Technaxx® * User Manual

PV Micro Inverter 300W TX-203

PV Micro Inverter 600W TX-204

Before using the appliance for the first time, please read the instructions for use and safety information carefully.

TX-203

TX-204

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capacities, or by persons lacking in experience or knowledge, unless they are supervised or instructed on the use of this device by a person responsible for their safety. Children should be supervised to ensure they do not play with this device.

Keep this user manual for future reference or product sharing carefully. Do the same with the original accessories for this product. In case of warranty, please contact the dealer or the store where you bought this product.

Enjoy your product. * Share your experience and opinion on one of the well-known internet portals.

Specifications are subject to change without notice - please be sure to use the latest manual available on the manufacturer's website.

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Important notes at the start

ATTENTION!

According to the German Federal Network Agency, installations exceeding 600W may only be carried out by electrical contractors. In addition, a corresponding report must be made to the network operator! Therefore, contact a specialist electrical company if your installation exceeds 600W!

Explanation of the pictograms used

Read the user manual.

Read the user manual

Warning

Caution, risk of electric shock.

Caution, hot surface

Note

● In principle, the installation should only be carried out by qualified personnel. For installations of more than 600 W, the installation must be carried out by a specialist electrical company! Please also observe the requirements of your network operator and local legal regulations.● Only use the product for purposes due to its intended function ● Do not damage the product. Following cases may damage the product: Incorrect voltage, accidents (including liquid or moisture), misuse or abuse of the product, faulty or improper installation, mains supply problems including power spikes or lightning damage, infestation by insects, tampering or modification of the product by persons other than authorized service personnel, exposure to abnormally corrosive materials, insertion of foreign objects into the unit, used with accessories not preapproved. ● Refer to and heed all warnings, precautions and safety instructions in the user manual.

Safety instructions

● Read the user manual carefully. They contain important information on the use, safety and maintenance of the device. Keep the user manual in a safe place and pass them on to subsequent users if necessary.
● The device may only be used for its intended purpose in accordance with this user manual.
● Observe the safety instructions during use.
● Before commissioning, check the device and its connecting cable as well as accessories for damage. Do not use the device if it shows visible damage.
● Operate the device only from household power sources. Check whether the mains voltage specified on the type plate corresponds to that of your mains supply.
● Do not squeeze the power cord, do not pull it over sharp edges or hot surfaces; do not use the power cord for carrying.
● If the power cord of this device is damaged, it must be replaced by the manufacturer or its customer service or a similarly qualified person in order to avoid hazards.
● The appliance is intended for household or similar use only. It must not be used for commercial purposes!
● Make sure that the device is well secured during operation and cannot be tripped over by cables.
● Never use the device after a malfunction, e.g. if the device has been dropped into water or damaged in any other way.
● The manufacturer assumes no responsibility in the event of incorrect use resulting from failure to follow the instructions for use.
● Modification or alteration of the product will affect the product safety. Caution: Risk of injury!
● All modifications and repairs to the device or accessories may only be carried out by the manufacturer or persons expressly authorized by the manufacturer for this purpose.
● Make sure that the product is operated from a power source that is easily accessible so that you can quickly disconnect the device from the mains in case of an emergency.
● Never open the product without authorization. Never carry out repairs yourself!

● Handle the product with care. It can be damaged by shocks, impacts or falling from even a low height.
● Keep the product away from extreme heat.
● Never immerse the product in water or other liquids.
● Technical changes and errors excepted!

Warning!

● Do not install the device if the AC cable of the micro inverter is damaged or broken.
● Before installing or using the micro inverter, read carefully all the instructions and safety notes in the user manual and on the device and other solar equipment.
● Do not connect the micro inverter to the operator grid until you have fully implemented the installation process and received confirmation / approval from the grid operator.
● Do not tamper with or manipulate the micro inverter or other parts of the equipment under any circumstances.
● Risk of damage due to improper modifications!
● Keep all contacts dry and clean!

Caution Risk of electric shock!

● When operating this device, certain parts of the device are under dangerous voltage, which can lead to serious physical injuries or death. Therefore, follow the following instructions to minimize the risk of injury.
● Disconnect the plug connection only in a de-energized state!
● Before carrying out visual inspections and maintenance work, check that the power supply is switched off and secured against being switched on again.

Caution, hot surface!

● The surface of the micro inverter can become very hot. Touching the surface can cause burns.
● Mount the micro inverter in such a way that accidental contact is not possible.
● Do not touch hot surfaces. When working on the micro inverter, wait until the surface has cooled down sufficiently.

Intended use

The micro inverter may only be operated with a fixed connection, Schuko plug (or plug type of the corresponding country) or Wieland plug to the public power grid. The micro inverter is not intended for mobile use. Modifications to the micro inverter are generally prohibited. For changes in the environment, you must always consult a qualified electrician. Assembly, installation and electrical connection.

Assembly, installation and electrical connection

Warning!

- All work including transport, installation, commissioning and maintenance must be carried out by qualified and trained personnel.
- The electrical connection to the central building services may only be carried out by a licensed electrician.
- Do not connect the micro inverter to the operator grid until you have fully implemented the installation process and have received confirmation / approval from the electricity network operator.
- If you mount the micro inverters at a great height, avoid possible fall risks.
- Do not insert electrically conductive parts into the plugs and sockets! Tools must be dry.

Caution measures during installation

- Installation must be performed with the unit disconnected from the grid and with the solar panels shaded and/or insulated.
- Refer to the technical data to ensure that the environmental conditions meet the requirements of the micro inverter (degree of protection, temperature, humidity, altitude, etc.).
- Install the micro inverter and all DC connections in a suitable location, for example under the solar panel, to avoid direct UV/sunlight exposure, rain exposure, snow accumulation, etc. In any case, sufficient air circulation for cooling must be ensured.
- Install the micro inverter in such a way that at least 2cm distance to the nearest surface is maintained. Otherwise, the micro inverter may overheat.
- Do not install in locations where gases or flammable materials may be present.

Qualified personnel

An adequately informed person or a person supervised by a person with electrical engineering skills and knowledge so that he or she recognizes the risks and avoids the hazards caused by electricity. For safety reasons, in this manual 'Qualified Personnel' means that this person is familiar with safety requirements, cooling systems and EMC and that this person is authorized to power, ground and attach equipment, systems and circuits according to existing safety procedures. The micro inverter, accessories and connected systems may only be commissioned and operated by qualified personnel.

Disclaimer

- In no event shall Technaxx Deutschland be liable/responsible for any direct, indirect punitive, incidental, special consequential danger, to property or life, improper storage, whatsoever arising out of or connected with the use or misuse of their products. - Error messages may appear depending on the environment it is used in.

Features

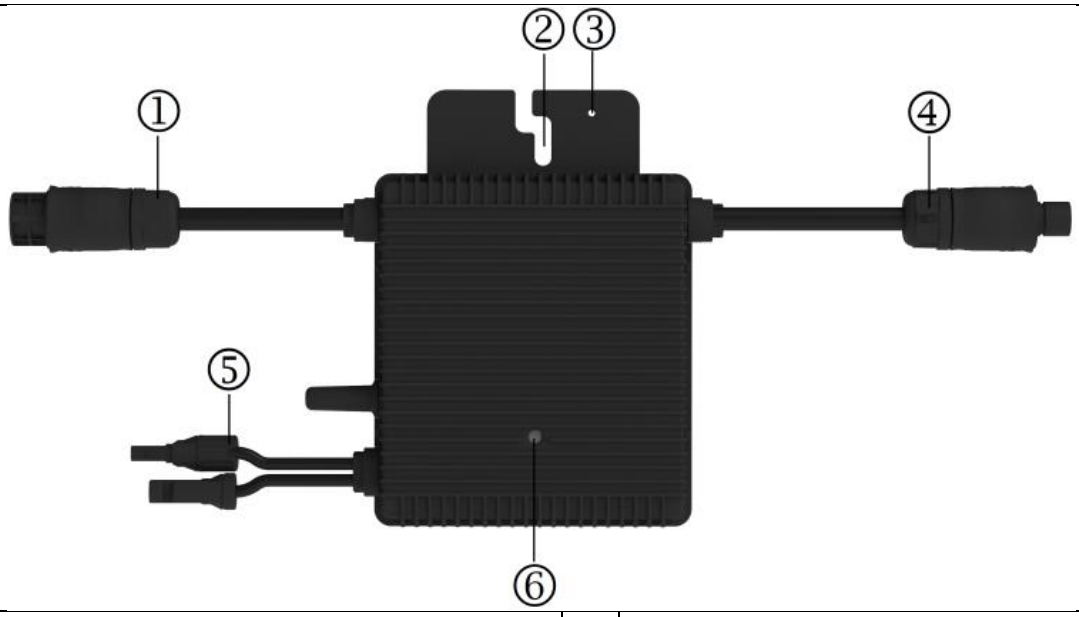
- Easy installation, just plug and play
- Lightweight and compact micro inverter
- Direct mounting on the racking system or panel frame
- Ideal for balcony power plants and mini solar systems
- On-grid system, for feeding power into the 230V household grid via socket plug
- MC4 connector for solar panel connection
- Max. solar panel power 240-380W
- Integrated MPPT charge controller for solar panels: particularly efficient power yield
- MPPT voltage range: DC29-48V
- VDE-certified: meets highest safety standards
- Waterproof IP67

Product details

Package content:		Product variants:
1x PV Micro Inverter	1x Female Betteri adapter	- TX-203: 300 Watt
1x AC input end cap	1x User manual	- TX-204: 600 Watt

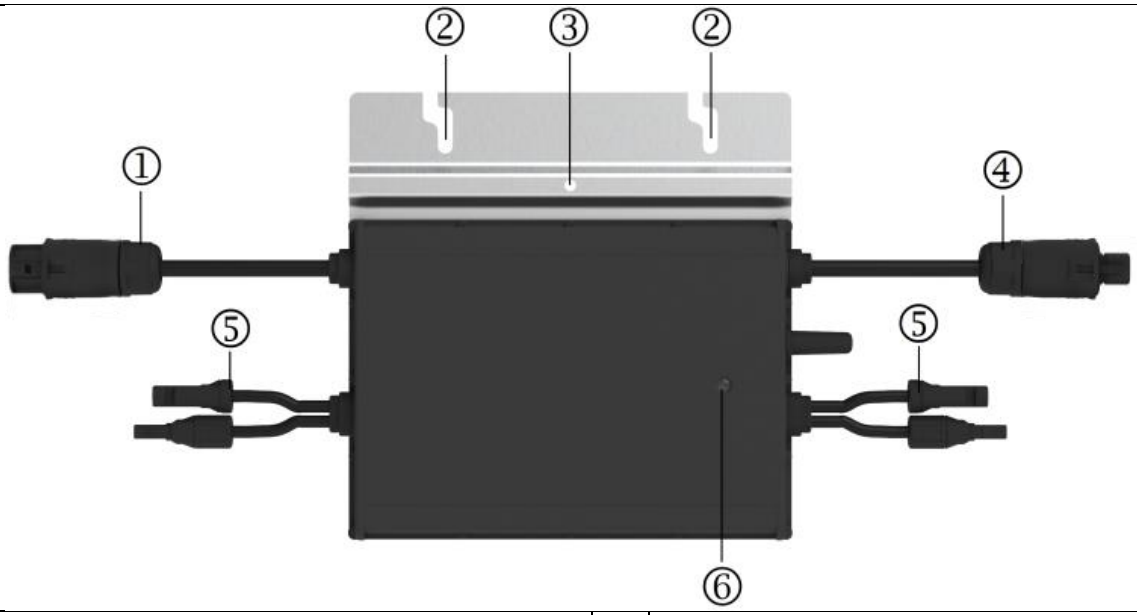
Prduct overview

PV Micro Inverter 300W TX-203



1	Betteri socket BC01 (input 230V AC)	4	Betteri plug BC01 (output 230V AC)
2	Mounting hole	5	Input solar panel (MC4 connector)
3	Ground connection	6	Indicator LED

PV Micro Inverter 600W TX-204



1	Betteri socket BC01 (input 230V AC)	4	Betteri plug BC01 (output 230V AC)
2	Mounting holes	5	Input solar panel (MC4 connector)
3	Ground connection	6	Indicator LED

Preparation

Requirements for the operation of a photovoltaic system

- Permission from the owner or owners' association if you are not the owner yourself
- Wieland socket, fixed connection or Schuko socket (country specific)
- RCD in the fuse box (standard nowadays)
- Socket, better protected outdoors
- Electricity meter with backstop or bidirectional meter

ATTENTION!
The following requirements must be met in order to operate a photovoltaic system.

- You must register your photovoltaic system with your responsible grid operator.
- In addition, a report must be submitted to the responsible authority (Market Master Data Register (MaStR)).
- You must have ensured that an appropriate and sufficiently dimensioned feed-in socket is already available.
- Be sure to contact a licensed electrical contractor to check the suitability of your house installation and the associated technical requirements.
- Meter replacement required: A bi-directional meter must be present or depending on what your electricity provider specifies. Simple electricity meters are often not sufficient.
- If necessary, the consent of the landlord is required.
- If you are unsure, please have the local conditions checked, if necessary, or contact your network operator for information.

ATTENTION!
If you use more than one micro inverter or if the power exceeds 600VA (600W), commissioning and reporting is only permitted by a specialized electrical company and grid operator! Also observe the requirements of your network operator and local legal regulations.

Connecting the micro inverter

CAUTION!
Check that the voltage and current specifications of your solar panel match those of the micro inverter.

CAUTION!
The DC operating voltage range of the solar panel must match the allowed input voltage range of the micro inverter.

CAUTION!
The maximum open circuit voltage of the solar panel must not exceed the listed maximum input voltage of the inverter.

CAUTION!
Only qualified personnel may install and/or replace micro inverters!

CAUTION!
Observe all local regulations and restrictions during installation.

CAUTION!

Before installing and using the micro inverter, carefully read all operating instructions and safety instructions (micro inverter, solar panel, etc.). Make sure that you have understood everything. Consult a suitable specialist if you are unsure.

CAUTION!

There is a risk of electric shock when installing this device.

CAUTION!

Do not touch live parts, including the connected solar panels, when the system is connected to the electrical mains.

CAUTION!

Note that the housing of the micro inverter is the heat sink and can reach a temperature of 80 °C. To reduce the risk of burns, do not touch the micro inverter housing.

CAUTION!

The external protective grounding conductor is connected to the protective grounding conductor terminal of the micro inverter via AC connection. When connecting, connect the AC terminal first to ensure grounding of the micro inverter. Then connect the DC terminals. When disconnecting, disconnect the AC first by opening the branch circuit breaker but keeping the protective grounding conductor in the branch circuit breaker connected to the micro inverter. Then disconnect the DC inputs.

CAUTION!

Do not, under any circumstances, connect the DC input if the AC connection is not connected.

CAUTION!

Install disconnect devices on the AC side of the micro inverter.

CAUTION!

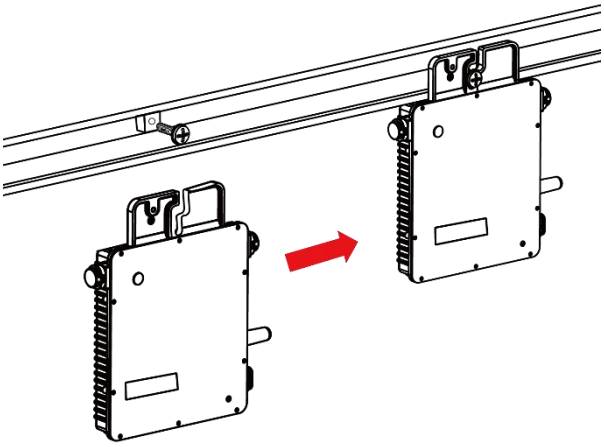
It is strongly recommended to install surge protectors in the appropriate meter box.

CAUTION!

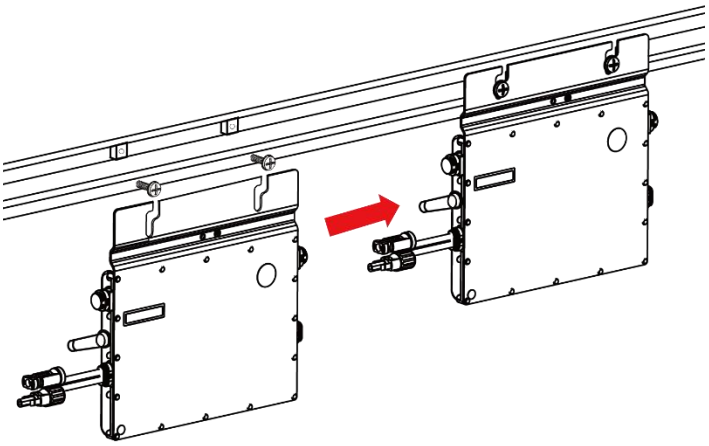
You should not use an AC residual current device to protect the corresponding circuit to the micro inverter, even if it is an outdoor circuit. None of the small residual current devices (5~30 mA) are designed for regeneration and will be damaged if regeneration occurs. The same is true for AC arc fault circuit breakers. They are not evaluated for regenerative power and could be damaged if regenerated with the output of a solar micro inverter.

Mount the micro inverter

1. Mark the location of the micro inverter on the racking system or panel frame.
2. Consider the location of the distribution box of the solar panel and other obstacles.
3. Fix the screw on the rail.
4. Hang the micro inverter on the screw (shown as picture below), and tighten the screw. The silver cover side of the micro inverter should be facing the panel.



TX-203 mounted to a racking system



TX-204 mounted to a racking system

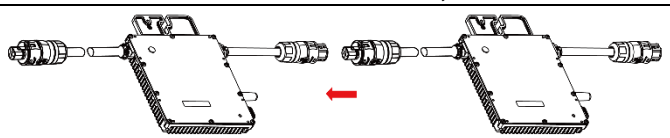
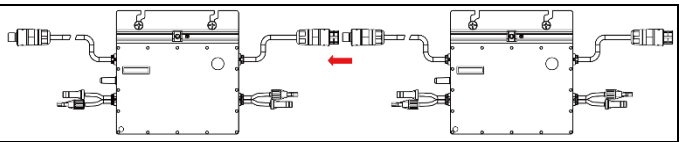
CAUTION!
Before installing the micro inverter: Check that the supply mains voltage at the common connection point matches the rated voltage of the micro inverter.

CAUTION!
DO NOT install the micro inverter (including DC and AC connections) where it will be exposed to sun, rain or snow. DO NOT mount it in gaps between panels. Leave a minimum clearance of 2cm between the solar panels above it and the micro inverter to allow proper airflow.

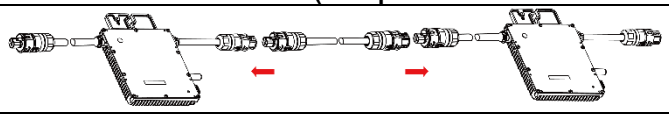
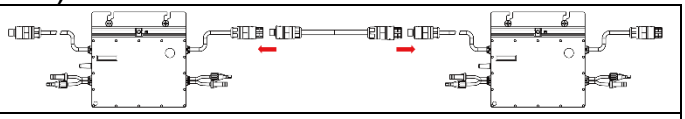
Connect micro inverter in parallel

CAUTION!
Do not connect more micro inverters together than allowed for each AC branch circuit (see technical data)!

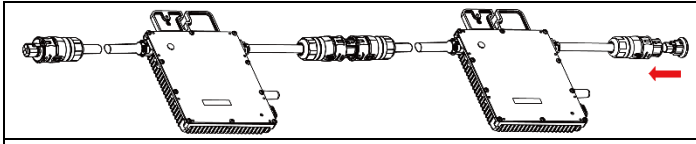
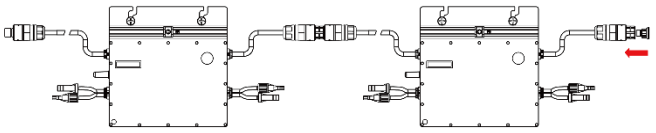
1. Connect the male AC connector of the first micro inverter with the female connector of the second micro inverter, to form a continuous AC branch circuit.

	
TX-203 AC connection	TX-204 AC connection

Note: The length of AC cable on micro inverter is around 0.98m/1.88m. If the distance between two micro inverters is more than 1m/2m, use an AC extension cable between two micro inverters (As picture indicated below).

	
TX-203 AC connection with extension cable	TX-204 AC connection with extension cable

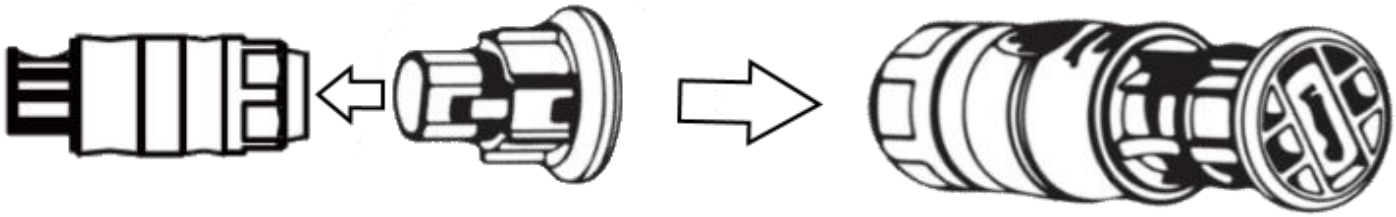
2. Install the AC end cap on the open AC connector of the last micro inverter in the AC branch circuit.

	
TX-203 AC end cap	TX-204 AC end cap

CAUTION!
Never exceed the maximum number of micro inverters in an AC branch circuit (see technical data)!

Install protective AC end cap

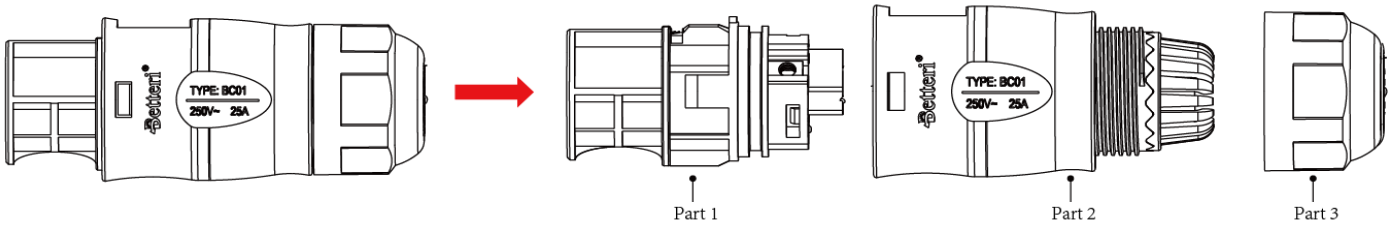
Like shown in the picture below connect the AC end cap from the accessory on the short AC 230V AC input cable (1).



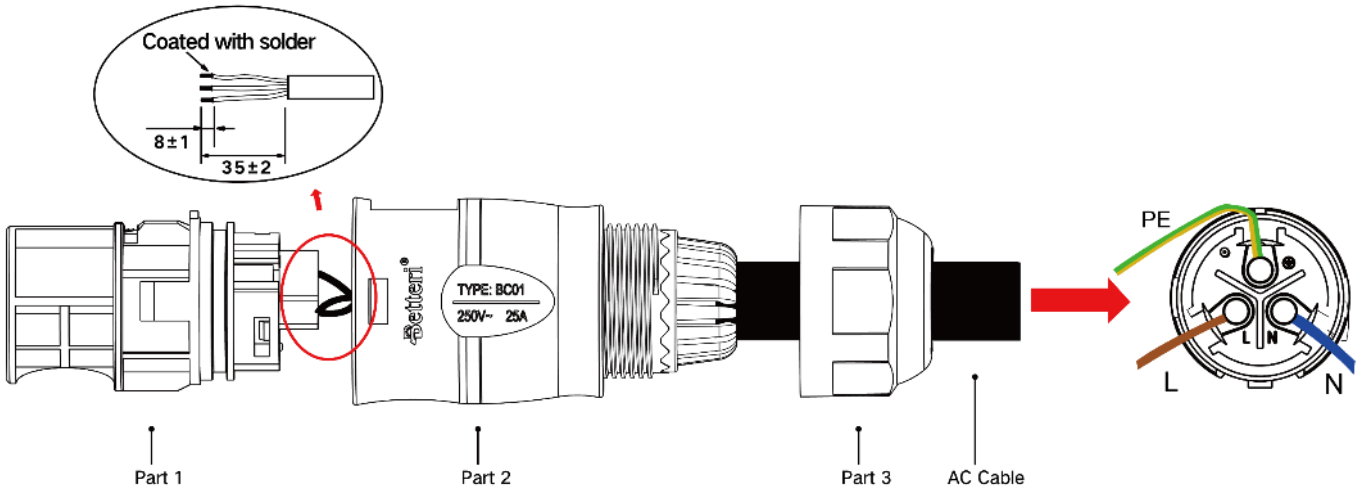
Connect AC grid connection cable

Make the AC grid connection cable.

1. Take the female AC adapter apart into 3 parts:

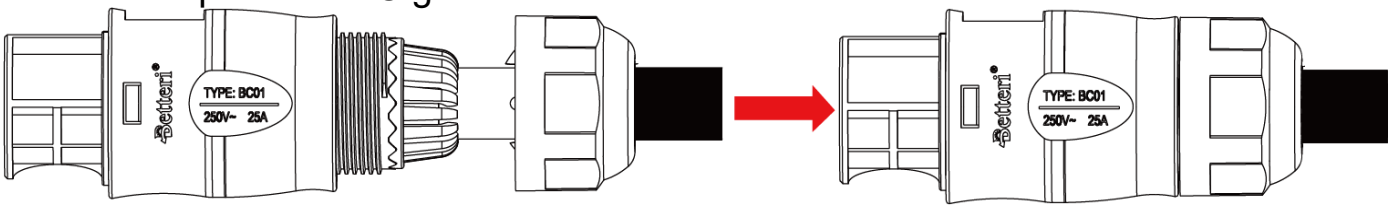


2. Insert the AC cable from Part 3 to Part 2, and complete the wiring for the L, N and Ground (PE) inside Part 1 AC port accordingly:

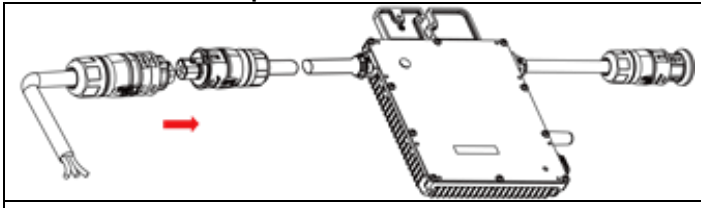
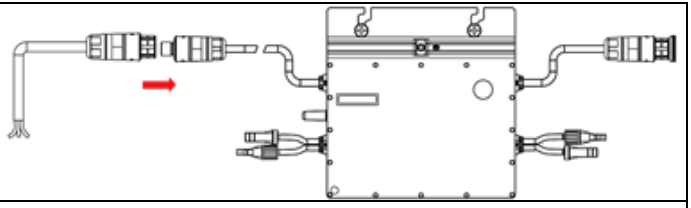


Note: L: Brown wire; N: Blue wire; PE: Green/Yellow wire
Use 3x1.5mm² (H07RN-F) cable as AC grid connection cable.

3. Plug the AC port Part 2 into Part 1 once complete the wiring and screw the Part 3 on and complete the AC grid connection cable:

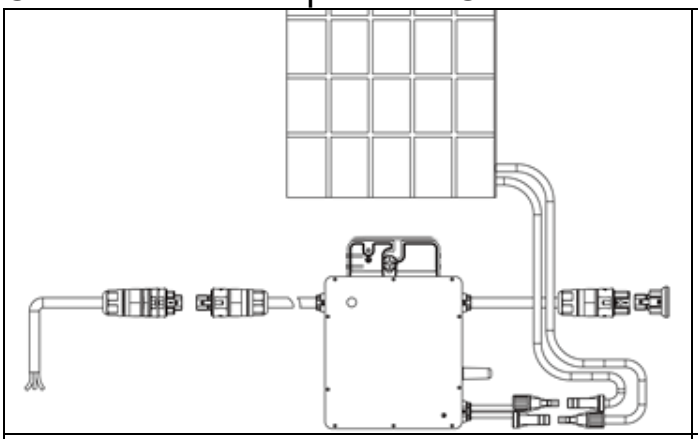
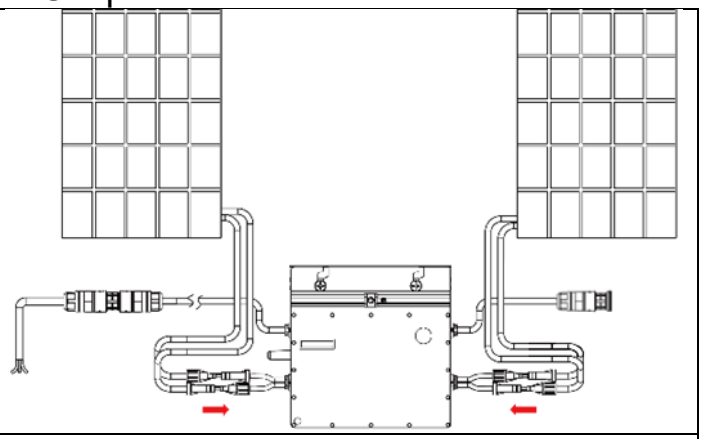


Connect the AC grid connection cable to the AC male connector of the first micro inverter to complete the circuit.

	
Connect AC end cable with TX-203	Connect AC end cable with TX-204

Connect the solar panels (DC connection)

Connect the solar panels DC cables to the DC input side of the micro inverter.

	
Connect solar panels with TX-203	Connect solar panels with TX-204

The TX-203 is connected to the solar panels via MC4 connectors. The TX-204 micro inverter provides two pairs of MC4 connectors for two solar panels. Simply connect the DC connection cables of the micro inverter to the matching counterpart of the solar panel. When doing so, plug the pair of connectors together until you hear a "click" sound. The connectors of some solar panels have the polarity (+, -) printed on them, which is valid for the panels. The DC cable of the TX-203/TX-204 with the plus marking (+) is connected to the - pole of the panel, the negative marked cable (-) to the + pole. Make sure that the polarity is correct.

The connected solar panel must not exceed the maximum permissible DC input voltage/solar panel voltage of the micro inverter (see type plate) under any circumstances!

Note: When plugging in the DC cables, if the AC cable is already plugged in, the micro inverter LED should immediately flash green and start synchronizing with the grid within 2 minutes. If the AC cable is not plugged in, the red LED will flash continuously and repeat this until the AC cable is plugged in (see chapter LED Status).

Connecting the micro inverter to the AC grid (AC connection)

A maximum of 12x TX-203 or 6x TX-204 may be connected to an EU / 50Hz / 230V installation with 16A automatic circuit breaker.

The connection to the mains is made with a suitable power cable. Only use 3-core cables that are also approved for outdoor installation and have a conductor cross-section adapted to the amperage (preferably 1.5mm² or 4mm²).

Fasten the connection cables to the mounting rail using UV-stable cable ties in such a way that the cables are protected from rain and sun and, in particular, the plug connections cannot lie in a puddle of water. To connect the micro inverter and the connection cable, the pre-assembled AC plug-in system in combination with an AC cable and assembled Betteri IP68 connection socket or the AC string input/output can be used, depending on the delivery variant. To mount a Wieland connector, the pre-assembled Betteri IP68 connector system must be removed.

Note: Other plug connections / systems may be possible, provided they are suitable for outdoor use and the current levels involved.

First commissioning

After mechanical and electrical installation of the solar power system, you can put the system into operation. There should be enough sunshine for this. The solar panels need to produce at least a start voltage of 22V.

Initial state:

1. The micro inverter is connected to the solar panels (see DC connection)
2. The individual micro inverters are connected to each other on the AC side if you have more than one (see AC connection)
3. The cables are fixed protected from rain and sunlight
4. The feed line is connected to the mains via a circuit breaker

Proceed as follows:

1. Turn on the circuit breaker and any other switches that may be present.
2. Switch on the main AC switch.
3. The unit LED should begin flashing green after you turn on the AC circuit breaker. See chapter LED status for more information.
4. The micro inverter starts feeding (grid synchronization) within 2 minutes if there is sufficient solar radiation. The status LED indicates the basic function. You can check the feed-in power with a suitable power socket energy meter* (*needs to be water proof for outside use!).
5. If you have installed a feed-in meter, you can also use it to check the current feed-in power or energy.

Note: When AC power is applied but the micro inverter is not started, approximately 0.2W of power can be measured for each micro inverter using a power meter. This power is reactive power, not consumption from the utility grid.

LED status

The LED of each micro inverter provides information about the current status. All micro inverters draw their supply voltage from the DC connector/solar panels.

Status during power up

The green LED will flash fast a few times. Then switch-on process usually takes up to 2 minutes. Following LED status can occur:

Flashing fast red (1s):	No AC connection	→ no grid feed
Flashing slow green (3s):	AC connection & DC connection voltage lower 22V	→ no grid feed
Flashing fast green (1s):	AC connection & DC connection voltage over 22V	→ grid feed
No LED Flashing/LED off:	No DC connection/solar panels connected	→ no grid feed

Status after the switch-on process

A fast green flashing LED indicates normal status and an active feed into the grid. If the LED remains flashing red after 3minutes, this indicates an error with solar panel voltage that is too low (below 22V) or a missing AC voltage.
The micro inverter can only start feeding (again) after the cause of the error has been eliminated. The reason for this error could be a faulty solar panel connection / AC connection or the connected grid exceeds / falls below the voltage / frequency range of the micro inverter. If the LED shows no function or remains OFF, the most common cause is that there is no connection to the solar panel or the solar panel voltage is far below the start voltage.

Troubleshooting

Maintenance work and troubleshooting on the micro inverter may only be carried out by qualified personnel. Modifications to the micro inverter are generally prohibited. The micro inverter is potted, the electronics cannot be repaired. The TX-203/TX-204 micro inverter draws its supply voltage from the DC side. To restart the micro inverter, the solar panels must be disconnected from the micro inverter. The start-up process usually takes place within 2 minutes. For troubleshooting purposes, perform the following steps in the order listed:

1. Check that all AC fuses are turned ON.
2. Check all connection cables for external damage.
3. Check all AC side connections for damage or connection errors.
4. Measure at the connection points. The applied mains voltage must not exceed or fall below the AC voltage range of 180-275V.
5. Restart the micro inverter by disconnecting and reconnecting the DC power / solar panels. A normal start-up process should be indicated by a green LED (see LED status).

CAUTION!
Never disconnect the DC cables while the micro inverter is generating power.

6. Measure the voltage of the solar panel to the micro inverter with a suitable multi-meter. The required starting voltage of the micro inverter is above DC22V.
7. Check the MC4 connectors of the micro inverter and solar panel(s). Damaged DC connections must be replaced.
8. If necessary, check with your grid operator whether the grid frequency matches the frequency range of the micro inverter.

CAUTION!
Do not attempt to repair the micro inverter.
If the above steps do not solve the problem, contact our support or an electrician. ~~you trust or turn to the prophet of your religion and start praying.~~

The AC connection on the micro inverter cannot be replaced/repaired. If the cable has been damaged, the device should be disposed of.

Unless otherwise specified, maintenance work must be carried out with the equipment disconnected from the mains (mains switch open) and the solar panels covered, or insulated.

Do not use rags or corrosive products for cleaning that could corrode parts of the equipment or cause electrostatic charges.

Avoid temporary repairs. All repairs should be made only with original spare parts.

Each micro inverter should be protected by a circuit breaker, but central disconnect protection is not required unless specified by national standards, or by the responsible network operator.

Technical specifications

- Verify that the voltage and current specifications of the solar panels match those of the micro inverter.
- The maximum open circuit voltage of the solar panel must be within the operating voltage range of the micro inverter.
- It is recommended that the maximum rated current in the MPP be equal to or less than the maximum input DC current. However, the maximum short circuit current must be equal to or less than the maximum DC input short circuit current.
- It is NOT recommended to oversize the output DC power of the solar panels by more than 1.35 times (based on the AC output power of the micro inverter).

Modell	**TX-203**	**TX-204**
DC-input		
Recommended panel power (W)	240-380 (per panel)	
Panel compatibility	60-cell or 72-cell panels	
Max. number of panels	1	2
Panel connection	MC4	
MPPT voltage range (V)	29-48	
Starting voltage (V)	22	
Operating voltage range (V)	16-60	
Max. input voltage (V)	60	
Max. input current (A)	11.5	2x 11.5
Max. input short-circuit current (A)	15	2x15

AC-output		
Rated output power (VA)	300	600
Rated output current (A)	1.36 at 220V 1.30 at 230V 1.25 at 240V	2.73 at 220V 2.61 at 230V 2.50 at 240V

Rated output voltage/range (V)	220/180-275 230/180-275 240/180-275	
Rated frequency/rated frequency range (Hz)	45-55 (under 50Hz @ 220 V & 230 V) 55-65 (under 60Hz @ 220 V & 230 V)	
Power factor	>0.99 standard 0.8 leading.....0.8 delayed	
Output current harmonic distortion	≤3%	
Maximum number of devices in series	12	6

Efficiency, safety and protection	
Peak efficiency	96.70%
CEC weighted efficiency	96.50%
MPPT rated efficiency	99.80%
Nightly power consumption (mW)	<50

Mechanical data		
Ambient temperature range (°C)	-40~+65	
Storage temperature range (°C)	-40~+85	
Dimensions (WxHxD) mm	182x164x29.5	250×170×28
Weight (kg)	1.98	3.00
Protection class	NEMA outdoor (IP67)	
Cooling	Natural circulating air - no fans	
AC output cable length (cm)	98	188
AC input cable length (cm)	10	8.5

Characteristics	
Compliance	VDE-AR-N 4105:2018, EN50549-1:2019, VFR2019, IEC/EN 62109-1/-2, IEC/EN 61000-3-2/-3, IEC/EN-61000-6-1/-2/-3/-4

Package content
1x PV Micro Inverter, 1x AC input end cap, 1x Female Betteri adapter, User manual

Support

Service phone No. for technical support: **01805 012643** (14 cent/minute from German fixed-line and 42 cent/minute from mobile networks). Free Email: **support@technaxx.de**
The support hotline is available Mon-Fri from 9am to 1pm & 2pm to 5pm

Declaration of Conformity

The EU Declaration of Conformity can be requested at the following address: www.technaxx.de/ (in the lower bar "Declaration of Conformity").

Disposal

Disposal of the packaging. Sort packaging materials by type upon disposal.

Dispose of cardboard and paperboard in the waste paper. Foils should be submitted for recyclables collection.

Disposing of old equipment (Applies in the European Union and other European countries with separate collection (collection of recyclable materials) Old equipment must not be disposed of with household waste! Every consumer is required by law to dispose of old devices that can no longer be used separately from household waste, e.g. at a collection point in his or her municipality or district. This ensures that the old devices are properly recycled and that negative effects on the environment are avoided. For this reason, electrical devices are marked with the symbol shown here.

Made in China

Distributed by:
Technaxx Deutschland GmbH & Co. KG
Konrad-Zuse-Ring 16-18,
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PV Micro Inverter 300W TX-203
PV Micro Inverter 600W TX-204