°C	T4@50°C	T4@40°C

Busbar sizes may be manufactured to sizes not specified to sizes in the table 3 above, including larger sizes in accordance with drawing 33712. The maximum allowable ambient and current will be marked on each arrangement.

The enclosures may also be manufactured to sizes not specified in the above Table 1. This assumes that any given dimension is not larger than the respective dimension of the largest or smaller than the respective dimension of the smallest enclosure. The power rating applied to a junction box of intermediate size is that of the next smallest enclosure.

Cable entries may be provided on the base, top, sides or back of the enclosure and alternatively, threaded bosses may be provided. An external and optional internal earth stud of minimum size M6 is provided on all enclosures.

The terminal boxes may be fitted with slotted trunking, an approved anti-condensation heater, plug and socket arrangements, bus-bars, as well as 'op pr' fibre optical splice cases and other 'op is' cable jointing facilities.

Optionally, the enclosure may be painted, and junction boxes marked T6/T85°C may be provided with a glass window.

12 Certificate history and evaluation reports

Issue	Date	Associated report	Notes
0	23/02/2022	R14591B/00	Issue of prime certificate

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

13 Conditions of Manufacture

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. Where the equipment is marked with both 'Ga' and 'Da', the maximum allowable power indicated on the label shall be either the lower of the two or both shall be included.
- iii. When the equipment is marked for 'op pr' the maximum ambient temperature that can be marked is -40°C to +60°C.
- iv. When trunking is fitted, it may be sited as required and the minimum creepage and clearance distances shall still be met.
- v. When marked for 'Ex ta', if terminals fitted are not suitable for a SCCA of 10 kA or above, then max. short circuit current is to be marked on the label.
- vi. When terminals are supplied with the enclosure, having a maximum insulation temperature as below. All terminals shall be installed in accordance with their Conditions of Safe Use/Schedule of Limitations/Conditions of Certification and the relevant codes of practice/wiring regulations, specifically to the minimum creepage and clearance requirements and to any limitations to ratings that may be observed due to method of installation.

The letter in the brackets next to the Temperature class and associated upper ambient relates to the following maximum operating temperatures required of the terminals fitted.				
(a)	(b)	(c)	(d)	(e)
≥ 85°C	≥ 100°C	≥ 120°C	≥ 190°C	≥ 105°C
Note: All terminals fitted shall be suitable for the lower operating temperature marked on the certification label.				

- vii. The product may be fitted with an anti-condensation heater. The heater shall be ATEX approved, with a temperature class equal or lower than the marked equipment and have an ambient temperature range that matches or exceeds that for the terminal box. Additionally, the heater shall be complete with a thermostat which prevents the operation of the heater at temperatures above +30°C.
- viii. When plug and sockets are fitted that are certified 'Ex d e' or 'Ex db eb', then the junction box marking shall include the symbol 'd' as part of the label marking code, as well as the appropriate gas/dust group marking if not 'IIC' and 'IIIC', as defined by the plug and socket approval. Any plugs and sockets shall be equipment approved.
- ix. The window option stated on the construction specification document is not permitted on the flanged lid enclosure arrangements.
- x. This certificate does not cover any plug and socket arrangements that may be fitted to the enclosure. All plug and socket arrangements fitted shall be appropriately designed to the ATEX Directive for this type of apparatus. Additionally, the plug and socket arrangements shall:
 - Be suitable for the intended temperature range of the junction box.
 - Be suitable to maintain the required creepage and clearances in accordance with EN IEC 60079-7.
 - Have a minimum ingress protection rating of IP54 (gas applications) or IP64 (if the boxes are marked for dust applications).
 - Have a declared contact resistance or power dissipation rating.
 - Be installed in accordance with their certificate conditions and the relevant codes of practice/wiring regulations.



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- xi. When busbar arrangements are provided, the maximum current, ambient temperature, as well as the corresponding temperature class shall be marked for the specific arrangement. Additionally, the appropriate cable entry temperature shall be marked.
- xii. When intermediate or larger size busbar arrangements are provided, the calculated temperature rise shall be in accordance with drawing 33712 and not exceed a rise of 80K.
- xiii. When a junction box is fitted with a Wave Division Multiplexer a Temperature Class limitation of T6 is applicable.

14 Specific Conditions of Use

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

- i. When the equipment ambient temperature is lower than -60°C , the equipment shall not be opened or worked on.
- ii. When used for Ex ia, Ex ib and Ex ta applications, over-power fault protection shall be provided and shall take into account the 'EPL' fault requirements necessary:
 - Ex ia – Two countable faults is to be applied to the current and/or voltage limiter.
 - Ex ib or Ex ta – Gb and Da applications – One countable fault is to be applied to the current and/or voltage limiter.
- iii. When used for Ex ia or Ex ib applications an anti-condensation heater may only be fitted when space permits the separation of the heater power conductors from the Ex ia or Ex ib conductors by a minimum of 50 mm.
- iv. When fitted with 'op pr' splice case, the fibre cable outside the enclosure shall be installed such, that mechanical damage is prevented.
- v. When marked 'Ex op is', the fibre optic source supplying this equipment shall be suitably certified as compliant with EN 60079-28:2015 and provide an inherently safe optical source (op is), EPL Gb, subsequently the parameters in Table 2 of the description apply.
- vi. When marked 'Ex eb op pr', the fibre connectors contained within the increased safety enclosure must not be separated whilst energised if an explosive atmosphere may be present.
- vii. If not used, fibre connectors within the increased safety enclosure must have dust covers fitted.
- viii. The fibre cables entering or exiting the increased safety enclosure must be suitably protected from breakages and satisfy the requirements of EN 60079-28 'op pr'.
- ix. When the enclosure is provided with busbar arrangements, they shall be installed in accordance with the user instructions only.
- x. Wave Division Multiplexer can only be fitted in T6 rated terminal boxes.

Certificate Annex

Certificate Number CML 21UKEX31093X
Equipment SX Range of Junction Boxes
Manufacturer Abtech Limited



The following documents describe the equipment defined in this certificate:

Issue 0

Drawing No	Sheets	Rev.	Approved date	Title
ABT28780	1 of 1	D	23 Feb 2022	SX Manufacturing Specification
ABT39135	1 of 1	A	23 Feb 2022	SX Certification Labels – ex eb, ib, ia, op is
ABT39138	1 of 1	A	23 Feb 2022	SX Certification Labels – op pr
ABT28781	1 of 1	C	23 Feb 2022	SX Range of Enclosures
ABT28782	1 of 1	A	23 Feb 2022	SX Range Large Window
ABT33712	1 of 1	A	23 Feb 2022	SX Busbar Facility
ABT31039	1 of 1	A	23 Feb 2022	GA Drawing S Range with FX Style Seal