

DC/DC

DVCH

По вопросам продаж и поддержки обращайтесь:

Алматы (7273)495-231
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Россия (495)268-04-70

Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Киргизия (996)312-96-26-47

Новокузнецк (3843)20-46-81
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Симферополь (3652)67-13-56
Казахстан (7172)727-132

Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Тверь (4822)63-31-35
Томск (3822)98-41-53
Тула (4872)74-02-29
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Ярославль (4852)69-52-93

DVCH1503-400

DC/DC converter



Abbildung ähnlich / device similar to figure



DVCH1503-400-derivate table

Type	Input voltage		Output voltage (configurable)		Output current	Cat. No.
	Nom.	Range	Nom.	Adj. range	Max.	
DVCH1503-400-24	400 VDC	200 - 470 VDC	24 VDC	2 - 30 VDC	56 A	105192/x/yyyy*
DVCH1503-400-12	400 VDC	200 - 470 VDC	12 VDC	2 - 15 VDC	112 A	105193/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

1 Input

Input voltage range	-	see DVCH1503-400-derivate table (valid for continuous operation)
Undervoltage range	0 - 200 VDC	Class C*
Lower restricted operation range	200 - 250 VDC	Continuous operation, class B*
Unrestricted operation range	250 - 450 VDC	Continuous operation, class A*
Upper restricted operation range	450 - 470 VDC	Continuous operation, class B*
Overvoltage range	470 - 500 VDC	≤ 10 s, class C*
Max. current consumption	8,5A	typ. 8 A @U _{IN} = 200VDC, see fig. 9.1
Input capacity	< 8 μF	Attention: No inrush current limitation in the device. Provide a pre-charging section in the application, otherwise there is a risk of a overvoltage damage to the input of the DC/DC converter.
No-load current consumption	≤ 5mA	-

* 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.

2 Output

Output voltage U_{nom}	-	see DVCH1503-400-derivate table (valid for continuous operation)
Initial accuracy (0-20 Hz)	$\pm 1,0\% U_{nom}$	-
Ripple & Noise	$< 1,8\% U_{nom}$	measurement bandwidth 20 MHz
Max. continuous output current I_{nom}	56A 112A	DVC1503-400-24, see fig. 9.3 DVC1503-400-12
Max. continuous output power P_{nom}	$\leq 1500W$	-
Current limiting	$1,1 \times I_{nom}$	above $1,0 \times I_{nom}$ U_{out} may sink
load regulation static (0-100% P_{nom})	$< 2,0\% U_{nom}$	-
transient load change (20-80% P_{nom})	$< 12,5\% U_{nom}$	bei $\frac{dI}{dt} < 100$ A/ms, without additional capacitance or inductance, measured directly at the output sockets
Recovery time	$< 3ms$	Duration from leaving the tolerance band until the permanently return to the tolerance band after a load step.
Slew rate for setpoint change	30V/s	valid only for controllable version

3 Enviroment

Working temperature (envrioment)	-40°C ... +70°C	-
Max. permissible temperature of the mounting surface	< 50°C	-
Overtemperature protection	-	<p>Automatic shutdown in case of overtemperature with 3 thresholds:</p> <ul style="list-style-type: none"> - At 1st threshold warning signal via CAN (60°C*) - At 2nd threshold error signal via CAN (90°C*) - At 3rd threshold protective shutdown (95°C*) <p>Automatic power derating in case of overtemperature ($\geq 60^\circ\text{C}^*$)</p> <p>* internal device temperature</p>
Storage temperature	-40°C ... +85°C	-
Humidity	100%	-
Dewing	allowed	-
Shock test acc. to DIN EN 60068-2-27	-	<p>half sinusoidal (Excitation) 250m/s² (Peak acceleration) 6ms (Duration) 1.000 schocks to each axis (Quantity) ±X, ±Y, ±Z (Axis)</p>
Vibration test acc. to DIN EN 60068-2-6	-	<p>sinusoidal (Excitation) 30m/s² (acceleration) 5 - 100Hz (frequenc, floating) 5g (acceleration) 10 - 500Hz (frequenc, floating) 9h per axis (Duration), 1 Oct/min X, Y, Z (Axis)</p>
Degree of protection acc. to EN 60529	IP65, IP67, IP6K9K	Using the appropriate mating connectors; except M12 screw connection points at the output

4 General data

Insulation strenght	500 VDC 4,25 kVDC	Output / Enclosure Input / Output + Enclosure + CAN
Insulation resistance	$\geq 30 \text{ M}\Omega$ at 500 VDC	Input / Output + Enclosure + CAN
Max. Efficiency	typ. 94% @ $U_{IN}=400\text{VDC}$	see fig. 9.2
Average efficiency	typ. 93,2% @ $U_{IN}=400\text{VDC}$	Averaging of the efficiency values at 25%, 50%, 75% und 100% of the nominal output power. see fig. 9.2
Current consumption auxiliary and control circuit	$\leq 51 \text{ mA}$	Current consumption pin 3 (KL15) / pin 4 (KL30) without HV voltage applied to input with active communication via CAN siehe fig. 9.4
Dimensions (LxWxH)	ca. (295 x 233 x 68,5) mm	without connections, see fig. 8.1
Enclosure	Aluminium	-
Weight	< 5 kg	-

5 Standards

EMC (Electromagnetic Compatibility)

Bezeichnung	Norm	Werte
Emitted interference	ECE R10.5 EN12895 EN 61204-3	- - acc. to 6.4.2, table H.3, for industrial enviroment (class A, cable length < 3 m)
Immunity	ECE R10.5 EN12895 EN 61204-3	- - acc. to 7.2.3, Noise immunity level for industrial enviroment (cable length < 3 m)

Electrical safety

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

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
Connection input / output	-	see chapter 7
Interlock-function	-	realized by HV-connector plugs. Guide via signal connection plug, see chapter 7.
Input fuse	-	No integrated input fuse. A fuse must be provided externally by the customer application.
Input discharge duration	< 5s	Time from disconnecting the input voltage to $U_{in} < 60VDC$
Reverse polarity protection input	-	reverse polarity protection through connection plug
Reverse polarity protection output	< 30VDC	Note: DVCH1503 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

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 (4mm², 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.

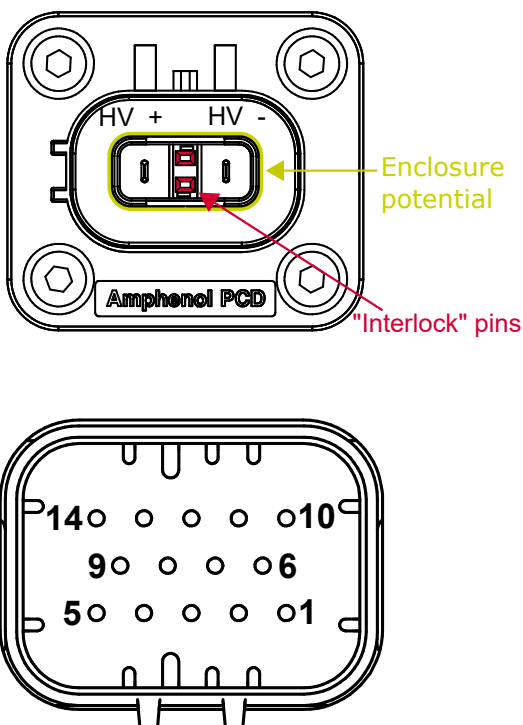
PIN "11": CAN_{Hi} (CAN High)

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.



8 Dimensions

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

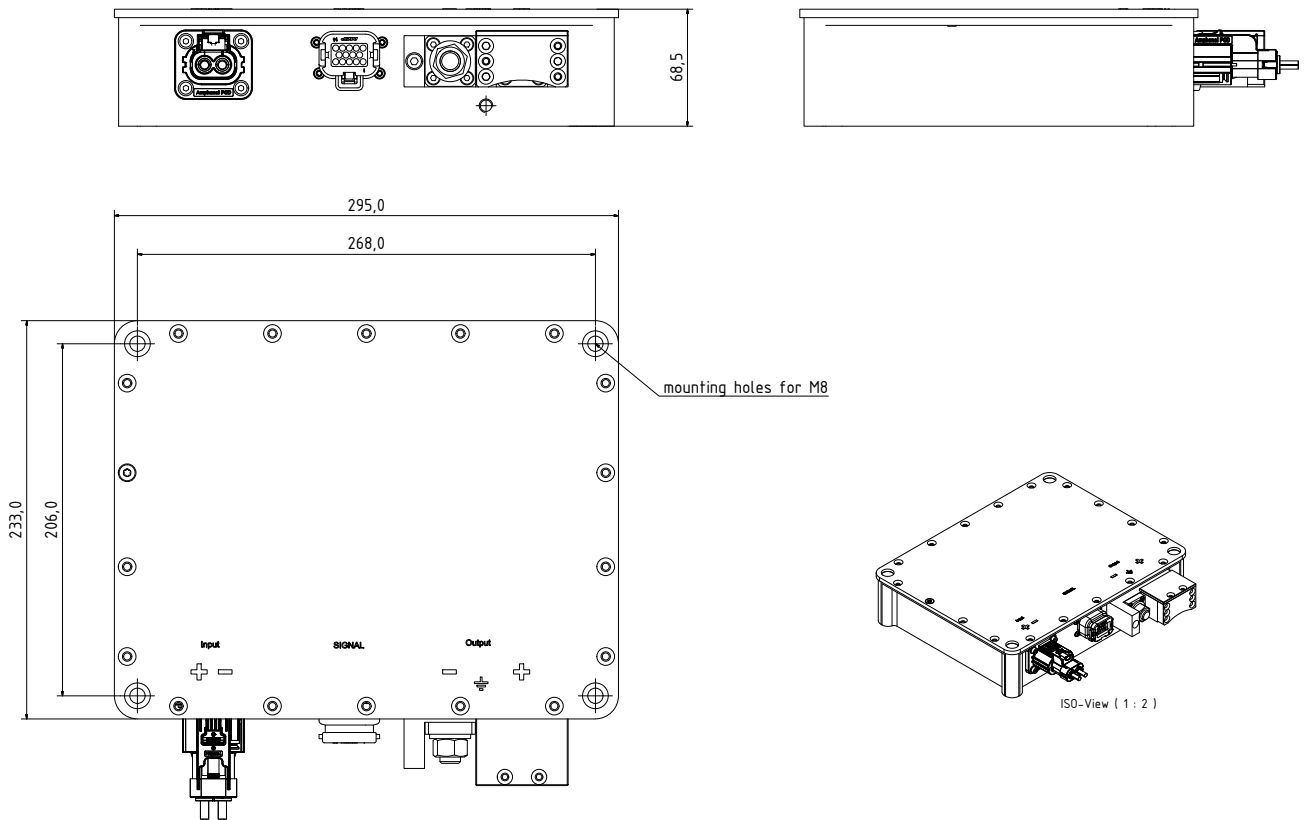


Figure 8.1: Dimensions

9 Characteristics

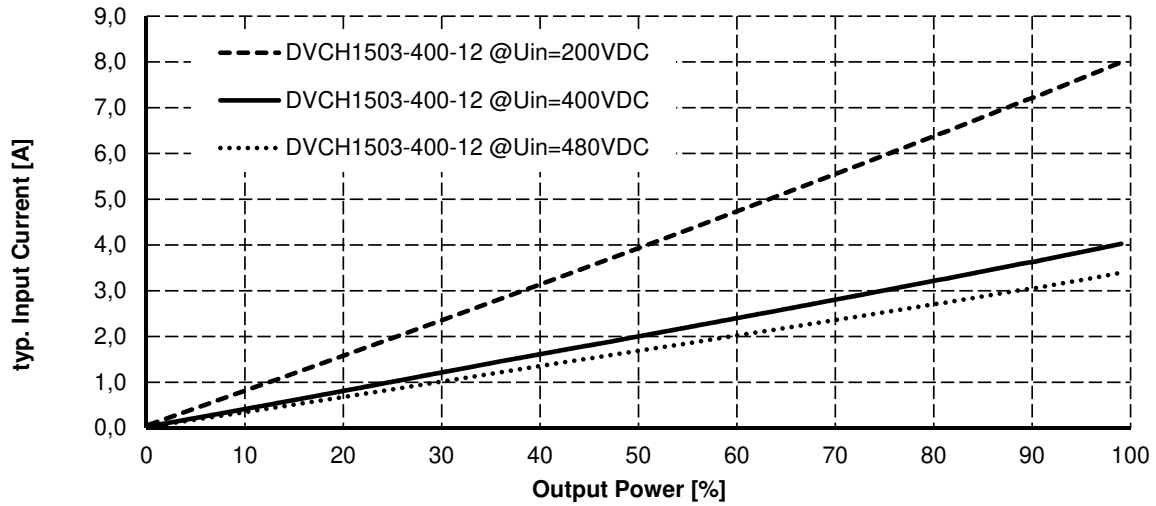


Figure 9.1: Current consumption depending on the output power

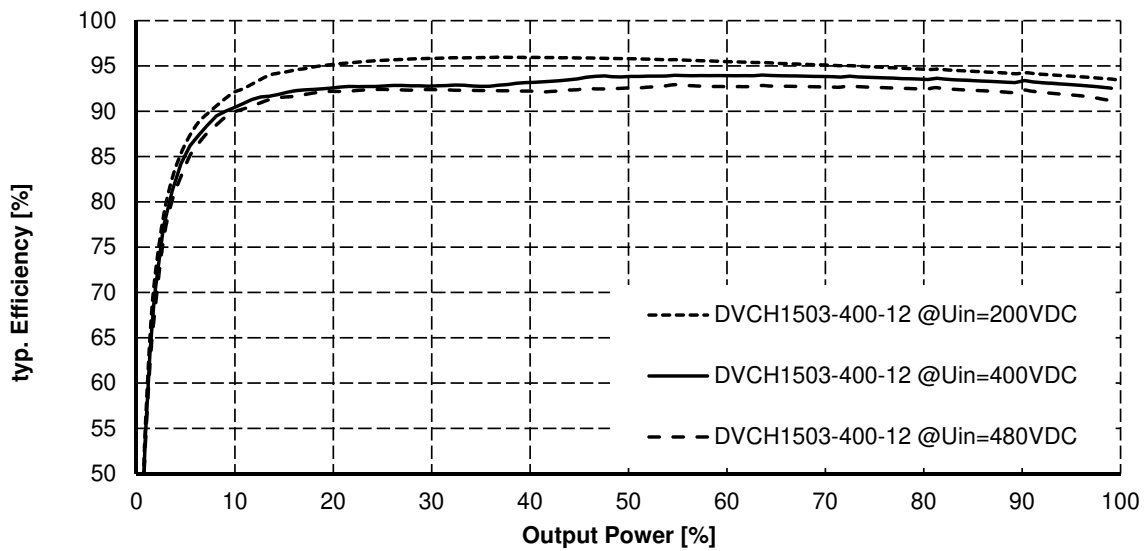


Figure 9.2: Efficiency as a function of output power

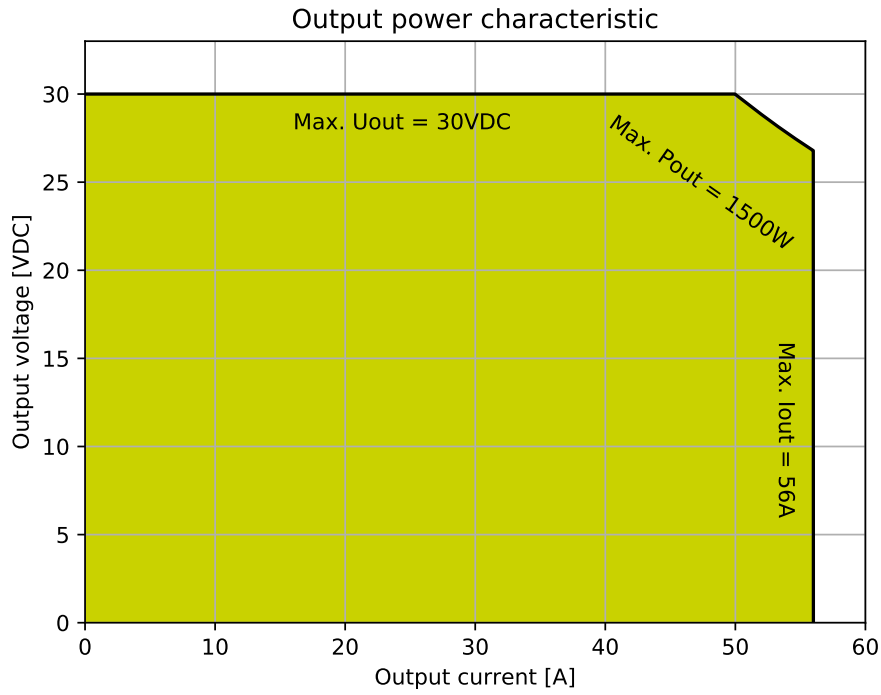


Figure 9.3: Output power

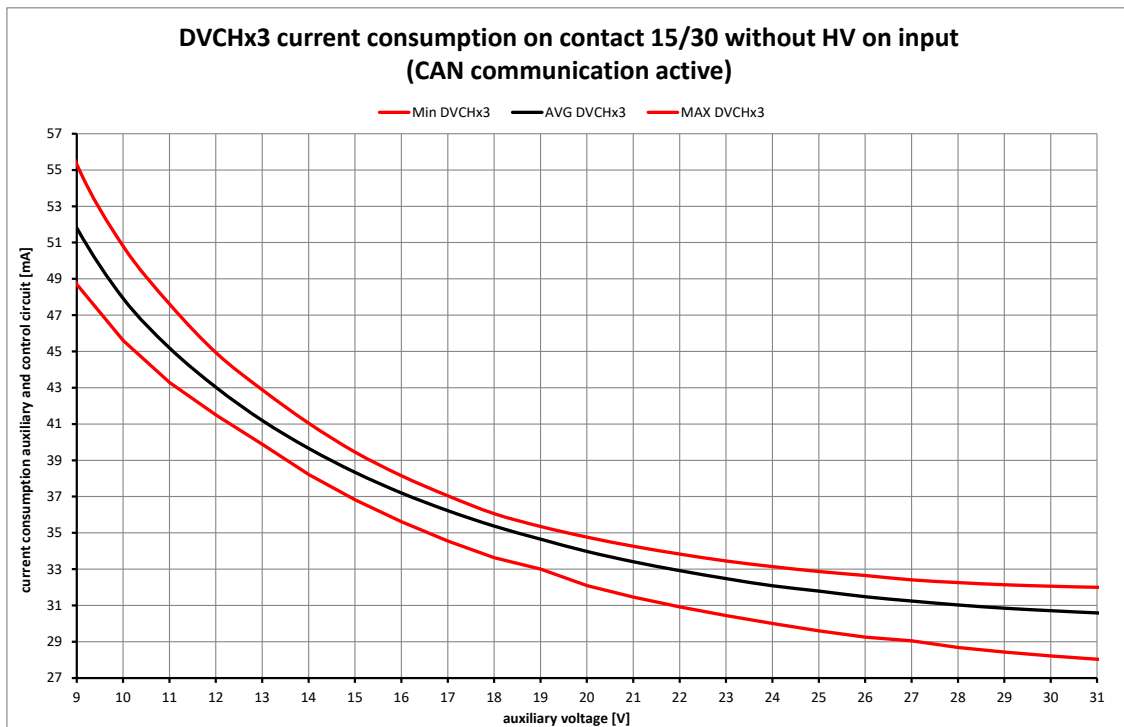


Figure 9.4: Current consumption auxiliary and control circuit

DVCH1503-700

DC/DC converter



Abbildung ähnlich / device similar to figure



DVCH1503-700-derivate table

Type	Input voltage		Output voltage (configurable)		Output current	Cat. No.
	Nom.	Range	Nom.	adj. range	Max.	
DVCH1503-700-24	700 VDC	400 - 900 VDC	24 VDC	2 - 30 VDC	56 A	105194/x/yyyy*
DVCH1503-700-12	700 VDC	400 - 900 VDC	12 VDC	2 - 15 VDC	112 A	105195/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

1 Input

Input voltage range	-	see DVCH1503-700-derivate table (valid for continuous operation)
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*
Max. current consumption	< 5 A	-
Input capacity	< 8,5 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.

2 Output

Output voltage U_{nom}	-	see DVCH1503-700-derivate table (valid for continuous operation)
Max. continuous output current I_{nom}	56A 112A	-
Max. continuous output power P_{nom}	$\leq 1500W$	-
Current limiting	$1,1 \times I_{nom}$	above $1,0 \times I_{nom}$ 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	30V/s	valid only for controllable version

3 Enviroment

Working temperature (envrioment)	-40°C ... +70°C	-
Max. permissible temperature of the mounting surface	< 50°C	-
Overttemperature protection	-	<p>Automatic shutdown in case of overtemperature with 3 thresholds:</p> <ul style="list-style-type: none"> - At 1st threshold warning signal via CAN (70°C*) - At 2nd threshold error signal via CAN (90°C*) - At 3rd threshold protective shutdown (95°C*) <p>Automatic power derating in case of overtemperature ($\geq 70^\circ\text{C}^*$)</p> <p>* internal device temperature</p>
Storage temperature	-40°C ... +85°C	-
Humidity	100%	-
Dewing	allowed	-
Shock test acc. to DIN EN 60068-2-27	-	<p>half sinusoidal (Excitation) 250m/s² (Peak acceleration) 6ms (Duration) 1.000 schocks to each axis (Quantity) ±X, ±Y, ±Z (Axis)</p>
Vibration test acc. to DIN EN 60068-2-6	-	<p>sinusoidal (Excitation) 30m/s² (acceleration) 5 - 100Hz (frequenc, floating) 5g (acceleration) 10 - 500Hz (frequenc, floating) 9h per axis (Duration), 1 Oct/min X, Y, Z (Axis)</p>
Degree of protection acc. to EN 60529	IP65, IP67, IP6K9K	Using the appropriate mating connectors; except M12 screw connection points at the output

4 General data

Insulation strenght	500 VDC 4,25 kVDC	Output / Enclosure Input / Output + Enclosure + CAN
Insulation resistance	≥ 30 MΩ at 500 VDC	Input / Output + Enclosure + CAN
Max. Efficiency	94%	-
Average efficiency	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 siehe fig. 9.2
Dimensions (LxWxH)	ca. (295 x 233 x 68,5) mm	without connections, see fig. 8.1
Enclosure	Aluminium	-
Weight	< 5 kg	-

5 Standards

EMC (Electromagnetic Compatibility)

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

Electrical safety

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

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
Connection input / output	-	see chapter 7
Interlock-function	-	realized by HV-connector plugs. Guide via signal connection plug, see chapter 7.
Input fuse	-	No integrated input fuse. A fuse must be provided externally by the customer application.
Reverse polarity protection input	-	reverse polarity protection through connection plug
Reverse polarity protection output	< 30VDC	Note: DVCH1503 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

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 (4mm², 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.

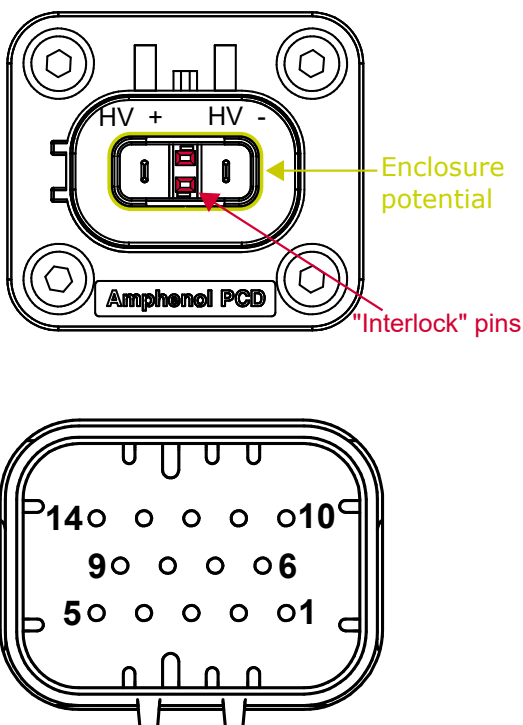
PIN "11": CAN_{Hi} (CAN High)

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.



8 Dimensions

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

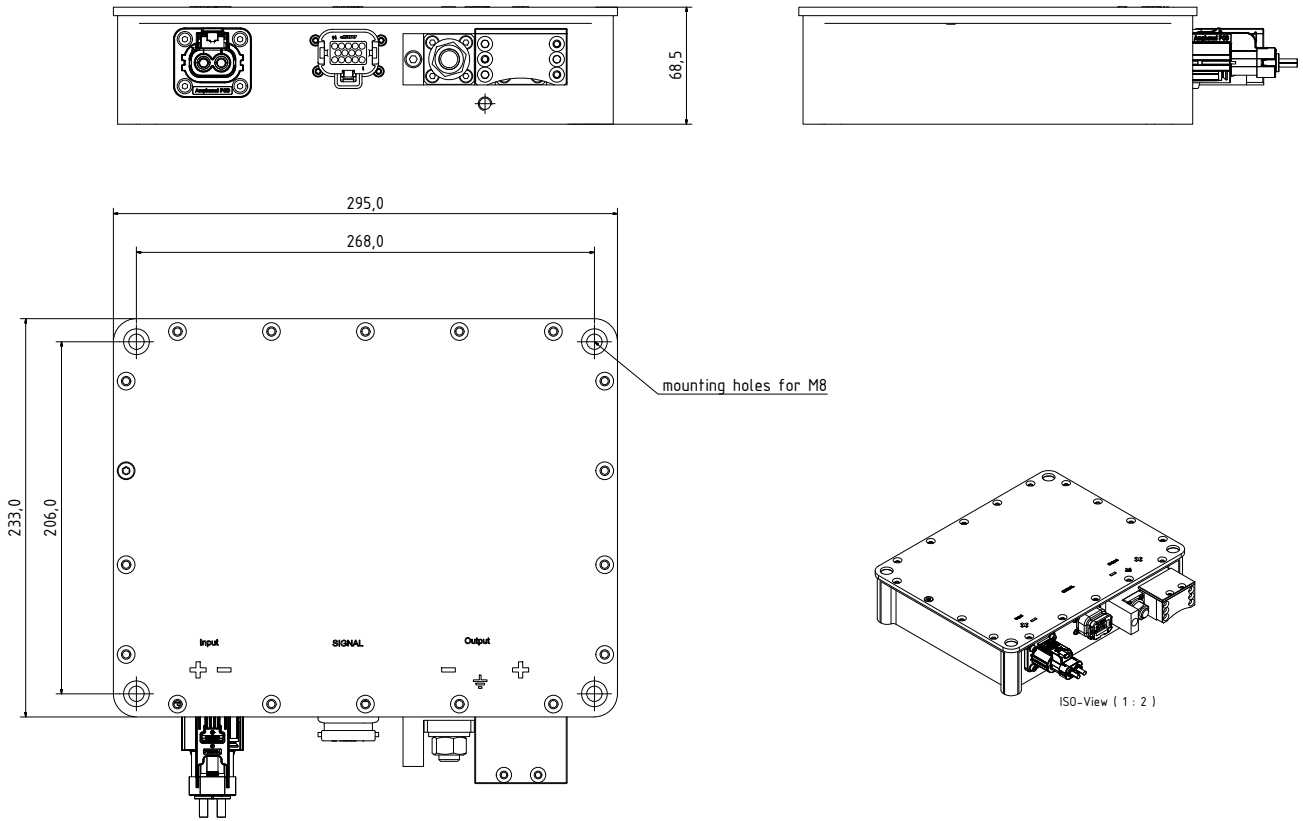


Figure 8.1: Dimensions

9 Characteristics

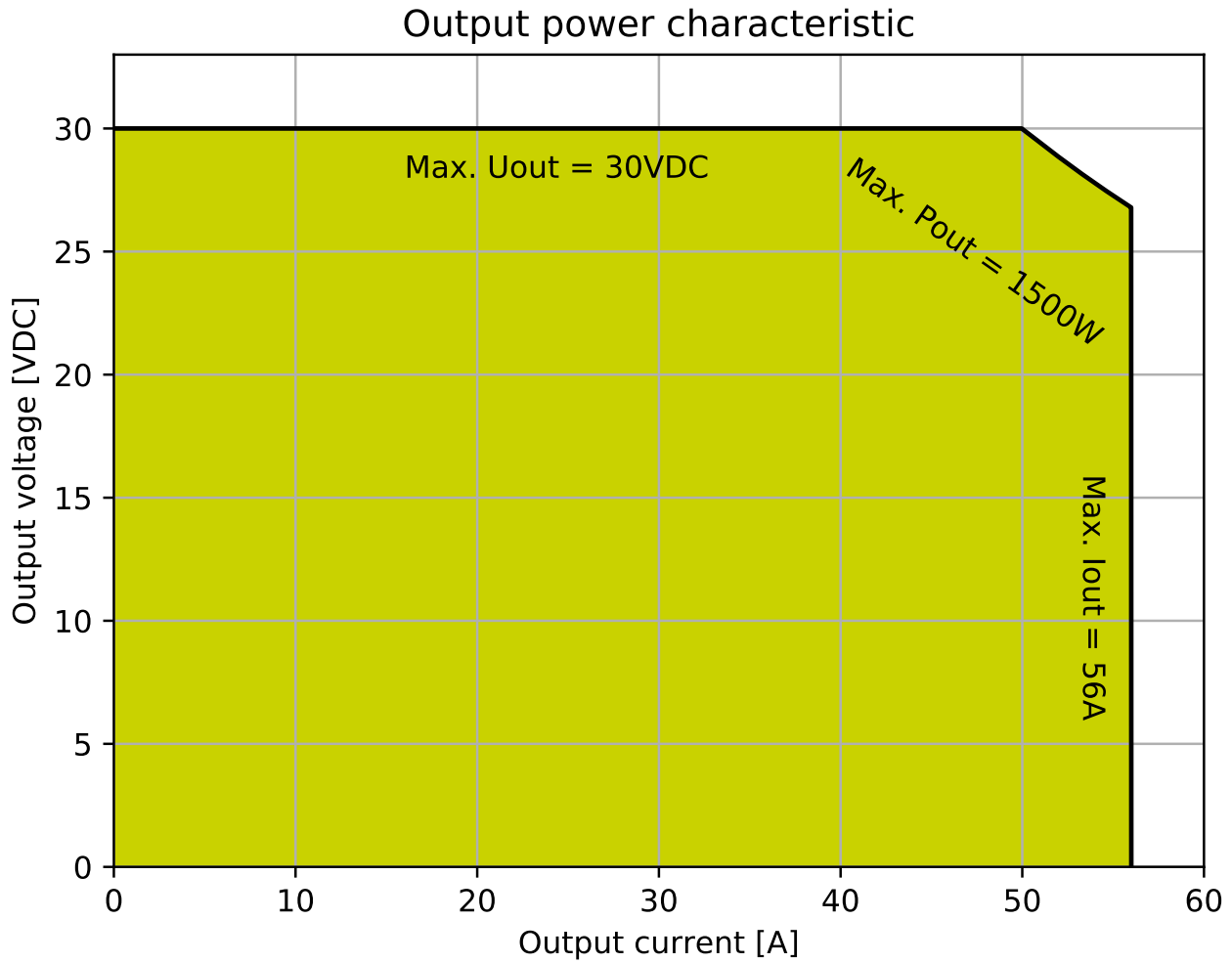


Figure 9.1: Output power

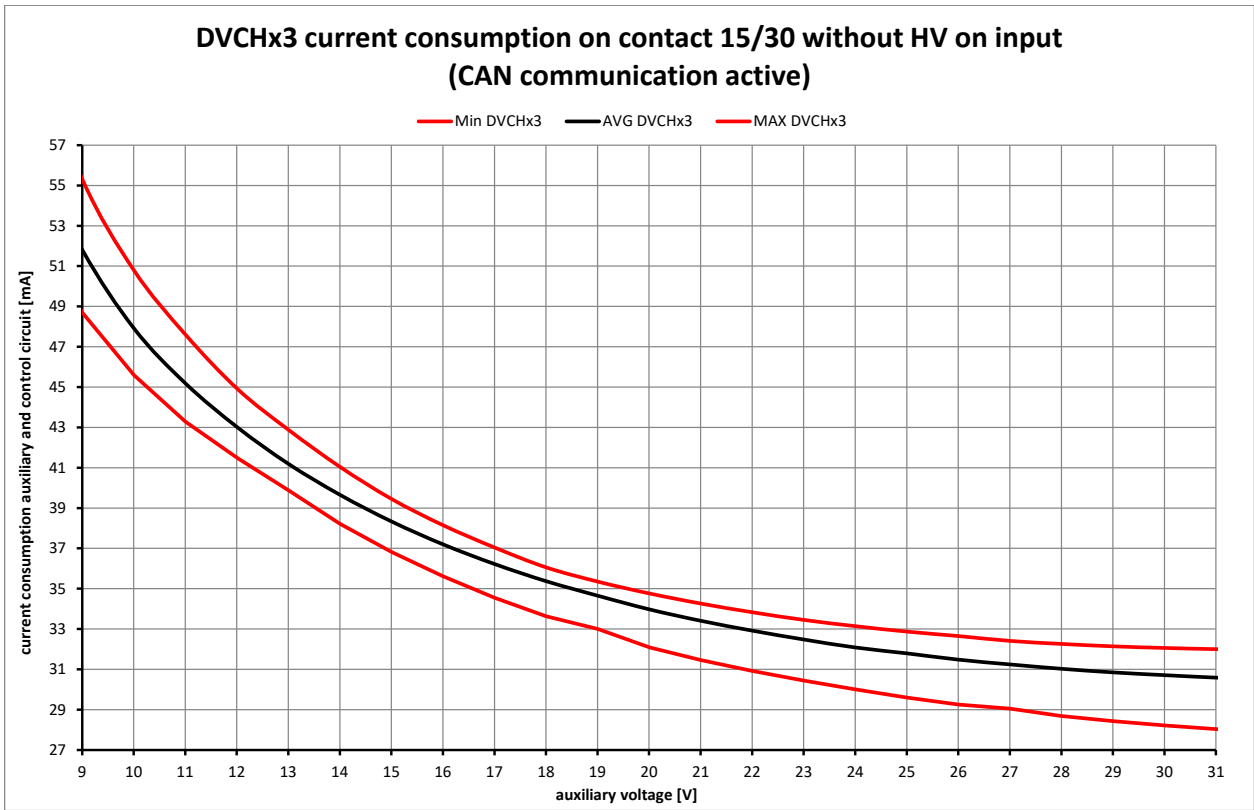


Figure 9.2: Current consumption auxiliary and control circuit

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

1 Input

Input voltage range	-	see DVCH3003-400-derivate table (valid for continuous operation)
Undervoltage range	0 - 200 VDC	Class C*
Lower restricted operation range	200 - 250 VDC	Continuous operation, class B*
Unrestricted operation range	250 - 450 VDC	Continuous operation, class A*
Upper restricted operation range	450 - 470 VDC	Continuous operation, class B*
Overvoltage range	470 - 500 VDC	≤ 10 s, class C*
Max. current consumption	≤ 16 A	-
Input capacity	< 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.

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.

2 Output

Output voltage U_{nom}	-	see DVCH3003-400-derivate table (valid for continuous operation)
Initial accuracy (0 - 20 Hz)	$\pm 1\% U_{nom}$	-
Ripple & Noise	< 500 mVpp	Measuring bandwidth 20 MHz
Max. continuous output current I_{nom}	56A 112A 224A	DVCH3003-400-48 DVCH3003-400-24, see fig. 9.1 DVCH3003-400-12
Max. continuous output power P_{nom}	$\leq 3000W$	-
Current limiting	$1,1 \times I_{nom}$	above $1,0 \times I_{nom}$ 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	30V/s	valid only for controllable version

3 Enviroment

Working temperature (envrioment)	-40°C ... +70°C	-
Max. permissible temperature of the mounting surface	< 50°C	-
Overttemperature protection	-	<p>Automatic shutdown in case of overtemperature with 3 thresholds:</p> <ul style="list-style-type: none"> - At 1st threshold warning signal via CAN (60°C*) - At 2nd threshold error signal via CAN (90°C*) - At 3nd threshold protective shutdown (95°C*) <p>Automatic power derating in case of overtemperature (≥60°C*)</p> <p>* internal device temperature</p>
Storage temperature	-40°C ... +85°C	-
Humidity	100%	-
Dewing	allowed	-
Shock test acc. to DIN EN 60068-2-27	-	<p>half sinusoidal (Excitation) 250m/s² (Peak acceleration) 6ms (Duration) 1.000 schocks to each axis (Quantity) ±X, ±Y, ±Z (Axis)</p>
Vibration test acc. to DIN EN 60068-2-6	-	<p>sinusoidal (Excitation) 30m/s² (acceleration) 5 - 100Hz (frequenc, floating) 5g (acceleration) 10 - 500Hz (frequenc, floating) 9h per axis (Duration), 1 Oct/min X, Y, Z (Axis)</p>
Degree of protection acc. to EN 60529	IP65, IP67, IP6K9K	Using the appropriate mating connectors; except M12 screw connection points at the output

4 General data

Insulation strenght	500 VDC 4,25 kVDC	Output / Enclosure Input / Output + Enclosure + CAN
Insulation resistance	≥ 30 MΩ at 500 VDC	Input / Output + Enclosure + CAN
Max. Efficiency	95%	-
Average efficiency	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 siehe fig. 9.2
Dimensions (LxWxH)	ca. (295 x 233 x 68,5) mm	without connections, see fig. 8.1
Enclosure	Aluminium	-
Weight	< 5 kg	-

5 Standards

EMC (Electromagnetic Compatibility)

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

Electrical safety

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

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
Connection input / output	-	see chapter 7
Interlock-function	-	realized by HV-connector plugs. Guide via signal connection plug, see chapter 7.
Input fuse	-	No integrated input fuse. A fuse must be provided externally by the customer application.
Input discharge duration	< 5s	Time from disconnecting the input voltage to $U_{in} < 60VDC$
Reverse polarity protection input	-	reverse polarity protection through connection plug
Reverse polarity protection output	< 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

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 (4mm², 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.

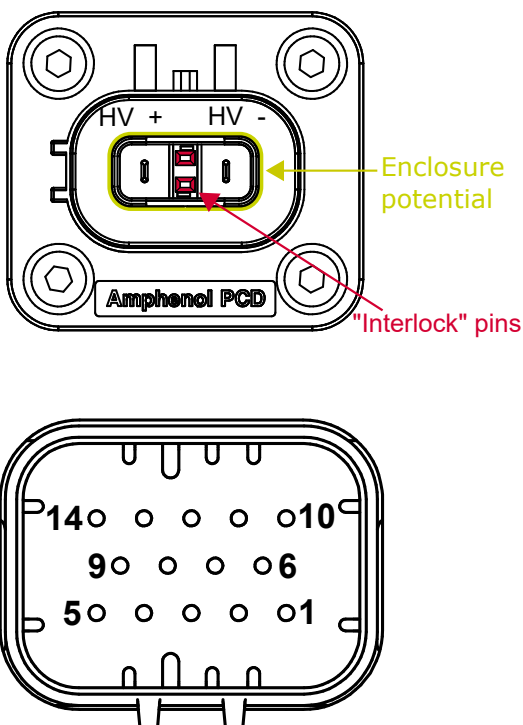
PIN "11": CAN_{Hi} (CAN High)

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.



8 Dimensions

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

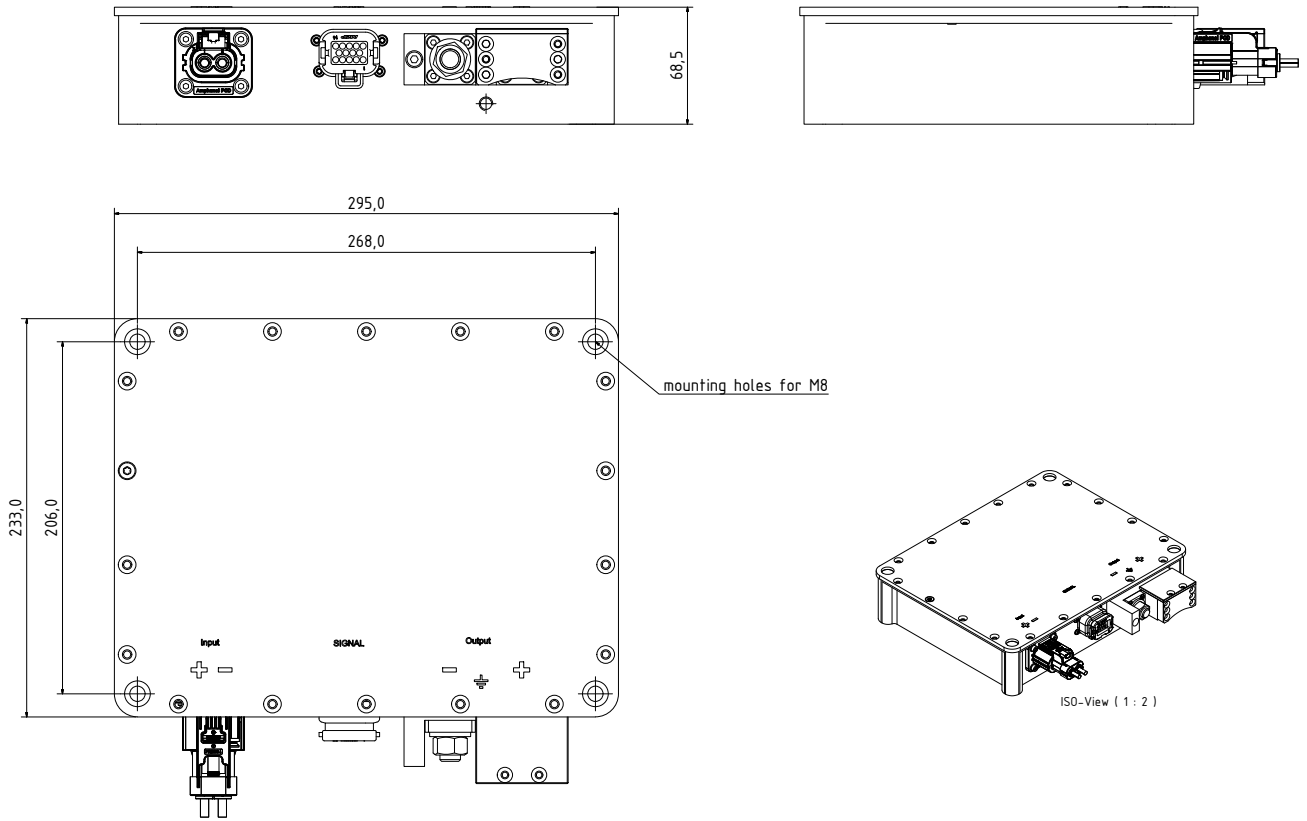


Figure 8.1: Dimensions

9 Characteristics

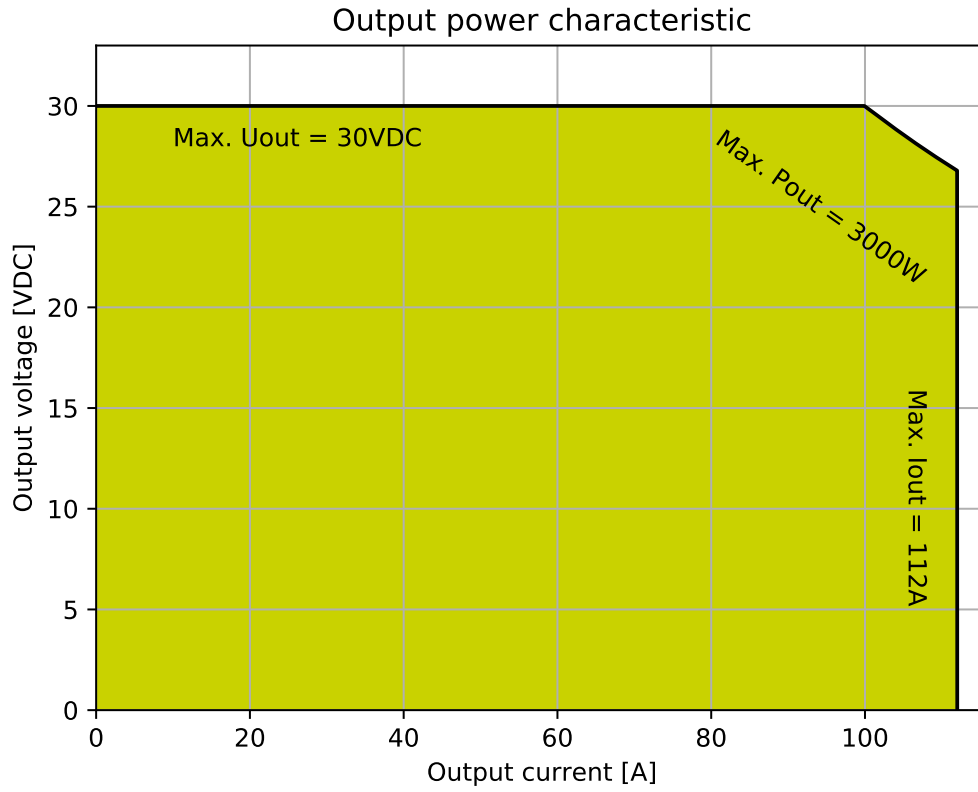


Figure 9.1: Output power

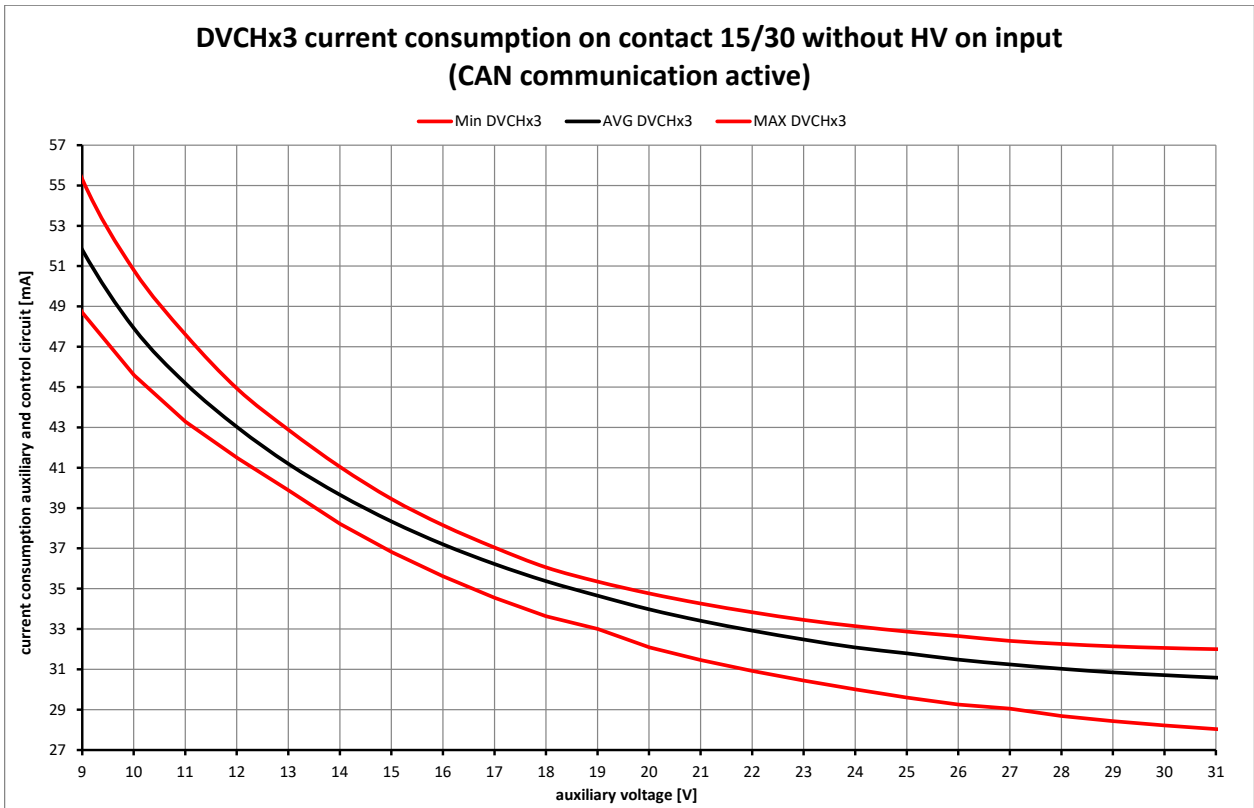


Figure 9.2: Current consumption auxiliary and control circuit

DVCH3003-700

DC/DC converter



Abbildung ähnlich / device similar to figure



DVCH3003-700-derivate table

Type	Input voltage		Output voltage (configurable)		Output current	Cat. No.
	Nom.	Range	Nom.	adj. range	Max.	
DVCH3003-700-24	700 VDC	400 - 900 VDC	24 VDC	2 - 30 VDC	112 A	105198/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

1 Input

Input voltage range	-	see DVCH3003-700-derivate table (valid for continuous operation)
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*
Max. current consumption	8 A	-
Input capacity	<11 μ F	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.

2 Output

Output voltage U_{nom}	-	see DVCH3003-700-derivate table (valid for continuous operation)
Initial accuracy (0 - 20 Hz)	$\pm 1\% U_{nom}$	-
Ripple & Noise	< 400 mVpp	measurement bandwidth 20 MHz
Max. continuous output current I_{nom}	112A	-
Max. continuous output power P_{nom}	$\leq 3000W$	-
Current limiting	$1,1 \times I_{nom}$	above $1,0 \times I_{nom}$ 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	30V/s	valid only for controllable version

3 Enviroment

Working temperature (envrioment)	-40°C ... +70°C	-
Max. permissible temperature of the mounting surface	< 50°C	-
Overtemperature protection	-	<p>Automatic shutdown in case of overtemperature with 3 thresholds:</p> <ul style="list-style-type: none"> - At 1st threshold warning signal via CAN (70°C*) - At 2nd threshold error signal via CAN (90°C*) - At 3rd threshold protective shutdown (95°C*) <p>Automatic power derating in case of overtemperature ($\geq 70^\circ\text{C}^*$)</p> <p>* internal device temperature</p>
Storage temperature	-40°C ... +85°C	-
Humidity	100%	-
Dewing	allowed	-
Shock test acc. to DIN EN 60068-2-27	-	<p>half sinusoidal (Excitation) 250m/s² (Peak acceleration) 6ms (Duration) 1.000 schocks to each axis (Quantity) $\pm X, \pm Y, \pm Z$ (Axis)</p>
Vibration test acc. to DIN EN 60068-2-6	-	<p>sinusoidal (Excitation) 30m/s² (acceleration) 5 - 100Hz (frequenc, floating) 5g (acceleration) 10 - 500Hz (frequenc, floating) 9h per axis (Duration), 1 Oct/min X, Y, Z (Axis)</p>
Degree of protection acc. to EN 60529	IP65, IP67, IP6K9K	Using the appropriate mating connectors; except M12 screw connection points at the output

4 General data

Insulation strenght	500 VDC 4,25 kVDC	Output / Enclosure Input / Output + Enclosure + CAN
Insulation resistance	≥ 30 MΩ at 500 VDC	Input / Output + Enclosure + CAN
Max. Efficiency	95%	-
Average efficiency	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 siehe fig. 9.2
Dimensions (LxWxH)	ca. (295 x 233 x 68,5) mm	without connections, see fig. 8.1
Enclosure	Aluminium	-
Weight	< 5 kg	-

5 Standards

EMC (Electromagnetic Compatibility)

Bezeichnung	Norm	Werte
Emitted interference	ECE R10.5 EN12895 EN 61204-3	- - acc. to 6.4.2, table H.3, for industrial enviroment (class A, cable length < 3 m)
Immunity	ECE R10.5 EN12895 EN 61204-3	- - acc. to 7.2.3, Noise immunity level for industrial enviroment (cable length < 3 m)

Electrical safety

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

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
Connection input / output	-	see chapter 7
Interlock-function	-	realized by HV-connector plugs. Guide via signal connection plug, see chapter 7.
Input fuse	-	No integrated input fuse. A fuse must be provided externally by the customer application.
Input discharge duration	< 5s	Time from disconnecting the input voltage to $U_{in} < 60VDC$
Reverse polarity protection input	-	reverse polarity protection through connection plug
Reverse polarity protection output	< 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

7 Connections

Inout

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)

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.

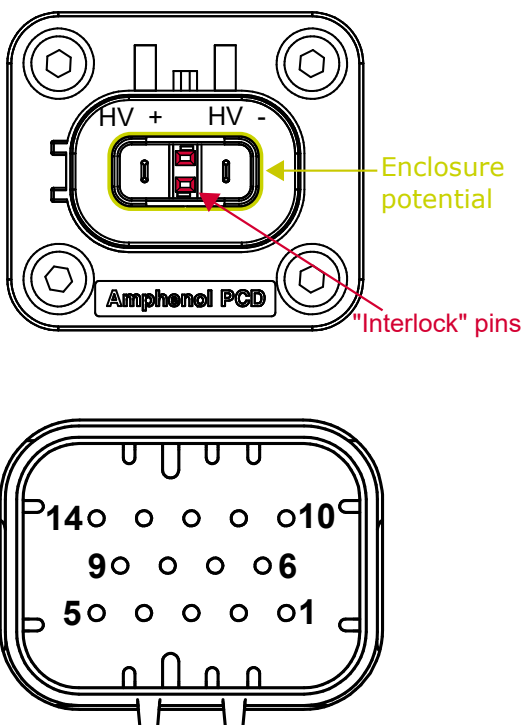
PIN "11": CAN_{Hi} (CAN High)

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.



8 Dimensions

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

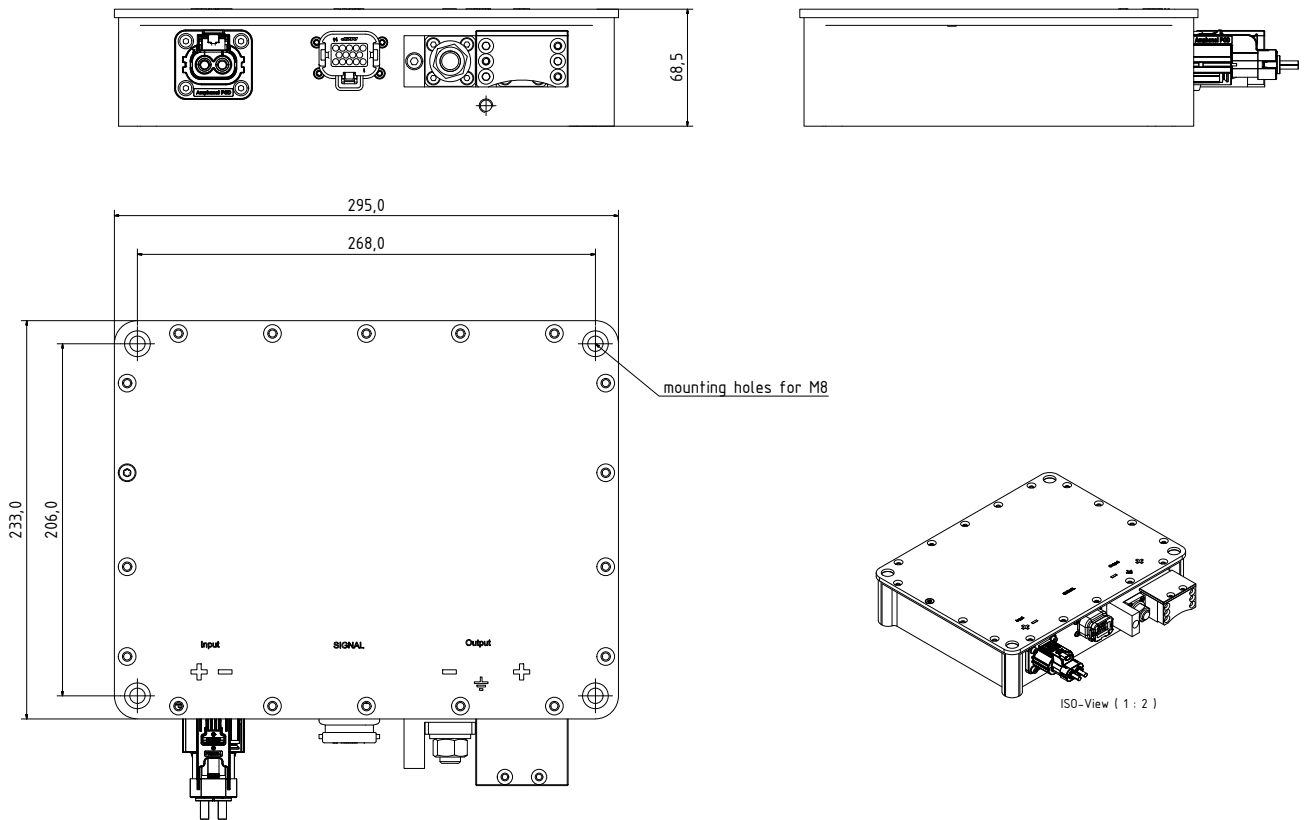


Figure 8.1: Dimensions

9 Characteristics

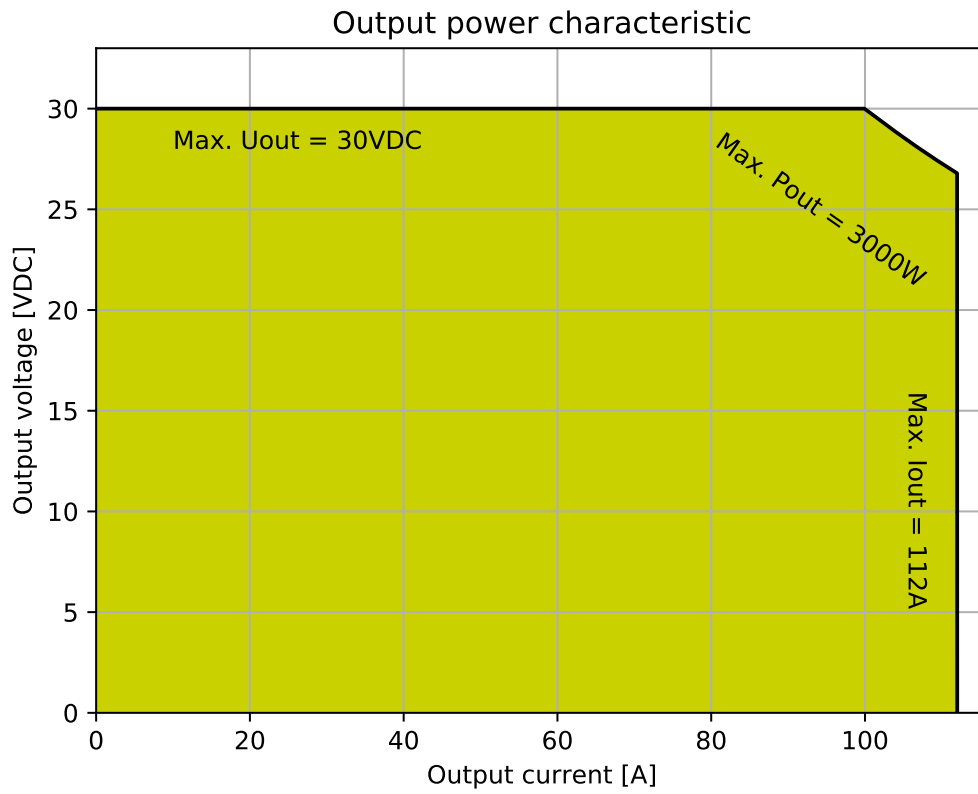


Figure 9.1: Output power

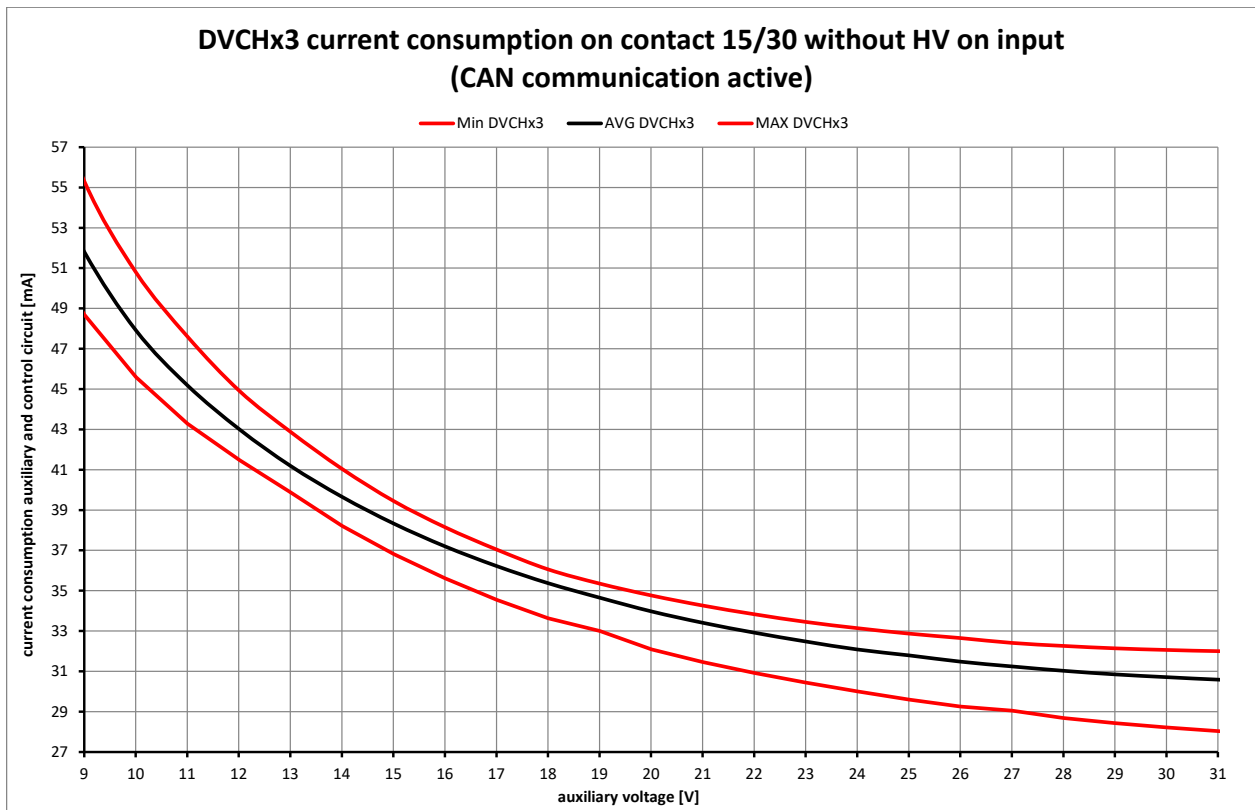


Figure 9.2: Current consumption auxiliary and control circuit

DVCH3000

DC/DC converter



- 400VDC - 800 VDC input voltage range
- Power range up to 3000 W
- High efficiency – typ. 95%
- Short-circuit, no load and over temperature protection
- IP-protection class IP65, IP67, IP6K9K
- Galvanical isolated switching regulator
- HV-Interlock

Abbildung ähnlich / device similar to figure



DVCH3000-Derivattabelle

Type	Input voltage		Output voltage	Output current	Cat. No.
	Nom.	Tol.	Nom.	Max.	
DVCH3000-555-13.8	555 VDC	400- 800 VDC	13,8 VDC	216 A	101344
DVCH3000-555-28	555 VDC	400- 800 VDC	28 VDC	108 A	101345
DVCH3000-555-55.2	555 VDC	400- 800 VDC	55,2 VDC	54 A	101349

Extended input voltage range, other output voltages, auxiliary voltage outputs and temperature signal on request

1 Input

Input voltage range	-	see DVCH3000-Derivattabelle (valid for continuous operation)
Max. current consumption	tbd	-
Input capacity	$\leq 7,5 \mu\text{F}$	Attention: No inrush current limitation in the device. Recommendation: Provide pre-charging section in the application.
No-load power	< 10 W approx. 3 W	Active without output load device in <i>shut-down</i> mode

2 Output

Output voltage U_{nom}	-	see DVCH3000-Derivattabelle (valid for continuous operation)
Initial accuracy	$\pm 1 \%$	-
Max. continuous output current I_{nom}	-	see DVCH3000-Derivattabelle (valid for continuous operation)
Max. continuous output power P_{nom}	$\leq 3000\text{W}$	-
Current limiting	$1,1 \times I_{\text{nom}}$	above $1,0 \times I_{\text{nom}}$ U_{out} may sink
Ripple & Noise	< 400 mVpp	measurement bandwidth 20 MHz
Leakage current	< 1 mA	Battery discharge current (primary side not supplied)

3 Enviroment

Working temperature (envrioment)	-40°C ... +85°C	-
Max. permissible temperature of the mounting surface	< +70°C	-
Overtemperature protection	-	Automatic latching shutdown in case of overtemperature. To Reset the input must be in a de-energized state. On request: Automatic power derating in case of overtemperature.
Storage temperature	-40°C ... +85°C	-
Humidity	100%	-
Dewing	allowed	-
Shock test acc. to DIN EN 60068-2-27	-	half sinusoidal (Excitation) 30m/s ² (Peak acceleration) 6ms (Duration) 1.000 schocks to each axis (Quantity) $\pm X, \pm Y, \pm Z$ (Axis)

Vibration test acc. to DIN EN 60068-2-6	-	sinusoidal (Excitation) 5g (acceleration) 5 - 100Hz (frequenc, floating) 5g (acceleration) 10 - 2000Hz (frequenc, floating) 3h 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 M10 / M12 screw connection points at the output

4 General data

Insulation strenght	3 kVDC	Input / Output + Enclosure
Efficiency	typ. 95 %	-
Dimensions	-	see fig. 8.1
Enclosure	Aluminium	-
Weight	approx. 5,5 kg	-

5 Standards

EMC (Electromagnetic Compatibility)

Bezeichnung	Norm	Werte
Emitted interference	EN61204-3	according to 6.4.2, Table H.3, for residential, commercial and light industrial environments (Class B, cable length < 10 m, internal frequencies < 108 MHz)
Immunity	EN61204-3	according to 7.2.3: Immunity level for industrial environment (cable length < 10 m)

Electrical safety

Title	Standard	Data
Safety of industrial trucks - Electrical requirements	DIN EN 1175	-

6 Installation and safety instructions

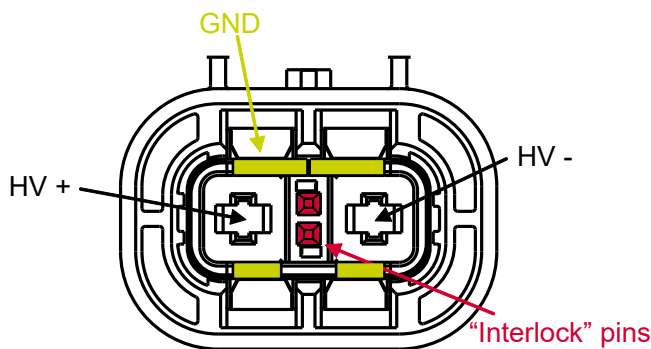
In addition to the general installation and safety instructions for DC/DC converters, the following values and supplements apply:

Mounting points	-	4x Mounting holes (Ø9 mm) see fig. 8.1
Installation orientation	-	any
Connection input / output	-	see chapter 7
Interlock-function	-	realized by HV-connector plugs. see chapter 7.
Input fuse	-	No integrated input fuse. A fuse must be provided externally by the customer application.
Reverse polarity protection input	-	reverse polarity protection through connection plug (No reverse polarity protection is integrated on the module)

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

7 Connections

Input	<p><u>TE Connectivity HVA280:</u></p> <ul style="list-style-type: none"> • 2-pole HV-Connector with interlock-contacts. • Pre-assembled cables with 2 m (Cat. No.: 140445) und 5 m (Cat. No.: 140445/1) available via Deutronic in accessories.
Output	<p><u>Gewindebolzen:</u></p> <p>[+]: M10 [max. tightening torque 20 Nm]</p> <p>[-]: M12 [max. tightening torque 35 Nm]</p>
Enclosure potential	<p><u>thread:</u></p> <ul style="list-style-type: none"> • M8 (Below the output connections, see fig. 8.1)



8 Dimensions

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

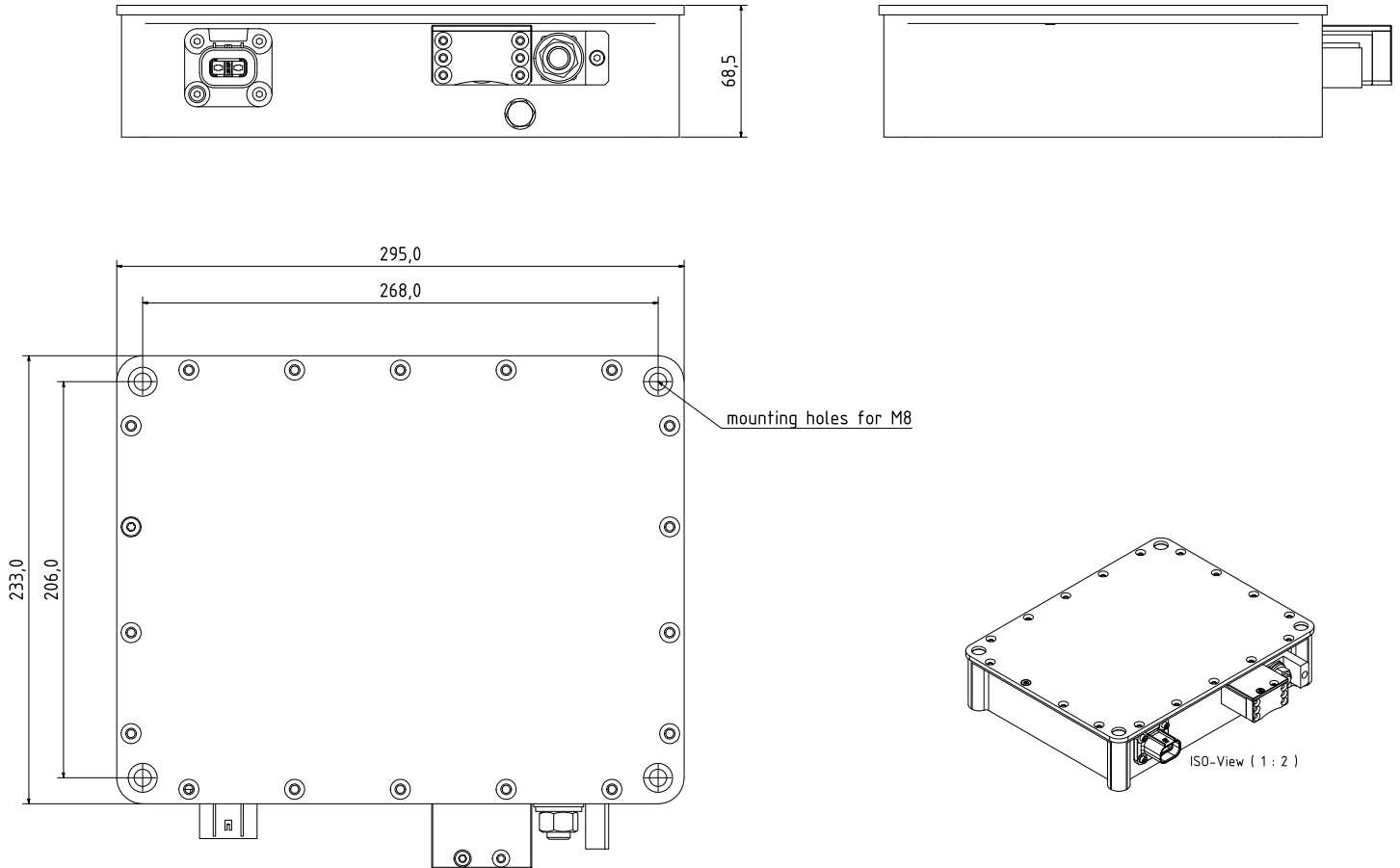


Figure 8.1: Dimensions

По вопросам продаж и поддержки обращайтесь:

Алматы (7273)495-231
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Россия (495)268-04-70

Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Киргизия (996)312-96-26-47

Новокузнецк (3843)20-46-81
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Симферополь (3652)67-13-56
Казахстан (7172)727-132

Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Тверь (4822)63-31-35
Томск (3822)98-41-53
Тула (4872)74-02-29
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Ярославль (4852)69-52-93