

REVISIONS AND THE EDITION OF THIS DOCUMENT

The current and most recently published edition of this document is available at www.milleteknik.com.

Audit log can be requested, see contact information for address or e-mail address.

The validity of this document can not be guaranteed, as new editions are published without prior notice.

User manual in original language: Swedish.

Instructions for use, technical data and translations thereof may contain errors. It is always the responsibility of the installer to install the product in a safe manner.

Installation video



<https://www.milleteknik.se/en54-1u-2u/>



READ THIS FIRST!

If possible, leave 100 mm of free space.

The system is intended for use in a controlled indoor environment.

Only authorized persons should install and maintain the system.

It is the installer's responsibility to ensure that the system is suitable for its intended use.

Documents accompanying the system must be kept in or in its immediate vicinity.

Ventilation should not be covered. Mains voltage should be disconnected during installation.

All information subject to change.

Upon installation of this product, the installer acknowledges and accepts the limitations of this product as described in this manual.

Instructions original language: Swedish.

About translation of this document

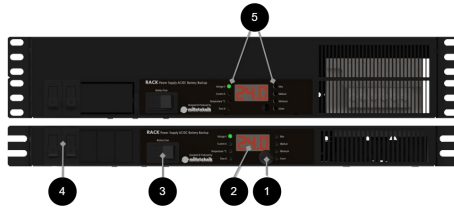
User manual and other documents are in the original language in Swedish. Other languages may be machine translated and/or not reviewed, errors may occur.

INSTALLATION AND COMMISSIONING

Instruction No:350-240 \$ {/d:article [1]/@xml:lang} \$

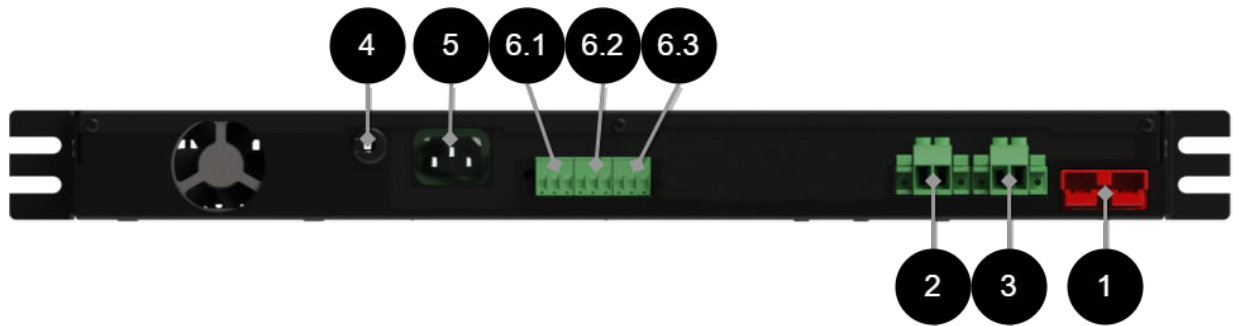
COMPONENT OVERVIEWS

Component overview



Component overview

Letter	Explanation
1	Motherboard.
2	Lockable door.
3	Battery fuse
4	Load fuses
5	LED



Component overview, back

No .	Explanation	Comment
1	Connection of battery cables	-
2	Load output 2	The fuse on the front is the one closest to the display.
3	Load output 1	Fuse on the front is the one closest to the corner.
4	Temperature sensor	-
5	Mains connection	230 V.
6.1	Relay 1	Mains failure, NO/CO/NC.
6.1	Relay 2	PSU over/under voltage, aged battery, battery not connected, broken fuse, low battery voltage in battery operation, NO/CO/NC.
6.3	Relay 3	Low system voltage, NO/CO/NC.

ENCLOSURES

Mounting

Installation in 19" rack



Installation in 19" rack.

No .	Explanation
1	The unit is mounted with screws into a 19" rack.



NOTE

Installation of the RACK EN54-COVER can be done before or after the unit is installed.

Installation of battery shelf



The battery shelf must be mounted in a 19" rack. Use the appropriate screw for the rack to attach the shelf.

Attach the shelf in at least two places on each side. Use as many screws as you need to keep the batteries and the shelf secure and stable.

In order for the device to function, batteries must be connected. These must be placed on a battery shelf that comes with prepared cabling. The battery shelf must be mounted in the rack before batteries are placed.



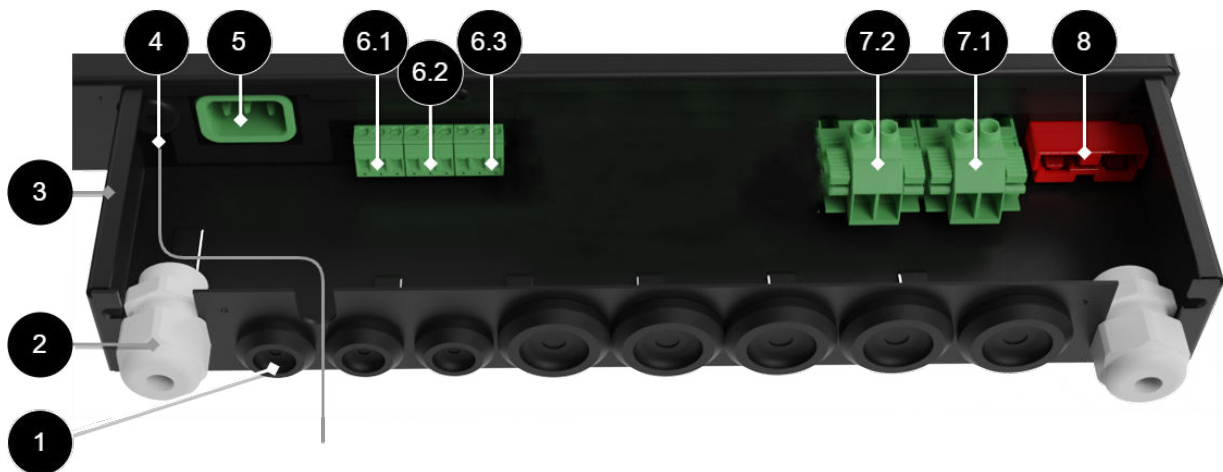
WARNING

The unit must be installed in a locked and protected indoor environment.

Risk of access to battery terminals. terminal protection must cover battery poles.

CONNECT MAINS

Pull wiring through the cable entry on the cabinet.



Back with shelter

No	Explanation
1	Cable entries for alarm cables and load cables.
2	Strain relief for mains cable.
3	Shelter in powder-coated sheet metal.
4	Temperature sensor.
5	Connection for mains cable.
6.1-6.3	Relay 1-3, see component overview [2] .
7.2	Load output 2.
7.1	Load output 1.
8	Forklift glove for connecting battery cables.



IMPORTANT

To protect the outputs on the back, a protective housing (1) in sheet metal is included. If the facility is to be EN 54-4 or SBF 110:8 approved, the protective housing must be mounted.

Connect mains 230 V AC

Connection of 230 V mains cabling to the unit takes place through the device connector on the back of the unit. Connect the power supply to the mains via easily accessible isolation switch and suitable ground fault protection (which is part of the building's existing wiring).

Temperature sensor

Temperature sensor for measuring battery temperature, place sensor between batteries.

The device has an internal temperature sensor and an external temperature sensor to measure internal and ambient temperature.

Alarm

See [table 6.1-6.3 \[2\]](#)

Alarm cable for battery fuse monitoring

Alarm cable for battery fuse monitoring.

Communication - optional

Connection to communication (via RS-485) can take place during customer customization.

Maximum wire resistance

The voltage at the furthest load point must not be lower than the requirements of the connected load.

Lowest voltage is given when batteries are almost discharged (21 V / 42 V) together with voltage drop in wiring. Ensure that the load can handle the lowest voltage with voltage drop in cabling.

FACTS ABOUT ILAST

ILAST is the sum of the connected loads. The cable resistance (RKABEL) is the sum of the cable resistance in both conductors x the cable length.

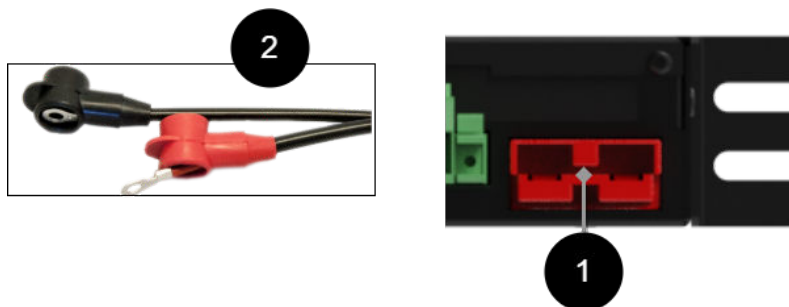
Minimum load voltage in battery operation taking into account voltage drop in cables = $VUT(MIN) - (ILAST \times RKABEL)$. VUT(MIN) is the limit for deep discharge (21 V / 42 V) when the batteries are empty.

The table takes into account to and from conductors, i.e. the actual distance in meters must be used.

Cable area

RKABEL	Ω / m
1.5 mm ²	0.024 Ω / m
2.5 mm ²	0.014 Ω / m
4 mm ²	0.009 Ω / m
6 mm ²	0.006 Ω / m
10 mm ²	0.0035 Ω / m
16 mm ²	0.0022 Ω / m

Connection of batteries in battery shelf



Use the included cabling to connect the batteries. Be careful not to short the terminals of the batteries. First connect wiring in batteries, (2). Cabling must have rubber pole protection that covers the battery pole. Then connect battery connector to the battery backup, (1).

SET BATTERY CAPACITY



Set battery capacity

No	Explanation
1	Set the steering wheel so that V lights up green.
2	Press and hold the multi selector for three seconds until C00 appears on the display. Turn the multi-selection dial until C01 is displayed and press the multi-selection dial (a light push) to select the battery capacity. To accept the setting, press and hold the button for three seconds.

- Factory default setting is 2 x 20 Ah.
- Turn to C00 and press the button once to return to the regular menu.



NOTE

The device retains settings even if power is completely cut to the device. You therefore do not need to set the battery capacity again when changing the battery.

HOW TO START THE DEVICE

After connection, start must take place in the following steps:

1. Connection/voltage setting of battery part.
2. Voltage setting to mains.
3. Apply voltage to the load by switching on the circuit breaker.

COMMISSIONING

When all connections have been made, the system has been configured and the three steps for how to start the device have been completed - then the following should happen:

- Status indication is off in normal operation.
- The load will be powered. Check with a voltmeter that the load voltage is between 26 and 27.3 V DC (48 V, 52-54.6 V DC).
- The batteries must be charged. Check this by measuring across the battery terminals. (Depending on the condition of the batteries, the voltage may vary but should be above 24 V DC, (48 V DC) and slowly increase by approximately 0.001 V/10 sec. When fully charged, the voltage of the batteries should be 27.3 V DC (48 V, 54, 6 V DC).
- The ALARM indicator diode on the panel must be off.
- All fault alarm relays must be in the pulled state. Check that there is a connection between CO and NC. Set the measuring instrument to continuity measurement and test termination. This should then indicate a short circuit.
- All relay outputs are normally energized and thus give an alarm in de-energized mode. When connecting to communication, the parent system sends queries. The superior system must then give an alarm if, for example, the unit is de-energized.

COMMUNICATION - OPTIONAL

Connection to communication (via RS-485) can take place during customer customization.

LIST OF SETTINGS VIA MULTI-SELECTOR WHEEL

Configuration mode on the display, accessed by a long button press on the multi-selector wheel.

(J) value is adjustable

(N) value is resettable

(U) Can perform a test/function

Complete list of settings via the multi selector

On display	Explanation
C00	Return to normal viewing mode.
C01	Setting of battery capacity in Ah (J).
C02	Setting the minimum allowed battery operating time (J).
C03	Alarm limit for low battery voltage in battery operation (J).
C04	Delay alarm mains failure (J).
C05	Low system voltage alarm (J).
C06	Show relay status, 100s = Power supply, 10s = Batteries 1s = Mains interruption. Tripped relay shows for power supply = 011. Tripped relay for battery shows = 101. Tripped relay for mains failure = 110. Example if all relays are set = 000. Alarm=0, energized relay=1.
C07	Charge Cycle (J). Duration of the charging phase, 72 hours. Full rest phase cycle is 20 days.
C08	Highest measured tension (N).
C09	Lowest measured tension (N).
C10	Highest measured temperature (N) - external temperature sensor.
C11	Lowest measured temperature (N) - external temperature sensor.
C12	Number of minutes with overtemperature (N).
C13	Number of minutes with sub-temperature (N).

On display	Explanation
C14	Stopwatch load current above 170% of nominal load (N). Risk of load bills triggering.
C15	Minute counter load current above 100% of nominal load (N). Risk that dimensioning requirements are not met.
C16	Day counter load current above 80% of nominal load (N). Risk that the warranty period is not reached.
C17	Perform battery connection test (U).
C18	Perform Cell Test (U).
C19	Perform Weekly Test (U).
C20	Calibrate battery voltage (J). Factory setting - May not be changed.
C21	Calibrate voltage from mains plug (J). Factory setting - May not be changed
C22	Calibrate zero current (N). Factory setting - May not be changed
C23	Calibrate load current (J). Factory setting - May not be changed
C24	Setting of nominal load (J).
C25	Limit value for deep discharge protection (J). ATTENTION! 1HE has hardware-controlled deep discharge.
C26	Limit value for weekly test (J).
C27	Original value for Cell test (J).
C28	Allowed additional voltage drop during cell test (J).
C29	Raw data from the A/D converter.
C30	Raw data from the A/D converter.
C31	Raw data from the A/D converter.
C32	Raw data from the A/D converter.
C33	Raw data from the A/D converter.
C34	Raw data from the A/D converter.
C35	Raw data from the A/D converter.
C36	Internal flags.
C37	Internal flags.
C58	Measured value from internal temperature sensor.
C59	Highest measured value from internal temperature sensor.

MAINTENANCE

The system with the exception of batteries is maintenance-free when installed in an indoor environment.

MAINTENANCE SCHEDULE BATTERIES

The maintenance schedule applies to batteries made by UPLUS and with the following serial names: US, USL, USF, and for batteries made by XLENT POWER with serial names XLT and XLL. For maintenance instructions see separate document "[care instructions valve-regulated lead-acid battery](#)".

Battery replacement

Series designation	Battery type	Replace battery after
XLT	3-5 years	2-3 years
US	6-9 years	3-5 years
USL	10-12 years	5-7 years
USF	12 years	8-10 years

* battery life depends mainly on ambient temperature and charging current. An AGM battery should never be charged with more than 30% of its rated capacity. The battery will be fully charges, but the charging current must not exceed 30% of its rated capacity.

Charging voltages

Charging voltage from power supply	12 V units	24 V units	48 V units
Minimum charging voltage	13.6 V	27.2 V	54.4 V
Maximum charging voltage	13.7 V	27.4 V	54.8 V
Tolerance	+/- 0.5%	+/- 0.5%	+/- 0.5%

terminal voltage

terminal voltage	After 15 minutes of rest / charging.
Minimum terminal voltage	12.9 V

terminal voltage	After 15 minutes of rest / charging.
Maximum allowable difference between battery pairs	0.5 V
New battery with terminal voltage below 12.0 V is defective and should be reported to the supplier.	

Ambient temperature for batteries

Temperature in battery backup	Temperature
Lowest	15 ° C
Recommended	20 ° C - 25 ° C
Highest	32 ° C
Warranty is valid only if the temperature is within these levels.	

Installation control batteries

1. Check that the battery is completely clean and that the terminals are free from corrosion.
2. Check and note the temperature in the battery compartment.
3. Check the terminal voltage of each battery before installation. If the difference between the batteries exceeds 0.5 V, the battery loop should be equalized in connection with installation. If any battery has a terminal voltage of less than 12V, this battery must be replaced with a new battery and reported to the supplier.
4. Connect the battery and check the charging voltage. The charging voltage should be between 2.25 V - 2.27 V per cell = between 13.5 V - 13.62 V for a 12 V system and between 27.0 V - 27.24 V for a 24 V system.

Year-round inspection

1. Check that the battery is completely clean and that the terminals are free from corrosion. If there is corrosion on the terminals: Check that the battery does not leak acid. Then clean the terminals and reconnect the battery. Then lubricate with battery terminal grease over the connected terminal.
2. Check and note the temperature in the battery compartment.
3. Check and note the average current.
4. Check that all connections are securely fastened and that there is no gap in the connection.
5. Check that the fan (if units have a fan) is working properly. Clean the fan if necessary.
6. Check the charging voltage by measuring with a multimeter between the connection points + & amp; -. The charging voltage should be between 2.25-2.27 volts per cell = between 13.5-13.62V for a 12V system and between 27-27.24V for a 24V system.
7. Turn off the rectifier and let the batteries rest for 10 - 15 minutes. Then measure the terminal voltage of each battery. After resting, the terminal voltage must be between 12.9 V - 13.5 V.

PRODUCT SHEET - TECHNICAL DATA

Technical specifications: EN54-4 Certified / SBF110:8 Approved battery backup

EN54 1U and EN 54 2U



The battery backup is mounted in a 19" rack.

NAME, ARTICLE NUMBER, E-NUMBER AND CERTIFICATE NUMBER

Name	Item number	Email number	Product name on certificate	Certified according to	SBSC Certificate number	Certification scheme:
EN54 24V 15A 1U	1U01R10024P150- EN54	52 135 55	RACK 27 150-1HE,	SBF 110:8 The product also meets SBF 110:7	No. 18-244	Scheme 1a (ISO/IEC 17067:2013)2017-12-18
EN54 24V 25A 2U	2U01R10024P250- EN54	52 135 56	RACK 27 250-2HE	SBF 110:8 The product also meets SBF 110:7	No. 18-244	Scheme 1a (ISO/IEC 17067:2013)2017-12-18
EN54 48V 7A 1U	1U01R10048P070- EN54	52 135 57	RACK 54 70-1HE	SBF 110:8 The product also meets SBF 110:7	No. 18-244	Scheme 1a (ISO/IEC 17067:2013)2017-12-18
EN54 48V 13A 2U	2U01R10048P130- EN54	52 135 58	RACK 54 130-2HE	SBF 110:8 The product also meets SBF 110:7	No. 18-244	Scheme 1a (ISO/IEC 17067:2013)2017-12-18

ABOUT EN54 1U AND EN54 2U

EN54 powers fire alarms with 24 V DC – 48 V DC. The rectifier in the power supply converts 230 V DC down to 48 V or 24 V and supplies power to all important parts of the fire alarm system. Batteries continue to power the fire alarm system when the power goes down. EN54 power supply is certified to be used in security facilities that must meet EN54-4 or be approved for SBF 110:8.

Long life, energy efficient and support is available if something goes wrong, now or in 10 years.

ABOUT CERTIFICATION

EN54 is used for fire alarm systems in public environments such as schools, offices and commercial properties.



FIXED INSTALLATION

The product is intended for fixed installation. The battery backup must be installed by a qualified installer.

Regulations and certifications

STANDARDS THAT PRODUCT (S) MEET AND ARE APPROVED FOR

EN54

EN50131-6:2017.

EN 54-4:1997, EN 54-4:1997/AC:1999, EN 54-4:1997/A1:2002 and EN 54-4:1997/A2:2006.
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SBF

SBF 110:8

SSF

SSF1014 Alarm class 1-4 (burglar alarm).
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SSF1014, Issue 5.

Certificate and certificate number

Certificate number, SBSC	Designation SBSC
No. 18-244	-

REQUIREMENTS THAT THE PRODUCT MEETS

The product meets the following requirements.

EMC:	EMC Directive 2014 / 30EU
Electricity:	Low voltage directive: 2014/35 / EU
CE:	CE directive according to: 765/2008
Emission:	EN61000-6-: 2001 EN55022: 1998: -A1: 2000, A2: 2003 Klass B, EN61000-3-2: 2001
Immunity:	SS-EN 50 130-4:2011 Edition 2, EN50131-6

**NOTE**

The product is part of electrical systems, is subject to the relevant electrical and safety directives and is not a machine according to the Machinery Directive (2006/42/EC).

**Battery combinations 1U and 2U****EN54 24V 15A 1U, EN54 24V 25A 2U**

Ah	Number of battery used in	combination with EN54 24V 15A 1U	combination with EN54 24V 25A 2U
28 Ah	2 pcs. 28 Ah	Yes	No
45 Ah	2 pcs. 45 Ah	Yes	Yes
55 Ah	2 pcs. 55 Ah F (front fed)	Yes	Yes
75 Ah	2 pcs. 75 Ah	Yes	Yes
90 Ah	4 pcs. 45 Ah	Yes	Yes
100 Ah	2 pcs. 100 Ah / 2 pcs 100 Ah F (front fed)	Yes	Yes
110 Ah	2 pcs. 55 Ah F (front fed)	Yes	Yes
125 Ah	2 pcs. 125 F (front fed)	Yes	Yes
135 Ah	6 pcs. 45 Ah	Yes	Yes
150 Ah	2 pcs. 150 F (front fed) or	Yes	Yes
	4 pcs. 75 Ah		
180 Ah	8 pcs. 45 Ah	Yes	Yes
200 Ah	2 pcs. 100 Ah or	Yes	Yes
	2 pcs. 100 Ah F (front fed)		
240 Ah	4 pcs. 120 Ah	No	Yes
250 Ah	4 pcs. 125 F (front fed)	No	Yes
300Ah	4 pcs. 150 F (front fed) or	No	Yes
	6 pcs. 100 F (front fed)		

EN54 48V 7A 1U, EN54 48V 13A 2U

Ah	Number of battery used in	combination with EN54 48V 7A 1U	combination with EN54 48V 13A 2U
20 Ah	4 pcs. 20 Ah	Yes	Yes
28 Ah	4 pcs. 28 Ah	Yes	Yes
45 Ah	4 pcs. 45 Ah	Yes	Yes
55 Ah	4 pcs. 55 Ah F (front fed)	Yes	Yes
75 Ah	4 pcs. 75 Ah	Yes	Yes
90 Ah	4 pcs. 45 Ah	Yes	Yes
100 Ah	4 pcs. 100 Ah F (front fed)	Yes	Yes
110 Ah	8 pcs. 55 Ah F (front fed)	No	Yes
120 Ah	4 pcs. 120 Ah	No	Yes
125 Ah	4 pcs. 125 Ah F (front fed)	No	Yes
150 Ah	4 pcs. 150 Ah F (front fed)	No	Yes
200 Ah	8 pcs. 100 Ah F (front fed)	No	Yes

Reserve operating times, power outlet and load output current

CARGO CURRENT

EN54 24V 15A 1U

Battery size	Maximum Power outlet i network operation (Imax. A)
28 Ah	12 A
45 Ah	11 A
55 Ah	10.3 A
75 Ah	9.1 A
90 Ah	8.2 A
100 Ah	7.5 A
110 Ah	6.9 A
120 Ah	6.3 A
125 Ah	6 A
135 Ah	5.3 A
150 Ah	4.3 A
180 Ah	2.5 A
200 Ah	1.3 A
Maximum power consumption battery operation: 14 A	
Maximum current consumption battery operation, (same as Imax.b): 15 A	

EN54 24V 25A 2U

Battery size	Maximum Power outlet i network operation (Imax. A)
45 Ah	24 A
55 Ah	23.3 A
75 Ah	22.1 A
90 Ah	21.2 A
100 Ah	20.5 A
110 Ah	19.9 A
120 Ah	19.3 A
125 Ah	19 a
135 Ah	18.3 A
150 Ah	17.4 A
180 Ah	15.5 A
200 Ah	14.3 A
240 Ah	11.8 A
250 Ah	11.2 A
300 Ah	8 A
Maximum power consumption battery operation: 14 A	
Maximum current consumption battery operation, (same as Imax.b): 15 A	

EN54 48V 7A 1U

Battery size	Maximum Power outlet i network operation (Imax. A)
14 Ah	6 A

Battery size	Maximum Power outlet i network operation (I _{max} . A)
20 Ah	5.6 A
90 Ah	5.1 A
100 Ah	4.1 A
120/125 Ah	3.4 A
135 Ah	2.2 A
150 Ah	1.3 A
180 Ah	0.65 A
Maximum current consumption battery operation: 14 A	
Maximum current consumption battery operation, (same as I _{max} .b): 15 A	

EN54 48V 13A 2U

Battery size	Maximum Power outlet i network operation (I _{max} . A)
20 Ah	11.6 A
28 Ah	11.1 A
45 Ah	10.1 A
55 Ah	9.4 A
75 Ah	8.2 A
90 Ah	7.3 A
100 Ah	6.6 A
110 Ah	6 A
120 Ah	5.4 A
125 Ah	5.1 A
150 Ah	3.5 A
200 Ah	0.4 A
Maximum power consumption battery operation: 14 A	
Maximum current consumption battery operation, (same as I _{max} .b): 15 A	

RESERVE OPERATING TIMES FOR DIFFERENT ALARM CLASSES - OVERVIEW

Alarm class	Spare operating time in the event of a power failure	Maximum number of hours of battery re-charging (80%)
EN54-4	-	24 h
SBF110: 8	30 h + 10 min	24 h
EN50131-6 grades 1-2	12 h	72 h
EN50131-6 grade 3	24 h	24 h
SSF1014 Alarm class 1/2	12 h	72 h
SSF1014 Alarm class 3/4	30 h	24 h

The table shows the requirements for backup operating time and recharging of batteries for different alarm classes.

Internal resistance 1U and 2U

24 V two pairs of power resistors each parallel 3.3 Ω

48 V two pairs of power resistors each parallel 15 Ω

Circuit boards - Technical data

TECHNICAL DATA - 1HE (MOTHERBOARD)

Info	Explanation
Article title	1HE
Description	Circuit board for control, distribution, status and alarm from the device.
Status indication	LED, display and communication output (RS-485).
Communication protocol	RS-485 Milleprotokollet - Optional
Error output	Potential-free relay switches rated 1 A @ 30 V DC (all fault outputs).
Self consumption, (in battery operation)	24 V units: 270 mA. 48 V units: 200 mA
Switching time	Batteries rest for 20-day cycles, after which a charging cycle picks up and charges the batteries for 72 hours. If there is a power failure when the batteries are in the charging cycle, there is no switching time.
Deep discharge	Deep discharge protection is activated: 1U / 24 V and 2U / 24 V systems when the power supply voltage is below 19 V DC. (1 U / 48 V and 2 U / 48 V systems when the power supply voltage is below 38 V DC.)
Tension, ripple	less than 210 mVp-p in normal operation. (Max 2 V in ripple voltage when recharging batteries, when the power supply goes within the current limit).

Alarm from alternating relay

Name	Alarm
Power Outage / Mains Alarm	NO / CO / NC
Fault in power supply and Fuse Error / PSU and Fuse Error	NO / CO / NC
Battery Error, Aged Battery	NO / CO / NC



Alarm displayed on Alarm (LED)

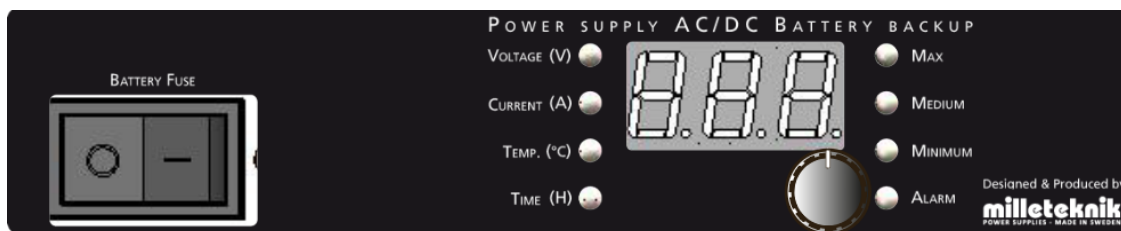
LED status (1)	Explanation	Comment
Off	Normal operation	-
1 blink	Network outages	-
2 flashes	Delayed network failure	10 second delay.
3 flashes	Charger error	If the batteries have not reached the desired voltage (26.7V) after completing the charging cycle. If the power supply drops below the limit value (26.5V) during the current dormant phase for the batteries. If the voltage from the power supply drops during the connection test for the batteries that occurs every 10 seconds. At low voltage in the power supply (26.7V), the batteries are disconnected every 10 minutes, if low voltage in the power supply remains an alarm is given. If the mains voltage is below system voltage (24V) during mains operation, an alarm is given.
4 flashes	Surge power supply	Voltage above 27.9 V DC (24 V), / 55.8 V DC (48 V).
5 blink	Battery fault	Aged batteries, failed weekly test. Cell test, the internal resistance of the battery has risen above the limit value. Failed connection test. Batteries are not connected or battery voltage below 16 V.
6 flashes	Low battery voltage	Low battery voltage in battery operation.
7 flashes	Summarmarm	Temperature alarm, the temperature is below or above the limit value. Fuse failure, load or battery fuse has blown. Fuse fault from external card with load outputs. Ground fault (D-Sub). Signal error (D-Sub). The temperature sensor is incorrect or missing. Fan fault.
8 blink	System error	The system is not calibrated.

Cargo fuses

	EN54 24V 15A 1U	EN54 24V 25A 2U	EN54 48V 7A 1U	EN54 48V 13A 2U
Load securing 1 (sits furthest towards the edge)	10 A	10 A	10 A	10 A

	EN54 24V 15A 1U	EN54 24V 25A 2U	EN54 48V 7A 1U	EN54 48V 13A 2U
Load securing 2	10 A	20 A	20 A	20 A
Load securing is installed at the factory and can not be retrofitted.				

WHAT IS SHOWN ON THE DISPLAY - 1HE



By default, the power supply has a front display for status information. The multi-selector dial allows you to read the value on the display. By turning the knob and clicking, the status to be read is selected.

LED that lights up	Display shows	Explanation
Voltage / Voltage (V)	Shows current voltage	-
Voltage / Voltage (V) + Max	Displays the maximum value for voltage	
Voltage / Voltage (V) + Medium	Displays average voltage	
Voltage / Voltage (V) + Minimum	Displays min value for voltage	
Current (A) / Current (A)	Displays current	
Current (A) / Current (A) + Max	Displays the maximum value for current	
Current (A) / Current (A) + Medium	Displays average value for current	
Current (A) / Current (A) - Minimum	Displays min-value for current	
Temp (° C)	Displays the current temperature in the system	Temperature, shows the line temperature sensor is not connected
Temp (° C) + Max	Displays maximum value for temperature	Displays value from internal or external temperature sensor.
Temp (° C) - Medium	Displays average temperature	Displays value from internal or external temperature sensor.
Temp (° C) - Minimum	Displays min-value for temperature	Displays value from internal or external temperature sensor.
Time (H)	Displays current operating time in hours	
Time (H) + Min	Shows the shortest measured operating time	

Power supply

POWER SUPPLY - TECHNICAL DATA HRP-300-24

In:	
EN54 24V 15A 1U	
Info	Explanation
Output voltage	27.3 V
Output current	0 A - 14 A
Output voltage, ripple	150 mVp-p
Overvoltage	30 V - 34.8 V
Voltage recharge, ripple / current limitation	Less than 1.2 Vp-p
Efficiency	87%
Current limitation	105% - 135%
Constant voltage	+/- 0.5%
Regulatory accuracy	+/- 1.0%
Input current (230 V)	1,8 A
Mains voltage frequency	47 Hz- 63 Hz
Mains voltage	230 V AC - 240 V AC
Brand effect	336 W
Temperature range	-40 ° C - + 70 ° C
Humidity range	20% - 90% RH non-condensed

Info	Explanation
The power supply is adapted and calibrated with the battery / hardware of the battery backup. Only power and calibrated power supplies may be used. Contact support when changing power supplies. Use of power supplies coming from another source may cause damage not covered by the warranty. Warranty is canceled if power supplies (from a source other than support / designated by support) that are not correctly calibrated are used.	

POWER SUPPLY - TECHNICAL DATA HRP-600-24

In:	
EN54 24V 25A 2U	
Info	Explanation
Output voltage	27.3 V
Output current	0 A - 27 A
Output voltage, ripple	150 mVp-p
Overvoltage	30 V - 34.8 V
Voltage recharge, ripple / current limitation	Less than 1.2 Vp-p
Efficiency	88%
Current limitation	105% - 135%
Constant voltage	+/- 0.5%
Regulatory accuracy	+/- 1.0%
Input current (230 V)	3,6 A
Mains voltage frequency	47 Hz- 63 Hz
Mains voltage	230 V AC - 240 V AC
Brand effect	648 W
Temperature range	-30°C - +70°C
Humidity range	20% - 90% RH non-condensed
The power supply is adapted and calibrated with the battery / hardware of the battery backup. Only power and calibrated power supplies may be used. Contact support when changing power supplies. Use of power supplies coming from another source may cause damage not covered by the warranty. Warranty is canceled if power supplies (from a source other than support / designated by support) that are not correctly calibrated are used.	

POWER SUPPLY - TECHNICAL DATA HRP-300-24

In:	
EN54 24V 7A 1U	
Info	Explanation
Output voltage	27.3 V
Output current	0 A - 14 A
Output voltage, ripple	150 mVp-p
Overvoltage	30 V - 34.8 V
Voltage recharge, ripple / current limitation	Less than 1.2 Vp-p
Efficiency	87%
Current limitation	105% - 135%
Constant voltage	+/- 0.5%
Regulatory accuracy	+/- 1.0%
Input current (230 V)	1,8 A
Mains voltage frequency	47 Hz- 63 Hz
Mains voltage	230 V AC - 240 V AC
Brand effect	336 W
Temperature range	-40 ° C - + 70 ° C
Humidity range	20% - 90% RH non-condensed
The power supply is adapted and calibrated with the battery / hardware of the battery backup. Only power and calibrated power supplies may be used. Contact support when changing power supplies. Use of power supplies coming from another source may cause damage not covered by the warranty. Warranty is canceled if power supplies (from a source other than support / designated by support) that are not correctly calibrated are used.	

POWER SUPPLY - TECHNICAL DATA HRP-600-24

In:	
EN54 48V 13A 2U	

Info	Explanation
Output voltage	27.3 V
Output current	0 A - 27 A
Output voltage, ripple	150 mVp-p
Overvoltage	30 V - 34.8 V
Voltage recharge, ripple / current limitation	Less than 1.2 Vp-p
Efficiency	88%
Current limitation	105% - 135%
Constant voltage	+/- 0.5%
Regulatory accuracy	+/- 1.0%
Input current (230 V)	3,6 A
Mains voltage frequency	47 Hz- 63 Hz
Mains voltage	230 V AC - 240 V AC
Brand effect	648 W
Temperature range	-30°C - +70°C
Humidity range	20% - 90% RH non-condensed
<p>The power supply is adapted and calibrated with the battery / hardware of the battery backup. Only power and calibrated power supplies may be used. Contact support when changing power supplies. Use of power supplies coming from another source may cause damage not covered by the warranty. Warranty is canceled if power supplies (from a source other than support / designated by support) that are not correctly calibrated are used.</p>	

Technical data enclosures

TECHNICAL DATA 1U

Info	Explanation
Name	1U
Enclosure class	IP 20
Measure	Height: 44 mm, width: 244 mm, depth: 280 mm.
Height units	1
Mounting	19 "rack
Ambient temperature	+ 5 ° C - + 40 ° C. For best battery life: + 15 ° C to + 25 ° C.
Environment	Environmental class 1, indoors. 20% ~ 90% relative humidity
Material	Powder coated sheet metal
Color	Black
Cable glands, number	8

TECHNICAL DATA 2U

Info	Explanation
Name	1U
Enclosure class	IP 20
Measure	Height: 88 mm, width: 244 mm, depth: 280 mm.
Height units	2
Mounting	19 "rack
Ambient temperature	+ 5 ° C - + 40 ° C. For best battery life: + 15 ° C to + 25 ° C.
Environment	Environmental class 1, indoors. 20% ~ 90% relative humidity
Material	Powder coated sheet metal
Color	Black
Cable glands, number	8

Link to the latest information

Products and software are subject to updates, you will always find the latest information on our website.

EN54

Warranty, support, country of manufacture and country of origin

WARRANTY 5 YEARS

The product has a five-year warranty, from the date of purchase (unless otherwise agreed). Free support during the warranty period is reached at support@milleteknik.se or telephone, +46 31-34 00 230. Compensation for travel and or working hours in connection with the location of faults, installation of repaired or replaced goods is not included in the warranty. Contact Milleteknik for more information. Milleteknik provides support during the product's lifetime, however, no later than 10 years after the date of purchase. Switching to an equivalent product may occur if Milleteknik deems that repair is not possible. Support may be added (at Milleteknik's descretion) after the warranty period has expired.

MANUFACTURER SUPPORT

Manufacturers provide support for the life of the product, however, for a maximum of 10 years after the date of purchase. Switching to an equivalent product may occur if the manufacturer deems that repair is not possible. Support costs will be added after the warranty period has expired.

SUPPORT

Do you need help with installation or connection?

You will find answers to many questions at: www.milleteknik.se/support

Phone: +46 31-340 02 30

Support is open: Monday-Thursday 08:00-16:00, Fridays 08:00-15:00. Closed 11:30-13:15.

SPARE PARTS

Contacted support for questions about spare parts.

SUPPORT AFTER THE WARRANTY PERIOD

Milleteknik provides support during the life of the product, but no longer than 10 years after the date of purchase. Replacement for an equivalent product may occur if the manufacturer deems that repair is not possible. Costs for support and replacement are added after the warranty period has expired.

QUESTIONS ABOUT PRODUCT PERFORMANCE?

Contact sales: 46 31-340 02 30, e-mail: sales@milleteknik.se

CONTACT US

Milleteknik AB

Ögärdesvägen 8 B

S-433 30 Partille

Sweden

+46 31-34 00 230

www.milleteknik.se

COUNTRY OF MANUFACTURE

Country of manufacture / country of origin is Sweden. For more information, contact your seller.

DESIGNED AND PRODUCED BY: MILLETEKNIK AB

Designed and produced by Milleteknik AB

Batteries - recommended, not included

BATTERIES ARE NOT INCLUDED THEY ARE SOLD SEPARATELY

Batteries are sold separately.

CERTIFIED WITH BATTERY TYPE

The device is certified with a UPLUS battery that must be used to maintain the certificate.

20 AH, 12 V AGM BATTERY

Fits in	Number of batteries	
Battery type	V	Ah
Maintenance-free AGM, lead-acid battery.	12 V	20 Ah

10+ Design life * battery

Article number	E-number	Article name	Terminal	Measure. Height width depth	Weight per piece	Make
MT113-12V20-01	5230538	UPLUS 12V 20Ah 10+ Design Life battery	M5 Bult	182x77x168 mm	6.0 kg	UPLUS

*Design life is the shelf life in years for an unused battery. Environmental factors such as heat and load affect the service life. Batteries that have a durability (+10 Design Life) of 10+ years usually need to be replaced after 5-6 years.

28 AH, 12 V AGM BATTERY

Battery type	V	Ah
Maintenance-free AGM, lead-acid battery.	12 V	28 Ah

10+ Design life * battery

Article number	E-number	Article name	Terminal	Measure. Height width depth	Weight per piece	Make
MT113-12V28-01	5230545	UPLUS 12V 28Ah 10+ Design Life battery	M5 Bult	165x125x175 mm	9.5 kg	UPLUS

*Design life is the shelf life in years for an unused battery. Environmental factors such as heat and load affect the service life. Batteries that have a durability (+10 Design Life) of 10+ years usually need to be replaced after 5-6 years.

45 AH, 12 V AGM BATTERY

Fits in	Number of batteries	
Battery type	V	Ah
Maintenance-free AGM, lead-acid battery.	12 V	45 Ah

10+ Design life * battery

Article number	E-number	Article name	Terminal	Measure. Height width depth	Weight per piece	Make
MT113-12V45-01	5230546	UPLUS 12V 45Ah 10+ Design Life battery	M5 Bult	197x165x170 mm	14.5 kg	UPLUS

*Design life is the shelf life in years for an unused battery. Environmental factors such as heat and load affect the service life. Batteries that have a durability (+10 Design Life) of 10+ years usually need to be replaced after 5-6 years.

75 AH, 12 V AGM BATTERY

Battery type	V	Ah
Maintenance-free AGM, lead-acid battery.	12 V	75 Ah

10+ Design life * battery

Article number	E-number	Article name	Terminal	Measure. Height width depth	Weight per piece	Make
MT113-12V75-01 ***	5230547	UPLUS 12V 75Ah 10+ Design Life battery	M6 Bult	295x168x214 mm	21 kg	UPLUS

*Design life is the shelf life in years for an unused battery. Environmental factors such as heat and load affect the service life. Batteries that have a durability (+10 Design Life) of 10+ years usually need to be replaced after 5-6 years.

100 AH, 12 V AGM BATTERY

Battery type	V	Ah
Maintenance-free AGM, lead-acid battery.	12 V	100 Ah

10+ Design life * battery

Article number	E-number	Article name	Terminal	Measure. Height width depth	Weight per piece	Make
MT113-12V100-01 ***	5230549	UPLUS 12V 100Ah 10+ Design Life battery	M8 Bult	330x173x212 mm	30 kg	UPLUS

*Design life is the shelf life in years for an unused battery. Environmental factors such as heat and load affect the service life. Batteries that have a durability (+10 Design Life) of 10+ years usually need to be replaced after 5-6 years.

55 AH, 12 V AGM BATTERY

Battery type	V	Ah
Maintenance-free AGM, lead-acid battery.	12 V	55 Ah

12+ Design life * battery

Article number	E-number	Article name	Terminal	Measure. Height width depth	Weight per piece	Make
MT114-12V55-FT ***	5230562	UPLUS 12V 55Ah 12+ Design Life battery	M6 Bult	277x106x222 mm	18 kg	UPLUS

** Design Life is the durability this year for unused battery. Environmental factors such as heat and load affect service life. Batteries that have a durability (+12 Design Life) of 12+ years usually need to be replaced after 5-6 years.

100 AH, 12 V AGM BATTERY

Battery type	V	Ah
Maintenance-free AGM, lead-acid battery.	12 V	100 Ah

12+ Design life * battery

Article number	E-number	Article name	Terminal	Measure. Height width depth	Weight per piece	Make
MT114-12V100-FT ***	5230563	UPLUS 12V 100Ah 12+ Design Life battery	M6 Bult	285x110x394 mm	35.6 kg	UPLUS

** Design Life is the durability this year for unused battery. Environmental factors such as heat and load affect service life. Batteries that have a durability (+12 Design Life) of 12+ years usually need to be replaced after 5-6 years.

MT114-12V125-FT *

Battery type	V	Ah
Maintenance-free AGM, lead-acid battery.	12 V	125 Ah

12+ Design life * battery

Article number	E-number	Article name	Terminal	Measure. Height width depth	Weight per piece	Make
MT114-12V125-FT ***	5230564	UPLUS 12V 125Ah 12+ Design Life battery	M6 Bult	287x110x551 mm	40.5 kg	UPLUS

** Design Life is the durability this year for unused battery. Environmental factors such as heat and load affect service life. Batteries that have a durability (+12 Design ILife) of 12+ years usually need to be replaced after 5-6 years.

150 AH, 12 V AGM BATTERY

Battery type	V	Ah
Maintenance-free AGM, lead-acid battery.	12 V	150 Ah

12+ Design life * battery

Article number	E-number	Article name	Terminal	Measure. Height width depth	Weight per piece	Make
MT114-12V150-FT ***	5230565	UPLUS 12V 150Ah 12+ Design Life battery	M6 Bult	287x110x551 mm	46.0 kg	UPLUS

** Design Life is the durability this year for unused battery. Environmental factors such as heat and load affect service life. Batteries that have a durability (+12 Design ILife) of 12+ years usually need to be replaced after 5-6 years.

RESERVE OPERATING TIMES FOR DIFFERENT ALARM CLASSES - OVERVIEW

The table shows the requirements for backup operating time and recharging of batteries for different alarm classes.

**IMPORTANT**

This is a guide and all times are approximate and may differ from actual times. Load, temperature and other factors come into play, which is why exact time can not be provided.

Applies to new batteries.

Amperage and batteries vary with configuration, check if the configuration can handle batteries and amperage.

Backup operating times 24 V units - with battery box, 28 Ah - 70 Ah

Medium current	28 Ah	42 Ah	65 Ah	70 Ah
-	4 batteries (14 Ah)	6 batteries (14 Ah)	4 batteries (20Ah + 45 Ah)	10 batteries (7 Ah)
Loading	Backup operating time (approx.), Minutes			
0.5 A	1650	2090	5574	3440
1 A	970	865	3252	2118
2 A	560	815	1770	1329
4 A	335	490	930	864
6 A	245	360	600	605
8 A	210	310	426	544
10 A	160	240	342	414
12 A	140	210	270	363
14 A	120	180	234	311
16 A	100	150	204	286

Medium current	28 Ah	42 Ah	65 Ah	70 Ah
18 A	90	130	150	254
20 A	84	126	138	241

Backup operating times 24 V units - with battery box, 90 Ah - 155 Ah

Medium current	90 Ah	110 Ah	135 Ah	155 Ah
-	4 batteries (45 Ah)	6 batteries (20 Ah + 45 Ah)	6 batteries (45 Ah)	8 batteries (20 Ah + 45 Ah)
Loading	Backup operating time (approx.), Minutes			
0.5 A	4705	5796	7056	8215
1 A	2928	3582	4392	5070
2 A	1836	2247	2754	3230
4 A	1183	1438	1762	2018
6 A	788	959	1175	1345
8 A	748	861	1048	1150
10 A	570	689	839	920
12 A	499	603	699	765
14 A	427	516	629	655
16 A	404	499	592	590
18 A	359	444	526	520
20 A	340	420	498	495

Subject to typos.

APPENDIX: MOUNT EN-54 COVER

EN54-COVER for rack-mounted EN54 is mandatory for installation in facilities that are EN 54-4 or SBF 110:8 approved.



1. Slide the hooks into the RACK EN54 COVER on the back of the unit.



2. Screw on the EN54-COVER, (2 screws).

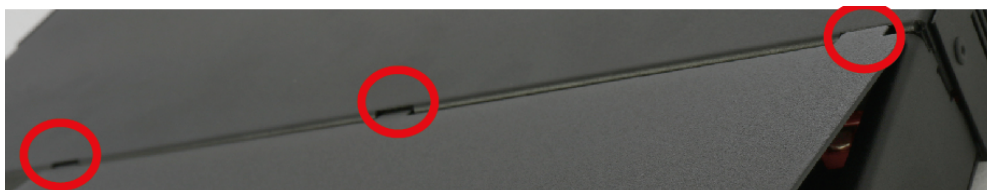


Connect other cabling before connecting to the mains. Note: The mains cable must be positioned as in the picture. The temperature sensor's protective sleeve may need to be removed to get the temperature sensor through the cable entry.



IMPORTANT

All connecting cables must go through the cable glands.



4. Push the hooks into the RACK EN54-COVER cover on the back of the RACK unit.



5. Screw on the cover, (2 screws).

ADDRESS AND CONTACT DETAILS

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