User manual

1. CAUTION

CAUTION	ATTENTION
• SEE INSTRUCTIONS BEFORE CONNECTING BATTERIES	• LIRE LES INSTRUCTIONS AVANT DE CONNECTER LES BATTERIES
• RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS	• IL Y A RISQUE D'EXPLOSION SI LA BATTERIE EST REMPLACEE PAR UNE BATTERIE DE TYPE INCORRECT METTRE AU REBUT LES BATTERIES USAGEES CONFORMEMENT AUX INSTRUCTIONS
• DO NOT CHARGE OR DISCHARGE BATTERIES AT A RATE EXCEEDING MANUFACTURER'S RECOMMENDATIONS	• NE PAS CHARGER NI DECHARGER LES BATTERIES HORS DES LIMITES SPECIFIEES PAR LE FABRICANT
• RISK OF ENERGY	• RISQUE D'ENERGIE
• ONLY FOR INDOOR USE	• UTILISATION A L'INTERIEUR SEULEMENT
• DO NOT RESTRICT VENTILATION OPENINGS	• NE PAS OBTURER LES OUIES D'AERATION
• BATTERIES TO BE REMOVED BEFORE TRANSPORTATION	• RETIRER LES BATTERIES AVANT TRANSPORT

Note: the battery breaker MUST be open to remove the batteries from the system.

SAFETY

Hazardous voltage inside the unit, the unit shall be installed by qualified service personnel.
See instructions before connecting or disconnecting batteries
Risk of explosion if batteries are replaced by an incorrect type
Dispose of used batteries according to the instructions
Do not charge or discharge batteries at a rate exceeding manufacturer's recommendations
Risk of Energy
Only for indoor use
Do not restrict ventilation openings
Batteries to be removed before transportation

WARNINGS

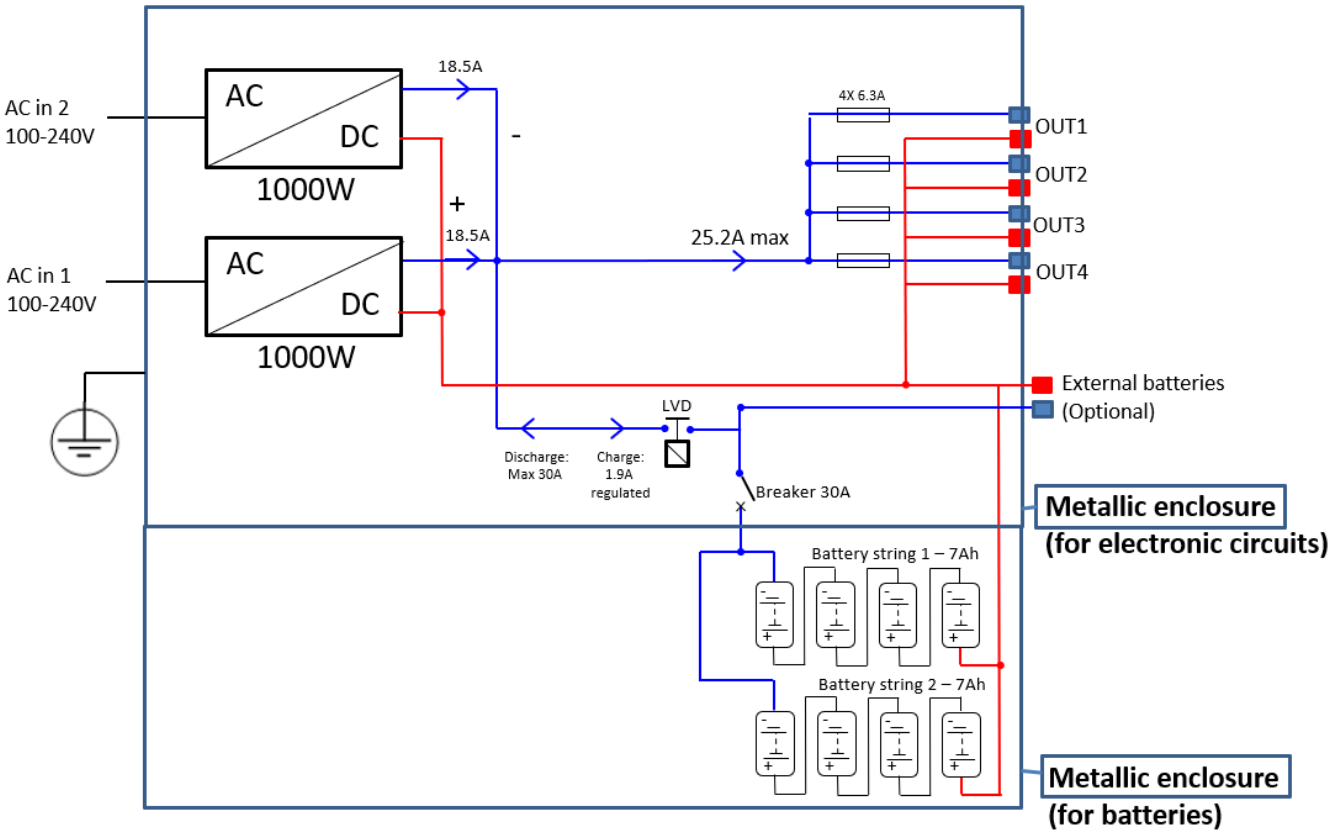
Multiple power source
This equipment is connected with batteries
In order to disconnect the DC outputs,
switch Off both power sources:
1. AC supply: remove the mains cables
and
2. Batteries: open the battery breaker

WARNING : This power supply is intended only for installation by a professional installer; is not suitable for use in locations where children are likely to be present.

2. SYSTEM DESCRIPTION

The battery charger rack is a power sub-rack of 2U high designed to support 2 rectifiers **ECOR1048TN** (1000W at 200-240Vac input range; 500W at 100-120Vac input range). Model CAR1048TN cannot be used inside this subrack (see additional note below).

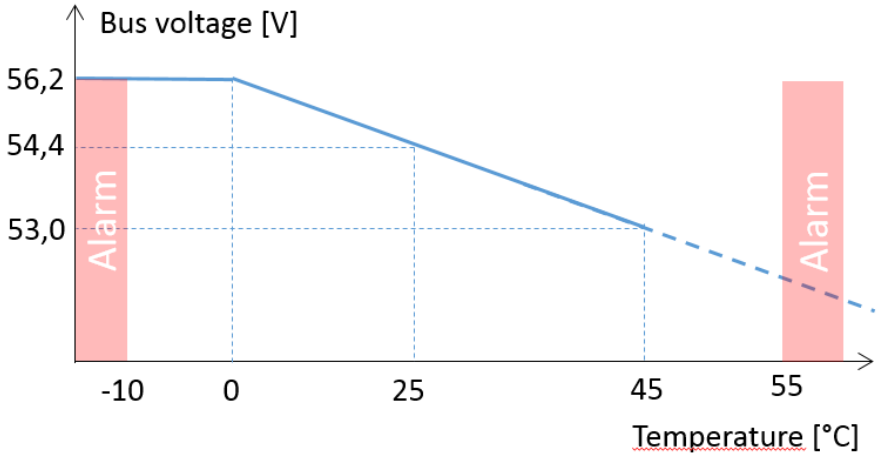
The rack is designed for a maximum output current of 25.2A (with 2 rectifiers installed) with forced cooling integrated in the module. Care must be taken to ensure free air circulation (front to rear) through the module.



A compartment for the batteries is included in the rack (up to eight batteries type NP7/12). A battery low voltage disconnect (LVD) device is part of the shelf: LVD is a switch, which separates the battery from the other parts of the system to avoid a deep discharge of the battery in case of AC mains failure.

LVD threshold is 41.5V ± 0.5V.
LVD is also open when batteries temperature probe reaches too high level (typ. 80°C)

The floating voltage on the batteries is determined by temperature inside the batteries compartment: 54.4V at 25°C, with temperature compensation of -72mV/°C, limited at 56.2V @0°C.



The batteries initial charge current is fixed at 1.9A typ.:

- 0.27 CA in case of 1 string of 4 batteries type NP7/12
- 0.135 CA in case of 2 strings of 4 batteries type NP7/12
- 0.067 CA in case of 4 strings of 4 batteries type NP7/12 (in case of PE6500/81 + external batteries)

Additional note:

This subrack has been qualified with use of ECOR1048TN. Use of model CAR1048TN is forbidden.

With CAR1048TN, the system with subrack REV01 will not work properly and only rectifier CAR1048TN may be damaged (the subrack will not be damaged).

With subrack REV02 (with Batteries breaker open):

- the system will not start with CAR1048TN (Orange LED on front of CAR1048TN)
- the system will not start when mixing CAR1048TN and ECOR1048TN (Orange LED on front of CAR1048TN and Red LED on front of ECOR1048TN)

Difference between versions PE6500/80 and PE6500/81: PE6500/81 is equipped with an external batteries connector to extend autonomy of the complete system. This extension shall be provided with a breaker 30A max.

3. MOUNTING

MOUNTING:

Fixing holes are provided on the two mounting brackets
Important : due to the weight (max. 30 kg) of the rack , two cantilever chassis supports or a shelf must be provided.

Weight empty subrack:	6.9 kg
Weight of rectifier:	1.1 kg
Weight of dummy:	0.25 kg
Weight of one battery 12V 7Ah:	2.65 kg
Max. weight (- 48V configuration with 2 battery strings):	30 kg
Max. weight (- 48V configuration with 1 battery string):	20 kg

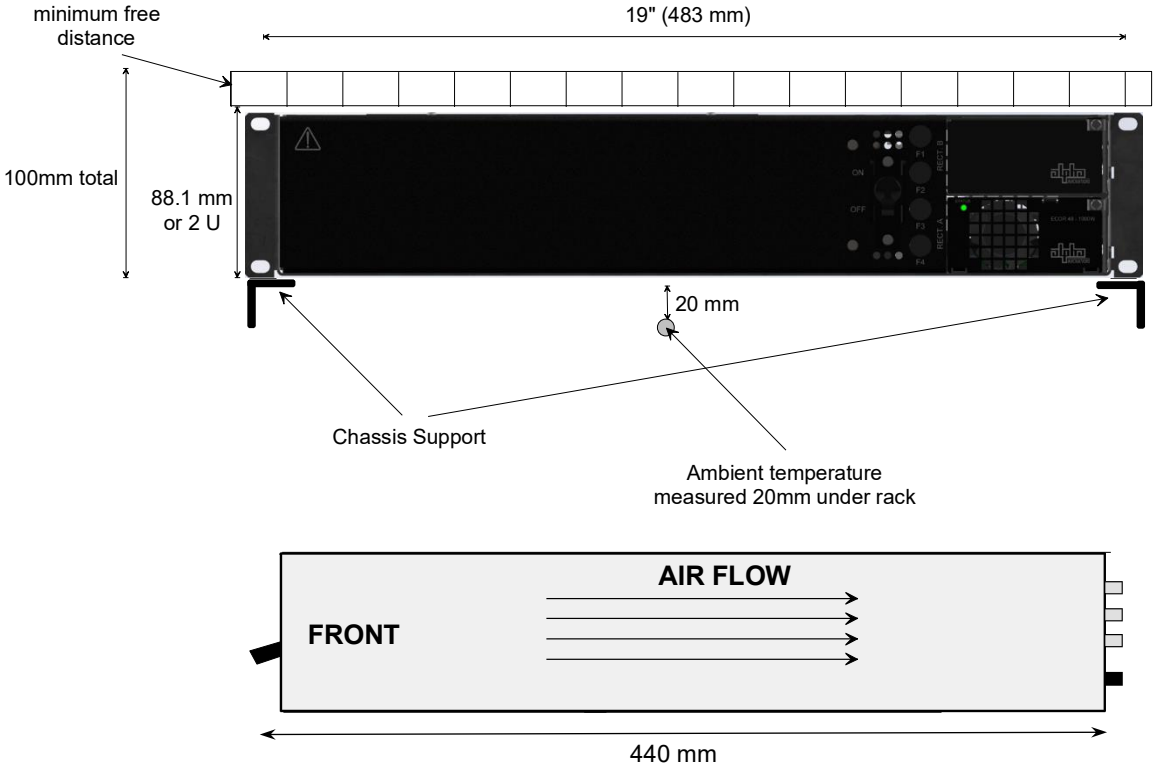
VENTILATION:

gas outlet: holes on top of the rack; the air circulation may not be impeded and a minimum distance of 10mm must be provided above the whole rack

cooling of the battery charger: the air flow is from front to back and the air circulation may not be impeded. A minimum distance of 40 mm must be provided between the rear of the rack and any vertical surface.

AMBIENT TEMPERATURE:

-5 … +45°C



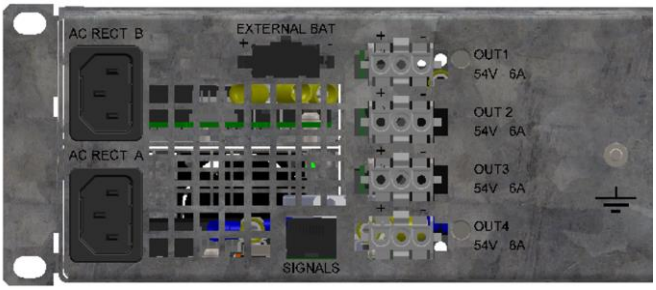
4. CONNECTIONS

4.1 Input AC connections

2 slots are available on front side for 2 rectifiers A and B with related AC input connector IEC C14 (male pins) on rear side.

Note: if only one rectifier (9411 011 05101) is used, it has to be mounted in slot RECT. A and a dummy (9411 041 05001) has to be mounted in slot RECT. B.

Front view



Rear view

Input voltage	*Ratings*	*Remarks*
Nominal	100 to 240 Vac	
Nominal load low input range	100 to 120Vac (-10%, +10%)	500W per rectifier
Nominal load high input range	200 to 240Vac (-10%, +10%)	1000W per rectifier

Power supply cord (3 x 1mm² or AWG16 min. with Line / Neutral / PE) is used as the main disconnect device, ensure that the socket-outlet is located / installed near the equipment and is easily accessible. One breaker (10A min.- 20A max type D) per power cord or one breaker 20A type D for both power cords is required for redundancy of the system.

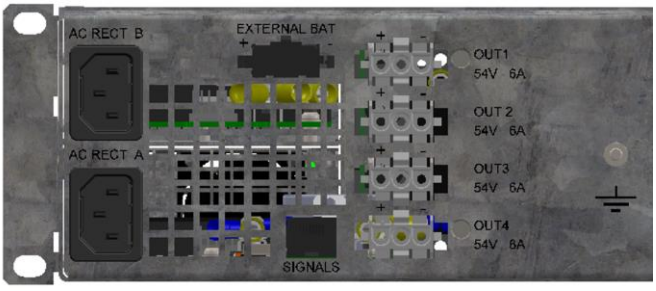
Note: **The subrack is a class I product and must be grounded to comply with Safety and EMC requirements via power supply cord or via additional Protective Earth wire to be connected on a M4 grounding screw provided on the rear side. The mains and grounding connections must be made in accordance with local Norms, Standards and rules.**

4.2 Output DC connections

4 DC outputs (OUT1 to OUT4) are available on the MATE-N-LOK connectors on the rear side (+ and – are not earthed).

Each output is protected by a related 6.3A (5x20mm Slow action) fuse present on the front of the rack (F1 to F4). For safety compliance, it may be replaced only with same type of fuse and rating of 6.3A max.

Front view

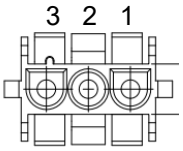


Rear view

	Connector on subrack	*Mating connector*
Housing	350767-1 from TE	350766-1 from TE
Contact pin	926883-1 from TE	926882-1 from TE

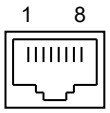
Pinning (view on connector on subrack):

1: -48V
2: NC
3: +0V



4.3 Signals/Alarms connections

RJ45 connector: rear view of the subrack:



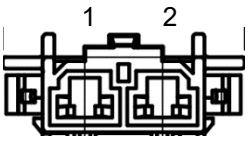
Alarms Return connected to +0V Power.

Pin	Signal	High level	Low level	Active	Active if
1	**DCA_OK**	Left open (External voltage Max 6V)	60 ohms max. to Alarm_Return (Max 0.6V at Max 10mA)	LOW	DCA OK (Rect A present with DC OK)
2	**Alarm_Return**	_	_	_	_
3	**DCB_OK**	Left open (External voltage Max 6V)	60 ohms max. to Alarml_Return (Max 0.6V at Max 10mA)	LOW	DCB OK (Rect B present with DC OK)
4	**Alarm_Return**	_	_	_	_
5	**BAT_TEMP**	Left open (External voltage Max 6V)	60 ohms max. to Alarm_Return (Max 0.6V at Max 10mA)	LOW	Battery temperature not in alarm (between -5°C and 50°C)
6	**NC**	_	_	_	_
7	**Alarm_Return**	_	_	_	_
8	**NC**	_	_	_	_

4.4 External batteries connections (for PE6500/81 only)

Connections are available on rear side to add batteries in an external box to increase autonomy of complete system.

Female Receptacle: PN 42818-0212 from Molex (Mating with 42816-0212)
Male contact : PN 42817-1014 from Molex (Mating with 42815-0114)



Pinning: 1: +0V (Batteries)
2: -48V (Batteries)

Important note: External box shall be protected with breaker 30A maximum.
Batteries shall be the same type as inside the shelf (type NP7/12).

5. BATTERIES PLACEMENT AND CONNECTIONS

5.1 Batteries: general

Before use, read the instructions given by the battery manufacturer

WARNING High Energy Hazard

Each external battery string MUST be protected according to the system power and the installed cross-section of the cables
The fuse or disconnecting device must be capable of interrupting the current in the event of a short-circuit.
The short-circuit current of the batteries is specified by the manufacturer

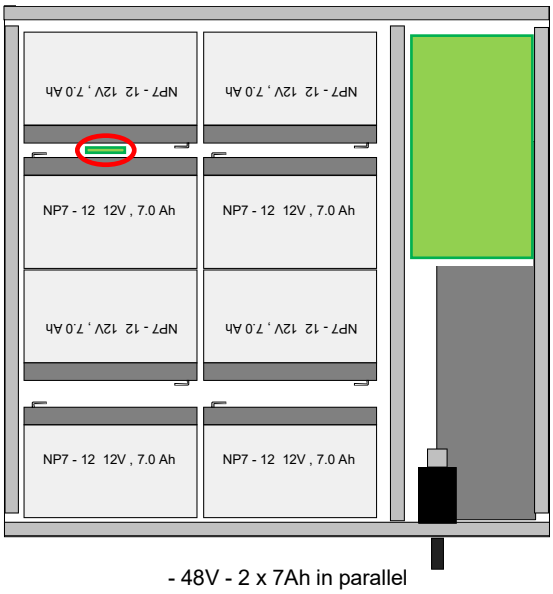
Shock hazard : all metal parts of batteries are alive and so there is a danger of injury from electric shock and of accidental short circuit. Touch the battery on the insulated part only. Be careful with non-insulated tools, bracelets and rings.

Explosion hazard : regardless of service conditions, hydrogen gas can escape from the pressure relief valves. Installation in hermetically enclosure is therefore prohibited.

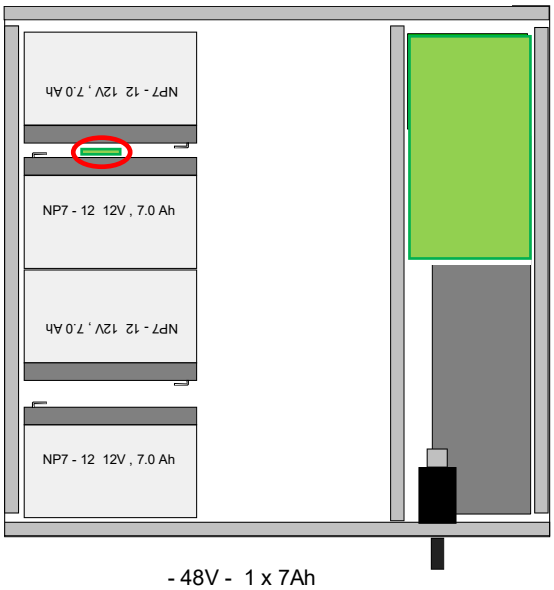
In case of use with PE6500/81 and External batteries box, check that each batteries string is at the same state of charge. If needed, the starting procedure (see chap.6) can be repeated for each string individually (by closing the batteries breakers individually).

5.2 Batteries location

Note: place carefully batteries to avoid damaging batteries temperature sensor



- 48V - 2 x 7Ah in parallel

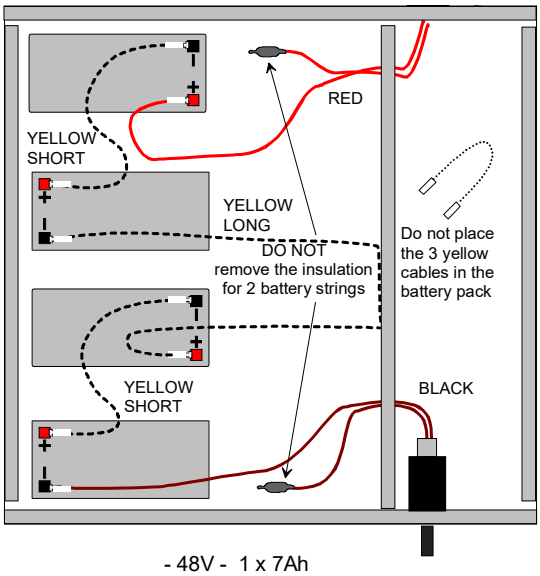


- 48V - 1 x 7Ah

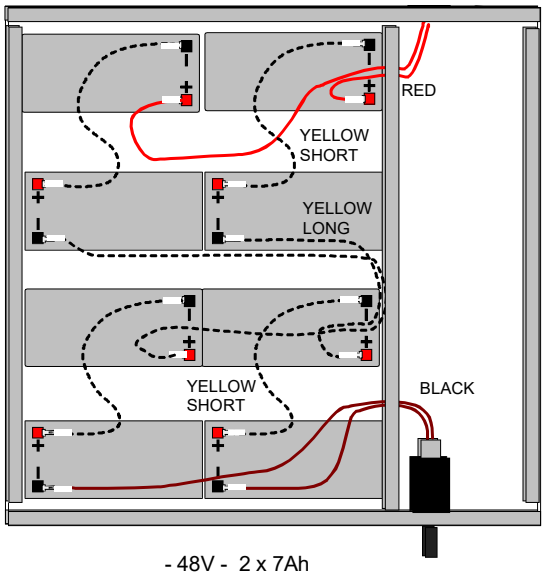
5.3 Batteries connections

The rack is delivered with two complete -48V yellow wires: 2 short and 1 long per string of batteries

* IF PRESENT: REMOVE THE MAINS CABLES FROM THE RACK
* OPEN THE BREAKER (handle down)
* PLACE FIRST THE BATTERIES VERTICALLY IN THE RACK
* CONNECT THE -48V YELLOW WIRES FIRST
(series connection of each battery string)
* THE LONG WIRES MUST GO ALONG THE MIDDLE SEPARATION WALL
* MEASURE THE VOLTAGE OF EACH BATTERY STRING:
between not connected + and – of each string
the string voltages must have the same voltage within +/- 1V (typical 48 .. 50V)
* CONNECT THE + (red) and – (black) WIRES TO EACH STRING
* LAY DOWN THE BATTERIES
* PLACE AND FIX THE COVER (11x Torx Countersunk M3x6)
* START THE SYSTEM AGAIN (see 6.1)



- 48V - 1 x 7Ah



- 48V - 2 x 7Ah

6. STARTING / SWITCHING OFF THE SYSTEM

6.1 Starting the system

1. Mains cable removed from the IEC rear socket or ensure that the mains is not connected to the system
2. Check that the battery breaker of the rack is open (down). Check that battery breaker in External batteries box if used with PE6500/81 is open.
3. Connect the loads to the MAT-N-LOK connectors
4. Connect the mains to the rack
5. Eventually check the DC output voltage; typical value: 54V
6. Close the battery breakers of the rack and External batteries box if used with PE6500/81 (see note 5.1 in case of different states of charge of batteries strings).

6.2 Switching OFF the system

1. Open battery breaker of the rack
2. Remove the mains from the rack

Note:

- ***The battery breaker MUST be open to remove the batteries from the system.***
- ***Charge the batteries during minimum one hour before using the equipment the first time.***

7. SYMBOLS

 Fonctional Earth grounding terminal (or Protective Earth if not provided via AC cables). Any interruption of protective conductor inside or outside the device or disconnection of the protective earth terminals is likely to make the device dangerous; intentional interruption is prohibited.

AC RECT. A & AC RECT. B : Mains connections via IEC plugs on rear side of rectifiers RECT.A & RECT. B

OUT1 to OUT4 : DC connections on rear side for outputs 1 to 4

F1 to F4: Output fuses (6.3AT max, 250V min) to protect outputs OUT1 to OUT4

 Electrostatic discharge (ESD): observe precautions for handling electrostatic sensitive devices

 Equipment containing batteries: see instructions on the cover and in the manual