

DBL2250...5500/3W

Intelligent Charging Computer

for use with 12VDC vehicle electrical systems / batteries



Abbildung ähnlich / device similar to figure



DBL2250...5500/3W-derivative table

Type	Input voltage [VAC]	Output voltage [VDC] (configurable)		Output current [A]	Cat. No.
		Nom.	FSV		
DBL2250/3W	400	14,4	14,4 / 13,8	100 / 150	107229/0/000
DBL3000/3W	400	14,4	14,4 / 13,8	150 / 200	107228/0/000
DBL5250/3W	400	14,4	14,4 / 13,8	300 / 350	107209/0/000
DBL5500/3W	400	14,4	14,4 / 13,8	260 / 360	107222/0/000

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1 Input

Input voltage AC	nom. 3x 400 VAC	tolerance: 340-460 VAC TN-S, TN-C, TT, IT systems, Connection to industrial systems
Input frequency	50 - 60 Hz	tolerance: 45 - 65 Hz
Inrush current	< 25 A	temperature independent, Active regulated limitation
Standby power	≤ 25 W	see fig. 9.2
Power factor	< 0,62	-
Hold up time	> 10 ms	-
Input fuse	16 A	Externally, a 3-pole circuit breaker with characteristic ≥ B must be provided. The circuit-breaker must be dimensioned in accordance with the country-specific regulations and to the maximum rated current specification.

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2 Output

Output voltage (adjustable)	2 - 17 VDC	for an output voltage > 15.5 VDC, the default OVP limit must be changed.
Nominal output voltage U_{nom}	15.0 VDC	-
Max. continuous output current	100 A 150 A 300 A 260 A	DBL2250 DBL3000 DBL5250 DBL5500
Max. short-term output current (Boost)	150 A 200 A 350 A 360 A	DBL2250 DBL3000 DBL5250 DBL5500
Boost	Adaptive method	Cooling time depends on boost duration (max. 1 min). After 1 min boost ($I_{out} > I_{nom}$) automatic cooling phase ($I_{out} \leq I_{nom}$) of 4 min.
Max. output power	≤ 2250 W ≤ 3000 W ≤ 5250 W ≤ 5400 W	DBL2250 DBL3000 DBL5250 DBL5500 with Boost (Automatic power adjustment depending on input voltage, ambient temperature, and load condition)
Power-on after mains voltage applied	< 9 s	AUTO mode activated
Initial tolerance $N_{initial}$	$U_{nom} +0.5\%$ / -0.1%	-
Load regulation tolerance N_{load}	$U_{nom} +0.1\%$ / -0.6%	-
Ripple & Noise N_{RN}	$< \pm 1.5\%$ U_{nom}	< 450 mVpp, 20 MHz measurement bandwidth
Total tolerance $N_{overall}$	$U_{nom} +2.1\%$ / -2.2%	$N_{overall} = N_{initial} + N_{load} + N_{RN}$
Regulation time	< 10 ms	Load change 10–90%: < 1 ms
Temperature drift	< 1.5 % U_{nom}	-25 °C ... +40 °C

3 Environment

Operating temperature	-25 °C...+60 °C	automatic output power adjustment
Storage temperature	-40 °C ... +85 °C	-
Humidity	max. 93 %	-
Condensation	not permitted	-
Pollution degree	2	according to EN50178
Climatic category	3K3	according to EN60721
Protection class	IP20 IP32	according to EN60529 internal electronic components

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4 General Data

Protection class	Class I	with PE connection
Isolation voltage	3000 VAC 500 VDC	Input / Output Output / Housing
Max. efficiency	typ. 93.4 % typ. 93.9 % typ. 93.5 % typ. 93.5 %	DBL2250 DBL3000 DBL5250 DBL5500 see Fig. 9.3
Average efficiency	typ. 90.2 % typ. 91.7 % typ. 92.4 % typ. 92.2 %	DBL2250 DBL3000 DBL5250 DBL5500 Average of efficiency values at 25%, 50%, 75% and 100% of nominal output power. see Fig. 9.4
Housing	Metal	-
Dimensions (LxWxH)	535 x 443 x 146 mm	without connectors, see Fig. 8.1
Weight	approx. 25.5 kg	without cables, without packaging
Signaling	3 x LED	Operating status indication

5 Standards

EMC (Electromagnetic Compatibility)

Description	Standard	Values
RF Emission	EN55011 Class B	with remote indicator / interface connection: Class A
Immunity	EN61000-6-2	-

Electrical Safety

Description	Standard	Values
Electrical Safety	EN61010 EN60335-1 EN60335-2-29	-

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6 Installation and Safety Instructions

In addition to the general installation and safety instructions, the following values and additions apply:

Cooling	internal fan	Automatic power reduction in case of excessive temperature due to insufficient convection. In case of fan failure, power reduction to emergency mode
Mounting points	-	6x threaded holes (side M6 thread, max. insertion depth 10 mm) see Fig. 8.1
Installation position	horizontal	-
Clearance top/bottom	> 20 mm	-
Clearance sides (for fan openings)	> 70 mm	Air intake and exhaust must be ensured
Connection input / output	-	see Chapter 7
Input fuse	-	No integrated input fuse. A fuse must be provided externally by the customer application.
Transient overvoltage protection	-	Varistor (4.5 kA / 175 J)
Reverse polarity protection output	-	In case of incorrect polarity, the charging process is interrupted

Warning: Components and heat sinks inside the device are under mains voltage, therefore the device must always be installed safely and protected against contact! The use of this built-in power supply is only permitted if the device has been correctly installed by an authorized specialist company. Proper connection of the protective conductor via the mains connection socket must be ensured and verified in all cases!

Restrictions / Notes for Two-Phase Operation

- Operation via two phase conductors is only recommended for emergency operation.
- During continuous operation, the maximum power should not be drawn.
- A basic requirement is that the input voltage during operation is as high as possible within the specified range (e.g. $U_{IN} = 400AC$).
- In two-phase operation, no power reduction is performed, so the 3-phase charging computer is fully operational with 2 phases.
- Note that due to higher stress on individual components, the devices age faster (input current is 3 times higher).

Charging Cable / Busbar

- Before selecting a cable or busbar, a power loss calculation is mandatory.
- In any case, sufficient cable cross-section must be ensured.
- Example of insufficient dimensioning: Charging cable with length 5m and cross-section 35mm² ($R \approx 5.4m\Omega$) – power loss in the cable at 350A is approx. 680W!
- There is a fire hazard! Adequate cooling must be ensured (e.g. cables must never be connected to the output in a coiled state, etc.)

General installation and safety instructions for charging computers can be found at: www.deutronic.de

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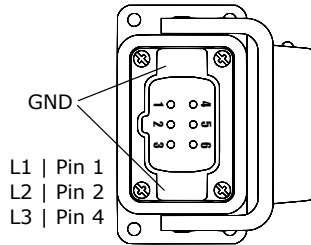
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7 Connections

Input connection

Three-phase connection



Connection of 3AC mains cable at the front of the device via Harting connector HAN6E/B with configuration:

- L1(Pin-1), L2(Pin-2), L3(Pin-4), PE(outer contacts)

For pin assignment see Fig. 7.1; connection of the neutral conductor [N] is not permitted! DC connection at the front of the device via Harting connector HAN6E/B with configuration:

- L1(Pin-1) and L2(Pin-2)

HAN: Mains connection via Harting connector HAN6E/B (Note: Plugging/unplugging under load is not permitted! Attention: Only the device-side connector is included in the delivery, not the mating connector! This can be obtained from Deutronic, Art. No.: 140442)

Figure 7.1: Pin assignment input connection

Output connection

Screw terminal M12

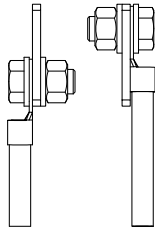


Figure 7.2: Output connection

Ua (+), GND (-); tightening torque 35 Nm

Installation according to Fig. 7.2

The output cables must be routed vertically downward and not twisted.

Communication interface^{[*1][*2]}

SUB-D 25-pin

For various purposes (e.g. potential-free relays, remote ON/OFF, signaling of operating status via external signal lamp, etc.)

Communication interface^{[*1][*2]}

SUB-D 9-pin

For communication or firmware update (standard PC interface)

[*1]

A shielded cable must be used to connect external equipment.

[*2]

WARNING: GND pins are not galvanically isolated from the power output! When connecting the device to an external control system, galvanic isolation is mandatory!

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8 Dimensions

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

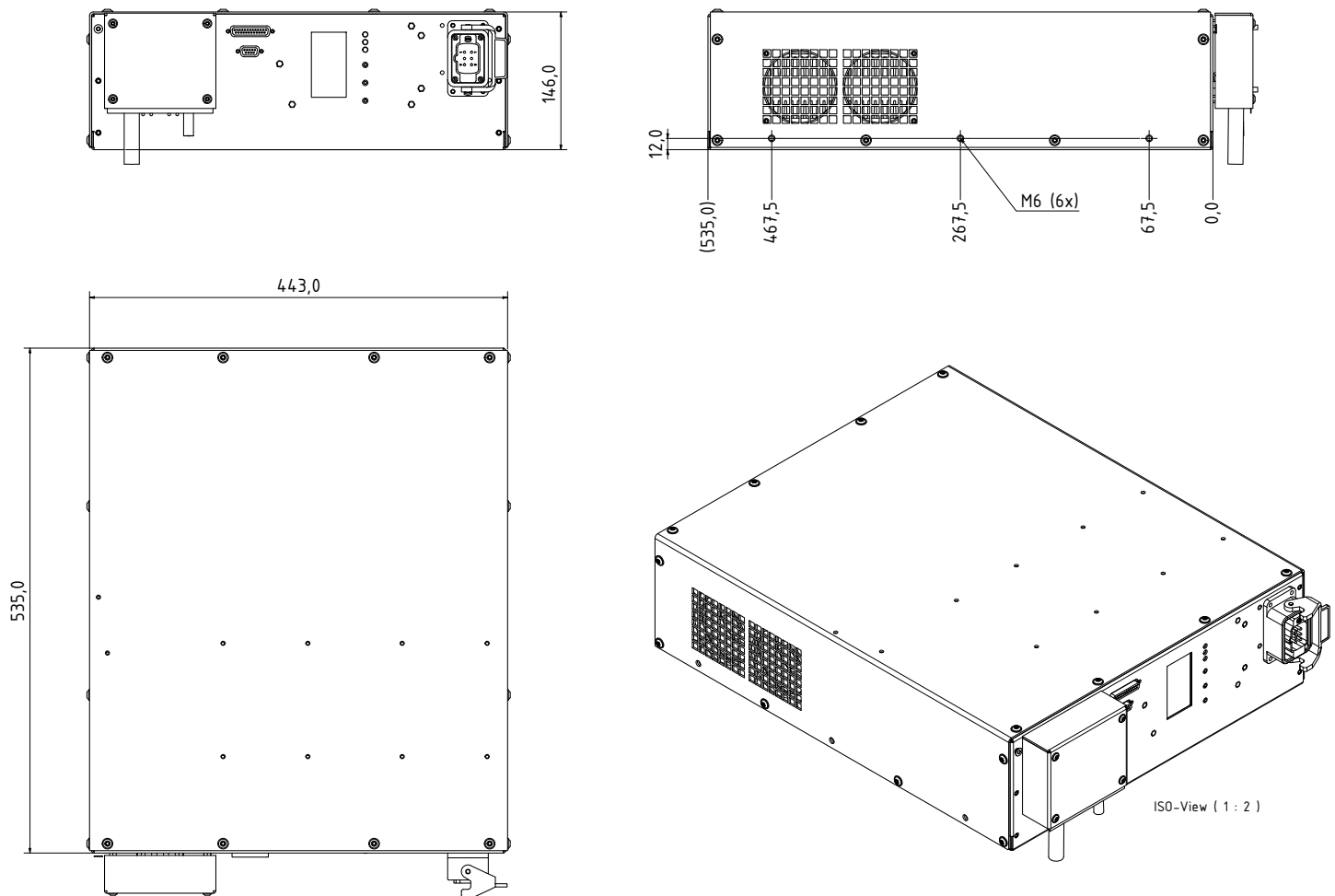


Figure 8.1: Dimensions

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9 Characteristic Curves

All characteristic curves shown were determined at an ambient temperature of 25°C and an input voltage of 400 VAC / 50 Hz (-400AC).

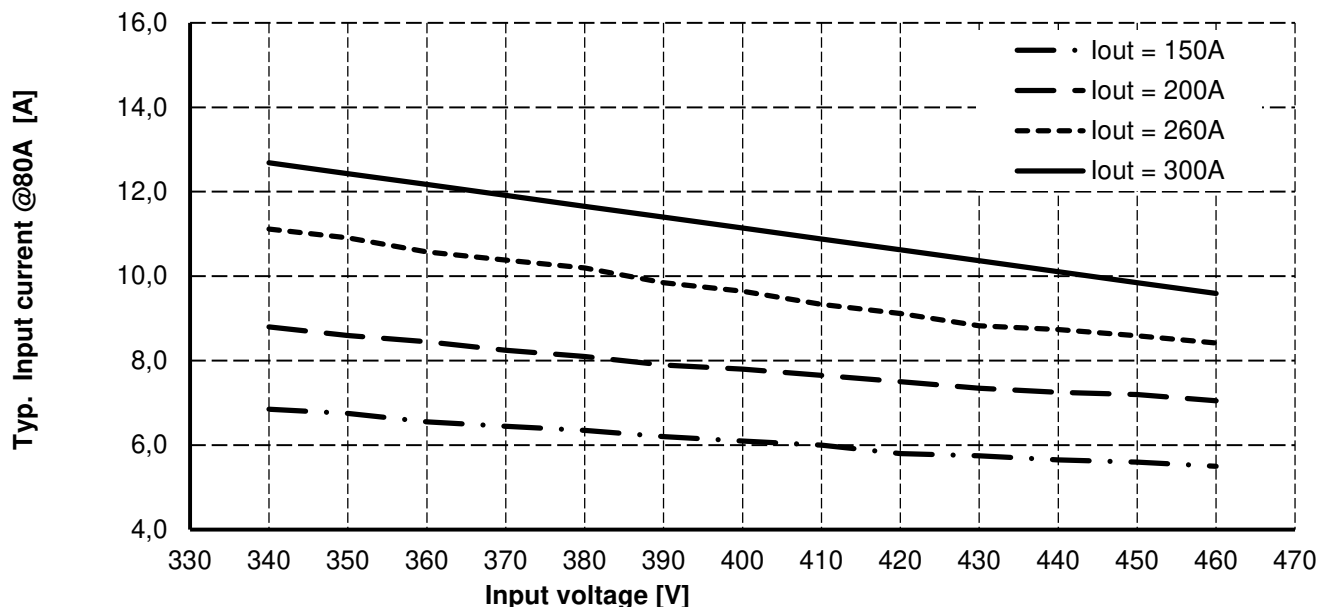


Figure 9.1: Typical maximum current consumption depending on input voltage

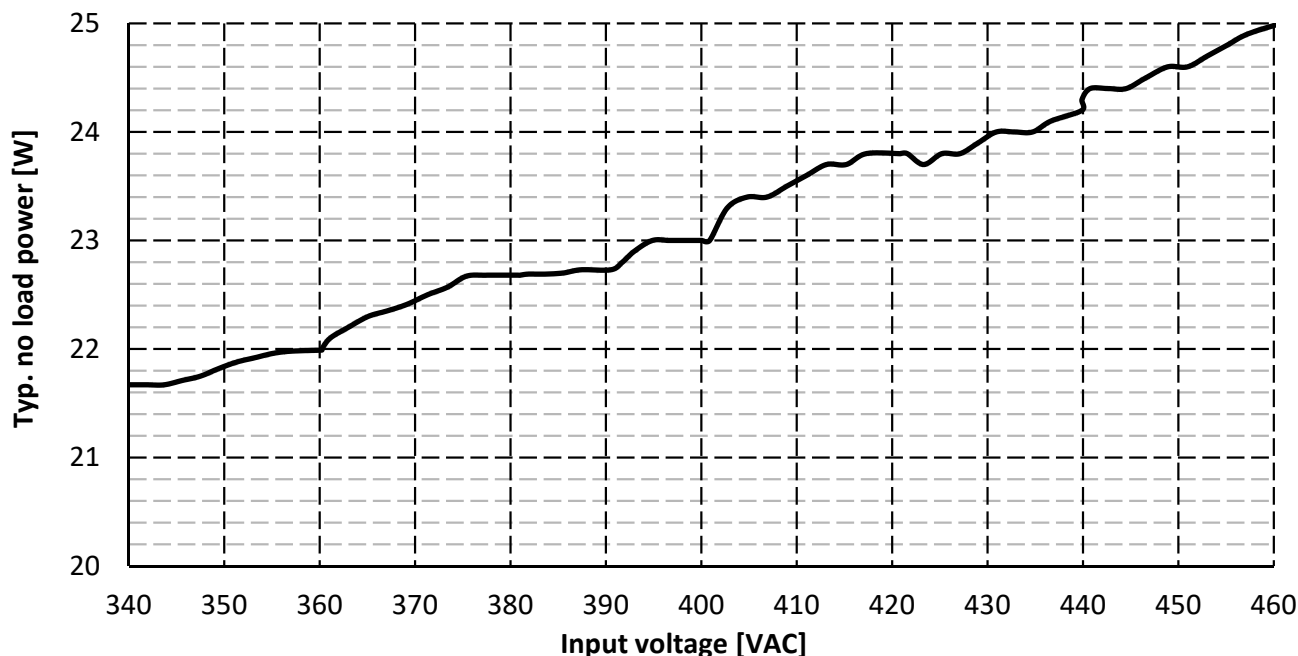


Figure 9.2: Typical standby power DBL2250...5500/3W-14-HAN-400AC

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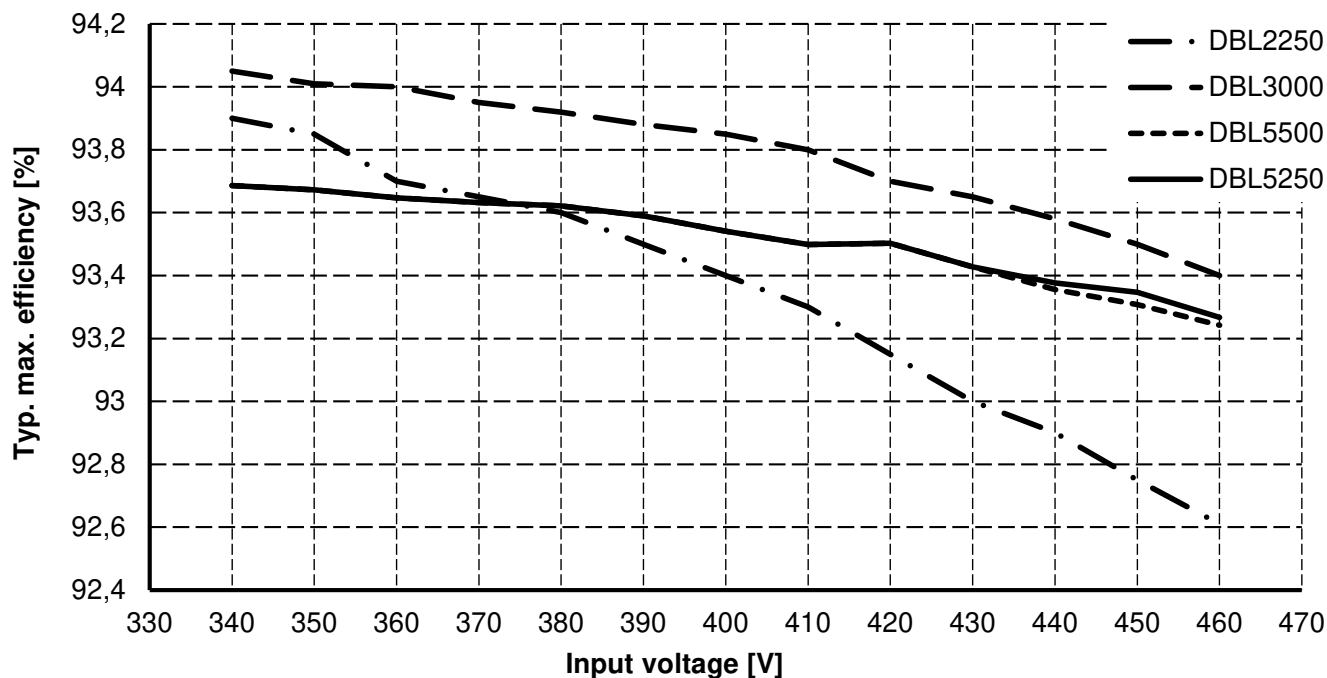


Figure 9.3: Typical maximum efficiency DBL2250...5500/3W-14-HAN-400AC

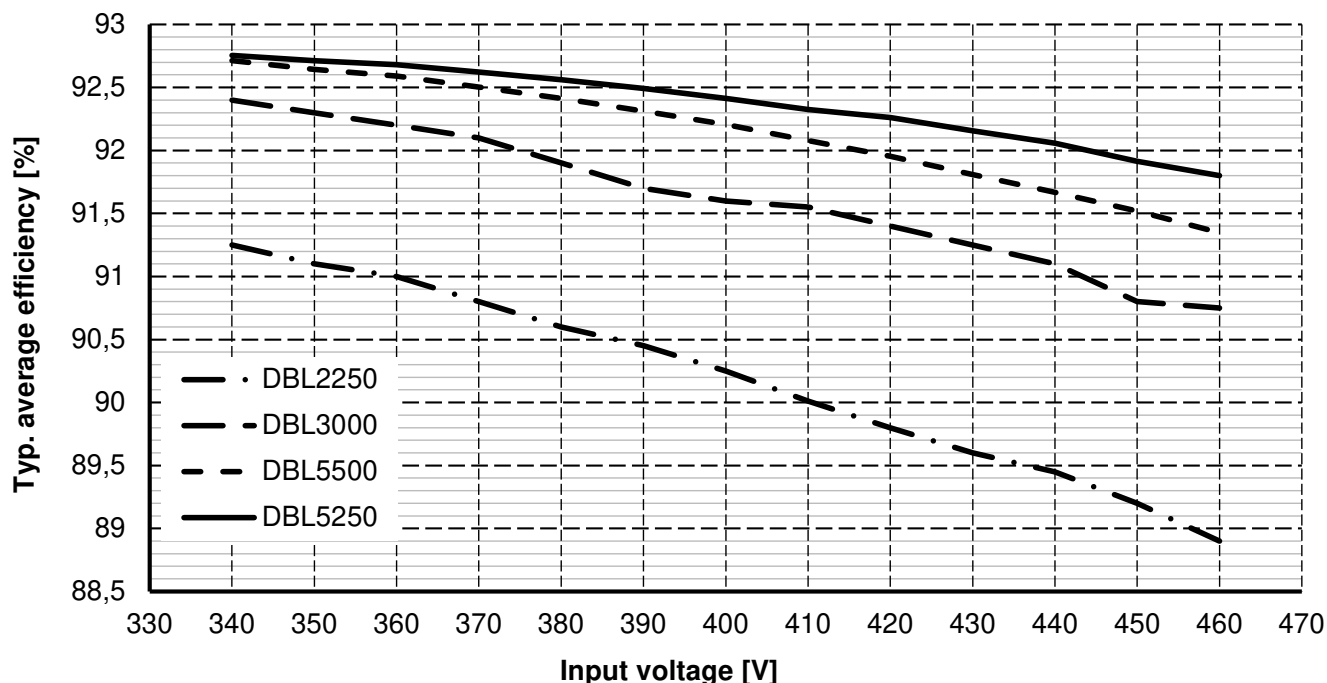


Figure 9.4: Typical average efficiency DBL2250...5500/3W-14-HAN-400AC

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10 Block Diagram

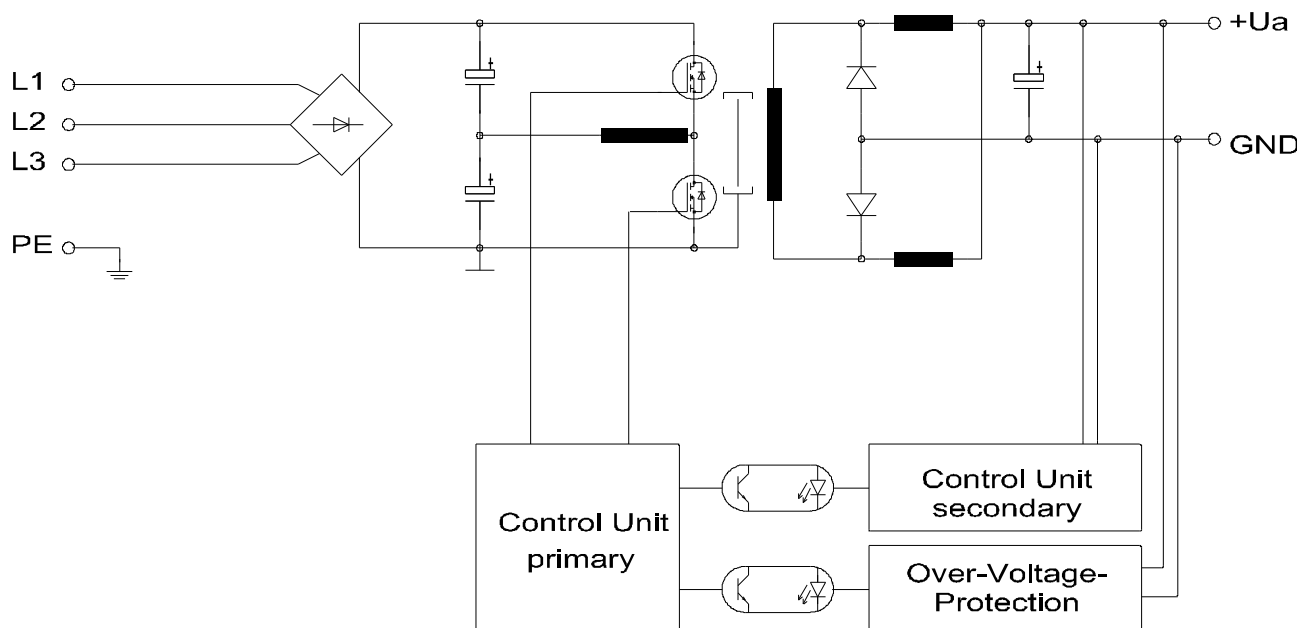


Figure 10.1: Block diagram

11 Functional Description

Features

Load detection, reverse polarity, short-circuit and overvoltage protection (OVP), cable compensation

Output (factory setting)

Monitoring of output voltage via OVP (Over Voltage Protection) and complete shutdown of charging current if the set charging voltage limit is exceeded at the output. Detailed functional description of device features can be found in the operating manual.

Charging (factory setting)

At startup of the DBL, the predefined charging voltage (e.g. 14.4 VDC) is set. If the charging current drops below the predefined threshold (e.g. 2.5 A), the charging voltage is reduced to float charge (e.g. 13.2 VDC). If the current demand increases, the charging voltage rises again to the predefined value (e.g. 14.4 VDC).

Current limitation

The current limit is user-configurable. During operation, the current limitation of the charger is automatically adjusted to operating conditions depending on mains voltage, operating temperature, load characteristics, etc. The maximum value / boost (see table on page 1) can be provided continuously for max. 1 minute with a subsequent cooling phase of approx. 4 minutes.

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