TECHNICAL PRODUCT INFORMATION

HFX & HFXE T8
ELECTRONIC BALLAST & COMBINED ELECTRONIC BALLAST AND EMERGENCY INVERTER FOR EX-ENVIRONMENT

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1 Applications

The HFX and HFXE T8 is a series of combined electronic ballasts and emergency light inverter for T8 fluorescent lamps used in Ex-environments, suitable for installation in Ex e enclosures.

The HFX and HFXE 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

2 Approvals

Approvals :

- QAN/QAR	0470 Nemko 01ATEX452Q/ NO/NEM/QAR08.0001/04
- Ex protection Code	Ex II 2 G Ex eb mb IIC T4
- IECEx Certificate :	IECEx PRE 14.0039U
- ATEX no.	Presafe 14 ATEX 5355U
- BRHZ no.	Pending

Reference standards :

- IEC 60079-0	2011
- IEC 60079-7	2006
- IEC 60079-18	2014
- EN 60079-0	2012
- EN 60079-7	2007
- EN 60079-18	2015

In accordance with:

- EN/IEC 61347-2-3
- EN/IEC 55015
- EN/IEC 61547
- EN/IEC 60921

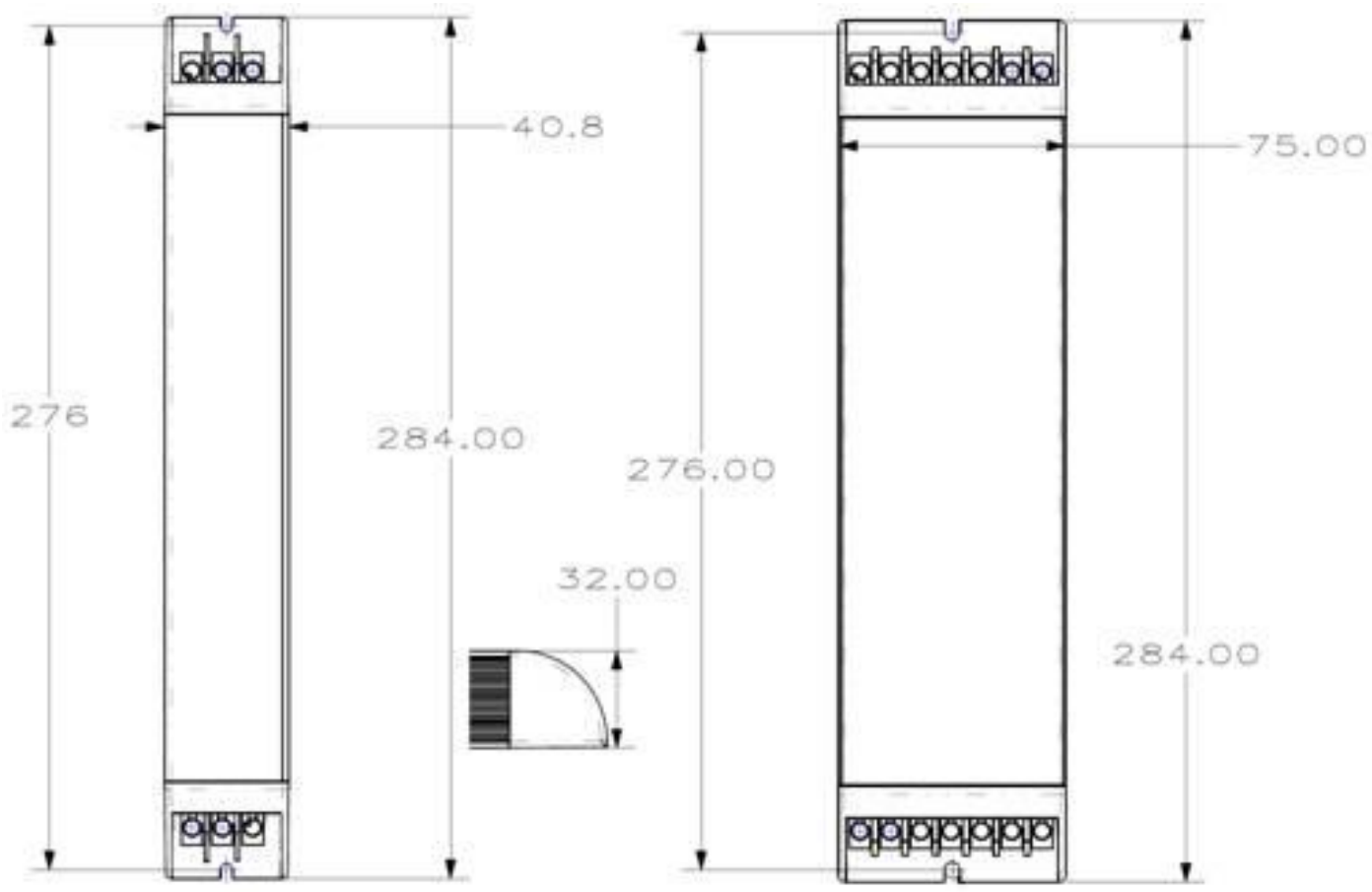
3 Technical data

3.1 Product range

Name	Description	Model	Art	Lamp power	Input Voltage AC 50/60Hz	-DC	Input Current	PF	Battery	Light output in % of normal operation	Service temperature	T C	Dimension LxWxH	Weight
HFX T8	Electronic ballast for fluorescent lamp	18	12918	1-2x18W T8	110-254VAC	220-250VDC	0,07-0,32A	0,95	NA		-30 to +70°C	85°C	285x41x32mm	510g
		36	12936	1-2x36W T8	110-254VAC	220-250VDC	0,13-0,59A	0,98			-30 to +70°C	85°C	285x41x32mm	510g
		58	12958	1-2x58W T8	220-254VAC	220-250VDC	0,23-0,57A	0,98			-30 to +65°C	85°C	285x41x32mm	510g
HFXE T8	Electronic ballast and emergency inverter for fluorescent lamp	18	11918	1-2x18W T8	110-254VAC	220-250VDC	0,07-0,32A	0,93	4,8V/4Ah/1,5h	22% of one lamp	-30 to +65°C	85°C	285x75x32mm	960g
									4,8V/4Ah/3h	16% of one lamp				
									8,4V/4Ah/1,5h	27% of one lamp				
		36	11936	1-2x36W T8	110-254VAC	220-250VDC	0,13-0,59A	0,95	4,8V/4Ah/1,5h	15% of one lamp	-30 to +65°C	85°C	285x75x32mm	960g
									8,4V/4Ah/1,5h	19% of one lamp				
									8,4V/4Ah/3h	15% of one lamp				
		58	11958	1-2x58W T8	220-254VAC	220-250VDC	0,23-0,57A	0,96	8,4V/4Ah/1,5h	14% of one lamp	-30 to +65°C	85°C	285x75x32mm	960g
									8,4V/4Ah/3h	10% of one lamp				

3.2 Mechanical data:

- Aluminum housing fastened with 2 screws in the plastic end-caps, c-c 276mm.



4 Installation

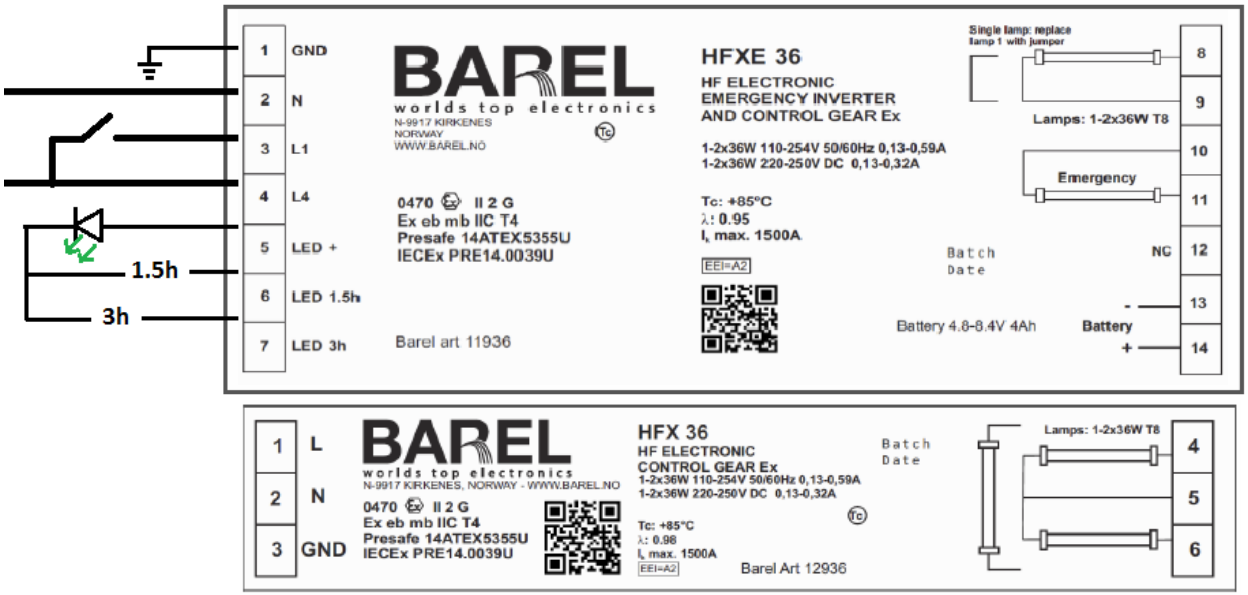
These components does not cause harm or injury when used as specified in these instructions. If this equipment is not utilised in a manner specified by the manufacturer, the protection by the equipment may be impaired.
Inrush current and circuit breaker characteristics/amount of units per circuit breaker must be considered in the installation.

4.1 Schedule of limitations:

- The temperature of the TC point must not be exceeded
- The minimum operating temperature of the HFX and HFXE T8 ballasts is -30°C
- Charging current = 220mA, 80mA permanent
- With one fault condition of the charging system, the charging power is limited to 2W by an transformer and the current is limited to 300mA
- Discharge current = 0.9A - 1.75A
- Discharge cut-off voltage = 4.0V for 4.8V battery and 7.2V for 8.4V battery
- The fault current on the battery input is limited to 6.8A
- HFX, HFXE T8 have an enhanced voltage according to Cl. 5.3.7.5. of IEC 60079-7, 304Vrms
- The indicator LED outputs has the following nominal ratings: 3V, 14mA and is limited to 5.4V and 18.3mA
- The ballast shall be mounted inside an Ex e luminaire and not directly exposed to light
- The terminal has a rating of 450V, Torque 0.5Nm and capacity on the screw side of one conductor with dimensions 1.0 - 2.5mm2 rigid or flex

4.2 Electrical connection

Electrical connections of the ballast must be done whith mains power supply off, and disconnected. The mains supply must be disconnected by an external 2-pole switch (both phases must be off). Connect "GND" to Protective Earth and chassis of the luminary or to a separate ground connection. The aluminium chassis is internally connected to the gnd pin. DC input: Connect – to "N" and + to "L/L1/L4". HFXE: Connect L1 via switch to allow battery charging while light is switched off. Indicator LED to be connected to 5-6 or 5-7 as indicated: Single T8 fluorescent lamp (1x18W,1x36W or 1x58W) to be connected as indicated on marking label. HFX: connect lamp from pin 4 to pin 6. HFXE: connect lamp from pin 10 to pin 11. Connect jumper between pin 8 and 9. (Short)



4.3 Battery

Batteries are to be assessed with final certification of luminaire. Charge and discharge characteristics are suitable for use with high-temp NiCd cells, 4,8V 4Ah (4C) or 8,4V 4Ah. HFXE detects the type of battery connected, and appropriate charge/discharge and cut off values are set internally. Connect battery to correct polarity of HFXE "13" and "14".

4.4 Operation HFXE

Setting of 1.5h and 3h operation is selected by connection of Charging Indicator (LED) to terminals 5, 6 and 7 as described in table below.
For manual operation (no selftest) a single colour (green) LED is used. The indicator LED will be green as long as the battery is in correct charge mode.
For a Selftest operation a bidirectional LED is used (RED / GREEN) connected such that OK = GREEN. For connection of the bicoulor LED the green coloured LED is refered to as Anode and Cathode

TEST :

NOTE : A full test should not be activated when the battery is empty or low capacity - this could result in a wrong error-message.

Manual 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. In case of failure: repair the problem and re-test, or reset unit by disconnecting mains.

Self test:

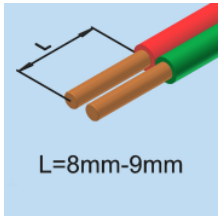
By using a bipolar LED connected to the 2 of the 3 pins 5, 6 or 7 as shown above, then a self-test will be performed. This test will automatically run a short test after 24h, then monthly and a full annual test operating the Emergency Lamp (LAMP 1) from the battery. The test-timer includes a random-period to avoid all luminaires to self-test at the same time. Disconnection/reset of mains and battery at the same time will reset the test-timer. Test-program is conducted acc to IEC 62034.

Indicator LED (green) no self-test	Indicator LED (red/green) self-test	System status	Action
Continuous green	Continuous green	System ok	Battery charging ok and no faults apparent.
No light	Continuous blinking red	Battery capacity problem	24 h charge periode after last discharge not completed, or faulty battery. Restest system after 24h charging period, or replace battery
No light	Intermittent blinking red	Faulty lamp	Faulty or missing lamp. Replace lamp. Lower lamp power in emergency mode may cause lamp-fault detection on functioning lamp. Fluorescent lamps are sensitive to lower ambient temperatures.
No light	Continuous red	Charging error	Battery defective or missing. Connect or replace battery.
No light	No light	No function	Connect to mains supply voltage within specified limits.

4.5 Cable

Cable cross sectional area: 1 – 2,5 mm2 (solid or multi wire).

Terminal torque: 0,5Nm.



Wire insulation voltage should be minimum 660V.
For Aluminium cables; a bi metallic connector should be used to provide a copper connection.

5 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. The ballast has a built-in lamp EOL protection, and will stop operation if the lamp has reached its EOL.
  - 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, and if possible separate from mains cabling internally in luminaire.