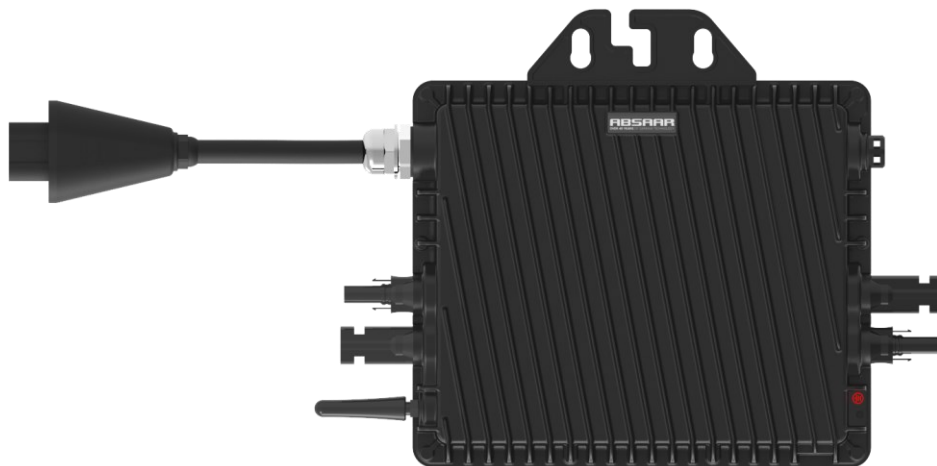


Absaar Micro-Inverter

AB400A, AB600A, AB800A



Translation of the original instruction

Release date of the Operating Instructions: 28/05/2024

Version of the Operating Instructions: 001

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D&W The Motion Corporation GmbH&Co.KG

Dückerweg 21

44867 Bochum

Germany

E-mail: info@duw-shop.de

Information concerning the Operating Instructions

This manual contains important instructions for the Absaar micro inverters AB400A / AB600A / AB800A and users must read it completely before installing or commissioning the device.

Further information

Product information is subject to change without prior notice. The user manual is updated regularly. Please contact us for the latest version.

Customer service

Please contact our customer service for further information:

Manufacturer D&W The Motion Corporation GmbH & Co. KG



***The Motion
Corporation***

Address Dückerweg 21
44867 Bochum
Germany

E-mail info@duw-shop.de



Please have the following information available for inquiries:

- Device type and model
- Troubleshooting

In addition, we are also interested in information and experiences, which result from using the machine and could prove to be useful for improving our products. Please get in touch with our customer service for this.

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1 Safety

1.1 Symbols in these instructions

Safety instructions

Please find the descriptions of the dangerous situation in the corresponding items of the documentation.

Please observe these notes!

Observe the locally applicable safety and accident prevention regulations!

DANGER



This symbol warns against an immediate risk to the life and health of persons.

- Activity that must not be done to prevent the danger

WARNING



This symbol warns of an imminent danger for life and health of persons as well as of damages to environment and property.

- Activity that must not be done to prevent the danger

CAUTION



This symbol warns of an imminent danger for the health of persons as well as of damages to environment and property.

- Activity that must not be done to prevent the danger

NOTE



This symbol warns of a dangerous situation and serves for marking a safety note referring the dealing with the machine or plant.

- Activity that is not allowed to prevent the damage to the machine or plant

1.2 Intended use

The Absaar micro-inverters AB400A, AB600A and AB800A convert DC direct current into AC alternating current. The power limits of the input and output voltage as well as currents are derived from the technical data.

The generated energy can be used for self-consumption or to feed surplus energy back into the local power grid. The micro-inverter is designed for use by end users or in professional applications.

The intended use also includes adherence to all specifications given in this manual.

Any use beyond the intended use or any other use is considered misuse and will invalidate any guarantee or warranty.

DANGER



Danger to life or risk of injury due to unintended use!

Unintended use can lead to severe impacts on health, with the possibility of life-threatening injuries and extensive material damages.

- Never connect too many PV modules. The maximum input voltages and input currents must be complied with
- The micro-inverter is designed for connection to PV modules. Other types of energy sources are not allowed
- Operation outside the ambient conditions defined in the technical data must be avoided.
- The micro-inverter must be professionally installed in accordance with these instructions.
- Do not connect directly to small or large consumers
- Do not manipulate
- Not intended for use in mobile or transportable applications
- Use in potentially explosive atmospheres is not permitted

1.3 Safety signs

Symbol	Description
--------	-------------



Treatment

In order to comply with European Directive 2002/96/EC on waste electrical and electronic equipment and its implementation into national law, electrical equipment that has reached the end of its life must be collected separately and returned to an approved recycling facility.

Any appliance that is no longer required must be returned to to an authorised dealer or an approved collection and recycling facility.



Danger from high voltage

High voltage in the micro- inverter can be life-threatening.



Caution

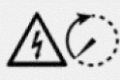
Keep a distance of 8 inches (20 cm) from the micro inverter when it is in operation.

**Caution of hot surfaces**

The micro- inverter can become hot during operation. Avoid contact with metal surfaces during operation.

**CE marking**

The micro inverter complies with the Low Voltage Directive of the European Union.

**Caution**

Risk of electric shock, time-controlled discharge of the energy storage system.

**Read the manual first**

Please read the installation instructions before installation, operation and maintenance.

1.4 Dangers from electrical current

Electrical current

⚠ DANGER**Risk to life and risk of injury from electrical current/ electrical voltage**

In case of direct or indirect contact with live parts, there is risk to life or risk of injury due to electrocution, if faults occur in the electrical components and cables!

- Only qualified electricians are allowed to work on the electrical system.
- If insulation is damaged, immediately switch off the power supply and get it repaired.
- Please observe extreme caution if the micro-inverter has been disconnected from the public grid, as some components may retain enough charge to generate a risk of electric shock. Before touching any parts of the micro-inverter, please make sure that the surface and all the equipment are within the limits of safe temperature and voltage potentials.
- Each input of the micro-inverter is connected to a PV module. Do not connect batteries or other power sources. The micro-inverter may only be used if all technical parameters have been observed and applied.
- Never bypass fuses or set them out of operation. If fuses have to be replaced, stick to the correct amperage.
- Keep humidity away from live parts. This can cause a short-circuit fault.

1.5 Behaviour in the event of danger

Measures in the event of fire and accidents

- Disconnect the micro inverter from the power supply immediately
- Rescue the persons from the danger zone only in case there is no risk to your own health.
- If necessary, initiate first-aid measures.
- Call the Fire department and / or ambulance service.

- In the event of fire: If there is no danger to your own health, fight the fire with fire extinguishing equipment and continue fighting the fire until the fire brigade arrives.
- Inform the responsible person on site.
- Clear the access routes for the rescue vehicles.
- Direct the rescue vehicles.

1.6 Explanation of radio interference

This micro inverter has been tested and complies with CE EMC requirements, which means that it is not affected by electromagnetic interference. Please note that incorrect installation can lead to electromagnetic interference. To determine whether the radio or television reception is disturbed by this device, you can switch the device off and on again. If this device does cause harmful interference to radio or television reception, please try the following measures to correct the interference:

1. Position the antenna of the other device.
2. Move the micro- inverter further away from the antenna.
3. Use metal or concrete materials or a roof to separate the micro inverter and the antenna.
4. Consult your supplier or an experienced radio/TV technician for help.

2 About the product

2.1 PV micro inverter system

A typical grid-connected PV micro-inverter system comprises PV modules, PV micro-inverters, meters, and power grid as shown below. The PV micro-inverter converts the direct current generated by the PV modules into alternating current that meets the requirements of the power grid. The alternating current is then fed into the grid via a meter.

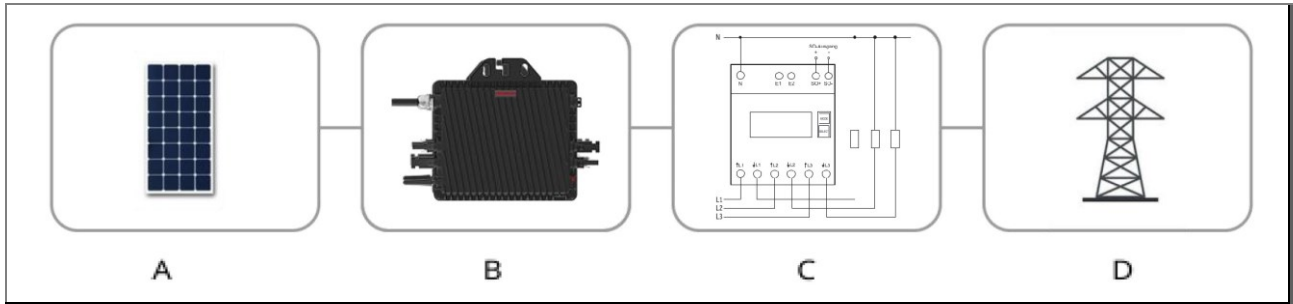


Fig. 1: Overview of system components

Description	
A	PV module
B	Micro- inverter
C	Power meter
D	Power grid

2.2 Micro inverter

The PV micro-inverter is a module-level solar inverter that tracks the maximum DC power point of each PV module, known as Maximum Power Point Tracking (MPPT). This module-level function of the MPPT means that other modules will not be affected if a PV module fails or is shaded, increasing the overall power production of the system. Micro-inverters can monitor the current, voltage, and power of each module to realise module-level data monitoring. In addition, micro-inverters carry only a few dozen volts of DC voltage (less than 60 volts), which reduces the safety risks as much as possible. The micro-inverters have module-level monitoring. The micro-inverter's data is collected by the integrated WLAN module and sent to the cloud of the monitoring platform.

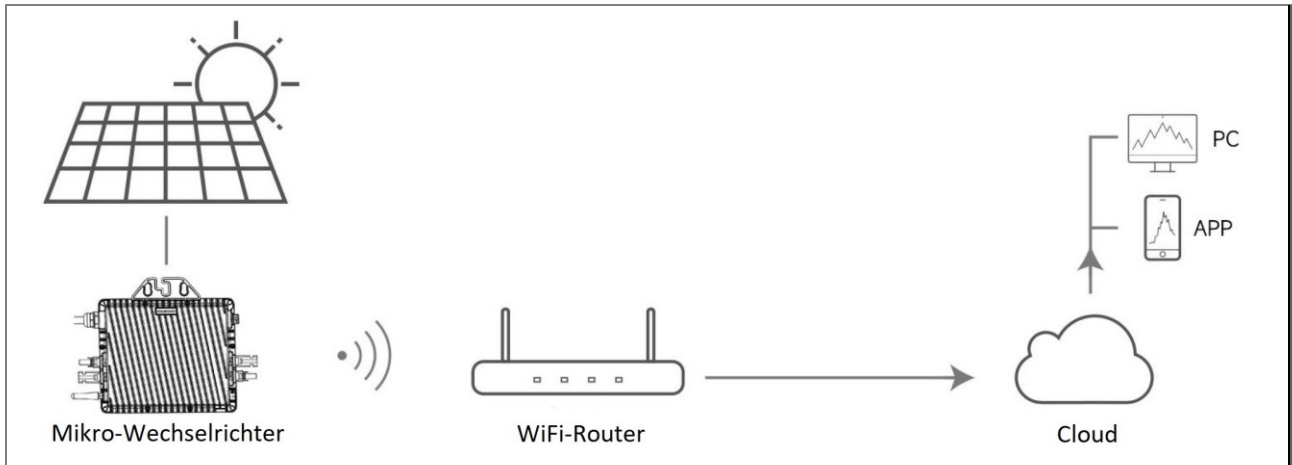


Fig. 2: Connectivity

2.3 Information on the 2-in-1 device

Micro-inverters can be divided into 1-in-1, 2-in-1 etc., depending on how many PV modules are connected to them. In other words, the micro-inverters can be connected to one module or two modules as shown below.

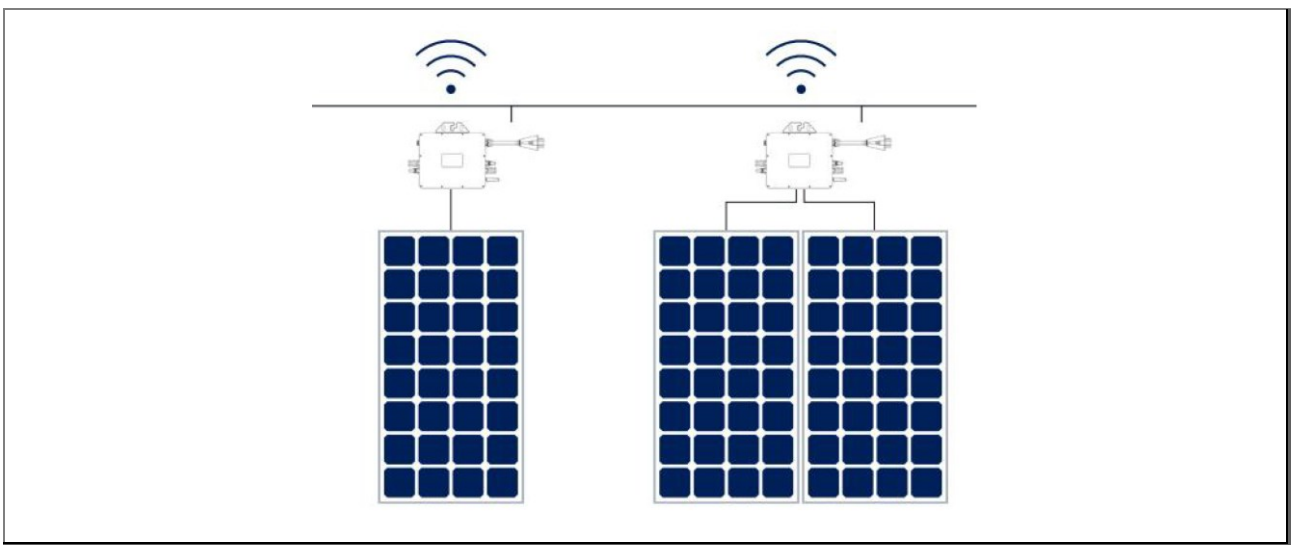


Fig. 3: Integration of one or more micro-inverters

This manual is about 2-in-1- micro-inverters with an output power from 400 watts up to 800 watts.

Each micro-inverter can be connected to up to two PV modules with independent MPPT and monitoring, allowing for greater energy yield and easier maintenance.

2.4 Characteristics

- Maximum output power 400/600/800 W
- Peak efficiency 96.70%
- Static MPPT efficiency 99.80%, dynamic MPPT efficiency 99.76% in cloudy weather
- Power factor: >0.99

- High reliability: IP67 (NEMA 6)

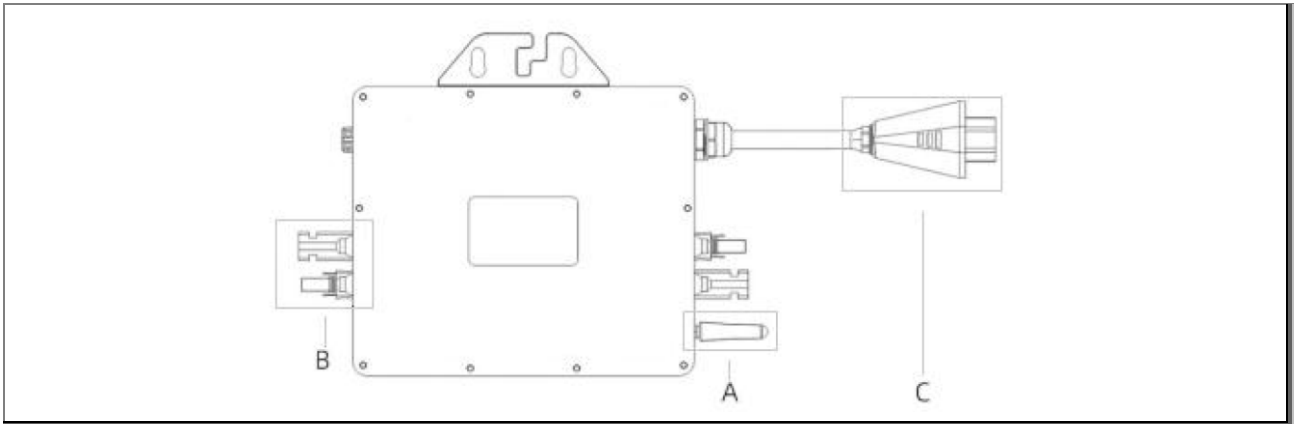


Fig. 4: Interfaces

Description	
A	WLAN antenna
B	DC connection – MC4 plug
C	AC Sub connection

3 Preparing for installation

⚠ WARNING



There is a risk of injury if personal protective equipment is not worn.

- Work clothing, protective gloves and, if necessary, protective goggles must be worn.

⚠ WARNING



Risk of environmental and property damage.

- All necessary permits should be obtained from the local utility company before connecting the micro-inverter to the mains. This connection may only be carried out by qualified personnel. It is the responsibility of the installer to provide external circuit breakers and over-current protection devices (OCPD).
- You must inspect the product before installation to ensure that no damage has occurred during transport. Such damage may affect insulation integrity and safety distances.
Carefully choose the installation site and adhere to the specified cooling requirements.

3.1 Unpacking

Open the packaging and remove the product. First of all, please check your scope of delivery according to the product scope listed below and inspect all components for any transport damage.

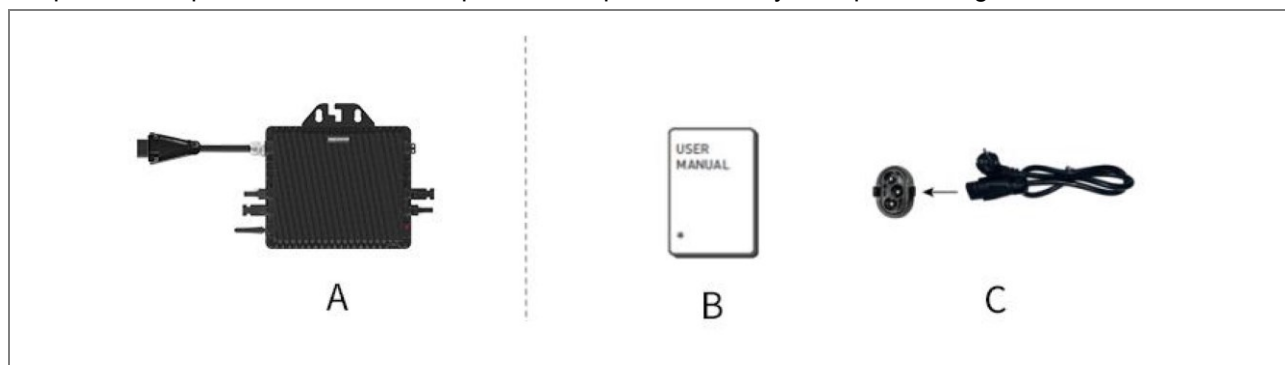


Fig. 5: Scope of delivery plus accessories

Number	Description	Scope of delivery
A	Micro- inverter	Inclusive
B	User manual	Inclusive
C	AC Plug Cable 2.5m, 3m or 5m (parallel use)	Optional

3.2 Position and space requirement

Please install the micro-inverter and all DC connections under the PV module or on the balcony wall to avoid direct sunlight, rain, snow formation, UV radiation, etc. The flat side of the micro-inverter should face upwards and face the PV module or balcony wall.

Leave at least 2 cm of space around the housing of the micro-inverter to ensure ventilation and heat dissipation.

3.3 Connecting several PV modules to the micro inverter

General guidelines:

1. PV modules should be connected to the DC input terminals of a micro-inverter.
2. Please use a DC extension cable if the original cable is not long enough. Please contact the local utility to ensure that the DC power cable complies with local regulations.

The typical cabling method is shown below

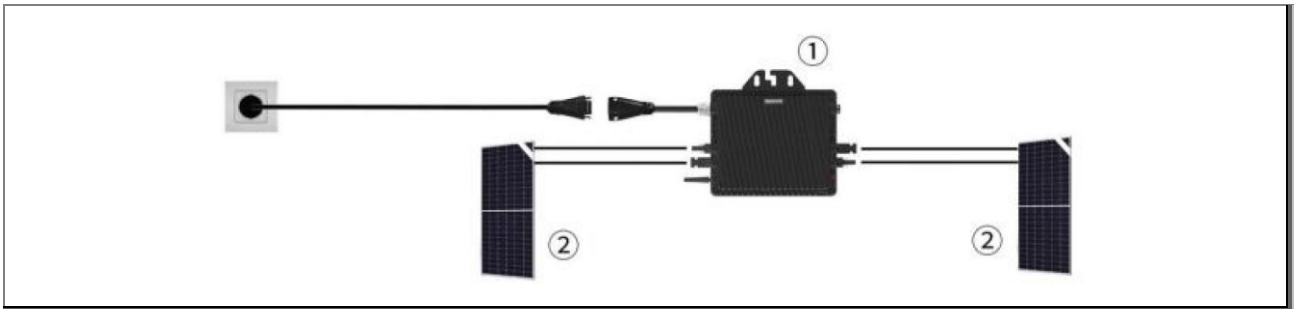


Fig. 6: Micro-inverter (1)/PV module (2)

Note

The voltage of the modules must not exceed the maximum input voltage of the micro-inverter (taking into consideration influences due to local temperature). Otherwise, the micro-inverter may be damaged (for information on determining the absolute maximum input voltage, see the "Technical data" section).

3.4 Installation tools

In addition to the tools that are recommended below, other auxiliary tools may also be used on site.

WARNING



There is a slight risk of injury if personal protective equipment is not worn during installation!

- Before installation, personal protective equipment in the form of work clothing, protective gloves and, if necessary, protective goggles must be worn.

Screwdriver	Multimeter
Socket wrench or Allen key	Highlighter
Diagnostic forceps	Cable ties
Cable cutter	Torque wrench and adjustable wrench
Wire stripper	Utility knife

3.5 AC branch circuit capacity

The micro-inverter AB400A/AB600A/AB800A can be used with 12AWG AC extension cable and the AC-T connector. The number of micro-inverters in each 12AWG AC branch circuit must not exceed the limit specified below.

Model	AB400A	AB600A	AB800A
Maximum number of micro-inverters per 12AWG branch circuit	10	7	5
Maximum overcurrent protection device (OCPD)	20 A	20 A	20 A

Note

The number of micro-inverters that can be connected to each AC branch circuit is determined by the current carrying capacity (also known as ampacity) of the cable.

4 App Download

Scan the QR code below to download the Absaar EMS app for your mobile devices.



Fig. 7: QR codes

5 Network configuration

5.1 Preparation

1. Switch on the micro-inverter
2. Switch on the router

5.2 Establishing a connection

1. Connect the phone to your WiFi and place the micro- inverter within this WiFi coverage area.
2. Open the Absaar EMS application, click on the 'WiFi settings' option, agree to authorise the app's location permissions and enter the WiFi password .

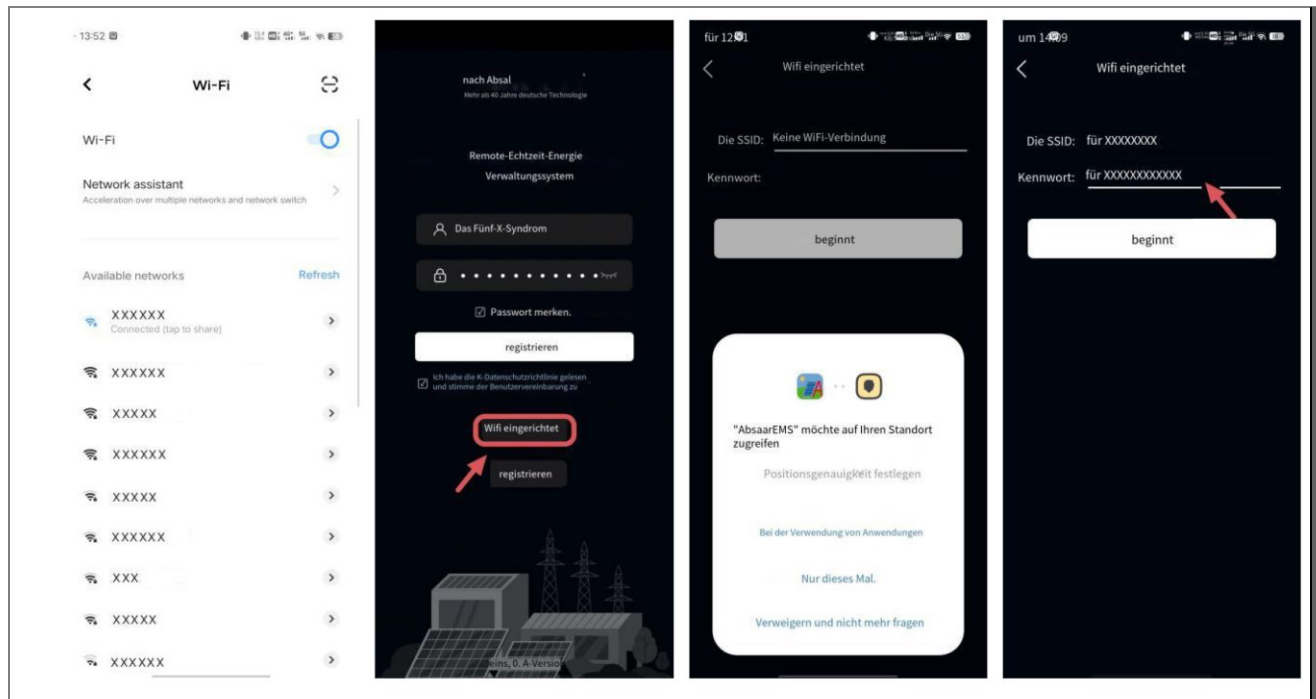


Fig. 8: Configuring the network settings

3. In the app, click "Start" while waiting for the micro-inverter LED light to slowly flash red and green alternately. When the app interface displays the SmartLink Completed content, it means that network pairing is complete. Next, please wait until the green LED lights up continuously to indicate that micro-inverter networking is successful.

Note

The IOS APP prompt information is slightly different.

6 Troubleshooting

6.1 LED display status

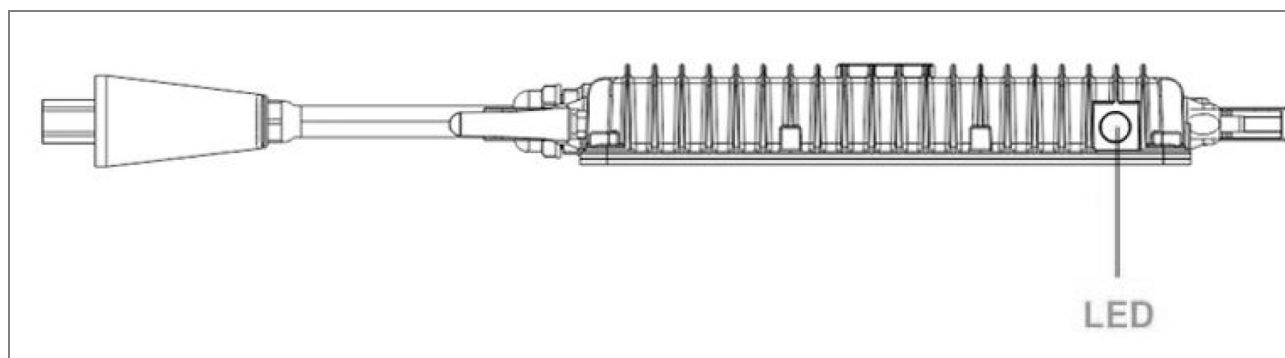


Fig. 9: LED status light

Status	LED
During the start-up process	Slowly flashes green
During operation	Solid green
Error status	Solid red
Networking	- During network connection: Red-green rapidly flashes alternately - Allow app to connect: Red-green slowly flashes alternately - The monitoring server is connected: Solid green

Note

The micro inverter is supplied with power from the DC side. If the LED light does not light up, please check the DC side connection. If the connection and input voltage are normal, contact your dealer or the technical support team.

The faults are reported to the monitoring system. Further information can be found in the app or the monitoring platform.

6.2 Error list

Alarm status	Handling recommendations
Over-temperature protection	- Check the ventilation and ambient temperature at the micro-inverter installation site. - If the ventilation is poor or the ambient temperature exceeds the limit, please make improvements to the ventilation and heat dissipation. - If the problem persists despite appropriate ventilation and ambient temperature, please contact your dealer or technical support team.

Offline	1. Please make sure the micro-inverter is operating normally (check that the DC voltage is in the normal range and check the status of the LED indicator). 2. Check that the serial number on the micro-inverter label matches the number on the monitoring platform. 3. Check the communication status between the built-in WLAN module and the monitoring system, and also between the built-in WLAN module and the micro-inverter. If communication is unsatisfactory, try to make some improvements. 4. If the alarm is triggered frequently and the issue cannot be resolved, contact your dealer or technical support team.
Mains voltage error	1. If the alarm occurs occasionally, the mains voltage may only be temporarily abnormal. The micro- inverter can recover automatically as soon as the mains voltage returns to normal. 2. If the alarm occurs frequently, check whether the mains voltage is within the acceptable range. If not, contact the local energy supplier or change the limit value for the mains undervoltage or overvoltage protection in the mains profile via a monitoring system with the consent of the local energy supplier. 3. If the fault persists, check the AC switch or the AC wiring.
Mains frequency error	1. If the alarm occurs occasionally, the mains voltage may only be temporarily abnormal. The micro-inverter can recover automatically as soon as the mains voltage returns to normal. 2. If the alarm occurs frequently, check that the mains frequency is within the acceptable range. If this is not the case, contact the local utility company or change the mains over-frequency protection limit via a monitoring system with the approval of the local utility company.
Mains failure	Please check that the AC switch, the branch switch and the AC wiring are in order
Mains disconnection	Please check that the AC switch, the branch switch and the AC wiring are in order
Overload fault	1. If the alarm occurs occasionally, the mains voltage may only be temporarily abnormal. The micro inverter can recover automatically as soon as the mains voltage returns to normal. 2. If the alarm occurs frequently, check whether the mains voltage is within the acceptable range. If not, contact the local energy supplier or change the limit value for the mains undervoltage or overvoltage protection in the mains profile via a monitoring system with the consent of the local energy supplier. 3. If the fault persists, check the AC switch or the AC wiring.
PV input overvoltage	1. Please make sure that the no-load voltage of the PV module is less than or equal to the maximum input voltage. 2. If the no-load voltage of the PV module is within the normal range, contact your dealer or the technical support team.

Note

The micro- inverter is supplied with power from the DC side. If the LED light does not light up, please check the DC side connection. If the connection and input voltage are normal, contact your dealer or the technical support team.

The faults are reported to the monitoring system. Further information can be found in the app or the monitoring platform.

6.3 Inspection on site

DANGER



Improper troubleshooting/error rectification is life-threatening due to electric shock!

- Further troubleshooting may only be carried out by qualified personnel
- The device must be disconnected from the power supply before carrying out any work on it.
- Do not open the device!

Step	Handling recommendations
1	Check that the mains voltage and frequency are within the range as specified in the "Specifications" section of this manual.
2	Check the connection to the public power grid. Disconnect the AC and DC power supply. Please note that when operating the micro-inverter, the AC power supply must first be disconnected to de-energise the micro-inverter, and then the DC power supply must be disconnected. Never disconnect the DC power cables while the micro-inverter is generating power.
3	Check the connection between all micro-inverters in the AC branch circuit. Make sure that each micro-inverter is powered from the public power grid as described in the previous step.
4	Make sure that each AC circuit breaker is working properly and is closed.
5	Check the DC connection between the micro-inverter and the PV module.
6	Make sure that the DC voltage of the PV modules is within the permissible range as specified in the "Specifications" section of this manual.
7	If the problem persists, please call customer service.

6.4 Routine maintenance

DANGER



Disassembling the micro-inverter poses a mortal danger due to electric shock!

- Only authorised personnel may carry out the maintenance work
- Personal protective equipment must be worn
- The device must be disconnected from the power supply before doing maintenance work.
- Do not open the device! For safety and insulation reasons, there are no parts that can be serviced by the user inside!

WARNING



- The AC output wiring harness (AC stub cable on the micro-inverter) cannot be replaced. If the cable is damaged the appliance should be scrapped.
- Do NOT use the micro-inverter if problems are detected. Restore the operating conditions once the fault has been corrected
- Maintenance work must be carried out while the micro-inverter is disconnected from the mains (mains switch open) and the PV modules are shaded or insulated, unless otherwise specified.
- Never clean the micro-inverter with cloths made of thread-like or corrosive materials, to avoid corrosion and electrostatic charges.
- Do not attempt to repair the micro-inverter yourself. Only approved spare parts may be used for all repairs.

NOTE



- When all micro-inverters are connected to the monitoring system, the monitoring system may, if necessary, limit the output power imbalance of all micro-inverters to less than 3.68 kW between phases.
- Each branch should have a circuit breaker. A central protection unit is not required.

During normal operation, periodically check the ambient conditions to make sure that the conditions have not changed over time and that the micro-inverter is not exposed to adverse weather conditions and is not obstructed.

Perform annual inspections of all components and clean the equipment with a vacuum cleaner or special brushes.

7 Shutting down

7.1 Decommissioning

Disconnect the micro-inverter from the DC input and AC output, remove all connecting cables from the micro-inverter, and remove the micro-inverter from the frame.

Please pack the micro-inverter in its original packaging. If the original packaging is no longer available, please use a box that holds 5 kg and can be completely closed.

7.2 Storage and transport

The packaging is specifically designed to protect the components in order to facilitate transport and subsequent handling. The transport of the micro-inverter, in particular on the road, must be carried out in such a way that the components (especially the electronic components) are protected against violent shocks, moisture, vibrations, etc. Please dispose of the packaging elements properly to avoid unexpected injuries.

Please check the condition of the components to be transported. After receiving the micro-inverter, you should check the container for external damage and check that all items have been received. Please call the shipping agent immediately if there is any damage or parts are missing. If the micro-inverter has been damaged, contact the supplier or authorised dealer to request a repair/return and ask for instructions regarding the procedure.

The storage temperature range of the micro-inverter is -40 to 85°C.

7.3 Disposal

- If the micro-inverter is not used immediately or stored for an extended period of time, ensure proper packaging. The equipment must be stored indoors in a well-ventilated area and without risk of damage to equipment components.
- Perform a full inspection when restarting the micro-inverter after it has been inoperative for an extended period of time.



Please dispose of the micro-inverters properly according to local regulations after they have been scrapped as they may be harmful to the environment.

8 Technical data

⚠ WARNING



You must check the following before installing the micro-inverter:

1. Make sure that the voltage and current specifications of the PV module match those of the micro-inverter.
 - The maximum no-load voltage of the PV module must be within the operating voltage range of the micro-inverter.
 - We recommend that the maximum rated current at MPP is equal to or less than the maximum input DC current.
2. The output DC power of the PV module must not exceed 1.35 times the output AC power of the micro-inverter.

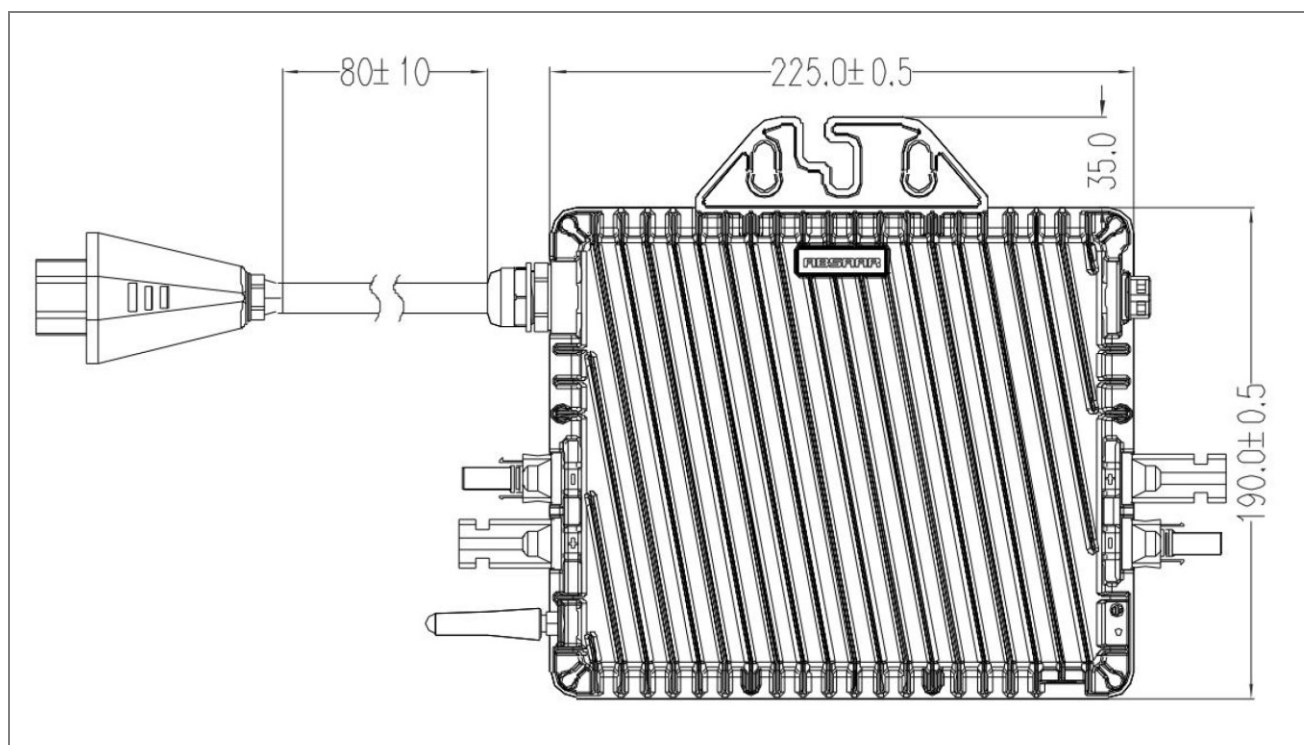


Fig. 10: Dimensions

Model	AB400A	AB600A	AB800A
PV input (DC)			
Adaptive photovoltaic power	210 x 2 W	210~420 x 2 W	210~560 x 2 W
Starting voltage	30 V	30 V	30 V
Full MPPT voltage range	33~55 V	33~55 V	33~55 V

Working voltage range	16~60 V	16~60 V	16~60 V
Maximum input current	7A x 2	12A x 2	14A x 2
Maximum input short-circuit current	15A * 2	20A x 2	25A x 2
Number of MPP trackers	2	2	2
AC output			
Rated output power	400 W	600 W	800 W
Rated output current	1.74 A	2.6 A	3.48 A
Rated mains voltage*	230 V (single-phase)	230 V (single-phase)	230 V (single-phase)
Mains voltage range	180~264 V AC	180~264 V AC	180~264 V AC
Rated mains frequency	50 Hz/60 Hz	50 Hz/60 Hz	50 Hz/60 Hz
Max. total harmonic distortion	<3% (nominal capacity)	<3% (nominal capacity)	<3% (nominal capacity)
Power factor	>0.99	>0.99	>0.99
Max parallelism	10 pcs.	7 pcs.	5 pcs.
Protection against island formation	Yes	Yes	Yes
AC short circuit protection	Yes	Yes	Yes
System			
Max. efficiency	96.70 %	96.70 %	96.70 %
Protection class	CLASS I	CLASS I	CLASS I
Protection level	IP67	IP67	IP67
Cooling method	Natural cooling	Natural cooling	Natural cooling
Monitoring	W-LAN	W-LAN	W-LAN
Ambient temperature range	-40°C ~ +65°C	-40°C ~ +65°C	-40°C ~ +65°C
Manufacturer's warranty	10 years	10 years	10 years
Mechanical data			
Dimensions (LxWxH)	225 mm x 225 mm x 37 mm	225 mm x 225 mm x 37 mm	225 mm x 225 mm x 37 mm
Weight	3.25 kg	3.25 kg	3.25 kg

Note

- 1* The rated voltage/frequency range may vary depending on local requirements.
 2* The exact number of micro-inverters per branch can be found in the local requirements.

9 EC- Declaration of Conformity

We,

Manufacturer: D&W The Motion Corporation GmbH&Co.KG

Address: Dürckerweg 21, 44867 Bochum, Germany

hereby declare that the object described below

Designation: Micro- inverter

Model: ABSAAR

Type: AB400A, AB600A, AB800A

Software version: DH01.001-000-000

Year of make: 2024

complies with the relevant Union harmonisation legislation:

Radio Equipment Directive 2014/53/EC

Low voltage directive 2014/35/EC

EMC directive 2014/30/EC

RoHS Directive 2011/65/EC

Applied harmonised standards:

DIN EN ISO 12100:2011-03

DIN EN 60204-1:2019-06

DIN EN 300328:2019-10

DIN EN 301489-1:2020-06

EN IEC 61000-6-3:2021

EN IEC 61000-6-1:2019

EN IEC 62311:2020-12

DIN EN 301489-17:2021-03

Applied national standards and technical specifications: ---

The declaration of conformity concerns exclusively our scope of delivery according to the order confirmation for the product mentioned above.

Person authorised for documents: Mr Heinz Völker

Bochum, 01/06/2024

Signature

Mr Heinz Völker

Managing Director

