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DVCH1503-700

DC/DC converter

galvanically isolated

Abbildung ähnlich / device similar to figure

DVCH1503-700-Derivattabelle

Type	Input voltage [VDC]		Output voltage [VDC]		Output current [A]	Cat. No.
	Nom.	*Range*	*Nom.*	*Range*	*Max.*	
DVCH1503-700-12	700	400 - 900	12	2 - 15	112	105195/x/yyy*
DVCH1503-700-24	700	400 - 900	24	2 - 30	56	105194/x/yyy*

*Order option:

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

- .../0/...without accessory
- .../20/... with heatsink (cooling fins in longitudinal direction)
- .../21/... with heatsink (cooling fins in transverse direction)
- .../22/... with cold plate (liquid cooling system)
- 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

Input voltage (Nom.)	700 VDC	Class A*
Undervoltage range	0 - 400 VDC	Class C*
Lower restricted operation range	400 - 450 VDC	Continuous operation, class B*
Unrestricted operation range	450 - 850 VDC	Continuous operation, class A*
Upper restricted operation range	850 - 900 VDC	Continuous operation, class B*
Overvoltage range	900 - 1000 VDC	≤ 10 s, class C*
Max. current consumption	< 5 A	-
No-load current consumption	< 45 mA	with applied HV voltage and active communication via CAN
Input capacity	< 5 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.

Class A	Unrestricted operation range	The DC/DC converter operates as designed in compliance with the tolerances specified in the data sheet.
Class 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.
Class C	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.

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2 Output

Output voltage (Nom.)	12 VDC 24 VDC	-
Initial tolerance $N_{initial}$	±1,0% U_{nom}	-
Ripple & Noise N_{RN}	< 450 mVpp	measurement bandwidth 20 MHz
Max. continuous output current I_{nom}	112 A 56 A	DVC1503-700-12 DVC1503-700-24
Max. continuous output power P_{nom}	≤ 1500 W	-
Current limiting	1,1 x I_{nom}	above 1,0 x I_{nom} U_{out} may sink
Recovery time	≤ 4 ms	Duration from leaving the tolerance band until the permanently return to the tolerance band after a load step.
Slew rate for setpoint change	30 V/s	-

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3 Environment

Working temperature (environment)	-40 °C ... +70 °C	-
Max. permissible temperature of the mounting surface	< 50 °C	-
Cooling	Contact cooling via mounting surface	An effective thermal connection between the mounting surface and the heat sink of the application is a requirement for safe and long-term operation.
Overtemperature protection	-	Linear derating between 70°C* and 90°C* (@OUT 24V) or 75°C* and 90°C* (@OUT 12V). When 90°C* is reached, the device switches off. * internal device temperature
Storage temperature	-40 °C ... +85 °C	-
Humidity	100 %	-
Dewing	allowed	-
Shock test acc. to DIN EN 60068-2-27	-	half sinusoidal (excitation) 250m/s^2 (peak acceleration) 6ms (duration) 1.000 shocks to each axis (quantity) ±X, ±Y, ±Z (axis)
Vibration test acc. to DIN EN 60068-2-6	-	sinusoidal (excitation) 30m/s^2 (acceleration) 5 - 100Hz (frequency, floating) 5g (acceleration) 10 - 500Hz (frequency, floating) 9h per axis (duration), 1 Oct/min X, Y, Z (axis)
Degree of protection acc. to EN 60529	IP65, IP67, IP6K9K	Using the appropriate mating connectors; except M12 screw connection points at the output

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4 General data

Insulation strength	500 VDC 4,25 kVDC 1 kVDC	Output / Enclosure Input / Output + Enclosure + CAN Output / CAN
Insulation resistance	≥ 30 MΩ at 500 VDC	Input / Output + Enclosure + CAN
Max. Efficiency	typ. 94 %	-
Average efficiency	typ. 93 %	Averaging of the efficiency values at 25%, 50%, 75% und 100% of the nominal output power.
Current consumption auxiliary and control circuit	≤ 51 mA	Current consumption pin 3 (KL15) / pin 4 (KL30) without HV voltage applied to input with active communication via CAN see fig. 9.3
Dimensions (LxWxH)	295 x 233 x 68,5 mm	without connections, see fig. 8.1
Enclosure	Aluminium	-
Weight	approx. 5,5 kg	-

5 Standards

EMC (Electromagnetic Compatibility)

Title	Standard	Data
Emitted interference	EN12895 EN 61204-3	- acc. to 6.4.2, table H.3, for industrial environment (class A, cable length < 3 m)
Immunity	EN12895 EN 61204-3	- acc. to 7.2.3, Noise immunity level for industrial environment (cable length < 3 m)

Electrical safety

Title	Standard	Data
Low-voltage switch mode power supplies - Safety requirements	DIN EN 61204-7	-
Safety of industrial trucks - Electrical requirements	designed according to DIN EN 1175*	-
Electrically powered road vehicles	ISO 6469-3	-

* The system integrator is responsible for compliance of all product-specific requirements in the final application.

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6 Installation and safety instructions

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

Mounting points	-	4x Mounting holes (Ø9 mm) see fig. 8.1
Installation orientation	-	any
Cooling	-	A sufficient cooling must be ensured externally in the customer application via the mounting surface.
Connection input / output	-	see chapter 7
Interlock-function	-	realized by HV-connector plugs. Guide via signal connection plug, see chapter 7. Attention: Max. ampacity of the HV interlock line ≤ 300 mA.
Input fuse	-	No integrated input fuse. A fuse must be provided externally by the customer application.
Input discharge duration	< 5 s	Time from disconnecting the input voltage to U_{in}< 60VDC
Reverse polarity protection input	-	reverse polarity protection through connection plug
Reverse polarity protection output	< 30 VDC	Note: DVCH1503 self-protection, does not protect the application from reverse polarity.
Parallel operation for increased output power	possible	see Functional description

The general installation and safety instructions for DC/DC converters can be found at: www.deutronic.com

7 Connections

Input

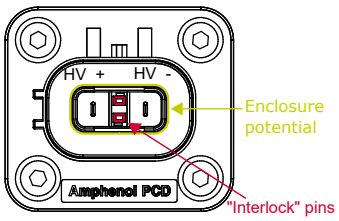

Figure 7.1: Connection input

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 (4mm², shielded single conductors)

Output

threaded bolt:

- M12 [max. torque 35Nm]

Enclosure potential

Thread:

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

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Signal (CAN)

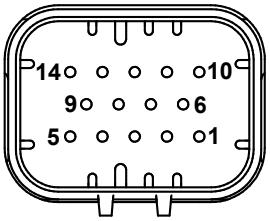

Figure 7.2: Connection CAN

TE connectivity AMPSEAL, 14-pins:

- 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: Inhibit-function* (10 - 30 VDC)
- Control of DCDC converter (output On / Off) via digital input possible

PIN ”8”: Digital Output

PIN ”9”: Digital Output: Power-Good function*
- Output of the current device status (output On / Off) possible via digital output
- At supply over KL30 the output voltage corresponds to the voltage on KL30
- If there is no supply via KL30 and high voltage is switched on, the voltage is 12V

PIN ”10”: n.C.

PIN ”11”: CAN_{Hi} (CAN High)

PIN ”12”: CAN_{LO} (CAN Low)

PIN ”13” / PIN ”14”: CAN_R
- To terminate the CAN bus with a 120Ω resistor, the CAN_R Pin ”13” must be connected to the CAN_R Pin ”14”.

PIN ”1” to PIN ”14” are galvanically isolated from the input and output circuit.
* The Inhibit and Power-Good functions can be activated via setting, further information can be found in the DC-CAN documentation.

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8 Dimensions

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

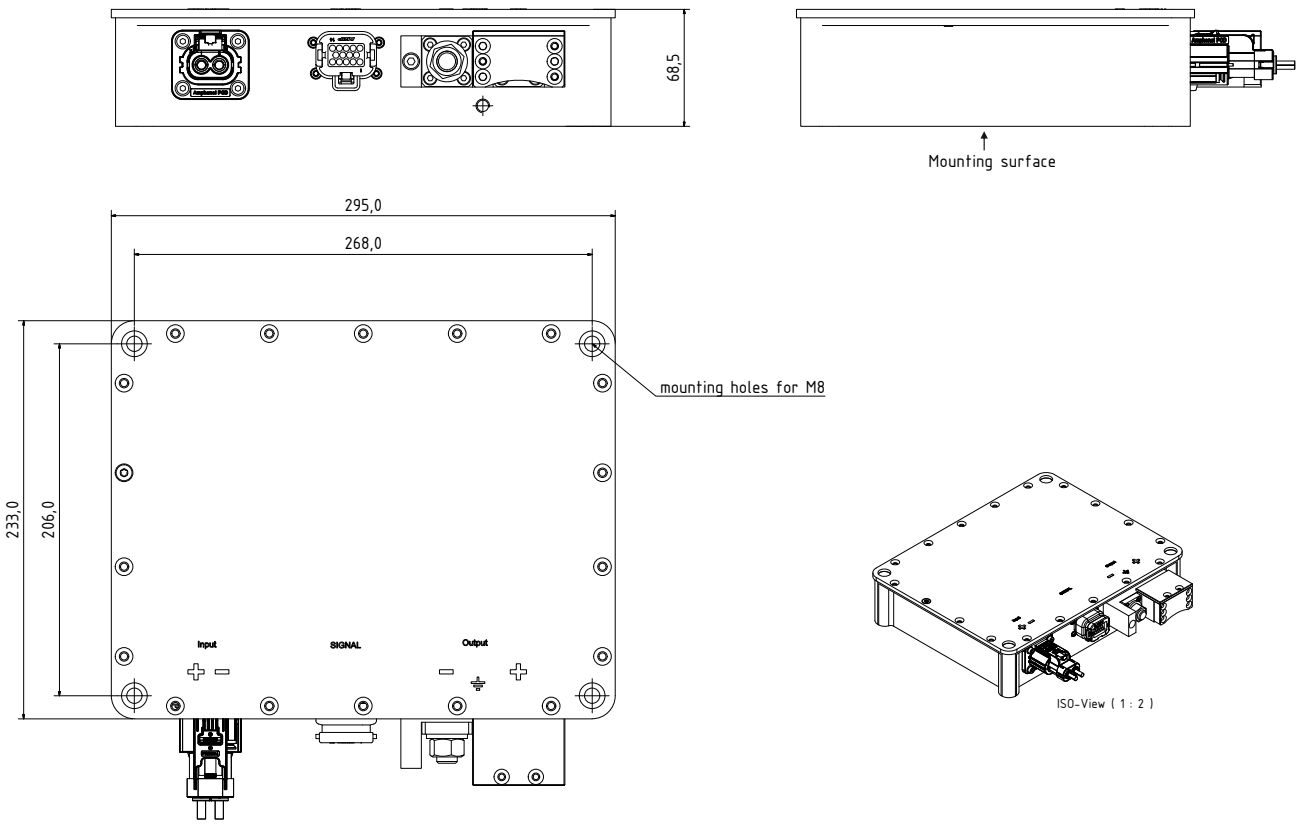

Figure 8.1: Dimensions

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9 Characteristics

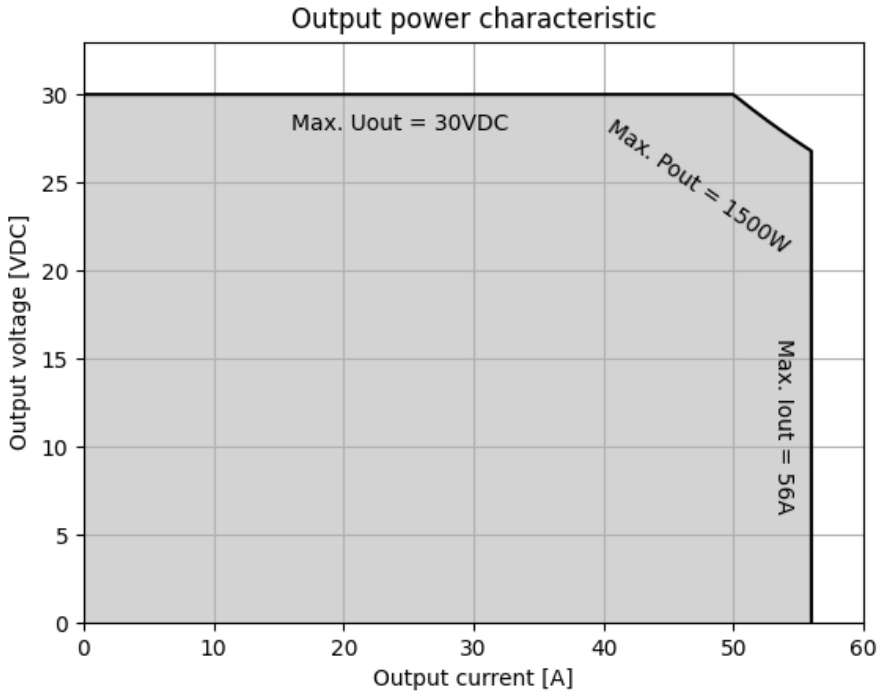

Figure 9.1: Output power DVCH1503-700-24

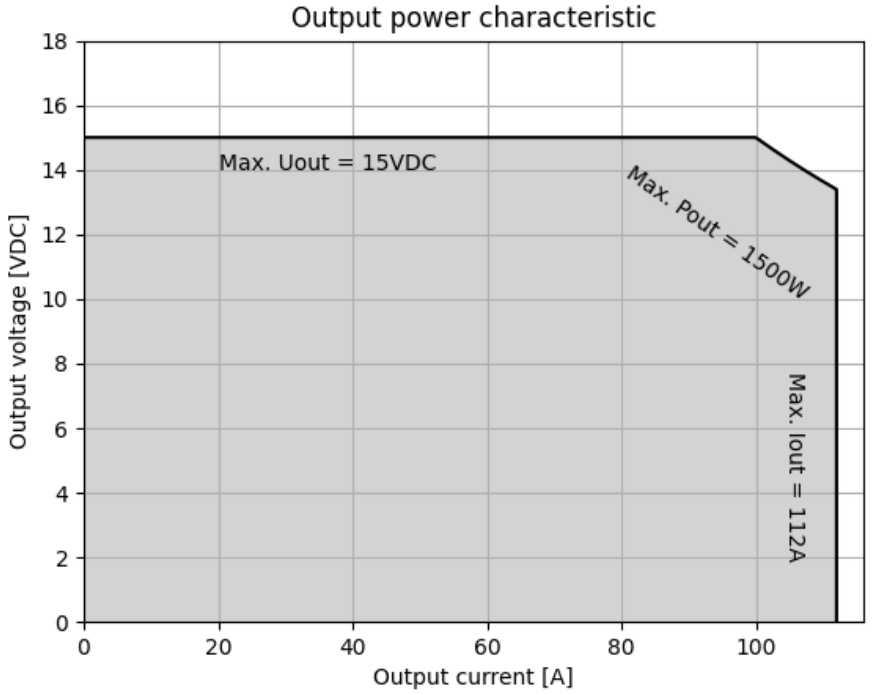

Figure 9.2: Output power DVCH1503-700-12

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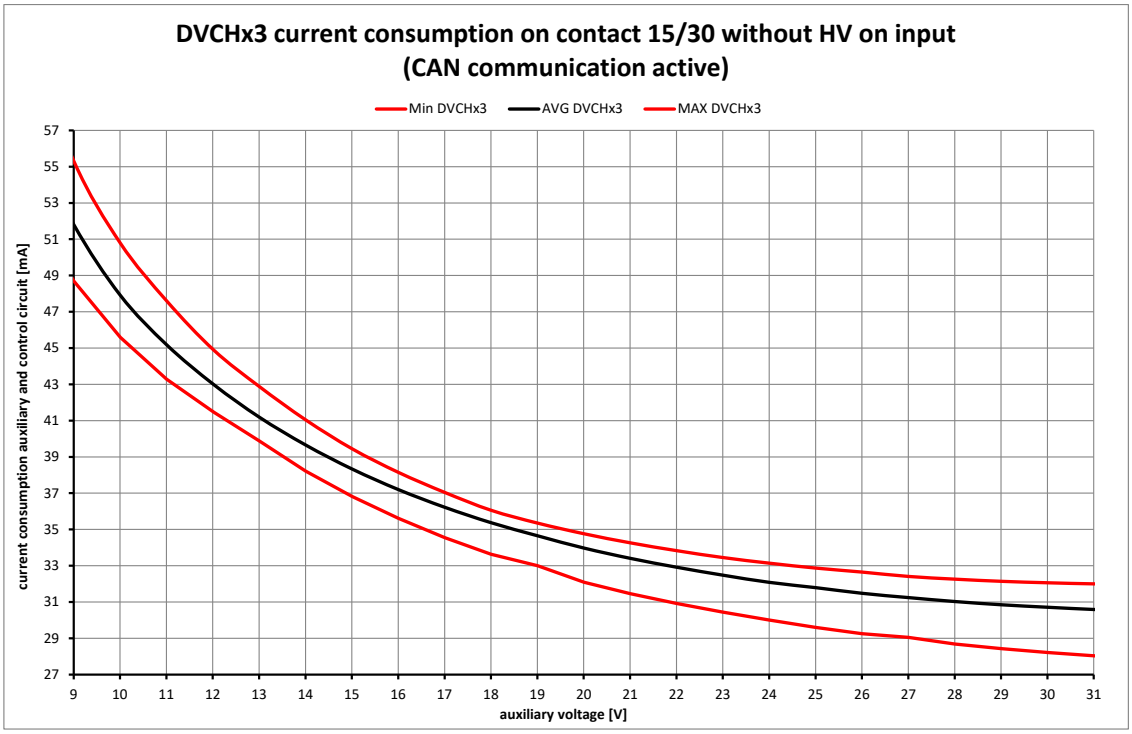

Figure 9.3: Current consumption auxiliary and control circuit