1 EU - Type Examination Certificate

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

3 Certificate Number: **ExVeritas 22 ATEX 1237U** Issue: **5**

4 Equipment: **HFX LED Driver, HFXE Emergency LED Driver: BG2 Series**

5 Manufacturer: **BAREL AS**

6 Address: **Havneveien 8, N-9917 Kirkenes, Norway**

7 This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

8 ExVeritas, Notified Body number 2804 in accordance with Article 17 of the Council Directive 2014/34/EU of 26 February 2014, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to design and construction of equipment and protective systems for use in potentially explosive atmospheres given in Annex II to the Directive

9 Compliance with the applicable Essential Health and Safety Requirements has been assured by compliance with the following Standards and section 16 of this certificate:

EN IEC 60079-0: 2018 **EN IEC 60079-7:2015+A1:2018** **EN 60079-18:2015+A1:2017**

10 If the sign “X” is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EU-Type Examination Certificate relates only to the design, construction, examination and tests of the specified equipment or protective system in accordance to the Directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

12 The marking of the equipment shall include the following:

II 2 G Ex eb mb IIC

DANAK
PROD Reg.No. 7044
Member of EA MLA

On behalf of ExVeritas
Peter Lauritzen
Managing Director

Schedule

13 Description of Equipment or Protective System

This certificate covers electronic drivers for LED lighting, HFX BG2, and combined driver and emergency inverter HFXE BG2, manufactured by Barel AS. Battery-packs are also included.

The product series HFX and HFXE BG2 are certified as Ex components, suitable for incorporation into suitable Ex enclosures, typically Ex e luminaires. The electronics are encapsulated in a potting compound, inside a metallic enclosure with plastic end-caps, designed to comply with protection type Ex mb. The connection terminals are spring-type, designed to comply with protection type Ex eb, suitable for factory wiring. The battery-packs are designed to comply with protection type Ex eb.

The model types covered under this certification are:

HFX Model Types:

Name	Part number	Output LED current/LED voltage	Ta (Ambient temperature in operation)	Tc (on marking label)
HFX LED BG2 6-12-1500 200mA 220-254VAC/220-250VDC	821420010	200mA/64-160VDC	-40°C to +76°C	88°C
HFX LED BG2 6-12-1500 250mA 220-254VAC/220-250VDC	821420020	250mA/64-160VDC		
HFX LED BG2 6-12-1500 370mA 220-254VAC/220-250VDC	821420030	370mA/64-160VDC		
HFX LED BG2 6-1200 250mA 110-127VAC/110-127VDC	821580020	250mA/64-128VDC		
HFX LED BG2 6-1200 370mA 110-127VAC/110-127VDC	821580030	370mA/64-128VDC		
HFX LED BG2 1200-1500 550mA 220-254VAC/220-250VDC	821430050	550mA/128-160VDC	-40°C to +66°C	
HFX LED BG2 DALI 6-12-1500 250mA 220-254VAC/220-250VDC	821421020	250mA/64-160VDC	-40°C to +76°C	
HFX LED BG2 DALI 6-12-1500 370mA 220-254VAC/220-250VDC	821421030	370mA/64-160VDC		
HFX LED BG2 DALI 6-1200 370mA 110-127VAC/110-127VDC	821381030	370mA/64-128VDC		
HFX LED BG2 DALI 3-600 370mA 110-254VAC/220-250VDC	821111030	370mA/32-64VDC		
HFX LED BG2 DALI 12-1500 550mA 220-254VAC/220-250VDC	821431050	550mA/128-160VDC	-40°C to +66°C	

HFXE Model types:

Name	Part number	Output LED current/LED voltage	Ta (Ambient temperature in operation)	Tc (on marking label)
HFXE LED BG2 6-12-1500 200mA 220-254VAC	831220110	200mA/64-160VDC	-40°C to +76°C	88°C
HFXE LED BG2 6-12-1500 250mA 220-254VAC	831220120	250mA/64-160VDC		
HFXE LED BG2 6-12-1500 370mA 220-254VAC	831220130	370mA/64-160VDC		
HFXE LED BG2 12-1500 550mA 220-254VAC	831230150	550mA/128-160VDC	-40°C to +66°C	
HFXE LED BG2 6-1200 250mA 110-127VAC	831380120	250mA/64-128VDC	-40°C to +76°C	
HFXE LED BG2 6-1200 370mA 110-127VAC	831380130	370mA/64-128VDC		
HFXE LED BG2 DALI 6-1200 370mA 110-127VAC	831581130	370mA/64-128VDC		
HFXE LED BG2 DALI 3-600 370mA 220-254VAC	831211130	370mA/32-64VDC		
HFXE LED BG2 DALI 6-12-1500 250mA 220-254VAC	831231120	250mA/64-160VDC		
HFXE LED BG2 DALI 6-12-1500 370mA 220-254VAC	831221130	370mA/64-160VDC		
HFXE LED BG2 DALI 12-1500 550mA 220-254VAC	831431150	550mA/128-160VDC	-40°C to +66°C	

Battery Pack Model types

Name	Cell configuration	Ta°C	Capacity	Voltage
Ex NiCD 7,2V 2,5Ah 6C-Pack	6xC-pack	-20 to +70	2,5Ah	7,2V
Ex NiCD 7,2V 5Ah 6D-Pack	6xD-pack	-40 to +45	5Ah	7,2V
Ex NiCD 7,2V 5Ah 6D-Stick	6xD-stick	-40 to +45	5Ah	7,2V

The C type battery packs are supplied as a stacked type of battery pack, 2 banks of 3 cells. The D type battery packs can be supplied as a stacked type of battery pack, 2 banks of 3 cells, or a stick type arrangement (single bank of 6 cells in line).

Schedule

14 Descriptive Documents

14.1 Associated Report and Certificate History:

Report Number	Cert Issue Date	Issue	Comment
R3340/A/1	2022-05-25	0	Initial issue of the Prime Certificate
R4323/A/1	2022-11-29	1	Minor error fixes and new functions for the DALI operation
R4491/A/1	2023-04-06	2	Modifications made to improve EMI performance and DALI functions
R4612/A/1	2023-11-22	3	Introduction of alternate potting compound
R5020/A/1	2024-04-16	4	Modifications made to improve EMI performance and DALI functions. Drawing list rationalised, IOM document control minimised
R5660/A/1	2025-01-27	5	Minor component and circuitry changes (and associated drawing) deemed to detail continued compliance with the applied standards.

14.2 Compliance Drawings:

Title:	Drawing No:	Rev:	Date:
Assembly and Potting BG2	820010	2	03.05.2022
Potting compound HFX-E BG2	820050	1	03.05.2022
BoM 229 ASSY	820006	11	07.11.2023
*BoM 239 ASSY (2 pages)	830006	9	21.11.2024
*BoM 242 ASSY	820007	7	22.11.2024
HFX BG2 ASSY	820001	1.4	02.04.2024
HFXE BG2 ASSY	830001	1.4	02.04.2024
Marking label	820002	1.3	08.11.2023
PCB HFX	229	J	07.11.2023
*PCB HFXE	239	K	21.11.2024
*PCB DALI Plug-in	242	K	27.11.2024
Safety and protective device BG2	820011	1.1	31.03.2022
Schematics 229 HFX (2 pages)	820019	J	08.11.2023
*Schematics 239 HFXE (6 pages)	830020	K	21.11.2024
*Schematics 242 DALI Plugin (5 pages)	820020	K	22.11.2024
Ex NiCD 7,2V ASSY	830030	1.2	03.05.2022
Installation and safety HFX LED BG2	-	1	05/04/2024
Installation and safety HFXE LED BG2	-	1	05/04/2024
TDS Ex NiCD 7,2V	-	3	10.05.2022

*Note: An * is included before the title of documents that are new or revised for Issue 5*

Schedule

15 Conditions of Certification

15.1 Schedule of Limitations

1. For Gas atmospheres the equipment must be housed within a suitably approved Ex eb Gb enclosure in end use equipment. For Dust atmospheres the equipment must be housed within a suitably approved Ex tb Db enclosure.
2. The following Service Temperatures must not be exceeded when incorporated into end use equipment:
   - HFX & HFXE Encapsulant: -40°C to +110°C*
   - HFX & HFXE Terminals: -40°C to +105°C
   - Battery Packs: -20°C to +70°C (C cells) & -40°C to +45°C (D cells)

   *Note that the hottest internal component has a 37 K temperature rise under full load conditions.
3. Thermal fuses (TCO's) are employed in the driver which limit the surface temperature of the encapsulant under fault conditions to a maximum of 112°C
4. The maximum temperature rise on the D cell type battery packs when supplying (discharge) a max potential fault current of 6.8A is 19.3K. Under a max nominal load of 2.5A the temperature rise is 6.3K. Under maximum charge conditions, constant current of 240mA, the battery pack has a temperature rise of 5.9K. The D cells type battery packs must not be subjected to ambient conditions in end use equipment of more than +39.1°C for compliance with the rated service temperature range of the batteries.
5. The maximum temperature rise on the C cell type battery packs when supplying (discharge) a max potential fault current of 6.8A is 2.9 K. Under a max nominal load of 2.5A the temperature rise is 13.8 K. Under maximum charge conditions, constant current of 240 mA, the battery pack has a temperature rise of 5.5K. The C cells type battery packs must not be subjected to ambient conditions in end use equipment of more than +64.5°C for compliance with the rated service temperature range of the batteries.
6. When incorporated into end use equipment the bare live parts of the terminals must have a ≥ 6mm clearance distance. The insulation must be stripped to within 1 mm of the terminal throat.
7. The equipment shall only be employed with a power supply which has a prospective short circuit current not exceeding 1500A.
8. The battery pack must not be replaced in hazardous areas (unless the area is shown to be free from a hazardous atmosphere).
9. The maximum discharge current form the battery packs under fault conditions is limited to 6.8 A (by 4 A internal fuse in the HFXE model types).
10. When stranded conductors are employed for mains connection they must be terminated with a ferrule.

15.2 Routine tests (Manufacturers responsibility)

1. A visual inspection of the encapsulated equipment shall be carried out to ensure there are no cracks, flaking, shrinkage, swelling, decomposition, softening or failure of adhesion.
2. A dielectric strength test at 1508VAC shall be conducted for 1 second:
   - between live phases and galvanically isolated circuits
   - between live phases and the surface of the compound and enclosure, which can be clad with a conductive foil for the test.

   Alternatively, a test voltage of 20% higher may be applied for 0.1 seconds. A DC test voltage is allowed as an alternative to the AC test voltage and shall be 140% of the specified AC r.m.s. test voltage.
3. A dielectric strength test at 500VAC shall be conducted for 1 second:
   - between galvanically isolated (output) circuits and the surface of the compound and enclosure, which can be clad with a conductive foil for the test.

   Alternatively, a test voltage of 20% higher may be applied for 0.1 seconds. A DC test voltage is allowed as an alternative to the AC test voltage and shall be 140% of the specified AC r.m.s. test voltage.

16 Essential Health and Safety Requirements

Essential Health and Safety Requirements are addressed by the standards listed in section 9 and where required the report listed in section 14.1

The manufacturer shall inform the Notified Body of any modifications to the design of the product described by this schedule.