CERTIFICATE OF CONFORMITY

1. **HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
2. **Certificate No:** **FM16US0250X**
3. **Equipment:** **SX, ZAG and BPG Junction Boxes**
   (Type Reference and Name) **Junction Boxes**
4. **Name of Listing Company:** **AB Controls & Technology Ltd**
5. **Address of Listing Company:** **Newhall Rd**
   Sheffield S9 2QJ
   United Kingdom
6. The examination and test results are recorded in confidential report number:

   0D6A6.AE dated 29th September 1998

7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

   FM 3600:2018, FM 3810:2018, ANSI/ISA 60079-0:2013, ANSI/ISA 60079-7:2013, ANSI/ISA 60079-31:2013,

8. If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.
9. This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.
10. Equipment Ratings:

    For use in the United States, the Series SX Junction Box as Increased Safety for Class I, Zone 1, AEx eb IIC T6, T5, T4, or T3 Gb; and Protection by Enclosure for Zone 21 AEx tb IIIC T85°C, T100°C, T135°C or T200°C for hazardous (classified) locations. Ambient operating temperature range is -50°C to 175°C.

    For use in the United States, the Series Zag Junction Box as Increased Safety for Class I, Zone 1, AEx eb IIC T6, T5, T4, or T3 Gb; and Protection by Enclosure for Zone 21 AEx tb IIIC T85°C, T100°C, T135°C or T180°C for hazardous (classified) locations. Ambient operating temperature range is -50°C to 150°C.

Certificate issued by:

J.E. Marquedant
VP, Manager, Electrical Systems

23 October 2018
Date

To verify the availability of the Approved product, please refer to www.approvalguide.com

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For use in the United States, the Series BPG Junction Box as Increased Safety for Class I, Zone 1, AEx eb IIC T6 or T4 Gb; and Protection by Enclosure for Zone 21 AEx tb IIIC T85°C or T100°C for hazardous (classified) locations. Ambient operating temperature range is -50°C to 90°C.

11. The marking of the equipment shall include:

SX Marking

Class I Zone 1 AEx eb IIC T6,T5,T4, or T3
Zone 21 AEx tb IIIC T85°C, T100°C, T135°C, or T200°C

ZAG Marking

Class I Zone 1 AEx eb IIC T6,T5,T4, or T3
Zone 21 AEx tb IIIC T85°C, T100°C, T135°C, or T180°C

BPG Marking

Class I Zone 1 AEx eb IIC T6 or T4
Zone 21 AEx tb IIIC T85°C or T100°C

12. **Description of Equipment:**

SX Description: The SX range of Enclosures are manufactured from steel (or alloys of steel), stainless steel, brass, or other alloys of copper. The lid is retained with a minimum of 4 captive screws. A tool is required to secure or to remove the lid. An optional 10mm minimum thickness glass window may be fitted to the inside wall of the enclosure with a maximum aperture size of 361mm x 361mm; the nominal size is 399mm x 399mm secured by 20 x M6 studs and RTV silicone sealant. The lid may be hinged and gland plates may be provided on the base, top, sides or back of the enclosure. Threaded bosses may be provided welded, brazed or soldered into position. Blanking plugs, cable glands, reducers and adapters and a breather drain may be provided into the enclosure via clearance entries or threaded holes, provided they meet the minimum IP requirements marked on the enclosure. […] An internal and external earth stud is provided on all enclosures, minimum size M6. Gaskets are manufactured from closed cell polychloroprene, neoprene bonded cork, closed cell silicone strip or solid silicone rubber. Entries for the installation of AEx certified cable entry devices may be added on site. Entry sizes are limited to no more than 0.5mm larger than the maximum diameter of the device entry thread.

ZAG Description: The ZAG boxes are manufactured from aluminium alloy having a tensile strength of not less than 145Nmm^{-2} and a magnesium content less than 6%. The boxes are fitted with gaskets of substantially round section closed cell silicone rubber. Entries maybe provided in the side wall or rear of the box. The box lid is either hinged or detachable from the box. The lid is retained with 4 or 6 captive screws. A tool is required to secure or to remove the lid. Terminal rails and chassis plates maybe secured using metal machine screws and vibration resistant washers. Terminal rails and chassis plates may be secured using metal machine screws only, The Terminal rails and chassis plates maybe secured the torque limit for M6 screws a Min of 4Nm and a maximum torque of 5Nm. M4 screws are min of 3Nm and Max of 4Nm. The ZAG-2 to ZAG-4 maybe fitted with a chassis plate of minimum thickness of 1.22mm, and the ZAG-5 to ZAG-16 maybe fitted with metal terminal rails. Terminal rail type must be appropriate to the increased safety certified terminals to be fitted. Quantity of rails fitted is dependent on the enclosure size and required terminal layout. Earth bonding is by an external and optional internal metal earthing stud provided on every box of minimum size M4. The external earth stud is provided with a sealing washer and locknut to maintain the IP rating of the enclosure followed by a vibration resistant washer and another nut as a minimum. If bare ended cables are to be connected then interlocking

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saddle washers shall also be provided. An optional glass window maybe fitted to the lid.

BPG Description: The BPG range of junction boxes are manufactured in glass reinforced polyester boxes. The BPG is molded from glass reinforced polyester resin type 45-LS-1100 or 45-LS-1200 or 2600/5308/27B (black) carbon loaded anti-static. The entries may be provided either through the side walls or the rear of the box. Entries may be tapped or clearance. The Lid is either hinged or detachable and retained with 4 of 6 captive screws. A tool will be required to open the lid of the enclosure. Terminal rails and chassis plates may be secured using metal machine screws and vibration resistant washers when tightened to the following torque limits: M6 screws minimum torque 4 Nm maximum torque 5 Nm M4 screws minimum torque 3 Nm maximum torque 4 Nm A pillar with a metal functional thread may be used as a replacement for the metal screw. The terminal rail may be secured to a chassis plate using machine screws and nuts. If the nuts are not of a self locking type then vibration resistant washers must be used. Terminal mounting BPG-l to BPG-5 inclusive, are fitted with a metal bar of minimum cross section 10mmx3mm. The bar may be drilled and tapped to permit the securing of the terminal block(s) using a suitable metal screw and vibration resistant washer. The bar may be drilled to permit the securing of the terminal block(s) using a-suitable metal screw and nut. If the nut is not of a self locking type, then a vibration resistant washer must be used. BPG-6 to BPG-15 inclusive, are fitted with metal terminal rails. Terminal rail type must be appropriate to the increased safety certified terminals to be fitted. Quantity of rails fitted is dependent on the enclosure size and required terminal layout. Earth Bonding Wire connections using an insulated copper cable with minimum cross section 4sqmm. Wire may be terminated with a crimp type tag and secured to the metal fitting to be bonded using a metal crew and or nut and vibration resistant washer. A bare ended cable may be terminated in a terminal way of any dedicated increased safety certified terminal block fitted in the enclosure. Continuous metal earth plate covering one or more walls of the enclosure. The earth plate may also cover the back of the enclosure to bond any entries on that face. The earth plate may be shaped such that the terminal rail rests on it and is secured through it to provide contact pressure. Contact pressure with the earth plate must be maintained using a metal screw thread and a vibration-resistant washer. Insulated pillars used to mount the earth bar, giving due consideration to creepage distances and clearances required by the European Standard for increased safety, constitute the provision of an isolated earth bar (primarily for, but not limited to, instrument earth use). Metal pillars used to secure both the terminal rail and the earth bar constitute adequate bonding of the two. A metal earth stud may be provided through the wall of the enclosure of minimum sizeM6. An earth stud may be internal only, external only or internal and external with a sealing washer next to the box wall on the outside. A stud shall be provided with a locknut, a vibration resistant washer and a second locknut as a minimum. If bare ended cables are to be connected then interlocking saddle washers shall also be provided.

Ratings – refer to tables contained model codes for each series.

Series SXa Junction Box
a = Enclosure size 0, 0.5, 1, 1.5, 2, 3, 4, 5, 6, 7, 8, 225, 45, 64, or 66.

Series ZAGa. Junction Box.
a = Enclosure size 2, 3, 4, 5, 6, 7, 9, 10, 10/9, 11, 12, 13, 15 or 16.

Series BPGa. Junction Box.
a = Enclosure size 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, or 15

13. **Specific Conditions of Use:**

Series SXa Junction Box

1) *Only Certified Suitably Rated NRTL Listed AEx terminals may be used.*
2) *The SX range of Junction boxes utilize a SX Enclosure fitted with suitably rated NRTL Listed AEx terminals. The total dissipated power for the particular application will be calculated in accordance with ANSI/ISA 60079-7:2013 Appendix E and will not exceed the values given in the table below.*

SCHEDULE

US Certificate Of Conformity No: FM16US0250X

SX Ref	Max Power Dissipation (W) Temperature Class, Max Surface Temperature for Gas and Dust and Ta Max.							
*Maximum Surface Temperature	T6 & T85°C				T5 & T100°C			
**Maximum Ambient	+40°C	55°C	60°C	65°C	+55°C	+70°C	+75°C	+80°C
SX0	19	3.34	2.23	1.84	19	3.34	2.23	1.84
SX0.5	22	3.9	2.8	2.1	22	3.9	2.8	2.1
SX1	29	4.97	3.86	2.7	29	4.97	3.86	2.7
SX1.5	32	5	4	2.8	32	5	4	2.8
SX2	36	5.64	4.23	2.88	36	5.64	4.23	2.88
SX3	42	5.9	4.1	3	42	5.9	4.1	3
SX4	44	6.1	4.36	3.19	44	6.1	4.36	3.19
SX5	50	9.35	6.19	4.2	50	9.35	6.19	4.2
SX6	57	10.1	7.97	5.6	57	10.1	7.97	5.6
SX7	68	17.14	9.36	6.67	68	17.14	9.36	6.67
SX8	119	15.95	15.17	10.74	119	15.95	15.17	10.74
SX225	359	NA	103	NA	359	NA	103	NA
SX45	8	1.65	1.28	1.57	8	1.65	1.28	1.57
SX64	10	0.7	0.5	0.3	10	0.7	0.5	0.3
SX66	14	2	1.9	1.5	14	2	1.9	1.5

SX Ref	Max Power Dissipation (W) Temperature Class, Max Surface Temperature for Gas and Dust and Ta Max.						
*Maximum Surface Temperature	T4 & T135°C				T3 & T200°C		
**Maximum Ambient	+80°C	60°C	80°C	60°C	+80°C	+80°C	+175°C
SX0	19	3.34	2.23	1.84	3.34	2.23	1.84
SX0.5	22	3.9	2.8	2.1	3.9	2.8	2.1
SX1	29	4.97	3.86	2.7	4.97	3.86	2.7
SX1.5	32	5	4	2.8	5	4	2.8
SX2	36	5.64	4.23	2.88	5.64	4.23	2.88
SX3	42	5.9	4.1	3	5.9	4.1	3
SX4	44	6.1	4.36	3.19	6.1	4.36	3.19
SX5	50	9.35	6.19	4.2	9.35	6.19	4.2
SX6	57	10.1	7.97	5.6	10.1	7.97	5.6
SX7	68	17.14	9.36	6.67	17.14	9.36	6.67
SX8	119	15.95	15.17	10.74	15.95	15.17	10.74
SX225	359	NA	103	NA	NA	103	NA
SX45	8	1.65	1.28	1.57	1.65	1.28	1.57
SX64	10	0.7	0.5	0.3	0.7	0.5	0.3
SX66	14	2	1.9	1.5	2	1.9	1.5

Series ZAGa. Junction Box

1) *Only Certified Suitably Rated NRTL Listed AEx terminals may be used.*
2) *The ZAG range of Junction boxes utilize a ZAG Enclosure fitted with suitably rated NRTL Listed AEx terminals. The total dissipated power for the particular application will be calculated in accordance with ANSI/ISA 60079-7:2013 Appendix E and will not exceed the values given in the table below.*

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SCHEDULE

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ZAG Ref	Max Power Dissipation (W) Temperature Class, Max Surface Temperature for Gas and Dust and Ta Max.			
*Maximum Surface Temperature	T6 /T85°C		T5 /T100°C	
**Maximum Ambient	+40°C	+55°C	+55°C	+70°C
2	0.9	0.45	0.9	0.45
3	1.2	0.6	1.2	0.6
4	1.7	0.85	1.7	0.85
5	1.5	0.75	1.5	0.75
6	2.2	1.1	2.2	1.1
7	2.9	1.45	2.9	1.45
9	3.4	1.7	3.4	1.7
10	5.4	2.7	5.4	2.7
10/9	5.4	2.7	5.4	2.7
11	5.4	2.7	5.4	2.7
12	8.0	4.0	8.0	4.0
13	10.4	5.2	10.4	5.2
15	9.5	4.75	9.5	4.75
16	14.0	7.0	14.0	7.0

ZAG Ref	Max Power Dissipation (W) Temperature Class, Max Surface Temperature for Gas and Dust and Ta Max.			
*Maximum Surface Temperature	T4 /T135°C		T3 /T180°C	
**Maximum Ambient	+90°C	+105°C	+135°C	+150°C
2	0.9	0.45	0.9	0.45
3	1.2	0.6	1.2	0.6
4	1.7	0.85	1.7	0.85
5	1.5	0.75	1.5	0.75
6	2.2	1.1	2.2	1.1
7	2.9	1.45	2.9	1.45
9	3.4	1.7	3.4	1.7
10	5.4	2.7	5.4	2.7
10/9	5.4	2.7	5.4	2.7
11	5.4	2.7	5.4	2.7
12	8.0	4.0	8.0	4.0
13	10.4	5.2	10.4	5.2
15	9.5	4.75	9.5	4.75
16	14.0	7.0	14.0	7.0

Series BPG Junction Box

1) *Only Certified Suitably Rated NRTL Listed AEx terminals may be used.*
2) *Clean Only with Damp Cloth.*
3) *The BPG range of Junction boxes utilize a BPG Enclosure fitted with suitably rated NRTL Listed AEx terminals. The total dissipated power for the particular application will be calculated in accordance with ANSI/ISA 60079-7:2013 Appendix E and will not exceed the values given in the table below.*

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SCHEDULE

US Certificate Of Conformity No: FM16US0250X

BPG Ref	Max Power Dissipation (W) Temperature Class, Max Surface Temperature for Gas and Dust and Ta Max.				
*Maximum Surface Temperature	T6/T85°C				T4/T100°C
**Maximum Ambient	+40°C	+55°C	+60°C	+65°C	+90°C
1	8.390	2.23	1.73	1.45	8.390
2	8.551	2.00	1.70	1.45	8.551
3	8.833	2.00	1.70	1.45	8.833
4	9.012	2.07	1.80	1.29	9.012
5	9.260	2.00	1.70	1.10	9.260
6	9.378	2.00	1.70	1.45	9.378
7	10.500	2.30	1.70	1.10	10.500
8	10.348	2.00	1.70	1.10	10.348
9	11.933	2.30	1.70	1.10	11.933
10	13.793	4.50	3.29	2.10	13.793
11	19.338	6.68	5.20	4.00	18.338
12	15.474	2.30	1.70	1.10	15.474
13	20.867	5.20	4.00	3.00	20.867
13.5	20.867	5.20	4.00	3.00	20.867
14	30.384	7.97	6.59	4.79	30.384
15	31.350	8.26	6.00	4.40	31.350

14. **Test and Assessment Procedure and Conditions:**

This Certificate has been issued in accordance with FM Approvals US Certification Requirements.

15. **Schedule Drawings**

A copy of the technical documentation has been kept by FM Approvals.

16. **Certificate History**

Details of the supplements to this certificate are described below:

Date	**Description**
29th September 1998	Original Issue.
23rd October 2018	Supplement 1: Report Reference: – 3049212 dated 23rd October 2018 Description of the Change: Updated Project Standards to latests version. Updated Series SX and ZAG model code structure and added Series BPG Junction Box.

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