ELTEK VALERE
always on

DC Power Rack

DCR PSR327-10.8 LV/HV

USER MANUAL

UM_DCR_PSR327_10.8_E_R1.0

Notes to this manual

ATTENTION! Read this manual carefully before installing and commissioning the specified unit. This manual is a part of the delivered unit. Familiarity with the contents of this manual is required for installing and operating the specified unit.
The rules for prevention of accidents for the specific country and the general safety rules in accordance with IEC 364 must be observed.

The function description in this manual corresponds to the date of publishing.
Technical changes and changes in form and content can be made at any time by the manufacturer without notice. There are no obligations to update the manual continually.

The unit is manufactured in accordance with applicable DIN and VDE standards such as VDE 0106 (part 100) and VDE 0100 (part 410). The CE marking on the module confirms compliance with EU standards 2006-95-EG (low voltage) and 89/339 EWG (electromagnetic compatibility) if the installation and operation instructions are followed.

Supplier:

✉	ELTEK VALERE DEUTSCHLAND GmbH
	GB Industrial
	Schillerstraße 16
	D-32052 Herford
☎	+ 49 (0) 5221 1708-210
FAX	+ 49 (0) 5221 1708-222
Email	Info.industrial@eltekvalere.com
Internet	http://www.eltekvalere.com

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Revision	Description of change	Writer	Date
00	Preliminary first edition	RTH	2007-12-17
01	First edition	RTH	2008-02-28
02	Minor text modifications, index of figures inserted	RTH	2008-05-19
1.0	New revision status numbering (X.X) introduced, layout adapted to DCR PSR327-8.1.	RTH	2009-06-08

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1. Safety Instructions and Waste Disposal Rules

Warning!

Because several components of operating electrical devices are charged by dangerous voltage, the improper handling of electrical devices may be the cause of accidents involving electrocution, injury, or material damages.

- Operation and maintenance of electrical devices must be performed by qualified skilled personnel such as electricians in accordance with EN 50110-1 or IEC 60950.
- Install the module only in areas with limited access to unskilled personnel.
- Before starting work, the electrical device must be disconnected from mains. Make sure that the module is earthed.
- Do not touch connector pins as they can be charged with dangerous voltage up to 30 seconds after disconnection.
- Only spare parts approved by the manufacturer must be used.

All electric devices must be disposed of separate from domestic waste at collecting points that have been set up by the government or municipal authority.

“Separate collection is the precondition to ensure specific treatment and recycling of WEEE and is necessary to achieve the chosen level of protection of human health and the environment in the Community.”

The above statement from EU directive 2002/96/EC applies to all electric devices installed within EU countries.

In countries outside the EU, different rules may apply regarding waste disposal of electric devices.

For more information about waste disposal of your discarded equipment, contact your ELTEK VALERE DEUTSCHLAND partner.

2. General Information

The DC power rack is a unit ready for integration in system cabinets with a standard 19" frame. A high voltage (HV) and low voltage (LV) version is available. The unit can be equipped with a maximum of four rectifiers of type PSR327 (PSR312) and delivers an output power to a maximum of 10.8kW. After safe mechanical and electrical connection, the unit is ready for operation.
Furthermore this rack is designed to be switched in parallel to the rack DCR PSR327-8.1 (for three rectifiers PSR327/312 and one DC controller UPC3) to extend the output power of the system.

2.1 Block Diagram

DCR PSR327-10.8 LV/HV

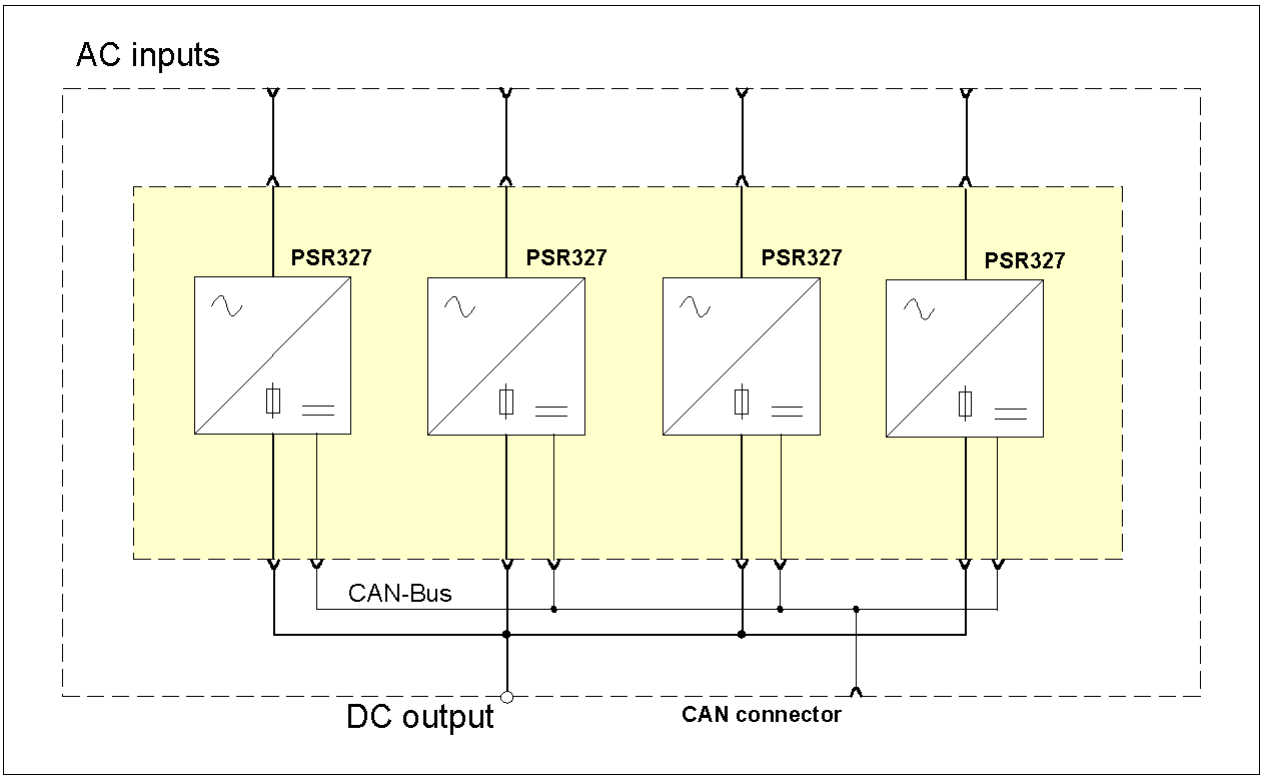

Figure 1) - Block diagram

2.2 Possible Configurations

Up to four PSR327 (PSR312) with output voltages according to the table below can be integrated into one rack.

Designation	Article code		For rectifier/ output voltage
DCR PSR327-10.8 LV	102-327-408.LV01	Input voltage = 230VAC	PSR312/24VDC
			PSR327/48VDC
			PSR327/60VDC
DCR PSR327-10.8 HV	102-327-408.HV01		PSR327/110VDC
			PSR327/220VDC

Output power of the rack, equipped with PSR312:

Number of installed Rectifiers (PSR312)	Output power (without redundancy)	Output power (n + 1)	Output power (n + 2)
1	1200W	---	---
2	2400W	1200W	---
3	3600W	2400W	1200W
4	4800W	3600W	2400W

Output power of the rack, equipped with PSR327:

Number of installed Rectifiers (PSR327)	Output power (without redundancy)	Output power (n + 1)	Output power (n + 2)
1	2700W	---	---
2	5400W	2700W	---
3	8100W	5400W	2700W
4	10800W	8100W	5400W

2.3 Perspective View

Figure 2) - Power rack fully equipped with four rectifiers PSR327.

Fastening elements according to figure 2)		Comment
1	Four screws M6 to fix the sub rack to the frame of the system cabinet	Component parts of the sub rack
2	Two adjustable assembly brackets (on the left and right side) to fix the sub rack to the rear frame of the system cabinet.	
3	Two captive screws are used for each module to secure it to the sub rack	Component parts of the modules

2.4 Optional Equipment

Description	Article Code
Cover plate (with handle) to cover empty slots, 1/4 x 19”, 3U, colour RAL 7035	881-MEC-BPL.03.21.B

2.5 Cooling and Air Flow Direction

The modules are cooled with internal fans. The airflow is from the front to rear side. The fans are monitored and speed controlled dependent on module temperature. To provide sufficient air flow, a minimum space (see figure 3, item “A”) of 50 mm is required between the backplane of the rack and the rear cabinet wall as well as an unobstructed supply of air to the front of the modules.

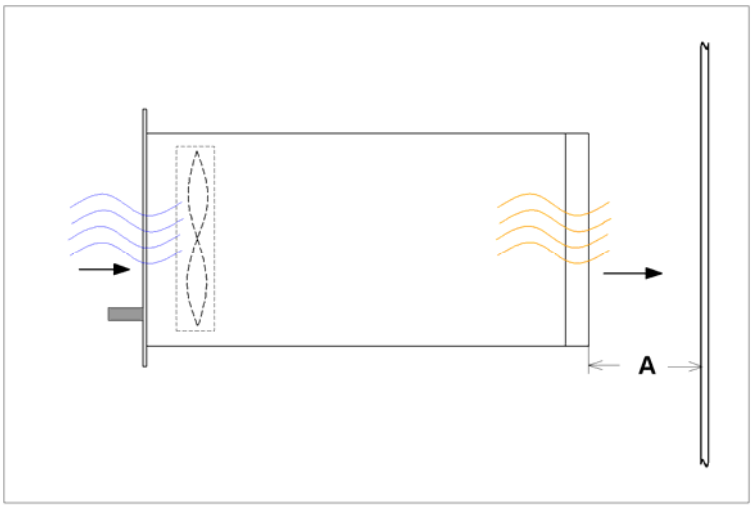

Figure 3) - Rack air flow

3. Handling

3.1 Storage

Power racks must be stored in a dry, dust free environment with a storage temperature in accordance with the specific technical data (see section 5).

3.2 Commissioning

1. Carefully unpack the unit and integrate it in your power supply cabinet with 4 screws M6 (**1**) at the front side.
2. Adjust the assembling brackets (**2**) on the left and right side of the rack with the relevant nuts of the rear cabinet frame and tighten the brackets with 4 screws M6 (**3**) as shown in figure 4).

Figure 4) - Rack mounting points

REMARK: Before assembling the rectifier modules, the following settings must be done on the empty rack:

1. CAN-Bus termination
2. CAN address designation

For details, see the following sections.

Front view of the empty DC power rack:

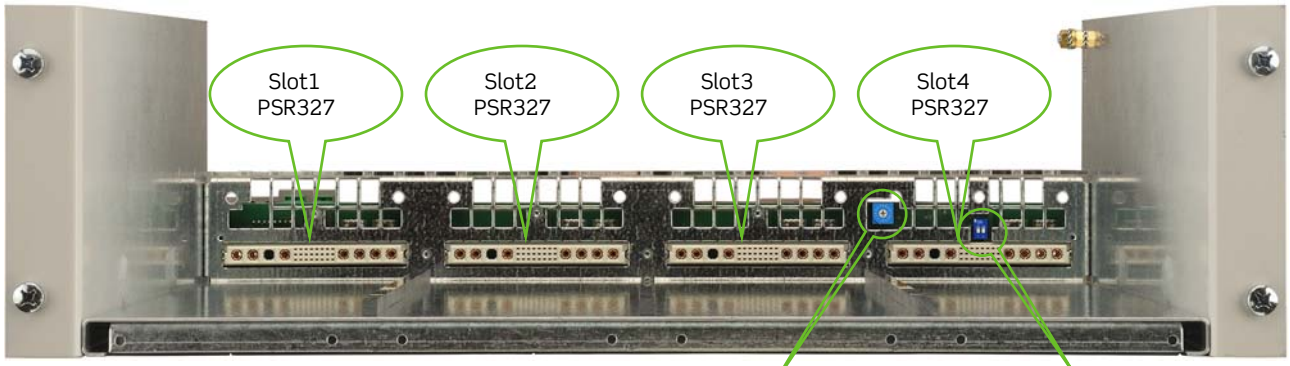

Figure 5) - Front view of the empty rack

Figure 6) - Rotary switch= CAN address selector (For details see the section 3.2.3 "CAN Address Designation")

Figure 7) - CAN-Bus termination switches (For details see the section 3.2.2 "CAN-Bus Termination")

3.2.1 Communication Interface

The DCR PSR327 is equipped with a serial data interface in accordance with the Controller Area Network (CAN) specification.
Several power racks and/or modules in a system can be controlled and monitored through the CAN-Bus by a central DC controller unit UPC3.
Two CAN-Bus connectors (X5= CAN 1; X6= CAN 2) are located on the rear side of the sub rack (see figure 9).

3.2.2 CAN-Bus Termination

The CAN-Bus must be terminated at both ends. If no other power rack and/or module is connected (CAN 2 not used), the CAN termination resistor must be enabled by setting the CAN termination switch 1, 2 or both (shown in figure 7) to "ON" position.
If CAN 2 is connected too, the CAN termination resistor must be disabled by setting the CAN termination switches 1 **and** 2 to "OFF" position. For switch functions in detail, see the table below.

Table "CAN-Bus termination switch functions"

Switch 1 position	Switch 2 position	CAN-Bus termination resistor:
ON	OFF	Enabled
OFF	ON	Enabled
ON	ON	Enabled
OFF	OFF	Disabled

ATTENTION: Missing terminations or too many terminations within the system can disturb the CAN-Bus communication. No more than two termination resistors should be activated on one bus and these should be located at both ends of the bus.

3.2.3 CAN Address Designation

All racks (modules) within a system must be addressed for a clear identification through the control unit.
The specific address for each rack must be designated with the CAN address selector (rotary switch) shown in figure 6).

Rotary switch position	Rack address
0	1
1	2
2	3
3	4
4	5
5	6
6	7
7	8
8	9
9	10
A	11
B	12
C	13
D	14
E	15
F	16

If only one rack is used within the power supply system, the rack must be addressed with the rack address 1 (rotary switch position “0” according to the table above).

A second used rack must be addressed with the rack address 2 (rotary switch position “1” according to the table above), etc.

The CAN addresses of the installed PSR rectifiers are automatically designated by the rack.

3.2.4 Assembling

After you have completed the settings, assemble the modules into the slots of the sub rack.
Fill the rack beginning with the left slot.
Unused PSR slots have to be covered with cover plates (see section 2.4 “Optional Equipment”).

3.2.5 Rear View/Electric Connectors

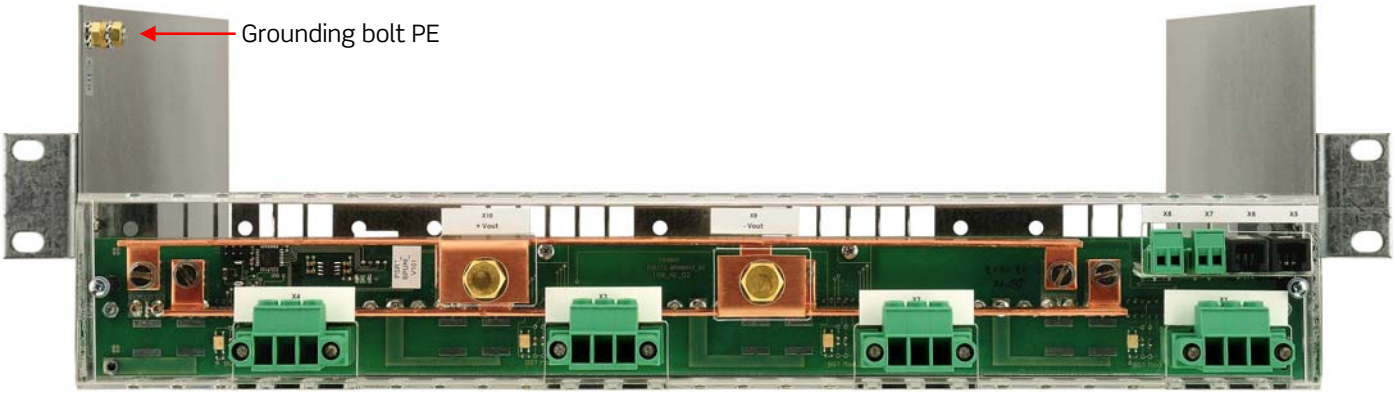

Figure 8) - Rear view

With the stickers affixed on the plexiglass guard, the connectors are labelled (X1 ... X10) for a clear identification.

Connect the input and output wires as well as the alarm wires to the rear connectors in accordance with the connection table on following page.

To clarify: The drawing (see figure 9) shows the labelling of the terminal blocks.

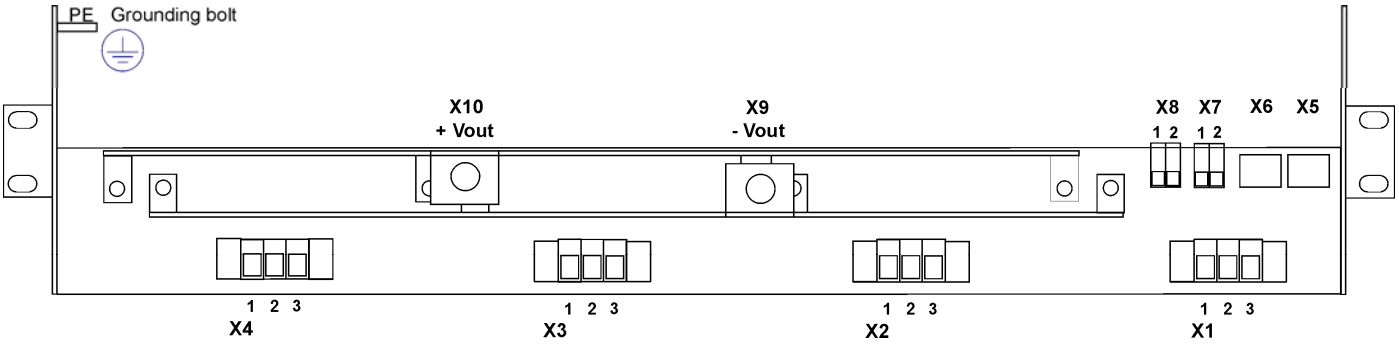

Figure 9) - Rear electric connectors

REMARK: The special grounding bolt (PE) of the rack itself must be grounded with the cabinet frame (common PE of the system).

☞ **Because PE of the AC input connectors (X1.1, X2.1, X3.1 and X4.1) are not connected with the grounding bolt (PE) of the rack, they must be connected with the common PE of the system.**

REMARK: The high voltage (HV) rack looks similar to the low voltage (LV) rack. The difference is, that the connector **X8** (sensor input for voltage drop compensation) is not connected for the HV rack!

3.2.6 Connection Table

Assignment of the rear side connectors according to figure 9).

Connec-tor	Function	Recommended wire cross section				
X1	AC input 1					
1	PE	2.5 mm²				
2	N	2.5 mm²				
3	L1	2.5 mm²				
X2	AC input 2					
1	PE	2.5 mm²				
2	N	2.5 mm²				
3	L2	2.5 mm²				
X3	AC input 3					
1	PE	2.5 mm²				
2	N	2.5 mm²				
3	L3	2.5 mm²				
X4	AC input 4					
1	PE	2.5 mm²				
2	N	2.5 mm²				
3	L4	2.5 mm²				
X5	CAN 1 (RJ11)	Cord set				
X6	CAN 2 (RJ11)	Cord set				
X7	Rectifier fault					
1	Relay output (COM, NC)	0.75mm²				
2	Relay output (COM, NC)	0.75mm²				
X8*	Sensor input for voltage drop compensation					
1	+ sense	0.75mm²				
2	- sense	0.75mm²				
		Recommended wire cross section, calculated for a fully equipped rack (4 rectifiers) @output voltage				
		24VDC	48VDC	60VDC	110VDC	220VDC
X9	DC output (minus pole), connection with M8 bolt (brass)	95mm²	120mm²	95mm²	35mm²	10mm²
X10	DC output (plus pole), connection with M8 bolt (brass)	95mm²	120mm²	95mm²	35mm²	10mm²

*Not connected for the HV-rack!

3.2.7 Schematic Diagram (Example of use)

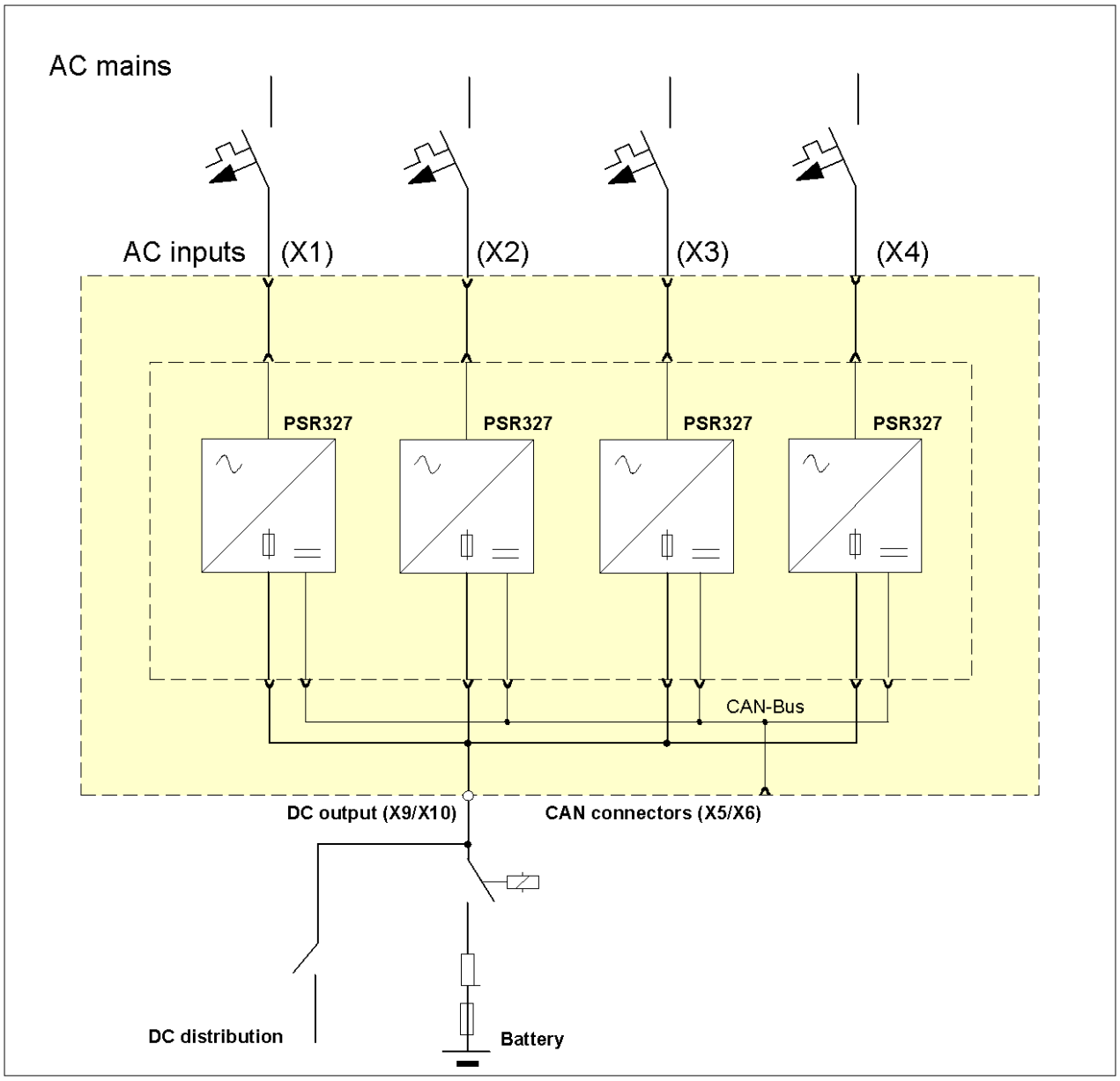

Figure 10) - Schematic diagram

☞ An external separate fuse per each input is recommended!
With this fuse each module individually can be switched ON/OFF and therefore unused slots are isolated (higher safety level).

Recommended input fuses: 16A MCB, characteristic "B"

4. Maintenance

In general, the system is maintenance-free.
A yearly inspection with following checks is recommended:

- Correct fan operation (rectifiers)
- Mechanical inspection
- Removal of dust and dirt
- Check for internal dust or humidity

ATTENTION! Dust combined with moisture or water may influence or destroy the internal electronic circuits.

Dust inside the unit can be blown out with dry compressed air.
The interval between the checks depends on ambient conditions of the installed system.

For the exchange of defective fans in the rectifier modules, an additional instruction manual is available on request.

5. Technical Specifications

Type designation	DCR PSR327-10.8 LV	DCR PSR327-10.8 HV
Article code	**102-327-408.LV01**	**102-327-408.HV01**
Main Data:		
Modules	Designed for the use of 1 up to max. 4 rectifiers of series PSR312 (Vo= 24VDC) or PSR327 (Vo= 48; 60VDC)	Designed for the use of 1 up to max. 4 rectifiers of series PSR327 (Vo= 110; 220VDC)
Input voltage	230VAC	←
Internal input fuses	There are no internal fuses, we recommend an individual fuse for each input	
Nominal output voltage	24, 48, 60VDC, depends on the used rectifiers	108, 216VDC, depends on the used rectifiers
Max. output current (rack fully equipped with 4 rectifiers)	200ADC @24VDC; 224ADC @48VDC; 180ADC @60VDC	100ADC @108VDC; 50ADC @216VDC
Output power	PSR312: 1200 up to 4800W; PSR327: 2700 up to 10800W	2700 up to 10800W
Electric connectors:		
AC input	4 x input (1 per each module)	←
DC output	1 x output (copper busbar)	←
Signalling contacts	1 x potential free relay output COM, NC (rectifier fault); max. switching capacity: 60VDC, 500mA	
Communication interfaces	2 x isolated CAN-Bus connectors (RJ12)	
Sensor input	1 x for voltage drop compensation	Not connected
Environmental:		
Max. installation altitude	≤1500 m	←
Ambient temperature	operation: -20°C...+55°C; storage: -40°C...+85°C	
Audible noise	≤ 45dB(A) at 1m distance	←
Mechanical:		
Type of construction	Sub rack, 19", 3U	←
Cooling	The rectifiers are fan-cooled (front-to-rear airflow), temperature-	

Surfaces	regulated and monitored powder coating RAL 7035 (front only), constructive parts: anodized metal
W/H/D	483/133/345mm, 388mm with rear connectors; (19”, 3U)
Minimum installation depth	438 mm ←
Weight	approx. 4.9 kg (excluding PSR modules)
Applicable standards:	
Mechanical construction	acc. to VDE 0160 edition 5.88 chapter 7.2.2
Protection class	IP20 ←
Climatic conditions	acc. to IEC 721-3-3 class 3K3/3Z1/3B1/3C2/3S2/3M2
RFI suppression / immunity	CE-label, (EN50081-1, EN55011/55022 class „B“, EN50082-2, EN61000-4 part 2/3/4/5)
Compliance to safety standards	acc. to EN60950-1, VDE0100 T410, VDE0110, EN60146

5.1 Dimensional Drawings:

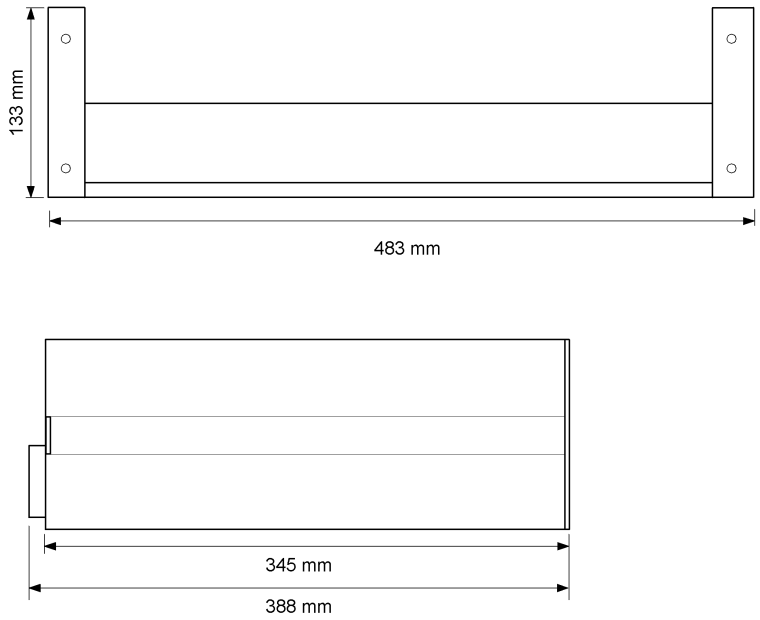

Figure 11) - Rack dimensions

6. Notes

Supplier:

✉	ELTEK VALERE DEUTSCHLAND GmbH GB Industrial Schillerstraße 16 D-32052 Herford
☎	+ 49 (0) 5221 1708-210
FAX	+ 49 (0) 5221 1708-222
Email	Info.industrial@eltekvalere.com
Internet	http://www.eltekvalere.com