

ABB Solar inverters

Quick Installation Guide

TRIO-20.0/27.6-TL-OUTD

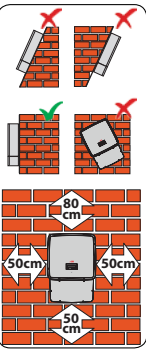
EN



Power and productivity  
for a better world™



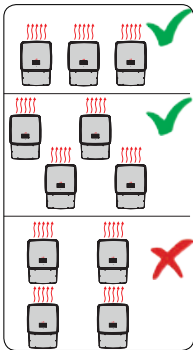
In addition to what is explained below, the safety and installation information provided in the installation manual must be read and followed. The technical documentation and the interface and management software for the product are available at the website.  
The device must be used in the manner described in the manual. If this is not the case the safety devices guaranteed by the inverter might be ineffective.



Installation position

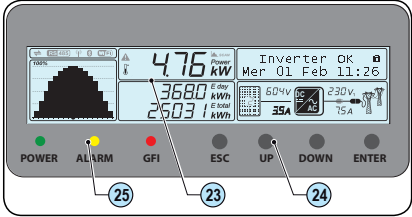
- Install on a wall or strong structure suitable for bearing the weight
- Install in safe, easy to reach places
- If possible, install at eye-level so that the display and status LEDs can be seen easily
- Install at a height that considers the heaviness of the equipment
- Install vertically with a maximum inclination of +/- 5°
- To carry out maintenance of the hardware and software of the equipment, remove the covers on the front. Check that there are the correct safety distances for the installation that will allow the normal control and maintenance operations to be carried out
- Comply with the indicated minimum distances
- For a multiple installation, position the inverters side by side
- If the space available does not allow this arrangement, position the inverters in a staggered arrangement as shown in the figure so that heat dissipation is not affected by other inverters

Final installation of the inverter must not compromise access to any disconnection devices that may be located externally.  
Please refer to the warranty terms and conditions available on the website and evaluate any possible exclusion due to improper installation.



LEDs and BUTTONS, in various combinations, can be used to view the status or carry out complex actions that are described more fully in the manual.

LED POWER	GREEN On if the inverter is working correctly. Flashes when checking the grid or if there is insufficient sunlight.
LED ALARM	YELLOW The inverter has detected an anomaly. The anomaly is shown on the display.
LED GFI	RED Ground fault on the DC side of the PV generator. The error is shown on the display.



ESC It is used to access the main menu, to go back to the previous menu or to go back to the previous digit to be edited.

UP It is used to scroll up the menu options or to shift the numerical scale in ascending order.

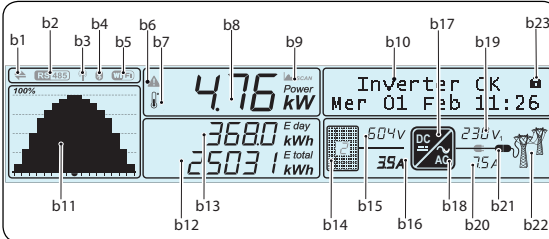
DOWN It is used to scroll down the menu options or to shift the numerical scale in descending order.

ENTER It can be used to confirm an action, to access the submenu for the selected option (indicated by the > symbol) or to switch to the next digit to be edited.

The operating parameters of the equipment are displayed through the display (23): warnings, alarms, channels, voltages, etc.

Description of symbols and display fields:

b1 RS485 data transmission	b13 Daily energy produced
b2 RS485 line present	b14 PV voltage > Vstart
b3 Radio line present	b15 DC voltage value
b4 Bluetooth line present (*)	b16 DC current value
b5 WiFi line present (*)	b17 DC/DC circuit part
b6 Warning	b18 DC/AC circuit part
b7 Temperature derating	b19 AC voltage value
b8 Instantaneous power	b20 AC current value
b9 MPP scan running	b21 Connection to the grid
b10 Graphic display	b22 Grid status
b11 Power graph	b23 Cyclic view on/off
b12 Total energy	(*) NOT available



Transport and handling

Transport of the equipment, especially by road, must be carried out with by suitable ways and means for protecting the components (in particular, the electronic components) from violent shocks, humidity, vibration, etc.

Lifting

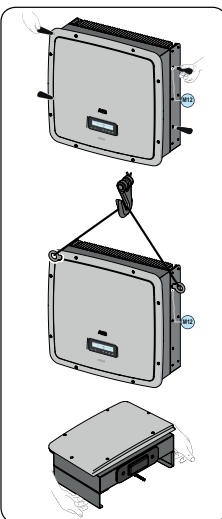
Where indicated and/or where there is a provision, eyebolts or handles, which can be used as anchorage points, are inserted and/or can be inserted.  
The ropes and means used for lifting must be suitable for bearing the weight of the equipment.

Unpacking and checking

The components of the packaging must be disposed on in accordance with the regulations in force in the country of installation.  
When you open the package, check that the equipment is undamaged and make sure all the components are present.  
If you find any defects or damage, stop unpacking and consult the carrier, and also promptly inform the Service ABB.

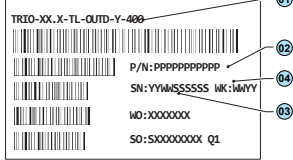
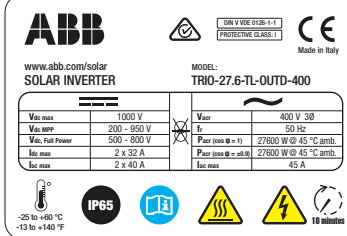
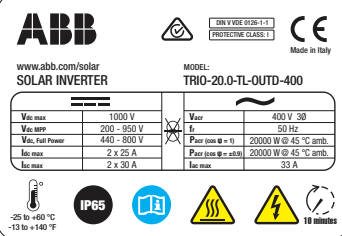
Weight of the equipment units

	Mass weight	Lifting points n°	Minimum rope height	Holes or Eyebolts UNI2947
INVERTER unit	TRIO-20.0: 60 kg TRIO-27.6: 65 kg	4	1.200 mm	M 12 - assembly kit with 4 handles and 2 eyebolts (to order: TRIO HANDLING KIT)
WIRING BOX unit	Standard / -S2: 7 kg -S2F / -S2X: 15 kg	2	-	-



Labels and Symbols

The labels on the inverter have the Agency marking, main technical data and identification of the equipment and manufacturer



- 01 Inverter model
- 02 Inverter Part Number
- 03 Inverter Serial Number
- 04 Week/Year of manufacture

The labels attached to the equipment must NOT be removed, damaged, dirtied, hidden, etc...

If the service password is requested, the field to be used is the serial number -SN: YYYWSSSSSS- shown on the label affixed to the top (inverter)

In the manual and/or in some cases on the equipment, the danger or hazard zones are indicated with signs, labels, symbols or icons.

Always refer to instruction manual	General warning - Important safety information	Hazardous voltage	Hot surfaces
Protection rating of equipment	Temperature range	Without isolation transformer	Direct and alternating currents, respectively
Positive pole and negative pole of the input voltage (DC)	Always use safety clothing and/or personal safety devices	Point of connection for grounding protection	Time need to discharge stored energy

2.

The models of inverter to which this guide refers are available in 2 power ratings: 20 kW / 27.6 kW.

For inverters of equal output power, the variant between the various models is the layout of the wiring box.

TRIO-XX.X-TL-OUTD	TRIO-XX.X-TL-OUTD-S2	TRIO-XX.X-TL-OUTD-S2F	TRIO-XX.X-TL-OUTD-S2X
<b>Standard</b> wiring box version: <ul style="list-style-type: none"><li>- DC cable infeed cable gland</li><li>- DC cable connection terminal block</li></ul>	<b>S2</b> wiring box version: <ul style="list-style-type: none"><li>- DC cable infeed cable gland</li><li>- DC cable connection terminal block</li><li>- AC+DC disconnect switch</li></ul>	<b>S2F</b> wiring box version: <ul style="list-style-type: none"><li>- Quick fit connectors</li><li>- String protection fuses</li><li>- AC+DC disconnect switch</li></ul>	<b>S2X</b> wiring box version: <ul style="list-style-type: none"><li>- Quick fit connectors</li><li>- String protection fuses</li><li>- DC overvoltage surge arresters</li><li>- AC overvoltage surge arresters</li><li>- AC+DC disconnect switch</li></ul>

Main components		
09 Communication board	13 DC input terminal board	17 AC output terminal board
10 Service cable glands	14 AC+DC disconnect switch	18 AC overvoltage surge arresters
11 DC cable glands	15 DC overvoltage surge arresters	19 Input connectors
12 Jumpers	16 AC cable gland	22 String fuses

3.

Environmental checks

- Consult the technical data to check the environmental parameters to be observed
- Installation of the unit in a location exposed to direct sunlight must be avoided as it may cause:
  - 1. power limitation phenomena in the inverter (with a resulting decreased energy production by the system)
  - 2. premature wear of the electrical/electromechanical components
  - 3. premature wear of the mechanical components (gaskets) and of the user interface (display)
- Do not install in small closed rooms where air cannot circulate freely
- To avoid overheating, always make sure the flow of air around the inverter is not blocked
- Do not install in places where gases or flammable substances may be present
- Do not install in rooms where people live or where the pro-

longed presence of people or animals is expected, because of the noise (about 50dB(A) at 1 m) that the inverter makes during operation

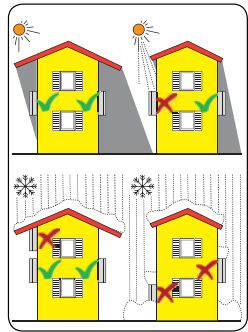
- Avoid electromagnetic interference that can compromise the correct operation of electronic equipment, with consequent situations of danger.

Installations above 2000 metres

On account of the rarefaction of the air (at high altitudes), particular conditions may occur:

- Less efficient cooling and therefore a greater likelihood of the device going into derating because of high internal temperatures
- Reduction in the dielectric resistance of the air that, in the presence of high operating voltages (DC input), can create electric arcs (discharges) that can reach the point of damaging the inverter

All installations at altitudes of over 2000 metres must be assessed case by case with the ABB Service department.



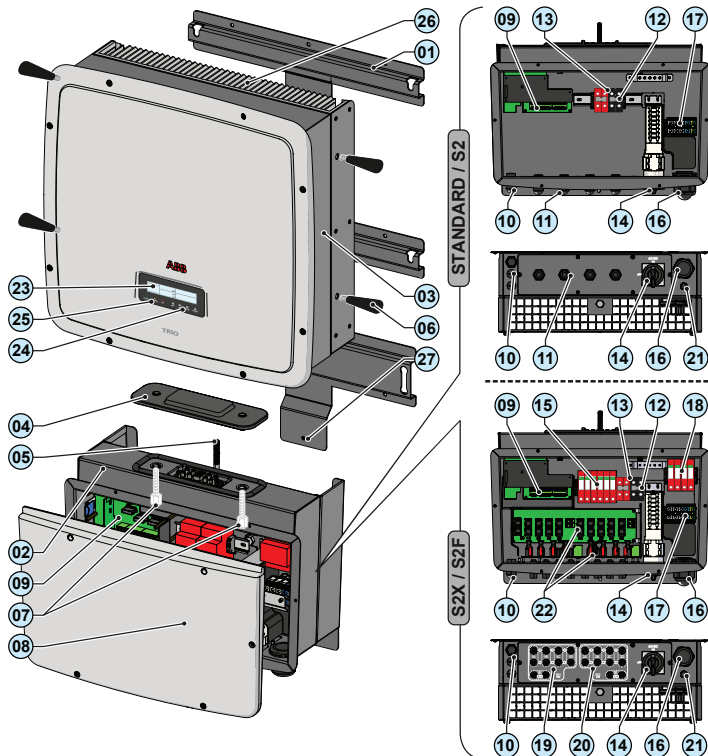
6.

Components available for all models	Quantity
Connector for connecting the configurable relay	2
Connector for the connection of the communication	4
L-key, TORX TX20	1
Two-hole gasket for M25 signal cable glands and cap	2 + 2
Two-hole gasket for M20 signal cable glands and cap	1 + 1
Bolts and screws for wall mounting	10 + 10
Jumpers for configuration of the parallel input channels	2

Components available for all models	Quantity
Bracket for wall mounting	1
Quick Installation Guide	1
Additional components for (-S) models	Quantity
Female quick fit connectors	8 (20.0kW) 10 (27.6kW)
Male quick fit connectors	8 (20.0kW) 10 (27.6kW)

7.

01 Bracket	10 Service cable glands	19 Input connectors (MPPT1)
02 Wiring box	11 DC cable glands	20 Input connectors (MPPT2)
03 Inverter	12 Jumpers	21 Anti-condensation valve
04 Cover	13 DC input terminal board	22 String fuses
05 Clamp screw	14 AC+DC disconnect switch	23 Display
06 Handles	15 DC overvoltage surge arresters	24 Keypad
07 Connector screws	16 AC cable gland	25 LEDpanel
08 Front cover	17 AC output terminal board	26 Heatsink
09 Communication board	18 AC overvoltage surge arresters	27 Locking screw



Wall mounting

- Position the bracket (01) perfectly level on the wall and use it as a drilling template.

- Drill the 10 holes required using a drill with 10mm bit. The holes must be about 70mm deep.

- Fix the bracket to the wall with the 10 wall anchors, 10mm in diameter, supplied.

- Hook on the wiring box (02) by inserting the head of the rear screws in the slots in the bracket, remove the front cover (08) and make all the necessary connections.  
N.B. It is not necessary to install the inverter (03) at this stage.

- Unscrew the connector screws (07) and remove the cover (04) so that you can reach the connector between the wiring box and the inverter.  
Put the cover in the special pocket provided at the back of the wiring box.

- Hook the inverter (03) to the bracket by inserting the head of the rear screws in the slots as shown in the figure. To make lifting easier, handles (06) or eyebolts (M12) can be attached to the side holes provided.

- Join the two parts by tightening the coupling screw (05) working from the lower part of the wiring box (02).

- Once the parts are connected, screw in the two connector screws (07) situated inside the wiring box.

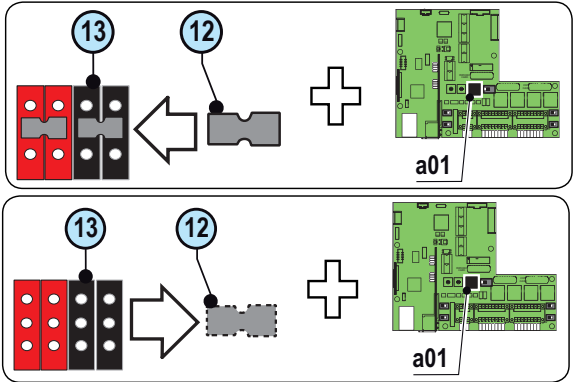
- Anchor the inverter to the bracket (01), tightening the locking screw (27) located on the lower side.



All versions of the inverter are equipped with two input channels (therefore with double maximum power point tracker MPPT) independent of each other, which can however be connected in parallel using a single MPPT.

**Configuration of parallel-connected channels**  
This configuration involves the use of the two input channels (MPPT) connected in parallel. This means that the jumpers (12) between the two channels (positive and negative) of the DC input terminal board (13) must be installed and that the switch a01 situated on the communication card (19) must be set to "PAR".

**Configuration of independent channels (default configuration)**  
This configuration involves the use of the two input channels (MPPT) in independent mode. This means that the jumpers (12) between the two channels (positive and negative) of the DC input terminal board (13) must not be installed and that the switch a01 situated on the communication card (19) must be set to "IND".



**Check for correct polarity in the input strings and absence of any leakage to ground in the PV generator.**  
When exposed to sunlight, the PV panels supply DC direct voltage to the inverter.  
The inside of the inverter may only be accessed after the equipment has been disconnected from the grid and from the photovoltaic generator.  
The inverter is only to be used with photovoltaic units with ground insulated input poles unless accessories allowing grounding of the inputs have been installed. In this case it is compulsory to install an isolation transformer on the AC side of the system.

**- Connection of inputs on the Standard and S2 models**  
For these two models, connection with the DC input terminal board (13) is made by inserting the cables in the DC cable glands (11). The maximum accepted cable cross-section ranges from 10 to 17 mm, whereas each individual terminal of the terminal board accepts a cable with cross-section of up to 50 mm² (tightening torque 6Nm).  
Unscrew the cable gland, remove the cover, insert the cable of suitable cross-section and connect it to the terminals on the DC input terminal board (13). Once the connection to the terminal board is complete, screw in the cable gland firmly (tightening torque 5.0Nm) and check the tightness.

**- Connection of inputs on the S2F / S2X model**  
Reversing polarity may result in serious damage. Always check the polarity before connecting up each string!  
Each input is equipped with protection fuses: check that the fuse current rating is properly sized for the photovoltaic modules installed.

For string connections using the S2F / S2X wiring box, the quick fit connectors (multicontact or weidmuller) situated at the bottom of the mechanics are used.  
For each input channel, there are two groups of connectors:  
- Input connectors (MPPT1) (19) with codes 1A, 1B, 1C, ... - Input connectors (MPPT2) (20) with codes 2A, 2B, 2C, ...  
Connect all the strings included in the design of the system and always check the tightness of the connectors.

In these versions of the wiring box, you MUST directly connect the individual strings coming into the inverter (do not make field switchboards for parallel strings). This is because the string fuses (22), situated on each input, are not sized to take strings in parallel (array).

If some string inputs are not used, check that there are covers on the connectors and install them if they are missing.  
This operation is necessary for the tightness of the inverter and to avoid damaging the free connector that could be used at a later date.

**Load protection breaker (AC disconnect switch) and line cable sizing**  
To protect the AC connection line of the inverter, we recommend installing a device for protection against over current and leakage with the following characteristics:

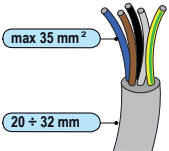
	TRIO-20.0-TL-OUTD	TRIO-27.6-TL-OUTD
Type	Automatic circuit breaker with differential thermal magnetic protection	
Voltage/Current rating	400V /40A	400V /63A
Magnetic protection characteristic	B/C	
Number of poles	3/4	
Type of differential protection	A/Ac	
Differential sensitivity	300mA	

ABB declares that the ABB transformerless inverters, in terms of their construction, do not inject continuous ground fault currents and therefore there is no requirement that the differential protection installed downstream of the inverter be type B in accordance with IEC 60755 / A.2.

**Characteristics and sizing of the line cable**  
For the connection of the inverter to the grid, you can choose between a star connection (3 phases + neutral) and a delta connection (3 phases).  
The cross-section of the AC line conductor must be sized in order to prevent unwanted disconnections of the inverter from the grid due to high impedance of the line that connects the inverter to the power supply point

Cross-section of the line conductor (mm²)	TRIO-20.0-TL-OUTD	TRIO-27.6-TL-OUTD
10	42m	30m
16	70m	50m
25	100m	78m
35	138m	98m

The values are calculated in nominal power conditions, taking into account:  
1. a power loss of not more than 1% along the line. 2. copper cable, with EPR/XLPE insulation, laid in free air



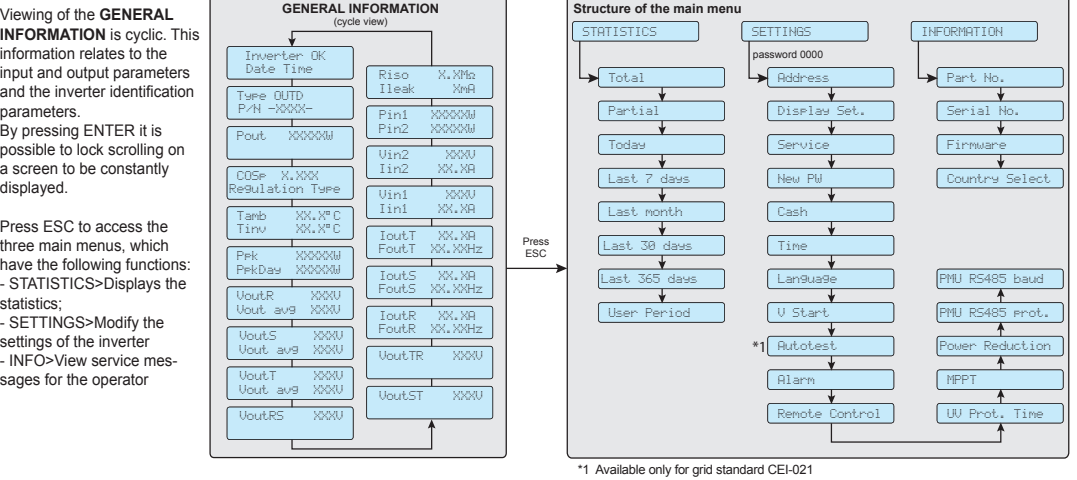
The inverter commissioning procedure is as follows:  
- Turn the AC+DC disconnect switch (14) to the ON position.  
If there are two separate external disconnect switches (one for DC and the other for AC), first close the AC disconnect switch and then the DC disconnect switch. There is no order of priority for opening the disconnect switches.  
- When the inverter has power, the first check performed is the one relating to the input voltage:  
1. If the DC input voltage is lower than the Vstart voltage (voltage required to begin the inverter's grid connection) the b14 icon remains off and the "Waiting sun" message is displayed b10.  
2. If the DC input voltage is higher than the Vstart voltage the b14 icon is displayed and the inverter goes to the next stage of the controls.  
In both cases the voltage levels and input current are displayed in the b15 and b16 fields.  
- The inverter performs a control of grid parameters. The b22 icon, which represents the grid distribution, can have different statuses:  
3. not present, if the mains voltage results as absent.  
4. flashing, if the mains voltage is present but outside the parameters dictated by the standard of the country of installation.  
5. turns on, if the mains voltage is present and within the parameters dictated by the standard of the country of installation. In this condition, the inverter starts the sequence of grid connection.

If the input voltage and the grid voltage are within the inverter operating intervals, connection to the grid will commence. After the inverter is connected, the icons on the whole line b21 will come on steady.

Once the connection sequence has been completed, the inverter starts to operate and indicates its correct operation by making a sound and by the green LED coming on steady on the LED panel (25).

If the inverter signals any errors/warnings the messages and their codes will be indicated on the display (23). This state will also cause switching of the multi-function relay (set to alarm mode in the menu SETTINGS>Alarm) which activates any external signalling device that may be connected.

The display (23) has a section b10 (graphic display) for moving through the menu using the buttons of the LED panel (25). Section b10 consists of 2 lines with 16 characters per line:



Refer to the manual for details regarding use and functions available in the menu.

	TRIO-20.0-TL-OUTD	TRIO-27.6-TL-OUTD
Input		
Rated Input Power (PdcR)	20750 Wp	28600 Wp
Maximum Input Power (Pdcmax)	22700 Wp	31000 Wp
Rated Input Voltage (Vdcr)	620 V	
Input Activation Voltage (Vstart)	360 V (adj. 250...500 V)	
Input operating range (Vdcmin...Vdcmax)	0.7 x Vstart...950 V	
Input voltage interval for MPP	200...950V	
Maximum Input Power for each MPPT	12000 W	16000 W
Input voltage Range for Operation at rated power with configuration of the MPPTs in parallel	440...800 V	500...800 V
DC Power Limitation for each MPPT with Independent Configuration of MPPT at Pacr,max unbalance example	12000 W [480V≤VMPPT≤800V] the other channel: PdcR-12000W [350V≤VMPPT≤800V]	16000 W [500V≤VMPPT≤800V] the other channel: PdcR-16000W [400V≤VMPPT≤800V]
Absolute Maximum Input Voltage (Vmax.abs)	1000 V	
Power derating vs. Input voltage (parallel or independent MPPT configuration)	Linear Derating From MAX to Null [800V≤VMPPT≤950V]	
Number of Independent MPPTs	2	
Maximum current for each MPPT	25.0 A	32.0 A
Maximum Backfeed current (from AC to DC side)	Negligible	

For the connection of the inverter to the grid, you can choose between a star connection (3 phases + neutral) and a delta connection (3 phases).

In any case, connection of the inverter to ground is mandatory.  
To prevent electrocution hazards, all the connection operations must be carried out with the disconnect switch downstream of the inverter (grid side) open and locked.

For all models, connection with the AC output terminal board (17) is made by inserting the cables in the AC cable gland (16).  
The maximum accepted cable cross-section ranges from 20 to 32 mm, whereas each individual terminal of the terminal board accepts a cable with cross-section of up to 35 mm² (tightening torque 2.5Nm).

Unscrew the cable gland, remove the cover, insert the cable of suitable cross-section and connect the conductors (Neutral, R, S, T and Ground) to the terminals on the AC output terminal board (17).  
Be careful not to change round one of the phases with neutral!  
Once the connection to the terminal board is complete, screw in the cable gland firmly (tightening torque 7.5Nm) and check the tightness.  
Before connecting the inverter to the distribution grid it is necessary to set the country standard by manipulating the two rotary switches a05.

Before connecting the inverter to the distribution grid it is necessary to set the country standard by manipulating the two rotary switches a05:  
Table: country standard and language

Switch 1	Switch 2	Country Grid Standard (name displayed)	Display language
0	0	NON-ASSIGNED	ENGLISH
0	1	GERMANY VDE 0126@400V (VDE 0126)	ENGLISH
0	5	ENEL@400V (ENEL)	ENGLISH
0	6	SPAIN@400V (RD 1699)	SPANISH
0	8	UK - G59@400V (UK G59)	ENGLISH
0	9	IRELAND@400V (IRELAND)	ENGLISH
0	A	AUSTRALIA@400V (AS 4777)	ENGLISH
0	B	ISRAEL@400V (ISRAEL)	ENGLISH
0	C	GERMANY - BDEW@400V (BDEW)	GERMAN
0	D	FRANCE@400V (FRANCE)	FRENCH
0	E	NETHERLANDS@400V (NETHERL)	DUTCH
0	F	GREECE@400V (GREECE)	ENGLISH
1	0	PORTUGAL@400V (PORTUGAL)	ENGLISH
1	1	CORSICA@400V (CORSICA)	FRENCH
1	2	HUNGARY@400V (HUNGARY)	ENGLISH
1	3	CHINA@400V (CHINA)	ENGLISH
1	4	KOREA@380V (KOREA)	ENGLISH
1	5	TAIWAN@400V (TAIWAN)	ENGLISH
1	6	CHECA REPUBLIC@400V (CZECH)	CZECH
1	7	GERMANY-VDE AR-N-4105@400V (VDE 4105)	GERMAN
1	8	CEI-021@400V EXTERNAL Protection (CEI021 IN)	ITALIAN
1	9	CEI-021@400V INTERNAL Protection (CEI021 EX)	ITALIAN
1	B	SOUTH AFRICA@400V (S.AFRICA)	ENGLISH

The settings become fixed after 24 hours of operation of the inverter (the PV generator simply has to be under power).  
The standard for the Italian grid which must be set during installation is 1-8 (CEI-021 @ 400V EXTERNAL Protection)

The following table shows the main components and the connections available on the control and communication board. Each cable that must be connected to the communication board must go through the three service cable glands (10).

Ref. inverter	Ref. manual	Description
S5	a01	Switch for setting parallel-connected or independent input channels
S7 e S8	a05	Rotary switches for setting the standard of the country and the language of the display
S3	a07	Switch for setting analogue sensor 1 to Volts or mA
S1	a08	Switch for setting analogue sensor 2 to Volts or mA
J2	a09	Terminal block connecting to the configurable relay that allows connection of external devices which, according to the mode selected in the menu SETTINGS>Alarm can, for example, signal malfunctions. The operating modes that can be set are: -Production -Alarm -Alarm (configurable) -Crepuscular
J3	a10	Terminal block for connection of: - Environmental sensors - Environmental sensor power supply (24Vdc) - Tachometer signal (WIND version)
J4	a11	Terminal block for connection of: - PC RS485 serial connection (to connect local or remote monitoring systems) - PMU serial connection (to manage active/reactive power infeed by the grid company). - Remote ON/OFF.
S2	a12	Switch for setting the termination resistance of the RS485 (PMU) line
S4	a13	Switch for setting the termination resistance of the RS485 (PC) line
J7 e J8	a14	Connection of the RS485 (PC) line on RJ45 connector
J5 e J6	a16	Connection of the RS485 (PMU) line on RJ45 connector

	TRIO-20.0-TL-OUTD	TRIO-27.6-TL-OUTD
Number of Pairs of DC Connections at Input	1 for each MPPT (Standard and -S2 versions)	1 for each MPPT (Standard and -S2 versions)
Type of Input DC Connectors	4 for each MPPT (-S2F / -S2X versions)	5 for each MPPT (-S2F / -S2X versions)
Type of photovoltaic panels that can be connected at input according to IEC 61730	Tool Free PV Connector WM / MC4 (Screw Terminal Block on Standard and -S2 versions)	Class A
Input protection	Protection for Inverter only, from current limited source, for standard and -S2 versions, and for versions with fuse with max 2 strings connected	
Reverse Polarity Protection	2 for each MPPT	
Input Overvoltage Protection - Varistors	3 (Class II) for each MPPT	
Input Overvoltage Protection - DIN rail surge arrester (-S2X version)	30.0A	40.0A
Maximum short-circuit current for each MPPT	In accordance with the local standard	
Isolation Control	40 A / 1000 V	
Characteristics of DC disconnect switch for each MPPT (Version with DC disconnect switch)	gPV / 1000 V / Max. 20A	
Fuses (-S2F and -S2X versions)	Three phase 3W or 4W+PE	
Output	Rated output voltage (Vacr)	
AC connection to the Grid	Rated output voltage (Vacr)	
Rated output voltage (Vacr)	300 Vac	
Output Voltage Range (Vacmin...Vacmax)	320...480 V <sup>(1)</sup>	
Rated Output Power (Pacr)	20000 W	27600 W
Maximum Output Power (Pacmax)	22000 W <sup>(3)</sup>	30000 W <sup>(4)</sup>
Maximum apparent Output Power (Sacmax)	22200 VA	30000 VA
Maximum Output Current (Iacmax)	33.0 A	45.0 A
Inrush Current	Negligible	
Maximum output fault current	<63Arms(100mS)	
Rated Output Frequency (fr)	50 Hz / 60 Hz	
Output Frequency Range (frmin...fmax)	47...53 Hz / 57...63 Hz <sup>(2)</sup>	> 0.995 (adj. ± 0.9, or fixed by display down to ± 0.8 with max 30 kVA)
Nominal Power Factor (Cosphiac,r) and adjustable range	> 0.995 (adj. ± 0.9, or fixed by display down to ± 0.8 with max 22 kVA)	
Total Harmonic Distortion of Current	< 3%	
Type of AC Connections	Screw terminal block, maximum cross-section 35 mm²	
Output protection	In accordance with the local standard	
Anti-islanding Protection	34.0 A	
Maximum AC Overcurrent protection	46.0 A	
Output Overvoltage Protection - Varistors	4	
Output Overvoltage Protection - DIN Rail surge arrester (-S2X version)	4 (Class II)	
Operating performance	Maximum Efficiency (ηmax)	
Maximum Efficiency (ηmax)	98.2%	
Weighted Efficiency (EURO/CEC)	98.0% / 98.0%	
Stand-by Consumption	< 8W	
Night-time Consumption	<1W	
Communication	Wired Local Monitoring	
Wired Local Monitoring	PVI-USB-RS485 232 (opt.), PVI-DESKTOP (opt.)	
Remote Monitoring	PVI-AEC-EVO (opt.), VSN700 Data Logger (opt.)	
Wireless Local Monitoring	PVI-DESKTOP (opt.) with PVI-RADIOMODULE (opt.)	
User Interface	Graphic Display	
Environmental	Ambient Temperature	
Ambient Temperature	-25...+60°C / -13...140°F with derating above 45°C/113°F	
Relative Humidity	0...100% condensing	
Noise Emission	< 50 db(A) @ 1 m	
Maximum Operating Altitude	2000 m / 6560 ft	
Environmental pollution classification for external environment	3	
Environmental Category	External	
Physical	Environmental Protection Rating	
Environmental Protection Rating	IP 65	
Cooling system	Natural	
Overvoltage Category in accordance with IEC 62109-1	II (DC input) III (AC output)	
Dimensions (H x V x D)	1061 x 702 x 292 mm	41.7" x 27.6" x 11.5"
Weight	Standard and S2: 67 kg/147lb	Standard and S2: 72 kg/158lb
S2F / S2X: 75 kg / 165 lb		S2F / S2X: 80 kg / 176 lb

Safety	I	
Safety Class	Transformerless (TL)	
Isolation Level	CE (50Hz only)	
Marking	1. The AC voltage range may vary depending on specific country grid standard 2. The Frequency range may vary depending on specific country grid standard 3. Limited to 20000 W for Germany 4. Limited to 27600 W for Germany	
Remark	Features not specifically listed in the present data sheet are not included in the product	

Contact us

www.abb.com/solarinverters



TRIO-20.0\_27.6-TL-OUTD-Quick Installation Guide EN-RevC  
EFFECTIVE 2014-02-12  
© Copyright 2014 ABB. All Rights Reserved.  
Specifications subject to change without notice.

Power and productivity  
for a better world™

