

DC/DC Power Rack

DDR PSC320-8.0 HV

USER MANUAL



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.

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DDR PSC320-8.0 HV

User Manual
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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 unit 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 INDUSTRIAL partner.

2. General Information

The DC/DC power rack is a unit ready for integration in system cabinets with a standard 19" frame. The unit can be equipped with a maximum of four DC/DC converters of type PSC320 (PSC312) and delivers an output power to a maximum of 8kW (PSC312: 4.8kW). After safe mechanical and electrical connection, the unit is ready for operation.

2.1 Block Diagram

DDR PSC320-8.0HV

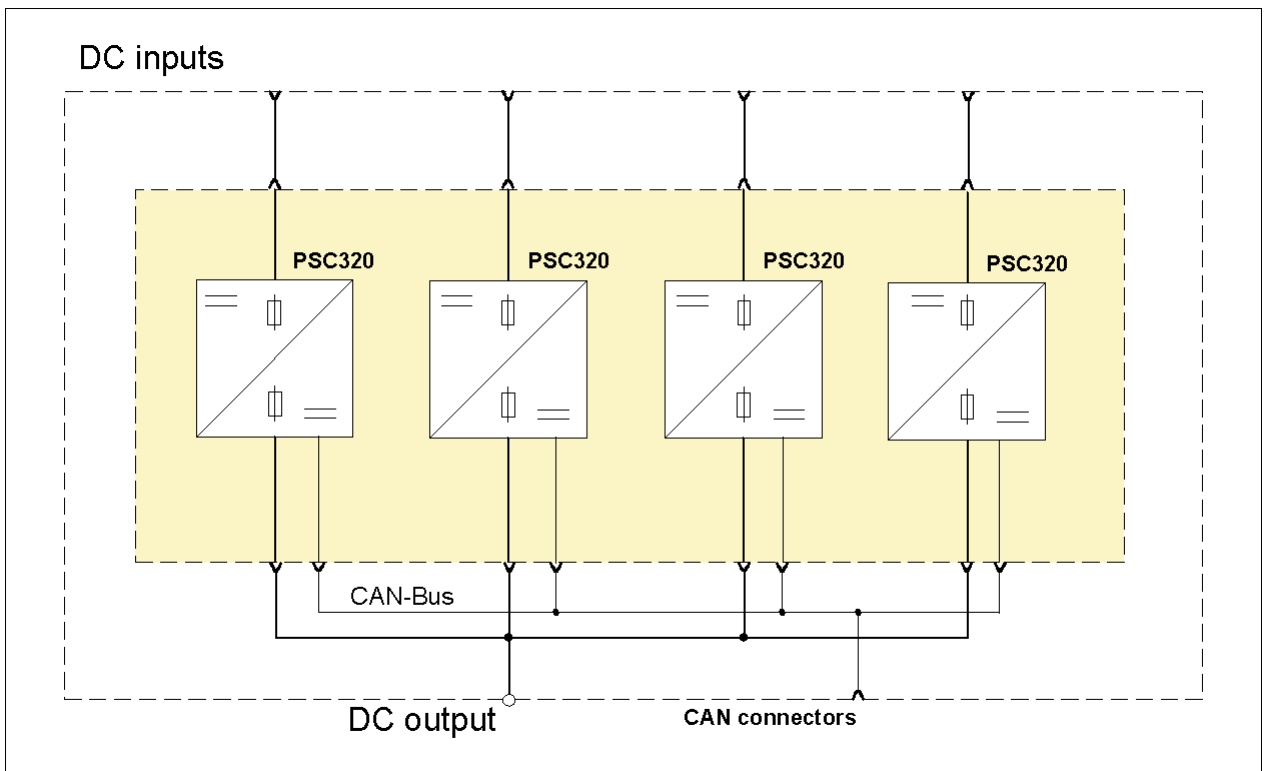


Figure 1) - Block diagram

2.2 Possible rack configurations

Up to four DC/DC converters PSC320HV (PSC312HV) with output voltages according to the table below can be integrated into one rack.

Designation	Article code		For DC/DC converter type/ output voltage
DDR PSC320-8.0 HV	202-320-408.00	Nominal input voltage = 220V _{DC}	PSC312/24V _{DC}
			PSC320/48V _{DC}
			PSC320/60V _{DC}
			PSC320/110V _{DC}
			PSC320/220V _{DC}

Output power of the rack, equipped with PSC312:

Number of installed converters (PSC312)	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 PSC320:

Number of installed converters (PSR320)	Output power (without redundancy)	Output power (n + 1)	Output power (n + 2)
1	2000W	---	---
2	4000W	2000W	---
3	6000W	4000W	2000W
4	8000W	6000W	4000W

2.3 Perspective View

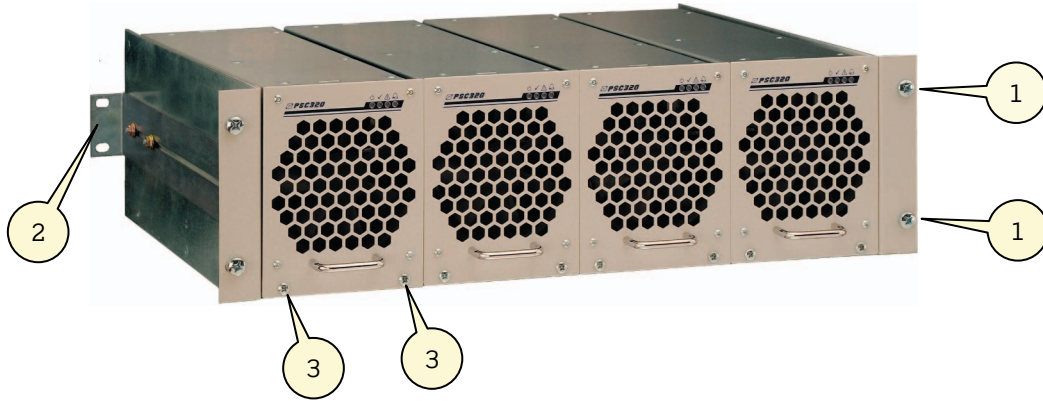


Figure 2) - Power rack fully equipped with four DC/DC converters PSC320.

1	Four screws M6 to fix the sub rack to the frame of the system cabinet	Components of the sub rack
2	Two adjustable assembly brackets (on the left and right side) to fix the sub rack on the rear frame of the system cabinet.	
3	Two captive screws per module to fix it on 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.

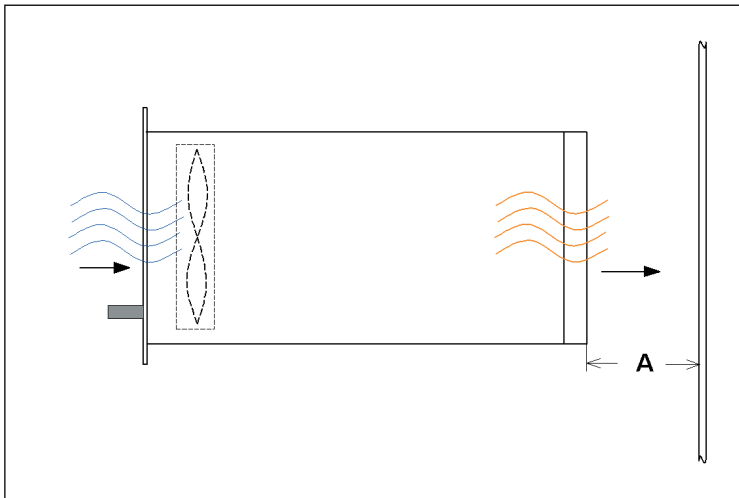


Figure 3) - Rack air flow

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 four 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.

View into the empty DC/DC power rack:

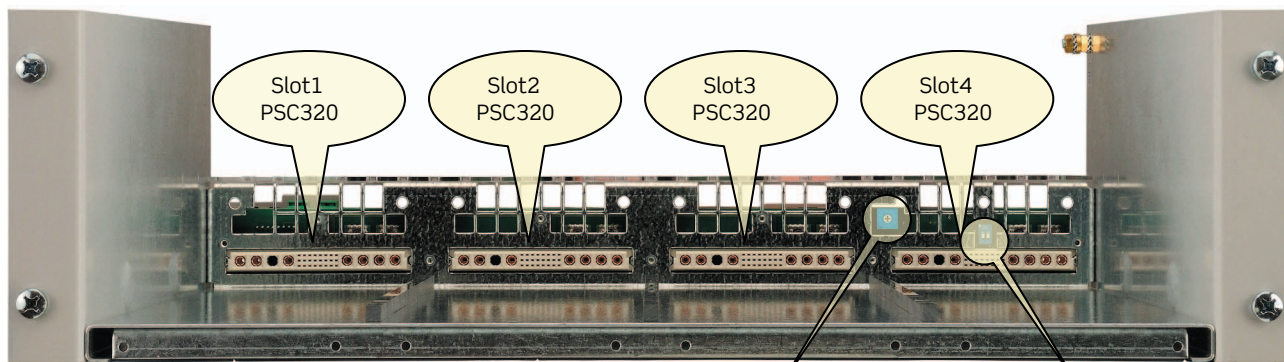


Figure 5) - Front view of the empty rack



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

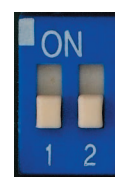


Figure 7) - CAN-Bus termination switches (For details see the section 3.2.2 “CAN-Bus Termination”)

3.2.1 Communication Interface

The DDR PSC320 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 fitted at 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 PSC modules 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 slots have to be covered with cover plates (see section 2.4 “Optional Equipment”).

3.2.5 Rear View/Electric Connectors

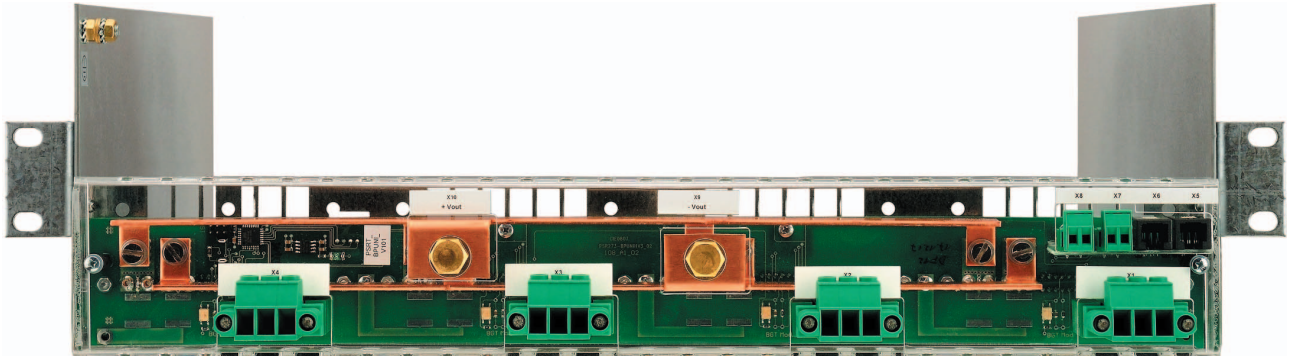


Figure 8) - Rear view

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.

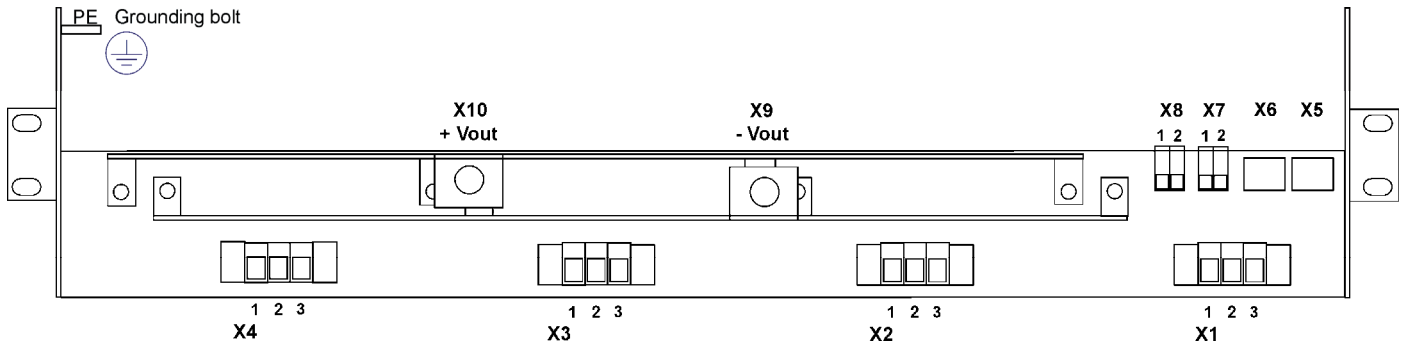



Figure 9) - Rear electric connectors

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 DC 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.

3.2.6 Connection Table

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

Connector	Function	Recommended wire cross section				
X1	DC input 1					
1	PE	2.5 mm ²				
2	Plus (+)	2.5 mm ²				
3	Minus (-)	2.5 mm ²				
X2	DC input 2					
1	PE	2.5 mm ²				
2	Plus (+)	2.5 mm ²				
3	Minus (-)	2.5 mm ²				
X3	DC input 3					
1	PE	2.5 mm ²				
2	Plus (+)	2.5 mm ²				
3	Minus (-)	2.5 mm ²				
X4	DC input 4					
1	PE	2.5 mm ²				
2	Plus (+)	2.5 mm ²				
3	Minus (-)	2.5 mm ²				
X5	CAN 1 (RJ11)	Cord set				
X6	CAN 2 (RJ11)	Cord set				
X7	Converter fault					
1	Relay output (COM, NC)	0.75mm ²				
2	Relay output (COM, NC)	0.75mm ²				
X8	Not connected					
1	Not connected					
2	Not connected					
		Recommended wire cross section, calculated for a fully equipped rack (4 converters) @output voltage				
		24V _{DC}	48V _{DC}	60V _{DC}	110V _{DC}	220V _{DC}
X9	DC output (minus pole), connection with M8 bolt (brass)	95mm ²	70mm ²	50mm ²	25mm ²	6mm ²
X10	DC output (plus pole), connection with M8 bolt (brass)	95mm ²	70mm ²	50mm ²	25mm ²	6mm ²

3.2.7 Schematic Diagram (Example of use)

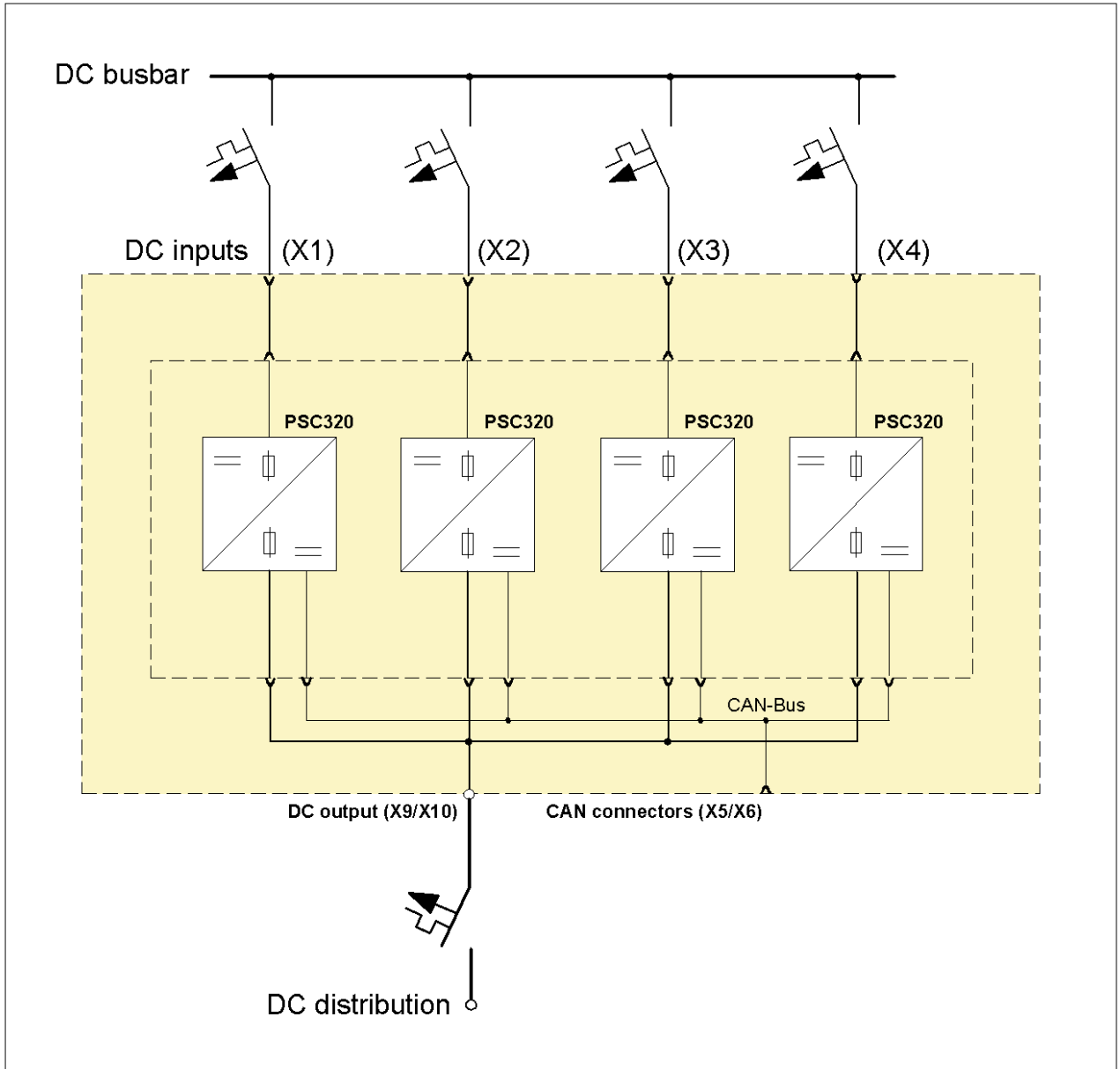


Figure 10) - Schematic diagram



An individual fuse for each input is recommended!

With this fuses each module individually can be switched ON/OFF and therefore unused slots are isolated (higher safety level).

Recommended input fuses: 13A MCB, characteristic “B”

4. Maintenance

In general, the system is maintenance-free.

A yearly inspection with following checks is recommended:

- Correct fan operation (modules)
- Optical/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 modules, an additional instruction manual is available on request.

5. Technical Specifications

Type designation	DDR PSC320-8.0 HV				
Article code	202-320-408.00				
Main Data:					
Modules	Designed for the use of one up to max. four DC/DC converters of series PSC312 ($V_o = 24V_{DC}$) or PSC320 ($V_o = 48; 60; 110; 220V_{DC}$)				
Nominal input voltage	220V _{DC}				
Internal input fuses	There are no internal fuses, we recommend an individual fuse for each input				
Nominal output voltage	24, 48, 60, 110, 220V _{DC} , depending on the used converters				
Max. output current (rack fully equipped with four DC/DC converters)	200A _{DC} @24V _{DC}	168A _{DC} @48V _{DC}	132A _{DC} @60V _{DC}	72A _{DC} @110V _{DC}	36A _{DC} @220V _{DC}
Output power	PSC312: 1200 up to 4800W; PSC320: 2000 up to 8000W				
Electric connectors:					
DC input	4 x input (1 per each module), screw terminals				
DC output	1 x output (copper busbar)				
Signalling contacts	1 x potential free relay output COM, NC (converter fault); max. switching capacity: 60V _{DC} , 500mA				
Communication interfaces	2 x isolated CAN-Bus connectors (RJ12)				
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 DC/DC converters are fan-cooled (front-to-rear airflow), temperature-regulated and monitored				
Surfaces	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 PSC 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:

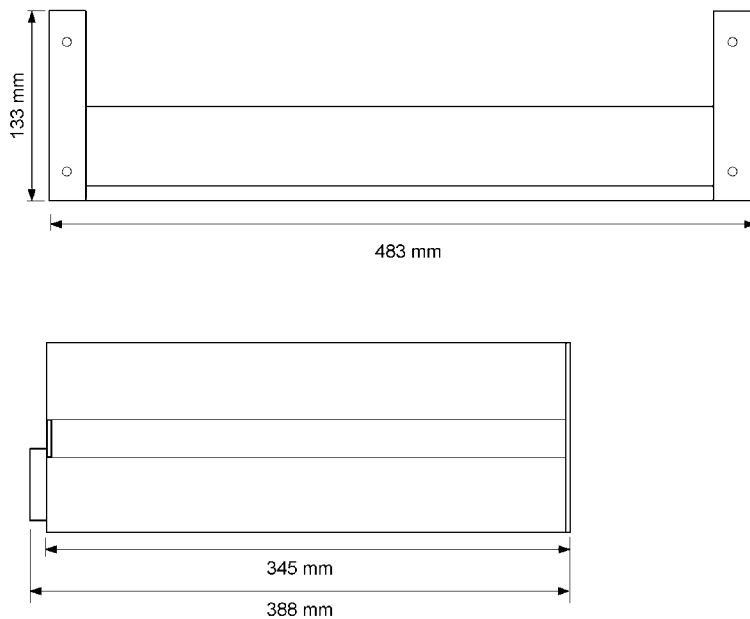


Figure 11) - Rack dimensions



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