DIEHL AKO

GB

Installation and Operating Manual

PLATINUM
INVERTER S

2100 S
3100 S
3800 S
4600 S
4601 S

Mat.-No. 715 019, Date 09/2008

PLATINUM inverter 2100 S, 3100 S, 3800 S, 4600 S, 4601 S

Thank you for purchasing a PLATINUM inverter 2100 S, 3100 S, 3800 S, 4600 S, 4601 S.

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 (0) 700 33 66 99 22

Fax +49 (0) 700 33 66 99 77

E-mail service.platinum@diehlako.com

PLATINUM inverter 2100 S, 3100 S, 3800 S, 4600 S, 4601 S

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

Signal words

Type and source of the danger!
➲ Action to avoid the danger.

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

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.
- Use the inverter exclusively in buildings or weatherproof places.
- 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 2100 S
- ➔ PLATINUM 3100 S
- ➔ PLATINUM 3800 S
- ➔ PLATINUM 4600 S
- ➔ PLATINUM 4601 S

Possible types:

- ➔ 3-phase PLATINUM ENS (5-pole AC terminal)
  - ➙ with DC disconnector
  - ➙ without DC disconnector
- ➔ 1-phase PLATINUM ENS-EPT (3-pole AC terminal)
  - ➙ 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

5 Mounting

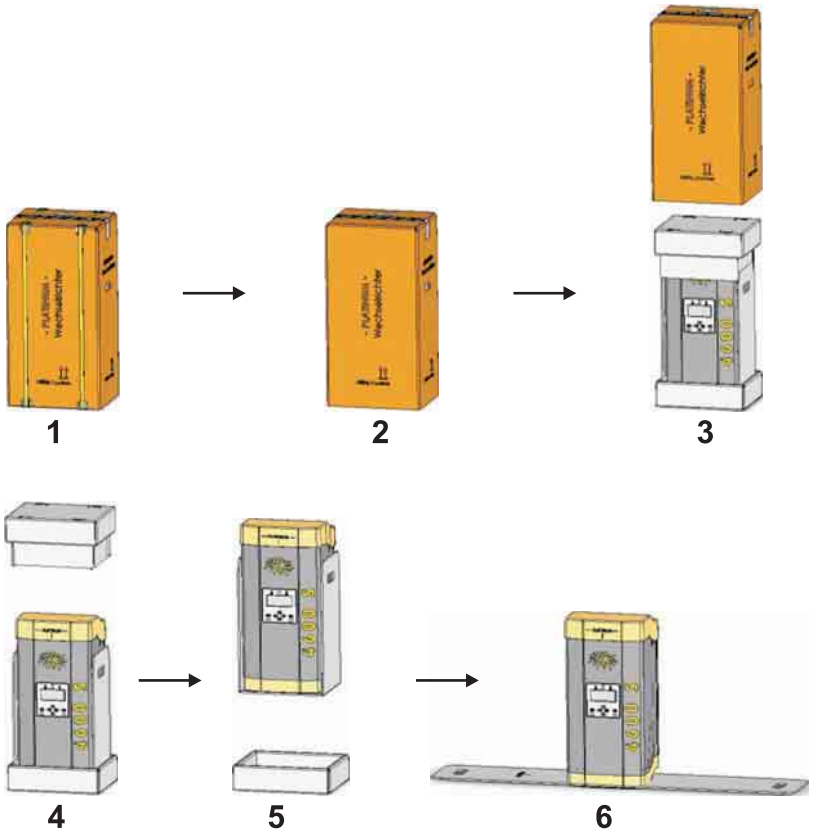
5.1 Scope of delivery

- ➔ Inverter
- ➔ Mounting fixture
- ➔ Operating manual
- ➔ Wieland RST 5i plug connector (3-phase PLATINUM ENS)

- or -

- ➔ Wieland RST 3i plug connector (1-phase PLATINUM ENS-EPT)

5.2 Unpacking



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 AKO.

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!

➲ Always protect inverters with a protective roof when installing them outdoors.

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

Caution

Material damage due to excessive dust formation!

➲ Protection Type IP54 does not apply to the interface card.

➲ Avoid excessive dust formation.

➲ Avoid dust formation with electrically conductive dust particles.

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

Mounting fixture

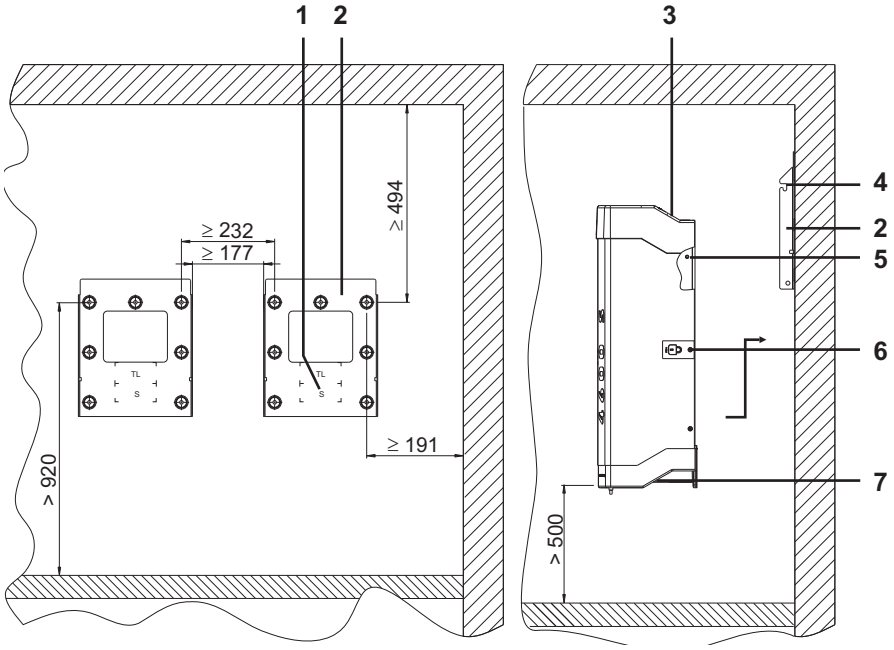


Fig. 1 Distances for mounting fixture positioning

(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. The locking screw is longer than the other housing screws.
  ➝ Do not remove the paper strip.
➲ Mark the mounting holes using the mounting fixture as a template.
  ➝ Observe dimensions and distances.
  ➝ 50 Observe a minimum distance of 50 cm to the floor.
  ➝ The later display position **1** is stamped into the mounting fixture **2**.
  ➝ The display position **1** for the PLATINUM S series is marked with an S.
➲ Drill the mounting holes and insert the screw anchors.
➲ Bolt down mounting fixture **2**.

PLATINUM inverter 2100 S, 3100 S, 3800 S, 4600 S, 4601 S
Mounting

Inverter

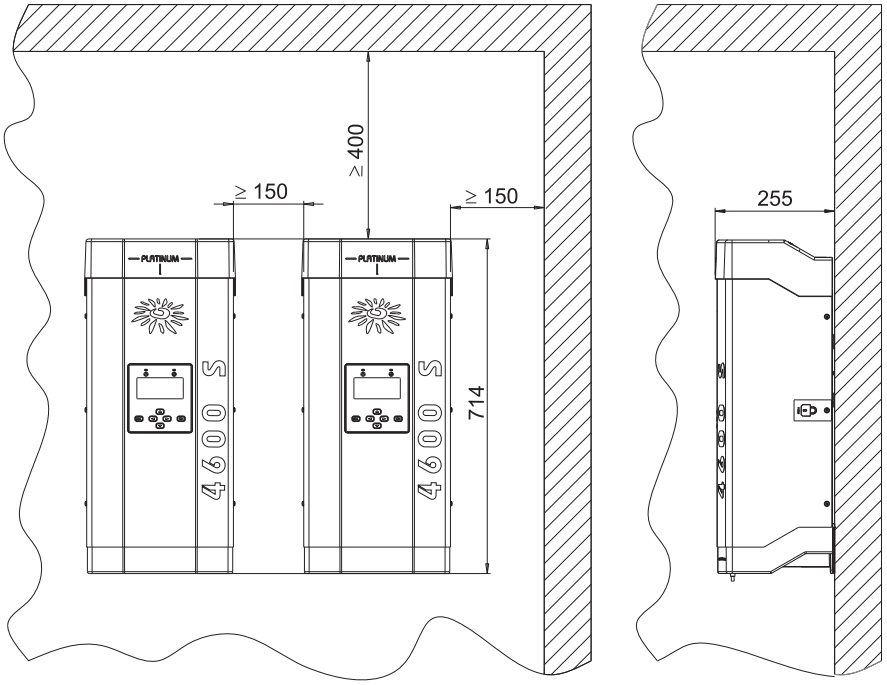


Fig. 2 Spacing between monted inverters

Mount inverters as follows:

- ➲ Observe a minimum distance of 50 cm to the floor.
- ➲ Slide the inverter heat sink into 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. 2).
- ➲ 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 Connecting the inverter

Danger

Danger to life due to high AC voltage!

➲ Switch off the mains power supply (AC side, fuse) before connecting the inverter.

Danger

Danger to life due to high AC voltage!

➲ Verify that galvanic isolation between the photovoltaic generator circuit and the AC circuit is maintained by the way the cables are run.

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 when inverter is out of operation.

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 AC cable resistance does not exceed 0.5 Ω.

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.

PLATINUM inverter 2100 S, 3100 S, 3800 S, 4600 S, 4601 S
Mounting

Terminal side 3-phase ENS

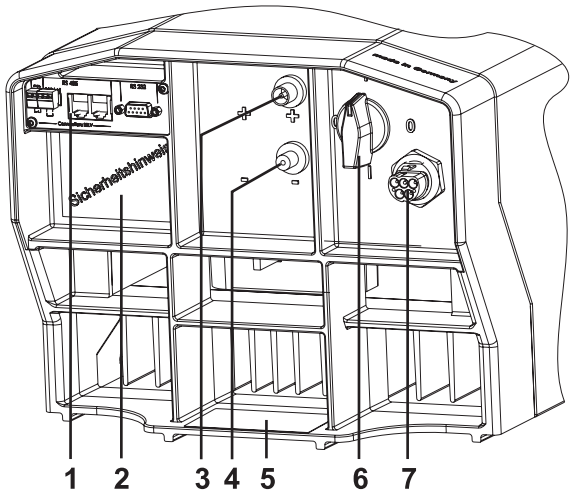


Fig. 3 Terminal side inverter 3-phase ENS

(1) Network terminals
(2) Safety sticker
(3) DC terminal +
(4) DC terminal -
(5) Type plate
(6) Switch knob DC disconnector (optional)
(7) AC terminal

Note *PLATINUM 3800S, 4600S and 4601S have two pairs of DC terminals. These DC terminals are internally parallelled.*

AC terminal 3-phase ENS

The Wieland RST 5i plug connector for the DC terminal is supplied with the inverter.

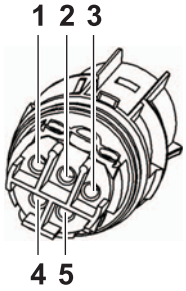


Fig. 4 Wiring diagram (terminal side)

(1) N
(2) PE
(3) L1 (feed phase)
(4) L2
(5) L3

Terminal side 1-phase ENS

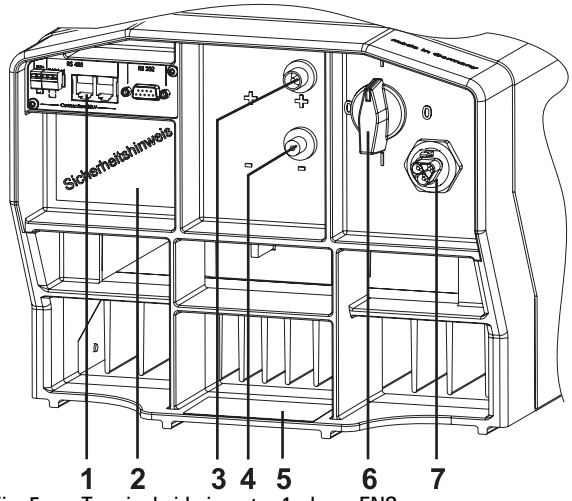


Fig. 5 Terminal side inverter 1-phase ENS

(1) Network terminals
(2) Safety sticker
(3) DC terminal +
(4) DC terminal -
(5) Type plate
(6) Switch knob DC disconnector (optional)
(7) AC terminal

Note

PLATINUM 3800S, 4600S and 4601S have two pairs of DC terminals. These DC terminals are internally parallelled.

AC terminal 1-phase ENS

The Wieland RST 3i connector plug intended for the AC terminal is enclosed.

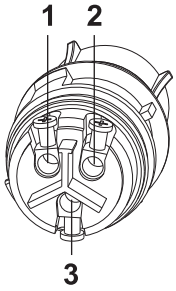


Fig. 6 Wiring diagram (terminal side)

(1) N
(2) L1 (feed phase)
(3) PE

When connecting several inverters:

➲ Distribute inverters evenly (as regards their power) between phases of the mains supply.

AC voltage connection

Establish AC voltage connection as follows:

➲ Establish a connection to the power supply system with a cable on the AC terminal as follows:
  ➝ with the Wieland RST 5i plug connector (3-phase ENS) supplied with the system
  ➝ with the Wieland RST 3i plug connector (1-phase ENS)
➲ Fuse the AC output with a fuse rating of not more than 25 A.
➲ Use lines matching the type-dependent AC.
➲ Mind different terminals for connection to AC mains power supply depending on whether 1-phase ENS or 3-phase ENS is used.

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.

Network terminals

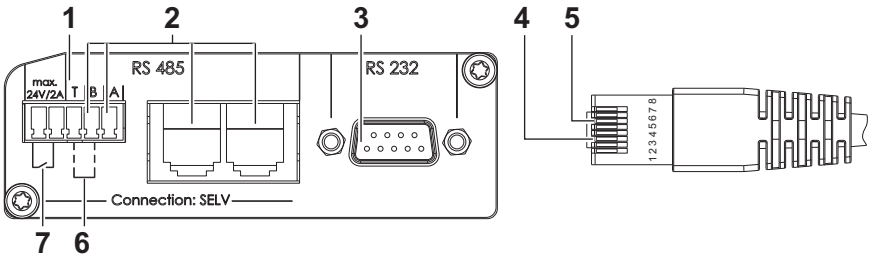


Fig. 7 Layout of network terminals

(1) Terminal connector
(2) EIA485 network terminals
(3) PC interface to EIA232 (exclusively for service purposes)
(4) Terminal B (pin 3)
(5) Terminal A (pin 6)
(6) Jumper for integrated terminator
(7) Relay output for external indicator (alarm contact)

Connection in the network

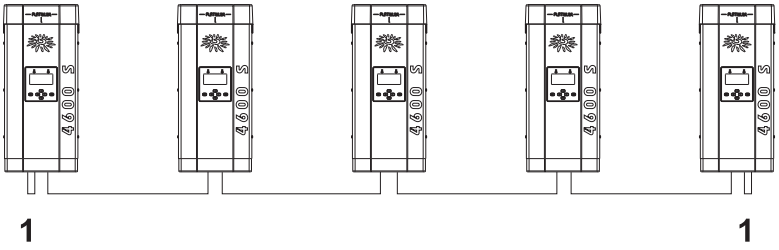


Fig. 8 Network layout

(1) Jumper for engaging the terminator

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:

- ➲ Connect the inverters to each other at serial interface EIA485, using a cable with RJ45 plug connectors or a cable on the terminal connector (see Fig. 7).
- ➲ Connect a terminator at each open end of the network.
  - ➝ Fasten the wire jumper at pins **T** and **B** of the plug connector with screw clamps supplied with the system.

Alarm contact

➲ Connect any external indicator device to the potential-free 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.

6 Startup

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.

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

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 a single inverter

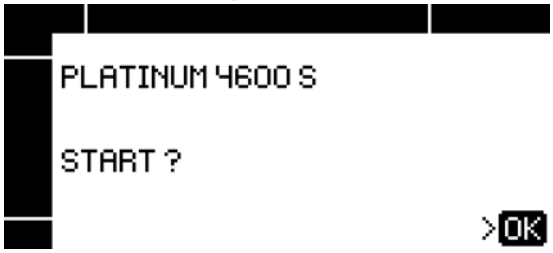
➲ Switch on the main power supply (fuse).

For inverters with DC disconnector:

➲ Set switch knob to 1.

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

Start 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.

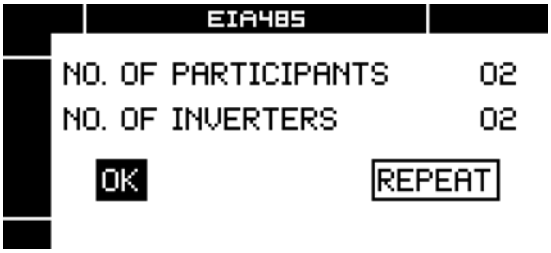
EIA485 bus

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:

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

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 **Date** appears.

In case of several networked inverters:

➔ Screen **Inverter numbering** appears.

Inverter numbering

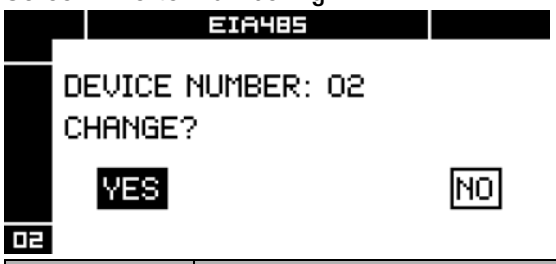
It is possible to network several inverters via the EIA 485 interface. Inverter numbers are allocated automatically during the network scan. The inverter number is displayed in the lower left corner of the screen.

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.

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. **Example**

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

Screen Inverter numbering:



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

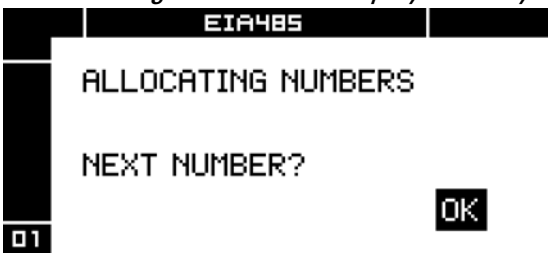
If NO was selected:

➔ The inverter adopts the displayed number und switches to the **Settings Date** screen.

If YES was selected:

➔ The display shows the following screen.

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



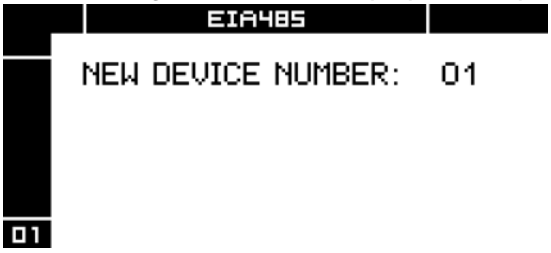
Key	Function
OK	The inverter adopts the next available number.

After OK was selected:

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

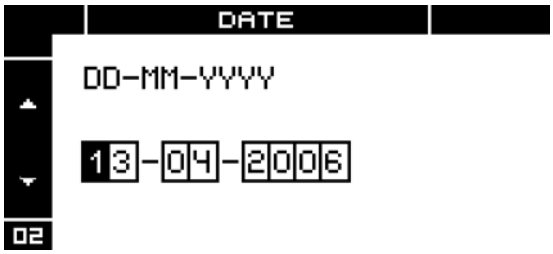
Example As soon as the OK key was pressed at the first inverter, this inverter is allocated no. 1, which is shown on the display. When the OK key was pressed at the second inverter, this inverter is allocated no. 2, etc..

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 **Date** screen.

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

It is possible to connect monitoring devices to the EIA485 bus, for example the PLATINUM Webmaster. If the PLATINUM Webmaster is connected to the internet, it obtains time and date from a time server. If, during a network scan, the inverter has recognized a monitoring device with own date and time settings, the inverter accepts these settings as default settings.

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.

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

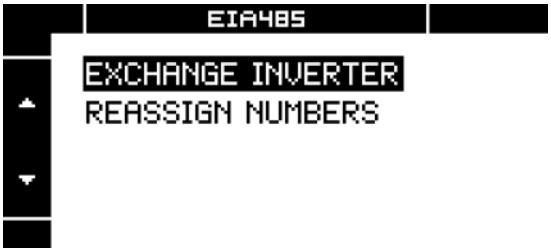
6.2 Replacing devices

If one or more PLATINUM inverters in a PV system are replaced, it is possible to maintain 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.

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



To accept device numbers of replaced inverters:

➲ Select **DEVICE REPLACEMENT**.

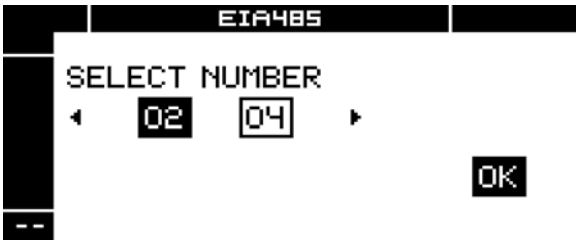
To renumber:

➲ Select **RENUMBERING**.

Note *If the device number is already in use, the inverter displays **TODO**.*

Replacement of devices

After **DEVICE REPLACEMENT** was selected, the replaced inverters show the following screen:

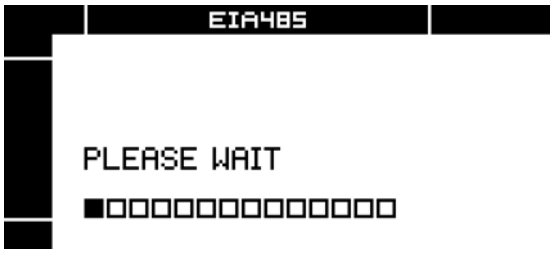


Key	Function
◀▶	Select device number.
OK	Accept selected device number.

On every replaced inverter:

➲ Select desired device number.
➲ Press OK key.

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.

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

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

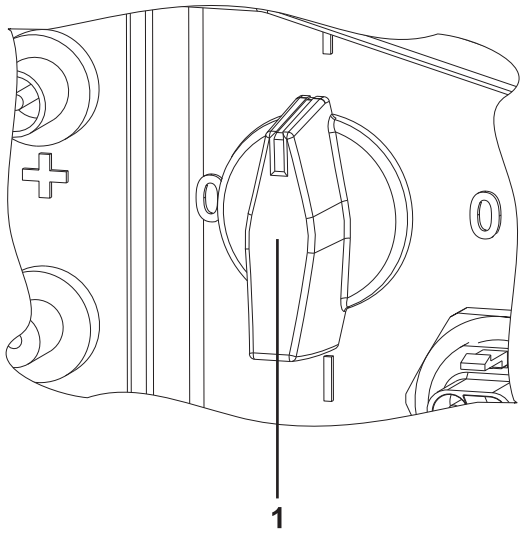


Fig. 9 DC disconnector

(1) DC disconnector

7.2 Display and operation

Note *If there is no input for approx. 2 minutes, the Webmaster switches to the standard display.*

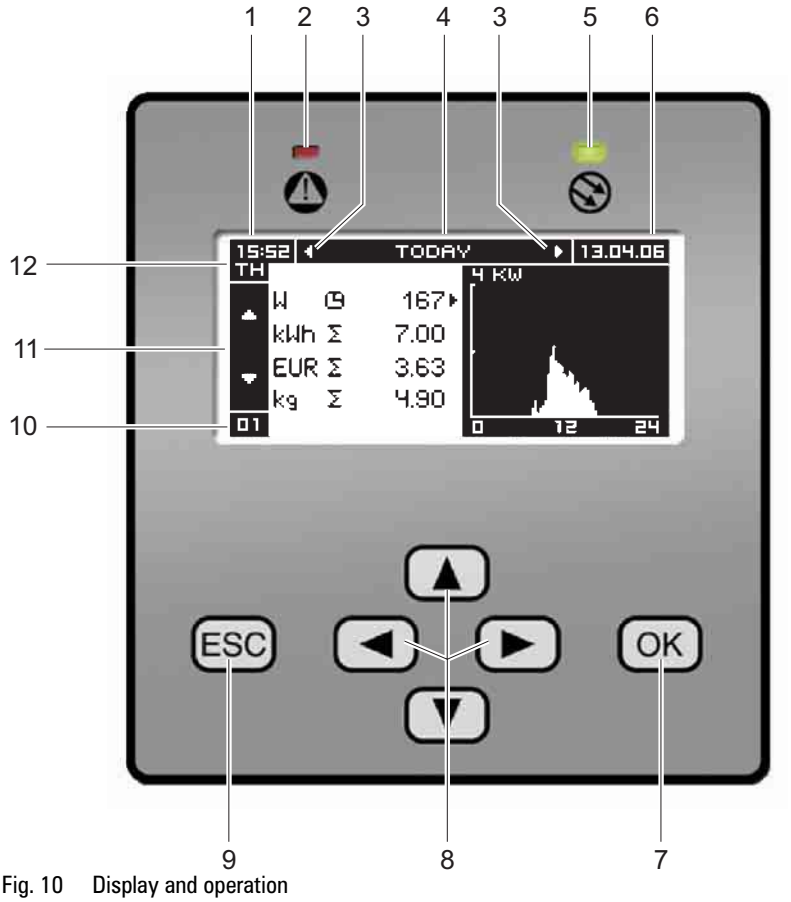


Fig. 10 Display and operation

(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 format DD.MM.YY.

Keys

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

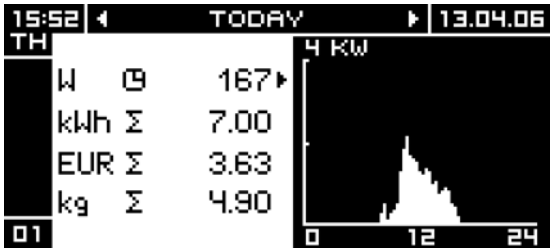
Device number

Displays the inverter number.

Day

Displays the day of the week.

7.3 Standard display



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 quantity displayed in graphic

Number in the top left corner of the graphic:

➔ maximum value of scale
➔ depending on max. DC power of the inverter

7.4 Main Menu

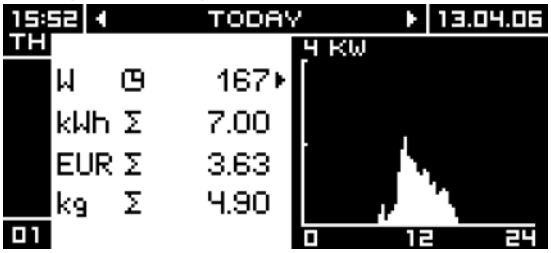
Key	Function
▲▼	Navigate within menu.
OK	Call up selected menu.

To return to main menu from all menus:

➲ Press ESC repeatedly.

7.5 Operating Display

The operating display shows a list with physical quantities and a corresponding graphic evaluation. Type and value of the displayed physical quantity 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 quantity 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:

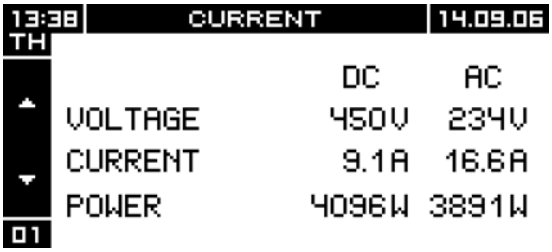
➔ maximum value of scale
➔ dependent on inverter power

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

Physical quantities

The following physical quantities 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

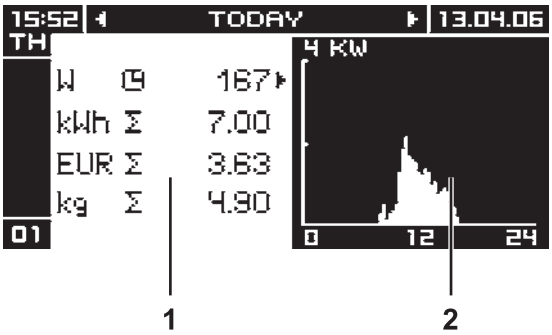
Period

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 quantities
(2) graphic of physical quantity

Physical quantities:

- Designation of the physical quantity
- current value ( )
- peak value ( )
- cumulative value ( )

Graphic of physical quantity:

- 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 quantity 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.*

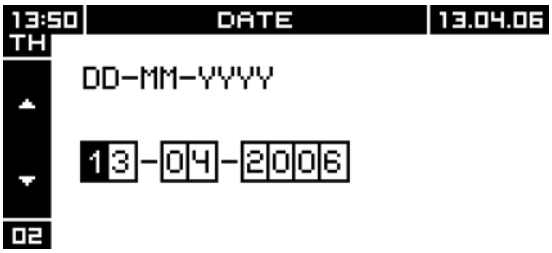
7.6 Settings

The following settings are possible in the menu **Settings**:

- ➔ Date/time
- ➔ 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.

Date



Key	Function
▲▼	Increment or decrement present digit.
◀▶	Select next or previous digit.
OK	Continue to menu **Time**.

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.

Language

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

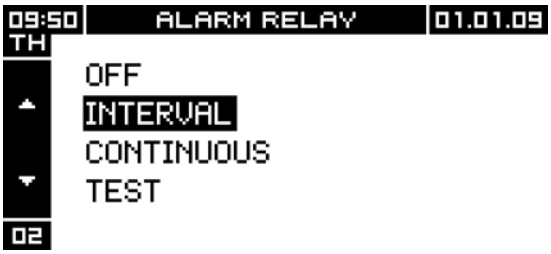
The inverter automatically shares the new language setting with all network participants.

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.

Alarm contact



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

OFF

➔ The alarm contact is constantly open when a safety-relevant or blokking error occurs.

INTERVAL

➔ The alarm contact opens and closes periodically when a safety-relevant or blocking error occurs.

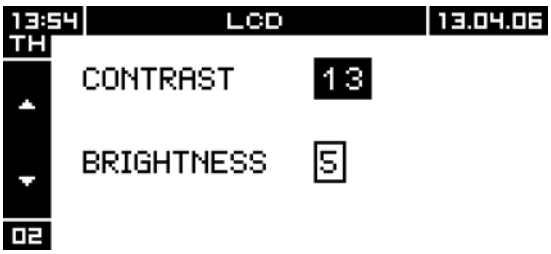
DURATION

➔ The alarm contact is constantly open when a safety-relevant or blokking error occurs.

TEST

➔ Close the alarm contact momentarily when the OK key is pressed.

LCD

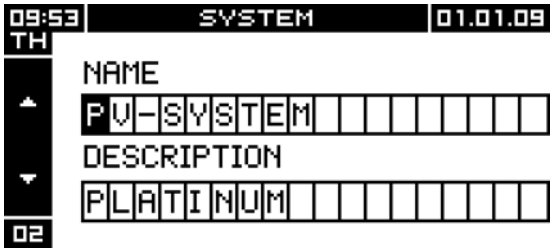


Key	Function
▲▼	Increase or reduce contrast or brightness.
◀▶	Navigate between input fields.
ESC	Back to menu **Settings**.
OK	Accept setting.

Feed rebate

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.

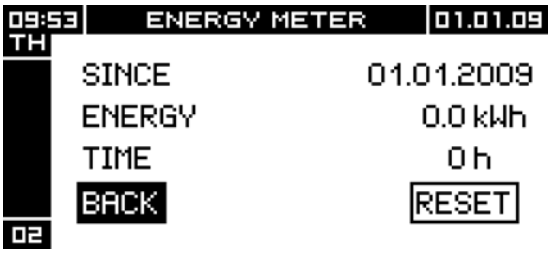
System



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

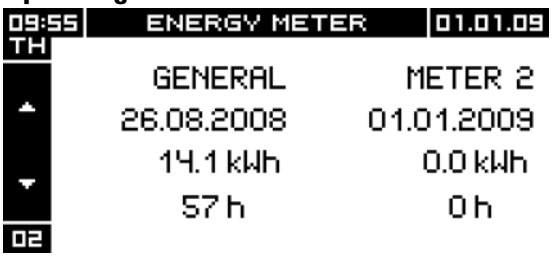
The menu **Information** shows the following information:

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

Note

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

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**.

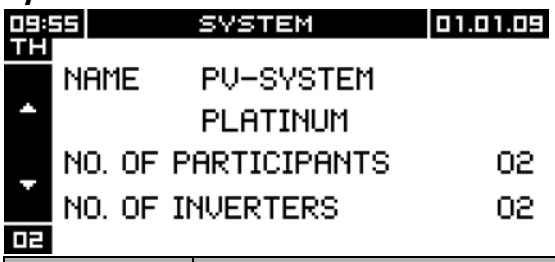
TOTAL

- ➔ 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

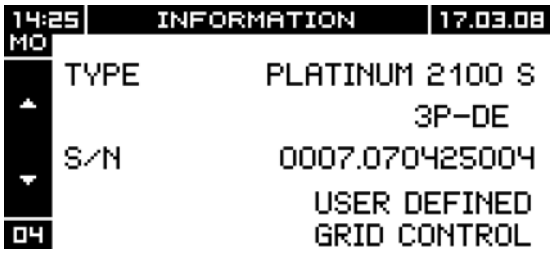
➔ Indicates inverter type.

S/N

➔ Indicates inverter serial number.

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

*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**.

SOFTWARE

➔ Shows the inverter software version.

HARDWARE

➔ Shows the inverter hardware version.

EIA485

➔ Shows the data bus software version.

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:

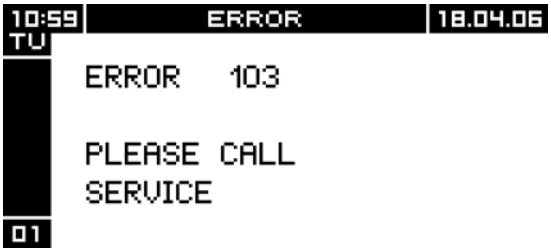
- ➲ Set DC disconnector to 0.
- ➲ Notify PLATINUM service.

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 AKO.



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 alarml.
➔ 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.

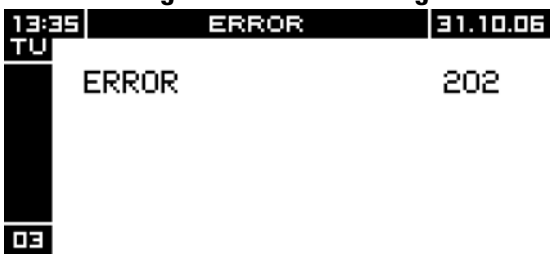
If the acoustic alarm is activated:

➔ 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 Menu

The menu Service offers the following information and functions:

- ➔ display event list
- ➔ display parameters
- ➔ activate/deactivate/configure insulation check
- ➔ 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:

➲ Select item Date/Time in Settings menu and press keys ◀ and ▶ at once for about 3 sec.

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

The inverter shows the last 100 detected events. **Note**

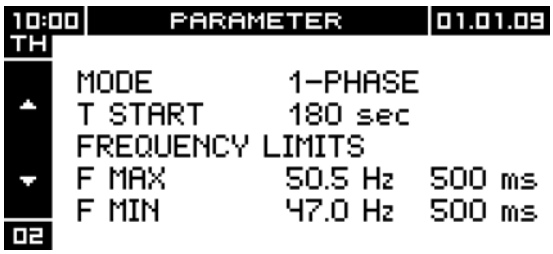
Explanations about the events see 12.1 Table of events.

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.

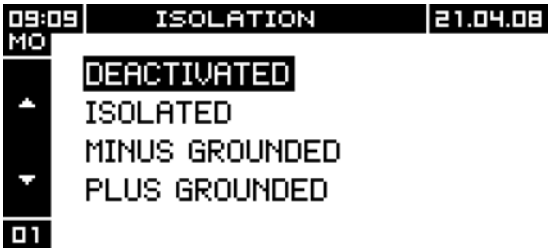
The screens **Parameters** show the valid ENS type and the currently set parameters such as start time, minimum and maximum values of frequency and voltage with the respective reaction times.



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

Isolation monitoring

The menu **Insulation monitoring** enables to check the insulation between solar generator terminal and protective conductor.



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

Note *Insulation monitoring is deactivated in the factory.*

When the OK key is pressed, the inverter accepts the changed parameters.

Four operating modes are possible depending on the type of installation:

- ➔ INSULATED
  - ➞ No connection installed between solar generator terminal and protective conductor
- ➔ MINUS GROUNDED
  - ➞ Negative terminal of the solar generator is connected to the protective conductor
- ➔ PLUS GROUNDED
  - ➞ Positive terminal of the solar generator is connected to thze protective conductor
- ➔ DEACTIVATED
  - ➞ Activate insulation monitoring

If the insulation monitoring is activated, the inverter constantly performs the insulation monitoring.

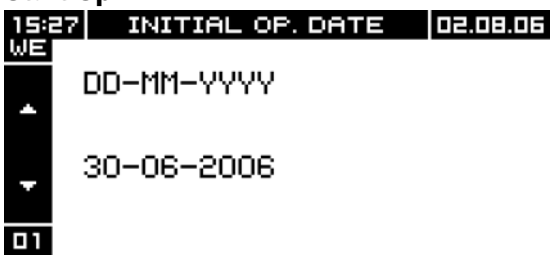
If the insulation resistance is too low:

➔ The inverter is separated from the mains until the error is resolved.
➔ The inverter shows an error message.

Reconfiguration

Inverter shows screen Start initial startup (see 6.1 Initial startup of a single inverter).

Start Up

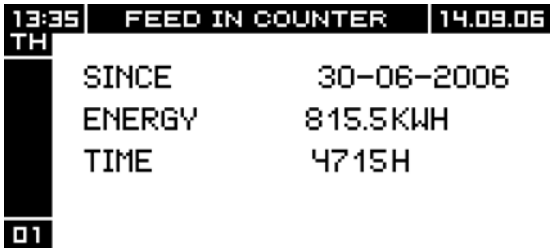


Key	Function
OK	Return to menu **Service**.
ESC	Return to menu **Service**.

Shows startup date.

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

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 a single 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 AKO.

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.
- ➲ 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

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.

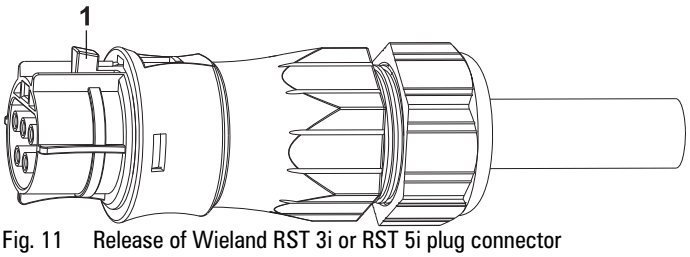


Fig. 11 Release of Wieland RST 3i or RST 5i plug connector

(1) Release button

To disconnect the inverter:

- ➲ Switch off the main power supply (fuse).
- ➲ Unlock and pull the feed output plug (AC-side).
- ➲ Pull plug connector of output voltage (DC side) or set DC disconnector to 0.
- ➲ 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.

10.2 Return consignment

In case of a return consignment:

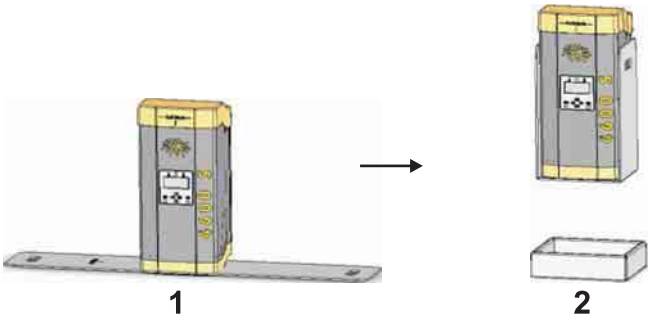
➲ Pack the inverter in the packaging of the replacement.

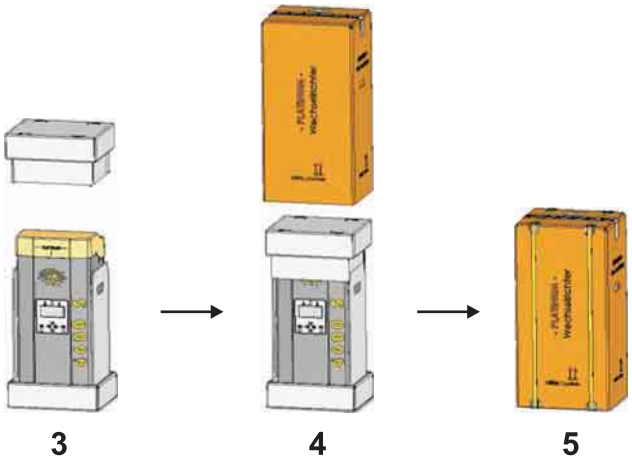
If a single inverter is returned:

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

Packaging

Pack the inverter as follows:





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 AKO takes back PLATINUM inverters completely.

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

12 Troubleshooting

12.1 Table of events

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

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

No.	Operating status	Measure
Blocking 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.
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.

PLATINUM inverter 2100 S, 3100 S, 3800 S, 4600 S, 4601 S
Troubleshooting

No.	Operating status	Measure
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 incerter checked. Have the mains quality checked.
210 211	Mains frequency limit exceeded or fallen below	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.
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 with the following norms:

- ➔ 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	2100 S	3100 S	3800 S	4600 S	4601 S
max. PV power	2,300 Wp	3,450 Wp	4,200 Wp	5,100 Wp	5,100 Wp
max. DC power	2,100 W	3,100 W	3,800 W	4,600 W	4,600 W
max. DC voltage	480 V	780 V	780 V	780 V	580 V
PV voltage range, M P P T	206 V — 390 V	314 V — 630 V	315 V— 630 V	320 V—630 V	278 V—470 V
max. input current	9 A	9A	12 A	13 A	16 A
Number of string inputs	1	1	2	2	2
DC section switch device	optional DC disconnector, integrated in the appliance				
Reverse battery protection	yes				
Output characteristics					
max. AC power	1,900 W	2,800 W	3,500 W	4,200 W	4,200 W
Nominal AC-power rating	1,750 W	2,550 W	3,150 W	3,800 W	3,800 W
max. AC	8.3 A	12.2 A	15.2 A	18.3 A	18.3 A
Feed operation starts at	13 W	14 W	18 W	18 W	17 W
Mains voltage/mains frequency range	230 V (-20%/+15%) / 47.5 Hz — 50.2 Hz				
Short-circuit proof	yes				
Internal consumption at night	below 2.5 W				
Interfaces					
DC input	Multicontact MC3, MC4				
AC output	Wieland RST 3i/5i				
Inverter network	EIA 485, 2xRJ45 Western Modular add. Plug connector with terminal screws				
PC connection (service)	EIA 232, SubD 9-pole socket				
Potential-free contact	max. 24 V AC/2A, plug connectors with terminal screws				
Appliance data					
max. conversion efficiency	94.4%	95.3%	95.3%	95.6%	94.6%
European efficiency	93.4%	94.4%	94.6%	94.8%	93.6%
Working temperature range	-20 °C— 60 °C				
max. temperature for nominal load	45 °C				
max. storage temperature	80 °C				
Protection Rating	IP 54 according to DIN EN 60529				
Dimensions	H 720 mm x W 320 mm x D 250 mm				
Weight	28 kg	35 kg	42 kg	43 kg	43 kg
Circuit concept	NF transformer with galvanic separation				
Optical display	Full graphic LCD 170x76 pixels				
Integrated datalogger	4 MB, sufficient for 30 yrs operating time				

15 EU Declaration of Conformity

Diehl AKO Stiftung & Co. KG Pfannerstraße 75 D-88239 Wangen im Allgäu, Germany	**Name and address of the issuer**
Solar inverter	**Product designation**
Platinum 2100 S, 3100 S, 3800 S, 4600 S, 4601 S	**Type designation**

The designated devices comply with the provisions of EU directives.

Especially the Low Voltage Directive 73/23/EWG (Nov. 2005) and the EMC Directive 89/336/EWG.

The designated devices conform to the following norms:

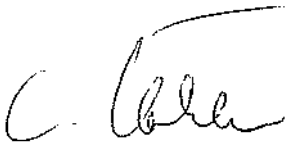
- ➔ DIN EN 50178
- ➔ VDE 0126-1-1
- ➔ DIN EN 61 000-3-2
- ➔ DIN EN 61 000-3-3
- ➔ DIN EN 61 000-6-2
- ➔ DIN EN 61 000-6-3

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, 06/04/2007

Diehl AKO Stiftung & Co. KG



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16 Manufacturer's warranty of Diehl AKO Stiftung & Co. KG for PLATINUM inverters

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

1. Warranted Products

This manufacturer warranty is valid for the types 2100 S, 3100 S, 3800 S, 4600 S and 4601 S of the inverters for photovoltaic systems manufactured by Diehl AKO Stiftung & Co. KG (Diehl AKO) of the PLATINUM line, as long as there is proof that the new appliance was purchased from Diehl AKO, MATRIX Power Systems GmbH or a wholesale or specialist dealer or a specialized installation firm authorized by them (products entitled to warranty). 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 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.

PLATINUM inverter 2100 S, 3100 S, 3800 S, 4600 S, 4601 S

Manufacturer's warranty of Diehl AKO Stiftung & Co. KG for PLATINUM inverters

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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