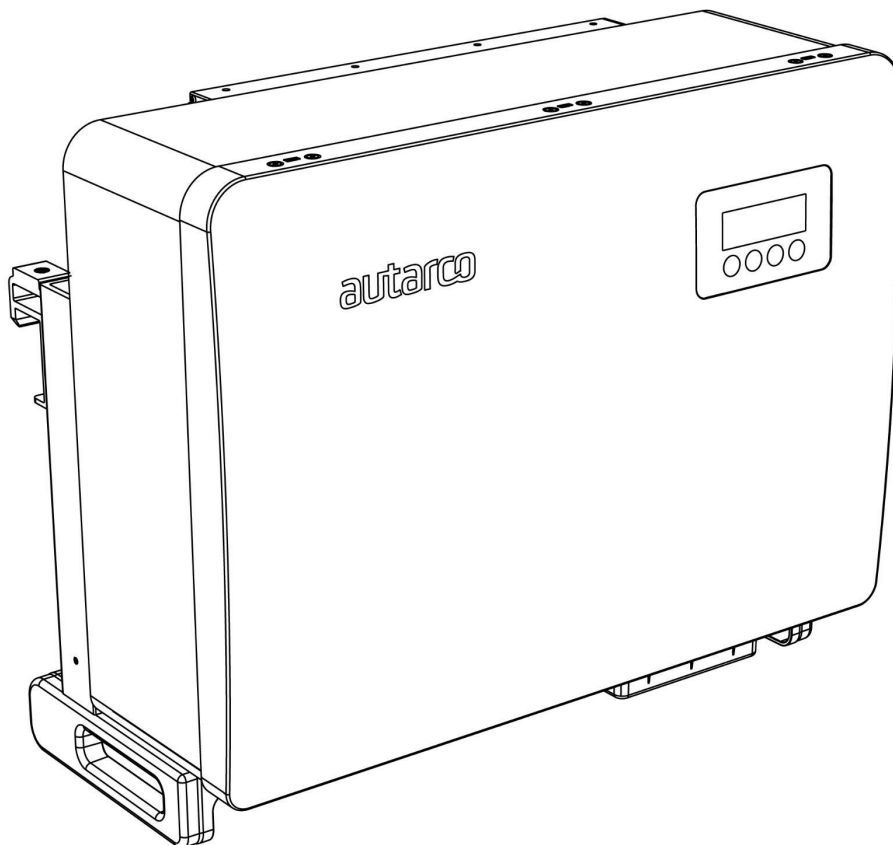




## Installation and Operation Manual

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### Solar Inverters UX-MII series



## **Contact Information**

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## **Other Information**

This manual is an integral part of the unit. Please read the manual carefully before installation, operation or maintenance. Keep this manual for future reference.

Product information is subject to change without notice. All trademarks are recognized as the property of their respective owners.

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# 1 Introduction

## 1.1 Read this first

This manual contains important information for use during installation and maintenance of the UX-MII-series Autarco inverter.

To reduce the risk of electrical shock, and to ensure the safe installation and operation of the UX-MII-series Autarco inverters, the following safety symbols appear throughout this document to indicate dangerous conditions and important safety instructions.



**WARNING!** Indicates safety instruction, which if not correctly followed, can result in injury or property damages.



**RISK OF ELECTRIC SHOCK!** Indicates safety instructions, which if not correctly followed, could result in electric shock.



**HOT SURFACE!** Indicates safety instructions, which if not correctly followed, could result in burns.

## 1.2 Target Audience

This manual is intended for anyone who uses Autarco UX-MII-series inverter. Before any further action, the operators must first read all safety regulations and be aware of the potential danger to operate high-voltage devices. Operators must also have a complete understanding of this device's features and functions.



**ATTENTION!** Qualified personnel means a person with valid license from the local authority in:

- Installing electrical equipment and PV power systems (up to 1000 V).
- Applying all applicable installation codes and using Personal Protective Equipment.
- Analyzing and reducing the hazards involved in performing electrical work.



**WARNING!** Do not use this product unless it has been successfully installed by qualified personnel in accordance with the instructions in chapter 4 "Installation".

## 1.3 Product versions covered by this document

The main purpose of this user manual is to provide instructions and detailed procedures for installing, operating, maintaining, and troubleshooting the UX-MII-series of Autarco inverters which includes the following models:

For 380/400V AC grid connection:

- S2.UX50000(S)-MII
- S2.UX60000(S)-MII

For direct transformer connection at 540 Volt:

- S2.UX60000(S)-HV-MII
- S2.UX70000(S)-HV-MII

The “S2.” in the product code means the product is a grid-tied inverter. If the product has an “S” at the end it comes with integrated DC switches. The -MII stands for the Mark II series.

The item code or SKU will include an additional number at the end. The final number references the default grid standard and colour of inverter. For example, S2.UX50000S-MII.1 is the 50kW model with Dutch grid standard as default, integrated DC switch and Autarco blue cover.

Please keep this user manual available at all times in case of emergency.

## 2 Preparation

### 2.1 Safety instructions



**DANGER!** Do not touch any internal components whilst the inverter is in operation.



**DANGER!** Do not stand close to the inverter during severe weather conditions such as lightning, etc.



Make sure you completely cover the surface of all PV arrays with opaque (dark) material before wiring them or make sure the DC circuit breaker or equivalent DC isolator is disconnected. This is because photovoltaic (PV) arrays create electrical energy when exposed to light, and could cause a hazardous condition.



The UX-MII series inverter must only be operated with PV arrays of protection class II, in accordance with IEC 61730, class A.



**WARNING!** The PV inverter will become hot during operation; please don't touch the heat sink or peripheral surface during or shortly after operation.

**NOTICE!** Do not directly connect the AC output of the inverter to any private AC equipment. The PV inverter is designed to feed AC power directly into the public utility power grid.



**NOTICE!** Do not connect PV array positive (+) or negative (-) to ground – doing so could cause serious damage to the inverter.



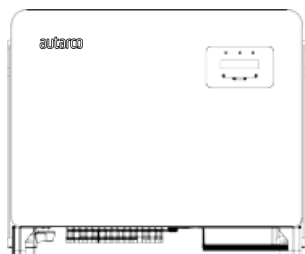
**WARNING!** The installation, service, recycling and disposal of the inverters must be performed by qualified personnel in compliance with national and local standards and regulations.



Please contact your dealer to get the information of authorized repair facilities for any maintenance or repairmen.

Any unauthorized actions including modification of product functionality of any form will affect the validation of warranty service; Autarco may deny the obligation of warranty service accordingly.

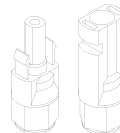
## 2.2 Package contents



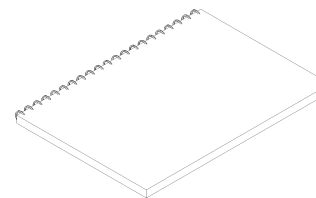
Autarco UX-MII-series inverter



Mounting bracket  
Incl. screws



MC4 connector pairs



Instruction manual

## 2.3 Internal DC switch

Please verify whether your Autarco UX-MII-series inverter is equipped with an internal DC switch. If there is an internal DC switch the product code will have an “S”. The switch can be found on the bottom of the inverter (see 3.3). If there isn’t an internal DC switch it is important to install an external DC disconnect in order to completely disconnect the solar PV module strings from the inverter.

## 2.4 Explanations of symbols on inverter



### DANGER - HIGH ELECTRIC VOLTAGE

This device is directly connected to the public grid. All work to the inverter shall be carried out by qualified personnel only. There might be residual currents in the inverter for up to 10 minutes because of large capacitors present.



### ATTENTION

This device is directly connected to electricity DC generators and the public AC grid.



### DANGER – HOT SURFACES

The components inside the inverter will get hot during operation, DO NOT touch aluminum housing during operating.



### ATTENTION

In case of any work to the inverter, always refer to this manual for detailed product information.



### ATTENTION

This device SHALL NOT be disposed of in residential waste. Please go to Chapter 9 “Recycling and Disposal” for proper treatments.





**CE MARK**

This equipment conforms to the basic requirements of the EU guideline governing low voltage and electromagnetic compatibility.

## 3 Product information

### 3.1 Overview

Autarco UX-MII-series grid tied inverters are state of the art, high efficiency, robust and reliable grid tied inverters at the best price quality ratio available. They are easy to install and carry a standard 5 year product warranty. Our rigorous quality control and testing facilities guarantee Autarco inverters meet the highest quality standards possible. These inverters are the key to our international track record of delivering extremely reliable solar power solutions.

Key features:

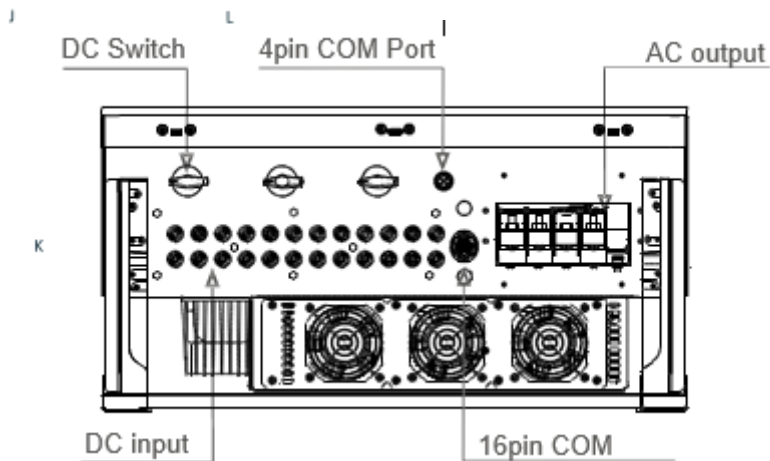
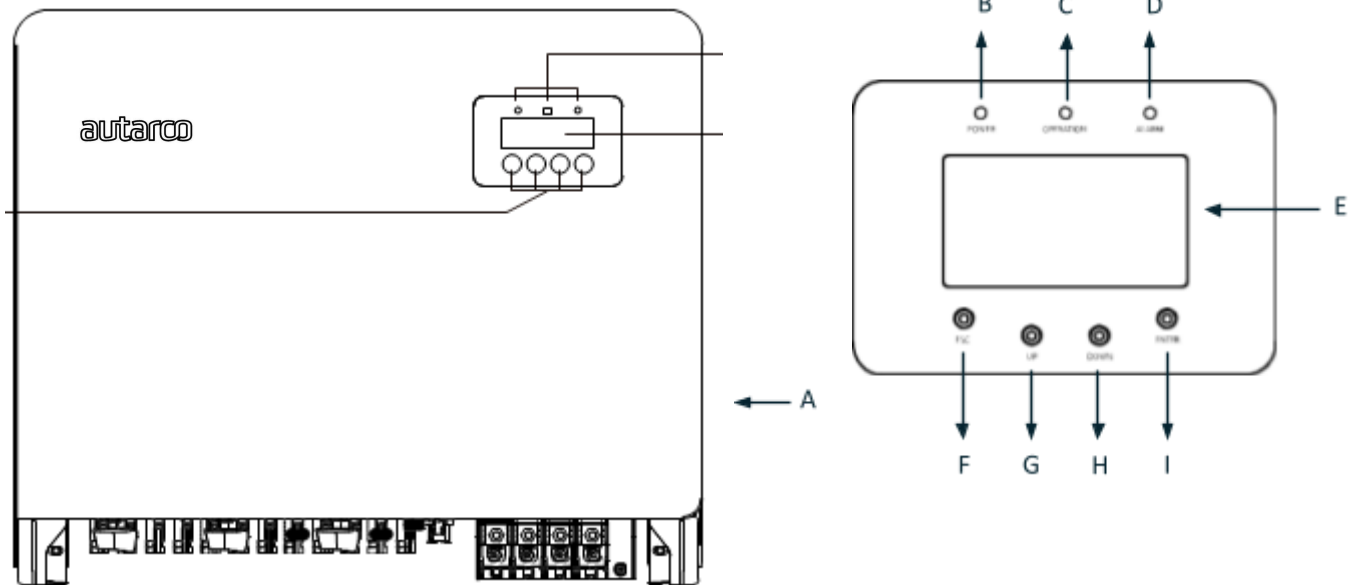
- Maximum efficiency of 98.7%
- 5/6 MPPT with wide voltage range
- Low turn off voltage
- High enclosure protection class IP66
- Intelligent redundant fan-cooling
- Standard five year product warranty
- Optional integrated DC switch
- High range of protective functions

For full specifications please see chapter 11 “Product specifications”.

### 3.2 Product identification

You can identify the inverter by the serial number (S/N) sticker on the side of the inverter. Important electrical specifications can also be found on the label which can be found on the left side of the inverter housing. Do not remove the label or the serial number as this voids the product warranty.

## 3.3 Product overview



- A: Inverter cover
- B: LED light – POWER
- C: LED light – OPERATION
- D: LED light – ALARM
- E: Display
- F: Escape key
- G: Up key
- H: Down key
- I: Enter key
- J: DC switch
- K: DC inputs
- L: AC output

### 3.4 Safety



**DANGER!** Do not install the inverter near flammable or explosive items.



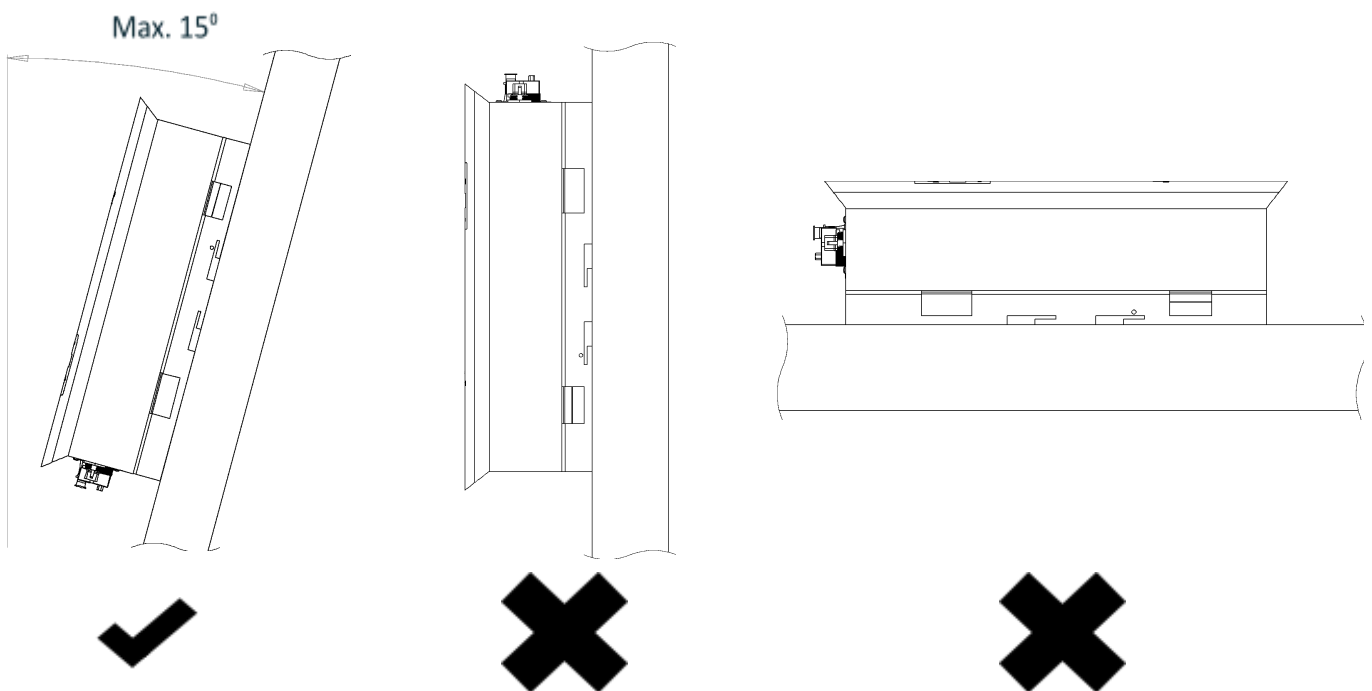
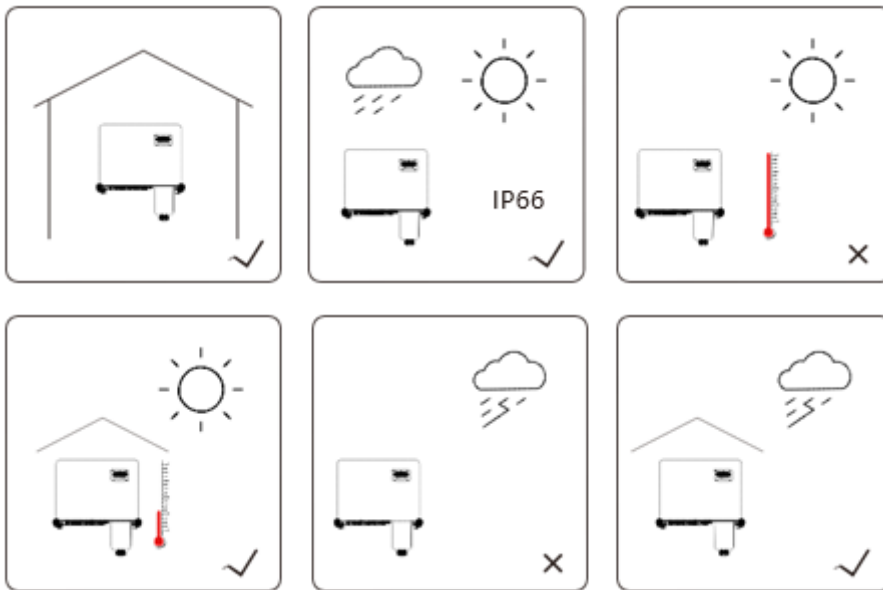
**WARNING!** The installation must be performed by qualified personnel and in compliance with national and local standards and regulations.  
This inverter will be connected to a high voltage DC power generator and AC grid. Inappropriate installation may jeopardize the life span of the inverter.



The installation site must have good ventilation conditions. Direct exposure to intense sunshine is not recommended and should be avoided with a shelter or roof. If installed in a dusty or industrial environment, regular cleaning with a dry brush is recommended. The inverter can be cleaned with a damp cloth with clean water only.

## 3.5 Mounting instructions

- The inverter is suitable for outdoor and indoor installation.
- Vertical installation is recommended, with a maximum inclination of 15° backwards.
- Make sure the mounting wall is strong enough to hold the weight of the inverter.
- The ambient temperature of the installation site should be between -20 °C and +60 °C.
- It is not recommended that the inverter is exposed to direct sunshine.
- Make sure of ample ventilation at the installation site, insufficient ventilation may reduce the performance of the electronic components inside the inverter and shorten the lifespan of the inverter.

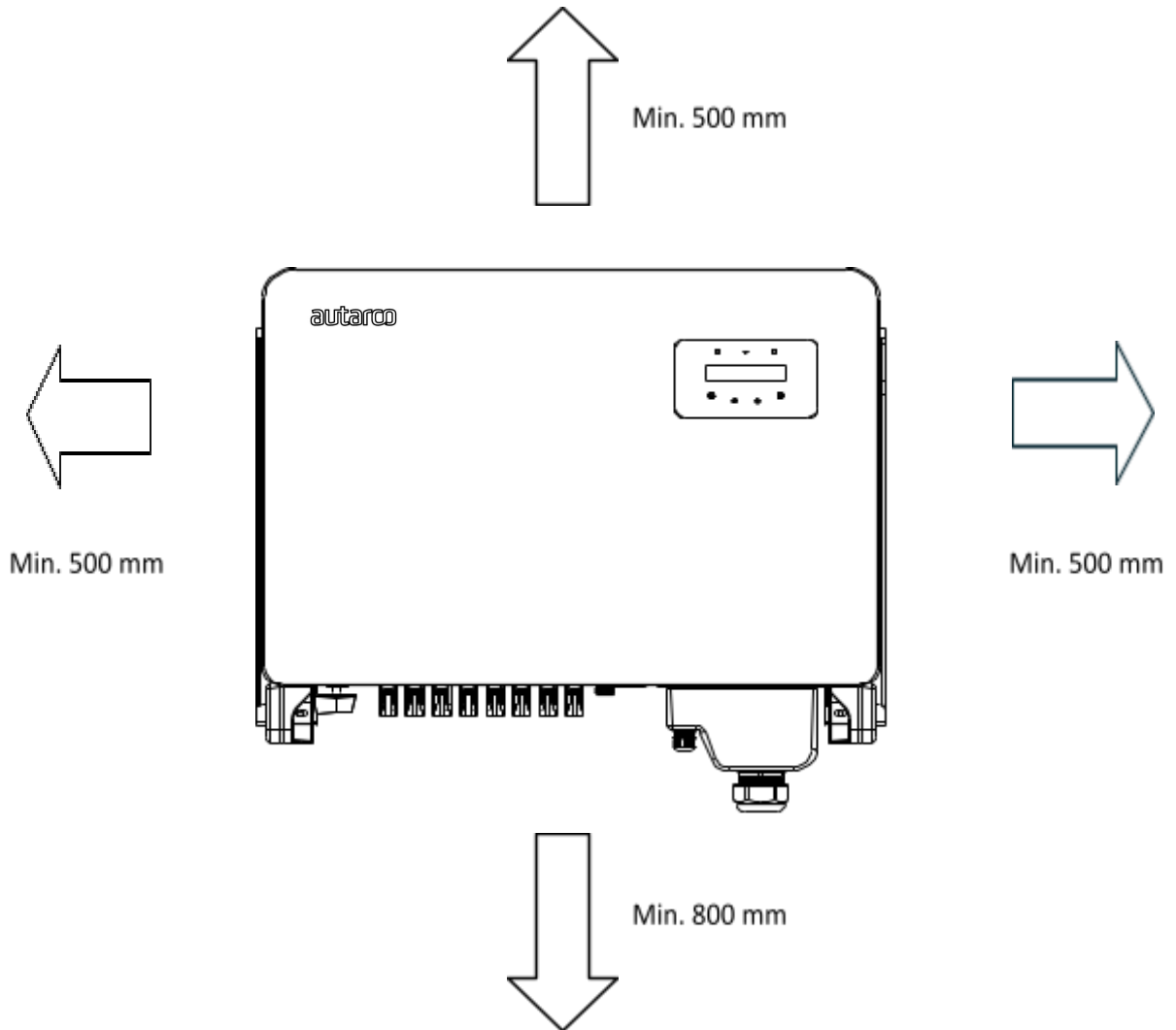


### 3.6 Safety clearance



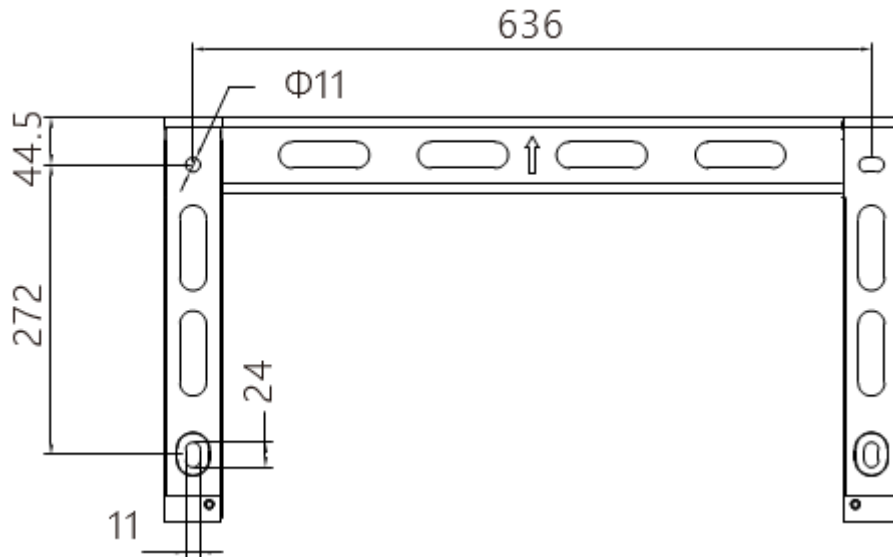
Caution! Make sure heat sinks are out of reach of children.

Observe the following minimum clearances to walls:

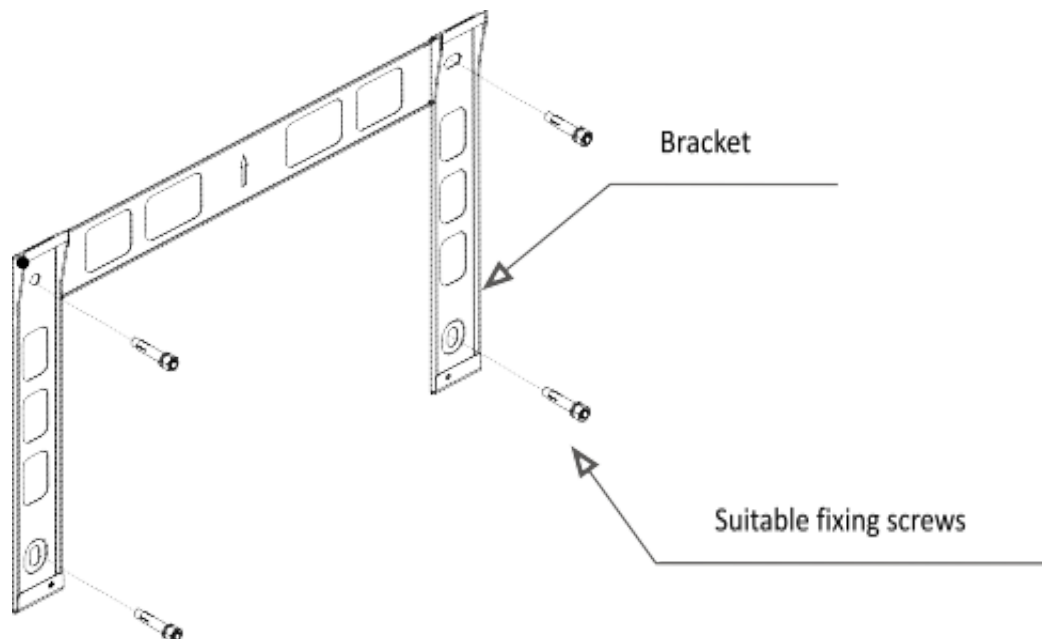


## 3.7 Mounting procedure

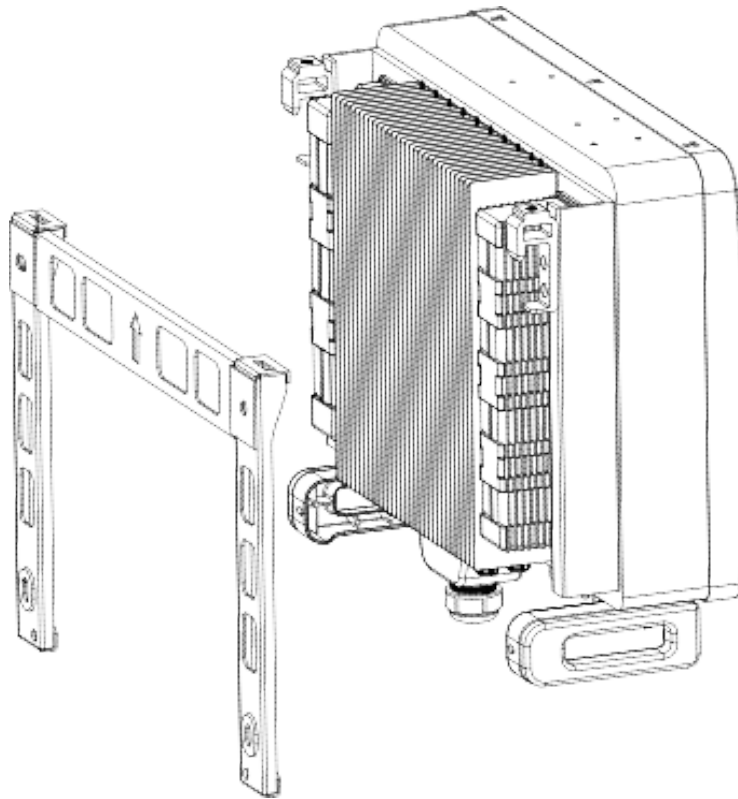
**Step 1 —** The wall bracket has the dimensions below. Please ensure the positions of the holes are suitable for fitting expansion bolts.



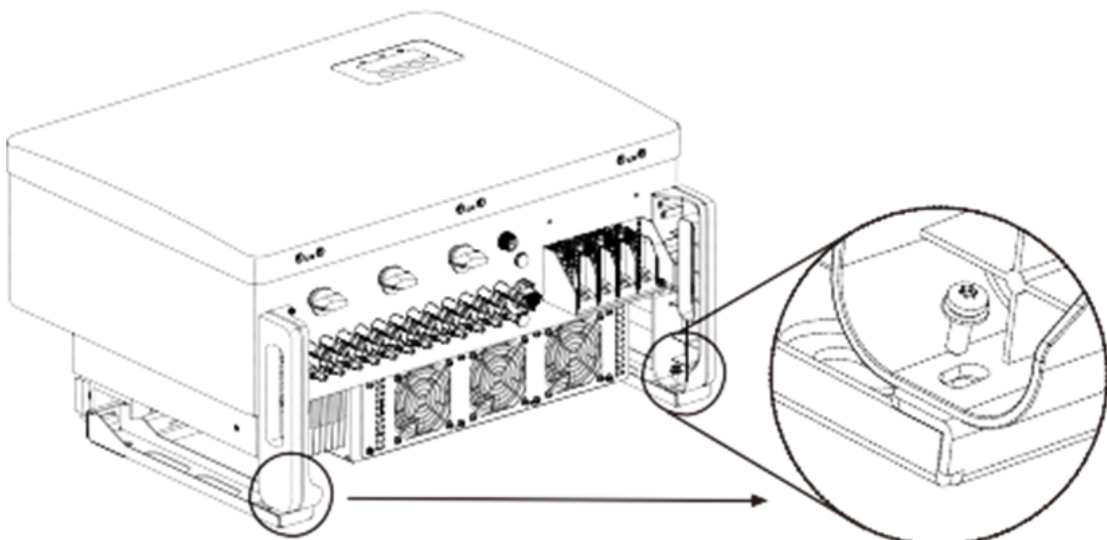
**Step 2 —** Mount the wall bracket onto the mounting wall with appropriate screws plugs.



**Step 3 —** Lower the inverter onto the bracket. The screw holes in the wall bracket should align with the raised convex on the inverter bracket.



**Step 4 —** Fix the bottom of the inverter to the wall bracket with the M4x9mm screws:



## 4 Electrical installation



**DANGER!** This inverter will be connected to a high voltage DC power generator and AC grid. The installation must be performed by qualified personnel and in compliance with national and local standards and regulations

### 4.1 AC connection



**DANGER!** Never connect or disconnect the connectors under load.



**NOTICE!** The AC connection to the electrical distribution grid must be performed only after receiving authorization from the utility that operates the grid.



**NOTICE!** Make sure to set the correct grid standard as part of system commissioning, see chapter 6.6.

The Autarco inverter is equipped with an integrated Residual Current Protective Device (RCPD) and Residual Current Operated Monitor (RCOM). The RCOM will detect the volume of the leakage current and compare it with the expected value, if the leakage current exceeds the permitted range, the RCPD will disconnect the inverter from the AC load.

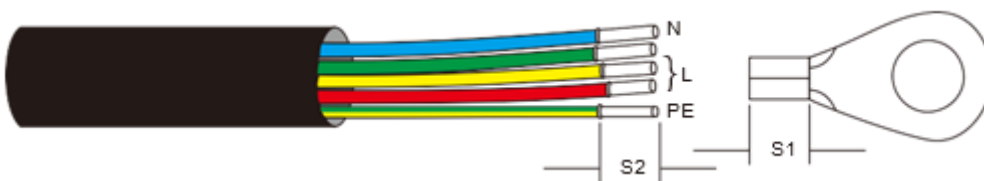
If regulations in the country of installation stipulate an external Residual Current Device (RCD), you must use a device with a tripping threshold of 100 mA or more. For the UX-MII series we recommend to use a 300 mA RCD. A type “A” RCD can be used in accordance with our “Manufacturer’s declaration for usage of residual current devices”. Contact Autarco for advice.

The AC cable used must be dimensioned in accordance with any local and national directives on cable dimensions which specify requirements for the minimum conductor cross-section. Cable dimensioning factors are e.g.: nominal AC current, type of cable, type of routing, cable bundling, ambient temperature and maximum specified line losses.



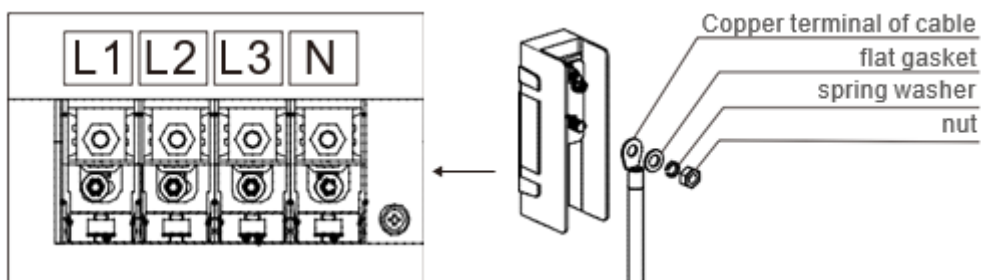
In the table below you find the recommended AC-cable. Make sure that the resistance of the cable is lower than 1.5 ohm.

Cable specification		Copper-cored cable
Traverse cross sectional area (mm <sup>2</sup> )	Range	35~185
	Recommended	70
Cable outer diameter (mm)	Range	38~56
	Recommended	45



Strip the AC cable off for 300 mm and then strip individual strands at S2 length. S2 must be 2..3 mm longer than S1. Use M10 crimping terminal. Strip the insulation of the wire past the cable crimping area of the OT terminal, then use a hydraulic crimp tool to crimp the terminal. The crimped portion of the terminal must be insulated with heat-shrinkable tube or insulating tape.

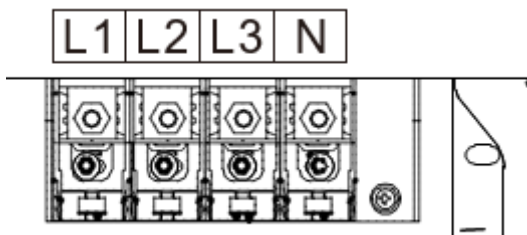
If choosing aluminum alloy cable, you must use copper aluminum (bi-metallic) transfer terminal and anti-oxidant grease in order to avoid direct contact between copper bar and Aluminum alloy cable. (Select a copper aluminum transfer terminal based on your cable specification).



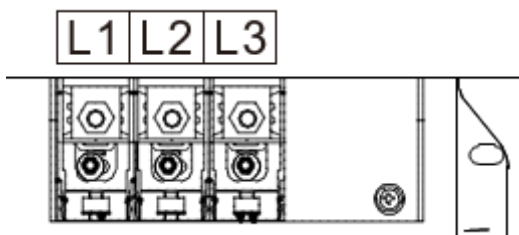
**Step 1** — Remove the plastic AC terminal cover and take the metal AC terminal cover out of the box.

**Step 2** — Insert the cable through the nut, sheath into the AC terminals. Tighten the screws on the terminal block. The required torque is 10~20Nm.

**Step 3** — For the 50 and 60 kW versions 3 phase, neutral and ground (PE) shall be used



For the High Voltage (HV) inverter version a 4 wire cable (3 phase + PE) must be used.



**Step 4** — Push the AC terminal cover up and fix it in place.



**NOTICE!** It is important that the AC wires are connected to the right terminals as indicated by the “L”, “N” and “Earth” symbols on each AC connector.

In the Netherlands and most other countries a second protective conductor is required as a matter of principle. In each case, observe the applicable regulations for the site.



The AC connection to the electrical distribution grid must be performed only after receiving authorization from the utility that operates the grid.

Always use separate fuses for consumer load. The inverters must be installed on a separate group. Use dedicated circuit breakers with load switch functionality for load switching.

The selection of the mains circuit breaker rating depends on the wiring design (wire cross-section area), cable type, wiring method, ambient temperature, inverter current rating etc. Derating of the circuit breaker rating may be necessary due to self-heating or if exposed to heat.

	<b>S2.UX5000S-MII</b>	<b>S2.UX6000S-MII</b>	<b>S2.UX6000S-HV-MII</b>	<b>S2.UX7000S-HV-MII</b>
Max. AC current (A)	83.6	100.3	79.4	92.6
Recommended fuse type gL/gG or comparable automatic circuit breaker rating (A)	100	125	80	100



**DANGER!** No consumer load should be applied between the mains circuit breaker and the inverter.

## 4.2 DC connections

Please always use the MC4 connectors from the inverter box to connect strings to the inverter.



**DANGER!** Never connect or disconnect the connectors under load.

UX-MII series inverters have five or six MPP trackers. The DC characteristics of each model are shown in the table below:

Inverter	MPP tracker	Max DC power	Max DC voltage	Max. DC current per MPPT
S2.UX50000S-MII	5	55kW	1100V	32A
S2.UX60000S-MII	6	66kW		
S2.UX60000S-HV-MII	6	66kW		
S2.UX70000S-HV-MII	6	77kW		



**DANGER!** Do not connect the strings with an open circuit voltage greater than the Max DC voltage of the inverter.

To connect the PV generator to the inverters we use 4mm<sup>2</sup> or 6mm<sup>2</sup> PV cable and MC4 connectors. For details on how to assemble MC4 connectors please refer to our MC4 connector manual.



**DANGER!** For protection against electric shock, MC4 connectors must be isolated from the PV array while being assembled or disassembled.



DC connections must not be unplugged while under load. They can be placed in a no-load state by switching off the DC/AC converter or breaking the DC circuit interrupter. Plugging and unplugging while under voltage is permitted. If the DC is connected in a reverse way or the inverter is faulty or not working properly, it is NOT allowed to turn off the DC-switch as it may damage the inverter. In this case make sure to bring the current in all strings below 0.5 A before switching off the DC-switch e.g by covering one panel in all 4 strings.



**CAUTION!** MC4 connectors are watertight IP67 but cannot be used permanently under water. Do not lay the MC4 connectors on the roof surface.



If any tools or parts are used in the MC4 connector assembly other than those listed in the MC4 connector manual, neither safety nor compliance with the technical data can be guaranteed.

### 4.3 Commissioning and Decommissioning sequence

Turn ON	Turn OFF
1. Connect AC side (if not connected yet)	1. Switch OFF the AC switch
2. Connect DC side (if not connected yet)	2. Switch OFF the DC switch
3. Switch ON the DC switch	
4. Switch ON the AC switch	

If the voltage of PV is higher than the start-up voltage, the inverter will turn on and the initial interface of the LCD will show “Current status: Waiting” on the upper left corner.

Then the inverter will check its internal parameters and the parameters of the AC and DC input to ensure that they are within the acceptable limits.

After 30-180 seconds (based on local requirement), the inverter will start to generate power. The green LED will be on continually and the LCD displays “Current status: Generating”.



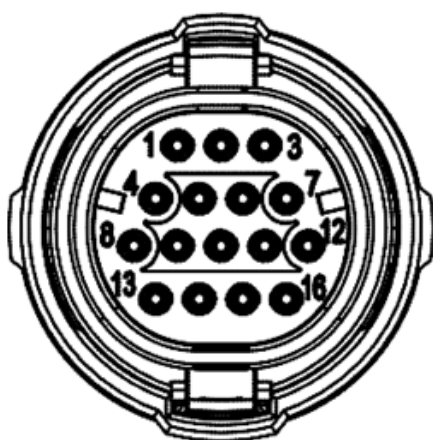
**NOTICE!** If the DC switch is switched on before the grid breaker, the inverter may show a fault message “No\_Grid” on current status, the fault will be cleared when grid voltage is normal.

## 5 Communication and monitoring

The UX-MII inverters have two communication ports.

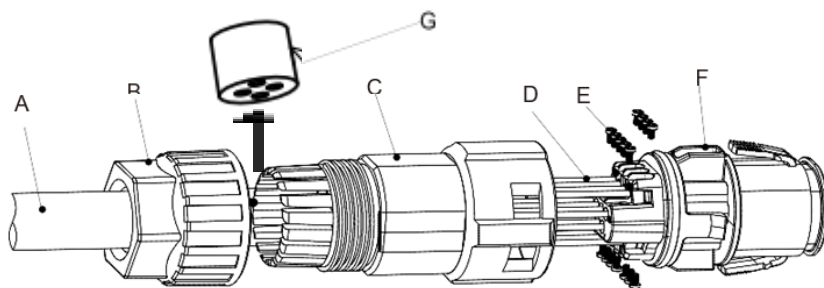
There is one 4-Pin COM port and one 16-Pin COM port. The 4-Pin COM port is used to connect Autarco's data logging sticks.

The 16-Pin COM port is used for daisy chaining inverters, DRM connections, Logic Interface Connection and consumption meter connection. The inverter package will include a 16-Pin COM connector to use with the 16-Pin COM port. The Pin definition is shown below. Facing the connector, Pin 1 is on the left of the first row, the rest is shown in the diagram below.



Pin	Definition	Pin	Definition
1	Meter RS485-A	9	DRM1/5
2	Meter RS485-B	10	DRM 2/6
3	COM1 485-A	11	DRM 3/7
4	COM1 485-B	12	DRM 4/8
5	\	13	RefGen
6	COM2 485-A	14	Com/DRM0
7	COM2 485-B	15	V+, 12V
8	\	16	V-, GND

The diagram below shows the assembly of the 16-Pin COM connector.



A - Main cable (Diameter: 4-6mm)

B - Locking Nut (Torque: 3.5-4N.m)

C - Sleeve

D - COM Wire (Dimension: 0.75-3mm<sup>2</sup>, stripping length: 10-12mm)

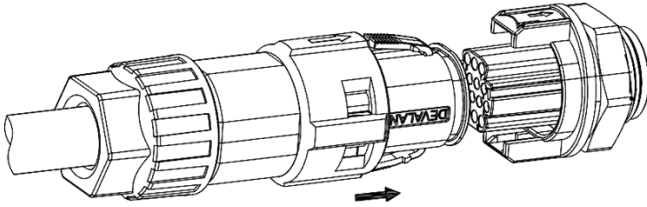
E - Locking Screw (Torque: 0.4-0.6N.m)

F - Connector

G - Seal. It allows to insert up to 4 cables (max  $\varnothing$  6.5 mm) for daisy-chain operation to ensure water-tightness.

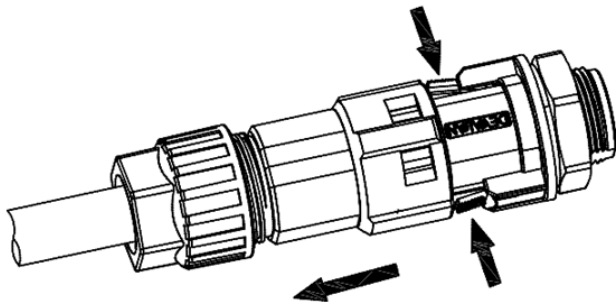
Connection steps:

1. Lead the main cable through the locking nut and the sleeve.
2. Strip the COM wires and insert into corresponding pin terminals. Then fasten the locking screws for the pin terminals
3. Push the sleeve onto the connector and fasten the locking nut on the end of the sleeve
4. Connect the connector to the 16-Pin COM port at the bottom of the inverter.

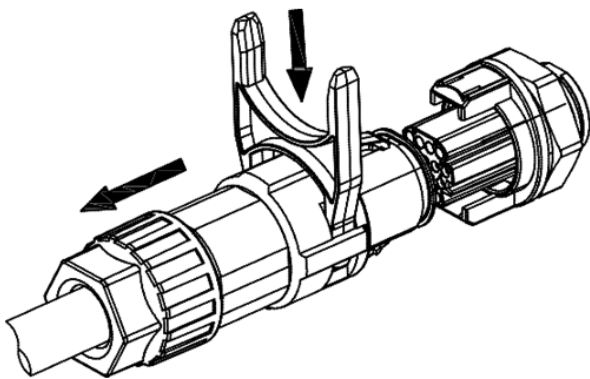


Disconnection steps:

1. Press the buttons on both sides of the connector and pull the connector to disconnect from the COM port.



2. Use the unlock tool to insert into the groove on the sleeve and pull the sleeve to disconnect from the connector



## 5.1 Inverter monitoring connection

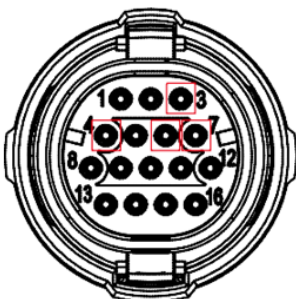
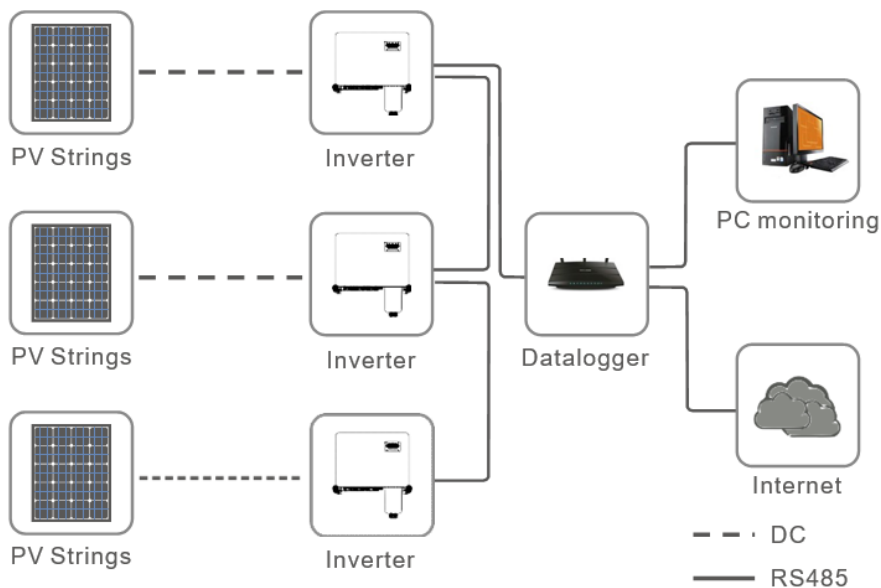
Autarco can provide optional accessories such as one-to-one datalogging sticks including WiFi stick, GPRS stick and LAN stick for the monitoring of a single inverter or one-to-multiple data logging boxes including WiFi box and GPRS Box for the monitoring of multiple inverters. Please refer to the corresponding manuals for details.

### 5.1.1 Monitoring for a single inverter

Every inverter can connect an Autarco one-to-one datalogging stick for remote monitoring purposes. The data logging stick should be directly connected to the 4-pin COM port at the bottom of the inverter. It is a simple plug and play design with fast installation. Details and the rest configuration process please refer to the datalogging stick manual.

### 5.1.2 Monitoring for multiple inverters

When multiple inverters need to be monitored these inverters can be daisy chained together using Pin 3/4 and Pin 6/7 of the 16-Pin COM port.



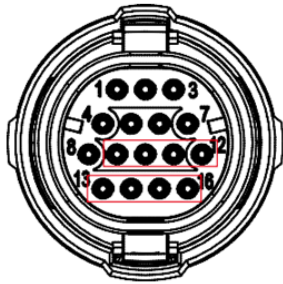
Pin	Definition	Description
3	COM1 485-A	RS485 INA
4	COM1 485-B	RS485 IN B
6	COM2 485-A	RS485 OUT A
7	COM2 485-B	RS485 OUT B



The RS485 cable can then be connected to a Autarco one-to-multiple datalogging box.

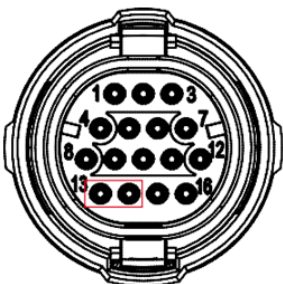
### 5.1.3 DRM Connection / Logic Interface Connection

Some countries may require inverters to support demand response modes. These can be connected using pins 9 through 16 of the 16-Pin COM connector.



Pin	Definition	Pin	Definition
9	DRM1/5	13	RefGen
10	DRM 2/6	14	Com/DRM0
11	DRM 3/7	15	V+, 12V
12	DRM 4/8	16	V-, GND

Some European countries may require a simple logic interface relay or contactor switch to operate the RUN/STOP of inverters. Pin 13 and 14 can be used to perform control logic. When the relay is closed the inverter can operate normally. When the relay is open, the inverter will reduce its output power to zero within 5s.

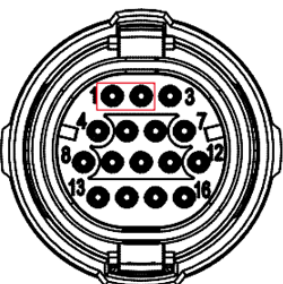


Pin	Definition
13	<u>RefGen</u>
14	Com/DRM0

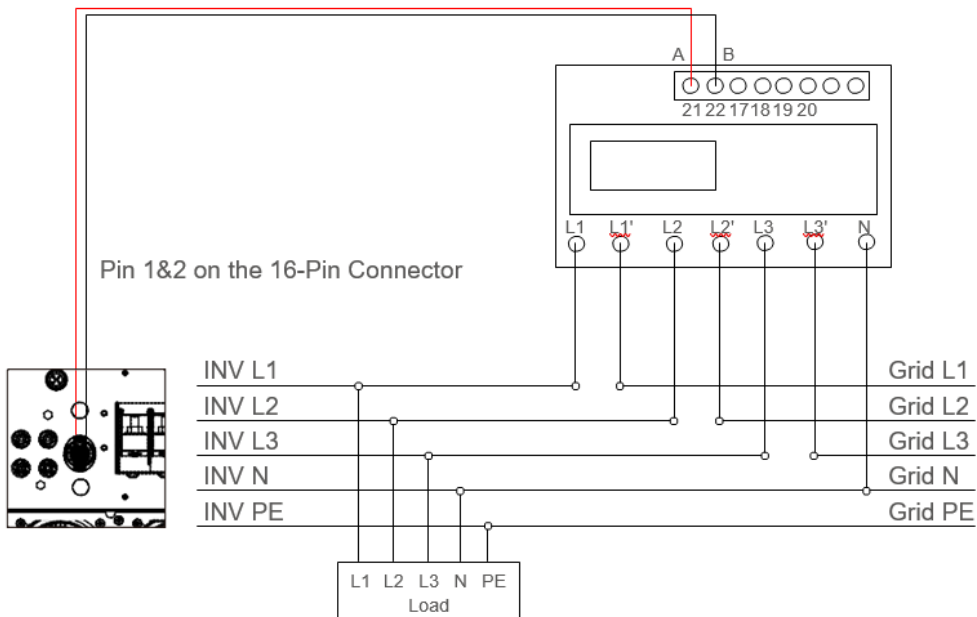
After wiring the connection of the DRM or Logic interface, these functions need to be enabled in the inverter. This is done in Advanced Settings (see below).

### 5.1.4 Meter connection

The inverter can work with a three phase smart meter to achieve Power Export Limitation and/or consumption monitoring. The Pin 1 and 2 of the 16-Pin COM port are used for Meter RS485 communication.

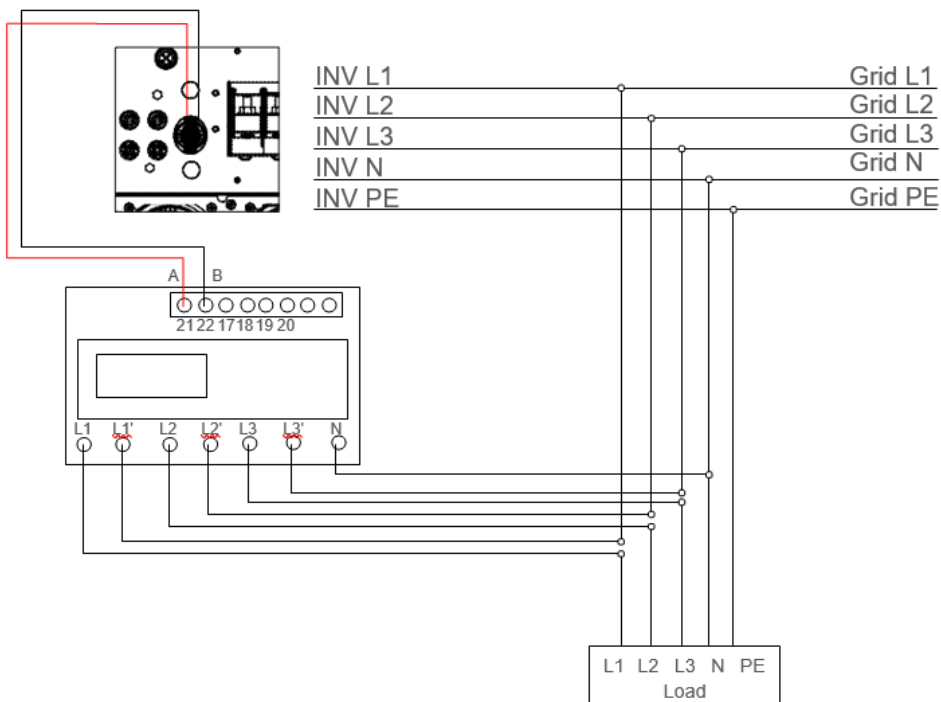


Pin	Definition
1	Meter RS485-A
2	Meter RS485-B



Meter in Grid

Pin 1&2 on the 16-Pin Connector



Meter in Load

## 6 Operation

### 6.1 LED indicator lights

There are three LED status indicator lights at the front panel of UX-MII series inverters. The left POWER light (red) indicates power status of the inverter. The middle OPERATION light (green) indicates the operation status. The right ALARM light (yellow) indicates the alarm status. Table 3.1 explains their meaning.

Light	Status	Description
● POWER (red)	ON	The PV array provides power to the inverter
	OFF	The PV array does not provide power to the inverter
● OPERATION (green)	ON	The inverter is feeding AC power to the grid
	OFF	The inverter is not feeding AC power to the grid
	FLASHING	The inverter is initializing
● ALARM (yellow)	ON	There is a fault. Refer to the inverter display and chapter 10 of this manual for details
	OFF	The inverter is operating normally

When the inverter DC switch and AC switch have been turned on, the inverter will start initializing. After approx. 3 minutes the inverter will start normal operation with the inverter display showing GENERATING.

### 6.2 Inverter display



**NOTICE!** During normal operation, make sure the optional integrated DC switch is switched “on”.

To operate the LCD-screen, the user must first press ESC + Enter button at the same time during 10 seconds to release. The display content consists of 2 lines. During regular operation the display shows the current power and operation status alternatively for 10 seconds. Pressing the UP or DOWN buttons will manually cycle through these two displays. Pressing the ENTER button gives access to the main menu which has four sub menus:

- Information, described in detail in chapter 6.3.
- Settings, described in detail in chapter 6.4.
- Advanced information, described in detail in chapter 6.5.
- Advanced settings, described in detail in chapter 6.6.

By pressing UP or DOWN keys you can cycle through these sub menus and click ENTER to go into the submenu.



**NOTICE!** Make sure that the LCD display and LEDs above are visible and can be operated with the buttons below. During normal operation, make sure the optional integrated DC switch is switched “on”.

## 6.3 Information


The UX-MII series inverters main menu provides access to operational data and information. The information is displayed by selecting "Information" from the main menu. By default the inverter display will scroll through the information states below. Pressing the ENTER key will lock or unlock the current display. You can also press UP or DOWN keys to move to the next screen. By pressing the ESC key returns to the main menu.

State	Description
V_DC01 %VALUE% V I_DC01 %VALUE% A	Shows the input voltage (V) of the MPPT1 Shows the input current (A) of the MPPT1
V_DC02 %VALUE% V I_DC2 %VALUE% A	Shows the input voltage (V) of the MPPT2 Shows the input current (A) of the MPPT2
V_DC03 %VALUE% V I_DC03 %VALUE% A	Shows the input voltage (V) of the MPPT3 Shows the input current (A) of the MPPT3
V_DC04 %VALUE% V I_DC04 %VALUE% A	Shows the input voltage (V) of the MPPT4 Shows the input current (A) of the MPPT4
V_DC05 %VALUE% V I_DC05 %VALUE% A	Shows the input voltage (V) of the MPPT5 Shows the input current (A) of the MPPT5
V_DC06 %VALUE% V I_DC06 %VALUE% A	Shows the input voltage (V) of the MPPT6 Shows the input current (A) of the MPPT6
V_A %VALUE% V I_A %VALUE% A	Shows the voltage (V) of the grid L1 Shows the current (A) of the grid L1
V_B %VALUE% V I_B %VALUE% A	Shows the voltage (V) of the grid L2 Shows the current (A) of the grid L2
V_C %VALUE% V I_C %VALUE% A	Shows the voltage (V) of the grid L3 Shows the current (A) of the grid L3
Status: %VALUE% Power: %VALUE% W	Shows the status of the inverter Shows current output power (W) of the inverter  For any status other than "Generating" and "Initializing" please refer to chapter 10 for troubleshooting
Rea_Power: %VALUE% Var App_Power: %VALUE% VA	Shows the real power generated Shows the apparent power generated
Grid frequency F_Grid %VALUE% Hz	Shows current frequency (Hz) of the grid
Total Energy %VALUE% kWh	Shows total energy output (kWh)
This Month: %VALUE% kWh Last Month: %VALUE% kWh	Total energy output in this month (kWh) Total energy output of last month (kWh)

Today: %VALUE% kWh Yesterday: %VALUE% kWh	Total energy output in this day (kWh) Total energy output of yesterday (kWh)
Inverter S/N	Serial ID of the inverter
Export_P: %VALUE% W Export_I: %VALUE% A	Shows the exported power Shows the exported current
Work Mode: DRM Number:	Demand response mode (only relevant for some markets) The demand response number (1-8) of the inverter
I_DC01 %VALUE% A I_DC02 %VALUE% A	Shows the input current (A) of the DC input 1 Shows the input current (A) of the DC input 2
I_DC03 %VALUE% A I_DC04 %VALUE% A	Shows the input current (A) of the DC input 3 Shows the input current (A) of the DC input 4
I_DC05 %VALUE% A I_DC06 %VALUE% A	Shows the input current (A) of the DC input 5 Shows the input current (A) of the DC input 6
I_DC07 %VALUE% A I_DC08 %VALUE% A	Shows the input current (A) of the DC input 7 Shows the input current (A) of the DC input 8
I_DC09 %VALUE% A I_DC10 %VALUE% A	Shows the input current (A) of the DC input 9 Shows the input current (A) of the DC input 10
I_DC11 %VALUE% A I_DC12 %VALUE% A	Shows the input current (A) of the DC input 11 Shows the input current (A) of the DC input 12

## 6.4 Settings

The following options are available under the Settings submenu:

Set Time and Date	<p>Press UP/DOWN keys to set change element Press ENTER key to move to next element Press ESC key to save date and return</p>
Set Address	<p>Assign a number (##) to the inverter to distinguish between multiple inverters when using parallel communication with WIFI-BOX, GPRS-BOX or WIFI-STICK-D. Note that the first inverter must be set to 1.</p> <p>Press UP/DOWN keys to change number Press ENTER key to save the setting Press ESC key to return.</p> <p> Changing the Address when using WIFI-STICK or LAN-STICK may result in monitoring to stop working.</p>

Press ENTER to enter the sub-menu and UP/DOWN to change the setting. Press ENTER to save or move to the next setting. Press the ESC key to cancel and return to the previous menu.

## 6.5 Advanced info



**WARNING!** Access to this section of the menu is for Autarco qualified and accredited technicians only. Unauthorized access will void the product and system warranty.

Screen can be scrolled through with UP/DOWN keys to see the information as per the table below. Press the ENTER key to enter a submenu. Press ESC key to go back to the main menu.


Alarm Messages	Scroll through the last ten alarm messages for troubleshooting purposes.
Running Message	The screen shows the internal operation parameters of the inverter
Version	The screen shows the operating software version of the inverter
Communication data	The screen shows information interpretable to qualified technicians only
Daily Energy	The screen shows a graph of daily energy output
Monthly Energy	The screen shows a graph of the monthly energy output
Yearly Energy	The screen shows a graph of the yearly energy output
Totally Energy	The screen shows a graph of the inverter total energy detail
Daily records	The screen shows the inverter work log, the information is interpretable to qualified technicians only

## 6.6 Advanced Settings



WARNING! Access to this section of the menu is for Autarco qualified and accredited technicians only. Unauthorized access will void the product and system warranty.

Screen can be scrolled through with UP/DOWN keys to see the information as per the table below. Press the ENTER key to enter a submenu. Press ESC key to go back to the main menu.



WARNING! Set GRID OFF (see below) before changing this setting.


Press UP/DOWN keys to cycle through available standards

Press ENTER key to save the setting - Press ESC key to cancel and return



When selecting User defined the following upper and lower values have to be set for voltage and frequency:

OV-G-V1: 300---480V	OV-G-F1: 50.2-63Hz
OV-G-V1-T: 0.01---9s	OV-G-F1-T: 0.01---9s
OV-G-V2: 300---490V	OV-G-F2: 51-63Hz
OV-G-V2-T: 0.01---1s	OV-G-F2-T: 0.01---9s
UN-G-V1: 173---336V	UN-G-F1: 47-59.5Hz
UN-G-V1-T: 0.01---9s	UN-G-F1-T: 0.01---9s
UN-G-V2: 132---319V	UN-G-F2: 47-59Hz
UN-G-V2-T: 0.01---1s	UN-G-F2-T: 0.01---9s

Press UP/DOWN keys to scroll through these values  
 Press ENTER key to edit the selected value  
 Press UP/DOWN keys to change the selected value  
 Press ENTER key to save and return  
 Press ESC key to cancel and return




WARNING! Set GRID ON (see below) before the new standard is activated.

	 <p>WARNING! Please note that the User-Def standard is not to be used without the agreement of the local grid authority.</p>
Grid ON/OFF	<p>Press UP/DOWN keys to cycle through grid ON/OFF options          Press ENTER key to save          Press ESC key to return</p>
Clear Energy	<p>Reset the inverters total kWh output to zero.</p>  <p>Using this function without previous approval from Autarco will void any existing kWh Guarantees.</p>
New Password	<p>Change the password to enter Advanced Info and Advanced Settings. Enter the current password before setting a new password. Press the DOWN key to move the cursor, Press the UP key to change the digit. Press the ENTER key to execute the setting. Press the ESC key to return to the previous menu.</p>
Power Control	<p>Inverter output active power and reactive power control can be set through this menu if the grid is unbalanced:</p> <ol style="list-style-type: none"> <li>1. Set output power</li> <li>2. Set reactive power</li> <li>3. Out_P with restore: set % of power by using UP/DOWN buttons</li> <li>4. Rea_P with restore</li> <li>5. Select PF curve</li> </ol>
Calibrate Energy	<p>Maintenance or replacement could clear or cause a different value for total energy. Use this function to allow the user to revise the value of total energy to the same value as before.</p> <p>Press the DOWN key to move the cursor, Press the UP key to revise the value. Press the ENTER key to execute the setting. Press the ESC key to return to the previous menu.</p> <p>Note: changing this value can only be done with permission by Autarco</p>
Special Settings	<p>Special settings can switch off functions temporarily for testing purposes. These tests should only be done by qualified Autarco personnel or trained installers when requested to do so. Submenu includes:</p> <ol style="list-style-type: none"> <li>1. Grid Filter Set</li> <li>2. Relay_Protect Set</li> <li>3. ILeak_Protect Set</li> <li>4. GROUND_Protect Set</li> <li>5. GRID INTF.02 Set</li> <li>6. MPPT Parallel Mode</li> <li>7. Cnst. Voltage Mode</li> <li>8. LV/FRT Set</li> </ol>



	<ol style="list-style-type: none"> <li>9. IgZero_COMP. Set</li> <li>10. PI Set</li> <li>11. IgADCheckPRO Set</li> <li>12. NoSmallPulse Set</li> <li>13. VarCompensation</li> <li>14. AFCI Set</li> </ol>
STD Mode Settings	<p>STD Mode Settings are used when demand response is required by grid operators.</p> <ol style="list-style-type: none"> <li>1. Working Mode Set</li> <li>2. Power Rate Limit</li> <li>3. Freq Derate Set</li> <li>4. 10mins Voltage Set</li> <li>5. Power Priority</li> <li>6. Initial Settings</li> <li>7. Voltage PCC Set</li> </ol>
Enable DRM/Logic Interface Settings	<p>The setting is "OFF" by default. If the setting is set to "ON", but the external DRM controlling device or logic interface relay is not connected or logic interface relay is opened, the inverter will display "LimbyDRM" and the inverter output power will be limited to zero.</p> <ol style="list-style-type: none"> <li>1. Select "Initial Settings"</li> <li>2. Select "DRM" and set it to "ON"</li> </ol>
Restore Settings	Restore Settings resets the inverter to factory defaults.
HMI Updater	Selecting HMI Updater will show the current software version the LCD screen is based on.
Internal EPM Set	<p>Internal power export management.</p> <ol style="list-style-type: none"> <li>1. Mode</li> <li>2. Backflow power</li> <li>3. Fail safe ON/OFF</li> </ol>
External EPM Set	<p>External power export management.</p> <ol style="list-style-type: none"> <li>1. 5G-EPM</li> <li>2. Others-EPM</li> </ol>
Restart HMI	This function is used to restart the HMI software.
Debug parameter	Shows debug parameters.
Fan test	Test intelligent fan
DSP Update	Selecting DSP Update will show the current internal software version.
Compensation Set	<p>This function is used to calibrate inverter output energy. It will not impact the energy count for inverters with RGM.</p> <ol style="list-style-type: none"> <li>1. Power parameter</li> <li>2. Voltage parameter</li> </ol>

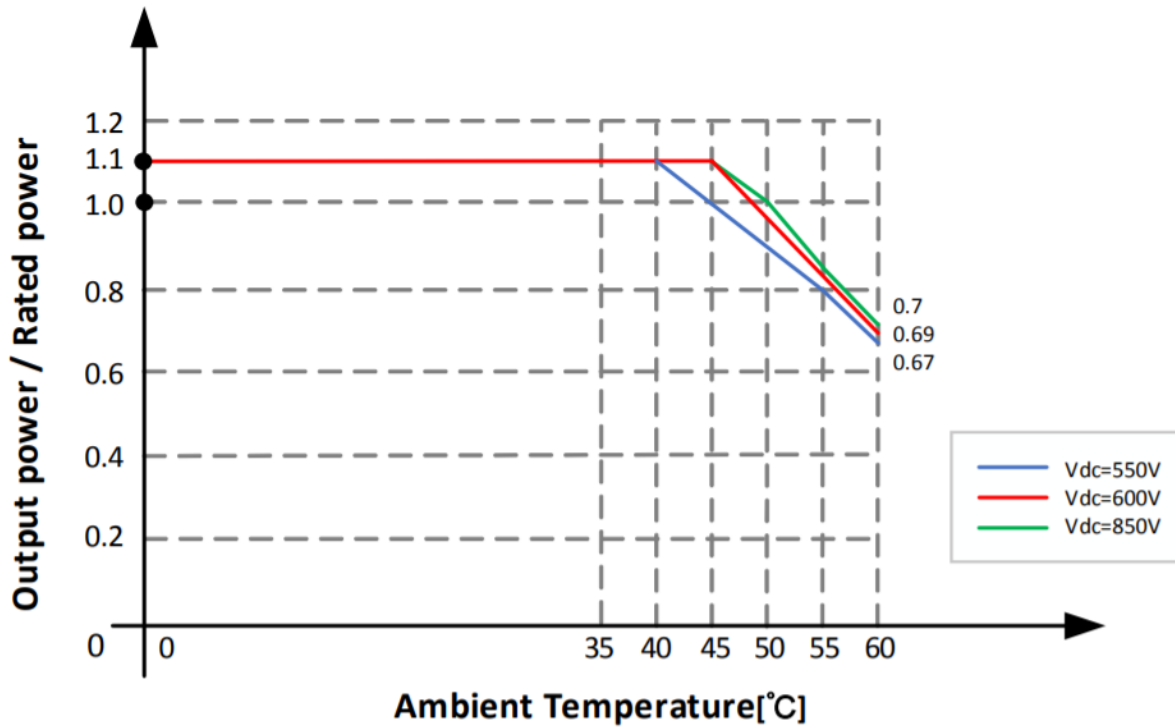
 Using this function without previous approval from Autarco will void any existing kWh Guarantees.	
I/V Curve	Used to create I/V curves for all DC inputs. <ol style="list-style-type: none"> <li>1. Set I/V curve</li> <li>2. I/V curve scan</li> </ol>

## Important Settings and Operation

AFCI	<p>Autarco inverters have a built-in AFCI which can detect arc faults in a DC-circuit and shut down the inverter to avoid further damage. Default it is OFF.</p> <p>AFCI ON/OFF</p> <p>AFCI Level</p> <p>Do not change the level unless requested so by maintenance personnel. If an arc-fault is detected more than 5 times in 24 hours, the inverter will shut down. A message will be displayed on the LCD-screen to indicate the string e.g. 03_ARC_FAULT</p>
I/V- Curve	<p>First select I/V curve to select the scanning voltage start point and the voltage interval.</p> <p>Start_V: 100.....1100 V</p> <p>Interval_V: 001...100 V</p> <p>In total 60 points can be scanned.</p> <p>Then go to I/V Curve Scan and Enter to start. When the scan is complete, it will say Scan OK. Select "String No. 01 and check the results.</p>
External EPM Set	Set to 5G EPM for external PELD.

## 6.7 External fan

The inverter's external fans switch on automatically when cooling via the heat sink is no longer sufficient. When the inverter's core temperature reaches 70°C, the fan will be activated. It will switch off once the core temperature is below 60°C.



## 7 Monitoring setup and system registration

The instructions about monitoring setup and system registration can be found in separate manuals enclosed in the documentation that came with this Autarco system. For more information please contact your Autarco installer or refer to our website [www.autarco.com](http://www.autarco.com).

## 8 Maintenance

The UX-MII-series inverters do not require regular maintenance. However, impurities such as dust and dirt accumulation on the heat sink may negatively affect the inverter's ability to dissipate heat. Any dirt or dust can be removed with a cloth or soft brush.



CAUTION! Do not touch the heat sink when the inverter is in operation. Turn OFF the inverter (see section 0) and allow for cooling down before cleaning.



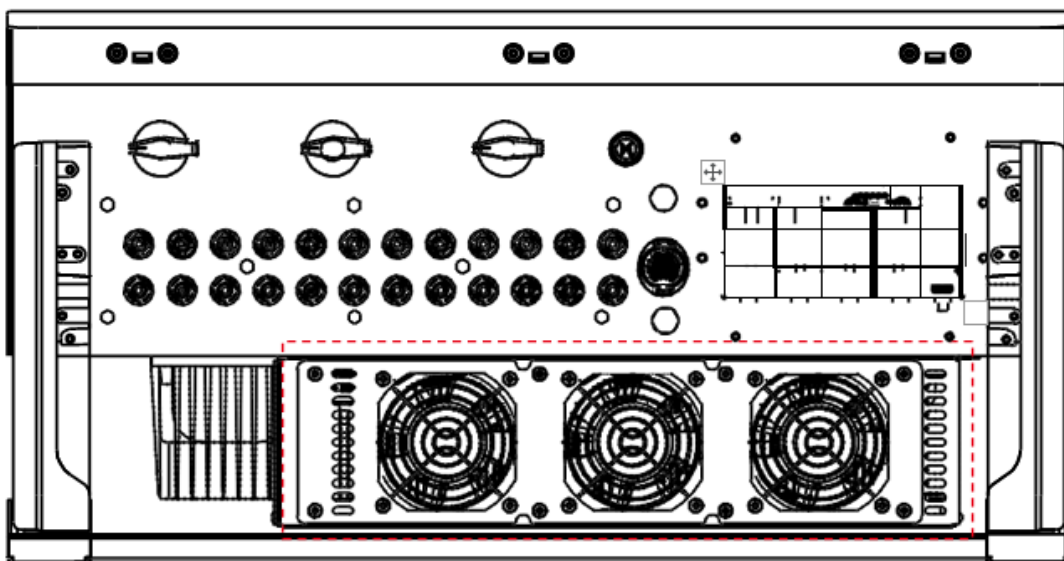
CAUTION! Never use any solvents, abrasives or corrosive materials to clean the inverter.

### 8.1 Fan Maintenance

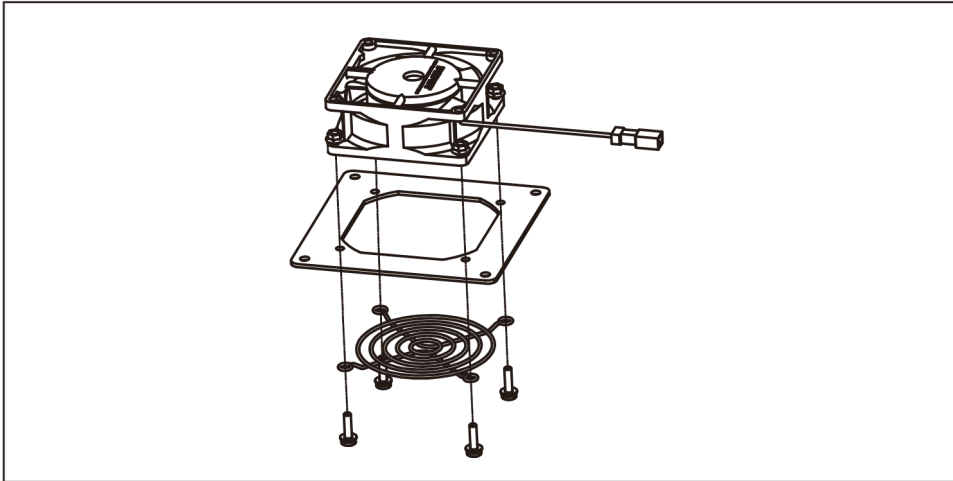
If the fan does not work properly, the inverter will not be cooled effectively and inverter efficiency may be reduced. Check the operation of the fans at least once per year. In dusty environments it is recommended to do this more often. Failure to do so may impact the warranty of the inverter.

Broken fans should be replaced following process below:

1. Turn off the "Grid ON/OFF" switch on the inverter LCD.
2. Disconnect the AC power.
3. Turn the DC switch to "OFF" position.
4. Wait for 15 minutes at least.
5. Remove the 8 screws on the fan plate and pull out the assembly slowly.



6. Disconnect the fan connector carefully and take out the fan.
7. Clean or replace the fan. Assemble the fan on the rack.



Connect the electrical wire and reinstall the fan assembly. Restart the inverter.

## 9 Disposal

To comply with European Directive 2002/96/EC on waste Electrical and Electronic Equipment and its implementation as national law, electrical equipment that has reached the end of its life must be collected separately and returned to an approved recycling facility. Ignoring this EU Directive may have severe effects on the environment and your health.

## 10 Troubleshooting

### 10.1 General

Display message	Action
Blank screen	<ul style="list-style-type: none"> <li>• Check that all switches are in the ON position (including internal DC switch if present)</li> <li>• Check AC and DC power supply. If DC power is higher than 10W and string voltage greater than 195 V the inverter should start.</li> <li>• If switches are on and AC and DC power supplies are available, please contact the installer.</li> </ul>

### 10.2 Internal component fault

Error type	Display message	Error code	Error description	Action
Over BUS DC voltage	OV-BUS	1021	Internal fault	<ol style="list-style-type: none"> <li>1. Restart inverter (up to three times).</li> <li>2. If error persists, contact installer for replacement inverter.</li> </ol>
Under BUS DC voltage	UN_BUS	1012	Internal fault	
DC BUS unbalance fault	UNB2_BUS	1024	Internal fault	
System initial fault	INI-PRO	1031	Internal fault	
Relay fault	Relay_PRO	1035	Internal fault	
DSP_B fault	DSP_B_PRO	1036	Internal fault	
DC injection	DCInj_PRO	1037	Internal fault	
12V under voltage fault	12Power_PR O	1038	Internal fault	

## 10.3 Grid errors

Error type	Display message	Error code	Error description	Action
Over voltage	OV-G-V	1010	Grid voltage exceeds the standard set in the inverter	<ol style="list-style-type: none"> <li>1. Wait to see if the grid voltage returns within limits.</li> <li>2. If the problem persists, check whether the grid standard is set correctly in Advanced Settings (see 6.6).</li> <li>3. Check V_AC, grid voltage, in the Information display of inverter (see 6.3) and perform independent measurement of grid voltage to confirm that the inverter reading is correct. If the measured voltage is outside the local grid standard limits, please contact your local utility as it may require monitoring and adjustment</li> <li>4. With agreement from utility it is possible to set a user defined voltage range (see 6.6).</li> </ol>
Under voltage	UN-G-V	1011	Grid voltage is below the standard set in the inverter	
Over frequency	OV-G-F	1012	Grid frequency exceeds the standard set in the inverter.	<ol style="list-style-type: none"> <li>1. Wait to see if the grid frequency returns within limits.</li> <li>2. If a problem persists, check whether the grid standard is set correct in Advanced Settings (see 6.6).</li> <li>3. Check grid frequency, in the Information display of inverter (see 6.3) and perform independent measurement of grid frequency to confirm that the inverter reading is correct. If the measured frequency is outside the local grid standard limits, please contact your local utility as it may require monitoring and adjustment.</li> <li>4. With agreement from utility it is possible to set a user defined frequency range (see 6.6).</li> </ol>
Under frequency	UN-G-V	1013	Grid frequency is below the standard set in the inverter.	
Grid impedance	G-IMP	1014	High grid impedance	<ol style="list-style-type: none"> <li>1. Wait to see if the grid returns within limits.</li> <li>2. If problem persists please contact your local utility as it may require monitoring and adjustment.</li> </ol>
No Grid	NO Grid	1015	The inverter cannot detect a grid.	<ol style="list-style-type: none"> <li>1. Check your AC power connections and switches.</li> <li>2. Restart the inverter.</li> <li>3. Call your local grid to resolve the black out.</li> </ol>





## 10.4 System and design fault

Error type	Display message	Error code	Error description	Action
Over DC voltage	OV-DC	1020	The DC input of the solar strings exceeds the inverters limits.	<ol style="list-style-type: none"> <li>1. Restart inverter (up to three times).</li> <li>2. Contact installer to:               <ol style="list-style-type: none"> <li>a. Perform independent measurement of string voltage to confirm that the inverter reading is correct.</li> </ol> </li> <li>3. Rewire strings so that string voltage is within accepted range.</li> </ol>
Over temperature	TEM-PRO	1032	The internal temperature of the inverter exceeds limits.	<ol style="list-style-type: none"> <li>1. Check the location of the inverter. Ensure it has adequate ventilation and is not exposed to direct sunlight.</li> <li>2. Contact installer to replace inverter in case problem persists.</li> </ol>
Short circuit fault	SHORT-PRO	1030	A short circuit has been detected in the system.	<ol style="list-style-type: none"> <li>1. Restart inverter (up to three times).</li> <li>2. Call installer to:               <ol style="list-style-type: none"> <li>a. Check for pinched, crimped or otherwise damaged cables and connections.</li> <li>b. Check all switches for short circuit.</li> </ol> </li> <li>3. If error persists, contact Autarco for a replacement inverter.</li> </ol>
Ground fault	GROUND-PRO	1033	Current flow detected through ground conductor.	<ol style="list-style-type: none"> <li>1. Restart inverter (up to three times).</li> <li>2. Call installer to:               <ol style="list-style-type: none"> <li>a. Check if there is any current on the ground conductor using a clamp meter.</li> <li>b. Check for pinched, crimped or otherwise damaged cables and connections.</li> </ol> </li> <li>3. If error persists, contact Autarco for a replacement inverter.</li> </ol>
Current leakage	ILeak_PRO	1034	A current leak has been detected.	<ol style="list-style-type: none"> <li>1. Restart inverter (up to three times).</li> <li>2. Call installer to:               <ol style="list-style-type: none"> <li>a. Check if there is any current on the ground conductor using a clamp meter.</li> <li>b. Check for pinched, crimped or otherwise damaged cables and connections.</li> </ol> </li> <li>3. If error persists, contact Autarco for a replacement inverter.</li> </ol>

## 11 Product specifications

	S2.UX50000S-MII	S2.UX60000S-MII	S2.UX60000S-HV-MII	S2.UX70000S-HV-MII
<b>Input</b>				
Max. DC voltage (V)	1100	1100	1100	1100
MPPT voltage range (V)	180-1000	180-1000	180-1000	180-1000
Turn on voltage (V)	195	195	195	195
Turn off voltage (V)	180	180	180	180
# MPPT	5	6	6	6
Max. DC current per MPPT (A)	32	32	32	32
Max short circuit current (A)	50	50	50	50
# Strings per MPPT	2	2	2	2
Total number of strings	10	12	12	12
DC connection type	MC4	MC4	MC4	MC4
<b>Output</b>				
Nominal AC power (W)	50000	60000	60000	70000
Max. AC power (W)	55000	66000	66000	77000
Nominal AC current (A)	76.0/72.2	91.2/86.6	72.2	84.2
Max. AC current (A)	83.6	100.3	79.4	92.6
Power connection	Three phase (or with neutral)			
Grid voltage range	According to VDE-AR-N 4105, VDE V 0124, VDE V 0126-1-1, UTE C15-712-1, NRS 097-1-2, G98, G99, EN 50549-1/-2, RD 1699, UNE 206006, UNE 206007-1, IEC61727, DEWA			
Grid frequency range	According to VDE-AR-N 4105, VDE V 0124, VDE V 0126-1-1, UTE C15-712-1, NRS 097-1-2, G98, G99, EN 50549-1/-2, RD 1699, UNE 206006, UNE 206007-1, IEC61727, DEWA			
Power factor	>0.99			
Harmonic distortion at nominal output	<3%			
AC connector	Terminal connectors			
Overvoltage category	OVC II (MAINS), OVC II (PV)			
<b>Power consumption</b>				
Nighttime power consumption (W)	< 1			
<b>Efficiencies</b>				
Max. efficiency	98.7%			
EU efficiency	98.3%		98.4%	

	S2.UX50000S-MII	S2.UX60000S-MII	S2.UX60000S-HV-MII	S2.UX70000S-HV-MII
<b>Safety protection</b>				
DC reverse-polarity protection			Yes	
Short circuit protection			Yes	
Output over current protection			Yes	
Output over voltage protection			Yes	
Insulation resistant monitoring			Yes	
Residual current detection			Yes	
Surge protection			Yes	
Grid monitoring			Yes	
Islanding protection			Yes	
Temperature protection			Yes	
Integrated DC switch			Standard	
<b>General data</b>				
Dimensions (W x H x D) (mm)			691*578*338	
Weight			54.5 kg	
Installation environment			Indoor or outdoor	
Mounting			Wall bracket	
Operating temperature range (°C)			-25 to 60	
Max. relative humidity			100% (without condensation)	
Maximum altitude			4000m	
IP protection rating			IP66	
Isolation type			Transformerless	
Cooling concept			Intelligent redundant cooling	
Noise level (dBA)			< 60	
LED indicators			3	
LCD display			LCD, 4 buttons	
Communication interfaces			1xRS485, 1x16 pin connector for meter, drn and daisy chaining	
Optional interfaces			Wi-Fi, GPRS, LAN, 4G	
Standard warranty			5 years	