

# DVCH3003-400

## DC/DC converter



Abbildung ähnlich / device similar to figure



DVCH3003-400-derivate table

Type	Input voltage		Output voltage (configurable)		Output current	Cat. No.
	Nom.	Range	Nom.	adj. range	Max.	
DVCH3003-400-12	400 VDC	200 - 470 VDC	12 VDC	2 - 15 VDC	224 A	105197/x/yyyy*
DVCH3003-400-24	400 VDC	200 - 470 VDC	24 VDC	2 - 30 VDC	112 A	105196/x/yyyy*
DVCH3003-400-48	400 VDC	200 - 470 VDC	48 VDC	4 - 60 VDC	56 A	105184/x/yyyy*

**\*Order option:**

.../x/...: Accessory variant

- .../0/...without accessory
- .../20/...with heatsink
- More on request

.../yyy: Setting (Standard setting or customized)

- .../000 DC-Standard CAN 2.0A
- .../001 DC-Standard CAN J1939
- Customer-specific parameterization on request

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# 1 Input

<b>Input voltage range</b>	-	see DVCH3003-400-derivate table (valid for continuous operation)
<b>Undervoltage range</b>	0 - 200 VDC	Class C*
<b>Lower restricted operation range</b>	200 - 250 VDC	Continuous operation, class B*
<b>Unrestricted operation range</b>	250 - 450 VDC	Continuous operation, class A*
<b>Upper restricted operation range</b>	450 - 470 VDC	Continuous operation, class B*
<b>Overvoltage range</b>	470 - 500 VDC	≤ 10 s, class C*
<b>Max. current consumption</b>	≤ 16 A	-
<b>Input capacity</b>	< 13 μF	Attention: No inrush current limitation in the device. Provide a pre-charging section in the application, otherwise there is a risk of a over-voltage damage to the input of the DC/DC converter.

## \* Evaluation criteria for the operation behavior

The following evaluation criteria describe the functional state of the DC/DC converter as a function of the operation input voltage.

<b>Class A</b>	Unrestricted operation range	The DC/DC converter operates as designed in compliance with the tolerances specified in the data sheet.
<b>Class B</b>	Lower and upper restricted operation range	One or more functions may go beyond the specified tolerance. After returning to the unrestricted operation range, the DC/DC converter operates again as designed.
<b>Class C</b>	Undervoltage and overvoltage range	One or more functions do not work as intended. After returning to the unrestricted operation range, the DC/DC converter operates again as designed.

## 2 Output

<b>Output voltage <math>U_{nom}</math></b>	-	see DVCH3003-400-derivate table (valid for continuous operation)
<b>Initial accuracy (0 - 20 Hz)</b>	$\pm 1\% U_{nom}$	-
<b>Ripple &amp; Noise</b>	< 500 mVpp	Measuring bandwidth 20 MHz
<b>Max. continuous output current <math>I_{nom}</math></b>	56A 112A 224A	DVCH3003-400-48 DVCH3003-400-24, see fig. 9.1 DVCH3003-400-12
<b>Max. continuous output power <math>P_{nom}</math></b>	$\leq 3000W$	-
<b>Current limiting</b>	$1,1 \times I_{nom}$	above $1,0 \times I_{nom}$ $U_{out}$ may sink
<b>Recovery time</b>	$\leq 4$ ms	Duration from leaving the tolerance band until the permanently return to the tolerance band after a load step.
<b>Slew rate for setpoint change</b>	30V/s	valid only for controllable version

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### 3 Enviroment

<b>Working temperature (envrioment)</b>	-40°C ... +70°C	-
<b>Max. permissible temperature of the mounting surface</b>	< 50°C	-
<b>Overtemperature protection</b>	-	<p>Automatic shutdown in case of overtemperature with 3 thresholds:</p> <ul style="list-style-type: none"> <li>- At 1st threshold warning signal via CAN (60°C*)</li> <li>- At 2nd threshold error signal via CAN (90°C*)</li> <li>- At 3rd threshold protective shutdown (95°C*)</li> </ul> <p>Automatic power derating in case of overtemperature (≥60°C*)</p> <p>* internal device temperature</p>
<b>Storage temperature</b>	-40°C ... +85°C	-
<b>Humidity</b>	100%	-
<b>Dewing</b>	allowed	-
<b>Shock test acc. to DIN EN 60068-2-27</b>	-	<p>half sinusoidal (Excitation)          250m/s<sup>2</sup> (Peak acceleration)          6ms (Duration)          1.000 schocks to each axis (Quantity)          ±X, ±Y, ±Z (Axis)</p>
<b>Vibration test acc. to DIN EN 60068-2-6</b>	-	<p>sinusoidal (Excitation)          30m/s<sup>2</sup> (acceleration)          5 - 100Hz (frequenc, floating)          5g (acceleration)          10 - 500Hz (frequenc, floating)          9h per axis (Duration), 1 Oct/min          X, Y, Z (Axis)</p>
<b>Degree of protection acc. to EN 60529</b>	IP65, IP67, IP6K9K	Using the appropriate mating connectors; except M12 screw connection points at the output

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## 4 General data

<b>Insulation strenght</b>	500 VDC 4,25 kVDC	Output / Enclosure Input / Output + Enclosure + CAN
<b>Insulation resistance</b>	≥ 30 MΩ at 500 VDC	Input / Output + Enclosure + CAN
<b>Max. Efficiency</b>	95%	-
<b>Average efficiency</b>	93%	Averaging of the efficiency values at 25%, 50%, 75% und 100% of the nominal output power.
<b>Current consumption auxiliary and control circuit</b>	≤ 51 mA	Current consumption pin 3 (KL15) / pin 4 (KL30) without HV voltage applied to input with active communication via CAN siehe fig. 9.2
<b>Dimensions (LxWxH)</b>	ca. (295 x 233 x 68,5) mm	without connections, see fig. 8.1
<b>Enclosure</b>	Aluminium	-
<b>Weight</b>	< 5 kg	-

## 5 Standards

### EMC (Electromagnetic Compatibility)

Bezeichnung	Norm	Werte
<b>Emitted interference</b>	EN12895 EN 61204-3	- acc. to 6.4.2, table H.3, for industrial enviroment (class A, cable length < 3 m)
<b>Immunity</b>	EN12895 EN 61204-3	- acc. to 7.2.3, Noise immunity level for industrial enviroment (cable length < 3 m)

### Electrical safety

Title	Standard	Data
<b>Safety of industrial trucks</b> - Electrical requirements	DIN EN 1175	-
<b>Electrically powered road vehicles</b>	ISO 6469-3	-

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## 6 Installation and safety instructions

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In addition to the general installation and safety instructions for DC/DC converters, the following values and supplements apply:

<b>Mounting points</b>	-	4x Mounting holes (Ø9 mm) see fig. 8.1
<b>Installation orientation</b>	-	any
<b>Connection input / output</b>	-	see chapter 7
<b>Interlock-function</b>	-	realized by HV-connector plugs. Guide via signal connection plug, see chapter 7.
<b>Input fuse</b>	-	No integrated input fuse. A fuse must be provided externally by the customer application.
<b>Input discharge duration</b>	< 5s	Time from disconnecting the input voltage to $U_{in} < 60VDC$
<b>Reverse polarity protection input</b>	-	reverse polarity protection through connection plug
<b>Reverse polarity protection output</b>	< 30VDC	Note: DVCH3003 self-protection, does not protect the application from reverse polarity.

The general installation and safety instructions for DC/DC converters can be found at: [www.deutronic.com](http://www.deutronic.com)

## 7 Connections

### Input

AMPHENOL, Excel Mate Eco HVSL282 02 2 A:

- 2 pole HV connector with interlock contacts.
- Matching mating connector: AMPHENOL, Excel Mate Eco HVSL282 06 2 A 104
- Contacts for mating connector: AMPHENOL, Excel Mate Eco, socket contact, crimp connection: C310003612
- HV-cable: Huber+Suhner, FHLR91XC13X (4mm<sup>2</sup>, shielded single conductors)

### Output

threaded bolt:

- M12 [max. torque 35Nm]

### Enclosure potential

Thread:

- M8 (below the output connections, see fig. 8.1)

### Signal (CAN)

TE connectivity AMPSEAL, 14-polig:

- 14-pin automotive connector (TE-Nr.: 776267-1)
- Matching mating connector: TE-connectivity AMPSEAL 14-pin, socket housing (TE-Nr.: 776273-1)
- Contacts for mating connector: TE-connectivity AMPSEAL socket contact, crimp connection (TE-Nr.: 770854-1)

PIN "1" / PIN "2": Interlock

- If the HV connector is properly connected to the input, PIN "1" and PIN "2" are connected via the HV connector.
- If the HV connector is disconnected from the device, the internal connection between PIN "1" and PIN "2" is also disconnected.

PIN "3": KL15 (10 - 30 VDC) switched plus of ignition starter switch

PIN "4": KL30 (10 - 30 VDC) continuous plus of the battery

PIN "5": Common GND

PIN "6": Digital Input

PIN "7": Digital Input

PIN "8": Digital Output

PIN "9": Digital Output

PIN "10": n.C.

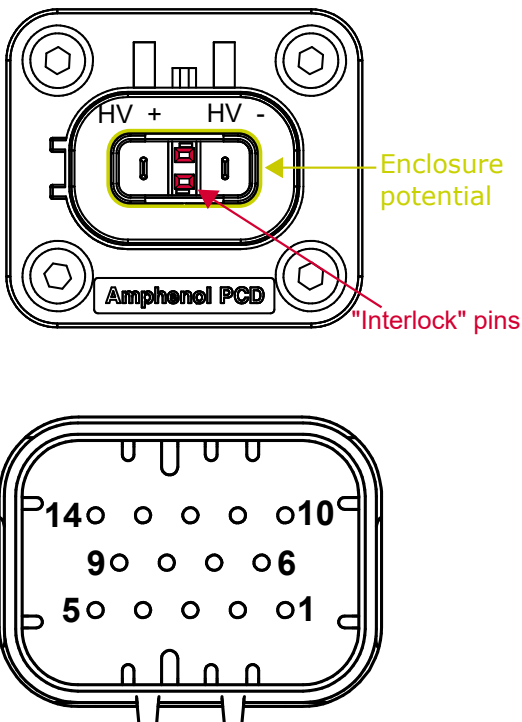
PIN "11": CAN<sub>Hi</sub> (CAN High)

PIN "12": CAN<sub>Lo</sub> (CAN Low)

PIN "13" / PIN "14": CAN<sub>R</sub>

- To terminate the CAN bus with a 120Ω resistor, the CAN<sub>R</sub> Pin"13" must be connected to the CAN<sub>R</sub> Pin"14".

**PIN "1" to PIN "14" are galvanically isolated from the input and output circuit.**



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## 8 Dimensions

All dimensions are given in millimeters and have a general tolerance according to DIN ISO 2768 - m.

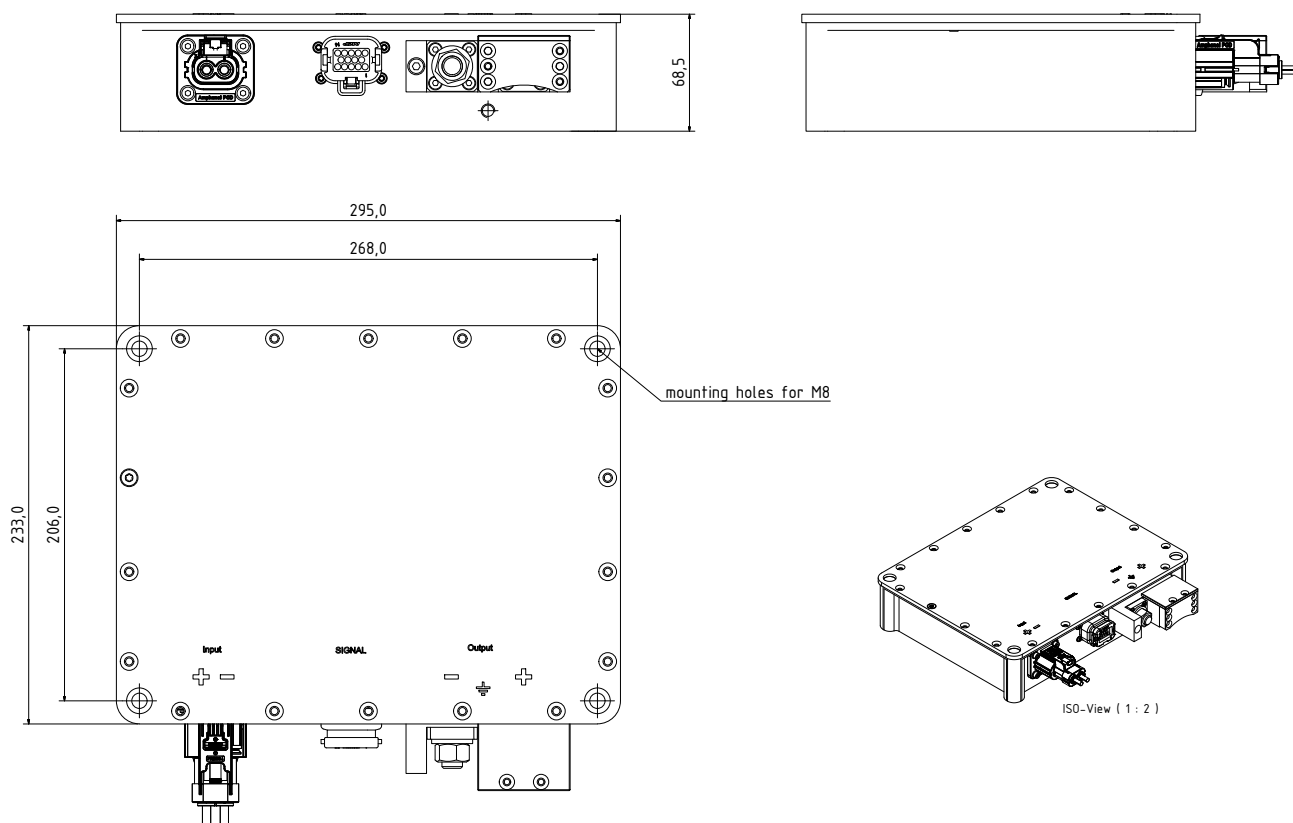


Figure 8.1: Dimensions

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## 9 Characteristics

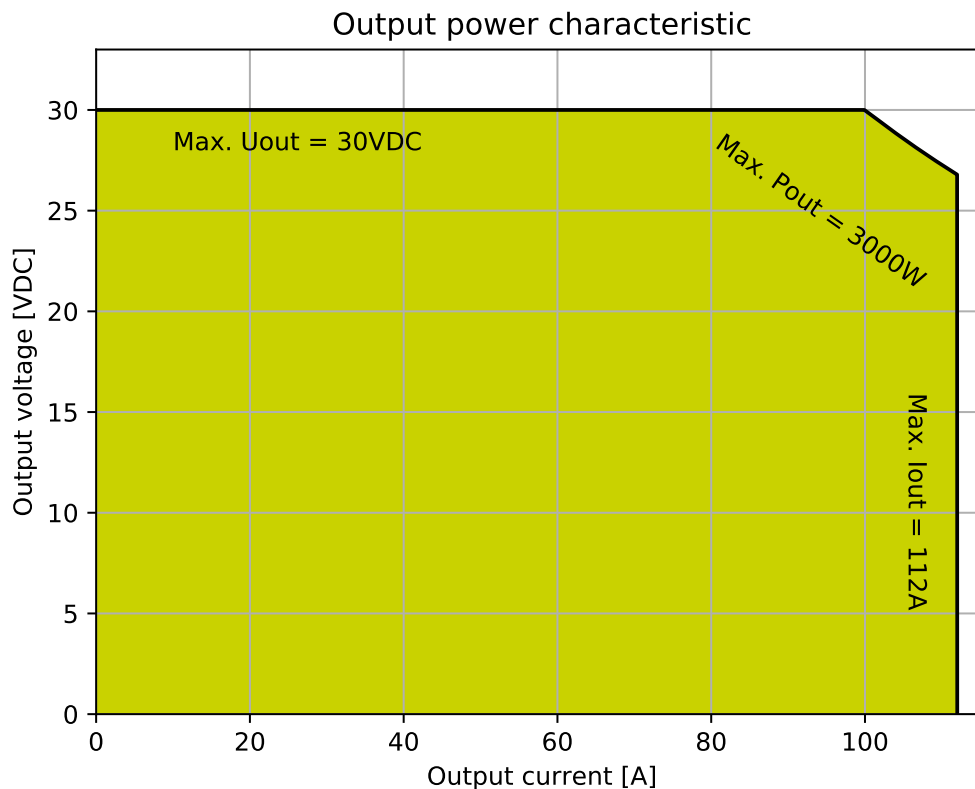


Figure 9.1: Output power

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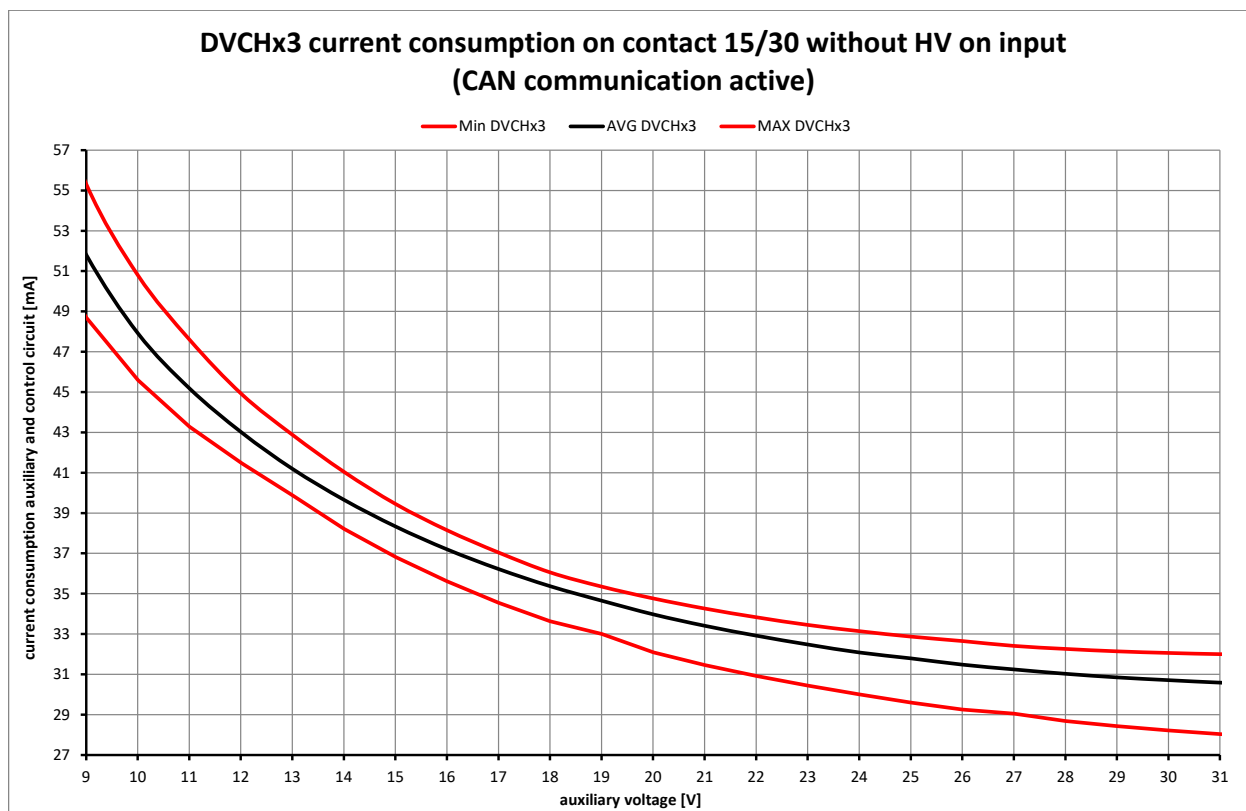


Figure 9.2: Current consumption auxiliary and control circuit

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