

Technaxx® * User Manual

Solar Balcony Power Plant 800W TX-241

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



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 subject to change without notice - please make sure you are using 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 800W 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 800W!

Explanation of the pictograms used



Read the user manual.



Warning



Caution, risk of electric shock.



Caution, hot surface

Note

● 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.
- Before installing or using the Solar Balcony Power Plant, please read all instructions and warnings in the technical documentation, on the microinverter and on the solar modules.
- 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.
- Perform all electrical installations in accordance with local regulations (including VDE).
- When installing and operating the plug-in photovoltaic system, observe the national legal regulations and the connection conditions of the grid operator.
In particular, DIN VDE V 0100-551-1 (VDE V 0100-551-1), VDE AR-N 4105:2018-11, DIN VDE 0100-712, DIN VDE 0100-410 and DIN VDE V 0628-1 (VDE V 0628-1).
- Note the information on determining the line reserve at the end of these operating instructions.
- Note that the housing of the micro inverter is a heat sink and can reach a temperature of 80 degrees Celsius. To reduce the risk of burns, do not touch the housing of the micro inverter.
- Do not squeeze or bend 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 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 to the public power supply. 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.
- 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.

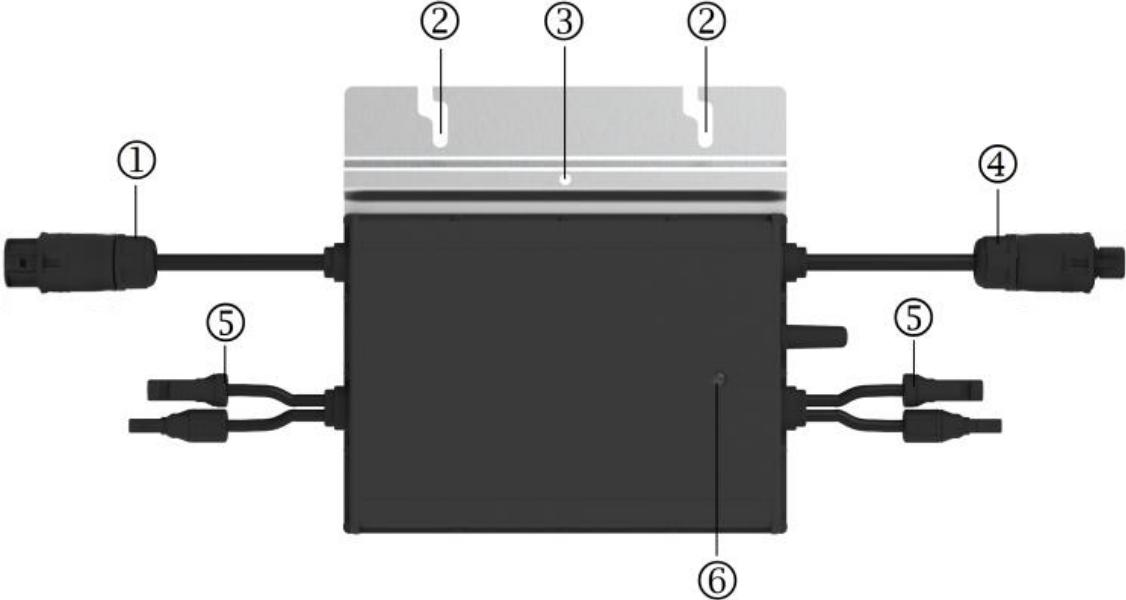
Features

- Attach to flat roof, terrace, balcony, fence and much more possibilities.
- Easy installation: connect, start, save power
- Lightweight and compact microinverter
- Suitable for feeding electricity into the 230V household grid
- Maximum feed-in power of the inverter 800W
- Ideal for covering the base load during the day in your home
- MPP tracking for optimal power feeding

Product details

Package content:		Product variants:
1x PV microinverter	1x Betteri socket adapter	- TX-241: 800 Watt
2x solar module for 410W	1x AC input end cap	
	1x connection cable	
	1x user manual	

Product overview

PV Micro Inverter 800W TX-242			
			
1	Betteri socket (input 230V AC)	4	Betteri plug (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 (recommendation), permanent connection or Schuko socket
- 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.
- 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.

Connecting the micro inverter

The micro inverter is already pre-installed on a solar module in this set. It may only be necessary to connect the solar modules (DC) to the micro inverter. On the AC side, only the connection with the enclosed connection cable must be made. A Wieland plug connection is recommended here according to VDE. A Schuko plug connection with a Schuko socket is also possible.



CAUTION!

Observe all local regulations and restrictions during installation.



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.

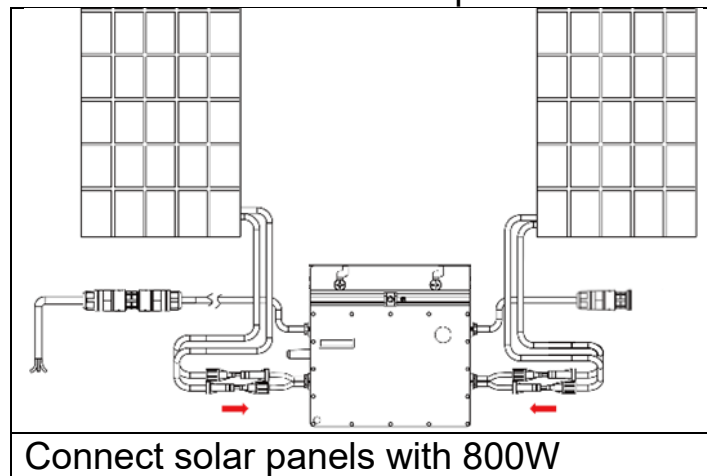


CAUTION!

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.

Connect the solar panels (DC connection)

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



The 800W 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 micro inverter 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.

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 1x 800W may be connected to an EU / 50Hz / 230V installation with 10A 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.

Mounting

Observe the following instructions for the corresponding installation.

General hints

- Before you start mounting, check the solar module, the inverter and all cables for visual damage.
- Do not stand on the module or the module frame. To prevent grease stains on the module, avoid contact with your hands on the glass surface and ideally wear work gloves.
- Place the solar module face down on a clean, flat, soft surface.
- Write down the model and serial number of the components [inverter, solar module(s)] and keep the numbers. In the event of a defect, we will need the numbers for unique identification.

Balcony

- The solar module is only suitable for installation up to a height of 4m (upper edge of the module), provided that there is also no public traffic below the module.

Flat roof (bitumen roof)

- The statics of the roof for the photovoltaic system must be checked by the customer. The photovoltaic system can be installed up to a roof height of 9m, a sea level of max. 350 m and a roof pitch of 45°.
- We recommend a distance of 1.25 m to fire walls of adjacent buildings (e.g. row houses). For more detailed requirements for your federal state, please refer to your state building code (LBO).
- Make sure that national and site-specific building regulations, occupational safety and accident prevention regulations, standards and environmental protection regulations are observed.

Weight the module mount evenly

- The solar module (up to 19kg) should be positioned at ground level or centered on a flat roof.
- Suitable is a bracket for mounting on bitumen, concrete, in the garden on the lawn or terrace.
- The weighting is calculated according to the terrain IV (urban area), where at least 15% of the area is covered with buildings, the average height of which exceeds 15m,

and may differ for other heights or terrain structures.

- In case of installation on a flat roof, the top edge of the building should be lower than 15m and the photovoltaic system should be at least 1.25m away from the neighbor's roof surface. The maximum slope of the ground may be 5°.
- One concrete slab should weigh 9kg.
- Check whether the statics of the installation site are suitable for the photovoltaic system. Technaxx Germany does not assume any liability for the suitability of your installation site.

Facade

- For the mounting you need your own dowels and screws. Since every wall is different.
- Up to a height (upper edge of the module) of 4m the glass-foil module can be used, as long as you cannot step directly under the module.

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
2. The microinverter is connected to the house mains via Wieland plug(recommended) or Schuko plug.
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 3 minutes, 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-242 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.



The AC connection on the micro inverter cannot be replaced/repared. 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

For the technical specifications of the solar module, please refer to the enclosed data sheet.

Inverter

Modell	TX-242
DC-input	
Recommended panel power (W)	320-540 (per panel)
Panel compatibility	60-cell or 72-cell panels
Max. number of panels	2
Panel connection	MC4
MPPT voltage range (V)	34-48
Starting voltage (V)	22
Operating voltage range (V)	16-60
Max. input voltage (V)	60
Max. input current (A)	2x 12.5
Max. input short-circuit current (A)	2x15

AC-output	
Rated output power (VA)	800
Rated output current (A)	3.64 at 220V 3.48 at 230V 3.33 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	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	250×170×28
Weight (kg)	3.00
Protection class	NEMA outdoor (IP67)

Cooling	Natural circulating air - no fans
AC output cable length (cm)	188
AC input cable length (cm)	8.5

Communication	
Transmission	2.4GHz Proprietary RF (Nordic)
Frequency range	2.403 - 2.475GHz
Radiated transmit power	max. 5.68dBm / 3.7mW

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

Appendix

Determining the line reserve

The PI Photovoltaic Institute Berlin in cooperation with the German Society for Solar Energy (DGS), the University of Applied Sciences (HTW) Berlin have worked out in a study that it is possible to feed in up to 2.6 amps (approx. 630W, equivalent to 2 solar modules) with plug-in solar devices in every household with circuit breakers without any safety concerns, without having to make any changes to the house electrics. However, there may be a deviation from the applicable standard for line loading. We have described how to comply with the requirements of the standard and how to test the line in this appendix. If mini solar systems feed into the existing final circuit, the current load on individual cable sections may exceed the designed standard size. To prevent overloading of the cables in the household, they are protected by a line circuit breaker (LSS). This switches off automatically as soon as an overload occurs. As a rule, several sockets and consumers are protected by a common line protection. Due to the additional power of the mini solar system, the currents from the utility grid and the mini solar system can now add up. However, the currents are not detected by the line circuit breaker, so theoretically an overload can occur. You can use the following formula to determine whether the existing line with your circuit breaker is sufficiently dimensioned:

I_z indicates the current carrying capacity of the line, which should be greater than the sum of the rated current of the protective device (circuit breaker in amperes) and the generating equipment (power in amperes). Both I_z and I_g can be found in the following table for the example application below.

$$I_z = I_n + I_g$$

I_z Permissible current carrying capacity of the line

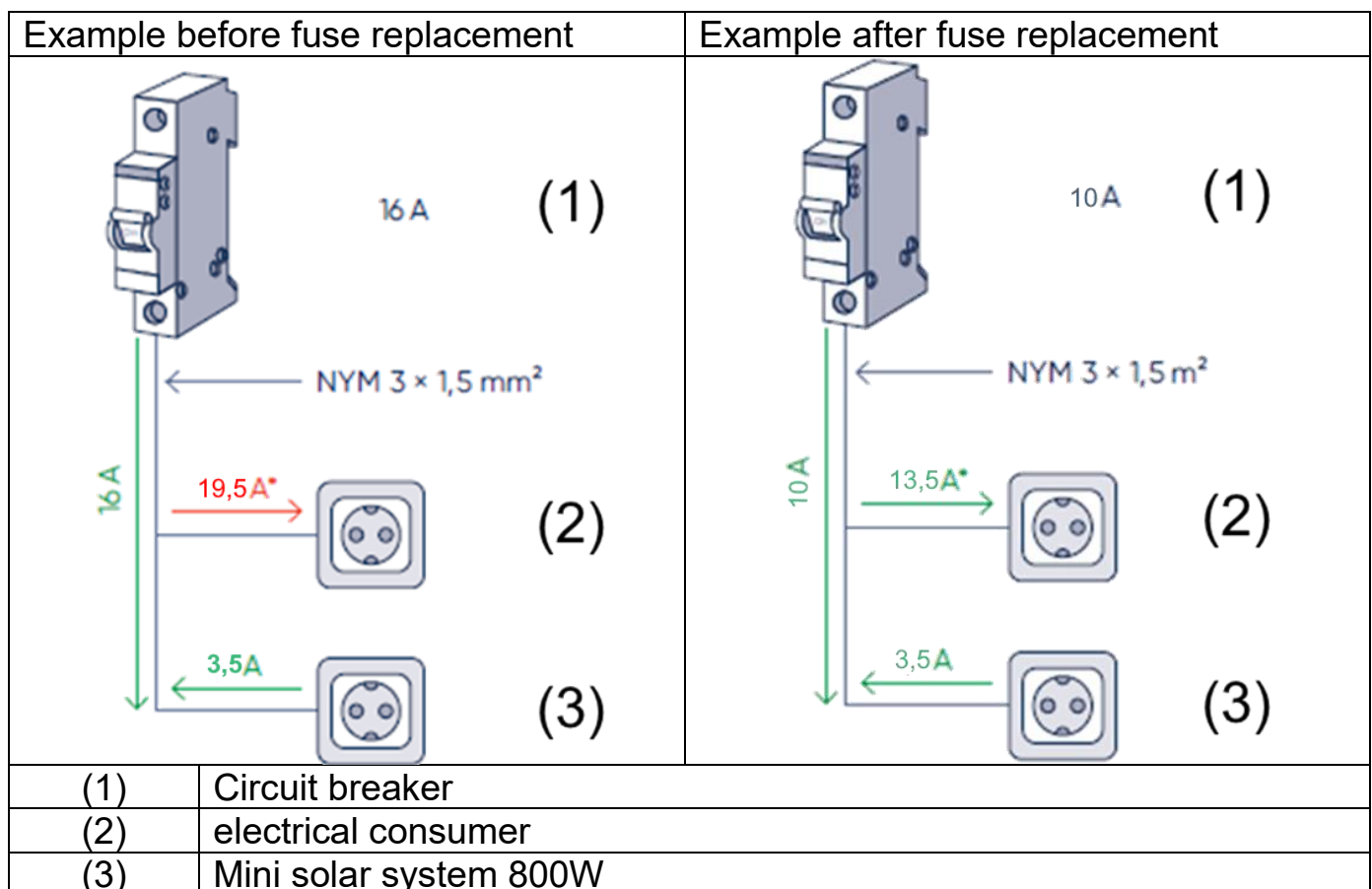
I_n Rated current of the protective device (circuit breaker)

I_g rated current of the power generation system

Load capacity of copper lines

Load capacity of copper cables and lines for fixed installation in buildings 1.5mm ² nominal cross-section; at ambient temperature 25°C, with 2 loaded cores*.				
Installation method	On thermally insulated walls	In electrical installation pipes	On walls	In the air
Current carrying capacity I _z of the conductors of the final circuit in amperes	16,5	17,5	21	23
Maximum rated current I _g of the power generation system with 16A circuit breaker	0,5	1,5	5	7
Maximum rated current I _g of the power generation system with 13A circuit breaker	3,5	4,5	8	10
Photovoltaic system	one solar module	two solar modules	one solar module	two solar modules
max. current load in amperes	1.75	3.5	1.75	3.5

* The example from the table is based on two loaded copper lines with a nominal cross-section of 1.5mm², which reflects the line in a typical German household. In the case of a larger cross-section or a different cable type, the permissible current-carrying capacity is different, so that this must be considered separately, in accordance with DIN VDE 0298-4.



* max. permissible line load is 16.5A

Determination of the line reserve

If the cable is a copper cable with a core cross-section of $3 \times 1.5 \text{mm}^2$, then the cable is designed for a continuous load of 16.5A (in thermally insulated walls at 25°C). The free capacity is the difference of the line with 16.5A, minus the circuit breaker with 16A. The free capacity is therefore 0.5A in thermally insulated walls. If the solar power exceeds the current of 0.5A, then the circuit breaker should be replaced with a smaller one in order to comply with the requirements of the DIN VDE 2948-4 standard. By exchanging the fuse for a smaller 10A fuse, 10A can now still be drawn from the power grid, resulting in free capacity for the power line with the difference of 3.5A. The power of the mini solar system could therefore be up to 805W. In the example (right half of the picture), the power of the mini solar system is 3.5A/800W, which complies with the permissible load.

Further safety instructions

- Only connect the mini solar system to a permanently connected socket, never to a multiple socket.
- If you still have older screw fuses installed, it is mandatory to replace them from 16A to the next smaller fuse.

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

Care and maintenance

Clean the device only with a dry or slightly damp, lint-free cloth.

Do not use abrasive cleaners to clean the device.

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

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Solar Balcony Power Plant 800W TX-241