

DBL2250...3000/3W

Intelligent Charging Computer

Intelligent Charging Computer for use with 12VDC vehicle electrical systems / batteries



Abbildung ähnlich / device similar to figure



DBL2250...3000/3W-derivative table

Type	Input voltage*	Output voltage (configurable)**		Output current Nom. / Boost	Cat. No.
		Nom.	FSV		
DBL2250/3W-14-HAN-400AC	3AC 400 V	14,4 VDC	14,4/13,8 VDC	100 A / 150 A	107229/0/000
DBL3000/3W-14-HAN-400AC	3AC 400 V	14,4 VDC	14,4/13,8 VDC	150 A / 200 A	107228/0/000

*400-500VAC (wide range input) on request

**Other output voltages (e.g. 28VDC) on request

Intelligent Charging Computer

DBL2250...3000/3W

Alle Daten gemessen bei 400 VAC | 50/60 Hz, I_{out,nom} und 25°C Umgebungstemperatur, wenn nicht anders gekennzeichnet. | All parameters are specified at 400 VAC | 50/60 Hz, I_{out,nom} 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.

1 Input

Input voltage AC	-400VAC: nom. 3x 400 VAC	tolerance: 340-460 VAC TN-S, TN-C, TT, IT systems, Connection to industrial systems; 2-phase operation possible (restrictions see page 6)
Input frequency	50 - 60 Hz	tolerance: 45 - 65 Hz
Input voltage DC	480 - 600 VDC	tolerance: 440-650 VDC
Inrush current	< 25 A	temperature independent, Active regulated limitation
Max. current consumption	DBL2250: 3x 7 A DBL3000: 3x 9 A	see fig. 9.1
Standby power	≤ 25 W	see fig. 9.2
Power factor	< 0,62	-
Hold up time	> 10 ms	-

2 Output

Output voltage (configurable)	2 - 17 VDC	For an output voltage > 15,5VDC the default OVP limit must be changed.
Max. continuous output current	DBL2250: 100 A DBL3000: 150 A	-
Max. Short-term output current (Boost)	DBL2250: 150 A DBL3000: 200 A	-
Boost	Adaptive process	Cooling time depends on boost time (max. 1min). After 1 min Boost ($I_{out} > I_{nom}$) automatic cooling phase ($I_{out} \leq I_{nom}$) of 4 min.
Max. output power	DBL2250: ≤ 2250 W DBL3000: ≤ 3000 W	with Boost (Automatic power adjustment depending on input voltage, ambient temperature and load condition)
Turn on after applying the mains voltage	< 9 s	-
Initial tolerance $N_{initial}$	$U_{nom} +0,5 \% / -0,1 \%$	-
Load toleranz N_{load}	$U_{nom} +0,1 \% / -0,6 \%$	-
Ripple & Noise N_{RN}	< ± 1,5% U_{nom}	< 450 mVpp, 20 MHz measurement bandwidth
Overall tolerance $N_{overall}$	$U_{nom} +2,1 \% / -2,2 \%$	$N_{overall} = N_{initial} + N_{load} + N_{RN}$
Recovery time	< 10 ms	load change 10-90%: < 1 ms
Temperature drift	< 1,5 % U_{nom}	-25 °C ... +40 °C
operating modes	charge- / power supply- / AUTO – mode	Further modes on request

Intelligent Charging Computer

DBL2250...3000/3W

Alle Daten gemessen bei 400 VAC | 50/60 Hz, $I_{out,nom}$ und 25°C Umgebungstemperatur, wenn nicht anders gekennzeichnet. | All parameters are specified at 400 VAC | 50/60 Hz, $I_{out,nom}$ 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 EMC (Electromagnetic Compatibility)

RF-emission	EN55011 class B	With signal lamp / interface connection: class A
Immunity	EN61000-6-2	-

4 Environment

Operating temperature	-25 °C...+60 °C	Automatic output power derating – see cooling; down to -40°C on request
Storage temperature	- 40 °C ... + 85 °C	-
Humidity	93 %	No operation during dew; coated PCB by varnish
Pollution degree	2	EN61010
Climatic category	3K3	EN60721
Degree of protection	IP20, IP32 (internal electronics)	EN60529

5 General data

Electrical safety		Construction acc. to EN61010, EN60335-1, EN60335-2-29
Protection class	class I	with PE connection
Isolation voltage	3000 VAC 500 VDC	Input / Output Output / Enclosure
Max. Efficiency	DBL2250: typ. 93,4% DBL3000: typ. 93,9%	see fig. 9.3
Average Efficiency	DBL2250: typ. 90,2% DBL3000: typ. 91,7%	Averaging of the efficiency values at 25%, 50%, 75% and 100% of the nominal output power. see fig. 9.4
Display		Big sized graphic display
3-key operator panel		Menu navigation as well as configuration / parametrization of operation mode and individual device parameters (among others output voltage, current limits, security parameters, start / stop behavior, short circuit reaction etc.) Extensive functional description see operating instructions
Signals		3 high power LED's for operating state indication / alarming
Enclosure		Metal
Dimensions		see fig. 8.1
Weight	approx. 25,5 kg	without cables and package

Intelligent Charging Computer

DBL2250...3000/3W

Alle Daten gemessen bei 400 VAC | 50/60 Hz, $I_{out,nom}$ und 25°C Umgebungstemperatur, wenn nicht anders gekennzeichnet. | All parameters are specified at 400 VAC | 50/60 Hz, $I_{out,nom}$ 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.

6 Installation and Safety Instructions

The general installation and safety instructions for charging computers can be found at www.deutronic.com

The following values and supplements apply in addition to the general installation and safety instructions for charging computers:

Application	-	Built-in power supply as charging computer for professional industrial use
Mounting direction	horizontal	according to position in fig. 8.1
Free space top/bottom	> 20 mm	-
Lateral clearance (for fan openings)	> 70 mm	Air supply and exhaust must be guaranteed
Mounting points	-	6x thread holes (lateral M6 thread, max. penetration depth 10 mm) see fig. 8.1 Option: Screw-on adapters for mounting in 19" switch cabinet
Cooling	internal fan	Automatic power reduction at too high temperature due to insufficient convection. In case of fan failure, power reduction to emergency program

Attention: Components and heat sinks inside the device are under mains voltage, therefore the device must always be installed safely and protected against accidental contact! This built-in power supply may only be used if the device has been correctly installed by an authorised specialist company. The proper connection of the protective conductor via the mains connection socket must always be ensured and checked!

Connection Input / Output	-	see chapter 7
Input fuse	external	use for each unit an external 3-pole circuit breaker (16A, Type B)
Transient over voltage protection	Varistor (4,5 kA / 71 J)	L1, L2, L3
Reverse polarity protection Input	-	No integrated reverse polarity protection at the input of the device. Reverse polarity protection is only provided by the plug connector.
Reverse polarity protection output	-	In case of wrong polarity the charging process is interrupted

Limitations / Notes for two-phase operation

- Operation via two outer conductors is only recommended for emergency operation.
- The maximum power should not be drawn during continuous operation.
- The basic requirement is that the input voltage applied during operation is as high as possible in the specified range (e.g. $U_{IN} = 400\text{AC}$).
- In two-phase operation there is no reduction in output power, so that the 3-phase charging computer is also fully operational with 2-phase.
- It should be noted that the devices age faster due to the higher load on individual components (3 times the input current flows).

Charging cable / busbar

- Before selecting a cable or busbar, a power loss calculation must be carried out.
- In any case, sufficient cable cross section must be ensured.
- Example of insufficient dimensioning: charging cable with length 5m and cross-section 35mm² ($R \approx 5,4\text{m}\Omega$) - Power loss in the cable is approx. 680W at 350A!
- There is a fire hazard! Sufficient cooling must be provided (e.g. cables must under no circumstances be connected to the output when rolled up, etc.)
- Further safety instructions can be found in the operating instructions

Intelligent Charging Computer

DBL2250...3000/3W

Alle Daten gemessen bei 400 VAC | 50/60 Hz, $I_{out,nom}$ und 25°C Umgebungstemperatur, wenn nicht anders gekennzeichnet. | All parameters are specified at 400 VAC | 50/60 Hz, $I_{out,nom}$ 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 to 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.

7 Connections

Input connector

3-phase mains connector

Connection of 3AC mains cable at the front side of the device with Harting Connector HAN6E/B:

- L1(Pin-1), L2(Pin-2), L3(Pin-4), PE(Contacts on the outside)

PIN assignment – see technical drawing 7.1; Connection of N [neutral] is not permitted!

HAN: Mains connection via Harting connector HAN6E/B (Note: Mains connection is NOT hot pluggable! Attention: Included in delivery is only the plug on the device side, The mating plug can be ordered from Deutronic cat. no.: 140442)

Output connector

Screw contact M12

Ua (+), GND (-); Tightening torque 35 Nm mounting acc. to fig. 7.2

Output cables must be mounted vertically downwards and not twisted. For further informations about the output cables see also chapter 6

Interface (25-pol. SUB-D)^{[*1][*2]}

For various purposes (e.g. floating Relays, Remote ON/OFF, Indication of the operating status via external signal lamp, etc.)

RS232 (9-pol. SUB-D)^{[*1][*2]}

For communication or firmware update (standard PC interface)

[*1]

A shielded cable must be used to connect external equipment.

[*2]

ATTENTION: GND-Pins not galvanically isolated to the power output! When connecting the device with an external control a galvanic isolation must be provided!

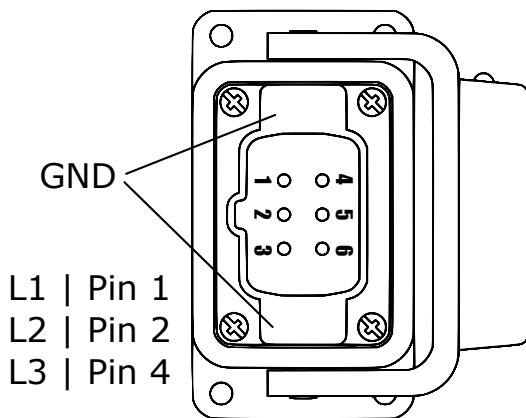


Figure 7.1: pin assignment of the input connection

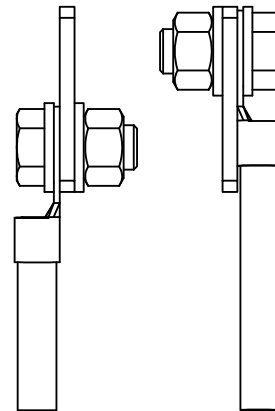


Figure 7.2: output connection

Intelligent Charging Computer

DBL2250...3000/3W

Alle Daten gemessen bei 400 VAC | 50/60 Hz, $I_{out,nom}$ und 25°C Umgebungstemperatur, wenn nicht anders gekennzeichnet. | All parameters are specified at 400 VAC | 50/60 Hz, $I_{out,nom}$ 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.

8 Dimensions

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

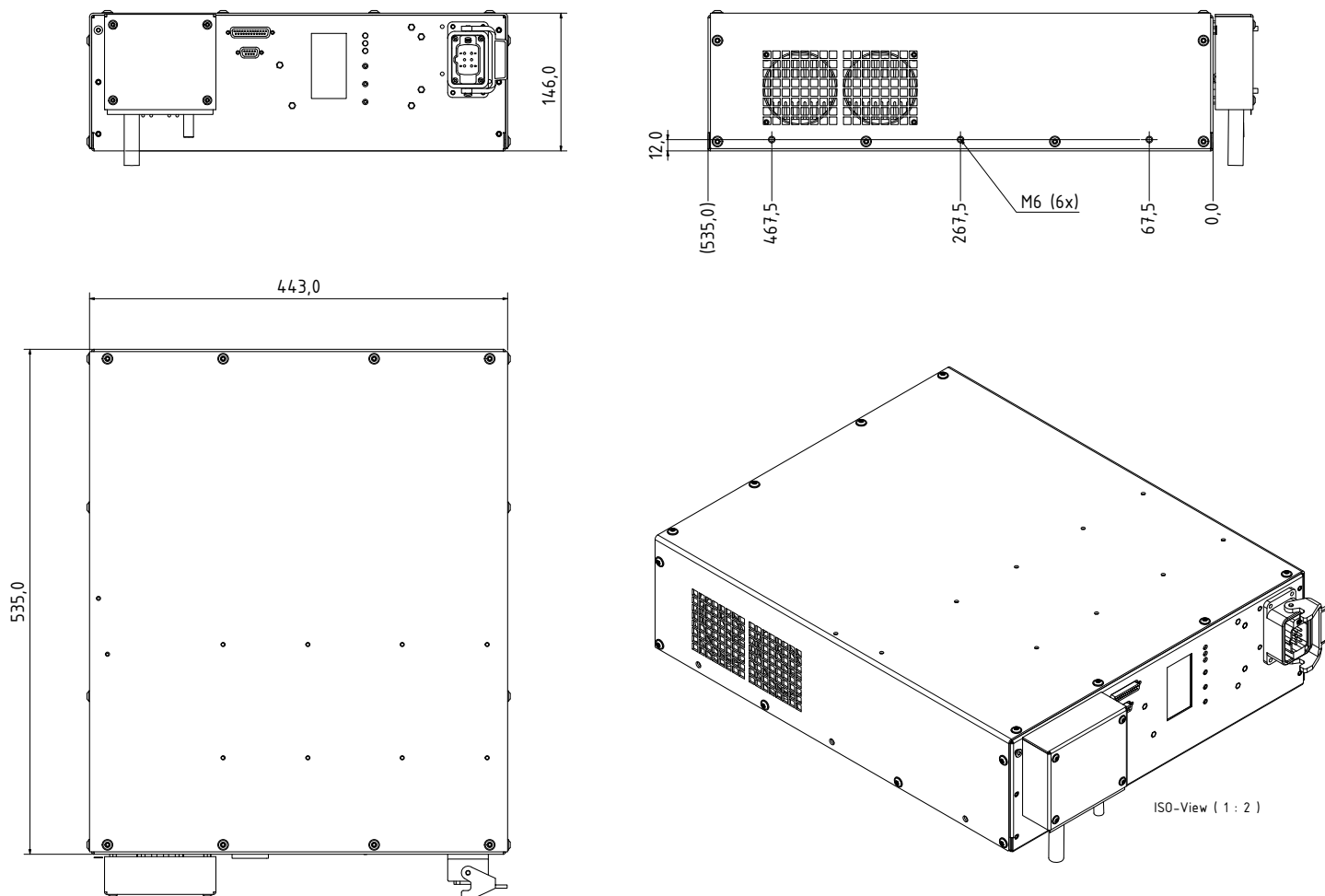


Figure 8.1: dimensions

Intelligent Charging Computer

DBL2250...3000/3W

Alle Daten gemessen bei 400 VAC | 50/60 Hz, $I_{out,nom}$ und 25°C Umgebungstemperatur, wenn nicht anders gekennzeichnet. | All parameters are specified at 400 VAC | 50/60 Hz, $I_{out,nom}$ 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

All characteristic curves shown were measured at an ambient temperature of 25°C and an input voltage of 400 VAC / 50 Hz.

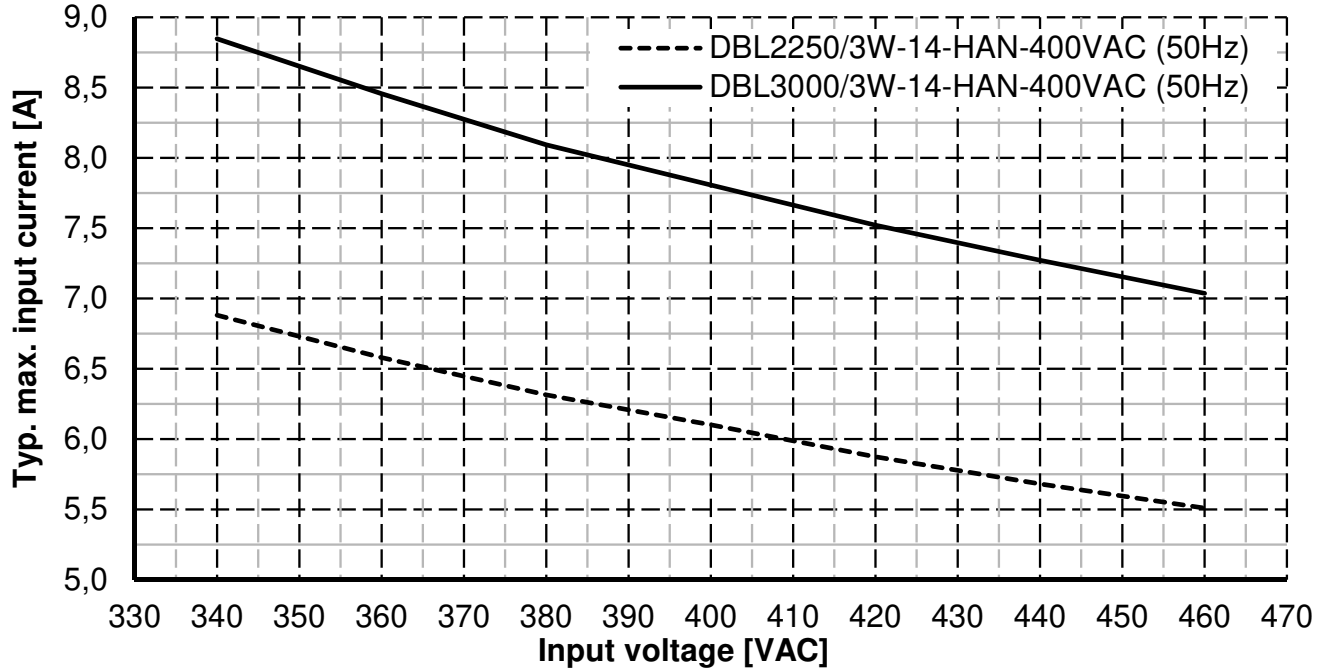


Figure 9.1: Typ. maximum current consumption depending on the input voltage

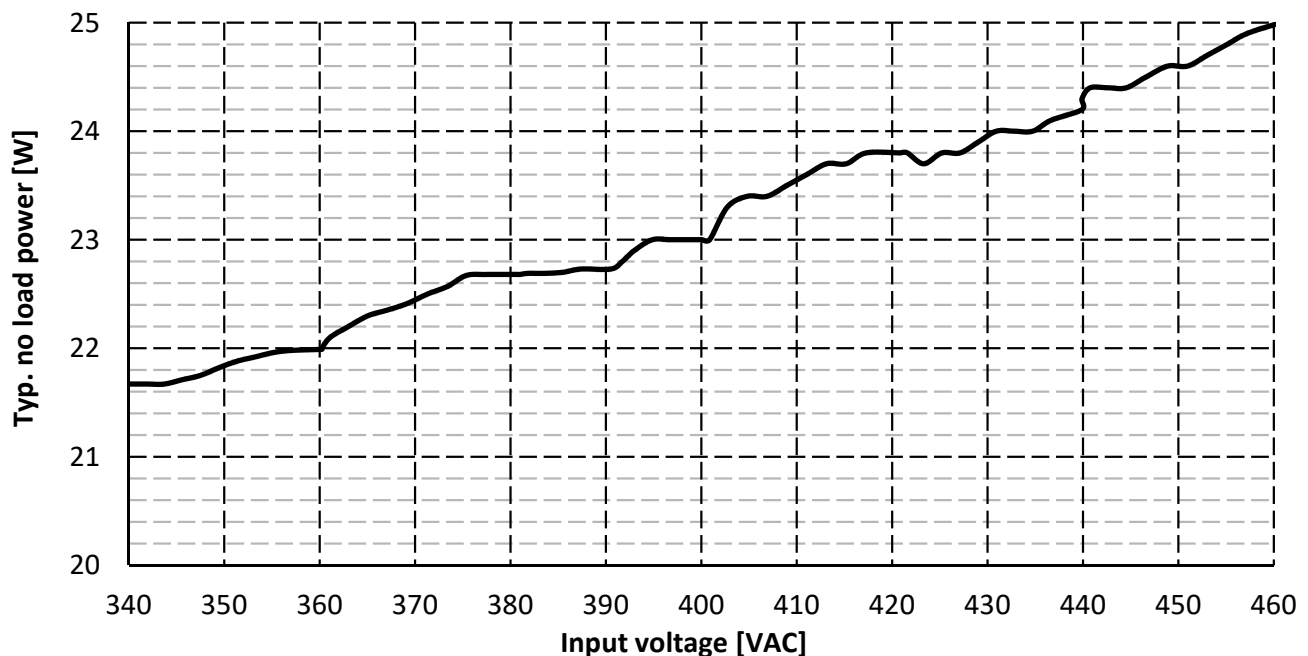


Figure 9.2: Typ. standby power DBL2250...3000/3W-14-HAN-400AC

Intelligent Charging Computer

DBL2250...3000/3W

Alle Daten gemessen bei 400 VAC | 50/60 Hz, $I_{out,nom}$ und 25°C Umgebungstemperatur, wenn nicht anders gekennzeichnet. | All parameters are specified at 400 VAC | 50/60 Hz, $I_{out,nom}$ 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 to 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.

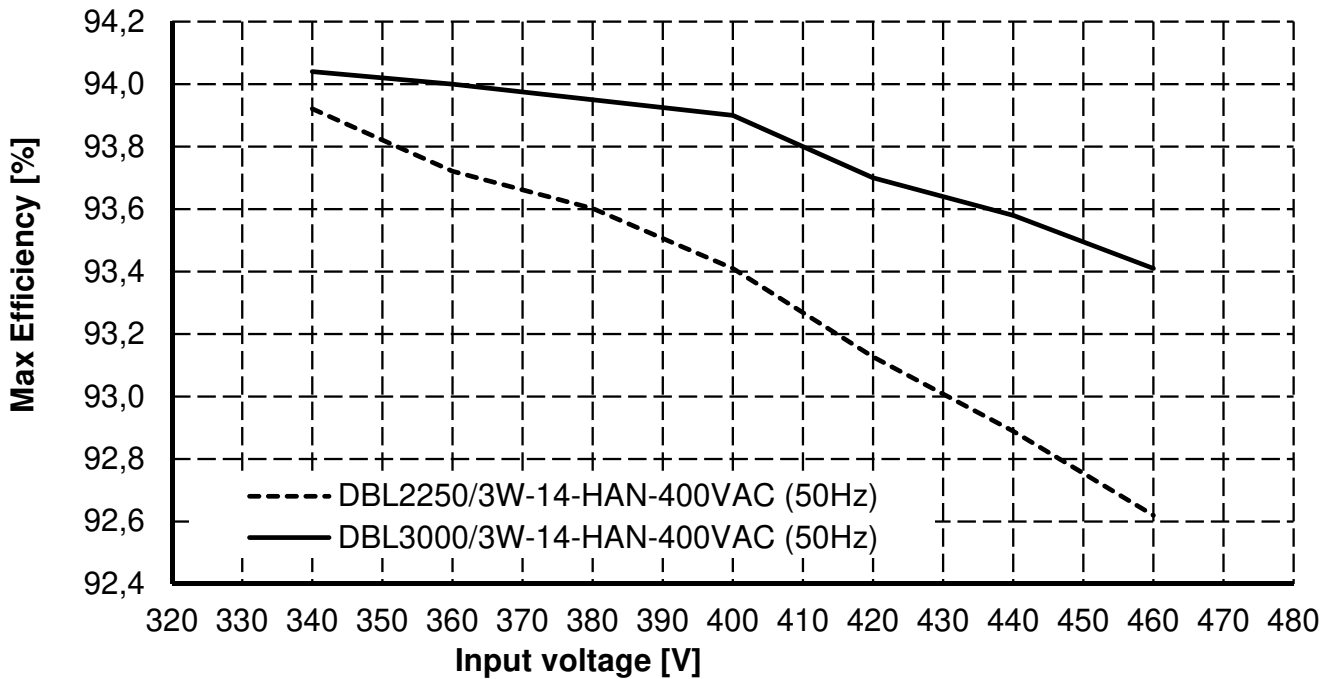


Figure 9.3: Typ. maximum efficiency DBL2250...3000/3W-14-HAN-400AC

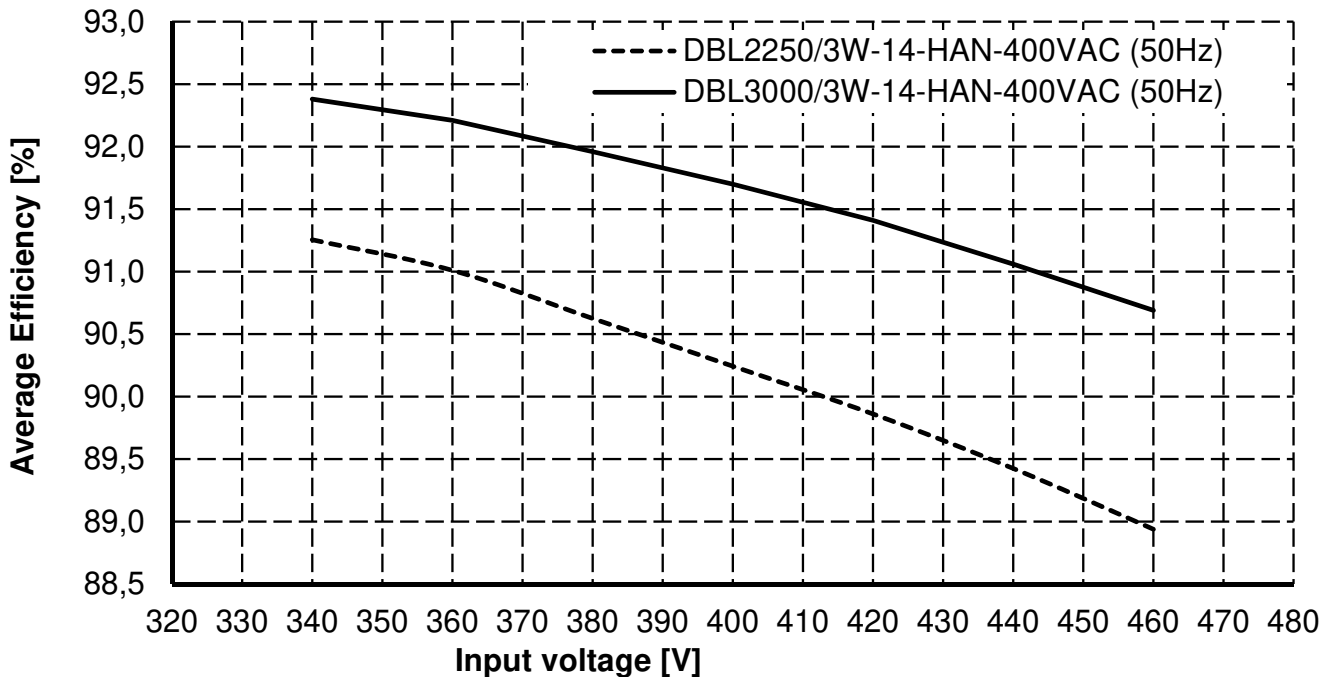


Figure 9.4: Typ. average efficiency DBL2250...3000/3W-14-HAN-400AC

Intelligent Charging Computer

DBL2250...3000/3W

Alle Daten gemessen bei 400 VAC | 50/60 Hz, $I_{out,nom}$ und 25°C Umgebungstemperatur, wenn nicht anders gekennzeichnet. | All parameters are specified at 400 VAC | 50/60 Hz, $I_{out,nom}$ 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.

10 Schematic

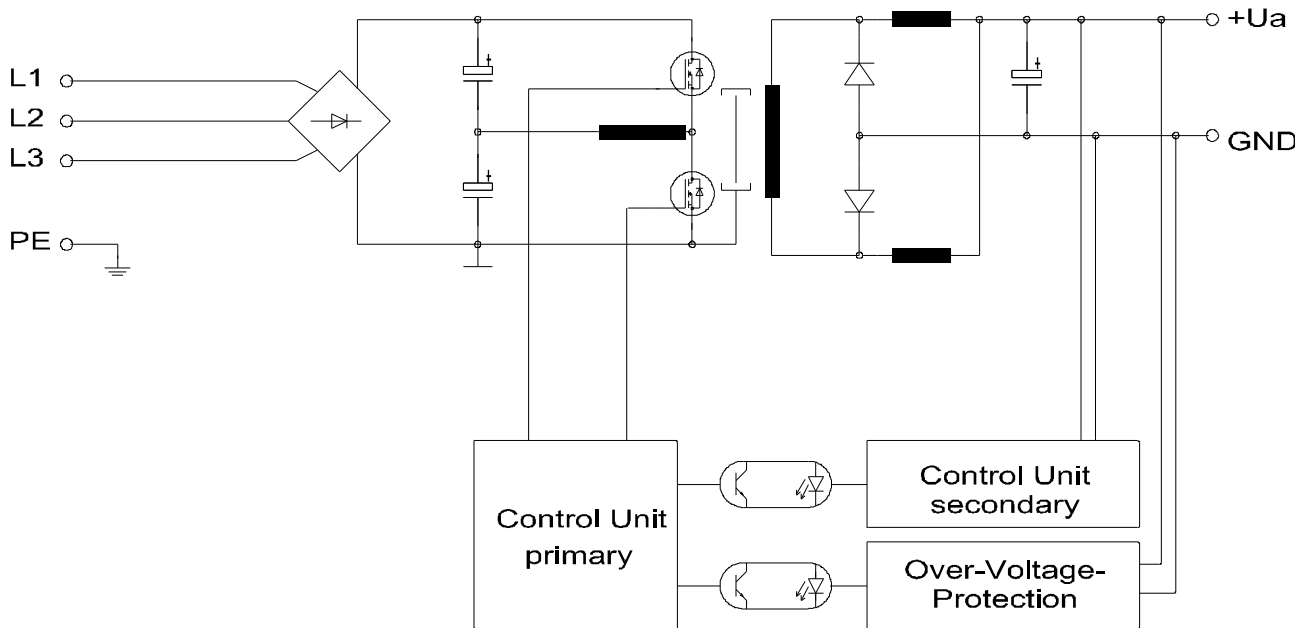


Figure 10.1: Schematic

11 Function description

Attributes

load detection, reverse polarity-, short circuit- and over voltage protection (OVP), cable compensation

Output (Factory settings)

Output voltage monitored by OVP (Over Voltage Protection) and complete disable of output current if preset charging voltage limit is exceeded. Extensive functional description of the charger's features - see operating instructions.

Charge Mode (Factory settings)

When starting the DBL the predefined charging voltage is set (e.g. 14,4VDC). If charging current goes under the predefined limit (e.g. 2,5A) then the charging voltage is reduced to trickle charge (e.g. 13,2VDC). If additional current is required, the charger will again increase the charging voltage (to e.g. 14,4VDC).

Current limiting

Current limit is user selectable. According to the operation state the current limit is automatically adjusted during operation, depending on mains voltage operating temperature, load characteristic etc. The maximum current limit value / boost (see table on page 1) is provided for max. 1 minute continuously followed by a cooling period for approximately 4 minutes.

Intelligent Charging Computer

DBL2250...3000/3W

Alle Daten gemessen bei 400 VAC | 50/60 Hz, $I_{out,nom}$ und 25°C Umgebungstemperatur, wenn nicht anders gekennzeichnet. | All parameters are specified at 400 VAC | 50/60 Hz, $I_{out,nom}$ 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.

12 Optional accessories for DBL series chargers

Charging cables (3 and 5 meters), external signal lamp, Ethernet/WLAN adapter, PC software and more accessories you will find on our webpage www.deutronic.com.

(For DBL series chargers with max. output current >100A we recommend using charging cables with a diameter of at least 25mm²).

Intelligent Charging Computer

DBL2250...3000/3W

Alle Daten gemessen bei 400 VAC | 50/60 Hz, $I_{out,nom}$ und 25°C Umgebungstemperatur, wenn nicht anders gekennzeichnet. | All parameters are specified at 400 VAC | 50/60 Hz, $I_{out,nom}$ 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.