

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

DC/DC converter

DVCH1503-700

Alle Daten gemessen bei , und 25°C Umgebungstemperatur, wenn nicht anders gekennzeichnet. I All parameters are specified at , and 25°C ambient, if not marked otherwise.
Technische Änderungen und Irrtümer vorbehalten. I Technical modifications and mistakes reserved.

Mit den Angaben im Katalog und in den Datenblättern werden Produkte beschrieben, nicht Eigenschaften zugesichert. Belastung mit „Grenzwerten“ (einfache Kombination) ist zulässig ohne bleibende Schäden der Produkte. Betrieb der Geräte mit Grenzwertbelastung für längere Zeit kann die Zuverlässigkeit beeinträchtigen. Grenzwerttoleranzen unterliegen üblichen Schwankungen. I Products are described by information contained in catalogs and data-sheets. It is not be considered as assured qualities. Stresses listed under „Maximum Rating“ (one at a time) may be applied to devices without resulting in permanent damage. The operation of the equipment for extended periods may affect device reliability. Limiting value tolerance are subject to usual fluctuation margins.

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.

DC/DC converter

DVCH1503-700

Alle Daten gemessen bei , und 25°C Umgebungstemperatur, wenn nicht anders gekennzeichnet. | All parameters are specified at , and 25°C ambient, if not marked otherwise.
Technische Änderungen und Irrtümer vorbehalten. | Technical modifications and mistakes reserved.

Mit den Angaben im Katalog und in den Datenblättern werden Produkte beschrieben, nicht Eigenschaften zugesichert. Belastung mit „Grenzwerten“ (einfache Kombination) ist zulässig ohne bleibende Schäden der Produkte. Betrieb der Geräte mit Grenzwertbelastung für längere Zeit kann die Zuverlässigkeit beeinträchtigen. Grenzwerttoleranzen unterliegen üblichen Schwankungen. | Products are described by information contained in catalogs and data-sheets. It is not be considered as assured qualities. Stresses listed under „Maximum Rating“ (one at a time) may be applied to devices without resulting in permanent damage. The operation of the equipment for extended periods may affect device reliability. Limiting value tolerance are subject to usual fluctuation margins.

2 Output

Output voltage (Nom.)	12 VDC 24 VDC	-
Initial tolerance $N_{initial}$	$\pm 1,0\% U_{nom}$	-
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}	$\leq 1500 W$	-
Current limiting	$1,1 \times I_{nom}$	above $1,0 \times I_{nom}$ U_{out} may sink
Recovery time	$\leq 4 ms$	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	-

DC/DC converter

DVCH1503-700

Alle Daten gemessen bei , und 25°C Umgebungstemperatur, wenn nicht anders gekennzeichnet. | All parameters are specified at , and 25°C ambient, if not marked otherwise.
Technische Änderungen und Irrtümer vorbehalten. | Technical modifications and mistakes reserved.

Mit den Angaben im Katalog und in den Datenblättern werden Produkte beschrieben, nicht Eigenschaften zugesichert. Belastung mit „Grenzwerten“ (einfache Kombination) ist zulässig ohne bleibende Schäden der Produkte. Betrieb der Geräte mit Grenzwertbelastung für längere Zeit kann die Zuverlässigkeit beeinträchtigen. Grenzwerttoleranzen unterliegen üblichen Schwankungen. | Products are described by information contained in catalogs and data-sheets. It is not be considered as assured qualities. Stresses listed under „Maximum Rating“ (one at a time) may be applied to devices without resulting in permanent damage. The operation of the equipment for extended periods may affect device reliability. Limiting value tolerance are subject to usual fluctuation margins.

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

DC/DC converter

DVCH1503-700

Alle Daten gemessen bei , und 25°C Umgebungstemperatur, wenn nicht anders gekennzeichnet. I All parameters are specified at , and 25°C ambient, if not marked otherwise.
Technische Änderungen und Irrtümer vorbehalten. I Technical modifications and mistakes reserved.

Mit den Angaben im Katalog und in den Datenblättern werden Produkte beschrieben, nicht Eigenschaften zugesichert. Belastung mit „Grenzwerten“ (einfache Kombination) ist zulässig ohne bleibende Schäden der Produkte. Betrieb der Geräte mit Grenzwertbelastung für längere Zeit kann die Zuverlässigkeit beeinträchtigen. Grenzwerttoleranzen unterliegen üblichen Schwankungen. I Products are described by information contained in catalogs and data-sheets. It is not be considered as assured qualities. Stresses listed under „Maximum Rating“ (one at a time) may be applied to devices without resulting in permanent damage. The operation of the equipment for extended periods may affect device reliability. Limiting value tolerance are subject to usual fluctuation margins.

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.

DC/DC converter

DVCH1503-700

Alle Daten gemessen bei , und 25°C Umgebungstemperatur, wenn nicht anders gekennzeichnet. I All parameters are specified at , and 25°C ambient, if not marked otherwise.
Technische Änderungen und Irrtümer vorbehalten. I Technical modifications and mistakes reserved.

Mit den Angaben im Katalog und in den Datenblättern werden Produkte beschrieben, nicht Eigenschaften zugesichert. Belastung mit „Grenzwerten“ (einfache Kombination) ist zulässig ohne bleibende Schäden der Produkte. Betrieb der Geräte mit Grenzwertbelastung für längere Zeit kann die Zuverlässigkeit beeinträchtigen. Grenzwerttoleranzen unterliegen üblichen Schwankungen. I Products are described by information contained in catalogs and data-sheets. It is not be considered as assured qualities. Stresses listed under „Maximum Rating“ (one at a time) may be applied to devices without resulting in permanent damage. The operation of the equipment for extended periods may affect device reliability. Limiting value tolerance are subject to usual fluctuation margins.

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 $U_{in} < 60$ VDC
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

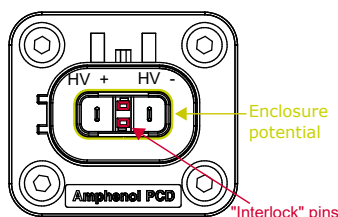


Figure 7.1: Connection input

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, FHRL91XC13X (4mm², shielded single conductors)

Output

threaded bolt:

- M12 [max. torque 35Nm]

Enclosure potential

Thread:

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

DC/DC converter

DVCH1503-700

Alle Daten gemessen bei , und 25°C Umgebungstemperatur, wenn nicht anders gekennzeichnet. I All parameters are specified at , and 25°C ambient, if not marked otherwise.

Technische Änderungen und Irrtümer vorbehalten. I Technical modifications and mistakes reserved.

Mit den Angaben im Katalog und in den Datenblättern werden Produkte beschrieben, nicht Eigenschaften zugesichert. Belastung mit „Grenzwerten“ (einfache Kombination) ist zulässig ohne bleibende Schäden der Produkte. Betrieb der Geräte mit Grenzwertbelastung für längere Zeit kann die Zuverlässigkeit beeinträchtigen. Grenzwerttoleranzen unterliegen üblichen Schwankungen. I Products are described by information contained in catalogs and data-sheets. It is not be considered as assured qualities. Stresses listed under „Maximum Rating“ (one at a time) may be applied to devices without resulting in permanent damage. The operation of the equipment for extended periods may affect device reliability. Limiting value tolerance are subject to usual fluctuation margins.

Signal (CAN)

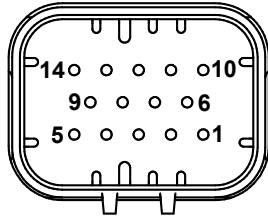


Figure 7.2: Connection CAN

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.

8 Dimensions

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

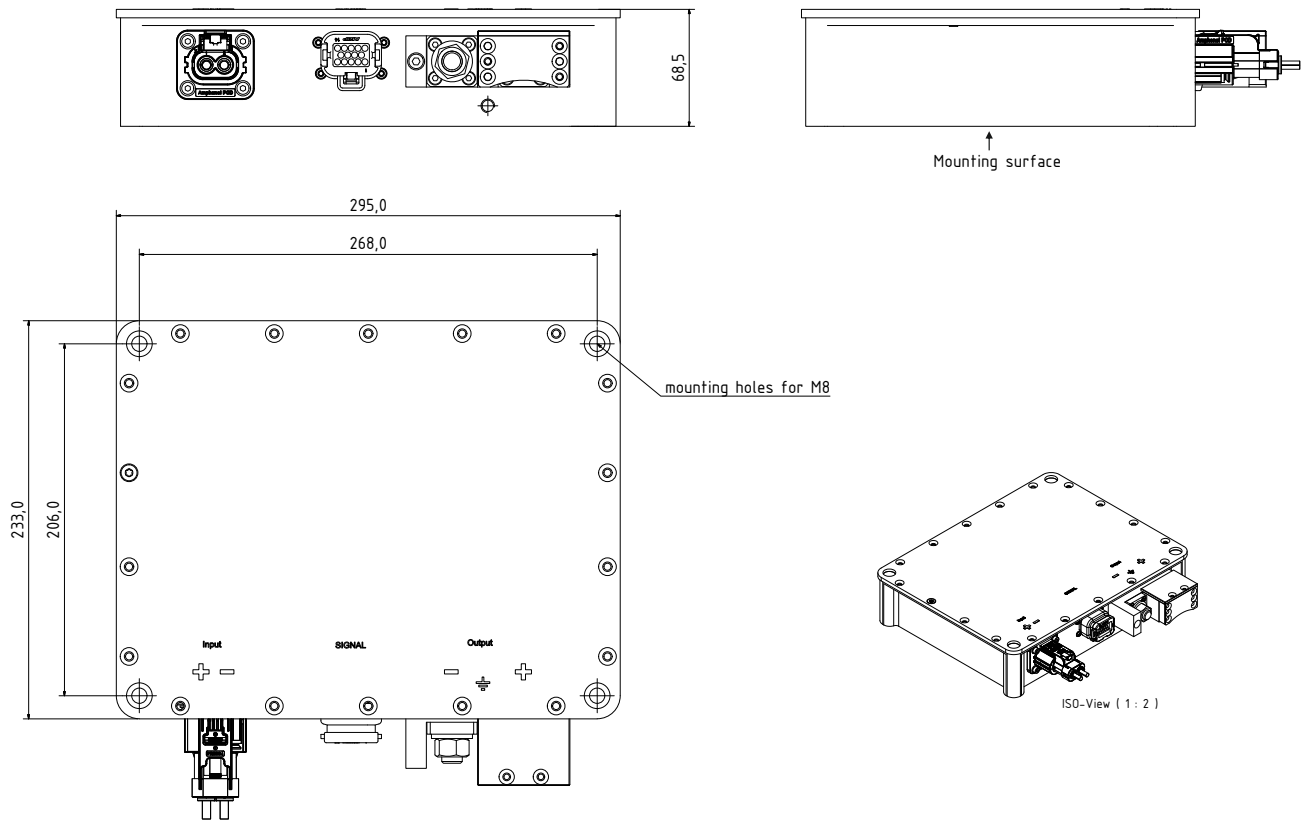


Figure 8.1: Dimensions

DC/DC converter

DVCH1503-700

Alle Daten gemessen bei , und 25°C Umgebungstemperatur, wenn nicht anders gekennzeichnet. | All parameters are specified at , and 25°C ambient, if not marked otherwise.
Technische Änderungen und Irrtümer vorbehalten. | Technical modifications and mistakes reserved.

Mit den Angaben im Katalog und in den Datenblättern werden Produkte beschrieben, nicht Eigenschaften zugesichert. Belastung mit „Grenzwerten“ (einfache Kombination) ist zulässig ohne bleibende Schäden der Produkte. Betrieb der Geräte mit Grenzwertbelastung für längere Zeit kann die Zuverlässigkeit beeinträchtigen. Grenzwerttoleranzen unterliegen üblichen Schwankungen. | Products are described by information contained in catalogs and data-sheets. It is not be considered as assured qualities. Stresses listed under „Maximum Rating“(one at a time) may be applied to devices without resulting in permanent damage. The operation of the equipment for extended periods may affect device reliability. Limiting value tolerance are subject to usual fluctuation margins.

9 Characteristics

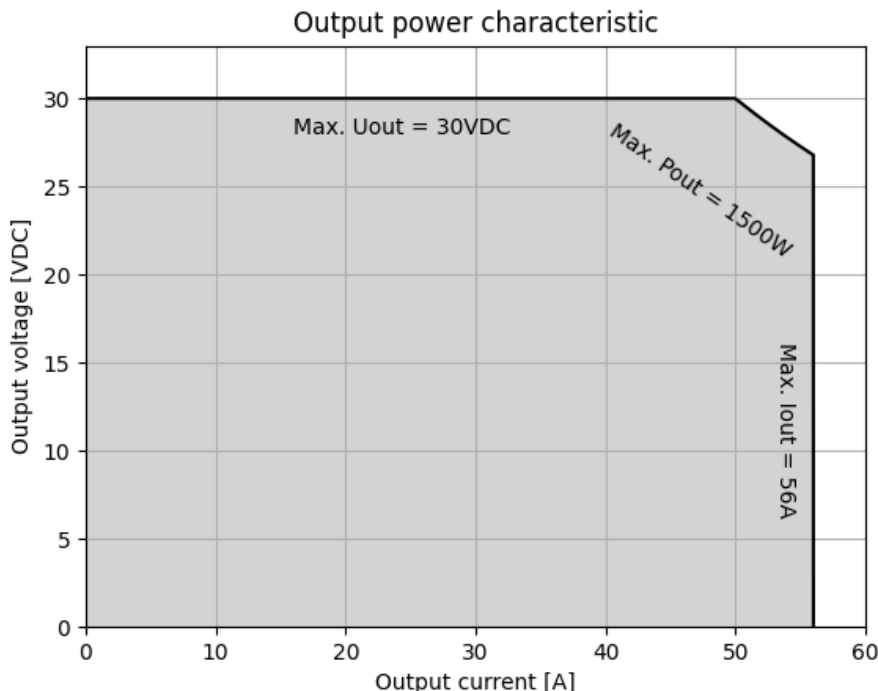


Figure 9.1: Output power DVCH1503-700-24

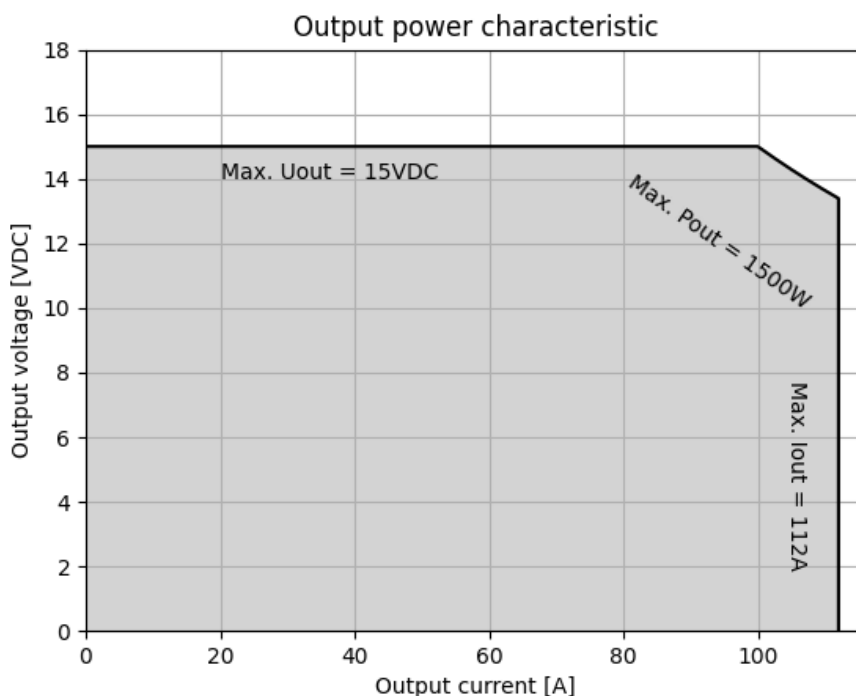


Figure 9.2: Output power DVCH1503-700-12

DC/DC converter

DVCH1503-700

Alle Daten gemessen bei , und 25°C Umgebungstemperatur, wenn nicht anders gekennzeichnet. I All parameters are specified at , and 25°C ambient, if not marked otherwise.
Technische Änderungen und Irrtümer vorbehalten. I Technical modifications and mistakes reserved.

Mit den Angaben im Katalog und in den Datenblättern werden Produkte beschrieben, nicht Eigenschaften zugesichert. Belastung mit „Grenzwerten“ (einfache Kombination) ist zulässig ohne bleibende Schäden der Produkte. Betrieb der Geräte mit Grenzwertbelastung für längere Zeit kann die Zuverlässigkeit beeinträchtigen. Grenzwerttoleranzen unterliegen üblichen Schwankungen. I Products are described by information contained in catalogs and data-sheets. It is not be considered as assured qualities. Stresses listed under „Maximum Rating“ (one at a time) may be applied to devices without resulting in permanent damage. The operation of the equipment for extended periods may affect device reliability. Limiting value tolerance are subject to usual fluctuation margins.

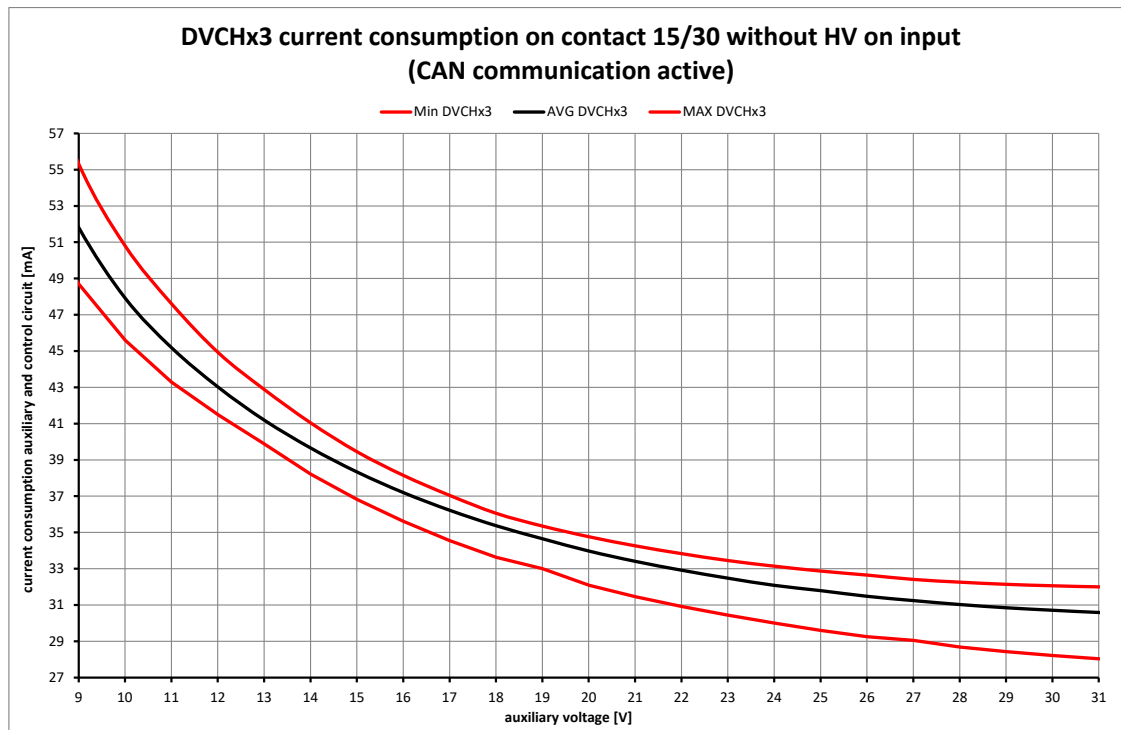


Figure 9.3: Current consumption auxiliary and control circuit

DC/DC converter

DVCH1503-700

Alle Daten gemessen bei , und 25°C Umgebungstemperatur, wenn nicht anders gekennzeichnet. | All parameters are specified at , and 25°C ambient, if not marked otherwise.
Technische Änderungen und Irrtümer vorbehalten. | Technical modifications and mistakes reserved.

Mit den Angaben im Katalog und in den Datenblättern werden Produkte beschrieben, nicht Eigenschaften zugesichert. Belastung mit „Grenzwerten“ (einfache Kombination) ist zulässig ohne bleibende Schäden der Produkte. Betrieb der Geräte mit Grenzwertbelastung für längere Zeit kann die Zuverlässigkeit beeinträchtigen. Grenzwerttoleranzen unterliegen üblichen Schwankungen. | Products are described by information contained in catalogs and data-sheets. It is not be considered as assured qualities. Stresses listed under „Maximum Rating“ (one at a time) may be applied to devices without resulting in permanent damage. The operation of the equipment for extended periods may affect device reliability. Limiting value tolerance are subject to usual fluctuation margins.

Authorised, valued-added distributor

Australia & New Zealand



Powerbox Australia Pty Ltd

Sydney Head Office
4 Beaumont Road,
Mt Kuring-Gai, NSW 2080
Australia



1800 251 380



sales@powerbox.com.au



powerbox.com.au

Powerbox Pacific Ltd

New Zealand Sales Office
1a Henry Rose Place,
Albany, Auckland
New Zealand 0632



09 4158 320



sales@powerbox.co.nz



powerbox.co.nz