



# **SOLO Photovoltaic Inverter**

## **Customer Troubleshooting Manual**

Version 1.01

IDS AG reserves the right to change technical details.

## 1 Introduction

The purpose of this document is to describe common IDS SOLO inverter diagnostics and offer troubleshooting advice to. This manual must be used with the corresponding Installation and user manual for the particular SOLO inverter.

## 2 Security advice



**WARNING!**

The device must only be operated and maintained by qualified personnel.



**WARNING!**

The device carries lethal grid and PV generator voltages. Consider a capacitor discharge time of 10 minutes! And beware that an automatic restart can follow a grid or photovoltaic voltage failure.



**WARNING!**

Consider all safety instructions displayed on the inverter and in the Installation and user manual!



**WARNING!**

If any information is unclear, please refer to IDS Service Centre!



### 3 Initial state and checks prior to start-up procedure

1	Initial state of the inverter	Main switch must be in "OFF" position Two-position switch must be in "Stop" position Emergency stop button must be in "inactive" state: push to activate and turn as indicated to release
2	Initial checks before starting the inverter	Cooling system pressure 2 bar String box contactor control and feedback signals are properly connected. PV string voltage must be available to the trackers of the inverter – all string box main switches or other switches, disconnectors, etc. on the PV lines must be switched to "ON" position. All external emergency buttons must be in "inactive" state 400V <sub>AC</sub> voltage must be available from the grid

### 4 Startup and shutdown procedures if external auxiliary supply is connected

No	Action	Indication		
		Signal lamp	Display / Status button*	Other
<b>Startup</b>				
1	Switch the auxiliary supply on	Flashing red	Company Logo** / Initializing -> Fault	Indicator lamp of ISB connected to the first PV input must be glowing red, Status button on display must be flashing red-yellow
2	Switch the main switch on	Dark	Logo / Off	The AC voltage is displayed
3	Set the two-position selector key to "Start" position	Flashing green -> Glowing green	Logo / Ready -> Running	Humming from the inverter can be heard
<b>Shutdown</b>				
1	Set the two-position selector key to "Stop"	Off	Logo / Off	Humming from the inverter stops
2	Switch the main switch off	Flashing red	Logo / Fault	Status button on display must be flashing red-yellow
3	Switch the auxiliary supply off	Off	Off	Indicator lamp of all ISB boxes must be off

Notes: \* Status button on display is visible when touching the display after Company logo appears.

\*\* Company logo (Logo) appears after switching on the display.



## 5 Startup and shutdown procedures if external auxiliary supply NOT installed

No	Action	Indication		
		Signal lamp	Display / Status button (after touching the display)	Other
<b>Startup</b>				
1	Switch the main switch on	Off	Logo / Initializing 20-30sec -> Off	AC voltage: 330V for SOLO 500 400V for SOLO 100 and SOLO 250
2	Set the two-position switch to "Start"	Flashing green	Logo / Ready 20-30 sec -> Running	Humming from the inverter must be heard
<b>Shutdown</b>				
1	Set the two-position switch to "Stop"	Off	Logo / Off	Humming from the inverter stops
2	Switch the main switch off	Off	Off	



## 6 Troubleshooting – inverter indication

Signal light	Display	Status	Observations / Diagnostics	Advised Action
Off	Off	OFF	No indications on the display or control lamps	<ul style="list-style-type: none"> <li>• Check the auxiliary voltage supply (230V<sub>AC</sub> or 3-phase 400V<sub>AC</sub>)</li> <li>• Check if 400V<sub>AC</sub> from grid is connected to the inverter</li> <li>• Contact IDS service</li> </ul>
Glowing red	Flashing red -yellow	Error	Check the error message in the events log	<ul style="list-style-type: none"> <li>• Depending on the message follow the instruction in Chapter 8</li> </ul>
Flashing red or red-green	Flashing cyan - yellow	Warning	Check the warning message in the events log.	<ul style="list-style-type: none"> <li>• Depending on the message follow the instruction in Chapter 8</li> </ul>
Flashing green	Yellow	Ready	No power generation No consumption from PV strings	<ul style="list-style-type: none"> <li>• Temporary state, no action to be done</li> </ul>
Glowing green	Yellow	Running	Decreased production on one or more of the trackers	<ul style="list-style-type: none"> <li>• Check if the main switches of corresponding string boxes are “ON”</li> <li>• Check if all the indicator lamps on corresponding string boxes are glowing</li> <li>• Contact IDS service</li> </ul>



## 7 Troubleshooting – IDS Web portal messages

Type of event – message in IDS portal	Observations / Diagnostics	Advised Action
Internal Fault	Signal light red	<ul style="list-style-type: none"> <li>• Contact IDS service</li> </ul>
E-Stop or Manual Stop	Signal light red	<ul style="list-style-type: none"> <li>• Check if emergency stop buttons are in “inactive” state</li> <li>• Main switch must be in “ON” state</li> <li>• Contact IDS service</li> </ul>
Fault PV System	Signal light red	<ul style="list-style-type: none"> <li>• Check PV trackers for overvoltage</li> <li>• Contact IDS service</li> </ul>
Fault Cooling System	Signal light red	<ul style="list-style-type: none"> <li>• Refill cooling system if needed to 2.0 bar.</li> <li>• Check for obstacles or contamination around the heat exchanger.</li> <li>• Check if all fans are rotating when the inverter is restarted</li> <li>• Contact IDS service</li> </ul>
Fault Indication Grid Monitoring	Signal light red	<ul style="list-style-type: none"> <li>• Check the grid voltage</li> <li>• Contact IDS service</li> </ul>



## 8 Troubleshooting – IDS Inverter VCU messages

Event code	Event message on VCU	Observations/Diagnostics	Advised Action
7, 9, 15, 17, 19, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 73, 75, 77, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, 185, 187, 193, 195, 197, 199, 201, 203	ERROR: Internal	Not measurable by customer	<ul style="list-style-type: none"> <li>• Contact IDS service</li> </ul>
21	ERROR: Grid synchronization lost	No grid connected Wrong phase sequence (AC main power) Grid frequency out of tolerance	<ul style="list-style-type: none"> <li>• Check grid connection, fuses and phase order</li> </ul>
23	ERROR: Passive precharge	Grid fault or internal error	<ul style="list-style-type: none"> <li>• Check grid connection and fuses</li> <li>• Check the auxiliary supply</li> <li>• Contact IDS service</li> </ul>
25	ERROR: E-Stop / E- Stop button activated	EStop button on inverter cabinet pressed or door switch open	<ul style="list-style-type: none"> <li>• Check EStop button on the front door, external EStop button and door switch</li> </ul>
27	ERROR: Inverter internal error circuit	Internal error	<ul style="list-style-type: none"> <li>• Contact IDS service</li> </ul>
29	ERROR: PV input 1 overcurrent	Wrong installation of PV panels/ shortcut between tracker inputs	<ul style="list-style-type: none"> <li>• Check PV connections integrity</li> </ul>
31	ERROR: PV input 2 overcurrent		
33	ERROR: PV input 3 overcurrent		
35	ERROR: PV input 1 overvoltage	Wrong installation of PV panels	<ul style="list-style-type: none"> <li>• Check the installation of PV panels</li> </ul>
37	ERROR: PV input 2 overvoltage	Low temperature Plant design	<ul style="list-style-type: none"> <li>• Check the temperature</li> <li>• Check the plant design</li> </ul>
39	ERROR: PV input 3 overvoltage		



41	ERROR: Cooling system flow/pressure	Air present in the cooling system Low cooling liquid pressure	<ul style="list-style-type: none"> <li>• Perform air venting of the cooling circuit</li> <li>• Check cooling system for leaks. Perform filling in and air venting of the cooling circuit</li> <li>• Contact IDS service</li> </ul>
43	ERROR: Cooling liquid overtemperature	Air in the system, difficulties with water circulation Cooling fan of heat exchanger not rotating Contamination of the heat exchanger	<ul style="list-style-type: none"> <li>• Perform air venting of the cooling circuit</li> <li>• Check/fix the fan wiring</li> <li>• Clean-up the contamination in and around the heat exchanger</li> <li>• Make sure that the heat exchanger is mounted on a place with no direct sunlight</li> <li>• Contact IDS service</li> </ul>
45	ERROR: Cabinet overtemperature	Fan not operating (fault with fan, fan supply or wiring) Air filter contaminated, obstacle in the air path Room temperature too high (above 50°C)	<ul style="list-style-type: none"> <li>• Replace the air filter, remove the obstacle</li> <li>• Provide enough room ventilation</li> <li>• Contact IDS service</li> </ul>
67	ERROR: Line contactor	Internal Error	<ul style="list-style-type: none"> <li>• Contact IDS service</li> </ul>
69	ERROR: E-Stop / E- Stop button activated	EStop button on inverter cabinet pressed or door switch open	<ul style="list-style-type: none"> <li>• Repeats ERROR 25</li> </ul>
71	ERROR: E-Stop / E- Stop button activated	EStop button on inverter cabinet pressed or door switch open	<ul style="list-style-type: none"> <li>• Repeats ERROR 25</li> </ul>
79, (81, 83)	ERROR: Grid overvoltage phase U (V, W)	Grid voltage parameter deviation	<ul style="list-style-type: none"> <li>• Check grid voltage, contact grid operator</li> </ul>
85, (87, 89)	ERROR: Grid undervoltage phase U (V, W)	Grid voltage parameter deviation	<ul style="list-style-type: none"> <li>• Check grid voltage, contact grid operator</li> </ul>
91 (93, 95)	ERROR: Grid overvoltage phase U (V, W) (slow)	Grid voltage parameter deviation	<ul style="list-style-type: none"> <li>• Check grid voltage, contact grid operator</li> </ul>



97, (99, 101)	ERROR: Grid overvoltage between phases U and V (V and W, W and U)	Grid voltage parameter deviation	<ul style="list-style-type: none"> <li>• Check grid voltage, contact grid operator</li> </ul>
103, (105,107)	ERROR: Grid undervoltage between phases U and V (V and W, W and U)	Grid voltage parameter deviation	<ul style="list-style-type: none"> <li>• Check grid voltage, contact grid operator</li> </ul>
109	ERROR: External grid monitoring	Grid monitor detected grid voltage or frequency outside of the VDE126-1-1 limits	<ul style="list-style-type: none"> <li>• Check grid voltage, contact grid operator</li> </ul>
143	WARNING: Inverter internal warning circuit	Internal warning	<ul style="list-style-type: none"> <li>• Contact IDS service</li> </ul>
145	WARNING: Cabinet overtemperature	Cabinet temperature has reached the warning level	<ul style="list-style-type: none"> <li>• Check the fans, filters, room temperature</li> </ul>
147	WARNING: Cooling liquid overtemperature	Cooling liquid temperature has reached the warning level	<ul style="list-style-type: none"> <li>• Check cooling system for leaks</li> <li>• Refill the cooling system to 2.0 bar</li> <li>• Check for obstacles or contamination around the heat exchanger</li> <li>• Check if all fans are rotating when the inverter is restarted</li> <li>• Contact IDS service</li> </ul>
149	WARNING: String / String box	One or more feedback connections of string boxes are open	<ul style="list-style-type: none"> <li>• Switch on all string box main switches</li> <li>• Check and fix the supply of the string box, including fuses in inverter and in string box</li> <li>• Check the supply and signal wiring of string boxes</li> <li>• Contact IDS service</li> </ul>
151	WARNING: Wrong power reduction commands	(Power limitation relay inputs) do not have an allowed combination.	<ul style="list-style-type: none"> <li>• Check the bridges / connections to power limitation terminals. Only one terminal may be active!</li> <li>• Contact IDS service</li> </ul>



153	WARNING: String / string box	Feedback interface from overnight string box is open	<ul style="list-style-type: none"> <li>• Switch on the string box main switch</li> <li>• Check and fix the supply of the string box, including fuses in inverter and in string box</li> <li>• Check the wiring</li> <li>• Contact IDS service</li> </ul>
155	WARNING: Isolation fault	Insulation fault	<ul style="list-style-type: none"> <li>• Check the insulation of the installed wiring</li> <li>• Contact IDS service</li> </ul>
157	WARNING: PV voltage missing	PV voltage missing	<ul style="list-style-type: none"> <li>• Check if the string boxes are switched on</li> <li>• Check the installation wiring of the string boxes</li> <li>• Check if the PV panels are not covered with snow</li> <li>• Contact IDS service</li> </ul>
159	WARNING: PV input disabled	PV input disabled by software	<ul style="list-style-type: none"> <li>• Contact IDS service</li> </ul>
161	WARNING: Internal	Internal warning	<ul style="list-style-type: none"> <li>• Contact IDS service</li> </ul>
163	WARNING: PV current missing	PV current missing	<ul style="list-style-type: none"> <li>• Contact IDS service</li> </ul>
165	WARNING: Start inhibit (grid out of range)	Start not possible (grid out of range)	<ul style="list-style-type: none"> <li>• Check grid parameters, contact grid operator</li> <li>• Contact IDS service</li> </ul>
167, 169, 171, 173	WARNING: Internal	Internal warning	<ul style="list-style-type: none"> <li>• Contact IDS service</li> </ul>
175	ERROR: Grid frequency too high	Grid parameter deviation	<ul style="list-style-type: none"> <li>• Check grid parameters, contact grid operator</li> </ul>
177	ERROR: Grid frequency too low		
179	ERROR: Grid fault (FRT timeout)	Grid voltage parameter deviation	<ul style="list-style-type: none"> <li>• Check grid parameters, contact grid operator</li> </ul>
181	ERROR: Wrong grid phase sequence	Wrong grid phase sequence	<ul style="list-style-type: none"> <li>• Check grid wiring, contact grid operator</li> </ul>
183	ERROR: Grid voltage harmonics too high	Grid parameter deviation	<ul style="list-style-type: none"> <li>• Check grid parameters, contact grid operator</li> </ul>



189	ERROR: Active precharge	Internal error	<ul style="list-style-type: none"> <li>• Contact IDS service</li> </ul>
191	ERROR: PV voltage or current out of range	PV voltage or current out of range	<ul style="list-style-type: none"> <li>• Check String box wiring</li> <li>• Contact IDS service</li> </ul>
205	ERROR: String / string box	String box feedback open	<ul style="list-style-type: none"> <li>• Check the wiring integrity of String box and panels</li> <li>• Contact IDS service</li> </ul>
209	WARNING: String box	String box feedback open or negative current detected	<ul style="list-style-type: none"> <li>• Check the wiring integrity of String box and panels</li> <li>• Contact IDS service</li> </ul>
211	WARNING: String low current	One or more string currents in a string box are lower than specified threshold	<ul style="list-style-type: none"> <li>• Check the wiring integrity of the string box and panels</li> <li>• Check the performance of connected panels</li> <li>• Contact IDS service</li> </ul>
213	WARNING: String box communication lost	No communication between the inverter and string boxes	<ul style="list-style-type: none"> <li>• Check the communication cabling</li> <li>• Contact IDS service</li> </ul>
215	WARNING: Wrong number of string box detected	No response between the inverter and some of string boxes	<ul style="list-style-type: none"> <li>• Check the communication cabling</li> <li>• Contact IDS service</li> </ul>
239	INFO: Power reduction activated/ deactivated	Indication of power reduction commands from grid operator	<ul style="list-style-type: none"> <li>• In case of suspected difference between commands from grid operator check the signal cables</li> <li>• Contact IDS service</li> </ul>

<i>Any other problems or questions?</i>	Call IDS service center and ask for advice.
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## Contacts

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