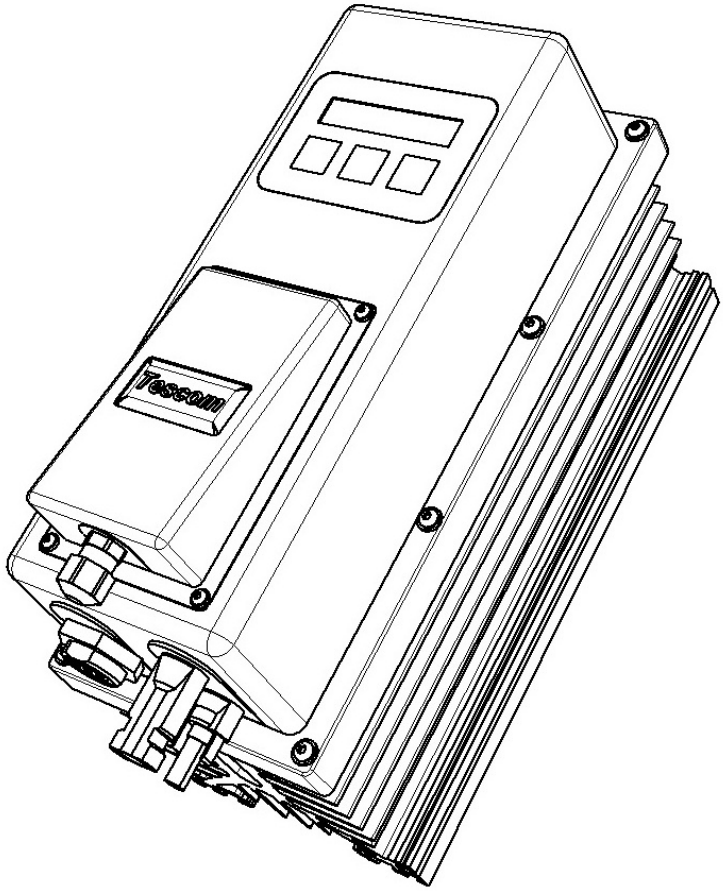
Tescom® Solar




# SOLAR DIRECT DRIVE

## USER MANUAL

## CONTENTS

# 1 NOTES ON THIS MANUAL

This manual describes how to install, commission and service the Solar Direct Drive.

## 1.1 VALIDITY

This manual applies to the following Solar Direct Drive model:

- SDD55

## 1.2 TARGET GROUP

This manual is intended for the installer and the operator.

## 1.3 STORAGE OF THE MANUAL

All manuals for the device and for the installed components must be stored in the immediate vicinity of the charge controller and must be accessible all the times.

## 1.4 SYMBOLS USED

The following types of safety messages and general information appear in this document:

| | |
|---|---|
| **DANGER!** | Danger indicates a hazardous situation which, if not avoided, will result in death or serious injury. |
| **WARNING!** | WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury. |
| **CAUTION!** | CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. |
| **NOTICE!** | NOTICE indicates a situation that can result in property damage if not avoided! |
| **INFORMATION!** | Information provides tips that are valuable for the optimal installation and operation of your product. |

## 1.5 NOMENCLATURE

| | |
|---|---|
| A | Ampere |
| AM | Air Mass |
| DIN | Deutsche Industry Norm |
| IP | Ingress Protection Rating |
| LC(D) | Liquid Crystal (Display) |
| MMI | Man Machine Interface |
| MPP | Maximum Power Point |
| MPPT | Maximum Power Point Tracking |
| PV | Photo Voltaic |
| (R) | Read Only |
| (R/W) | Read and Write Access |
| SDD | Solar Direct Drive |
| SPD | Surge Protection Device |
| STC | Standard Test Conditions |
| $T_c$ | Cell Temperature of Solar Panel in $^0$C |
| V | Volt |
| W | Watt |

# 2 SAFETY INSTRUCTIONS

## 2.1 APPROPRIATE USAGE

The Solar Direct Drive "SDD" has been developed to operate industrial 3 phase electrical motors by inverting direct current of the connected PV array.

The Solar Direct Drive may only be operated with PV array (modules and cabling) of protection class II. Do not connect any sources of energy other than PV modules to the SDD.

Already when designing the PV plant, ensure that the values comply with the permitted operating range of all components at all times. The maximum open circuit voltage of the PV array may not be greater than the maximum input voltage of the SDD (850 V), even at very low ambient temperatures.

The suitability of a PV array for the charge controller primarily depends on the output voltage and output power of the PV array. In this regard, observe the limits specified by the module manufacturer. Appropriate usage also includes observing all documentation.

## 2.2 GENERAL SAFETY INSTRUCTIONS

| | |
|---|---|
| ⚠ **DANGER!** | **Danger to life due to high voltages in the charge controller.**<br>• All work on the charge controller must only be carried out by an electrically skilled person. |
| ⚠ **CAUTION!** | **Danger of burn injuries due to hot enclosure parts.**<br>• Do not touch the metal parts of the SDD during operation. |

Grounding the PV array

Observe all local regulations for grounding the PV array. Ensure that connecting the array frame and other electrically conductive surfaces so that there is continuous conduction and to ground them in order to ensure optimal protection for plants.

## 2.3 TRASPORTATION SAFETY

SDD package is designed to protect device from collisions. Always, transport the SDD in its original packaging. If this is no longer available, you can also use an equivalent box that fulfills the following requirements:

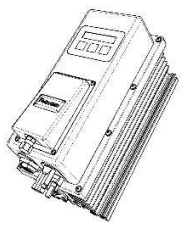
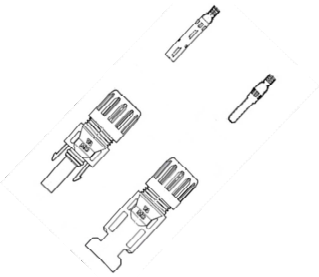
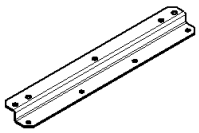
- Suitable for loads up to 5 kg
- Can be closed fully

SDD may not operate, if device is crashed. During transportation, ensure that package will not fall or move freely.

Extreme temperature conditions may damage electronic parts. Transport device within recommended storage temperatures.

# 3 UNPACKING

## 3.1 SCOPE OF DELIVERY

| A | B | C | D | E |
|---|---|---|---|---|
|  |  |  |  |  |

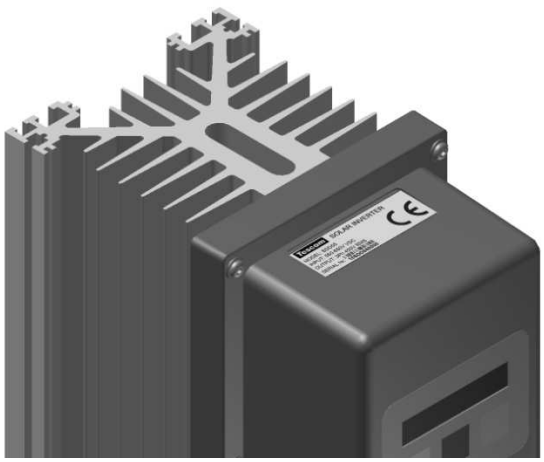
| Object | Quantity | Description |
|---|---|---|
| A | 1 | SDD55 |
| B | 1 | Wieland RST20i5 male connector with strain relief |
| C | 1 | MC4 male and female connector with terminals (cable type) |
| D | 2 | Wall mount accessory |
| E | 1 | User manual and guarantee certificate |

## 3.2 CHECK FOR TRANSPORT DAMAGE

Check the charge controller for visible external damage, such as cracks in the enclosure. Contact your dealer if you find any damage.

## 3.3 IDENTIFYING THE SOLAR DIRECT DRIVE

You can identify the charge controller by the type label. The type label is on top of the enclosure.



# 4 ASSEMBLY

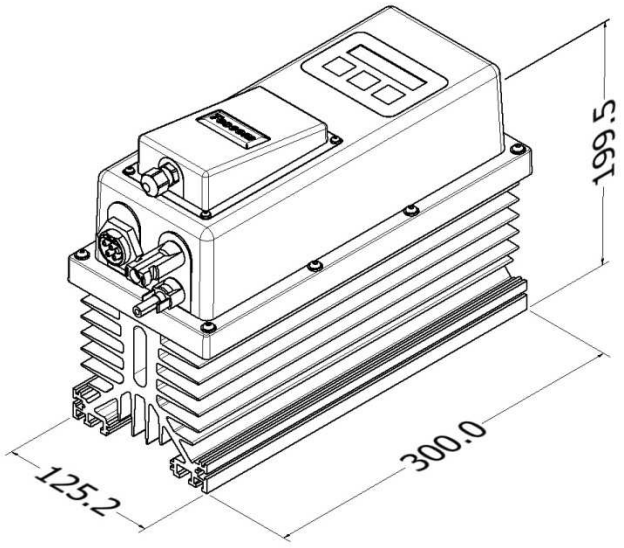
| | |
|---|---|
| ⚠ **CAUTION!** | **Risk of injury due to the SDD's heavy weight.**<br>• Take the weight of the charge controller of approx. 5 kg into account. |

## 4.1 SELECTING THE MOUNTING LOCATION

| | |
|---|---|
| ⚠ **DANGER!** | **Danger to life due to fire or explosion.**<br>The charge controller enclosure can become hot during operation.<br>• Do not mount the SDD on flammable construction materials.<br>• Do not mount the SDD near highly flammable materials.<br>• Do not mount the SDD in potentially explosive areas. |
| ⚠ **CAUTION!** | **Danger of burn injuries due to hot enclosure parts.**<br>• Mount the SDD in such a way that it cannot be touched inadvertently during operation. |

### 4.1.1 DIMENSIONS

| Dimension | Measure |
|---|---|
| Height | 300 mm |
| Width | 130 mm |
| Depth | 199.5 mm |



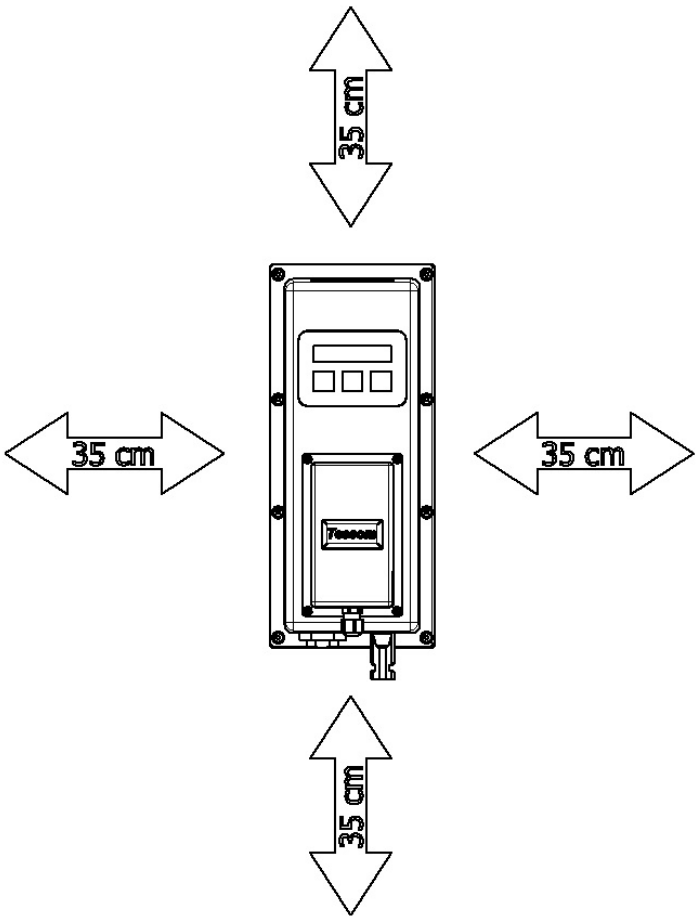
### 4.1.2 AMBIENT CONDITIONS

- The mounting location and method must be suitable for the weight and dimensions.
- Mount on a solid surface.
- The mounting location must be accessible at all times.
- The SDD must be easy to remove from the mounting location at any time.
- The ambient temperature should be between 0 °C and +45 °C to guarantee optimal operation.
- Do not expose the SDD to direct sunlight to avoid power losses due to overheating.

### 4.1.3 SAFETY CLEARANCES

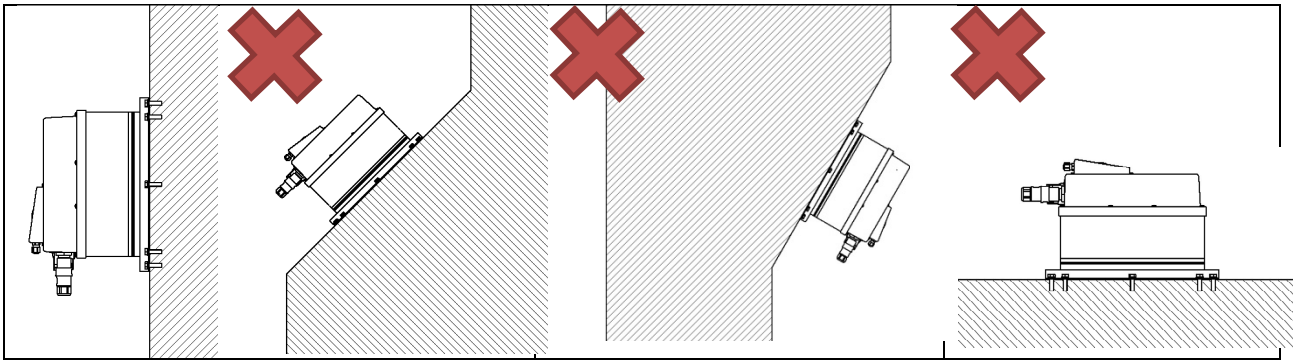
Observe the following safety clearances to walls, other devices or objects to ensure sufficient heat dissipation.

| Direction | Safety Clearance |
|---|---|
| Sides | 35 cm |
| Top | 35 cm |
| Bottom | 35 cm |




| | |
|---|---|
| **INFORMATION!** | If necessary, increase the clearances between SDD and its surroundings. |

### 4.1.4 MOUNTING POSITION

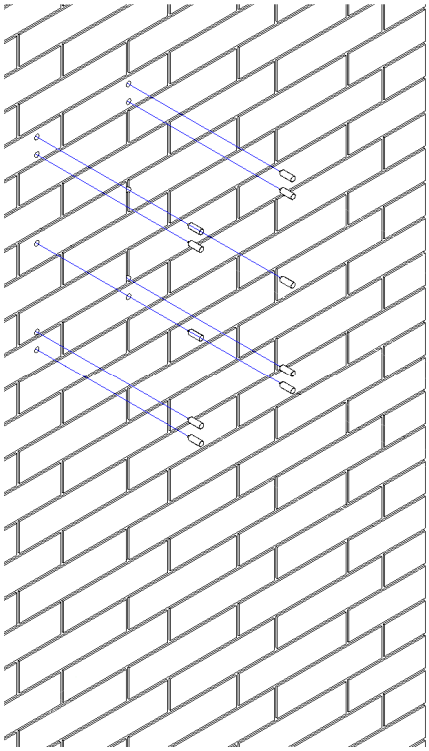


**WARNING!** Do not mount the device to wall with an angle. This will prevent heat dissipation.

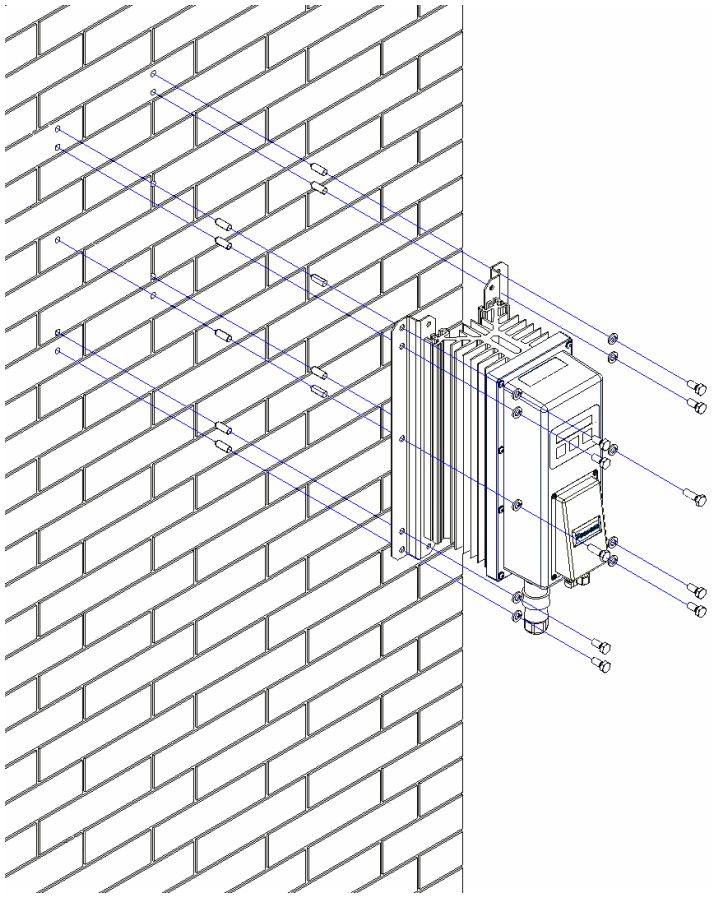
- Mount vertically
- Install at eye level in order to allow operation conditions to be read at all times.

## 4.2 MOUNTING INSTRUCTIONS

1. Mark the position of the drill holes. Drill the holes (diameter: at least 8 mm) at the indicated positions and use wall anchors (at least M8).



2. Screw the SDD onto the wall using the mounting plates. Use fastening material suitable for the surface.



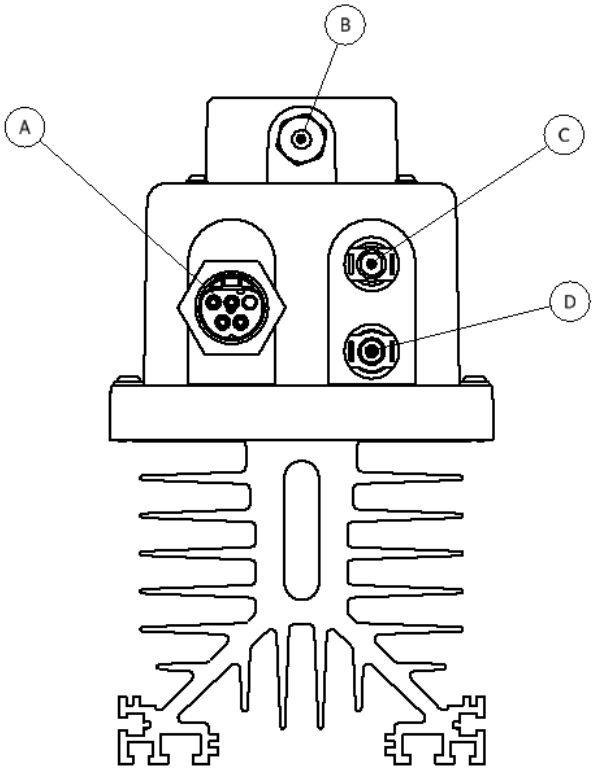
3. Make sure that the device is securely in place.

# 5 ELECTRICAL CONNECTION

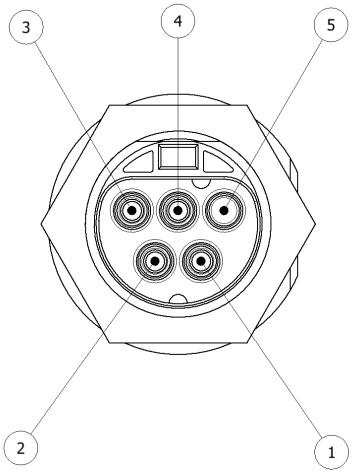
## 5.1 SAFETY

| | |
|---|---|
|  **DANGER!** | **Danger to life due to high voltages in the solar direct drive**<br>• Disconnect PV array using a disconnection unit and secure it against accidental reactivation<br>• Ensure that no voltage is present in the system |
|  **WARNING!** | **Risk of injury due to electric shock**<br>If all cables with different voltages are routed in parallel, damaged cable insulations may lead to a short circuit.<br>• Route all cables separately. |
|  **NOTICE!** | **Overvoltage can destroy the system**<br>• Use an external overvoltage protector in areas with an increased risk of thunderstorms and lightning. |
|  **NOTICE!** | **Electrostatic discharges may damage the charge controller**<br>• Ground yourself before touching a component inside the charge controller. |

## 5.2 OVERVIEW OF THE CONNECTION AREA




| ITEM | Description |
|---|---|
| A | AC Output Connector |
| B | Optional accessories connection |
| C | MC4 connector female |
| D | MC4 connector male |




| ITEM | Description |
|---|---|
| 1 | Phase I |
| 2 | Phase II |
| 3 | Phase III |
| 4 | Earth |
| 5 | Not connected |

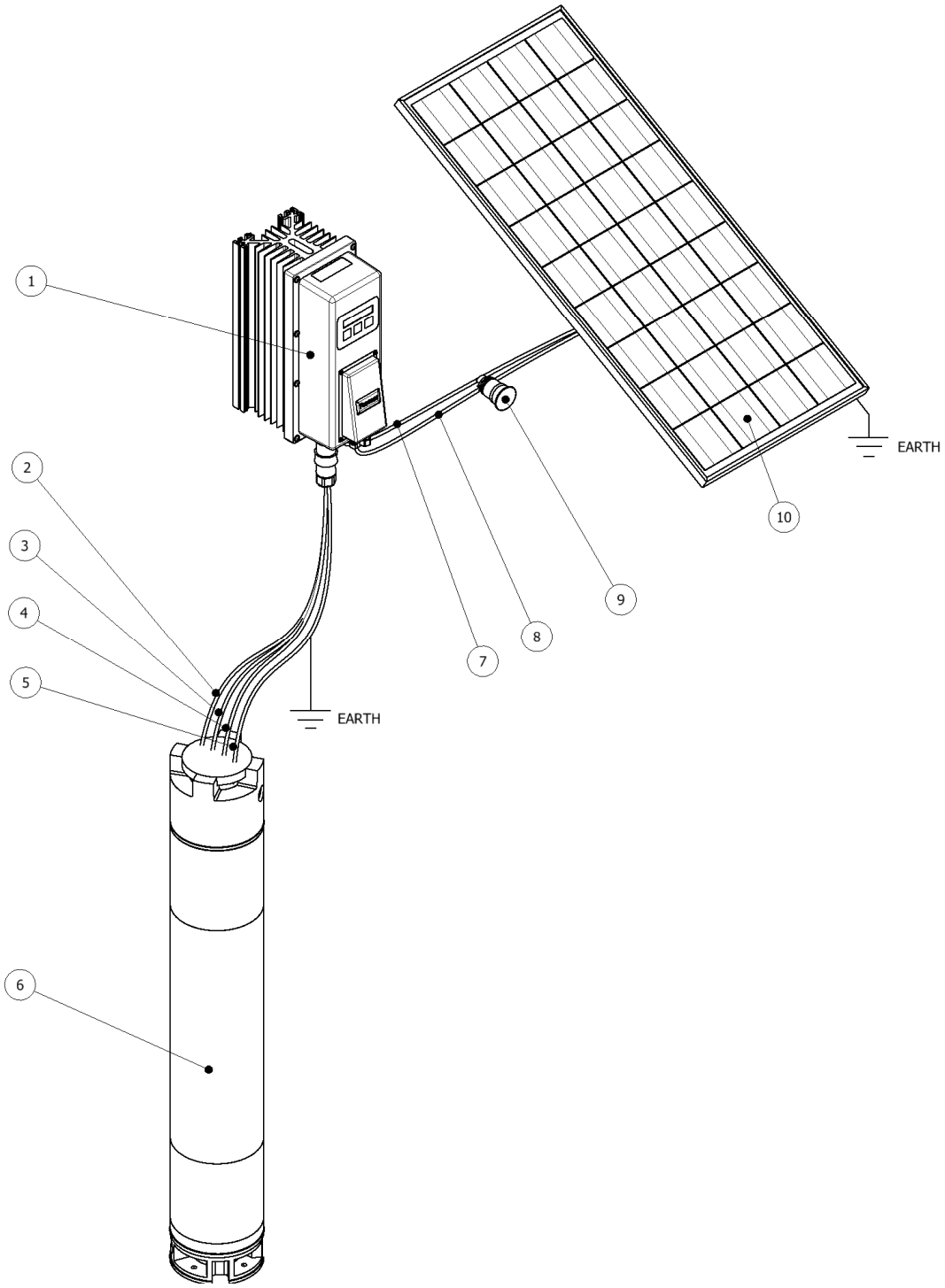
## 5.3 GROUNDING

| | |
|---|---|
| **DANGER!** | **Risk of lethal electric shock**<br><br>The SDD has the protection class of I.<br><br>• Ground the SDD properly, regardless of whether the PV is grounded |

Connected AC motor's ground should be connected to SDD. One of pins is dedicated to this connection on the output connector of the SDD.

PV array should be grounded separately and in compliance with local rules and regulations.

| Item | Description |
|---|---|
| 1 | SDD |
| 2 | Phase I cable connection |
| 3 | Phase II cable connection |
| 4 | Phase III cable connection |
| 5 | Earth connection |
| 6 | Immersion pump |
| 7 | Negative PV cable connection |
| 8 | Positive PV cable connection |
| 9 | Emergency Power Off button |
| 10 | PV array |


1
2
3
4
5
6
7
8
9
10
EARTH
EARTH

## 5.3 PV ARRAY CONNECTION (DC)

| | |
|---|---|
| **NOTICE!** | Improperly connecting the SDD to the PV array may irreparably damage it |

Due to high DC voltages, PV array should be connected to the system over an emergency power off button. In case of an emergency, PV array should be separated from the system immediately.

PV array should be protected against lightning. Proper protection equipment should be installed before operation of the system.

The following threshold values at the DC input of the SDD should be adhered to:

| **Maximum input voltage** | **Maximum input current** |
|---|---|
| 850V (DC) | 10.5A (DC) |

## 5.4 CONNECTION PROCEDURE

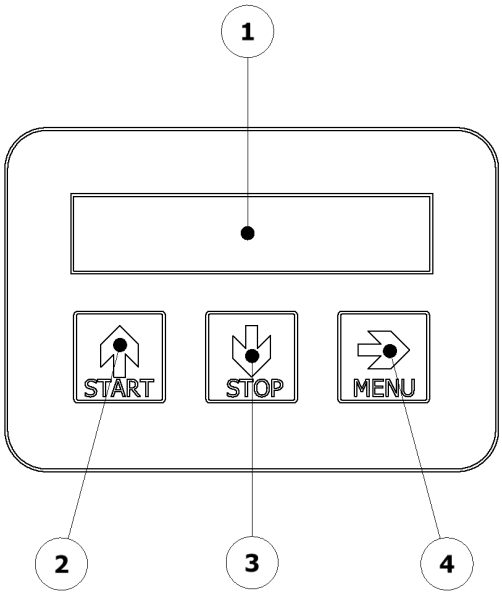
| | |
|---|---|
| **DANGER!** | **Danger to life due to high voltages in the SDD**<br>• All work on the SDD must only be carried out by an electrically skilled person. |

1. Mount input cables of the pump motor the Wieland 5 pin connector provided with SDD
2. Connect pump motor to SDD with the Wieland 5 pin connector.
3. Mount negative and positive PV cables to the MC4 connectors provided with SDD
4. Connect negative PV cable to SDD
5. Connect positive PV cable to SDD
6. Turn on PV array circuit breaker
7. Device should be powered, if there is enough solar power

# 5 OPERATION

## 5.2 DISPLAY OVERVIEW

### 5.2.1 CONTROL BUTTONS




| Item | Description |
|---|---|
| A | Start Button |
| B | Stop Button |
| C | Menu Button |
| D | Display Area |

### 5.2.2 DISPLAY

The display of SDD is 2x16 Liquid Crystal Display.


First row of the LCD displays menu information and labels. Second row of the LCD displays values to be changed, measurements, errors etc. Display changes dynamically depending on chosen menu. Refer to "Menu System" section for information on each menu display.

## 5.3 MENU SYSTEM

A simple menu system allows user to display and modify parameters of the system.

### DEFAULT

At startup after a system check and welcome messages the LC- display enters the default menu showing the "default screen" that provides a survey about the most essential operation parameters.


### SAVINGS

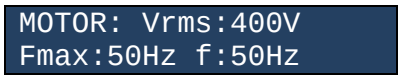
One activation of the "MENU" key switches the default menu to the menu "ADC1" that is indicating the actual PV-array voltage, the DC current of the PV-array and the power that is currently consumed.


### DRIVE CONDITION

The "drive condition" menu provides all essential parameter of the power stage on to the screen. This data is the actual output frequency, the temperature of the power stage and the actual switching frequency of the system


### MOTOR

In the "Motor" menu the parameter of the attached motor is set. The activation of the menu is initiated after the "UP" or "DOWN" key is pressed. The parameter to change starts blinking and can be altered by the "UP" or "DOWN" key. The "MENU" key changes the parameter that can be modified. Pressing simultaneously the "UP" and "DOWN" key stores the selection into an $E^2$PROM. A long activation of the "MENU" key will switch to the next menu.




### OUTPUT MODE

This menu selects the either variable voltage variable frequency (VVVF) for motor operation mode or a static output voltage of a 3- phase system, e.g. 3 x 400V. The "*" symbol indicates the current selection and further options can be selected by the "UP" and "DOWN" keys. Storing the actual selection is achieved by activating "UP" and "DOWN" key simultaneously.

## MINIMUM STARTUP VOLTAGE

This setting directly influences the PV-array under voltage detection level, the appearance of the corresponding ERROR message that is issued on screen of the "Default menu". The set value represents the threshold voltage that automatically starts the drive once after sunrise if activated.


The "UP" and "DOWN" key increments and decrements the displayed minimum startup voltage level in steps of 10V. Pressing simultaneously the "UP" and "DOWN" key stores the selection into an $E^2$PROM.

## START STOP MODE

The "Start Stop Mode" menu selects the method of starting the SDD. This menu can activate the automatic start function "autostart" and activates the digital inputs.


The optional modem can - if present - override these settings and start / stop the SDD any time. Options are selected through the "UP" and "DOWN" keys. The actual selection is marked with "*" at the beginning of the line. Pressing simultaneously the "UP" and "DOWN" key stores the selection into an $E^2$PROM. Pressing "MODE" switches to the next menu.

## MENU "LCD BACKLIGHT" (R/W)

In case a custom specific module with backlight functionality is employed in the SDD, the backlight can be activated, deactivated or temporarily activated after key activation in this menu. The actual selection is marked with "*" at the beginning of the line. Pressing simultaneously the "UP" and "DOWN" key stores the selection into an $E^2$PROM. Pressing "MODE" switches to the next menu.


## MENU "LCD CONTRAST" (R/W)

The display contrast is set in this menu in 10 steps. Please use the "UP" and "DOWN" key to modify the contrast to your requirements. The actual setting is marked with "*" within the scale of the line. Pressing simultaneously the "UP" and "DOWN" key stores the selection into an $E^2$PROM. A long activation of the "MODE" key switches to the next menu.


## MENU "SIM" (R/W)

This menu is only available when a modem has been detected by the SDD and the SIM card PIN is required. The PIN is entered digit by digit underlined by the cursor. "MENU" shifts the cursor to the next digit. Pressing simultaneously the "UP" and "DOWN" key stores the entered PIN into an $E^2$PROM and submits it to the connected MODEM for verification. This stored PIN1 is used automatically by the SDD to sign in the modem. In

case an error occurs during the automatic submission the SIM menu automatically pops up requesting a manual interaction. A long activation of the "MODE" key switches to the next menu.


## MENU "COMMUNICATION" (R/W)

The protocol for the serial communication is selected through this menu. This function is usually set from factory but might be of interest in case of later modifications or repairs and for extended service purposes. The actual selection is marked with "*" at the beginning of the line. Pressing simultaneously the "UP" and "DOWN" key stores the selection into an $E^2$PROM. Pressing "MODE" switches to the next menu. Please note that communication speed is fixed to 2400 Baud and 8 data bits no parity and 1 stop bit in case the communication through serial connection has been selected.


## MENU "DIG_OUT" (R/W)

The operation of the digital output is selected through this menu. This function allows the SDD to be used in cooperation with other sources of energy. Through the keyboard a power threshold is set as shown in the LCD. The keys "UP" and "DOWN" increment / decrement the value in steps of 100W or 1000W, while "MODE" shifts the cursor right. Is the actually delivered power of the SDD higher than this set level, the digital output will turn-on, e.g. the digital output is actively connected to the 0V level. Pressing simultaneously the "UP" and "DOWN" key stores the selection into an $E^2$PROM. Pressing "MODE" switches to the next menu.


## MENU "PUMP PROTECT" (R/W)

An optional protection for pumps with a defined minimum mechanical speed is activated and parameterized through this menu. This function protects pumps to be run at too low speed if required. Some pumps do not require such a function and sometimes it is even not desired depending on the type of pump. In case the selected speed cannot be reached at current PV supply and on the other hand the actual load conditions, the SDD will stop the drive and restart after the time [minutes] set in the display has elapsed. The "MODE" key shifts the cursor right and "UP" / "DOWN" increment / decrement the selected digit. Pressing simultaneously the "UP" and "DOWN" key stores the selection into an $E^2$PROM. Pressing "MODE" switches to the next menu.


## MENU "SERVICE" (R/W)

The access to this menu area is reserved to service personnel only. Several menus are in this service section to modify internal settings of the SDD. Altering parameter in this section can damage the .SDD and in worst case destroy the power stage.

## MENU DIGITAL INPUT / OUTPUT (I/O) / UART (R/W)

The digital interface comprises two safety isolated outputs and 3 safety isolated inputs. One I/O pair is assigned / reserved to the serial communication for the optional modem. The remaining output and the two remaining inputs can be assigned to remotely control the operation of the SDD for example through connected level switches of a water tank. Pressing the "UP" or "DOWN" button will alter the activation status of digital I/Os. In the above shown LC- Display example all available I/O's, e.g. the remaining 2 inputs and the remaining output are de-activated and hence the SDD can only be started through either the keypad or the optional GSM module Several combinations are selectable in this menu that will be explained in a separate chapter later.

```
DIGITAL INPUTS
*DIG*=off  COM=1
```

## MENU SWITCHING FREQUENCY (R/W)

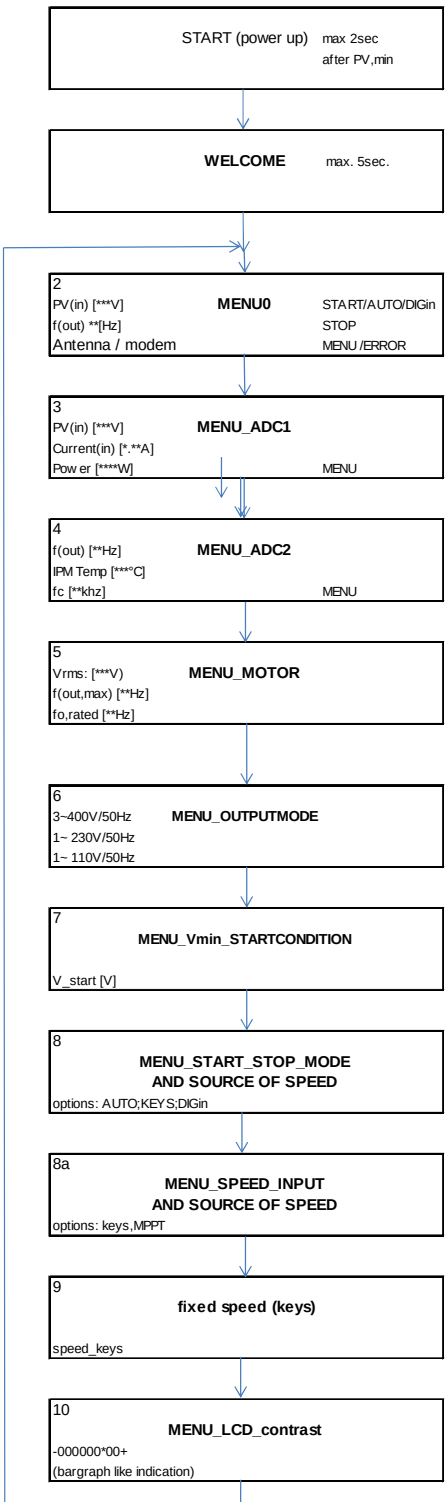
The SDD is configured from factory to operate at 4kHz switching frequency to be ensure reliable operation even at the maximum specified ambient temperature conditions and full load. However if smaller rated loads are connected to the SDD the automatic selection option of the switching frequency might lead to 8kHz operation which in conjunction with the motor might create a less noisy operation. The selection of fixed 4kHz switching frequency and the described automatic selection option is selected through this menu. The actual selection is marked with a "*" at the beginning of the line. Pressing simultaneously the "UP" and "DOWN" key stores the selection into an $E^2$PROM. Pressing "MODE" switches to the next menu.

```
Switching freq
 fc=automatic
```

## 5.4 MENU STRUCTURE AND KEY ASSIGNMENT

SOLAR DIRECT DRIVE: MENU structure and key assignment:

**rev 0.3**




| KEY: | 1st FUNCTION: | 2nd FUNCTION: |
|---|---|---|
| START | no function | |
| STOP | no function | |
| MENU | no function | |
| START&STOP | no function | |

| | | |
|---|---|---|
| START | no function | |
| STOP | no function | |
| MENU | no function | |
| START&STOP | no function | |

| | | |
|---|---|---|
| START | start drive | |
| STOP | stop drive (clear SC ERROR) | |
| MENU | next menu | |
| START&STOP | no function | |

| | | |
|---|---|---|
| START | next menu | |
| STOP | previous menu | |
| MENU | next menu | |
| START&STOP | no function | |

| | | |
|---|---|---|
| START | next menu | |
| STOP | previous menu | |
| MENU | next menu | |
| START&STOP | no function | |

| | 1st touch | then… |
|---|---|---|
| START | activate menu | increase value |
| STOP | activate menu | decrease value |
| MENU | next menu | shift to next data |
| MENU_LONG | exit and return to MENU_MOTOR | exit and return to MENU_MOTOR |
| START&STOP | no function | store in E²PROM & return to 1st touch |

| | | |
|---|---|---|
| START | select next | |
| STOP | select previous | |
| MENU | next menu | |
| START&STOP | store & return to 1st touch | |

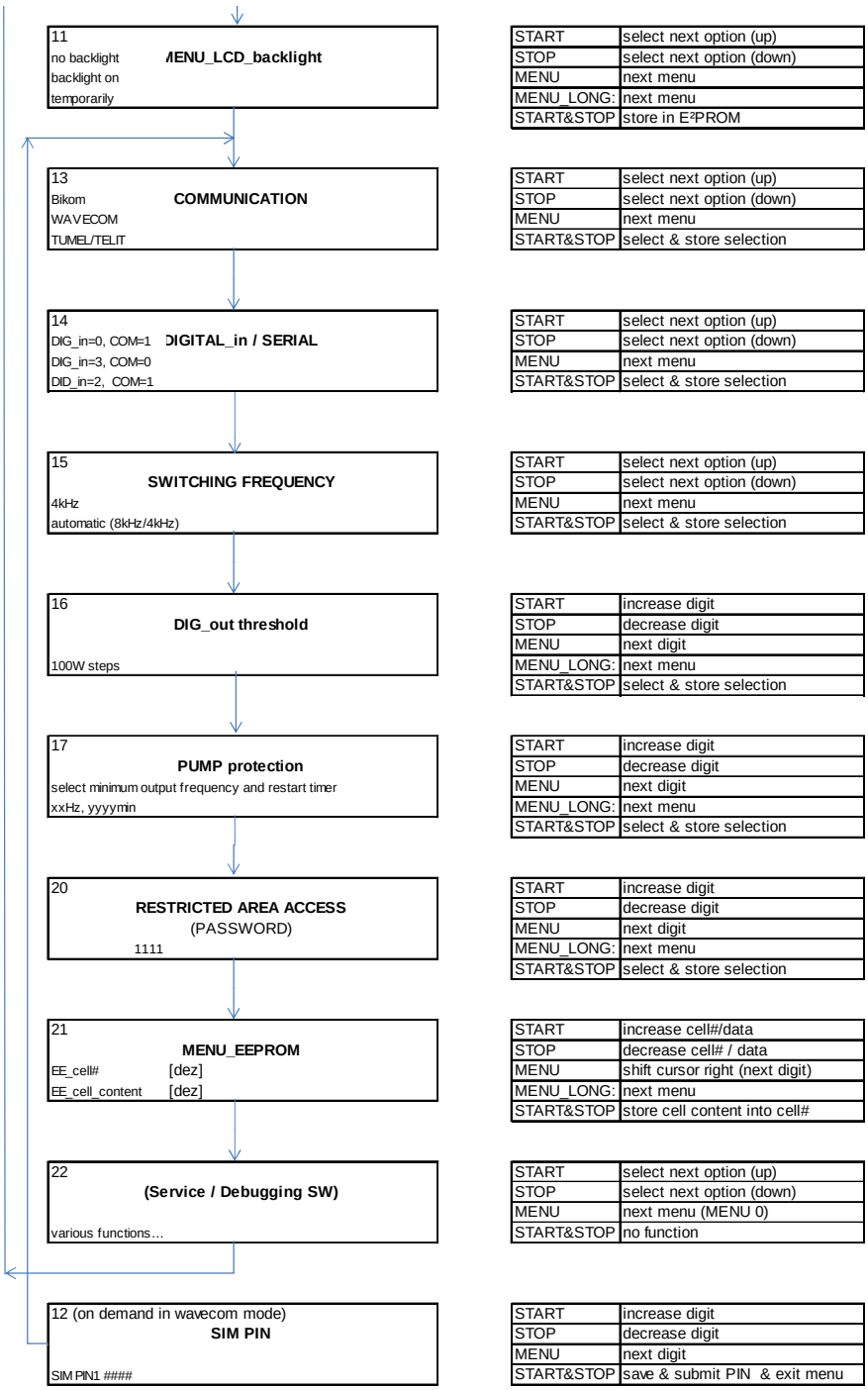
| | | |
|---|---|---|
| START | increase | |
| STOP | decrease | |
| MENU | next menu | |
| START&STOP | store & return | |

| | | |
|---|---|---|
| START | selection up | |
| STOP | selection down | |
| MENU | next menu | |
| START&STOP | store in E²PROM | |

| | | |
|---|---|---|
| START | change speed select option | |
| STOP | change speed select option | |
| MENU | next menu | |
| START&STOP | store in E²PROM | |

| | | |
|---|---|---|
| START | increase value | |
| STOP | decrease value | |
| MENU | next menu | |
| START&STOP | store speed (fixed speed) | |

| | | |
|---|---|---|
| START | increase contrast | |
| STOP | decrease contrast | |
| MENU | next menu | |
| START&STOP | store in E²PROM | |




| | |
|---|---|
| START | select next option (up) |
| STOP | select next option (down) |
| MENU | next menu |
| MENU_LONG: | next menu |
| START&STOP | store in E²PROM |

| | |
|---|---|
| START | select next option (up) |
| STOP | select next option (down) |
| MENU | next menu |
| START&STOP | select & store selection |

| | |
|---|---|
| START | select next option (up) |
| STOP | select next option (down) |
| MENU | next menu |
| START&STOP | select & store selection |

| | |
|---|---|
| START | select next option (up) |
| STOP | select next option (down) |
| MENU | next menu |
| START&STOP | select & store selection |

| | |
|---|---|
| START | increase digit |
| STOP | decrease digit |
| MENU | next digit |
| MENU_LONG: | next menu |
| START&STOP | select & store selection |

| | |
|---|---|
| START | increase digit |
| STOP | decrease digit |
| MENU | next digit |
| MENU_LONG: | next menu |
| START&STOP | select & store selection |

| | |
|---|---|
| START | increase digit |
| STOP | decrease digit |
| MENU | next digit |
| MENU_LONG: | next menu |
| START&STOP | select & store selection |

| | |
|---|---|
| START | increase cell#/data |
| STOP | decrease cell# / data |
| MENU | shift cursor right (next digit) |
| MENU_LONG: | next menu |
| START&STOP | store cell content into cell# |

| | |
|---|---|
| START | select next option (up) |
| STOP | select next option (down) |
| MENU | next menu (MENU 0) |
| START&STOP | no function |

| | |
|---|---|
| START | increase digit |
| STOP | decrease digit |
| MENU | next digit |
| START&STOP | save & submit PIN & exit menu |

# 6 MAINTENANCE AND CLEANING

SDD protection class is IP65. Device needs no maintenance other that cleaning of the cooling fins. It is only necessary to clean the cooling fins if the SDD's heat dissipation is restricted by dirt. User should;

- heatsink and cooling fins of the SDD for possible dirt accumulation every month
- carefully remove the dirt accumulated on heatsink and cooling fins with a suitable soft brush

| | |
|---|---|
| ⚠ **CAUTION!** | **Danger of burn injuries due to hot enclosure parts**<br>• Do not touch the metal parts of the SDD during operation. |

# 7 FAILURE SEARCH

## 7.1 ERROR MESSAGES

Error messages related to system failures could be found read on the "Default Screen". When and error occurs, contact technical support with the respective error code. Contact information is at the end of this user's manual.


Meaning of the short error messages is listed in the table;

| Message | Meaning |
|---|---|
| EOC | Over current |
| ESC | Short circuit |
| EOT | Over temperature |
| ERRPV | PV voltage low |

## 7.2 FAULT SEARCH

| FAULT | POSSIBLE SOLUTION |
|---|---|
| All connectors are connected, but device has no power | Check for the loose cable connections<br>Measure the voltage on the connectors on the PV panel side. If it is zero;<br>Check if PV panel circuit breaker is open or closed<br>Check if PV panel circuit breaker fuses are not broken |
| All connectors are connected, device has power but there is no output | Check for the loose cable connections<br>Measure the voltage on the output of the device. If there is no voltage call the service |

## 7.3 ERRORS RELATED TO USAGE

Errors could occur due to misusage of the SDD. These could be;

- operating the device in ambient conditions other than stated in technical datasheet
- mishandled and untidy cabling, which could lead to short circuits
- wrong mounting and positioning of the device
- misconfiguration of attached PV array

These could result in errors mentioned in section 7.1.

# 8 DECOMMISSIONING

## 8.1 DISASSEMBLY

| | |
|---|---|
| CAUTION! | **Risk of injury due to the SDD's heavy weight**<br>• Take the weight of the SDD of approx. 5 kg into account. |
| DANGER! | **Danger to life due to high voltages in the SDD**<br>If all cables with different voltages are routed in parallel, damaged cable insulations may lead to a short circuit.<br>• Switch off all fuses and ensure that they cannot be reactivated. |

Decommissioning procedure;

1. Wait until the LCD on the SDD has gone out.
2. Disconnect the PV array from SDD.
3. Disconnect the load from SDD
4. Loosen the screws of the wall mount accessory of the SDD
5. Remove the SDD

## 8.2 PACKAGING

If possible, always package the SDD in the original packaging. If this is no longer available, you can also use an equivalent box that fulfills the following requirements:

- Suitable for loads up to 5 kg
- Can be closed fully

## 8.3 STORAGE

Store the SDD in a dry place with ambient temperatures between -25 °C and +60 °C.

## 8.4 DISPOSAL

Dispose of the SDD at the end of its service life in accordance with the disposal regulations for electronic waste which apply at the installation site at that time. Alternatively, send it back to TESCOM Solar with shipping paid by sender, and labeled "FOR DISPOSAL".

# 11 TECHNICAL DATA

| INPUT | |
|---|---|
| Max. DC Voltage | 850Vdc |
| Startup Voltage | 550Vdc – 650Vdc |
| Optimal MPPT Voltage range | 350Vdc – 750Vdc |
| Number of MPP trackers | 1 |
| Max. Input current | 10A |
| Max. PV current | 20A |
| Recommended cable cross-section | 6 $mm^2$ |
| Max. cross-section of cables that can be connected | 10 $mm^2$ |
| OUTPUT | |
| Nominal output voltage | 3 phase AC 400Vrms |
| Max. Output current | 10.5A |
| Max. Efficiency | %96 |
| Max. Output Power | 5500W |
| Output frequency range | 0 Hz – 87 Hz |
| GENERAL | |
| Dimensions (W x H x D) | 130mm x 305mm x 195mm |
| Protection rating according to IEC 60529 | IP65 |
| Weight | 5,8 kg |
| EC Declaration of Conformity | |
| Display | 2 line 16 character Liquid Crystal Display |
| Mounting Type | Wall mount |
| Parallel operation | Not available |
| Isolation to PE connection to heatsink | 2500 Vrms for max. 1 min. |
| AMBIENT CONDITIONS | |
| Permissible ambient temperature during operation | Between -10°C and 45°C |
| Air humidity | %90 |
| Altitude without voltage degrading | 2000m |
| Max. Heatsink temperature during operation | 85°C |
| PROTECTIONS | |
| Overtemperature | Available |
| Overvoltage(PV) | Not available |
| Overload | Available |
| Short circuit (PV) | Not available |
| Reverse Polarity | Not available |

## 12 CONTACT

If you have technical problems concerning our products, contact the TESCOM Service Line. We need the following information in order to provide you with the necessary assistance:

- Serial number of the SDD's
- Quantity of additional SDD's
- Type and quantity of connected PV modules
- Type of battery connected
- Nominal battery capacity
- Nominal battery voltage
- Communication products connected

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