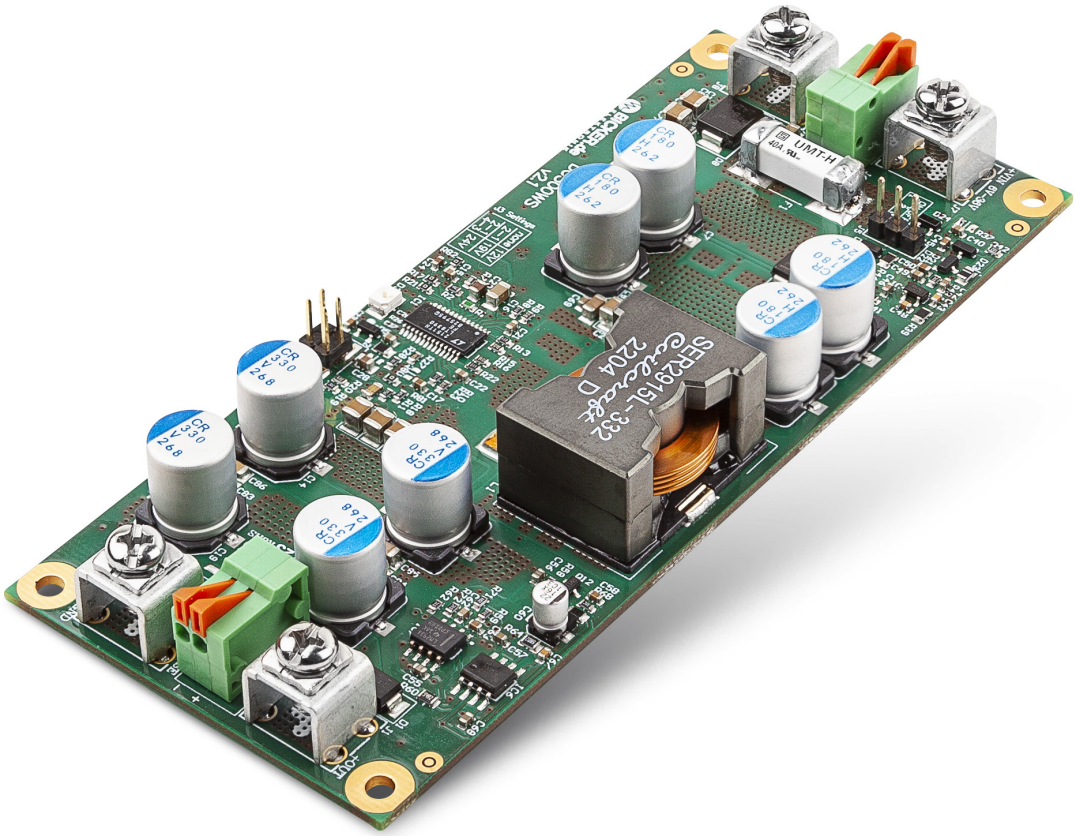
English

BICKER.de ELEKTRONIK

USER MANUAL

DC300WS

DC/DC 300W POWER SUPPLY



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Legend of used symbols

Symbol	Description
	Attention! Important hazard warning.
	Do not dispose of in the domestic waste.
	Warning of electrical voltage.

Revision Directory

Date	Change
16.05.2023 Revision 0-4	Initial version
09.05.2025 Revision 1-0	Release version
07.08.2025 Revision 1-1	Chapter „F3 Description of connectors“ (Remote On/Off) Pin assignment corrected
04.11.2025 Revision 1-2	Chapter „B3 Instructions for mobile use“ implemented

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A Brief specification

DC300WS

300 Watt DC/DC converter

- **Ultra wide input range 6…36 V DC**
- **Output voltage +12 V, +19 V or +24 V DC flexibly selectable**
- **Very compact design**
- **Temperature range –20...+70°C**
- **High efficiency up to 98 %**
- **More than 10 years capacitor lifetime**
- **Sense connector at the output**
- **Remote On/Off**

Technical Data	
Input voltage	6 V – 36 V
Input current	<40 A
Output voltages	12V, 19V, 24V – adjustable via jumper
Max. output current	12 V / 25 A 19 V / 15.8 A 24 V / 12.5 A
Max. output power	300 W at all adjustable output voltages
Capacitive load	4700 µF
Protection	Input: · Active reverse polarity protection · UVLO (under voltage lockout) · OVP (over voltage lockout) Output: · OVP (overvoltage protection) · OCP (active overcurrent and short circuit protection)
Derating	See chapter D2
Ambient temperature	Operating: -20…+70 °C; Storage / Transport: -20…+70 °C
Operating altitude	≤5000 m
Max. permitted humidity	≤95 % (at +25 °C, no dew)
Dimensions W / H / D	132 x 17 x 56 mm
Weight	~115 g

B Introduction and description

Read carefully before initial operation!

This manual shall help the user to get familiar with the product and its components and features. It shall provide information as accurately and completely as possible.

The manual as well as all documents has to be read and followed strictly before installation. Otherwise warranty and guarantee can be cancelled partly or completely. Any liability on the part of Bicker Elektronik is excluded for possible existing errors as well as non-compliance with the instructions for use and installation.

B1 Description of the product and its functions

The DC300WS is a powerful DC/DC converter with an output power of up to 300 W and a wide input voltage range of 6 - 36 V. From an input voltage of 11 V, full power can be drawn over the entire ambient temperature range from -20 to +70°C without derating. Via the jumper (J3) the user can set the output voltage to 12 V, 19 V or 24 V before operation. A green status LED indicates that the converter is ready for operation.

The DC300WS also has the option of controlled activation of the device using active low logic (remote on/off) via the input-side, separate spring contact connection (J6). Jumper (J5) must be set to use this functionality as described in later chapters.

Sense lines can optionally be connected via the spring contact connection (J4) on the output side in order to compensate the voltage drop at the output with long lines and high currents.

The DC300WS has several protections to safe the device from errors and defects. These include reverse polarity protection on the input side, input undervoltage blocking, input overvoltage protection, overtemperature protection and output-side overvoltage and short-circuit protection.

B2 Intended use

The DC300WS is designed for use in a suitable metal housing. When installing, make sure that the DC300WS is connected to the housing via the supplied Thermal Pad in order to ensure cooling of the components underneath.

The ambient temperature specified in the technical details is the air temperature directly at the components and must not fall below (minimum value) or exceed (maximum value).

The power supply is designed for professional use in areas such as industrial control, communications and instrumentation. It must not be used in devices or systems in which a malfunction could lead to serious injuries or endanger human life.

The DC300WS is not suitable to charge energy storage devices such as batteries, EDLC or lithium batteries. When used as a charger, it can cause fire or endanger life and limb!

The device must be protected from being touched during operation because, depending on the power, the temperatures can get too high and cause burns.

B3 Instructions for mobile use

The DC300WS is suitable for use in cars, trucks, agricultural machinery, motorhomes and other mobile applications.

- **Voltage range:** The ultra-wide input voltage range of 6–36 V DC reliably covers both voltage dips (e.g. during cold starts) and increased charging voltages in the vehicle electrical system and ensures stable operation under all driving conditions.
- **Thermal Management:** Mounting on a thermally conductive surface is essential to ensure maximum output power without thermal derating. The included thermal pad optimizes heat dissipation.
- **Electrical installation:** The connecting cables should be short, adequately dimensioned, and protected against vibration. The power supply already has integrated input fuses – however, an additional fuse in the vehicle's electrical system is still recommended.
- **Overvoltage protection:** For on-board power supplies with critical interference requirements (load-dump pulses), a TVS diode (e. g., 5 kW type for 12 V systems, 10 kW for 24 V systems) at the input is recommended to protect the power supply against transient overvoltages up to 100 V (12 V) or 200 V (24 V).
- **Environmental protection:** The optionally available PSZ-1111 (IP20) enclosure offers basic mechanical protection with an integrated thermal pad. For dusty, humid environments or outdoor installations, a custom enclosure with IP65/IP67 protection should be used.
- **EMC compliance:** Installation must be carried out in compliance with the relevant EMC standards (e.g., ECE R10, ISO 11452). Shielded cables, proper grounding, and suitable interference filters have to be provided according to the application requirements.

IMPORTANT NOTE: When installed correctly and taking these points into account, the DC300WS is ideally suited for mobile applications.

C Safety instructions

WARNING!

Disregarding of following issues can result in electric shock, fire, serious injury or death.

1. Care must be taken to ensure proper and professional wiring.
2. The device pack must not be exposed to fire and temperatures outside the specification.
3. The device must not be immersed in water or exposed to splash water.
4. The device must not be operated in a humid environment or in an environment where dew and condensation are to be expected.
5. The device must not be opened, overheated or otherwise soldered / welded.
6. Changes or attempts to repair the device are to be omitted.
7. Effects of foreign objects on the device must be avoided (e.g. metal parts).
8. Do not put obviously damaged devices into operation (e.g. dents, burn marks, rough contamination).
9. Keep ventilation openings clear.
10. Device must not be dropped.
11. All parts of the device and accessories must not be eaten or swallowed.
12. A current limited source is to be used.
13. During operation, the circuit board, the housing and any exposed connections must not be touched. Touching the circuit board, the housing or the connection terminals can cause burns, especially at very high power levels.
14. The device is not suitable for direct charging of energy storage devices

ATTENTION!

1. Improper use as well as opening and disassembling of the device will void the warranty.
2. The device may only be used as intended.
3. The national accident prevention and safety regulations must be observed.
4. The assembly of the device and the electrical installation have to be state of the art.
5. The electrical, thermal and mechanical limit values have to be observed.
6. The DC300WS wiring specifications - as described in this manual - have to be followed.

D Technical Data

D1 General Technical Data

INPUT DATA Unless otherwise stated, all specifications apply to +25 °C ambient temperature, 6–36 V DC input voltage and nominal output current (I_N).	
Input voltage	DC
Input voltage range	6–36 V DC
Electric strength max.	39 V
Approximate current consumption @ 300 W output power U_{IN} = 12 V U_{IN} = 19 V U_{IN} = 24 V U_{IN} = 36 V	 ~27 A ~17 A ~13.5 A ~9.0 A
Efficiency	up to 98 %
Internal input fuse	40 A (SMD)
Standby consumption	<1 W
PSON setting (J5)	J5 1-2: PSON (J6) active; PSON (J6) short-circuit = on J5 2-3: PSON (J6) inactive, permanent on
Switch-on time	≤1.6 sec
Protection	under voltage: 5 V over voltage: 39 V active reverse polarity
Insulation voltage	No separation between input and output

OUTPUT DATA Unless otherwise stated, all specifications apply to +25 °C ambient temperature, 6–36 V DC input voltage and nominal output current (I_N).	
Output voltage	12 V, 19 V, 24 V – adjustable via Jumper
Output voltage tolerance	+5 % / –1.5 %
Capacitive load	4700 µF
Maximum output current U_{OUT} = 12 V U_{OUT} = 19 V U_{OUT} = 24 V	 25 A 15.8 A 12.5 A
Ripple & Noise	max. 100 mV_{p-p}
Output power	300 W
Protection	Short circuit Over current >41 A Over voltage >28 V
Derating	See chapter D2

CONNECTION DATA INPUT (J7, J8) / OUTPUT (J1, J2)	
Connection method	Screwterminal M4
Conductor cross-section solid	not provided
Conductor cross-section flexible	12 … 14 AWG / 3.3…2.08 mm^2 Ring or fork cable lug
Conductor cross-section with ferrule	not provided
Stripping length	n.a.
Tightening torque	1.1 Nm

CONNECTION DATA PSON (J6) / SENSE (J4)	
Connection method	Spring contact clamp (screwless)
Conductor cross-section solid	20 … 26 AWG / 0.5…0.12 mm^2
Conductor cross-section flexible	20 … 26 AWG / 0.5…0.12 mm^2
Conductor cross-section with ferrule	not provided
Stripping length	9…10 mm
Tightening torque	n.a.

GENERAL DATA	
Flammability class according to UL 94 (housing / terminal blocks)	Yes
Weight	~115 g
UPS connection in parallel	No
UPS connection in series	No

HOUSING	
Degree of protection	n.a.
Protection class	n.a.
Mounting type	n.a.
Housing version	n.a.
Dimension W / H / D	n.a.

ENVIRONMENTAL CONDITIONS	
Ambient temperature (operation)	-20… +70 °C
Ambient temperature (start up without load)	-30 °C
Ambient temperature (storage / transport)	-20… +70 °C
Max. permitted humidity	Operating: 10…90 % RH, non-condensing Storage: 10…95 % RH, non-condensing
Operating altitude	≤5000 m
Climate class	3k3 (EN 60721)
Degree of pollution	2
Overvoltage category EN 61010-1 EN 61010-2-201	 I I
Indoor / Outdoor use	Yes / No

STANDARDS	
Safety extra-low voltage	IEC 61010-1 (SELV) IEC 61010-2-201

APPROVALS	
UL	n.a.
CSA	n.a.
CB Scheme	n.a.

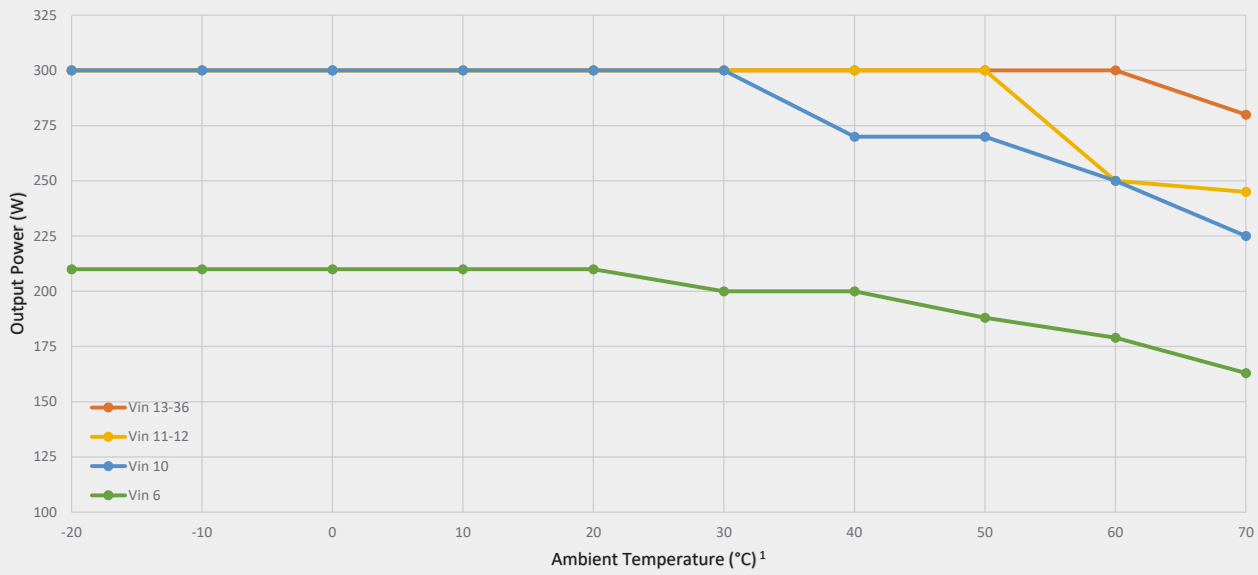
INTERFERENCE IMMUNITY ACCORDING TO EN 61000 (INDUSTRY)	
Basic standard CE	**Fulfilled requirements according to EN 61000 (CE) (Interference immunity of industrial environment)**
Electrostatic discharge EN 61000-4-2 Contact discharge Air discharge Comment	 4 kV 8 kV Criterion A
Fast transients (Burst) EN 61000-4-4 Test voltage Comment	 2 kV Criterion A
Surge voltage load (Surge) EN 61000-4-5 Test voltage L–N Test voltage L–PE, N–PE Comment	 2 kV 4 kV Criterion A

EMISSION ACCORDING TO EN 55016-2-3 (DOMESTIC)	
Basic standard CE	**Fulfilled requirements according to EN 55016-2-3 (CE) (Domestic)**
Conducted emission from the power port EN 55016-2-3 Frequency range Comment	The power supply has no built-in filter components. It is the user's responsibility to take appropriate measures and to eliminate interference in their entire system in order to comply with the legally specified limit values.
Electric field radiated emission EN 55016-2-3 Frequency range Comment	The power supply has no built-in filter components. It is the user's responsibility to take appropriate measures and to eliminate interference in their entire system in order to comply with the legally specified limit values.

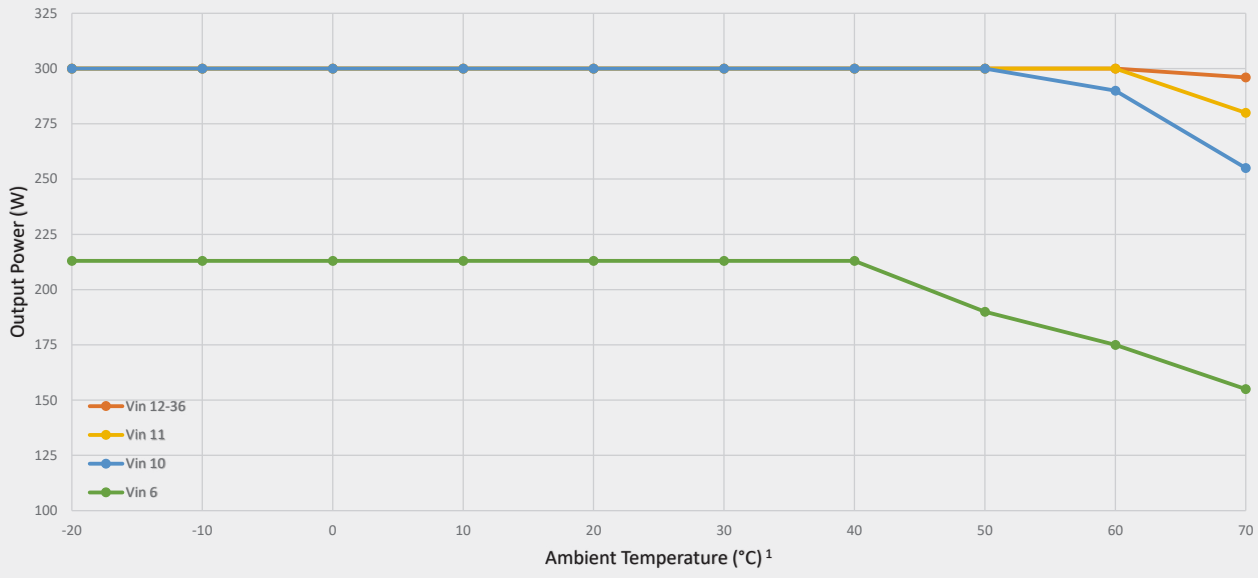
LEGEND	
Criterion A	Normal operating behaviour within the defined limits.
Criterion B	Temporary impairment of the operating behaviour, that is corrected by the device itself.

D2 Derating

12 V_{OUT}

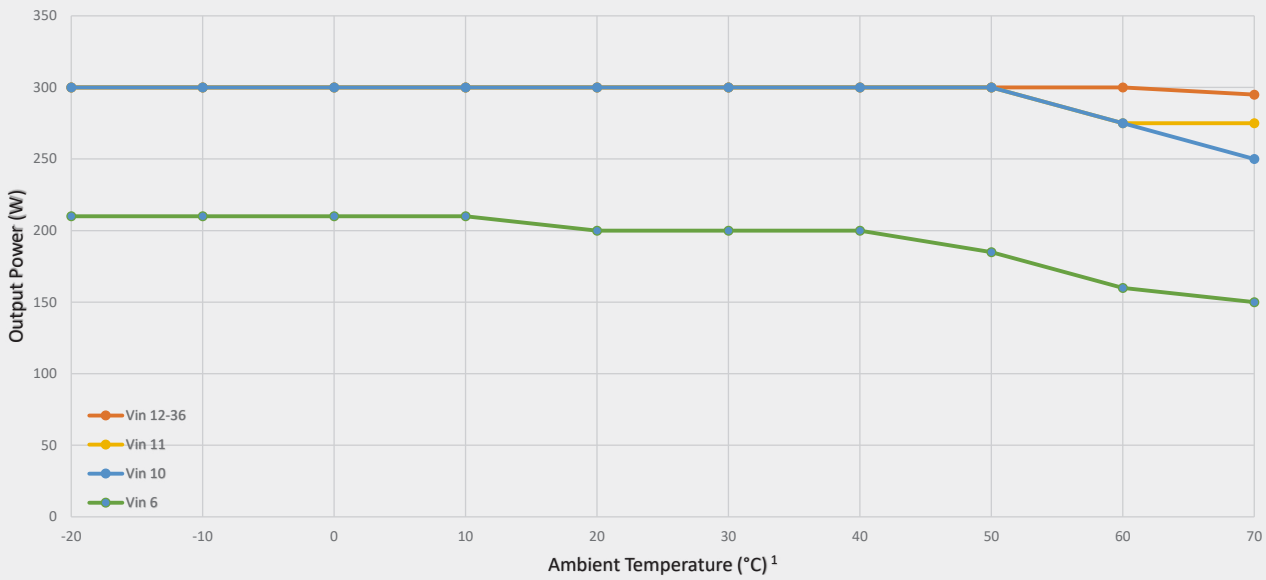


19 V_{OUT}



1 : Temperature directly at the components

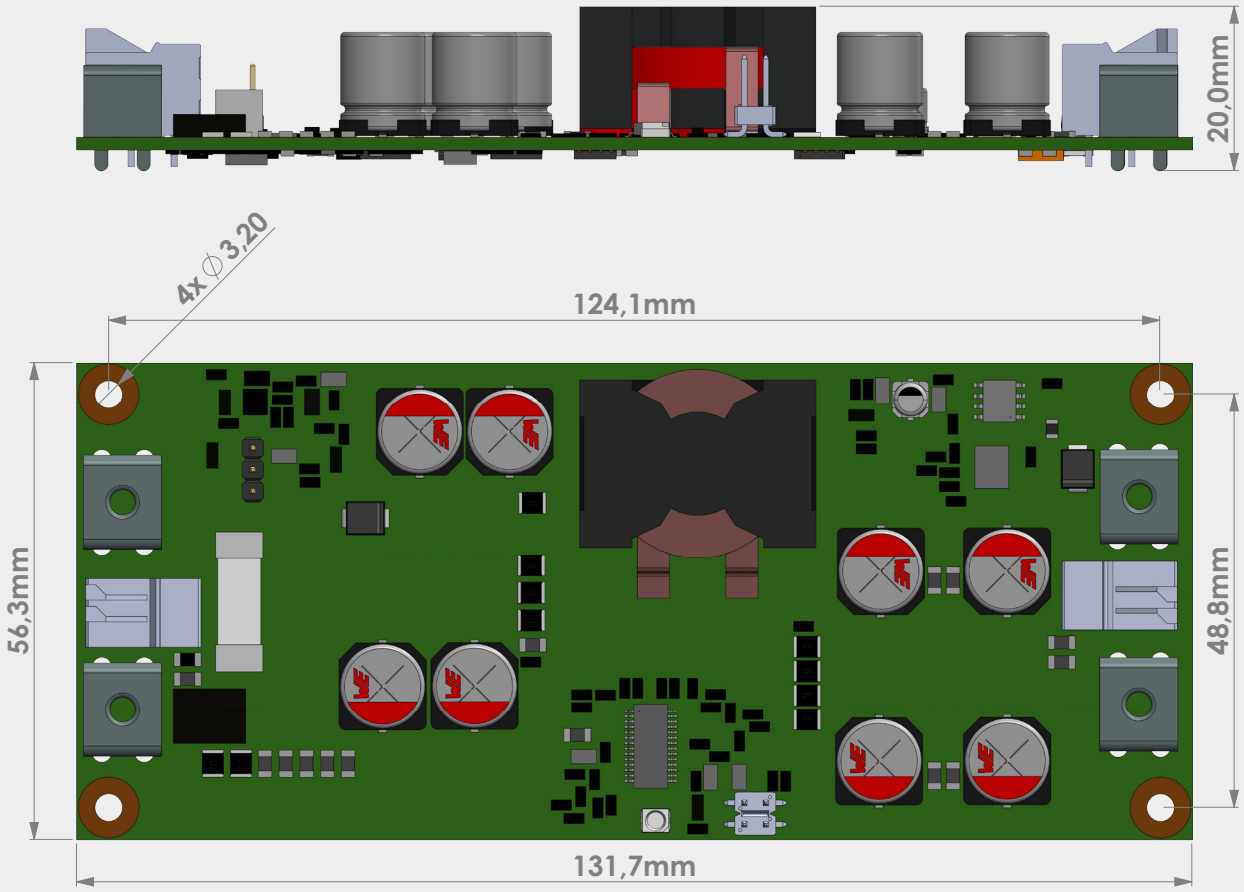
24 V_{OUT}



[1] : *Temperature directly at the components*

D3 Drawing

Unless otherwise stated,
Tolerance according to:
DIN ISO 2768 T1 - m
DIN ISO 2768 T2 - K



E General Data

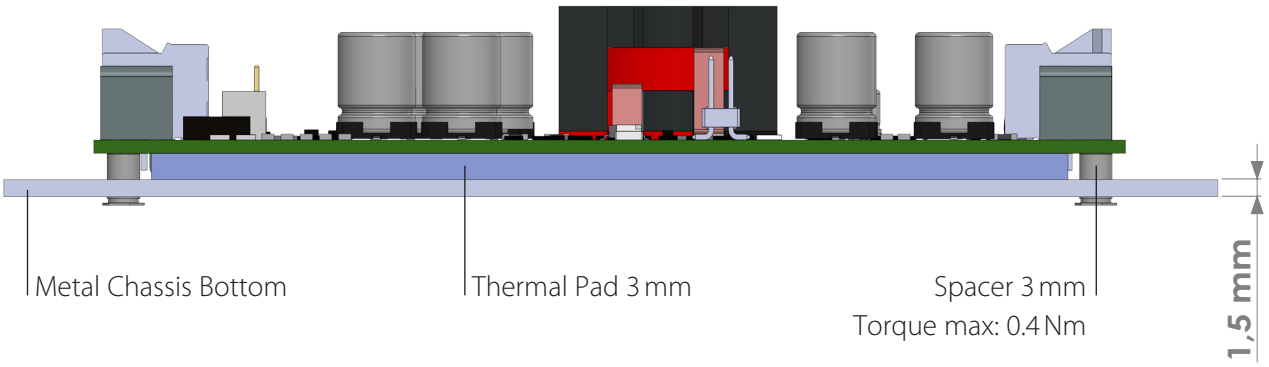
E1 Assembly and installation advice

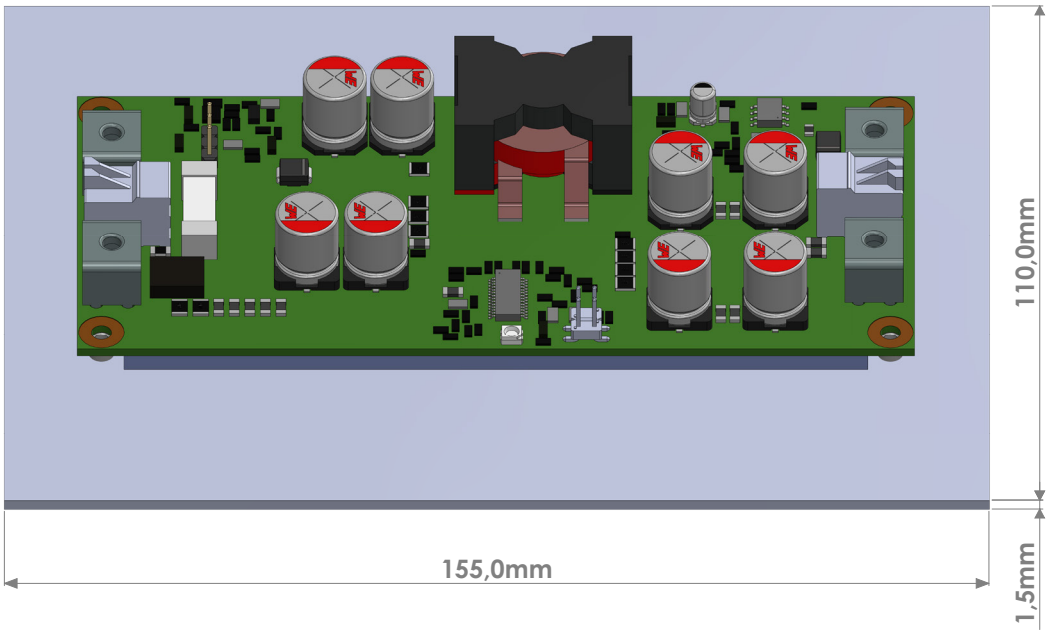
Installation and operation of this device is only allowed to be executed by a qualified electrician! The application has to be separated from any power during the mounting process. Wires have to be connected safely and must not have contact with sharp edges. Pay attention to correct polarity! Before commissioning, check all the connections for correctness!

E2 Installation and cooling

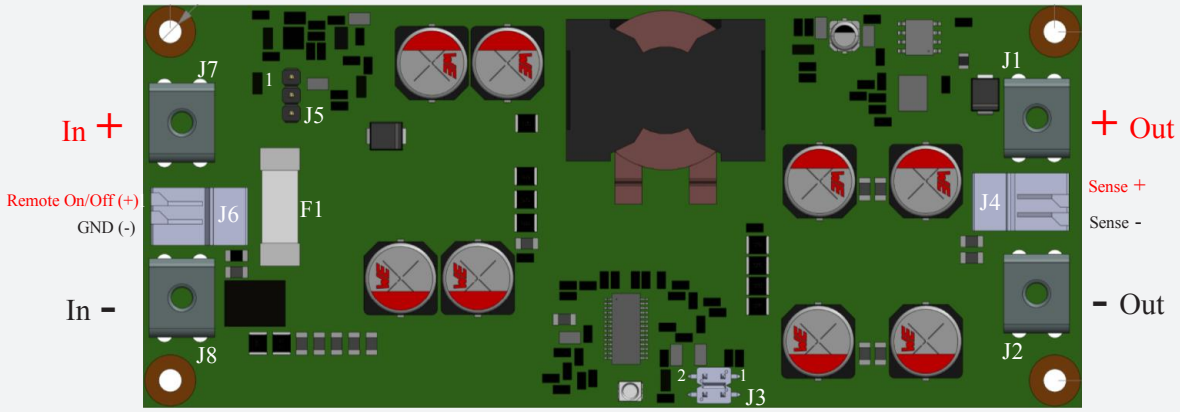
Using the provided Thermal Pad the DC300WS has to be mounted in a metal case via the bottomside of the board. In order to cool the power supply, a heat-absorbing surface of at least 170 cm^2 and a minimum material thickness of 1.5 mm are required (drawing below). During operation, it must be ensured that the ambient temperature directly at the components is within the permitted range. For installation in a case, spacers with a height of 3 mm have to be used at the mounting holes to avoid bending and thus damaging the power supply.

IMPORTANT: The Thermal Pad foil has to be removed before mounting!





E3 Description of connectors

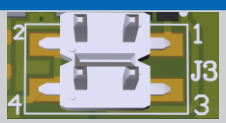
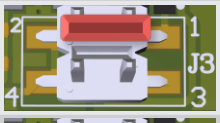
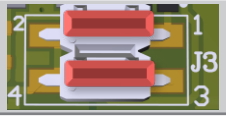


TYPE	FUNCTION
J1	VDC output Plus (+)
J2	VDC output Minus (–)
J3	Configuration output voltage
J4	Output sense connection
J5	Remote On/Off configuration
J6	Remote On/Off connection
J7	VDC input Plus (+)
J8	VDC input Minus (–)

OUTPUT VOLTAGE CONFIGURATION (J3)

To configure the output voltage, the pins are set using a jumper as shown in the table below.

The setting may only be made when the power supply is switched off!

OUTPUT VOLTAGE	PIN CONFIGURATION	PICTURE
12 Volt	no	
19 Volt	Pin 1-2	
24 Volt	Pin 1-2 Pin 3-4	

REMOTE SENSE (J4)

Via the connection (J4) measuring lines can be connected to the input points of the device to be operated. This automatically compensates for voltage drops caused by high currents, when lines are too long.

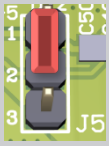
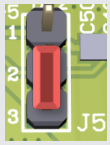
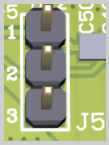
The connection of the lines must be done when power supplies are switched off! It must be ensured that the polarity is correct and both measuring lines (Sense + and Sense –) have to be connected!

The J4 connection has neither reverse polarity nor short-circuit protection and improper use can damage the entire device. Pay attention to the stripping length of the connecting strand of 9…10 mm.
The wired spring clip connector J4 must be checked for tightness by a gentle pull test prior to use.

REMOTE ON/OFF (J5/J6)

Remote activation can be activated via the jumper (J5) by bridging Pin 1 and Pin 2. When the configuration is activated, the power supply must be switched on via the connector (J6). This is done either by permanently shorting the two connections of J6, or by setting J6 pin 1 to ground (–). If pins 2 and 3 of (J5) are bridged or not bridged at all, the power supply switches on as soon as an input voltage is present.

The lines and jumpers have to be connected when the power supply is switched off! No active voltage may be connected to the J6 pins!

J5 CONFIGURATION	REMOTE ACTIVATED	PICTURE	FUNCTIONALITY
Pin 1 – Pin 2	Yes		Output active: J6 Remote On/Off to ground or both pins shorted
Pin 3 – Pin 2	No		Output voltage active when input voltage is present
non	No		Output voltage active when input voltage is present

The J6 connection has neither reverse polarity nor overvoltage protection and improper use can damage the entire device.
Pay attention to the stripping length of the connecting strand of 9…10 mm.
The wired spring clip connector J4 must be checked for tightness by a gentle pull test prior to use.

E4 Initial operation

The correct installation of the power supply has to be ensured. Alle cables at the connectors have to be checked for proper contact, seating and polarity. The desired output voltage is to be set via the jumpers as in „Output voltage configuration".

After that, start takes place by applying the supply voltage: From a voltage of 5 V at the input terminals, the power supply provides the set output voltage.

It is important to ensure that the source supplies enough current to guarantee the required power at the output. The formula

$$P_{IN} = P_{OUT\ MAX} \times 1.25$$

can be used as a guideline for dimensioning an input voltage supply.

E5 Scope of delivery

SCOPE OF DELIVERY	
QUANTITY	**DESCRIPTION**
1x device	DC300WS
1x	Thermal Pad
3x	2.54 mm Jumper mating connector
4x	3 mm spacer round

E6 Accessory

PSZ-1111: aluminium U chassis with cover

E7 Reverse polarity / Overcurrent / Short circuit

Reverse polarity:
The device has active reverse polarity protection at the input if the input terminal is connected with reverse polarity while the device is still switched off (e.g. during commissioning).

Overcurrent:
If the load current at the output is too high, the device switches it off. For maximally allowed current values and peak current values refer to chapter D „Technical Data". A restart attempt occurs every 1 ms (non-lacht). If the power supply is in this state, the LED switches off.

Short circuit:
In the event of a short-circuit at the output of the power supply, the output is immediately disconnected (<5 ms). A restart attempt occurs every 1 ms in normal mode (non-latch). The impact of a short-circuit to the device depends on length and diameter (impedance) of the output wiring. In case of a short-circuit directly at the plugs a damage of the device can occur. If the power supply is in this state, the LED switches off.

E8 Maintenance

The UPS contains no serviceable parts. In case of a malfunction the upstream power source has to be disconnected and cables have to be removed. Use a dry cloth for cleaning!

E9 Disposal

Electric and electronic devices must not be disposed with domestic waste!
Please consider to each country's own regulation about recycling and disposal of used batteries at the end of their lifetime or resending to any recycling organization.

E10 Disclaimer

We, the Bicker Elektronik GmbH, have checked the contents of this document for compliance with the hardware and software described. Nevertheless, deviations can not be ruled out, so we assume no liability for the complete agreement. The information in this publication is checked regularly, necessary corrections are included in the updated versions.

Suggestions for improvement as well as tips and criticism are always welcome.

E11 Name / Address / Support E-Mail / Phone number of the manufacturer

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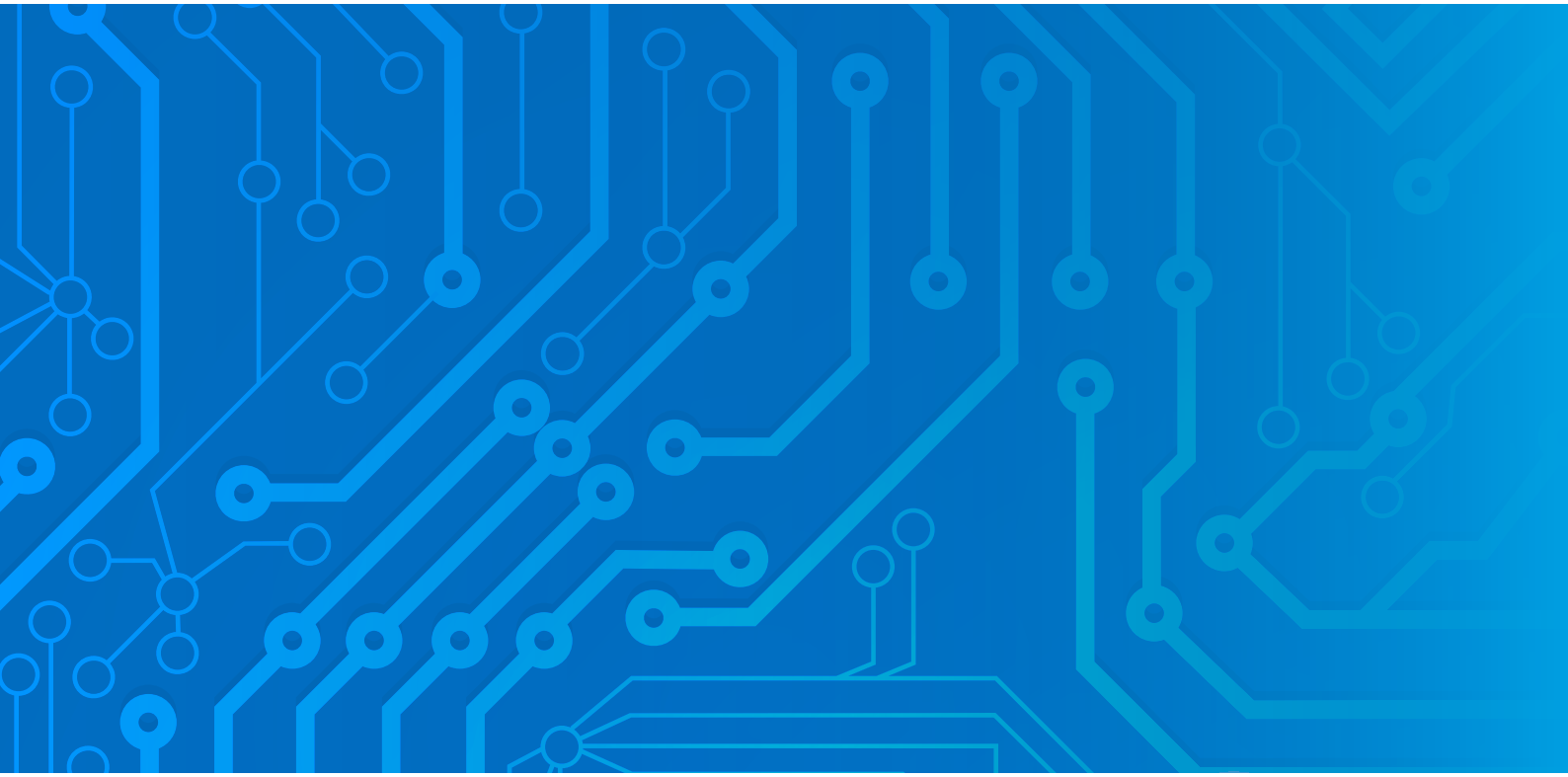

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