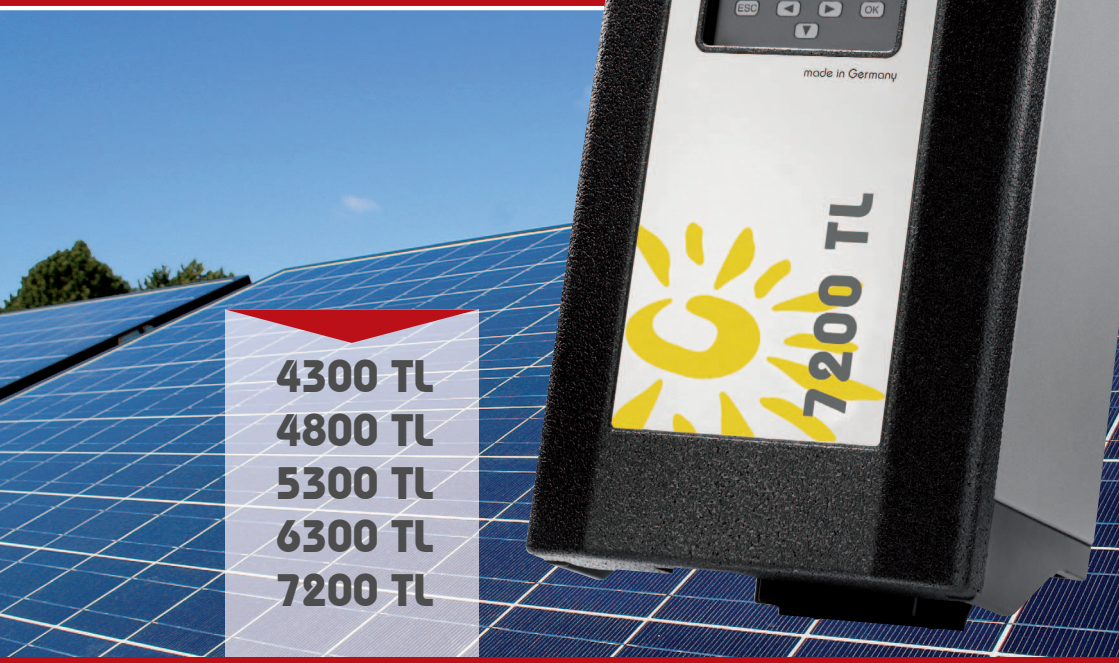
DIEHL AKO

GB

Installation and Operating manual

PLATINUM
INVERTER TL



4300 TL
4800 TL
5300 TL
6300 TL
7200 TL

Mat. No. 734 559-AB, Version 05/2010

PLATINUM Inverter 4300 TL, 4800 TL, 5300 TL, 6300 TL, 7200 TL

Thank you for purchasing a PLATINUM Inverter 4300 TL, 4800 TL, 5300 TL, 6300 TL, 7200 TL.

In this instruction, we have compiled all information that is important for installation and operation.

If you still have any trouble, please call our service hotline.

Service hotline

The Diehl-Controls service hotline is accessible as follows:

Tel +49 7522 73 777

Fax +49 7522 73 737

E-Mail service.platinum@diehlako.com

PLATINUM Inverter 4300 TL, 4800 TL, 5300 TL, 6300 TL, 7200 TL

1 Symbols

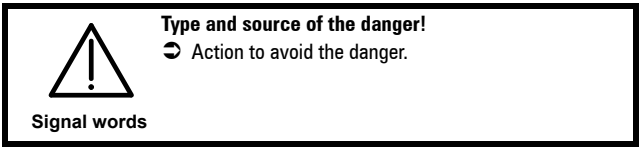
1.1 Warning notices

Classification of warning notices

The warning notices differentiate between three types of dangers indicated by the following signal words:

- ➔ **Caution** warns of material damage.
- ➔ **Warning** warns of bodily harm.
- ➔ **Danger** warns of a danger to life.

Layout of the warning notices



1.2 Other symbols

Instructions

Layout of instructions:

➲ Instruction to do something.

Result of the action, if necessary.

Lists

Layout of bulleted lists:

- ➔ List level 1
  - → List level 2

Layout of numbered lists:

1. List level 1
2. List level 1
   2.1 List level 2
   2.2 List level 2

1.3 Symbols on the product

	Vorsicht: Gehäusetemperatur >60°C ! Caution: The temperature of the enclosure can be higher than 60°C !
	Warnung: Eingriffe in und am Gerät sind nur durch Elektro-Fachkräfte durchzuführen ! Warning: All work inside and around the device must be done by skilled personnel only !
	Warnung: Entladezeit der Kondensatoren bis zu 30 min. ! Warning: The capacitors within the device require up to 30 minutes to discharge !

2 Safety and Dangers

- Use inverters according to their intended use.
- Use inverters in original and technically fully intact condition without unauthorized modifications.
- Ensure that inverters are installed and serviced by qualified specialists only.
  - → The qualified specialist personnel requires a license from the relevant energy suppliers.
- Always mount inverters in a vertical position.
- Ensure that all protection devices are fully operational.
- Verify that ventilation openings are not blocked or covered.
- Protect inverters from direct sunlight.
- Prior to installation and maintenance work, make certain that the inverter is de-energized.
- Ensure that regulations stipulated by trade associations and inspection authorities and agencies are observed and that the connection conditions of the relevant energy supplier or equivalent national and international rules and regulations are adhered to.
- Observe conditions of use (see 14 Technical Data).

3 Intended Use

- Use the inverter exclusively to feed photovoltaically converted solar energy into the public 230 V/50 Hz mains.
- Do not use the inverter in autonomous power systems.
- Do not use the inverter in vehicles.

4 Function

4.1 Variants

The PLATINUM line includes the following variants with different power ranges (see 14 Technical Data):

- ➔ PLATINUM 4300 TL
- ➔ PLATINUM 4800 TL
- ➔ PLATINUM 5300 TL
- ➔ PLATINUM 6300 TL
- ➔ PLATINUM 7200 TL

Possible types:

- ➔ with DC disconnector
- ➔ without DC disconnector

4.2 Options

Upgrades for an inverter or an inverter system:

- ➔ Inverter networking via EIA 485 bus.
  Much easier and more comprehensive input and monitoring options.
- ➔ Optical and acoustical indicator (warning) devices.
- ➔ Remote monitoring or remote readout with PLATINUM WebMaster
- ➔ Central display of systems with PLATINUM ViewMaster
- ➔ Evaluation of system data with PLATINUM PV-Monitor
- ➔ Remote control of AC power in connection with PLATINUM PowerCommander, PLATINUM WebMaster and a control device on the mains supply side.

5 Mounting

5.1 Scope of delivery

- ➔ Inverter
- ➔ Mounting fixture
- ➔ Brief instruction

Note *A detailed installation and operating manual is available in the download area of our website www.diehlako.de.*

5.2 Unpacking

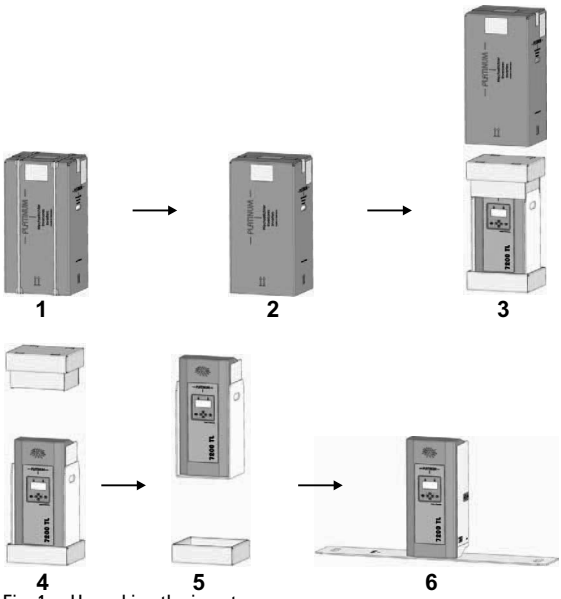


Fig. 1 Unpacking the inverter

Unpack the inverter as follows:

1. Put the box in vertical position according to box markings.
2. Cut packing straps without damaging the box.
3. Remove the cardboard sleeve.
4. Remove the lid pad.
5. Hold the inverter at the grip openings and lift it out of the base pad.
6. Put down the inverter.

5.3 Mounting the inverter

Danger

Danger to life due to electric shock!

➲ Have the inverter opened exclusively by the PLATINUM service or service partners authorized by DIEHL Controls.

Danger

Danger to life due to incorrect connection of inverter!

➲ Have inverters installed by qualified specialists only. The qualified specialist personnel requires a license from the relevant energy suppliers.

Danger

Danger to life due to inverter dropping from the wall!

➲ Use mounting elements appropriate for the mounting wall and the weight of the inverter unit.

➲ Wear protective footwear when mounting and dismounting inverters.

Caution

Material damage due to unprotected installation site!

➲ Observe admissible ambient temperature (see 14 Technical Data).

Caution

Material damage due to excessive dust formation!

➲ Protection type IP66 does not apply to the communication interface.

➲ Avoid excessive dust formation.

➲ Avoid dust formation with electrically conductive dust particles.

Note *DIEHL Controls advises against installing the inverter in living spaces.*

Protector

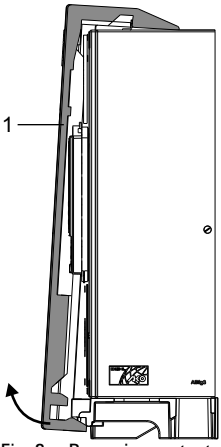


Fig. 2 Removing protector

(1) Protector

➲ Hold protector **1** on bottom side and pull away from inverter.

During assembly:

➲ Hang protector on left or right side of inverter.
➲ Hang protector in upper fixture.

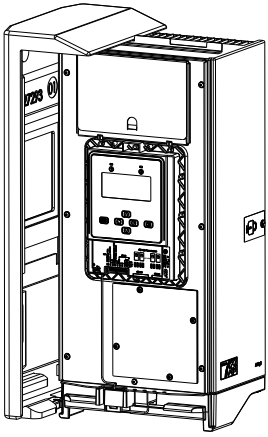


Fig. 3 Protector position during assembly

Mounting fixture

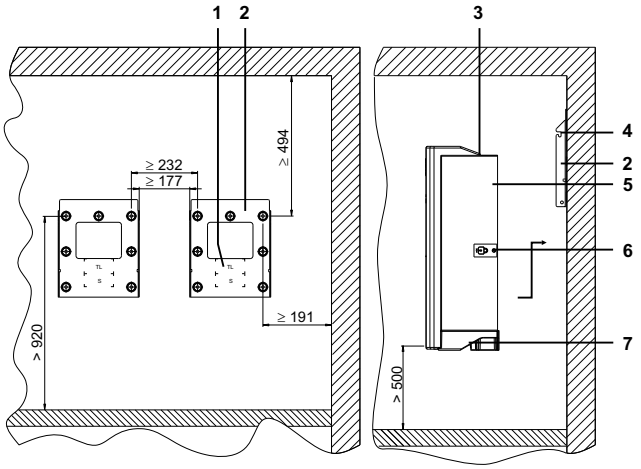


Fig. 4 Spacing for position of mounting fixture (indications in mm)

(1) Display-Position
(2) Mounting fixture
(3) Ventilation openings
(4) Slotted piece for mounting bolts
(5) Mounting bolts
(6) Locking screw
(7) Grip moldings

Install the mounting fixture as follows:

- ➲ Unscrew mounting fixture **2** from the back of the inverter.
  - ➙ Two locking screws secure the inverter in the mounting fixture.
  - ➙ The locking screw **6** is marked by a paper strip with a lock symbol.
  - ➙ Do not remove the paper strip.
- ➲ Mark the mounting holes using the mounting fixture as a template.
  - ➙ Observe dimensions and distances.
  - ➙ Observe a minimum distance of 50 cm to the floor.
  - ➙ The later display-position **1** is stamped into the mounting fixture **2** as a contour.
  - ➙ The display position **1** for the PLATINUM TL series is marked TL.
- ➲ Drill the mounting holes and insert the screw anchors.
- ➲ Bolt down mounting fixture **2**.

PLATINUM Inverter 4300 TL, 4800 TL, 5300 TL, 6300 TL, 7200 TL
Mounting

Inverter

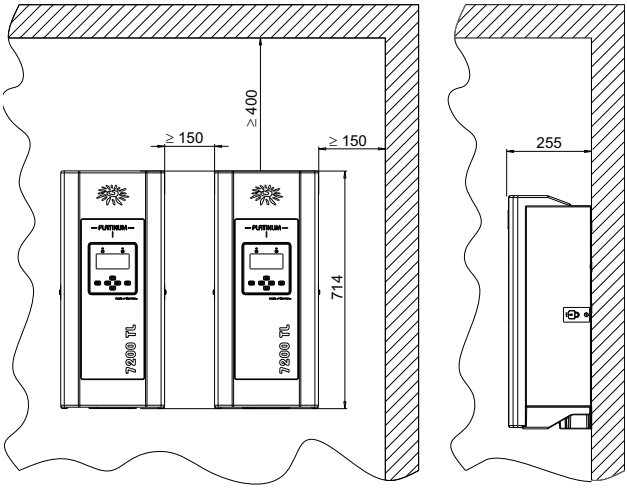


Fig. 5 Spacing for mounting of inverters (indications in mm)

Mount inverters as follows:

- ➲ Observe a minimum distance of 50 cm to the floor.
- ➲ Slide cooling element of the inverter into the mounting fixture **2**. Use the outer cooling fins as guides in mounting fixture **2**.
- ➲ Hold the inverter at molded grips **7** and push up until mounting bolts **5** drop into slotted pieces **4** on both sides.
- ➲ Let down the inverter.

Mounting bolts **5** are seated in the slotted pieces.

- ➲ Verify that minimum distances are kept (see Fig. 5).
- ➲ Verify that the inverter is hanging in the mounting fixture correctly.
- ➲ Secure the inverter by inserting and tightening the locking screw **6** in the marked position (paper strip).
- ➲ Ensure that the locking screw **6** is accessible for the dismounting of the inverter.

5.4 Connection of the inverter

Danger

Danger to life due to high AC voltage!

- ➲ Switch off the mains power supply (AC side) before connecting the inverter (fuse).
- ➲ Connect the inverter exclusively to TN or TTmains (see IEC 60364-1) with 230 V.
- ➲ Maximum allowed fuse on alternating voltage side: 40 A.

Danger

Danger to life due to high DC voltage!

- ➲ Prior to connecting the inverter, verify that voltage is applied to the generator-side DC terminal.
- ➲ Prior to connecting the inverter, verify that the DC voltage polarity is correct.
- ➲ Wear insulating protective clothing and face protection if there is voltage present at the DC input.
- ➲ Remove DC cable exclusively if inverter is out of operation.

Caution

Risk of burns due to hot surfaces!

After a longer operation with high power, housing temperatures of > 60 °C are possible.

- ➲ Do not touch hot surfaces.

Caution

Material damage due to DC plug connectors that don't fit!

- ➲ Use exclusively DC cable connectors and DC receptacles of the same type and manufacturer.
- ➲ Make sure that cable connector in latched in receptacle correctly.

Caution

Lack of performance and functionality due to inappropriate cables!

- ➲ Ensure that wire cross sections and fuses conform to VDE 100 Part 430.
- ➲ Ensure that any network cables between two inverters are not longer than 30 m.
- ➲ For DC cables, use a wire cross section of at least 2.5 mm^2.
- ➲ Ensure that the maximum AC cable resistance of 0.5 Ω is not exceeded.

Caution

Material damage due to excessive voltage!

- ➲ Ensure that the max. DC voltage is not exceeded (see 14 Technical Data).
- ➲ Connect exclusively safety extra low voltage on the contact of the external indicator.

Terminal side

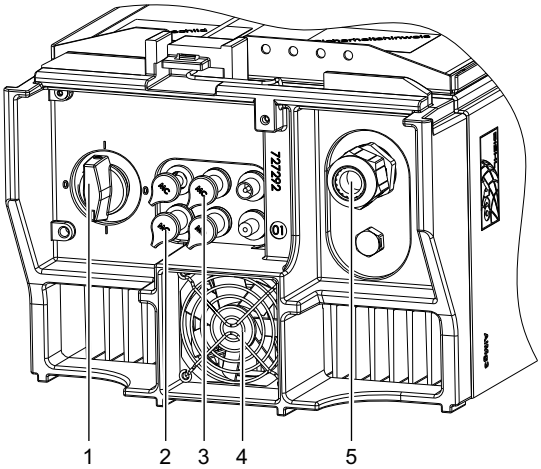


Fig. 6 Terminal side inverter

(1) Switch knob DC disconnector (optional)
(2) DC terminals -
(3) DC terminals +
(4) Fan (not for 4300 TL)
(5) Bushing for AC voltage cable

AC terminal

Caution

Destruction of the inverter due to high AC voltage!

➲ Never connect the invterter between two phases.

Caution

Destruction of inverter due to high nominal alternating power!

➲ Observe the maximum admissible unbalanced load of power plant operator.

➲ Distribute inverters between the three phases in such a way that the difference of alternating power on the phases does not exceed the maximum admissible unbalanced load.

Example

In case of an unbalanced load of 4,600 W (nominal power) it is possible to connect a PLATINUM inverter 5300 TL to a phase as a single device. In case of a PLATINUM inverter 7200 TL, the nominal AC power exceeds the admissible value. In this case, it is necessary to divide the nominal AC power to at least two inverters with less power and to at least two phases.

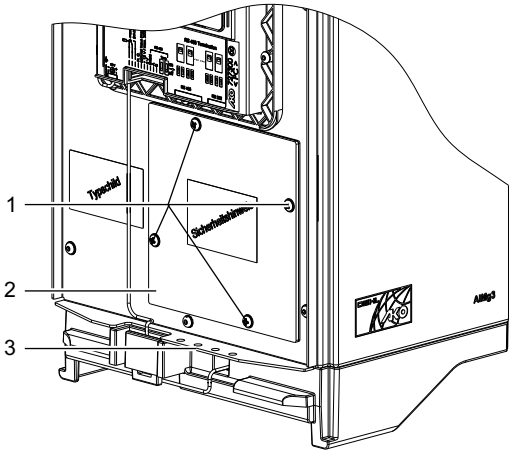


Fig. 7 Cover of AC voltage connection

(1) Screws
(2) Cover of AC voltage connection area
(3) Tray for screws

Establish AC voltage connection as follows:

- ➲ Open cover of AC voltage connection area **2**.
- ➲ Put screws in tray **3**.
- ➲ Put cable through bushing for AC voltage connection cable.

Note

Suitable for cable diameters between 12 and 21 mm.

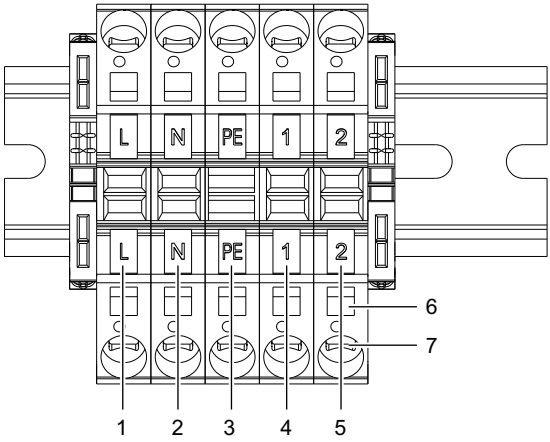


Fig. 8 AC terminal

(1) L1 (feed phase)
(2) N
(3) PE
(4) L2 (exclusively for 3-phase ENS)
(5) L3 (exclusively for 3-phase ENS)
(6) Release opening
(7) Cable input

To connect the cables:

- ➲ Use lines matching the type-dependent AC.
- ➲ Fuse lines accordingly.
- ➲ Stick screwdrive in release opening **6** and press release.
- ➲ Push cable into cable input **7** as far as it will go.
  Ensure that no uninsulated cable parts are visible.
- ➲ Unlock release.
- ➲ Pull out screwdriver.

Note *Terminal suitable for cable diameter between 2.5 and 10 mm^2.*

To guarantee degree of protection IP66:

- ➲ Use a seal between cover and housing.

When the AC voltage connection is completed:

- ➲ Close cover of AC voltage connection area.
- ➲ Fasten cover with screws.

DC voltage connection

Establish DC voltage connection as follows:

- ➲ Establish a connection to the solar panel on the DC input with a cable with a DC plug connector.
- ➲ If more than one strand is connected, ensure that the number and type of solar modules and the PV power are identical for every strand.
- ➲ Put protective caps on unused plug connectors.

Connection to PLATINUM network

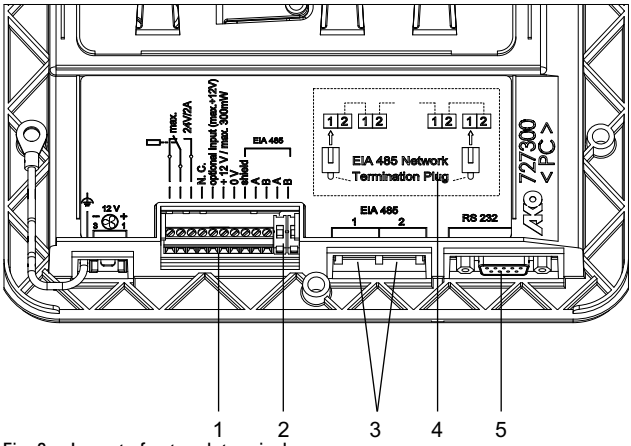


Fig. 9 Layout of network terminals

(1) Terminal strip
(2) Twist-on connector for EIA 485 bus line
(3) EIA485 network terminals
(4) Connection diagram for terminating resistor
(5) PC interface to EIA232 (exclusively for service purposes)

Note

It is possible to connect up to 50 PLATINUM inverters.

Terminal strip connectors

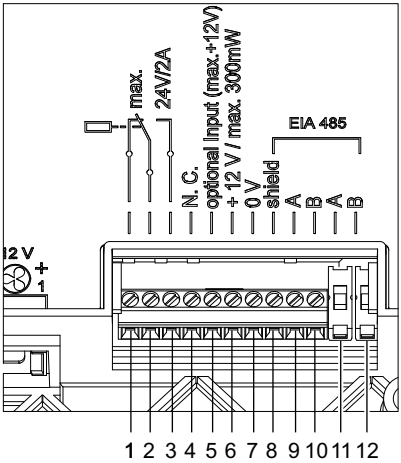


Fig. 10 Layout of terminal strip connectors

(1) Alarm contact (break contact)
(2) Alarm contact (center contact)
(3) Alarm contact (NO contact)
(4) not allocated
(5) Input, max. 12 V (option)
(6) Supply voltage for ext. consumer 12 V, max. 300 mW
(7) Supply voltage for ext. consumer 0 V,
(8) Shielding EIA485 (RS485)
(9) Line A of EIA485 bus line
(10) Line B of EIA485 bus line
(11) Line A of EIA485 bus line
(12) Line B of EIA485 bus line

Note

Terminal strip is protected through cover Opening the cover is possible without tools.

DIEHL Controls recommends to use connectors if EIA485 bus line as follows:

➔ For incoming line pair:
  → connector 9
  → connector 10
➔ For outgoing line pair:
  → connector 11
  → connector 12

Network connection

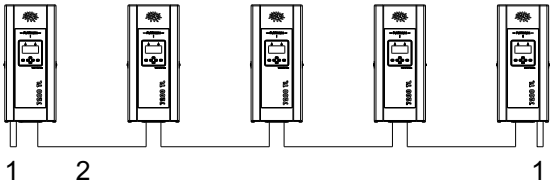


Fig. 11 Network layout

(1) Termination option for engaging the terminating resistor
(2) EIA485 bus line

Warning

Material damage due to interchanged lines!

- ➲ Ensure that lines A and B are allocated correctly.
- ➲ Use exclusively CAT-5 cables with twisted lines and shielding.

Establish connection to network as follows:

- ➲ Establish connection between inverters or inverters and monitoring devices on serial interface EIA485 using a cable with RJ45 plugs or cable on terminal connector (connection A and B) (see Fig. 9).
- ➲ For lines without RJ45 plugs, connect lines A and B in RJ45 plugs on connectors A and B.

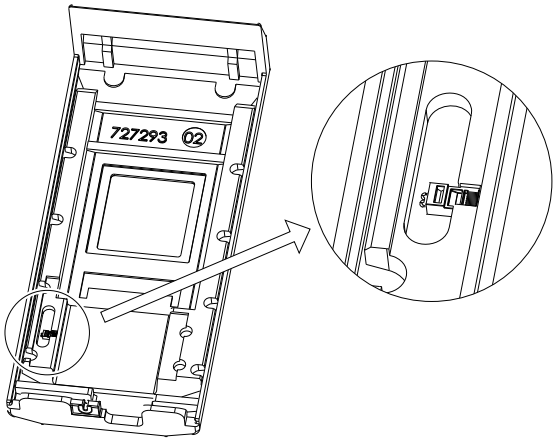


Fig. 12 Termination plug

It is possible to engage the integrated terminating resistor on both open ends of the network.

Note

Plugged-in termination plugs guarantee a functioning network. The termination plug is clamped into the inside of the protector and fixated with a sticker labelled ***Netzwerk Terminierungsstecker / Network Termination Plug****.*

On first and last inverter in PLATINUM network:

➲ Plug termination plug into slot for network connection **1**.

Alarm contact

➲ Connect any external indicator device to the potential-free relay contact.
  → When an error is detected, the contact is closed and activates the indicator device (optical or acoustic warning).
  → Setting: see menu Settings → function Alarm contact

➲ Only use safety extra low voltage (SELV) of max. 24 V as supply voltage.

Phase Balancer

In order to use the PhaseBalancer, it is necessary to connect the inverters via the RS 232 interface. The connection is established with the connecting cable provided with the Phase Balancer. For information on Phase Balancer and connection of the connecting cable, see installation and operating manual PLATINUM Phase Balancer.

Mounting protector

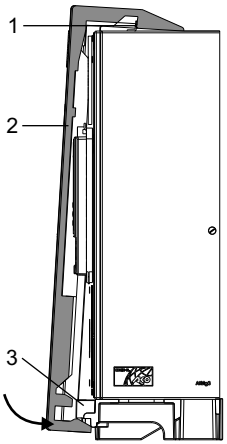


Fig. 13 Mounting protector

(1) upper fixture
(2) Protector
(3) lower fixture

➲ Put upper part of protector **2** on upper fixture **1** and slightly push down housing.
➲ Slide bottom part of protector in liwer fixture **3**.

6 Start Up

Note

Independent of demand, the inverter activates the fan as soon as power input is started (e.g. every morning). When feeding in, the inverter activates the fan as required.

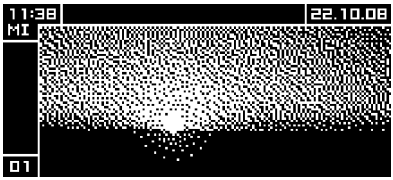
During the startup, several basic settings such as language selection, date and time settings are set.

Note

In order to transfer all settings correctly, it is necessary to do one complete startup.

If several inverters are installed which are networked via the EIA 485 interface, the startup can be carried out at any one of the installed inverters (master programming). This inverter transmits the configuration settings to all other inverters in the network. Every inverter is automatically assigned a number at its initial startup. The free allocation of this number is possible in a further step.

The inverters that are not used for input entries display other screen contents depending on the menu. If no entry is possible, the inverter shows the start screen.



Start screen

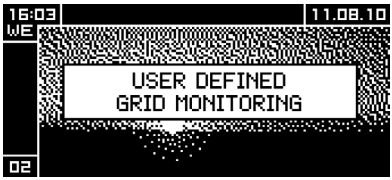
If any input has been entered in the inverter, the inverter shows the start screen after a restart.

All inverters that are not operated during the configuration will show the blocking screen.

Note

If parameters of the inverter have been adapted to special requirements of the energy supplier, this is indicated on the start screen.

After changing parameters, the inverter shows the following screen:



6.1 Initial startup of inverter

Caution

Lack of function due to missing setting!

- ➲ Adjust Phase Balancer settings within 4 hours after startup of inverter (see 6.2 Phase Balancer). Setting at a later time is no longer possible.
- ➲ Reconfigure country code within four hours after startup of inverter. Setting at a later time is no longer possible.

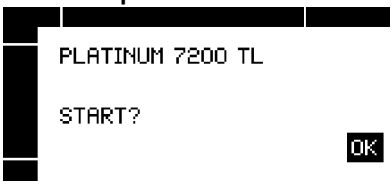
➲ Switch on the main power supply (fuse).

For inverters with DC disconnector:

➲ Set switch knob to 1.

The inverter is supplied with power. Configuration through the following dialogs.

Initial startup



Key	Function
OK	Start configuration process with this inverter.

Language selection

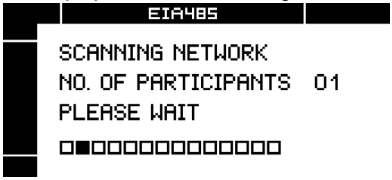
Key	Function
▲▼	Select language.
OK	Accept selected language.

After the configuration process has been started:

➔ the inverter scans the network connected by the EIA485-Bus for other inverters.
➔ all inverters connected to the network are blocked.

EIA485 bus

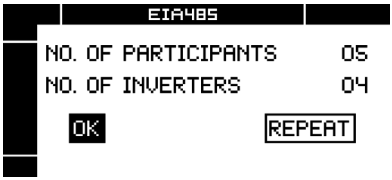
As long as the network scan (Scanning Network) is still in process, the display shows the following screen:



When the network scan is completed, the display shows the number of detected bus participants. In case of a single inverter, the display shows 01.

Note

The network scan can only recognize more than 1 inverter if the inverters are correctly networked via the EIA 485 interface.



If the number of detected bus participants (e.g. inverters, data loggers, etc.) does not agree with the installation:

➲ Check connections (EIA 485 interfaces) if required.
➲ Select REPEAT.
➲ Press OK key.

If the number of detected bus participants is in agreement with the installation:

➲ Select OK.
➲ Press OK key.

In case of a single inverter:

➔ Screen **Country Code** appears.

In case of several networked inverters:

➔ Screen **Inverter numbering** appears.

Note

If one or several inverters have been replaced or not all inverters are numbered correctly, this can be corrected (see 6.3 Replacing devices).

Inverter numbering

It is possible to network several inverters via the EIA 485 interface. Inverter numbers are allocated automatically during the network scan. The inverter number is displayed in the lower left corner of the screen.

For a clearer overview, the inverters can be re-numbered for specific requirements. For instance, the inverter number can be defined according to the installation sequence.

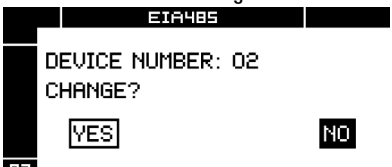
Example

With three inverters installed, the left one can be allocated the no. 1, the middle one can be no. 2 and the right-hand one no. 3.

Note

The following screen is not displayed if only one inverter is configured.

Screen Inverter numbering:



Key	Function
◀▶	YES = Allocate user-defined number to inverter. NO = Accept inverter number unchanged.
OK	Confirm selection.

If NO was selected:

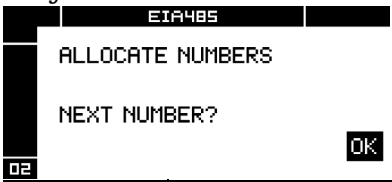
➔ The inverter adopts the displayed number und switches to the **Country Code Setting** screen.

If YES was selected:

➔ The display shows the following screen.

Note

The following screen is not displayed if only one inverter is configured.



Key	Function
OK	The inverter adopts the next available number.

After OK was selected:

➲ Allocate numbers to inverters in the required sequence.
- ➙ The inverter adopts the next available number.
- ➙ The display shows the screen below:

Example

As soon as the OK key was pressed at the first inverter, this inverter is allocated no. 1, which is shown on the display. When the OK key was pressed at the second inverter, this inverter is allocated no. 2, etc..

Note *The following screen is not displayed if only one inverter is started up.*

- ➔ Entry only at one inverter. All inverters connected to the network are blocked.
- ➔ With the number allocation completed, the inverter switches to the **Country Code** screen.

Country code

In the menu **Country code**, the country where the inverter is operated is set. Country-specific net conditions are set automatically in dependence on the selected country.

Note

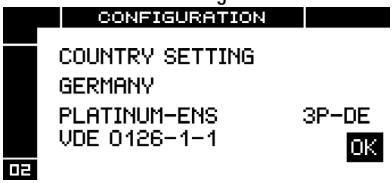
The setting can be changed within 4 hours after the setting and the start of the feeding into the mains supply. Without feeding, the period is prolonged. After the period has expired, the setting cannot be changed anymore.

Key	Function
▲▼	Select country.
OK	Accept selection.

To select country code:

➲ Select desired country.
➲ Press OK key.

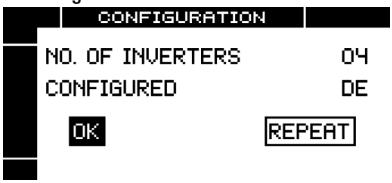
Inverter shows following screen:



➲ Press OK key.

The inverter automatically transmits the country code setting to all network participants.

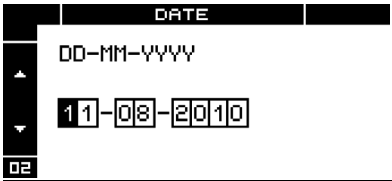
If the transmission has been successful and a network is established, the inverter will show the number of configured inverters and the type of configuration.



If an inverter is replaced, only the country code of the replaced inverter can be changed.

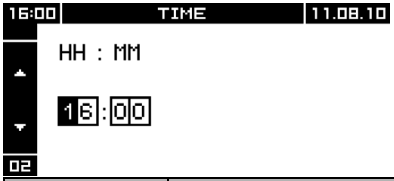
Note

Date



Key	Function
▲▼	Increment or decrement present digit.
◀▶	Select next or previous digit.
OK	Accept date setting.

Time



Key	Function
▲▼	Increment or decrement present digit.
◀▶	Select next or previous digit.
OK	Accept time setting.

Note

Changing date or time can result in overwriting saved data or cause gaps in data recording.

To accept time setting:

➲ Select SELECT.
➲ Press OK key.

The inverter automatically shares the new time setting with all network participants.

To reset time:

➲ Select BACK.
➲ Press OK key.

After setting the time, the configuration (language, date and time) are automatically transferred to all other inverters in the network (if available).

After the data transmission, the inverter will show the menu **Time settings** (see 7.6 Settings).

6.2 Phase Balancer

An unbalanced load ist he difference between the nominal AC power on the three mains phases.

The energy provider and the power plant operator determine the admissible maximum unbalanced load for the installation of inverters on different phases of the supply mains.

The Phase Balancer function makes sure that the admissible maximum unbalanced load is not exceeded.

- ➔ Failure of an inverter module
- ➔ different AC powers occurring in dependence of the load

It is possible to set the admissible maximum power (unbalanced load) and the reaction time according to the specifications of the power plant operator (see 8.1 Service-Menü).

6.3 Replacing devices

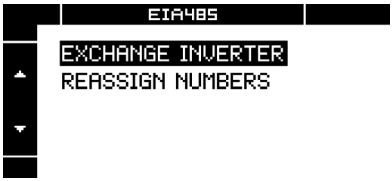
If one or more PLATINUM inverters in a PV system are replaced by another device, it is possible to transfer the device numbers of the replaced inverters.

During the network scan, the inverter automatically identifies any replaced devices.

It is possible to either use the old device numbers for the substitute devices or renumber the devices.

If inverters without a device number or doubly allocated device numbers are detected during the network scan, this can be corrected by renumbering.

Display and operation are confined to the replaced inverters. All other inverters show the start screen.



To accept device numbers of replaced inverters:

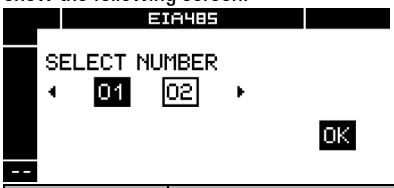
➲ Select **EXCHANGE INVERTER**.

To renumber:

➲ Select **REASSIGN NUMBERS**.

Replacement of devices

After **EXCHANGE INVERTER** was selected, the replaced inverters show the following screen:



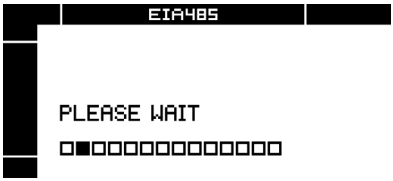
Key	Function
◀▶	Select device number.
OK	Accept selected device number.

On every replaced inverter:

➲ Select desired device number.
➲ Press OK key.

Inverter does another network scan.

The inverter automatically transmits the device numbers to all other inverters.



Inverter is added to PLATINUM network.
Inverter shows main menu.
Inverter shows device number of the replaced device in the lower left corner.

After device replacement:

➲ Set date and time.

Reassign numbers

➲ Renumbering see 6.1 Initial startup of inverter.

7 Operation

7.1 DC disconnector

Note

The DC disconnector is exclusively available for variants with DC disconnector. A banderole on the lower part of the inverter indicates whether a DC disconnector is available.

The DC disconnector enables switching on and off the solar generator.

To engage the solar generator:

➲ Set DC disconnector to 1.

To switch off the solar generator:

➲ Set DC disconnector to 0.

Note

DIEHL Controls recommends to actuate the DC disconnector once a year to prevent the welding of contacts.

DIEHL Controls recommends to switch off the mains voltage (AC) before switching off the DC disconnector to minimize wear and tear of the contacts.

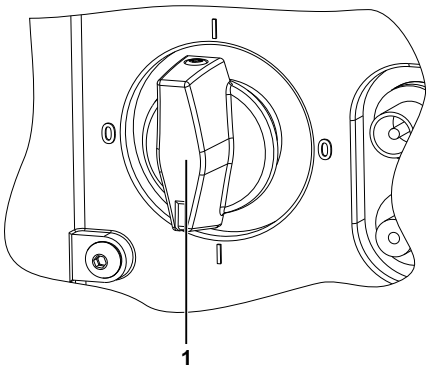


Fig. 14 DC disconnector

(1) DC disconnector

7.2 Display and operation

If there is no input for approx. 2 minutes, inverter switches to standard display during feed. **Note**

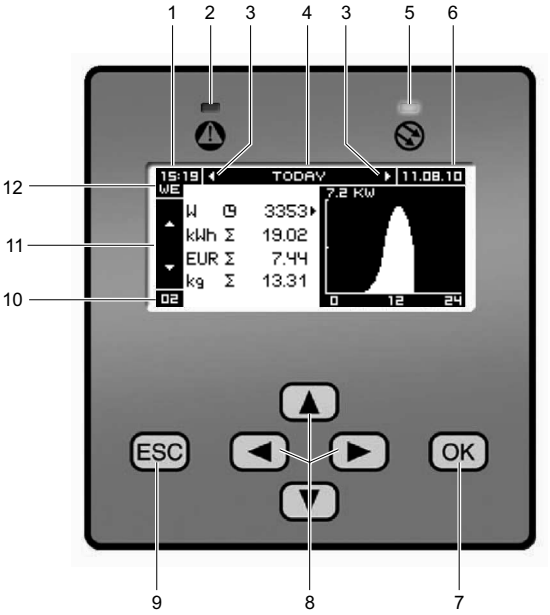


Fig. 15 Display and operation

(1) Time
(2) LED red
(3) Scroll arrows horizontal
(4) Title
(5) LED green
(6) Date
(7) OK key
(8) Navigation keys
(9) ESC key
(10) Device number
(11) Scroll arrows vertical
(12) Day

Time

Time display in 24-hour format.

LEDs

Two LEDs indicate the operating status of the inverter.

LED red

The LED red indicates the following:

Display	Operating status
LED off	Normal operation
LED flashes	- Error - Contact for external indicator closed (depending on selected setting)

LED green

The LED green indicates the following:

Display	Operating status
LED on	Power feed on
LED flashes	Preparing for power feed
LED off	Inverter off

Both LEDs

Both LEDs blinking indicate that the inverter is performing a network scan.

Scroll arrows

The menu contains other menu items.

➲ Navigate using keys ▼ and ▲, or ◀ and ▶.

Title

Title of the selected menu.

Date

Date display in formats DD.MM.YY, MM.DD.YY oder YY.MM.DD.

Adjustable in menu **Time settings**.

Keys

The functions of the keys are indicated in the tables under the illustrations.

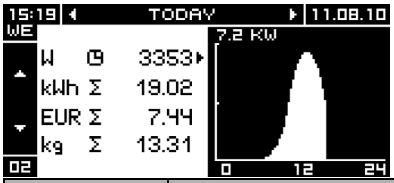
Device number

Displays the inverter number.

Day

Displays the day of the week.

7.3 Standard screen



Key	Function
◀▶	Navigate within the display period.
▲▼	Switch to screen **Current**.
ESC	Call up **Main Menu**.

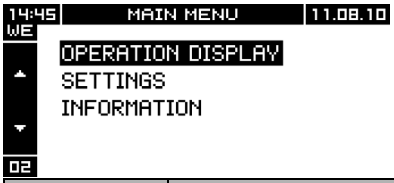
Arrow to the right of the table:

➔ designation of physical value displayed in graphic

Number in the top left corner of the graphic:

➔ maximum value of scale
➔ Depending on max. DC power of inverter

7.4 Main Menu



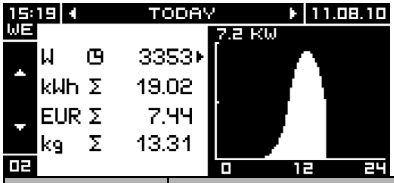
Key	Function
▲▼	Navigate within menu.
OK	Call up selected menu.

To return to main menu from all menus:

➲ Press ESC repeatedly.

7.5 Operation Display

The operation display shows a list of physical values and a corresponding evaluation graph. Type and value of the displayed physical value depend on the selected period. The illustration below shows an example for the period **TODAY**.



Key	Function
◀▶	Navigate within the display period.
▲▼	Switch to menu **Current**.
ESC	Back to **Main Menu**.

Arrow to the right of the table:

➔ designation of physical value displayed in graphic

Units:

- ➔ W: feed power
- ➔ kWh or MWh: feed power for the indicated period
- ➔ EUR: rebate for the indicated period (Adjustable in menu Settings.)
- ➔ kg: quantity of saved carbon dioxide (CO_2)

Number in the top left corner of the graphic:

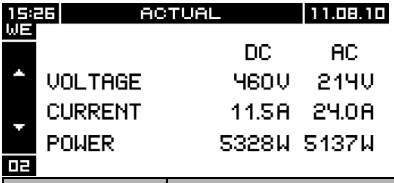
- ➔ maximum value of scale
- ➔ dependent on inverter power

Horizontal axis in graphic:

- ➔ time scale (e. g. hours of a day)

Current

Current shows a list of the current electric values for DC and AC side.



Key	Function
▲▼	Switch to menu **Today**.
ESC	Back to **Main Menu**.

Physical values

The following physical values are indicated:

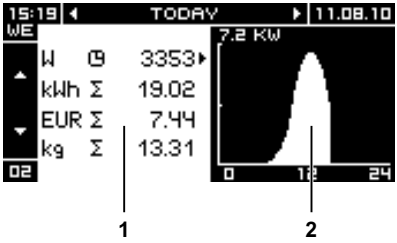
- feed power in W (graphically depicted in the periods **TODAY** and **YESTERDAY**)
- feed energy in kWh or MWh (graphically depicted as columns in the periods **WEEK**, **MONTH** and **YEAR**)
- Rebate in country-specific currency
  - Values > 999,000 are displayed as a factor
  - Example: 1,234,567 € is displayed as 1,234E6
- CO_2 emission reduction in kg or t
- DC and AC voltage
- DC and AC
- DC and AC power

Display period

The following display periods can be selected:

- Today
- Yesterday
- Current week
- Previous week
- Current month
- Previous month
- Current year
- Previous year
- Since startup

Note *The values displayed by the inverter may differ from the readings of calibrated electricity meters.*



(1) Physical values
(2) Graphic of physical value

Physical values:

- Designation of the physical value
- Current value ( )
- Peak value ( )
- Cumulative value ( )

Graphic of physical value:

- ➔ Day: in hours (0 - 24)
- ➔ Week: one column per day (Mo. - Su.)
- ➔ Month: one column per day
- ➔ Year: one column per month (Jan. – Dec.)

Note

Type and value of the displayed physical value depend on the selected period.
*Graphic: For the display periods **TODAY** and **YESTERDAY**, the progress of the feed power is displayed. For all other display periods the feed energy per time interval is displayed.*
*Table: For the display period **TODAY**, the current power value is displayed. For all other periods, the maximum value is displayed.*

7.6 Settings

In the menu **Settings** the following settings are possible:

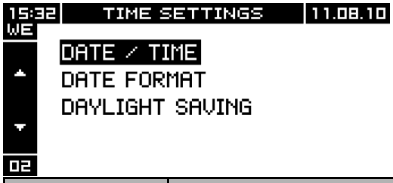
- ➔ Time settings
- ➔ Language
- ➔ Alarm volume
- ➔ Alarm contact function
- ➔ LCD
- ➔ Rebate
- ➔ System
- ➔ Energy meter

Key	Function
▲▼	Navigate within menu.
ESC	Back to **Main Menu**.
OK	Call up selected menu.

Time settings

In the menu **Time settings**, the following settings are possible:

- ➔ Date
- ➔ Time
- ➔ Date format
- ➔ Daylight saving time



Key	Function
▲▼	Navigate within menu.
ESC	Back to menu **Settings**.
OK	Call up selected menu.

Date

Key	Function
▲▼	Increment or decrement present digit.
◀▶	Select next or previous digit.
OK	Accept date setting.

Time

Key	Function
▲▼	Increment or decrement present digit.
◀▶	Select next or previous digit.
OK	Accept time setting.

Note

Changing date or time can result in overwriting saved data or cause gaps in data recording.

To accept time setting:

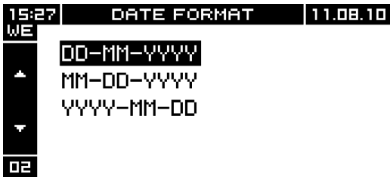
➲ Select SELECT.
➲ Press OK key.

The inverter automatically shares the new time setting with all network participants.

To not accept time setting:

➲ Select CANCEL.
➲ Press OK key.

Date format



Key	Function
▲▼	Select format.
OK	Confirm format.
ESC	Return to menu **Time setting**.

Daylight saving time

Key	Function
▲▼	Navigate within menu.
OK	Confirm selection.
ESC	Return to menu **Time setting**.

MANUALLY

➔ Manual setting of daylight saving time required.

AUTOMATIC

➔ Inverter sets daylight saving time automatically, depending on set country and calendar.

If the MANUALLY option is selected, the following screen will appear the next time the date or time is set:

To set daylight saving time:

➲ Select YES.
➲ Press OK key.

Inverter adds 1 hour to set time.

To not set daylight saving time:

➲ Select NO.
➲ Press OK key.

Inverter uses set time unchanged.

Language

Key	Function
▲▼	Navigate within menu.
ESC	Back to menu **Settings**.
OK	Accept selected language.

The inverter automatically shares the new language setting with all network participants.

Alarm volume

Key	Function
▲▼	Increase or reduce alarm volume.
ESC	Back to menu **Settings**.
OK	Accept alarm volume setting.

The inverter automatically transfers the alarm volume setting to all network participants.

Alarmkontakt

Key	Function
▲▼	Navigate within menu.
ESC	Back to menu **Settings**.
OK	Accept setting.

OFF

➔ The alarm contact (NO contact) is constantly open if a safety-relevant or blocking error occurs.
➔ Alarmkontakt ist deaktiviert.

INTERVAL

➔ The alarm contact (NO contact) opens and closes periodically if a safety-relevant or blocking error occurs.

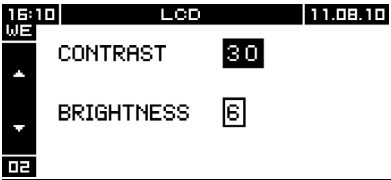
CONTINUOUS

➔ If a safety-relevant or blocking error occurs, the alarm contact (NO contact) is constantly closed until the error is remedied.

TEST

➔ Close alarm contact temporarily while selecting a menu item.

LCD

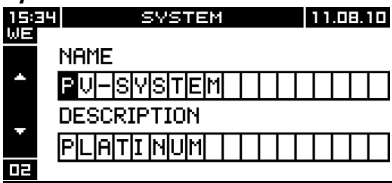


Key	Function
▲▼	Increase or reduce contrast or brightness.
◀▶	Navigate between input fields.
ESC	Back to menu **Settings**.
OK	Accept setting.

Feed payback

Key	Function
CURRENCY	Currency in which the rebate is displayed.
VALUE/KWH	Value for 1 kWh feed current (for rebate calculation).
▲▼	Increment or decrement present digit.
◀▶	Navigate between input fields.
ESC	Back to menu **Settings**.
OK	Accept setting.

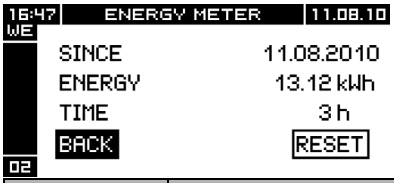
System



Key	Function
▲▼	Increment or decrement present digit.
◀▶	Navigate between input fields.
ESC	Back to menu **Settings**.
OK	Accept setting.

Energy meter

The energy meter enables the metering of energy and operating hours since the start of the inverter or since a reset of the energy meter.



Key	Function
BACK	Back to menu **Settings**.
RESET	Set energy meter to 0.
◀▶	Select BACK or RESET.
OK	Confirm selection.
ESC	Back to menu **Settings**.

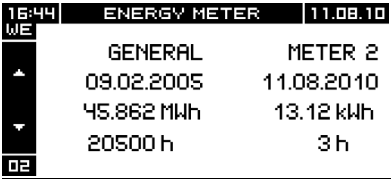
7.7 Information

The menu **Information** shows the following information:

- ➔ Operating data
- ➔ System data
- ➔ Inverter type
- ➔ Inverter version
- ➔ Event information

*The menu **Information** merely displays the value. It is not possible to change the values.* **Note**

Operating data



Key	Function
▲	Call up screen **Inverter version**.
▼	Call up screen **System data**.
ESC	Back to menu **Main Menu**.
OK	Back to menu **Main Menu**.

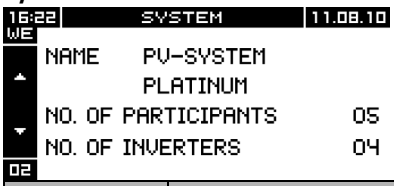
GENERAL

- ➔ Shows feed data of the inverter since the startup.
- ➔ Resetting is not possible.

METER 2

- ➔ Shows feed data of the inverter since the latest reset of meter 2.

System data



Key	Function
▲	Call up screen **Operating data**.
▼	Call up screen **Inverter type**.
ESC	Back to menu **Main Menu**.
OK	Back to menu **Main Menu**.

NAME

➔ Shows the name of the PV system.

NUMBER OF PARTICIPANTS

➔ Indicates number of network participants (e. g. inverter and monitoring devices such as PLATINUM PV-Monitor, PLATINUM ViewMaster and PLATINUM Webmaster).

NUMBER OF INVERTERS

➔ Shows the number of inverters in the network.

Inverter type

Key	Function
▲	Call up screen **System data**.
▼	Call up screen **Inverter version**.
ESC	Back to menu **Main Menu**.
OK	Back to menu **Main Menu**.

TYPE

➔ Indicates inverter type.

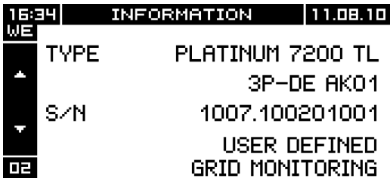
S/N

➔ Indicates inverter serial number.

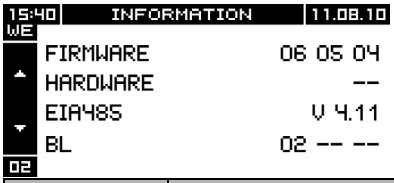
Note

When contacting the PLATINUM service, have the serial number ready.

*After changing the inverter network parameters, the display shows **USER-DEFINED NETWORK MONITORING**.*



Inverter version



Key	Function
▲	Call up screen **Inverter type**.
▼	Call up screen **Operating data**.
ESC	Back to menu **Main Menu**.
OK	Back to menu **Main Menu**.

FIRMWARE

➔ Shows the inverter software version.

HARDWARE

➔ Shows the inverter hardware version.

EIA485

➔ Shows the data bus software version.

BL

➔ Shows version of bootloader software.

7.8 Error display

The error displays are meant for the user. Any detected errors are displayed with a slight delay. In case of an error, the inverter displays the error type and error code. Error causes and measures see 12 Troubleshooting.

Three types of errors:

- ➔ fatal errors
- ➔ blocking errors
- ➔ non-blocking errors

Fatal errors

Warning

Destruction of the inverter due to fatal errors!

- ➲ Switch off AC.
- ➲ Switch off DC.

If available:

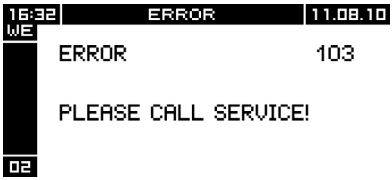
- ➲ Set DC disconnector to 0.
- ➲ Notify PLATINUM service.

Blocking errors

Danger

Danger to life due to electric shock!

➲ Have the inverter opened exclusively by the PLATINUM service or service partners authorized by DIEHL Controls.



In case of a blocking errror:

➔ the inverter is permanently off.
➔ the inverter gives an optical alarm (red LED flashing).
➔ the inverter gives an acoustic alarm.
➔ the inverter closes the alarm contact.
Setting: see screen **Settings → function Alarm contact**.

Exclusively service personnel can remedy the blocking error and switch the inverter back on.

To stop the acoustic alarm:

➲ Press any key.

To delete the error display:

➲ Press ESC key.

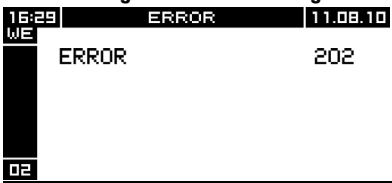
If the acoustic alarm is activated:

➔ Inverter switches off acoustic alarm.

➲ Press key ESC again.

Inverter shows start screen.
Red LED flashes as long as the error persists.

Non-blocking errors and warnings



Key	Function
OK	Clears the error display
ESC	Leave error display.

Non-blocking errors are of a transient nature (e.g. mains voltage surge). The inverter remains switched off until the error cause no longer persists.

When the error has been remedied, the inverter automatically switches to normal operation.

Until the error is resolved:

➔ The inverter displays the screen **Non-blocking error**.
➔ The red LED is flashing.
➲ Delete error display with key ESC.

8 Service

8.1 Service-Menü

The menu Service offers the following information and functions:

- ➔ display event list
- ➔ display parameters
- ➔ set max. unbalanced load (Phase balancer)
- ➔ reconfiguration
- ➔ display startup date
- ➔ display feed meter

Note

To display other parameters or to change the parameters is exclusively possible with a separate service tool.

To call up the Service Menu:

➲ Go to menu **Settings** and select menu item **Time setting** and press buttons ◀ and ▶ for about 3 s.

Key	Function
▲▼	Navigate within menu.
ESC	Return to standard display.
OK	Call up selected menu.

Event list

Key	Function
▲▼	Navigate within the event list.
ESC	Return to menu **Service**.

Columns:

- ➔ 1. column: Event no.
- ➔ 2. column: Event date
- ➔ 3. column: Event time
- ➔ 4. column: Event code

Note

The inverter shows the last 100 detected events.

Explanations about the events see 12.1 Table of events.

Have the event code and the serial number ready when contacting the PLATINUM service.

Parameters

In some supply areas, the values for supply voltage and frequency may differ temporarily or permanently from the factory settings. It is possible to adapt the PLATINUM inverter to these values. Contact the PLATINUM service for more information.

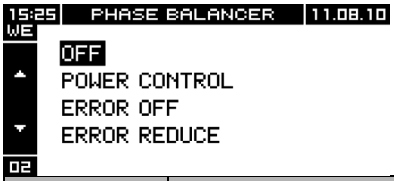
The screens **Parameters** show the valid ENS type and the currently set parameters such as start time, minimum and maximum values of frequency and voltage with the respective reaction times.

Note *The parameters can exclusively be modified by certified persons with the PLATINUM service tool.*

Phase Balancer

It is possible to set the admissible maximum power (unbalanced load) and the reaction time according to the specifications of the power plant operator.

Operating mode



Key	Function
▲▼	Select operating mode.
ESC	Back to menu **Main Menu**.
OK	Accept selected operating mode.

OFF

➔ Switch off Phase Balancer function.
➔ No limit of unbalanced load.

POWER CONTROL

➔ Switch on Phase Balancer function.
➔ The inverter monitors and limits the difference between AC powers.

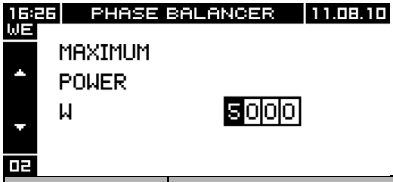
ERROR OFF

➔ If one of the inverters fails, the other inverters will also be disconnected from the mains (e.g. in case of an admissible unbalanced load of 0 W).

ERROR REDUCE

➔ If one of the inverters fails, the other two inverters will limit the AC power to the set unbalanced load.

admissible maximum power (unbalanced load)



Key	Function
▲▼	Increment or decrement present digit.
◀▶	Select next or previous digit.
ESC	Back to menu **Main Menu**.
OK	Accept setting.

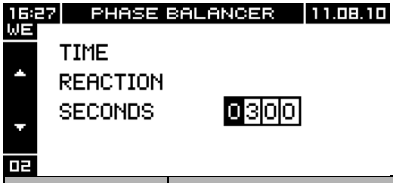
Range of values:

➔ 200 W to 9,999 W

Factory setting:

➔ 5,000 W

Reaction time



Key	Function
▲▼	Increment or decrement present digit.
◀▶	Select next or previous digit.
ESC	Back to menu **Main Menu**.
OK	Accept setting.

Range of values:

➔ 10 s to 9,999 s

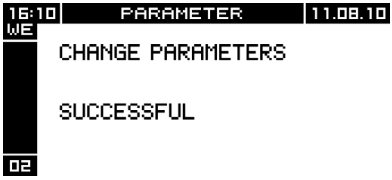
Factory setting:

➔ 300 s

If the inverter is connected in the PLATINUM network, all parameters and the Phase Balancer settings are transferred to the other inverters of the PLATINUM network after the reaction time has been confirmed.

During the transfer, the inverter shows the following screen.

After a successful transfer, the inverter shows the following screen.



Note

If an inverter's feed power is rediced due to unbalanced loads, there will be no status message on the inverter.

Reconfiguration

Inverter shows Start screen and carries out startup process again (see 6.1 Initial startup of inverter).

Note

A reconfiguration of the country is only possible within the first four hours after the connection. Afterwards, this menu item is blocked.

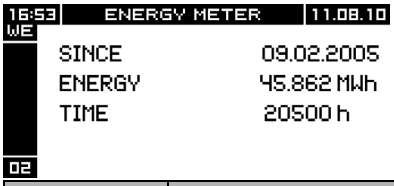
Startup

Key	Function
OK	Return to menu **Service**.
ESC	Return to menu **Service**.

Shows startup date.

Note *The menu is only a display. Values cannot be changed.*

Meter



Key	Function
OK	Return to menu **Service**.
ESC	Return to menu **Service**.

The menu is only a display. Values cannot be changed.

Inverter numbering

To change the inverter numbering after startup:

➲ Select **Reconfiguration** in the Service Menu.
➲ Change inverter numbers see 6.1 Initial startup of inverter, subsection Allocating inverter numbers.

9 Maintenance

Danger

Danger to life due to electric shock!

➲ Have the inverter opened exclusively by the PLATINUM service or service partners authorized by DIEHL Controls.

Danger

Danger to life do to DC and AC high voltage!

➲ Wear insulating protective clothing and face protection.

➲ Have any cleaning or maintenance works carried out exclusively by trained personnel.
The qualified specialist personnel requires a license from the relevant energy suppliers.

Prior to every maintenance work or cleaning:

➲ Switch off the main power supply (fuse).

➲ Set switch knob of DC connector to 0.

➲ Condensers require up to 30 min to discharge. Do not touch connectors (DC/AC) for at least 5 minutes after switching off.

➲ Ensure that the DC cables are de-energized.

In case of a PLATINUM inverter without DC disconnector:

➲ Pull the plugs in the following order:
1. AC side
2. DC side

9.1 Maintenance

The inverter is maintenance-free.

9.2 Cleaning

Caution

Damage of fan due to high fan speed!

➲ Exclusively clean the PLATINUM inverter carefully with compressed air.

To assure the cooling, regularly:

➲ Clean ventilation openings with:
- → vacuum cleaner
- → soft brush
- → compressed air

10 Placing out of operation

10.1 Dismounting

Danger

Danger to life do to DC and AC high voltage!

➲ Wear insulating protective clothing and face protection.

➲ Have inverters uninstalled by qualified specialists only.
The qualified specialist personnel requires a license from the relevant energy suppliers.

➲ Switch off the main power supply (fuse).

➲ Set switch knob of DC connector to 0.

➲ Do not touch terminals (DC/AC) for at least 5 minutes after disconnection (discharging time of capacitors).

➲ Ensure that the DC cables are de-energized.

In case of a PLATINUM inverter without DC disconnector:

➲ Pull the plugs in the following order:
1. AC side
2. DC side

Danger

Danger to life due to inverter dropping from the wall!

➲ Use mounting elements appropriate for the mounting wall and the weight of the inverter unit.

➲ Wear protective footwear when mounting and dismounting inverters.

To disconnect the inverter:

- ➲ Switch off the main power supply (fuse).
- ➲ Remove cable from AC terminal.
- ➲ Set DC disconnector to 0 and pull plug connector of input voltage (DC side).
- ➲ Disconnect remaining connectors as required.

Dismount the inverter as follows:

- ➲ Loosen and remove the locking screws (paper strip).
- ➲ Lift the inverter up and out of the mounting fixture.

Remove the mounting fixture as follows:

- ➲ Unscrew the mounting fixture.
- ➲ Insert the mounting fixture at the back of the inverter.
- ➲ Secure the mounting fixture with the locking screws.

In case of a return consignment:

- ➲ Pack the inverter in the packaging of the replacement.

If a single inverter is returned:

- ➲ Demand additional packaging from Diehl-Controls or reuse it.

Packaging

Pack inverter as follows:

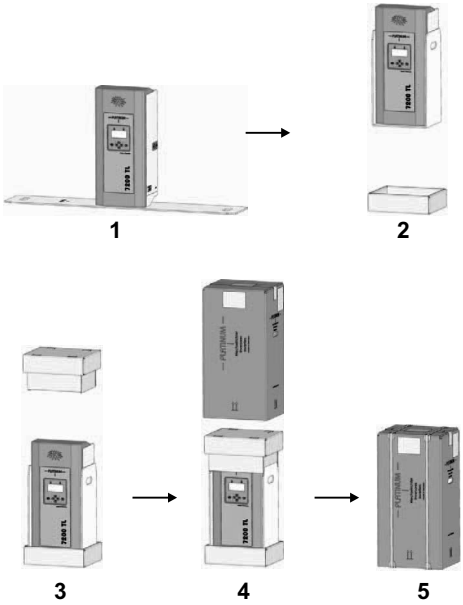


Fig. 16 Packing of inverter

1. Rest the inverter on the inner packaging.
2. Put the inverter with the inner packaging into the base pad.
3. Place the lid pad on the inverter.
4. Slide the outer box over the inverter.
5. Secure the box with packing straps.

11 Disposal

- Dispose of packaging and consumed parts according to the rules and regulations applicable in the country where the device was installed.
- Do not dispose of the PLATINUM inverter in the household waste.

Note

DIEHL Controls takes back PLATINUM inverters completely.

It is possible to dispose of PLATINUM inverter through communal disposal of electrical appliances.

12 Troubleshooting

12.1 Table of events

To isolate the error, have the following information ready when calling Service:

- displayed error number (No.)
- serial number of the inverter (see 7.7 Information)

No.	Operating status	Measure
Fatal errors		
90	AC voltage too high	Separate inverter from mains. Check connection of AC plug.
91	DC voltage too high	Separate inverter from mains. Separate inverter from DC terminal. Check module interconnection.
92	Polarity of DC connection reversed	Check DC connection.
93	Insulation error between PV+ or PV- and earth	Check insulation of PV modules. Check insulation of PV wiring.
Blocking errors		
100 to 103	Blocking system error	Separate inverter from mains. Restart inverter. If measure is not successful: Call Service.
104	DC voltage too high	Check module interconnection.

PLATINUM Inverter 4300 TL, 4800 TL, 5300 TL, 6300 TL, 7200 TL
Troubleshooting

No.	Operating status	Measure
105	Startup: Polarity of DC connection reversed	Check DC connection.
106 to 129	Blocking system error	Separate inverter from mains. Restart inverter. If measure is not successful: Call Service.
130	Connections L and N reversed	Check connections L and N on AC plug.
131 to 199	System error	Separate inverter from mains. Restart inverter. If measure is not successful: Call Service.
Non-blocking errors		
201	Amplitude limit for feed phase exceeded or fallen below	Have voltage amplitude of feed phase checked.
202 to 204	exclusively for 3 phase ENS Amplitude limit of phase voltages exceeded or fallen below	Ensure that all fuses are switched on. Startup: Have inverter 3-phase connected.
208	System incident on feed phase (voltage peak)	If error occurs frequently: Have all bondings and fuses between the consumer's terminal and the inverter checked. Have the mains quality checked.
210 211	Mains frequency above or below limits	If inverter is running on emergency power (different main frequency): No measure required.
212 to 219	Diagnosis support during service	Provide the service with the error code if required.
220 to 224	measured temperatures too high	Check ventilation openings.

No.	Operating status	Measure
230 to 233	Temperature sensor defective	Separate inverter from mains. Restart inverter. If measure is not successful: Call Service.
234 to 289	Diagnosis support during service	Provide the service with the error code if required.
290	Subsequent error in case of system incident or excess temperature	No measure required.
291 to 299	Diagnosis support during service	Provide the service with the error code if required.
Warning		
300 to 399	Diagnosis support during service Inverter stores warning in event memory	Provide the service with the error code if required.
Information		
400 to 499	Diagnosis support during service Inverter stores warning in event memory	Provide the service with the error code if required.

13 Standards and Approvals

The inverter complies to the following standards:

- DIN EN 50 178
- DIN EN 61 000-6-2
- DIN EN 61 000-6-3
- DIN VDE 0126-1-1
- DIN EN 61000-3-2
- DIN EN 61000-3-3
- DIN EN 61000-3-11
- DIN EN 61000-3-12

14 Technical Data

Input characteristics	4300 TL	4800 TL	5300 TL	6300 TL	7200 TL
Max. PV power	4,900 Wp	5,400 Wp	6,000 Wp	7,100 Wp	8,000 Wp
Max. DC power	4,300 W	4,800 W	5,300 W	6,300 W	7,200 W
Max. DC voltage	880 V				
PV voltage range, M P P T	351 – 710 V	348 – 710 V	349 – 710 V	350 – 710 V	351– 710 V
Max. input current	13.0 A	14.5 A	16.0 A	18.5 A	21.0 A
Number of string inputs	2	2	2	3	3
Number of MPP trackers	1				
DC disconnect	Optional DC disconnector, integrated in the appliance				
Reverse battery protection	yes				
Output characteristics					
Max. AC power	4,120 W	4,600 W	5,000 W	6,000 W	6,900 W
Nominal AC power rating	3,750 W	4,200 W	4,600 W	5,500 W	6,300 W
Nominal AC current	16.3 A	18.3 A	20.0 A	23.9 A	27.4 A
Max. AC current	17.9 A	20.0 A	21.7 A	26.1 A	30.0 A
Feed operation starts at	7 W	7 W	7 W	8 W	8 W
Mains output voltage range	230 V (+/-20%) single-phased				
Mains frequency	47,5 Hz – 52,2 Hz				
Short-circuit proof	yes				
Internal consumption at night	below 2 W				
Interfaces					
DC input	DC-Stecker, Multicontact MC4				
AC output	Spring clamp connectors				
PLATINUM network	EIA 485, 2x RJ45 Western Modular add. plug connector with terminal screws				
Service interface	EIA 232, SubD 9-pole socket				
Potential-free relay contact	Change-over contact, maximum 24 V_{AC}/2A, plug connector with terminal screws				
Appliance data					
Max. conversion efficiency	97.3%	97.4%	97.4%	97.7%	98.0%
European efficiency	96.8%	97.0%	97.0%	97.3%	97.6%
Working temperature range	-20 °C to +60 °C				

PLATINUM Inverter 4300 TL, 4800 TL, 5300 TL, 6300 TL, 7200 TL
Technical Data

Input characteristics	4300 TL	4800 TL	5300 TL	6300 TL	7200 TL
Max. temperature during operation at nominal power output	+45 °C				
Storage temperature	-20 °C to +80 °C				
Max. air humidity	95%				
Protection Type (except digital interface)	IP 66 according to DIN EN 60529				
Dimensions	H 720 mm x W 320 mm x D 250 mm				
Weight	27 kg	28 kg	28 kg	29 kg	29 kg
Circuit concept	Transformerless, DIVE, RACE, ENS according to VDE 0126-1-1				
Optical display	Full graphic 170 x 76 pixels				
Integrated datalogger	Storage capacity sufficient for 30 yrs operating time				

Note

Technical data apply to maximum height above MSL of 2,000 m.

15 EC Declaration of Conformity

Name and address of the issuer:
Diehl AKO Stiftung & Co. KG
Pfannerstraße 75
D-88239 Wangen im Allgäu, Germany

Product designation:
Solar inverter

Type designation:
PLATINUM 4300 TL, 4800 TL, 5300 TL, 6300 TL, 7200 TL
PLATINUM 13000 TL, 16000 TL, 19000 TL, 22000 TL

The designated devices comply with the provisions of EU directives.

Especially the Low Voltage Directive 2006/65/EG and the EMC directive 2004/108/EG.

The designated devices conform to the following norms:

- DIN EN 50178: 1998-04
- DIN EN 61 000-3-2: 2006-10
- DIN EN 61 000-3-12: 2005-09
- DIN EN 61 000-3-3: 1994 / A2: 2005
- DIN EN 61 000-3-11: 2001-04
- DIN EN 61 000-6-2: 2006-03
- DIN EN 61 000-6-3: 2007-09

Consequently the products mentioned above carry the CE mark.

Furthermore, we declare that the products mentioned above comply with the prescriptions of the VDEW (German Electricity Industry Association) that apply to solar inverters according to the "Directive for the Connection and Parallel Operation of Energy Generation Equipments in the Low-Voltage Mains".

Wangen im Allgäu, 09/01/2009
Diehl AKO Stiftung & Co. KG

ppa. Klaus Frehner
CEO Photovoltaics

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16 Manufacturers Warranty of Diehl AKO Stiftung & Co. KG

(Address: D-88239 Wangen im Allgäu, Pfannerstraße 75)

1. Warranted Products

This manufacturer's warranty applies to the types 4300 TL, 4800 TL, 5300 TL, 6300 TL and 7200 TL of the PLATINUM range of inverters for photovoltaic systems manufactured by Diehl AKO Stiftung & Co. KG (Diehl AKO), as far as these inverters were evidently purchased as new units from Diehl AKO or MATRIX Power Systems GmbH or from a wholesaler, retailer or specialist installation company authorized by one of the mentioned companies (Warranted Products). Such evidence is regarded as given when Diehl AKO is provided with an original invoice documenting the delivery of a Warranted Product to the Warranted User and if Diehl AKO is identified as the manufacturer by an authentic manufacturer label on the Warranted Product.

2. Beneficiaries from this manufacturer's warranty

Diehl AKO grants this manufacturer's warranty only to users who demonstrably have purchased, and are the actual users of a Warranted Product (Warranted User). Traders of any kind and trade level do not gain from this manufacturer's warranty any rights and claims against Diehl AKO.

3. Establishment of the warranty

The manufacturer's warranty is meant as an offer by Diehl AKO directly to the Warranted User on entering a warranty agreement under the conditions laid down in this document. The warranty contract is established directly and automatically between Diehl AKO and the Warranted User at the moment of purchase of a Warranted Product, if the Warranted User does not object to the establishment of the warranty agreement, in writing to Diehl AKO within 2 (two) weeks from the purchase date of a Warranted Product.

4. Coverage of the manufacturer's warranty

The manufacturer's warranty grants the Warranted User warranty rights in addition to the Warranted User's warranty rights granted by the respective vendor. Warranty rights vis-à-vis the respective vendor and statutory product liability rights are unaffected by the manufacturer's warranty.

5. Period and assertion of the manufacturer's warranty

The manufacturer's warranty applies to defects of the Warranted Products which demonstrably occur between the beginning of the twenty-fifth and the end of the sixtieth month after installation and commissioning of a Warranted Product at the Warranted User's premises (Warranty Period). This Warranty Period ends not later than

PLATINUM Inverter 4300 TL, 4800 TL, 5300 TL, 6300 TL, 7200 TL
Manufacturers Warranty of Diehl AKO Stiftung & Co. KG

72 months after the manufacturing date of the Warranted Product, as stated on the type plate of the Warranted Product. For Warranted Products repaired or replaced by Diehl AKO, the manufacturer's warranty expires with the end of the original Warranty Period. Legal and/or contractual warranty claims of any kind, which arise during a statutory or contractual warranty period, can not be derived from this manufacturer's warranty.

Any claims based on the manufacturer's warranty must be asserted in writing by the Warranted User to Diehl AKO within the Warranty Period. Such warranty claims can be submitted through an authorized specialist retailer, wholesaler or specialist installation company, or through MATRIX Power Systems GmbH.

6. Rights under the manufacturer's warranty – Damage and costs not covered

If a defect of the Warranted Product occurs during the Warranty Period and if Diehl AKO is responsible for this defect and if this defect impairs or reduces the functionality of the Warranted Product to a significant extent, Diehl AKO will choose to carry out either free-of-charge repairs or free-of-charge replacement of the Warranted Products with a product that offers at least the same or the same type of functionality and performance.

Such repairs or replacement will be carried out only at the Diehl AKO factory. Transport to Diehl AKO must be in the original packaging or other packaging that is at least of the same quality as the original packaging. If the Warranted user requests repair or replacement at a site other than the Diehl AKO factory, Diehl AKO can agree to this request. In this case, however, the Warranted User will bear any travel costs and additional labor costs according to DIEHL AKO standard rates.

Any claims from the manufacturer's warranty beyond free-of-charge repair or free-of-charge replacement are ruled out, especially any claims on compensation for defect-related capital damage, e.g. loss of profit including compensation for lost power feeds, costs of installation and de-installation, costs of fault diagnostics, recall costs and interruption to production processes.

If no defect is found in the Warranted Product sent in for repair or replacement, or if there is no claim based on the manufacturer's warranty for any other reason, Diehl AKO may demand from the Warranted User an administration fee (flat rate per product) plus the costs of transport back to the Warranted User.

Any claims based on this manufacturer's warranty expire 6 months after occurrence of the fault, but not later than 3 months after the end of the Warranty Period.

7. Exclusion cases

Any claims of the Warranted User are excluded in the following cases:

- ➔ Improper use
- ➔ Unprofessional or incorrect installation, installation not complying to standards, or installation not following the installation directions or instructions provided by Diehl AKO
- ➔ Unprofessional or incorrect operation and use, or operation and use against the operating directions or instructions provided by Diehl AKO
- ➔ Operation with defective protective systems
- ➔ Any unauthorized modifications or repairs
- ➔ Use of replacement parts and accessories non-compliant with the original Diehl AKO specifications
- ➔ Failure to perform continuous maintenance according to the maintenance directions and instructions provided by Diehl AKO
- ➔ Removal, damage or destruction of the sealing or the type plate installed by Diehl AKO or MATRIX Power Systems
- ➔ Foreign-body influence and force majeure
- ➔ Non-compliance with applicable safety regulations
- ➔ Transport damage
- ➔ Lightning damage

8. Portability of the guarantee

This agreement on guarantee and the rights that result from it can only be transferred from a licencee to a third party with a previous, written approval. When the guaranteed products are removed from the original assembly and operation spot and reassembled at a different location the guarantee expires automatically.

In cases other than those agreed on the guarantee may be tranferred to a third licencee when (i) the third licencee acquires the operation real estate from the licencee entitled to the guarantee, (ii) proof of the acquisition is presented to Diehl AKO in written and with the naming of the third licencee, (iii) the products assembled that are guaranteed remain unchanged and (iv) the third licencee declares to Diehl AKO its agreement to these conditions of guarantee in written form.

9. General provisions

Claims by the Warranted User based on this manufacturer's warranty can only be transferred to third parties with prior written consent of Diehl AKO.

Should any clause of this manufacturer's warranty be or become void, all other stipulations of the manufacturers warranty remain in force. In place of the clause that is or has become void, a valid clause is automatically regarded as agreed. The replacement clause will be as close as possible to the voided clause in its economic substance. The same rule applies to any missing clause in this agreement.

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This manufacturer's warranty is subject only to the laws of the Federal Republic of Germany, excluding the stipulations of Private International Law and the UN Convention on the International Sale of Goods.

The exclusive place of jurisdiction in case of any conflict arising from, or in connection with this manufacturer's warranty, is Wangen im Allgäu/FRG.

our common future

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