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TECHNICAL PRODUCT INFORMATION

HFXE T8

E1003 and E1004 series

COMBINED ELECTRONIC BALLAST AND EMERGENCY INVERTER FOR EX-ENVIRONMENT

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1 Applications

The HFXE series of combined electronic ballasts and emergency light inverter for EX-environments are suitable for use in Ex e luminaires.

The HFXE-range will be suitable for use in explosive gas athmospheres like :

- Oil Industry — Off- & On-shore Installations, Gas Stations, Fuel Reservoirs, Oil Tankers
- Mining Industry — Mines, Plants, Mills
- Chemical Industry — Production Plants

Lamp End Of Life (EOL) protection according to EN/IEC 60079-7:2006

2 Approvals HFXE series

Approvals :

- QAN/QAR	0470 Nemko 01ATEX452Q/ NO/NEM/QAR08.0001/04
- Ex protection Code	Ex II 2 G Ex eb mb IIC T5
- NEMKO Certificate :	IECEx NEM09.0002U
- ATEX no.	Nemko 09ATEX1103U
- ULBR/INMETRO	11/UL-BRHZ 0020U

Reference standards :

- IEC 60079-0	2007
- IEC 60079-7	2006
- IEC 60079-18	2004
- EN 60079-0	2009
- EN 60079-7	2007
- EN 60079-18	2009
- ABNT NBR IEC 60079-0	2008-11
- ABNT NBR IEC 60079-7	2008-02
- ABNT NBR IEC 60079-18	2007-12

In accordance with:

- IEC 61347-2-3	2000+A1:2004
- EN50028	
- EN60928	
- EN55015: 2006	
- INMETRO Portaria 179	2010-05-18

3 HFXE Technical data

3.1 Product range HFXE

Model		Electronic Ballast :				EMERGENCY Inverter :				
	E1003 220-250V	Voltage	Rated current	Ta / Tc Ta min -25	Lamps T8	Batt Voltage	Battery capacity	Duration	discharge current	Light Output
Art.No.	Type	50-60Hz	A	▫C	W	Vdc	Ah	h	A	%
12018	HFXE 118 E1003	220 - 250VAC	0.09 - 0.07	75 / 90	1 x 18	4.8	4	1- 1.5	1,6	22
						4.8	4	3	1,1	16
						8.4	4	1- 1.5	1.2	27
12618	HFXE 218 E1003	220 - 250VAC	0.18 - 0.14	75 / 90	2 x 18	4.8	4	1- 1.5	1,6	22
		220-250VDC				4.8	4	3	1,1	16
						8.4	4	1- 1.5	1.2	27
12036	HFXE 136 E1003	220 - 250VAC	0.18 - 0.14	75 / 90	1 x 36	4.8	4	1- 1.5	1,8	15
						8.4	4	1- 1.5	1,5	19
						8.4	4	3	1,1	15
12673	HFXE 236 E1003	220 - 250VAC	0.34 - 0.30	75 / 90	2 x 36	4.8	4	1- 1.5	1,8	15
		220-250VDC				8.4	4	1- 1.5	1,5	19
						8.4	4	3	1,1	15
12058	HFXE 158 E1003	220 - 250VAC	0.25 - 0.22	60 / 91	1 x 58	8.4	4	1.5	1,6	13
						8.4	4	3	1.1	10
12658	HFXE 258 E1003	220 - 250VAC	0.51 - 0.45	60 / 91	2 x 58	8.4	4	1.5	1,6	13
						8.4	4	3	1.1	10
	E1004 110-127V									
12718	HFXE 118 E1004	110 - 127VAC	0.18 - 0.15	68 / 84	1 x 18	4.8 – 8.4	See values for 230V versions above Setting of 1, 1.5 and 3h operation is selected by connection of Charging Indicator (LED) to terminals 6, 7 and 8			
12728	HFXE 218 E1004	110 - 127VAC	0.34 - 0.30	68 / 84	2 x 18	4.8 – 8.4				
12726	HFXE 136 E1004	110 - 127VAC	0.34 - 0.30	68 / 84	1 x 36	4.8 – 8.4				
12736	HFXE 236 E1004	110 - 127VAC	0.60 - 0.50	58 / 73	2 x 36	4.8 – 8.4				
12758	HFXE 158 E1004	110 - 127VAC	0.51 - 0.45	68 / 84	1 x 58	8.4				

3.2 Mechanical data HFXE-series :

- Plastic housing fastened with 2 screws.
- 14 or 12 screw connectors
- Electronics moulded in polyurethane compound inside housing.

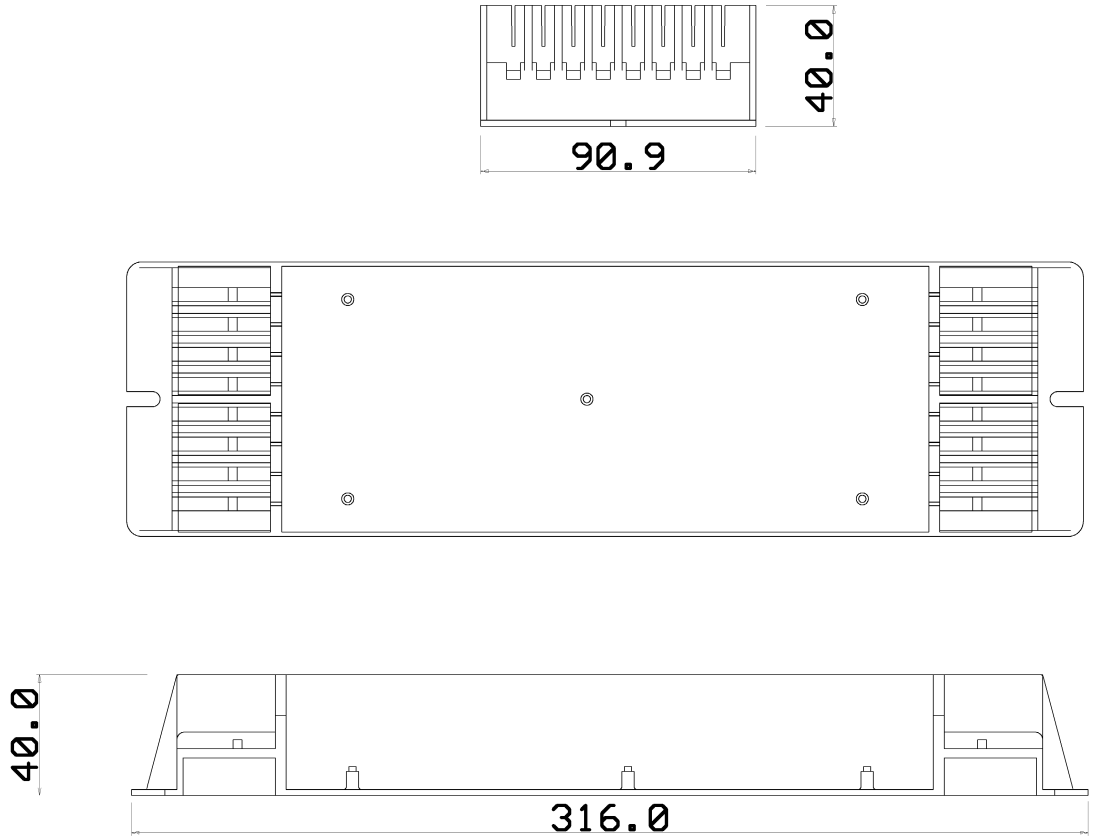


Fig. 1 Physical dimensions HFXE

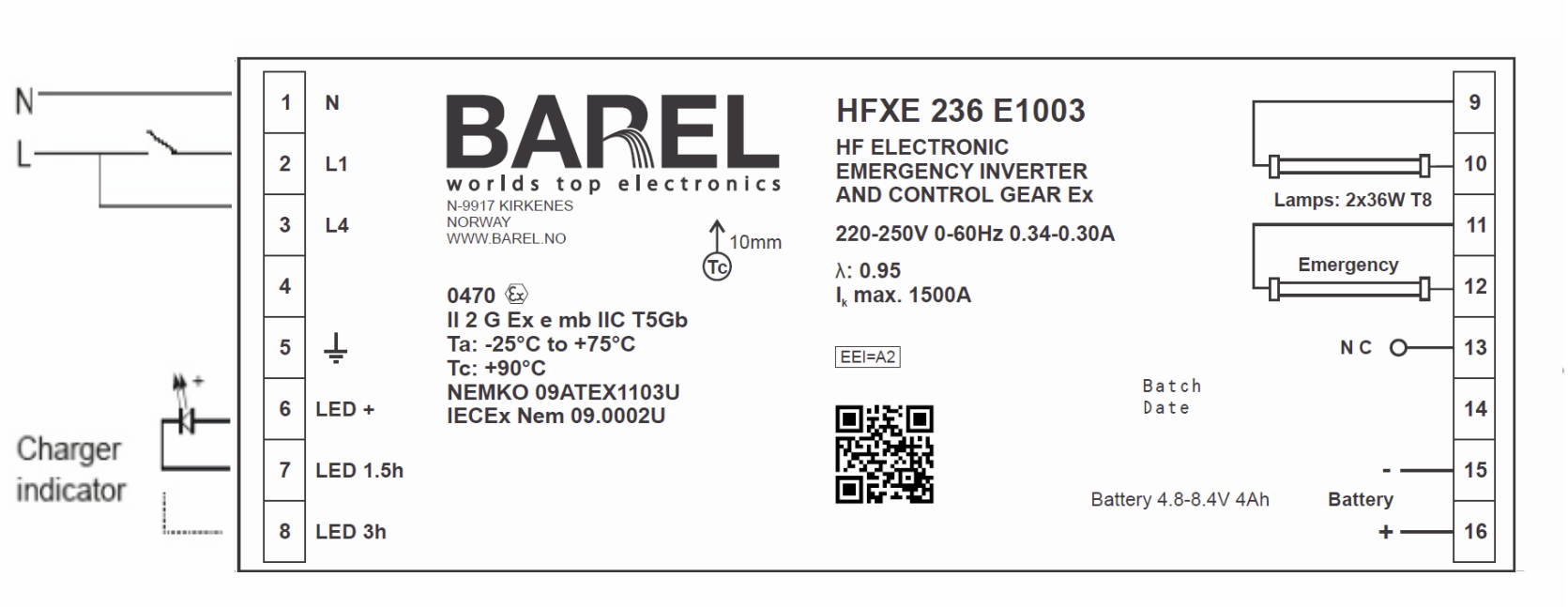
4 Installations of HFXE ballasts

Tc point value must not be exceeded in final installation.
Metal conductor temperatures should be measured in final installation to ensure that no adverse heating effects from neighbouring components (125°C max).

This component does not cause harm or injury when used as specified in these instructions

4.1 Electrical connection

Installation and servicing of the ballast must be done with mains power supply disconnected by an external 2-pole switch (both phases must be off).



Connector 13 “NC” has no internal connection, and may be used for battery-cable extension.

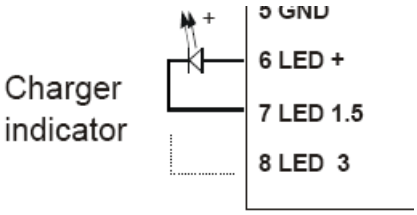
4.2 Operation

Setting of 1, 1.5 and 3h operation is selected by connection of Charging Indicator (LED) to terminals 6, 7 and 8 as described in table below.
For manuel operation (no selftest) a single colour LED is used,

A = Anode, C = Cathode

For a Selftest operation a bidirectional LED is used (RED / GREEN) connected such that OK = GREEN. For connection of the bicolor LED the green colored LED is referred to as Anode and Cathode

Operation Connection	1 hour	1.5 hours	3 hours
Anode Cathode	A= 7 C= 8	A = 6 C = 7	A = 6 C = 8



Connection terminals 6 – 8 of HFXE

TEST :

NOTE : A full test should not be activated when the battery is empty or low capacity, because this could result in a wrong error-message.
A test is activated manually, as a selftest or by connection of a test-switch.

Manuel test:

By disconnecting the mains when the battery has been charged for a minimum of 24 hours. Status of the test must be observed manually.

Self test:

By using a Bipolar LED connected to the 2 of the 3 pins 6, 7 or 8 as shown above, then a self test will be performed. This test will automatically run a short Monthly test and one Full Annual test operating the Emergency Lamp (LAMP 1) from the battery.

ERROR REPORT

There are 4 different types of ERROR messages :

- Charging error	Typically caused by disconnected or defective battery. This ERROR-signal occurs immediately without activating a test.
- Lamp error	Typically caused by defective or disconnected lamp
- Battery Capacity error	Typically defective battery or too short charging time before testing
- Not connected to any supply	If the unit is not connected to the mains supply or to a battery source or when this battery source is discharged.

Error Indication on Bicolour LED :

- Charging error	Continuous RED
- Lamp error	Intermittent blinking red LED
- Battery Capacity error	Continuous blinking red LED
- No Error = OK	Green LED

4.3 Cable

Cross sectional area of the cable: 1.0 - 2.5 mm2 (multi wire).
Terminal torque: 0,6-0,8Nm.
Strip 9 mm of wire insulation.

4.4 Earth connection

The ballast is referred to ground at Pin 5 GND.

5 Battery

The HFXE can be used with either 4 or 7 battery cells (1,2VDC) connected. Based upon the measured values of the Battery voltage during charging, the unit will detect if 4 or 7 battery cells is connected

Battery:

Battery Type:	NiCd - High Temp cells
Maximum ambient temp	Ref. battery supplier specification
Maximum cell temperature	Ref. battery supplier specification
Cell clearance	1,6 mm
Charge current	100 – 400mA
Number of cells	7
Undervoltage disconnect	6,3V (minimum)
Number of cells	4
Undervoltage disconnect	3,7V (minimum)

Comments:
The battery is normally regarded as a part of the luminary and is often made with different mechanical options regarding cell arrangement, wire lengths, wire connections and fastening details.
The batteries are fully charged within maximum 24 hours.
The level of the charge current will vary depending on the charge status.

6 What to do if…

- No light when first connected to the mains:
  - Check that the mains voltage is in the voltage range of the ballast.
  - Check that the screws at the connection terminal are tightened.
  - Check that correct lightsources are connected and that these are ok.
- The lamp(s) lights up, but stop immediately after.
  - Change the tubes with new ones.
  - Check the wires, the contacts and the switches in both sides of the luminaire.
  - Check that the correct lamp type is used. Barel recommend using only high quality fluorescent lamps.

If problems with conducted emission during EMC measurements, contact Barel for assistance. Important issues are:

- Keep all wires short.
- Separate lamp wires from mains supply wires
- Ground the ballast through a short wire connection