Read these instructions before installation and operation!

BF560-12 (12 V DC, 2 A) Installation Instructions

LPCB 176p | VdS G218032 | CE 2831 17 | UKCA 0832 22

EN 54-4, EN 50131-6 Boxed Power Supply Unit (PSU) with Touch Protection

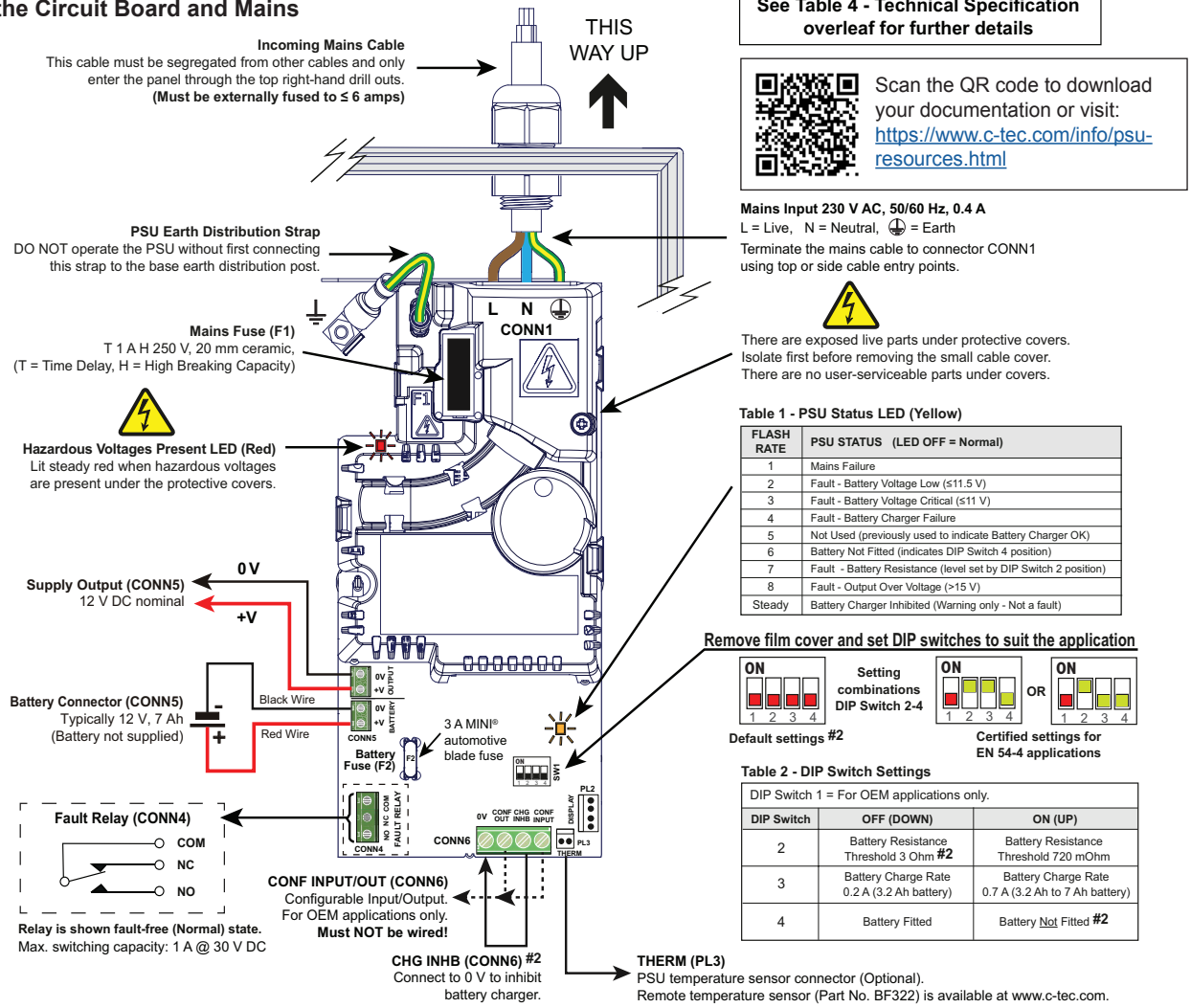
WARNING: THIS PSU MUST BE INSTALLED AND MAINTAINED BY A SUITABLY SKILLED AND TECHNICALLY COMPETENT PERSON. THIS PSU IS A PIECE OF CLASS 1 PERMANENTLY CONNECTED EQUIPMENT AND MUST BE RELIABLY EARTHED.

The BF560-12 is a boxed mains input to regulated DC PSU providing 2 A @ 12 V DC nominal, designed for use with fire and security systems. Combining the functions of a PSU, battery charging unit and battery monitoring unit, it is fully compliant with EN 54-4 + A1 + A2, EN 62368-1 and has been tested to comply electrically/environmentally with EN 50131-6 (Type A, up to Grade 4 ***#1***, Environmental Class II). The PSU is supplied with touch-protective 'live parts' covers and is approved by BRE/VdS.

All wiring must be installed in accordance with all applicable national, regional or local standards. In the UK, this is BS 7671 (IET Wiring Regulations). Fuses must comply with IEC/EN 60127-2. See Figure 1 for PSU connection details.
The requirement for the mains supply to the PSU is fixed wiring (≥1.0 mm², <2.5 mm²), either using 3-core cable, or a suitable three conductor system fed from an isolating switched fused spur at 3 A, or a 6 A Type B circuit breaker to IEC/EN 60898-1. The mains supply must be exclusive to the PSU and be reliably earthed at the indicated earthing point.

HINT: *As an alternative to a switched fused spur, a double-pole isolating switch with 3 mm air gaps on the contacts & switching L & N only, may be used in the mains feed from the Main Distribution Board to the PSU, providing it meets the appropriate wiring regulations.*

Figure 1 - PSU Connection Details with Touch Protection Covers for the Circuit Board and Mains



See Table 4 - Technical Specification overleaf for further details

Scan the QR code to download your documentation or visit: https://www.c-tec.com/info/psu-resources.html

Mains Input 230 V AC, 50/60 Hz, 0.4 A
L = Live, N = Neutral, ⏚ = Earth
Terminate the mains cable to connector CONN1 using top or side cable entry points.

There are exposed live parts under protective covers. Isolate first before removing the small cable cover. There are no user-serviceable parts under covers.

Table 1 - PSU Status LED (Yellow)

FLASH RATE	PSU STATUS (LED OFF = Normal)
1	Mains Failure
2	Fault - Battery Voltage Low (≤11.5 V)
3	Fault - Battery Voltage Critical (≤11 V)
4	Fault - Battery Charger Failure
5	Not Used (previously used to indicate Battery Charger OK)
6	Battery Not Fitted (indicates DIP Switch 4 position)
7	Fault - Battery Resistance (level set by DIP Switch 2 position)
8	Fault - Output Over Voltage (>15 V)
Steady	Battery Charger Inhibited (Warning only - Not a fault)

Remove film cover and set DIP switches to suit the application

Default settings #2 | Certified settings for EN 54-4 applications

Table 2 - DIP Switch Settings

DIP Switch 1 = For OEM applications only.		
DIP Switch	**OFF (DOWN)**	**ON (UP)**
2	Battery Resistance Threshold 3 Ohm #2	Battery Resistance Threshold 720 mOhm
3	Battery Charge Rate 0.2 A (3.2 Ah battery)	Battery Charge Rate 0.7 A (3.2 Ah to 7 Ah battery)
4	Battery Fitted	Battery Not Fitted #2

Note: On a standard 'as-supplied' unit (default settings), the PSU is set with DIP Switch 4 in the OFF (DOWN) position for 'Battery Fitted'. If a fully charged battery is NOT connected to the PSU, a fault will occur on initial power-up due to the PSU's monitoring function, see Figure 1, Table 2 - DIP Switch Settings (above).

Over Current/Over Load Protection: If the output load attempts to pull current more than the PSU rating, the PSU will shutdown and try to auto-recover after approximately 10 seconds and will continue to do so until the overload is removed. If the PSU is subjected to a short circuit across the output terminals, the PSU may trip and require power cycling to reset. Reset the PSU by switching off mains and disconnecting the battery, then wait for the red 'Hazardous Voltage Present' LED to extinguish before re-applying mains and battery. Check the battery fuse (F2) has not blown.

WARNING: There is a risk of explosion if an incorrect battery type or size is used. Always dispose of used batteries in accordance with the battery manufacturer's instructions and local regulations. Batteries are heavy and can produce dangerously high currents if shorted. Take care when handling and routing battery leads to avoid damage. The supplied battery leads with 6.3 mm receptacles are also suitable for 4.8 mm battery contacts. The battery may be safely secured using cable ties if required.

Battery Fault Monitoring: This PSU complies with EN 54-4 and, therefore must monitor the battery's internal resistance and report faults when batteries are fitted. The battery resistance fault threshold directly relates to the battery's ability to deliver the rated current to the load.

Battery Characteristics: VRLA battery resistance varies with manufacturer quality, battery age (from date of manufacture, particularly if left uncharged during shipping or storage), temperature, size and state of charge. It is common for so-called "new" batteries to be more than six months old if the supply chain is not properly managed. Therefore, it is essential to fit good quality, new batteries that have not been shelf-soiled during shipment or storage. VRLA battery resistance naturally increases in cold environments and may make marginally usable batteries at room temperature unusable at low temperatures. Careful siting of the product may alleviate some of the natural limitations of VRLA batteries. Smaller batteries have a higher resistance than larger batteries, as shown in Table 3 (right).

Battery Life: VRLA battery life is typically rated at 20°C. Raising the temperature by 10°C will halve the expected usable life of a VRLA battery. Therefore, operating at 40°C will lead to only a quarter of the expected life. High temperature also degrades battery life during shipping and storage.

Table 3 - Battery Internal Resistance
(for information only)

VRLA Battery	Typical Battery Resistance (single battery x2 for 24 V systems)
12 V, 2 Ah	280 mΩ
12 V, 3.2 Ah	100 mΩ
12 V, 7 Ah	85 mΩ
12 V, 12 Ah *	72 mΩ
12 V, 17 Ah *	65 mΩ
12 V, 38 Ah *	58 mΩ

* Separate battery enclosure required.
VRLA = Valve Regulated Lead Acid

Battery Disconnection: If the battery is disconnected in service for any reason, including (but not limited to) installation, commissioning, test, replacement or accidental disconnection, the monitoring circuit must be reset to ensure correct operation. To reset the monitoring circuit, ensure the battery is connected and then disconnect the mains power supply. Wait for **min. 10 seconds**, then reconnect the mains power supply.

Table 4 - Technical Specification

POWER SUPPLY SPECIFICATION: BF560-12 (12 V DC, 2 A)		
Mains supply voltage (AC):	230 V ~, 50/60 Hz. Rated current: 0.4 A r.m.s.	
Maximum continuous output current:	2 A (battery charger disabled)	
Battery charge capacity (C):	3.2 Ah to 12 Ah (battery charged up to 80% of maximum capacity in 24 hours)	
Maximum approved VRLA battery size:	Up to 7 Ah (maximum battery size that can be fitted within the PSU enclosure)	
Output power rating:	'I max a' = 1.8 A continuous if DIP Switch 3 OFF (DOWN). 'I max a' = 1.3 A continuous if DIP Switch 3 ON (UP). **Note:** Taking a load current greater than 'I max a' will temporarily reduce the battery charge current.	
	'I max b' = 2 A, charging device switched off via CONN6, bridge CHG INHB terminal to 0 V ***#2***.	
	'I min' = 0 mA	
Maximum power output voltage 'V max':	15 V	
Minimum power output voltage 'V min':	9.8 V with mains on	10.29 V with mains off
Output ripple voltage (peak-to-peak):	195 mV r.m.s. (<550 mV p-p)	
Battery characteristics:	Final voltage @ discharge current: 10.5 V ± 2%	Float charge voltage: 13.65 V ± 1% @ 20°C
	Battery temperature compensation: -18 mV/ K (6 cells, i.e. -3 mV/K/cell)	
	Quiescent current drain on mains fail: 12 mA approx.	

CONNECTIONS	
Mains Input (CONN1):	Mains supply input terminals: Live, Neutral & Earth. 1 mm² to 2.5 mm² cable size.
Supply Output (CONN5):	12 V DC output for auxiliary equipment. 1 mm² cable size, <30 m cable length (screened cable must be used).
Battery Connector (CONN5):	Connection to the VRLA battery (connection cables supplied). 1 mm² cable size.
Fault Relay (CONN4):	Isolated changeover relay output, rated 1 A @ 30 V DC, 1 mm² cable size <30 m cable length (screened cable must be used). CONN4 should not be used for compliance with EN 50131-6, PL2 provides serial data for all fault signals.
Battery Charge Inhibit (CONN6):	Bridge CHG INHB terminal to 0 V to inhibit battery charger ***#2***. 1 mm² cable size.
Conf Input/Output (CONN6):	Configurable input/output (for OEM applications only). Must NOT be wired!
Display (PL2):	4-way Molex connection from the PSU to a display card or OEM equipment. The transmission of C-TEC data protocol is available for third-party OEM applications. Optional BF423 PSU configurator is available on request.
Therm (PL3):	2-way Molex connection for external PSU temperature sensor. Optional BF322 PSU temperature sensor is available on request.

INDICATORS	
3 x Front Panel Indicators: 	✓ (Green Steady LED) - The Supply Output (CONN5) is healthy and within range
	✕ (Yellow Steady LED) - A fault is present on the PSU
	▭ (Yellow LED) - A fault with an auxiliary unit (user-definable), 10 to 15 V, 3.5 to 7 mA.
2 x LED indicators on the circuit board:	Hazardous Voltages Present (Red LED): Lit steady when dangerous voltages are present.
	PSU Status (Yellow LED): Flashes in accordance with PSU Status Table 1, see Figure 1 for further details.

FUSES (compliant with IEC/EN 60127-2)	
Mains fuse (F1):	T 1 A H 250 V, 20 mm ceramic (T = Time Delay, H = High Breaking Capacity)
Battery fuse (F2):	3 A MINI® automotive blade fuse

PHYSICAL	
Dimensions (mm):	380 (W) x 235 (H) x 96 (D)
Weight/Construction:	1.55 kg (without batteries)/Plastic lid and base
Enclosure finish:	RAL7035 textured

FITMENTS & OPERATING CONDITIONS
Five mounting holes are provided for Ø4-5 mm CSK screws. Mount ≤2 m on a vertical surface. When choosing screw fixings, wall condition, construction and in-service weight must be considered. For EN 54-4 compliance, for connection to type 1 components, the PSE must be physically close to the component to reduce the risk of damage to the transmission path between them, i.e. the transmission path is not exposed. If side-by-side installation is not possible, then the relevant transmission path must be installed in a separate robust conduit for protection against mechanical damage. The PSU enclosure has an IP30 rating (to EN 60529) and is designed for **indoor use only**. The components are selected to operate within their specification when the environmental conditions outside the enclosure comply with class 3k5 of the latest edition of IEC 721-3-3. Temperature range: -10°C to +40°C. Maximum humidity: 95% non-condensing.

CERTIFICATES & DECLARATION OF PERFORMANCES to EU No. 305/2011, CPR (Certificates and DoPs are available for download on C-TEC's website)		
VdS Approval No.: G218032	LPCB Certificate No.: 176p	UKCA Certificate No.: 0832-UKCA-CPR-F1066
Declaration of Performance: DOP0000060	CPR Certificate No.: 2831-CPR-F2283	EN 54-4:1997 + A1:2002 + A2:2006

E&OE. No responsibility can be accepted by the manufacturer or distributors of these power supplies for any misinterpretation of this instruction, or for the compliance of the system as a whole. The manufacturers policy is one of continuous improvement and we reserve the right to make changes to product specifications at our discretion and without prior notice.

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