POWER SUPPLY UNIT

HEPHEA242
HEPHEA244

INSTALLATION AND USER GUIDE

ISO9001

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SUMMARY

1 GENERAL SPECIFICATIONS

References HEPHEA242 and HEPHEA244 identify four power supply boxes designed to be appropriate for the use as power unit with a reserve of energy for the supply of a fire detection installation in accordance with the Directive of the Products of Construction CPD 89/106/CEE. The electric and mechanical realization of these products is compliant with the EN standards 54-4:1997 + A1:2002 + A2:2006, EN12101-10 and EN60950-1:2001.
The equipment can be used in different fields of application from the ones specified provided that the limits indicated in the paragraphs 1-2 and 1-3 of this document are respected.

1-1 CONSTRUCTION SPECIFICATION

The power supply units AU224K and AU424K use switching technology.
This choice of technology gives the following benefits:

- A significant reduction of dimensions and weight;
- An excellent electric efficiency allowing energy saving;
- An excellent stability in time.

The choice of a toroidal transformer ensures a maximum safety for the operator and the supplied equipment. The voltages present on all the circuits after the transformer are less than 60V, which reduces to the minimum the risk of accidental contact with dangerous voltages.
The power supply unit is composed of a metal box, with an index of protection of IP30.It contains the power supply block and it can receive the lead buffer batteries.
On the box front panel, two indicators (green and yellow) are present for indications of mains power supply presence and faults. The power supply units have two distinct electronic outputs, with open collector, for the indication of fault and lack of mains power supply.
There are also 2 relays outputs free of potential for the indication of fault and lack of mains power supply

1-2 FUNCTIONAL CHARATERISTICS

The power supply unit provides a DC voltage ranging between 21V and 28,5V ±2% according to the operational conditions and the ambient temperature (battery recharge temperature compensated). The unit is constantly controlled by a microprocessor of last generation which signal a fault condition if one of the following anomalies is found:

- Battery fuse fault
- Damaged battery
- Inefficient battery recharge circuit
- Mains power supply not present
- Output voltage provided by the supply block out of range (<22,5V o >29,6V ±2%)

Indications are given by the two indicators present on the front panel, each one of them shows 3 states: ON, OFF and blinking. The main combinations along with their meaning are indicated on the serigraphy close to the indicators on the front of the box. Those are described on the paragraph 3. The control of the batteries is carried out periodically (every 4 minutes under normal conditions of operation) by the power supply unit via a functional test of the battery. To check the battery, the system reduces the supply voltage of the sector by carrying it from 27,5V to 21V and checks at the same time the output voltage of the battery. If the voltage does not fall below 22,5V the battery is considered as operational, if it does, then a fault state is considered.
The system verifies also periodically the value of the resistance of the battery and the associated circuitry, as demanded by the EN54-4/A2; the fault is signalled when the resistance is over 0,8Ω.

1-3 TECHNICAL DETAILED LISTS

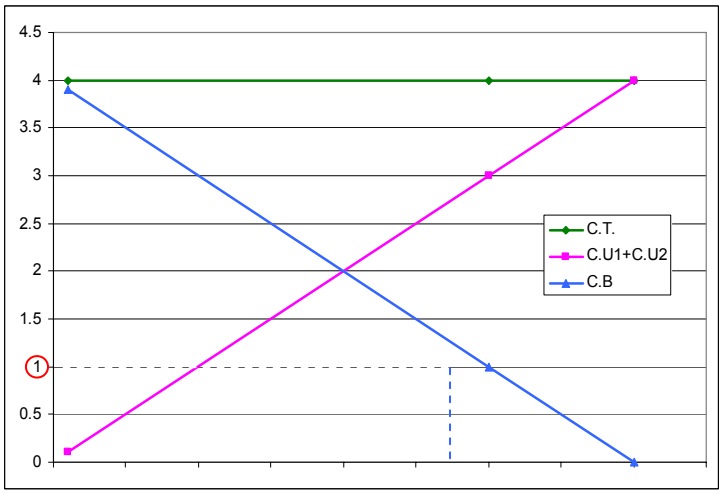
GENERAL CHARATERISTICS		
	HEPHEA242	**HEPHEA244**
COMMERCIAL DESIGNATION	**HEPHEA242** (27,5Vcc - 2A, metallic box)	**HEPHEA244** (27,5Vcc - 4A, metallic box)
CONSTRUCTION CHARATERISTIC	According with EN54-4:1997 + A1:2002 + A2:2006, EN12101-10 and EN 60950-1:2001	
BOX	Metal epoxy varnishing; IP protection: IP30	
EXTERNAL DIMENSIONS	Metallic box CM02: H385 x W405 x D160 mm Metallic box CM03: H500 x W420 x D200 Rack drawer TR01: H130 x W485 x D265 mm	
WEIGHT (without batteries)	HEPHEA242: 7 Kg [CM02]	HEPHEA244: 8 Kg [CM02]
AMBIENT CONDITIONS	-5 °C .. +40 °C,maximum humidities 93%, no condensation ambiental classes 1 (EN12101-10)	
COOLING	Natural by convection	
INSTALLATION LOCAL	Inside buildings (protected from climatics modifications)	

ELECTRICAL CHARACTERISTICS		
	HEPHEA242	**HEPHEA244**
INPUT VOLTAGE	230V +10% / -15%	
POWER SUPPLY FREQUENCY	50Hz sinusoidal	
MAX CURRENT CONSUMED ON MAINS	550 mA	1,1A
SECURITY TRANSFORMER	80VA primary 230V, secondary 34V	150VA primary 230V, secondary 34V
REGULATION TYPE	Switching PWM BUCK with at 50kHz commutation frequency and security transformer for isolation from mains	
CONTROL TYPE	Included µP control, with possibility to synchronize the battery test by external command	
NUMBER OF AVAILABLE OUTPUTS	2 protected by independent fuses	
OUTPUT VOLTAGE	min=21V±2% max=28,5V±2% (available voltage on the output, on different operational conditions, for the supply of the unit, the external loads and refill batteries).	
MAXIMUM RESIDUAL ONDULATION	<500 mVpp under charging and supply from mains condition (<2%)	<800 mVpp under charging and supply from mains condition (<3%)
TYPICAL RESIDUAL ONDULATION	50 mVpp (0.2%)	100 mVpp (0.4%)
MINIMUM LOAD	100mA	
TOTAL AVAILABLE CURRENT FOR OUTPUT AND BATTERIES REFILL	2A	4A
MAX AVAILABLE PERMANENT CURRENT FOR THE OUTPUT	1,5A	3A
MAX AVAILABLE CURRENT FOR THE BATTERY REFILL	0,5A	1A

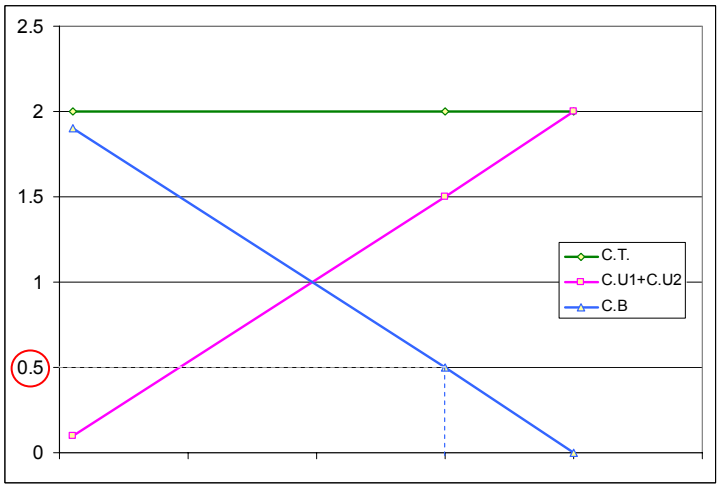
	HEPHEA242	HEPHEA244
RELAY OUTPUT FOR THE SEGNALATION OF THE MAINS STATUS AND FAULT	30V= - 1A	
ELECTRONIC OUTPUT FOR THE SEGNALATION OF THE MAINS STATUS	Positive output voltage between 19,2V= and 28,5V= when mains is active. Max current 10mA.	
COMMAND INPUT FOR THE BATTERY TEST	The input should not be used with a power supply unit that works in autonomous mode. It works with a voltage between 0 and 5V=. Surveillance current <1mA.	
MAXIMUM CURRENT ABSORBED BY THE UNIT WITHOUT MAINS	50mA	
BATTERY TYPE	HEPHEA242 (metallic box): 2 lead batteries12V 12Ah, waterproof, material class HB at least. Type: YUASA NP12-12	HEPHEA244 (metallic box): 2 lead batteries 12V 24Ah connected in serial, waterproof, material class HB at least Type: YUASA NP24-12
MAX ADMISSIBLE RESISTANCE FOR BATTERIES AND ASSOCIATED CIRCUITRY	0,8Ω ± 5%	
REGULATION MAINS VARIATIONS (-15%/+10%)	<2%	
REGULATION LOADS VARIATIONS (2.5-100%)	<2%	
PROTECTION OF BATTERIES POLARITY INVERSION	Fuse and diode	
FUSES: **MAINS INPUT** **SECOND. TRANSFORMER** **BATTERIES** **EXITS 1 AND 2**	 T0,63A 250V approved T3,15A 250V approved T3,15A 250V approved T1,6A 250V approved	 T1,6A 250V approved T6,3A 250V approved T6,3A 250V approved T3,15A 250V approved

	HEPHEA242	HEPHEA244
Maximum available courrent to guarantee a 72h autonomy without mains (batteries recommended)	0.1A	0.25A
Maximum available courrent to guarantee a 30h autonomy without mains (batteries recommended)	0.35A	0.75A
Maximum available courrent to guarantee a 4h autonomy without mains (batteries recommended)	1.5A	3A

Outputs characteristics

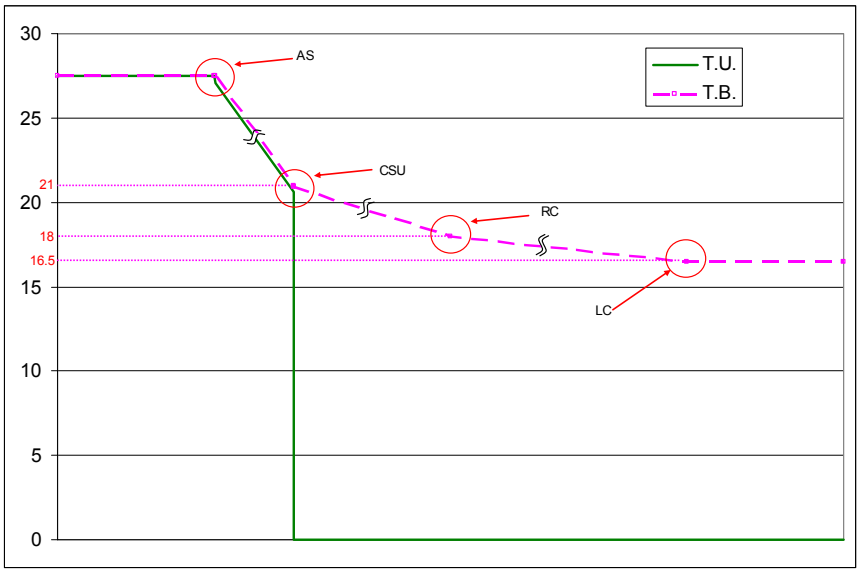


Distribution of the whole current (C.T.) between outputs (C.U1+C.U2) and batteries (C.B) (HEPHEA244)



Distribution of the whole current (C.T.) between outputs (C.U1+C.U2) and batteries (C.B) (HEPHEA242)

NOTA : The underlined currents correspond to the minimum necessary values to satisfy the recharge prescriptions of the batteries indicated by the standard.



Caratteristiche uscite utilizzatori vs. uscita batterie

LEGGENDA :

AS : Mains absence; the difference between the voltage of the outputs and the battery depends to the load applied.
CSU : Outputs Isolation o (battery at 21V±5%, consumption <8mA±10%); the outputs are reconnected when mains return
RC : Reduction of the consumption to 3.5mA±10% (18V±5% battery)
LC : Consumption reduced to 500µA±10% (16.5V±5% battery)

1-4 PRODUCER'S DECLARATION

The producer that developed and produce the power supply unit described in this manual declares that:

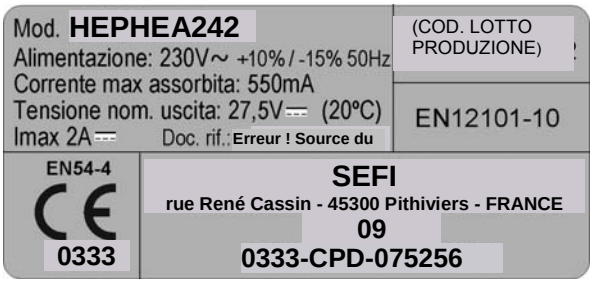
- The project was developed according to an internal quality management system which plans a series of rules for a correct development of all the subsets of the product.
- The electric and mechanic project of those products has been developed according to the security characteristics written in the EN60950-1:2001.
- All the integrated components were selected in the purpose that them characteristics satisfy the requirements of the 3K5 of the standard IEC 721-3-3 and what whatever are the internal or external ambient conditions.

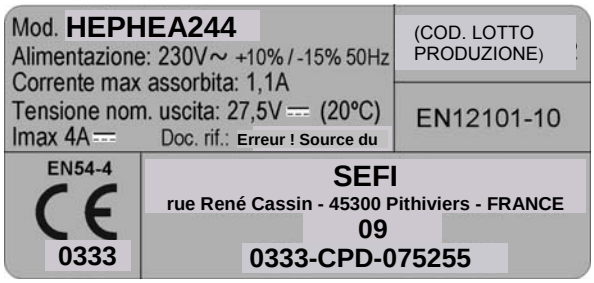
1-5 SECURITY INFORMATIONS

This equipment is intended to be linked with the mains network 230V. To avoid any risk of electric shock, any interventions must be realized out of mains. Products complies with the standard EN60950-1:2001. The works with mains voltage active are authorized only for the interventions during which the switch-off is impossible. The interventions are restricted to qualified technicians only

1-6 LABELING AND IDENTIFICATION OF THE CERTIFIED PRODUCT

On the supply units HEPHEA242 and HEPHEA244, on the right external side of the box, is applied the label that clearly identifies the model, the essential datas and the CE certification according to CPD. An indication for each model is given below:





The label characterizes in particular:

a) in the up-left quadrant:
   - The identifier name of the product,
   - The supply voltage and the maximum current absorbed from the mains,
   - The typical nominal output voltage reported to an ambient temperature of 20ºC,
   - The maximum current supplied from all parts of the unit,
   - The reference to the present installation and user manual;

b) in the up-right quadrant: the object identifier code of production;
c) In the central-right quadrant: the reference European norm for which the product has been certified;
d) In the down-left quadrant: The CE sign with the body number notified at European level that has release the certification;
e) In the down-right quadrant:

   - The name and address of the object producer,
   - At last, two figures refering to the year in which the labeling has been set,
   - The number of the CE certificate of conformity according to European directive CPD 89/106/CEE.

2 INSTALLATION AND CONNECTIONS

2-1 POWER SUPPLY BLOCK

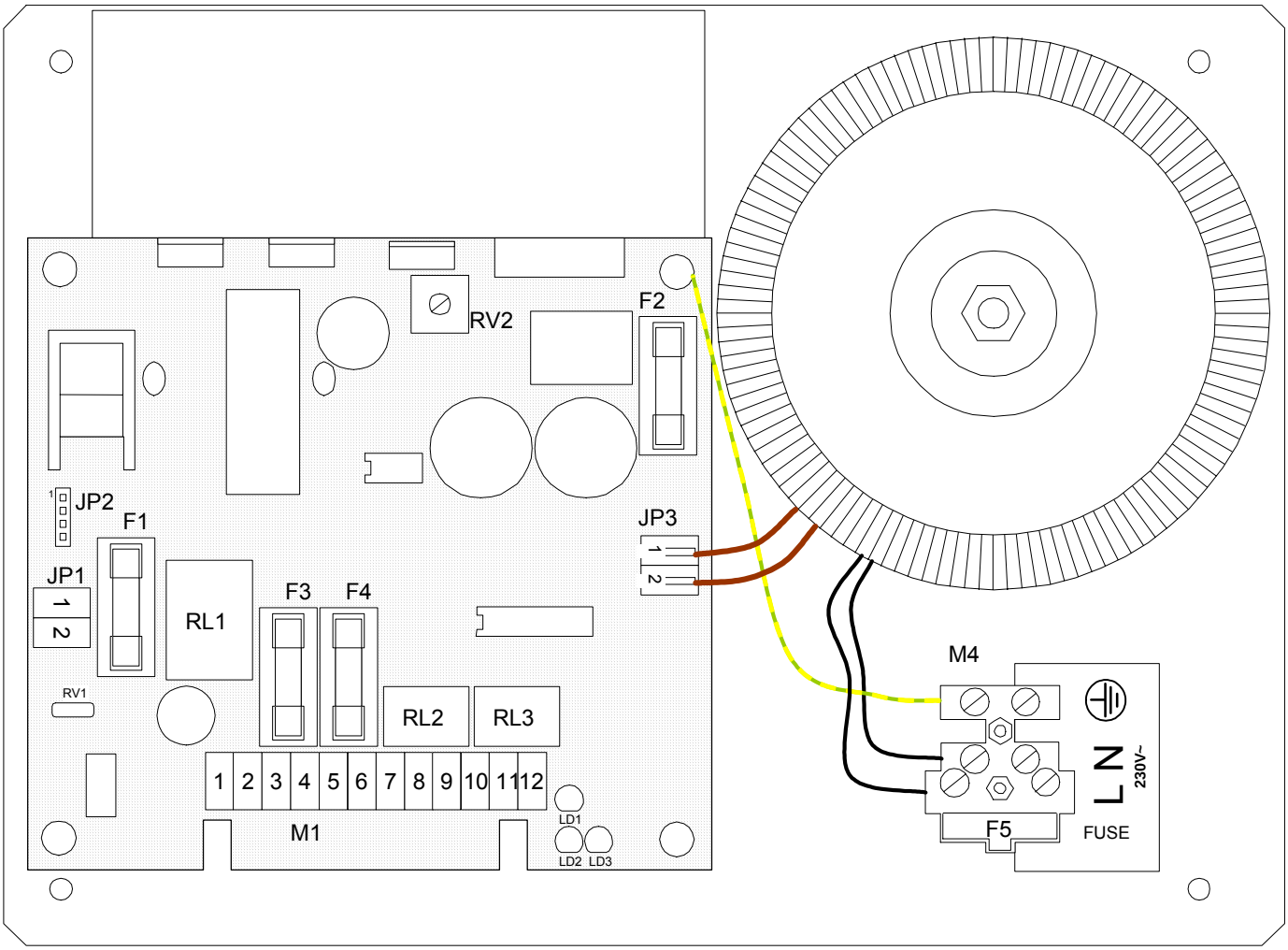


Figure 1 –Power supply blocks AUx24A2

2-1-1 DEVICES AND CONNECTIONS

M1:

1	SUPPLY OUTPUT N.1 (+): 27,5V ± 1,5% (@ 20°C / 100mA). Output protected by fuse F3	
2	SUPPLY OUTPUT N.1 (-)	
3	SUPPLY OUTPUT N.2 (+):27,5V ± 1,5% (@ 20°C / 100mA). Output protected by fuse F4	
4	SUPPLY OUTPUT N.2 (-)	
5	MAINS PRESENCE ELECTRONIC OUTPUT. Positive voltage output when mains are active **(don't use in autonomous mode).**	
6	EXTERNAL TEST INPUT **(don't use in autonomous mode).**	
7	FAULT RELAY (relay normally active)	normally open (N.O.)
8		normally closed (N.C.)
9		common (COM)
10	RELE' DI PRESENZA RETE (relay normally activated with mains presence)	normally open (N.O.)
11		normally closed (N.C.)
12		common (COM)

JP3:

1,2	SECONDARY TRANFORMER INPUT 34Vac (protected by fuse F2)

JP1:

1	+ OUTPUT FOR BATTERIES: 27,5V ±1,5% (nominal at 20°C without batteries or with batteries charged at 100%). The output can be disconnected by RL1 under battery fault condition (batteries voltage < 21V±2%, output voltage < 21V±2%).
2	- OUTPUT FOR BATTERIES

M4:

L, N	PIN FOR MAIN INPUT 230V~ +10%/-15% 50Hz	INGRES
⏚	PIN FOR CONNECTION TO ELECTRICAL GROUND	COLLEC

NOTA

Connection with the mains must be carried out by qualified staff and in respect with the usual cares. Moreover the following criteria must be respected:

a) For the entry and the exit of the cables it is necessary to use distinct holes with press packs.
b) For connection with the mains it is necessary to use suitable cables with a minimum section of 1,5mm² and an inflammability class HB or better.
c) Bare the conductive wires over a length just sufficient enough to allow their insertion in the corresponding terminals.
d) Insert the conductive wires into the connector blocks and tighten sufficiently. Avoid an excessive tightening which could damage or cut the conductive wires. Check that all the necessary conductive wires are inserted inside the terminals.
e) Gather the conductive wires and fix the cables on the appropriated places on the back of the box.
f) The electric cables for the mains must be separated and distant from the electronics parts and other cables.
g) Carry out and check connection with the ground.
h) Install on the connection upstream, a bipolar device of cut and protection of the mains power supply.

F1: FUSE FOR BATTERIES PROTECTION T3.15A 250V certified for HEPHEA242 or T6,3A 250V certified for HEPHEA244.

F2: FUSE FOR SECONDARY TRANSFORMER PROTECTION T3.15A 250V certified for HEPHEA242 or T6,3A 250V certified for HEPHEA244.

F3,F4: FUSE FOR OUTPUT PROTECTION 1 and 2 T1,6A 250V certified for HEPHEA242 or T3,15A 250V certified for HEPHEA244.

F5: FUSE FOR MAINS PROTECTION T0,63A 250V certified for HEPHEA242 or T1,6A 250V certified for HEPHEA244.

JP2: CONNECTION OF LED MODULE FOR FRONT PANEL VISUALISATION.

Visualisation module is provided already connected on JP2 – DO NOT DISCONNECT

LD1: LED FOR VISUALIZATION OF THE MAINS PRESENCE. When it is turned on, it means that the supply unit works with the mains voltage.

LD2: LED FOR SIGNALIZATION OF CORRECT OPERATION OF THE SYSTEM. When it is turned on, it means that there are not failure conditions on the power supply unit.

LD3: LED FOR SIGNALIZATION OF BATTERIES DISCONNECTION. When it is turned on, it means that the unit cut the battery, because of a failure (when there is mains).

RV1: THERMAL COMPENSATION for batteries recharge voltage

RV2: OUTPUT VOLTAGE REGULATION **(DO NOT MODIFY)**

RL1: RELAY FOR BATTERIES DISCONNECTION
RL2 FAULT RELAY. It is activated in condition of no fault presence (positive security), and it is deactivated when the unit detect any conditions of fault. Max load 1A a 30V=
RL3 MAINS RELAY. It is activated when there is mains (positive security) and it is deactivated when there is'nt any. Max load 1A a 30V=

NOTA The indications N.C., N.O., COM of relais are referred to normal active conditions.

NOTA Only SELV (very low voltage circuits galvanically insulated from other circuit and earth) circuit can be connected to relais contact.

2-2 NECESSARY TOOLS FOR INSTALLATION

Necessary tools for installation of power supply:
- 4 ankles of suitable size (see below), screw and discs;
- hammer drill with bits for concrete adjusted to the selected ankles;
- 6 mm screwdriver for the fixation of the metal plate necessary to block the batteries.

2-3 WALL MOUNTING

The power supply box must be mounted vertically and fixed on a stable wall adapted to support the weight of the equipment.
The box is fixed on the wall using four ankles of 8mm, screws and discs of adequate size.
Fixing plates are integrated on the back side of the box to maintain it to a suitable distance from the wall:

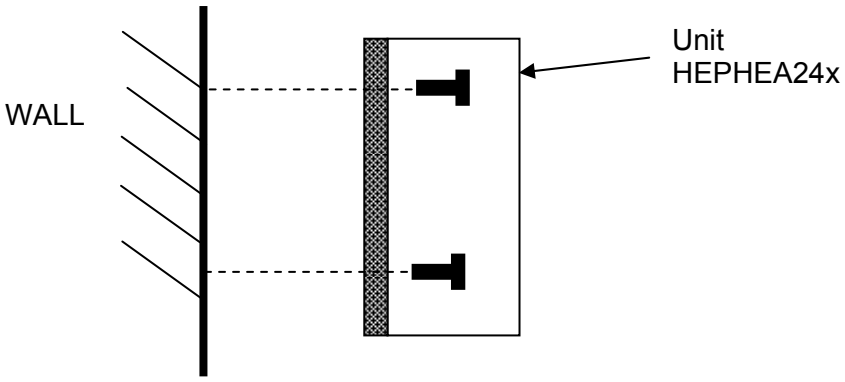


Figure 2 – Wall mounting

2-4 MAINS CONNECTION

The connection of the block to the mains must be carried out by qualified staff and respecting the usual cares and the law.
For connection it is necessary to use suitable conductive wires with a minimum section of 1,5mm ² and holes glands. All the materials used must have a minimum inflammability class of HB.
The conductive wire for the power supply have to be fixed on the back of the box (see Figure 3) on the dedicated position and has to be separate from the electronic components and input/output cables.
In particular it is necessary to use diferent holes for the cables of the mains electric input and the cables of the voltage output given by the power supply unit.
It is necessary to install on the upstream of the power supply a differential circuit breaker to protect the system from an accidental short-circuit to the ground.

NOTA The cables must not be tinned.

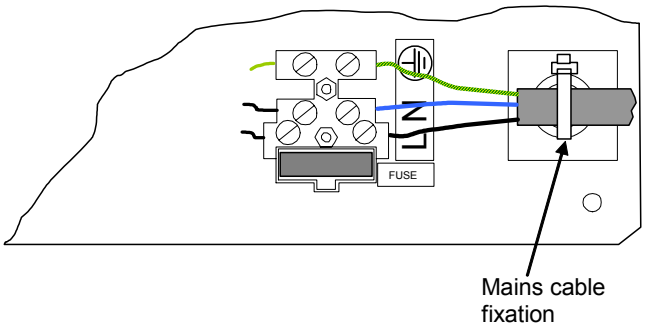
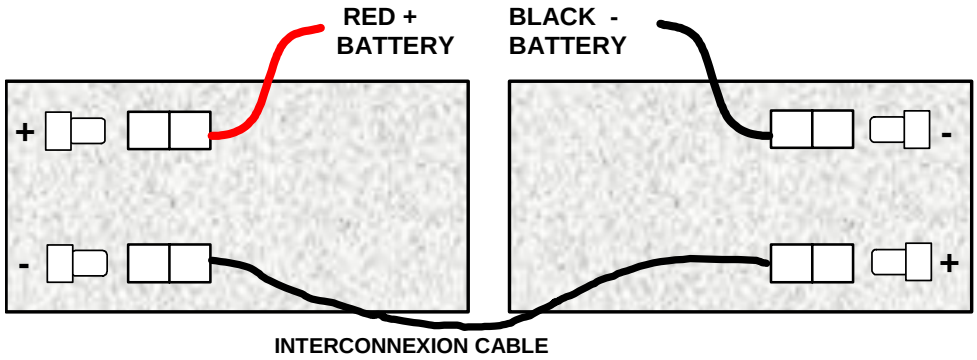


Figure 3 – Mains cable fixation

2-5 BATTERIES INSTALLATION AND CONNECTION

th batteries must be placed on the bottom of the box and fixed with the safety plate furnished.
A cable is dedicated for the batteries connection, it consists of two conductive wire (a red and a black).
The batteries connection are carried out the following way:



The BLACK conductive wire must be connected on the terminal (-) of the first battery, while the RED conductive wire must be connected on the terminal (+) of the second battery. The batteries must be inter-connected together with another cable which connects the terminal (+) of the first battery to the terminal (-) of the second.
The batteries must be of lead type, waterproof with a capacity ranging between 12Ah and 24Ah

IMPORTANT REMARKS:

a) Pay attention: not reverse the connections of batteries. A polarity inversion can damage the equipment.
b) Connect the batteries only when the installation is ended and all links and insulations are verified.
c) Use batteries of the same type and with a flammability class UL94-HB or higher.

2-6 CONNECTIONS

Morsetto	*Dettaglio*	*Tipo di cavo*
M4-1 **M4-2** **M4-3**	Phase (L), Neutral (N), Ground (⏚)	Cable 3 x 1,5mm² flammability class ≥HB
M1-1	Output n°1 (+)	Cable 2 x 1,5mm² flammability class ≥HB
M1-2	Output n°1 (-)	
M1-3	Output n°2 (+)	Cable 2 x 1,5mm² flammability class ≥HB
M1-4	Output n°2 (-)	
M1-7 **M1-8** **M1-9**	Fault relay	Cable 2-3 x 0,5mm² flammability class ≥HB
M1-10 **M1-11** **M1-12**	Mains presence relay	Cable 2-3 x 0,5mm² flammability class ≥HB

3 FRONT PANEL SIGNALISATIONS

The signalisations are made by the means of green and yellow LEDs and present on the front panel are described on the following table:

GREEN LED MAINS	*YELLOW LED FAULT*	*POWER SUPLLY BLOCK STATE*
●	○	**Normal operation.** Mains present, no fault.
●	●	Mains present. Monitoring electronic circuit in fault status.
⊙	●	Mains present. Output voltage on fault status (on voltage).
⊙	⊙	Mains present. Battery switched off or damaged.
○	⊙	Mains not present. Operation under battery supply only.
○	●	Mains not present from more than 20 minutes or output voltage insufficient (operation on batteries supply only)
○	○	Mains not present and batteries discharged/disconnected. Power supply unit disabled.

Legend: ● = ON ○ = OFF ⊙ = Blinking

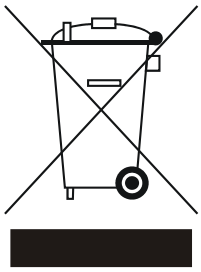
4 PREVENTIVE PERIODIC MAINTENANCE

To guarantee the efficiency of the power supply box, the user needs to plan a periodic maintenance carried out by qualified staff.
The maintenance have to include the control and the tightening of the wires connections and a control of the voltages provided by the power supply unit for the refill of the battery and the output.
Moreover the effectiveness of the batteries needs to be checked and need to be replaced within the time recommended by the manufacturer, time which can not be higher than five years.

ATTENTION
For battery replacement use only battery types indicated on this guide.

5 ENVIRONMENTAL SPECIFICATIONS

In accordance with the European directives, these products must be recycled in specialized places..



Used batteries must be put in the rubbish according to the instructions of recycling indicated by the manufacturer

NOTE: