ENERGO

DC UPS

Uninterruptible power supply

48 V DC

NFC 13-100 / NFC 13-200 compliant

EN User manual

MAN200005 | Da | 2024.11

1. Safety

This user manual contains all the instructions for the installation, commissioning and use of the **ENERGO** uninterruptible power supply. Please follow them very carefully to ensure the product functions correctly.
It is vital to read the Safety Instructions before installing or commissioning this product.

Safety instructions:

ENERGO is a DC UPS designed to be connected to the 115 V / 230 V public distribution network. It ensures continuity of service for equipment in the event of a power outage. The backup function, Li-ion battery, is integrated into the product.

- A sectioning device must be provided upstream in accordance with the rules in force.
- In order to avoid any risk of electric shock, any intervention must be carried out with the power off (upstream sectioning device open).
- The intervention must be carried out only by authorized personnel.
- The battery does not require any maintenance, it is prohibited to open it.
- When assembling, connect the earth wire first and when disassembling, disconnect it last.
- Respect the orientation of the product (see photo on the first page).
- Ensure sufficient convection (minimum clearance 50 mm on the sides).
- Size and protect the cables according to the maximum input/output current (≥ 0.15 mm2/A).
- Respect the thermal and mechanical limits.
- The supplied battery is a Li-ion type.
- Caution, there is a risk of explosion if the battery is replaced by an incorrect type!
- At the end of its life, recycle the product and its battery in accordance with the instructions.
- Complies with EN 62368-1 (This equipment is not suitable for use in places where children may be present).

2. Directives and environmental and public health protection

SLAT is committed to protecting the environment and public health through its products and complies with the corresponding directives.

SLAT designs and manufactures all its products in accordance with the environmental directives RoHS (Restriction of Hazardous Substances) and WEEE (Waste Electrical and Electronic Equipment).

The product must be recycled at the end of its life. The battery can be easily removed by qualified professionals independent from SLAT to for end-of-life recycling.

SLAT products comply with the EC directives.

CE

3. GENERAL INFORMATION

3.1 The company

To meet its customers' requirements more effectively:

- SLAT has been designing and manufacturing all its products according to standard ISO 14001 since 2007.
- SLAT recycles its products at the end of their life cycle by means of its recycling programme.

3.2 Purpose of the manual

The user manual provides provide the information necessary for the positioning, connection, configuration and operation of the **ENERGO** equipment.

This manual is also available in PDF format from the MySLAT space at www.slat.com.

3.3 Related documentation

The following documents are associated with this user manual:

- Installation manual
- Commercial brochure

This documentation is available at www.slat.com.

3.4 Intended audience

The operations and information described in this manual must only be performed by authorised, trained operators.

3.5 Indicator labels

Three types of important notifications are used in this manual.
The type of notification informs you of the potential consequences of non-compliance with the instructions.
These consequences are not exhaustive and are listed in order of ascending risk:

IMPORTANT REMARK!

Contains additional information. Non-compliance will not cause damage to equipment or injury.

CAUTION!

Equipment and property may be seriously damaged or people may be seriously injured if the precautions for use are not followed.

DANGER!

Failure to comply with the notification may lead to serious injury or death.

4. The product

4.1 Description

ENERGO is a DC UPS (**U**ninterruptible **P**ower **S**upply) designed for security systems. In the event of a power outage or glitch, it ensures continuity of service for the equipment it powers with its integrated backup function. With its C13 100 function, it powers the automation and components (coils and motorisation of the circuit breakers) of medium voltage delivery substations.

Functions

- Maintains control of sensitive equipment in the event power outages or glitches.
- Filters electromagnetic interference.
- Delivers a rated voltage of 54.76 V DC to the equipment.

4.2 Operating principle

When connected to the mains, the **ENERGO** uninterruptible power supply stores energy and continuously powers the connected devices.
If the mains supply fails, the built-in emergency supply continues to provide power to the connected devices without interruption for the entire autonomy duration selected. Local or remote restart possible after the end of autonomy.

Detail of functions in chapter 7.

4.3 Product views

Figure 4.1: Exterior view

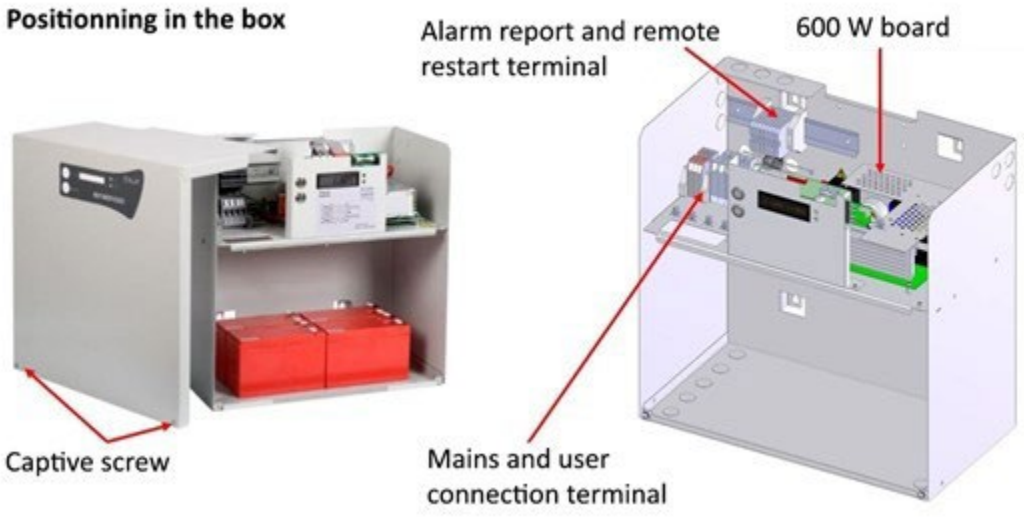


Figure 4.2: Location of component parts

4.4 Product names

The list of product names is available on www.slat.com.

Designation	Code	Weight with batteries
ENERGO 48V 12A C85 LI	3681285026	24.5 kg
ENERGO 48V 12A C85 LI 4DJ	3681286026	25.0 kg

Table 5.1: Names, weights and operating power of the products

4.5 Contents of the delivery

The product is delivered with:

- The installation manual
- The batteries are delivered unmounted and separately wrapped inside the packaging of the ENERGO box (a single package)
- The wiring kit for battery connection is already mounted in the box.

4.6 Battery

The Li-ion battery has the following characteristics:

- Capacity of 26 Ah
- Technology: LiFePO4
- No risk of thermal runaway
- Lifespan: 10 years @ 25°

The actual autonomy time depends on the power consumed and the temperature of use.

4.7 ENERGO and backup associativity

Only combine **ENERGO 48V 12A C85 LI** and **ENERGO 48V 12A C85 LI 4DJ** with the 48V 30 AH battery supplied by SLAT. The use of other batteries is not permitted.

5. Installation

5.1 Positioning / Installation on support

The product must be installed according to safety standard EN 62368-1.

The **ENERGO** box is designed for wall-mounting:

1 Place the product on the wall and mark the fastening points (holes for 4 screws).
2 Drill four holes in the wall and insert plugs suitable for the substrate and the weight of the product (not supplied - ø 6 x 55 mm recommended).
3 Attach the product using 4 screws (not supplied – ø 5 x 55 mm recommended).

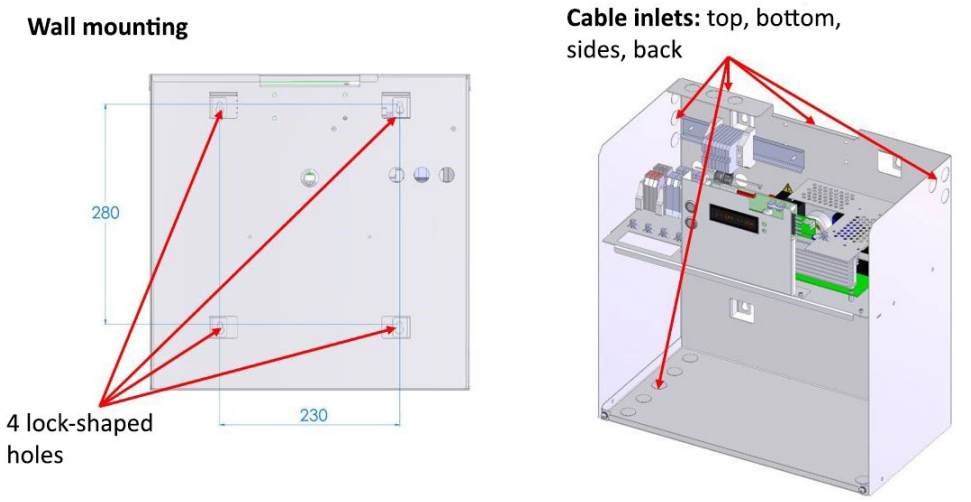


Figure 5.1: Position on the wall

CAUTION!

Ensure the product is firmly attached to the wall to avoid it falling!

5.2 Connection

5.2.1 Connection specifications

Phase, neutral	Screw terminals 4 mm² max
Earth	Screw terminals 16 mm² max
User output	Double screw terminals 10 mm² max
Communication / alarm reports	Screw terminals 2.5 mm² max
Length to be stripped	7 mm

Table 5.1: Connection specifications

DANGER!

The cable cross-section used must be selected according to the operating current.

5.2.2 Wiring

After installing the product on its support, the wiring must be carried out.
A label to facilitate connection is placed on the front on the display board support.

Wiring methods

Connect the wires according to the symbols shown on the label (flat screwdriver for screw terminals).

CAUTION!

To avoid wiring mistakes, make a careful note of the positioning of the connectors and terminal blocks and their respective symbols.

Connection

DANGER!

The application must be switched off in order to connect the equipment.

The circuit breaker upstream of the application must be open!

The stripped ends of the mains cables must be crimped before being connected to the product terminals!

Always connect the ground wire first before connecting the power supply to the mains!

The wires are connected according to the following steps:

1. Connect the **ENERGO** power supply to the mains
   The mains input cables must be connected to the screw terminal according to their colour:
   - Yellow/green - ground wire ⏚
   - Blue - neutral wire (N)
   - Brown - live wire (L)

   After connecting the ground wire, the “neutral” and “live” wires can be connected.

2. Connect **ENERGO** to the user
   The product is connected to the application via the screw terminal or directly on the circuit breakers (version with four circuit breakers).
   The initial output voltage is set to the rated value 54.76 V DC.
   Once connection is complete, the upstream circuit breaker can be closed to start up the product.

ENERGO model connection terminals (with 2 fused user feeders):

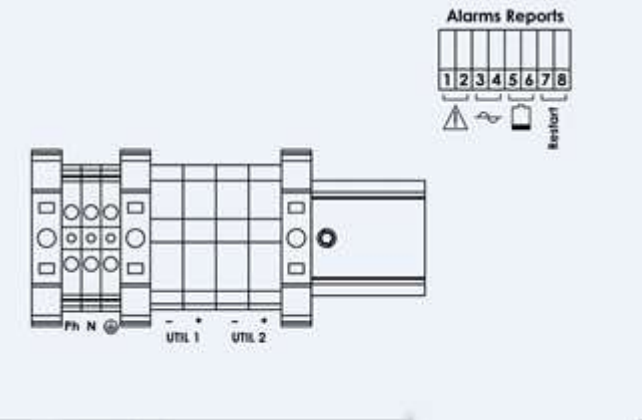


Figure 5.2: ENERGO model connection terminals (with 2 fused user feeders)

ENERGO DJ model connection terminals (with 4 fused user feeders):

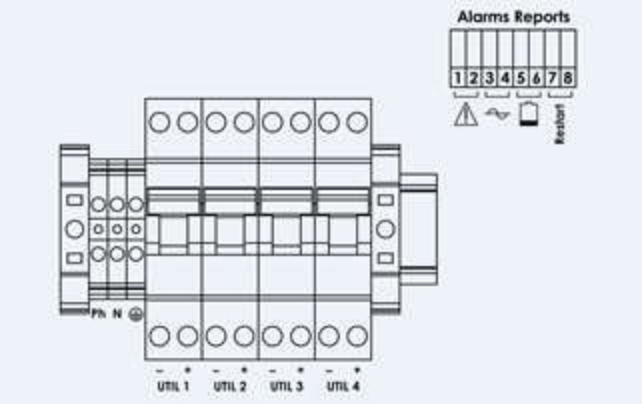


Figure 5.3: ENERGO DJ model connection terminals (with 4 fused user feeders)

The various authorised battery layouts (top view)
for ENERGO LI and ENERGO LI DJ models in 48V.

Figure 5.4: 48V 26AH

5.2.3 Commissioning

Once all the connections have been made, **ENERGO** starts up automatically when the upstream circuit breaker is closed**.**

6. Operation

It is possible to interact with the product during operation. There are two communication modes:

- Local report and/or remote report.

6.1 Local report on the product

2 three-coloured green/yellow/red LEDs indicate the following faults or operation:

Output LEDs (user)

	Output LED state
User outputs supplied	Steady green
Charger fault	Steady red
Fuse fault	Steady red
User outputs not supplied	Off

Battery LED

	Battery LED state
Battery charged	Steady green
Battery being charged	Intermittent green (On 1.8 s/off 0.2 s)
Operating on battery	Steady yellow
Low battery, if the voltage is < 44.4 V (48 V DC) ⇨ end of autonomy or battery to be changed	Flashing yellow (On 1 s/off 1 s)
Battery test fault	Steady red
Battery out of service and no mains supply	Off

6.2 Remote alarm reports + remote restart

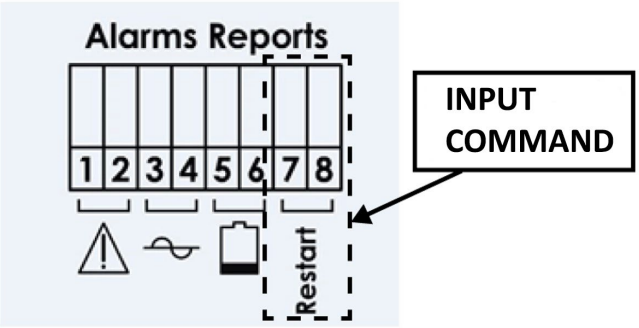


Figure 6.1 : Alarm reports + remote restart

A – Alarm reports

Positive safety contacts (coils active if no faults)

Alarm reports			
Name	**Terminals**	**Status**	**Fault conditions**
General fault	1-2	Open in the event of a fault	Charger or mains or battery or impedance fault
Mains present	3-4	Open in the event of a fault	No mains power
Battery flat alarm	5-6	Open in the event of a fault	Battery voltage < 44.4 V (48 V DC) or 22.2 V (24 V DC)

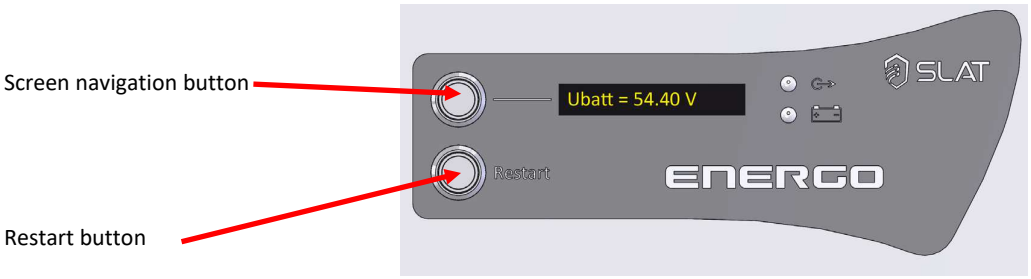
Table 6.1: Alarm reports

B – Remote restart

Input command for remote restart (via relay, pushbutton, etc.)

Terminals 7 - 8

6.3 Communication via the LCD display



Display:

The product continuously displays the standard menu. The standard menu display is incremented every ten seconds to indicate the next item of information and runs on a loop.

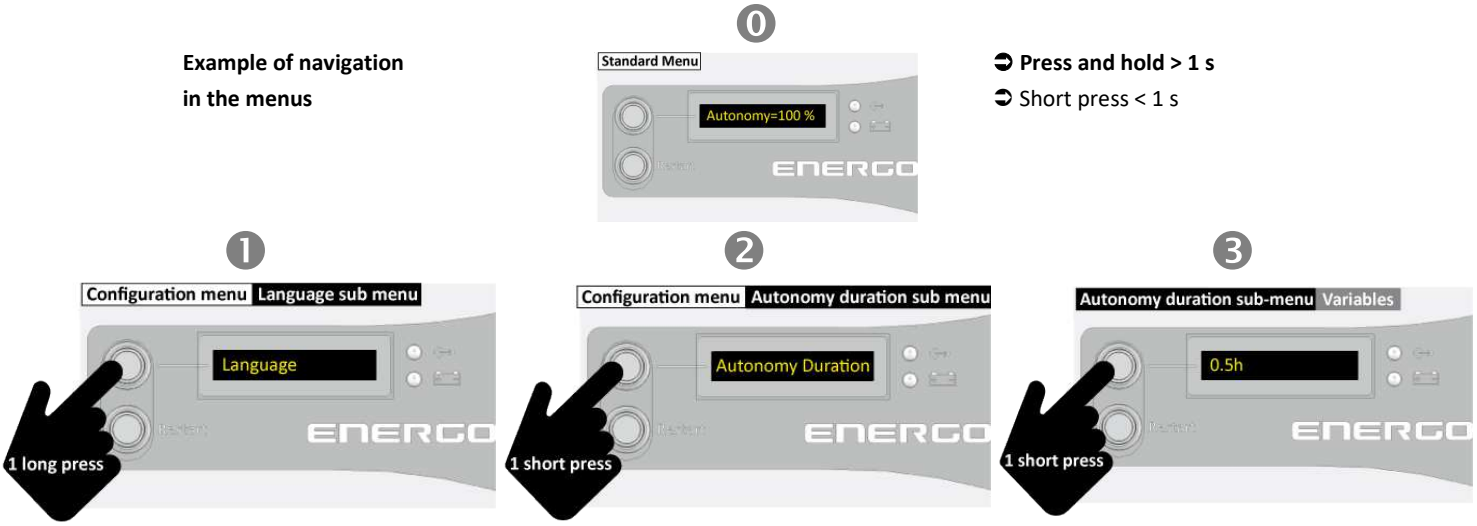
Press and hold (>1 s) to access the configuration menu.

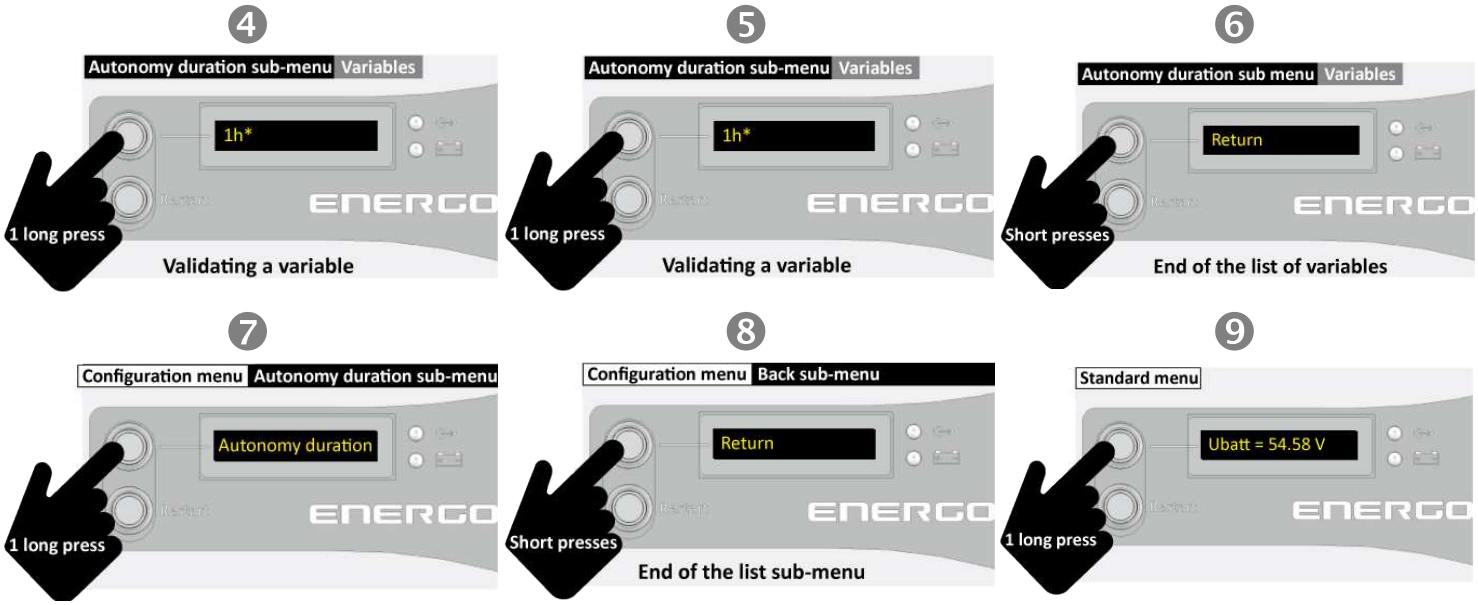
Pressing and holding once in the configuration menu gives access to one of the proposed sub-menus.

Press and hold to select a variable in one of the sub-menus. A selected variable has a * next to it.

The selected variables are saved in the memory to restart the product with the same configuration.

Example of navigation in the menus





Description of the menus:

Standard Menu:

1. Ubatt : displays the battery voltage to two decimal places
2. Ibatt : displays the battery current to two decimal places
3. Uout : displays the output voltage to two decimal places
4. Iout : displays the total output current to two decimal places
5. Autonomy : displays the remaining autonomy as a percentage (in the case of new batteries, the autonomy displayed is 0% until the batteries are fully charged)
6. Fuse 1 fault (if present) *(user 1 output fuse)*
7. Fuse 2 fault (if present) *(user 2 output fuse)*
8. Change Batt. fault (if present) *(degraded performance or end of life)*
9. Battery fault (if present) *(no battery or battery out of service)*
10. Battery fault (if present) *(< 44.4 V (48 V DC))*
11. Charger fault (if present) *(charger function out of service)*
12. Mains fault (if present) *(no mains power or outside tolerance)*

Configuration menu:

Language sub-menu:

1. French
2. English
3. German
4. Back

Autonomy duration sub-menu

1. 0.5 h *(default value)*
2. 1 h
3. 2 h
4. 4 h
5. 8 h
6. 12 h
7. Unlimited (see 9.1.3, page 17)
8. Back

Restart delay sub-menu:

1. 0 to 30 s
2. Back

Battery Test submenu:

1. Battery Test?

2. 1 long press ➔ Test in progress ➔ Battery OK / Battery to be changed (automatic return to normal menu)

OR

1 short press ➔ Return

If you perform a battery test with one of the following conditions ➔ Mains absent or battery charging ➔ Battery test impossible

Back

7. Eco Mode

If there is no mains power and if the set autonomy time is ≥ 1 hour (see sub-menu paragraph 6.3 page 12) the LCD display turns off to save energy. To activate the display again, simply press one of the two buttons on the front panel.

8. Built-in functions

1. LED test function

The two LEDs on the front light up for one second when the board is switched on.

2. Battery circuit test function.

This function is used to detect whether the battery is present or not. The battery mesh test is performed every 30 seconds during the first 20 minutes, then every 15 minutes.

3. Restart function (C13-100)

After a period of autonomy which the user can configure via the LED screen [30 min (0.5 h), 1 h, 2 h, 4 h, 8 h, 12 h or unlimited (see 9.1.3, page 17)], the battery is disconnected from the user.

All the indicator LEDs are switched off except for the restart LED which flashes (on for 0.4s / off for 1.6s) indicating it is on standby for a restart. This can be done manually using the restart button or remotely (see 6.2, page 11).

Text display: **Restart in progress** or **Restart inactive**

Take into account the consumed output power and the battery capacity when selecting the autonomy duration

4. Wind turbine function

To avoid connecting all the turbines in a wind farm to the grid at the same time, closure of the MV circuit breakers can be delayed after a remote restart command. Execution of the order can be delayed by 1 to 30 seconds. This

delay can be configured from the LCD screen (see 6.3 Communication via the LCD display in the “Restart delay” sub-menu) and only applied for remote restarts.

5. Cold start function

It is possible to start up without mains (battery operated). In this case it is necessary to press the restart button, the restart button flashes, the display lights on and the product starts in restart mode [Restart function (C13-100) above].

9. Maintenance and troubleshooting

Maintenance

The product has been designed to function for a long period of time **without requiring maintenance**.

Replacing the battery at the end of its service life is all that is necessary. The provisional end-of-life for the supplied battery is indicated by **ENERGO**

IMPORTANT REMARK!

Any work on the product must only be performed by qualified personnel.

For additional technical assistance, contact the SLAT hotline: +33 4 78 66 63 70.

For an RMA request (authorisation to return goods), refer to chapter 10.2.

No equipment may be returned without prior issuance of an RMA number.

10. Technical Data

10.1 Electrical characteristics

10.1.1 Electrical characteristics of the supply

Mains input	
AC network voltage	98 V to 265 V
Frequency	47 Hz to 63 Hz
Class	1
Inrush current	Limited by NTC
Neutral system	TT, TN, IT
Primary short-circuit protection	Slow-blow fuse on the phase
	8 A slow-blow
Shock wave protection	Differential mode by varistor and filter
Primary current @ 97.8 V	7.7 A
Primary current @ 264.5 V	7.7 A
Circuit breaker to be provided upstream	Curve D
Increased protection against atmospheric and industrial disturbance	1.2/50 µs wave and 8/20 ns wave

Table 9.1: Mains input electrical characteristics

10.1.2 Electrical output characteristics

Output	
One user output	DC voltage
Rated voltage U_n	54.4 V
Rated output current I_n	12 A
Permissible peak currents	Tableau 9.3: Pointes de courant admissibles, page 17
Voltage precision	+/- 0.5%
Current limitation	In: 12 A
Peak-to-peak HF residual ripple (20 MHz-50 Ω)	< 4% of U_n
Effective LF residual ripple	< 0.5% of U_n
Static and dynamic regulation characteristics	< 5% of U_n for cumulative variations of the mains and the load (from 10 to 90%)
User output protection	**48 V 12 A** 12.5 A fuses 1500 A slow-blow 10A or D circuit breakers (for DJ version)
η @ 20% of user load	85%
η @ 100% of user load	91%
Protection against output short-circuits	by cutting off the power supply with cyclical restart
Protection against user output surges	deregulation or connection error, by cut-off with cyclical restart if output voltage > U_n+10%

Table 9.2: Electrical output characteristics

10.1.3 Functional characteristics

Two or four user outputs continuously supply a constant voltage of 54.4 V DC to the equipment to be powered. In the event of a power outage, the built-in battery maintains the electricity supply to the equipment connected to ENERGO for the selected autonomy duration (see 6.3, page 12 in the “Restart delay” sub-menu). If the battery voltage reaches the threshold of **43.2 V** +/-3% it is disconnected.

10.1.4 Peak currents

The table below shows the maximum peak current duration in ms.

Model	Peak current duration (limited by fuse)	
	500 ms	100 ms
48 V 12 A	17 A	56 A
48 V 12 A 4DJ	50 A	60 A

Table 9.3: Permissible peak currents

10.2 Mechanical characteristics

Mechanical specifications	
Cabinet	Painted steel (RAL 7035)
Protection rating	IP 31
Weight	11 kg without battery
Installation	Box for wall-mounting with 4 screws, diameter 5 mm
Dimensions	L 408 x H 408 x D 224 mm
Removable cover with captive screw	Pozidriv 2 screwdriver
Opening condemnable	by plumb bob
Lock-shaped holes	To hang the cabinet before screws are permanently tightened
Cable inlets on the bottom of the cabinet	5 cable gland openings on each side
Cable inlets on the top of the cabinet	3 cable gland openings on each side and on the top

Table 9.4: Mechanical specifications

10.3 Environmental specifications

Environmental specifications		
Storage temperature	Without battery	-25 to +85°C
Operating temperature	at 100% charge	-5 to +40°C
	at 75% charge in battery charging mode	-5 to +50°C
Relative humidity	in storage	20 to 95%
Altitude	Above 2000 m, the temperature is lowered by 5% every 1000 m.	

Table 9.5: Environmental specifications

10.4 Standards

The product is designed to meet the LV and EMC directives (immunity and emission). It is compliant with the following standards.

10.4.1 Safety standards

Standard No.	Title/Content
EN 62368-1 (2020)	Audio/video, information and communication technology equipment Part 1: Safety requirements

Table 9.6: Safety standards

10.4.2 EMC standards

Standard No.	Title/Content
EN 61000-6-2 (2019)	Immunity standard for industrial environments (generic standard)
EN 61000-6-4 (2019)	Immunity standard for industrial environments (generic standard)
EN 61000-3-2 (2019) (classe A)	Limits for harmonic current emissions (equipment input current <= 16 A per phase).
EN 55032 (2015) (classe B)	Electromagnetic compatibility of multimedia equipment
EN 55024 (2011)	Information technology equipment - Immunity characteristics - Limits and methods of measurement

Table 9.7: EMC standards

10.4.3 Electrical standards

Standard No.	Title/Content
NFC 13-100	Standard for delivery stations supplied by a public HTA distribution network (up to 33kV)
EN 61000-6-4 (2019)	Standard on high-voltage electrical installations for electrical energy production sites, industrial, tertiary and agricultural sites.

Table 9.8: Electrical standards

11. Warranty and Product Returns

11.1 Warranty

The equipment is guaranteed for three years from the date of delivery (ex-works). It is strictly limited to reimbursement or replacement (at our discretion and without compensation of any sort) of parts recognised as faulty by our services, following the return of the product to our workshops at the buyer's expense. The replacement or repair of equipment is possible only in our workshops. In order to allow our customers to benefit from the latest technical improvements, SLAT reserves the right to carry out any alterations considered appropriate.

N.B. the battery is guaranteed for 12 months see battery manufacturer's warranty

IMPORTANT REMARK!

Mechanical opening of the covers of the sub-assemblies inside the product cancels the manufacturer warranty!

11.2 Product Returns

11.2.1 Product under warranty

For the maintenance of your products under warranty, SLAT offer the best solution to facilitate your repairs and minimise lead times:

- Contact the Customer Service department using the form available on our web site www.slat.com, taking care to fill in all the required fields.
- The RMA form will be processed and sent back by the SLAT account manager.
- After receiving your RMA form, return two copies with your product(s), one INSIDE the package and the other on the OUTSIDE of the package for warehouse identification purposes, thereby guaranteeing traceability of your product.
- The repaired or replaced product(s) will be returned within a maximum of 15 business days.

11.2.2 Product no longer under warranty

Product repair by SLAT

Contact Customer Services at service.client@slat.fr making sure that you provide all the following information:

- Last name / First name
- Company / Full address / Telephone / Email
- Exact model of the product (indicated on the product label) / SLAT reference (indicated on the product label, code number) / Serial No. / Quantity / Problem(s) encountered (describe the faults encountered with the product)

The form to request the RMA number is available at www.slat.com.

The account manager will send the RMA form by email together with a quote according to the relevant product range.

After receiving your RMA form, return two copies with your product(s), one INSIDE the package and the other on the OUTSIDE of the package for warehouse identification purposes, thereby guaranteeing traceability of your product. The repairs will be performed only after the receipt of the accepted quote together with a repair order form. If the quote is rejected, please return it to service.client@slat.fr marked “refused” and specify whether the equipment should be destroyed or returned in its existing condition (in this case a charge of €150 will be invoiced for handling costs).

The repaired or replaced product(s) will be returned within a maximum of 15 business days. A new three-month warranty is attributed to the product in question.

Conditions: The authorisation to return products is issued by SLAT.

An RMA number is assigned to each product to be returned. Each RMA number is valid for 30 days.

No equipment may be returned without prior issuance of an RMA number.

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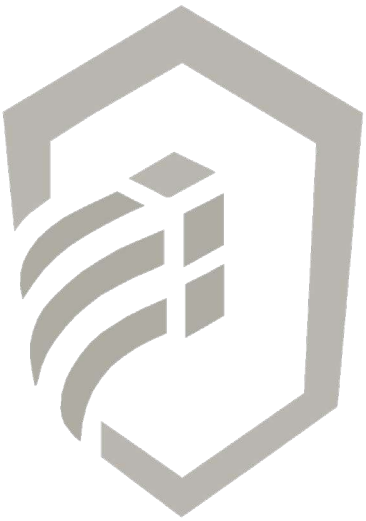

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