ELTEK VALERE
always on

DC/DC CONVERTER

PSC305-HV

USER MANUAL

Notes to this manual

ATTENTION! Read this manual very carefully before installing and commissioning the specified module.
This manual is a part of the delivered module. Familiarity with the contents of this manual is required for installing and operating the specified module.
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 module 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 2004-108-EG (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

Changes and errors excepted.

The current revision status of this user manual is the following:

Revision: 3.0

Date: 2010-01-19

Revision	Description of change	Writer	Date
00	First edition	RTH	2007-11-06
01	Correction of output voltage values	RTH	2008-01-28
02	Section “Commissioning” reworked, minor text modifications, default values corrected	RTH	2008-02-14
1.0	Minor layout & text modifications, new revision status numbering (X.X) introduced, index of figures inserted.	RTH	2009-01-06
2.0	Default values in section 4.6 changed, minor text modifications.	RTH	2009-03-24
3.0	Section 4.7 "Setting of the output voltage/threshold values" inserted, "Technical Specifications" completed.	RTH	2010-01-19

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1A. Safety Instructions

Warning!

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

- Operation and maintenance of electrical modules 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 module 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.

1B. Electric Waste Disposal

Separate collection is the precondition to ensure specific treatment and recycling of waste electrical and electronic equipment and is necessary to achieve the chosen level of protection of human health and the environment.

In the case of waste disposal of your discarded equipment we recommend to contact a waste management company.

2. General information

The PSC305 is a module with rear side connectors and is designed to be mounted in an assembly set 19" sub rack according to section 3.2. Due to its state-of-the-art circuit design, the unit has very low losses and therefore very compact dimensions, low weight and a very high power density.
The PSC305 can be used as electrically isolated DC power supply.
The nominal output power per unit is 480 W. Several units can be switched in parallel to increase the system output power or to build redundant power supply systems (n + 1-principle)

3. Type range/equipment

Type Designation	Article Code	Nominal Output Voltage	Nominal Output Current
PSC305-HV/24-20	201-005-747.00	24V_{DC}	20A_{DC}
PSC305-HV/48-10	201-005-757.00	48V_{DC}	10A_{DC}
PSC305-HV/60-8	201-005-767.00	60V_{DC}	8.0A_{DC}
PSC305-HV/110-4.4	201-005-777.00	110V_{DC}	4.4A_{DC}
PSC305-HV/220-2.2	201-005-787.00	220V_{DC}	2.2A_{DC}

3.1 Main data

DC input voltage range:	90 to 275 V_{DC}
DC input current:	4.9A_{DC} @110V_{DC}/2.5A_{DC} @220V_{DC}
Nominal output power:	480W

Specific data: See section 7.

3.2 Available options and assembly equipment

Designation	Material Code
DC/DC power rack DDR PSC305-HV (assembly set 19" sub rack 4U incl. backplane) for six DC/DC converters PSC305 (single input/output connection for each module)	202-305-607.00
Cover plate (with handle) to cover unused PSC slots, 3U; RAL 7035	881-MEC-BPL.03.14.B
Fan rack (recommended)	102-308-FR1.HV02
CAN dongle, incl. software; necessary to change the output voltage value/internal default values of the DC/DC converter.	880-CAN-DNG.00

Figure 1) DC/DC power rack fully equipped with six DC/DC converters PSC305

Figure 2) Fan rack (recommended)

3.3 Front view/front side LED panel

Figure 3) Front view

The PSC305-HV is equipped with the following four LED indicators:

- INPUT OK
- OUTPUT OK
- Vout>
- ALARM

For more information about the LED indicators, see section 4.4.

Two captive screws are used for each module to secure it to the subrack (components of the module)

3.4 Rear side connection

Socket outlet (DC-Input, DC-Output & Signals):

Pin assignment of the rear side connector:

Pin	Function
2b	-
5b	(-) Output
8b	-
11b	(+) Output
13a	CAN-CVpp
13c	(-) output voltage sense link
14a	CAN-H
14c	CAN-L
15a	(+) 20 V free floating
15c	CAN-CVCC
16a	AGND
16c	(-) 20V free floating
17a	Hardwarecoding CODE2
17c	Hardwarecoding CODE1
18a	General alarm NC
18c	General alarm COM
19a	General alarm NO
19c	-
20a	-
20c	(+) output voltage sense link
22b	PE
25b	-
28b	(+) DC input
31b	(-) DC input

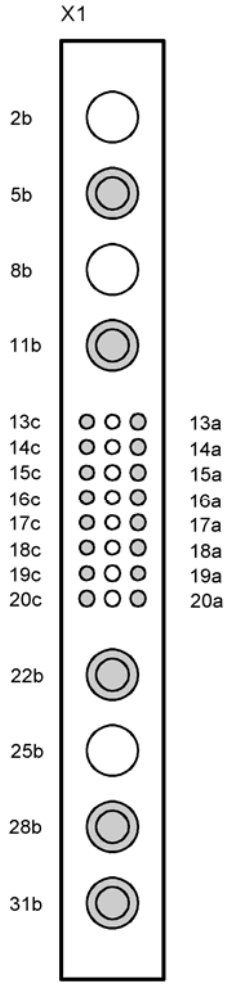

Figure 4) Rear side connector (shown from the rear side of the module).

3.5 Cooling and air flow direction

Normally the DC/DC converters PSC305 integrated in the serial power rack are convection-cooled.
The cooling air flows through the perforated cover (see figure 5A).

REMARK: We recommend the use of the optional **fan rack** (see section 3.2), because in most applications there is no enough space for sufficient natural airflow inside the power supply cabinet. The fans are temperature-controlled and r.p.m.-monitored. The air flow is from bottom to top (see figure 5B).

To provide sufficient air flow, a minimum space (see item "A" in figures 5A) and 5B) of 2 U (approx. 90 mm) is required between the top of the sub rack and the roof of the power supply cabinet as well as an unobstructed supply of air.

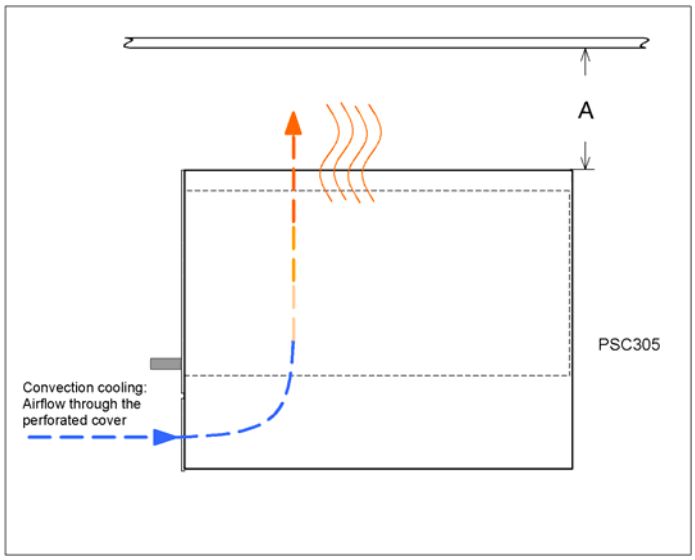

Figure 5A) Rack airflow, convection-cooled

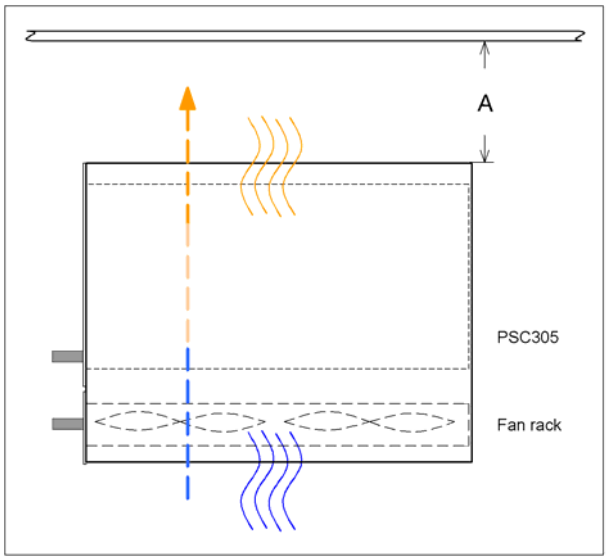

Figure 5B) Rack airflow with fan rack

3.6 Communication interface

The DC/DC converter PSC305 is equipped with a serial data interface in accordance with the Controller Area Network (CAN) specification.
The CAN-Bus connection is integrated in the rear side connector.
Several modules in a system or parallel connection can be monitored through the CAN-Bus by a central DC controller unit UPC3S.

Following parameters of a specific DC/DC converter unit can be monitored:

- Output voltage
- Output current
- Module temperature
- Module status

4. Handling

4.1 Storage

The modules must be stored in a dry, dust free room with a storage temperature in accordance with the specific technical data (see section 7).

4.2 Commissioning

Note: Before commissioning the module make sure that the input voltage corresponds to the input voltage range of the unit as specified on the type plate and that the output voltage of paralleled units matches.

1. Carefully unpack the unit
2. Fill the rack beginning with the left slot.
3. Put the unit into an empty slot.
4. Carefully slide in the unit until the module connector touched the backplane connector.
5. Increase the force until the unit fits in completely. Avoid using too much force. If the unit does not fit in, begin again at Step 3.
6. Secure the unit using the two captive screws (M3x12) provided with the module.

Note: The PSC305 serially is equipped with an internal output side decoupling diode. This ensures hot plug-**in** capability of the unit and enables the operator to **add** modules under operating conditions.

Note: But if the module is to be **removed** it previously must be **switched off** by the external input fuse!

	**Caution:** After switching off the module the internal capacitors are still fully charged. Do not touch connector pins as they can still be charged with dangerous voltage after disconnection.

4.3 Output power diagram

The output characteristic of the PSC305 is a power limited IV characteristic curve in accordance with DIN 41772/DIN 41773.

For modules in parallel operation mode, a load balance of approximately ±10% is attained due to a sloping output voltage line (-1% at 100% Inom).

The module is continuously short-circuit proof due to constant current control.

Output power diagram (example PSC305-HV/48-10):

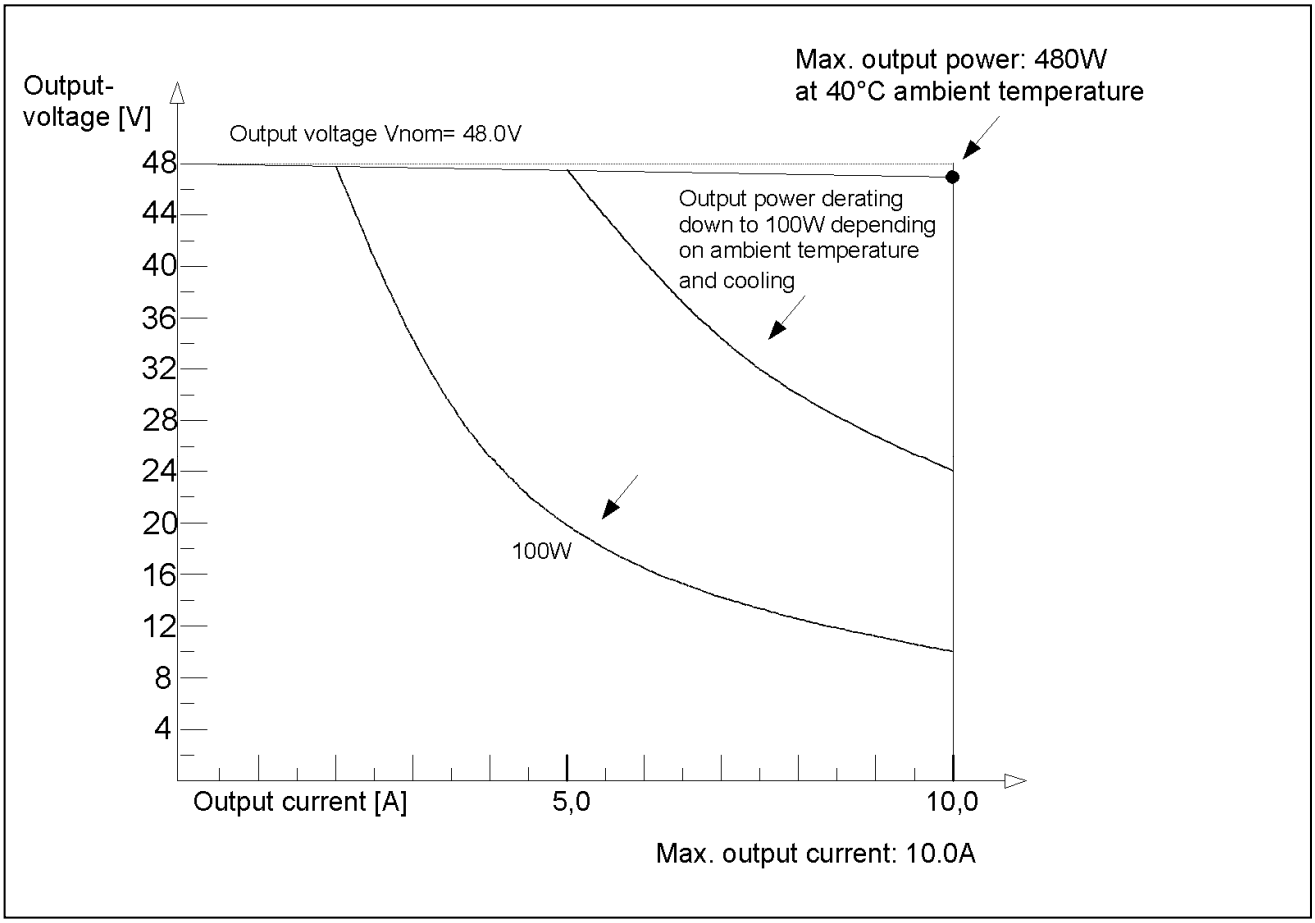

Figure 6) Output power diagram

4.4 LED indications

Functions of front panel LED indicators

LED	Colour	Function
	green	Input voltage ok (criterion: Vi= 80 V_{DC} to 300 V_{DC})
	green	Vout ok (criterion: Vout ≥85% of adjusted value)*
	red	Vout > (criterion: Vout ≥ adjusted operating threshold)*
	red	General fault**: Vin incorrect, Vout incorrect, module overtemperature and short circuit

*For the output voltage threshold values (factory-set), see section 4.6

**The module is equipped with an isolated signalling contact (normally open contact).
The maximum load is 60V_{DC}/500 mA. The contact is time-delayed and reacts after approximately 10 seconds.

4.5 Monitoring

Monitoring functions

Monitored values	Criteria	Function
DC input voltage	Input voltage less than 80V; higher 300V	The module automatically switches off.
DC output voltage	Output voltage higher than the adjusted operating threshold*	The module automatically switches off (self locking). The module manually must be restarted.
Module temperature	Heat sink temperature ≥80°C	The module automatically switches off. It automatically switches on when the heat sink cools down to ≤70°C.

*For the output voltage threshold values (factory-set), see section 4.6

4.6 Default values

The following factory-set default values are stored in PSC305 modules:

Default values	24V version	48V version	60V version	110V version	220V version
Vo (V_{DC})	24.0	48.0	60.0	110.0	220.0
V> (V_{DC})	25.2	50.4	63.0	115.5	231.0
Iconst (A_{DC})	20.0	10.0	8.0	4.4	2.2
V< (V_{DC})	22.8	45.6	57.0	104.5	209.0

4.7 Setting of the output voltage/threshold values

The output voltage/threshold values individually can be set within the scope of the output voltage adjustment range (see section 7) using a CAN dongle and PC software (see section 3.2 "Available Options and Assembly Equipment"). A specific manual is available on request.

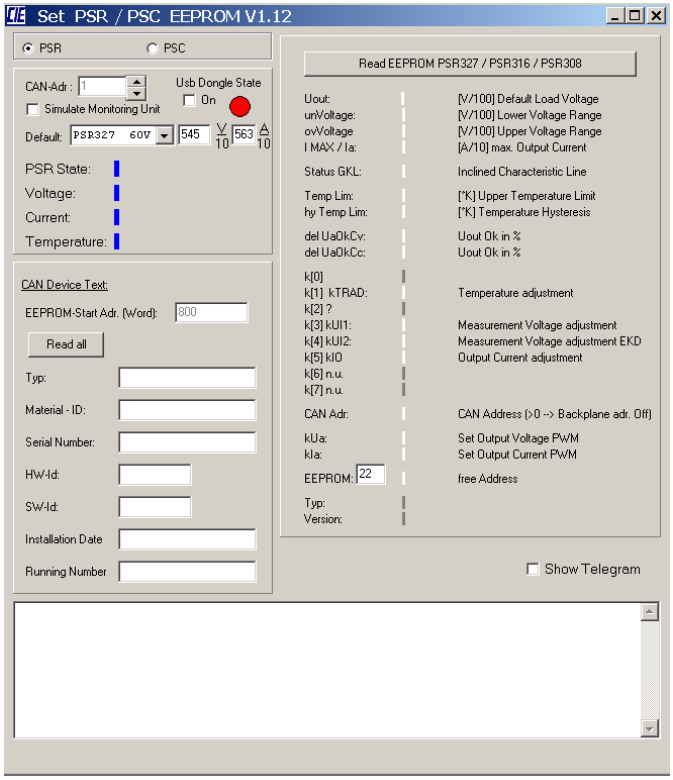

Figure 7) Screenshot "PC software for CAN-Dongle"

5. Maintenance

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

- Mechanical inspection
- Removal of dust and dirt, especially on radiator surfaces
- 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 module.

6. Troubleshooting

Symptom	Possible reason	Corrective action
No output voltage	• Is the input voltage present? • PSC305 module plugged in securely? • Incorrect polarity of input voltage? • Short circuit at the output?	→ Check → Check → Check → Check
Deviation of the output voltage	• Is the unit operating in power limitation mode due to overload? • If an external sensor lead is used for the output voltage, is the connection faultless?	→ Reduce the load → Check

If the module still does not work even though all checks have been done, contact your sales agent or the ELTEK VALERE DEUTSCHLAND service department.

7. Technical specifications

Type designation	**PSC305-HV/24-20**	**PSC305-HV/48-10**	**PSC305-HV/60-8**	**PSC305-HV/110-4.4**	**PSC305-HV/220-2.2**
Article code	**201-005-747.00**	**201-005-757.00**	**201-005-767.00**	**201-005-777.0**	**201-005-787.00**
DC input:					
DC input voltage range	90 - 275VDC				
Input current	4.9ADC @ 110VDC/2.5ADC @ 220VDC				
Efficiency	≥89%				
Internal input fusing	10A (6.3x32mm)				
DC output:					
Nominal output voltage (factory set)*	24VDC	48VDC	60VDC	110VDC	220VDC
Nominal output current @ nominal output voltage	20.0ADC	10.0ADC	8.0ADC	4.4ADC	2.2ADC
Nominal output power	480W				
Adjustable output voltage range*	19 - 36VDC	38 - 75VDC	48 - 88.5VDC	87 - 160VDC	172 - 313VDC
Factory set output over voltage threshold* V> (105% Vnom)	25.2VDC	50.4VDC	63.0VDC	115.5VDC	231.0VDC
Factory set output under voltage threshold* V< (95% Vnom)	22.8VDC	45.6VDC	57.0VDC	104.5VDC	209.0VDC
*The output voltage/threshold values individually can be set within the scope of the output voltage adjustment range using a CAN dongle and PC software.					
Voltage ripple	≤20mVpp/	≤20mVpp	≤20mVpp	≤≤100mVpp	≤≤200mVpp
Psophometric acc. to CCITT-A	≤1.8mV	≤1.8mV	≤1.8mV	-	-
Dynamic accuracy of the charge voltage	≤3% Vnom at load changes between 10%-90%-10% Inom; transient time ≤1.5ms				
Short circuit protection	continuously short-circuit proof; 1 x Inom				
Parallel operation	yes (max. 24 units with DC controller unit UPC3S); current balance approx. ±10% Inom				
Internal decoupling at the output	yes; active low loss decoupling circuit in the negative output line				
Internal output fuse	40A	25A	20A	10A	5A
Standard Features:					
LED signalling	Operation (green), Vo OK (green), Vo> (red), Alarm (red)				
Isolated signalling contact	"General fault"; maximum load: 60 VDC/500 mA				
Communications interface	CAN- Bus, proprietary protocol				
Environmental:					
Ambient temperature	Operation: -20°C to +55°C; storage: -40°C to +85°C; output power derating to 100W depending on ambient temperature and cooling				
Climatic conditions	according to IEC 721-3-3 class 3K3/3Z1/3B1/3C2/3S2/3M2				
Max. installation altitude	≤1500m				
Audible noise	≤30dBA				

Mechanical:

Type of construction	1/6 x 19", 3U				
Cooling	Convection cooling, bottom to top airflow (forced cooling recommended)				
Connections	DC input, DC output and signalization: DIN41612-M-connector				
Dimensions (W/H/D)	71/128/285mm				
Minimum installation depth	390 mm plus 25.5mm handle depth (in combination with an assembly set 19" sub rack)				
Weight	approx. 2.2 kg	approx. 2.2 kg	approx. 2.2 kg	approx. 2.2 kg	approx. 2.2kg
Type of enclosure / Protection class	IP20 (front panel)/1				
Colour	Front panel: RAL 7035; print: neutral, RAL 9005				

Compliances:

CE conformity	yes
Compliance to safety standards	EN60950-1; VDE0100 T410; VDE0110; EN50178; EN60146
Compliance to EMC standards	EN55011/22 class "B"; EN61000-4 T2-5

7.1 Dimensional drawings:

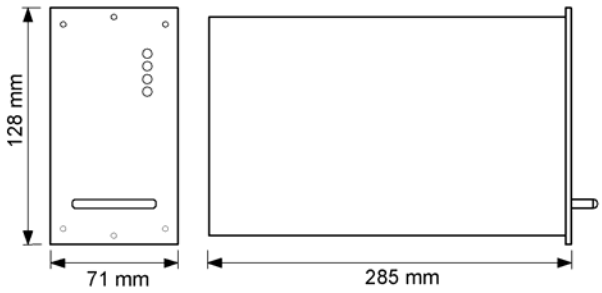

Figure 8) Module dimensions

8. Notes

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
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