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BENY Microinverter

BYM2000/2400/2800 Wi-Fi



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⚠️ If the models and specifications in this product catalogue change due to product updates, we will not provide prior notification.

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User and Installation Manual

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ZBENY

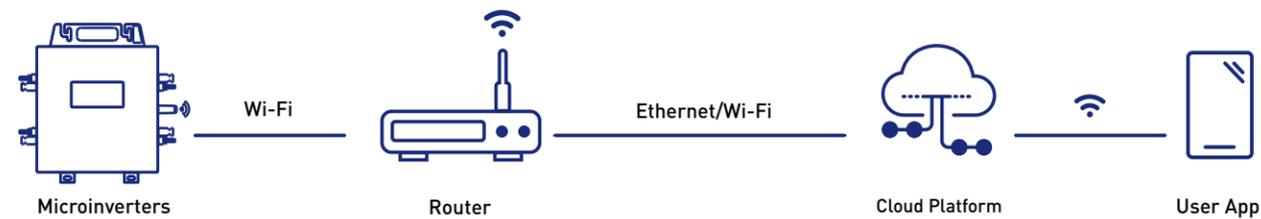
BENY microinverter system description

The system consists of a set of microinverters and other connected accessories.

Microinverters convert direct current (DC) from photovoltaic modules into alternating current (AC) and feed it into the public grid. Each microinverter works independently to ensure that each photovoltaic module generates maximum power. This setup enables users to directly control the power generation of individual PV modules, thereby increasing the flexibility and reliability of the system.

The monitoring equipment monitors the working status of each microinverter and photovoltaic module in the power station, and transmits power generation data and other information to the cloud monitoring platform or local server, so that users can understand and query the working status of the power station.

BENY microinverters provide the option to monitor power generation through Wi-Fi, support real-time, daily, monthly and annual production assessment data query ; support module-level problem detection and facilitate maintenance.



Manual

This manual contains important instructions for BENY microinverters.

It must be read in its entirety before installing or commissioning the equipment.

For safety, only qualified technicians, who have received training or have demonstrated the requisite skills can install and maintain this microinverter under the guidance of this User Manual.

Professional and technical personnel must:

- ① Undergo professional installation training.
- ② Read this User Manual and be proficient in operation-related safety matters.
- ③ Be familiar with the relevant safety regulations of the electrical system.

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1. Security information

1.1 Safety instructions

Microinverters are designed and tested in strict accordance with relevant safety standards of various countries. At the same time, for electronic equipment, its installation, debugging, operation and maintenance must comply with relevant safety regulations.

In order to ensure the safe installation and operation of the microinverter and reduce the risk of electric shock, this manual uses safety symbols to indicate some danger instructions and safety precautions. Precautions during specific operations will also be explained in detail in the corresponding chapters.

1.2 Symbol

Symbol	Usage
	Treatment To comply with European Directive 2002/96/EC on waste Electrical and Electronic Equipment and its implementation as national law, electrical equipment that has reached the end of its life must be collected separately and returned to an approved recycling facility. Any device no longer required must be returned to an authorized dealer or approved collection and recycling facility.
	Caution Do not come within 8 inches [20cm] of the microinverter for any length of time while it is in operation.
	Danger of high voltages Danger to life due to high voltage in the microinverter.
	Beware of hot surface The inverter can become hot during operation. Avoid contact with metal surfaces during operation.
	CE mark The inverter complies with the requirements of the low voltage directive for the European Union.
	Read manual first Please read the installation manual first before installation, operation and maintenance.

2. Microinverter product information

2.1 BYM2000/2400/2800 technical specifications

Input Data (DC)			
Model	BYM2000	BYM2400	BYM2800
Recommended input power (STC)	(450~750)W*4, 60~75-cell/120~150 half-cell (350~550)W*8, 66~75-cell/132~150 half-cell		
MPPT voltage range	24V~50V		
Operating voltage range	16V~60V		
Maximum input voltage	60V		
Max. short circuit current	20A*4		24A*4
Max. input current	18A*4		20A*4
Output Data (AC)			
Rated output power	2000VA	2400VA	2800VA
Rated voltage (range)	230V (196V~265V)		
Rated frequency (range)	50Hz/60Hz (46.5Hz~62Hz)		
Maximum continuous output current	9.10A	11.0A	12.8A
Maximum harmonic distortion	<4%		
Power factor	>0.99 (Default)		
Maximum connection number in one string (40A circuit breaker, 10AWG cable)	4 units	3 units	2 units
Efficiency			
Peak efficiency	97.5%		
MPPT efficiency	>99.8%		
Night power consumption	<100mW		
Other Parameters			
Communication method	Wi-Fi		
Safety protection	Class I		
Enclosure rating	IP67		
Operating temperature	-40°C to +70°C		
Storage temperature	-40°C to +85°C		
Relative humidity	0~98%		
Transformer design	High frequency transformer, Electrical isolated		
Overvoltage class	OVC III (AC), OVC II (PV)		

Warranty period	12 / 25 years (Optional)
Dimensions (L*W*H mm)	389*302*43
Weight (kg)	7.45
Safety regulations	IEC/EN 61000-6, CISPR11+A1+A2, IEC/EN 62109-1/2, EN 50549-1:2019 VDE-AR-N 4105:2018/DIN VDE 0124:2020, AS 4777.2 :2020, INMETRO, UTE C15-712-1/DIN VDE 0126/VFR 2019, G98, CEI 0-21:2020, NC RFG, NTS DAKKS .

The BENY microinverter can be directly connected to the single-phase grid, or it can be connected to the three-phase grid by connecting multiple units on the three single-phase grids. Contact customer service support to check compatibility.

2.2 Wi-Fi communication

Using the Wi-Fi microinverter, the built-in gateway avoids complicated wiring methods, making the connection simple and fast, and convenient to operate. The Wi-Fi communication frequency band is 2.4G, and the radius is up to 100 meters. The communication range is wide, the speed is fast. The microinverter that uses Wi-Fi communication can be configured by the mobile phone APP of BENY microinverter.

2.3 Microinverter system coding instructions

- Microinverter adopts the double-code rule that UID and CID coexist, where the UID number is the product serial number SN.
 - UID is the complete code of the product, which is the unique ID when it leaves the factory, and contains a total of 16 hexadecimal numbers (0~F).
 - The lower 8 digits of UID are CID, which is the abbreviated representation of the product code used in monitoring and communication.
- The SN of the microinverter monitoring gateway is an 8-digit CID number.
- The SNs of other products in the microinverter family are all 8-digit CID numbers.

X X X X X X X X
 S₇ S₆ S₅ S₄ S₃ S₂ S₁ S₀

Example: 9 0 0 0 0 0 0 1 monitoring gateway
 1 0 0 1 0 0 1 1 single-in microinverter

S7: Equipment type are defined as:

- A,B,C,: Refers to single, dual, quad-in microinverters with Wi-Fi communication mode respectively
- 5: Paralleling Optimizer(BYPO-2)
 7: ToolKit
 9: Monitoring gateway(EMU)

3. Microinverter system installation

3.1 Installation Notes

- The grid voltage at the public connection point must comply with the AC voltage level on the microinverter label.
- PV module electrical parameters must comply with the DC input range on the microinverter label.
- The solar modules and brackets for installing and using the microinverter must be connected to a reliable ground.
- When a ground fault occurs, the equipment is at risk of electric shock. It is strongly recommended to install surge protection devices in the power distribution cabinet.
- Ensure that the environmental conditions meet the requirements of the microinverter (protection level, temperature, humidity, altitude, etc.)
- Installation must be carried out when the equipment is disconnected from the power grid (turn off the mains isolation switch) or when the photovoltaic modules are blocked or isolated.
- Do not expose the microinverter housing to direct sunlight. It can be installed under the photovoltaic module to ensure its normal operation in a cool or shaded environment. Failure to meet this condition may trigger microinverter output derating.

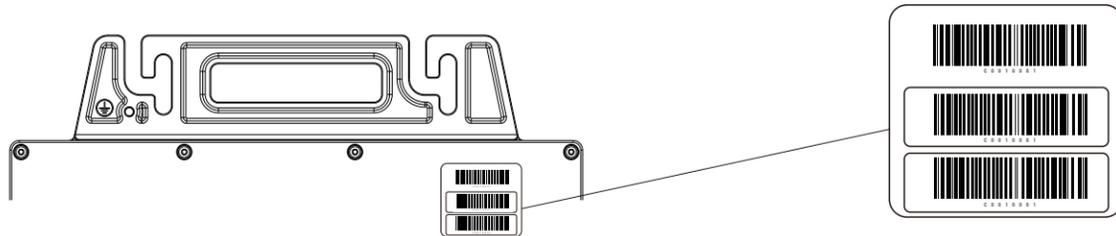


- To avoid overheating, always ensure that the airflow around the microinverter is not blocked and keep it as high as possible greater than 30mm from any obstructing plane (roof, ground, etc.).
- Do not install where gas or flammable substances may be present.



- Only install on metal structures specifically designed for photovoltaic modules (provided by the installation technician).

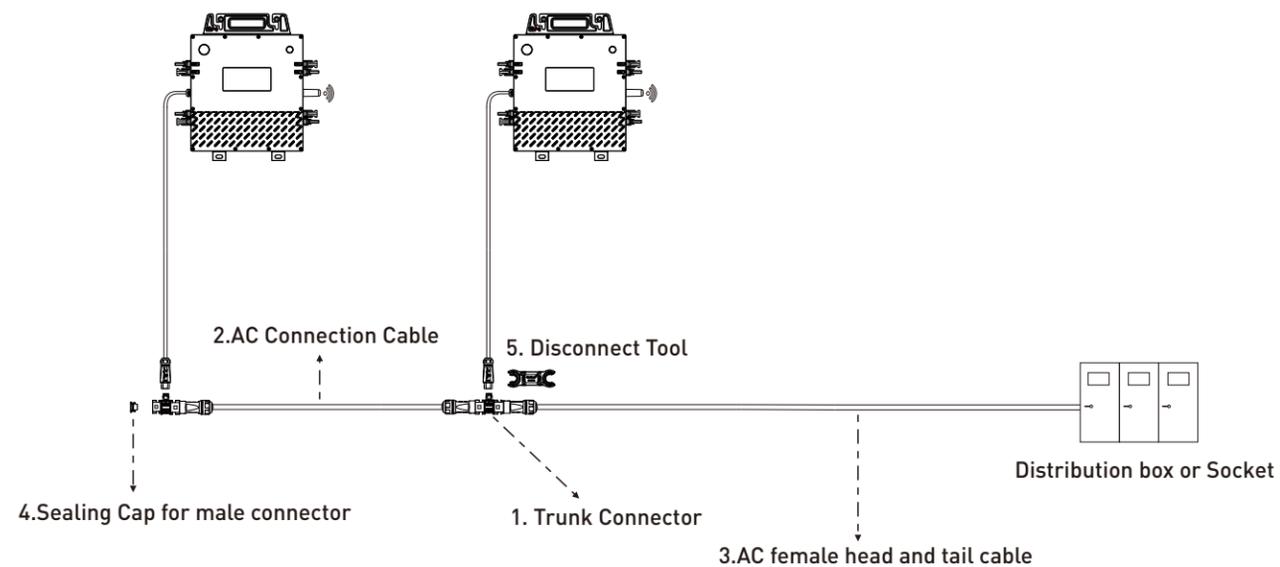
11. Each BENY microinverter has two detachable serial number labels on the casing and devices can be added later by scanning the QR code through the APP. If it is inconvenient to tear off the barcode after installation, please tear off the barcode in advance and paste it in an easily accessible place.



3.2 Accessories List

NOTE: The following accessories and wiring methods are standard wiring methods (quick connection type). If purchasing self-wiring method, please refer to the "Self-Wiring Guide" separately.

System diagram



Accessories Details			
NO.	Name	Remark	Photo
1	Trunk Connector	Connect the microinverter's AC output to the AC Trunk	
2	AC Connection Cable	Make a customized AC Trunk by utilizing Trunk Connectors and Extension Connectors	
3	AC female head and tail cable	For connecting a microinverter to a distribution box (Applicable only to one unit)	
4	Sealing Cap for male connector	Cover unused connection ports on the Trunk	
5	Disconnect Tool	Used to disassemble main line and branch line break.	
6	DC Y type MC4 set	Used for parallel connection of two photovoltaic modules, one positive and one negative	
7	DC extension cable	Used when the length of the PV module DC cable are not enough, one positive and one negative	
8	DC Connector Cap	To protect unused DC ports of microinverters	

3.3 Installation tool for BENY microinverter

1. Please refer to "3.2 Accessories List" based on your order information to check whether the accessories in the box are complete and check whether the product appearance is intact. If any parts are lost or damaged during transportation, please contact the carrier immediately. If the microinverter product itself is damaged, please contact your supplier or authorized dealer for repair/return and request instructions on the process.

2. In addition to solar array modules and supporting tools, customers need to prepare:



Gloves



Cable Tie



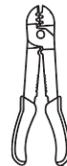
Diagonal Cutter



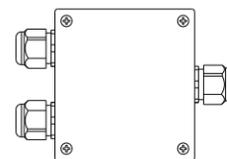
Wire Stripper



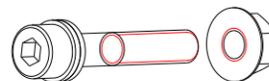
Torque Wrench



Crimping Tool



Outdoor waterproof junction box

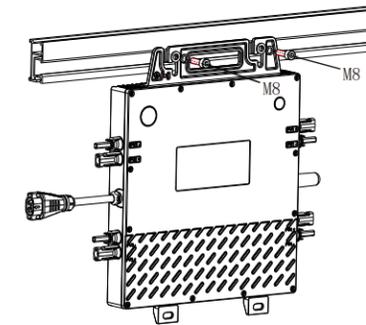


Inverter mounting kit(screws, nuts)

NOTE: BENY solar microinverters are easy to be installed. Each microinverter can simply be mounted on a rack directly below the module. module-side low-voltage DC connectors can be directly connected to the microinverter, eliminating the danger of high-voltage DC voltages.

3.4 Installation step

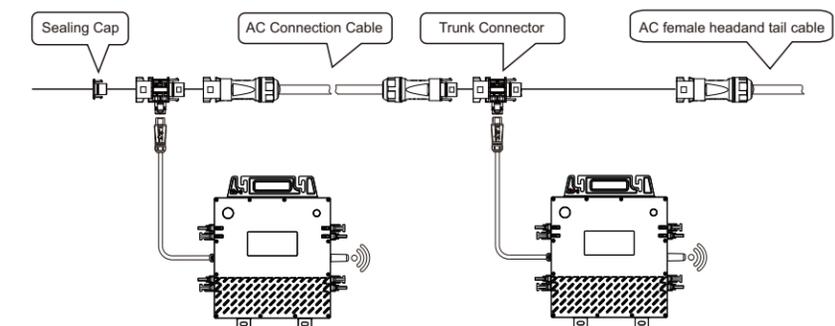
Step 1 Install the BENY microinverter on the bracket



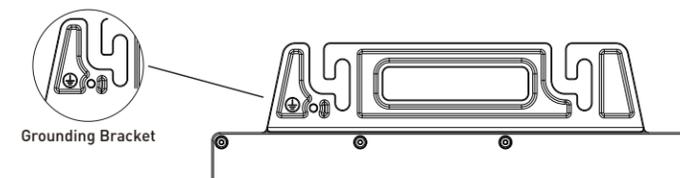
During fixation, the surface of the metal support should be closely fitted to the installation surface of the microinverter and the contact area should be maximized to ensure the thermal conductivity effect.

Step 2 Assemble the AC Trunk

This part gives a step-by-step guide for assembling the AC Trunk which consists of the Sealing Cap, Connection Cable and Trunk Connector as shown below.

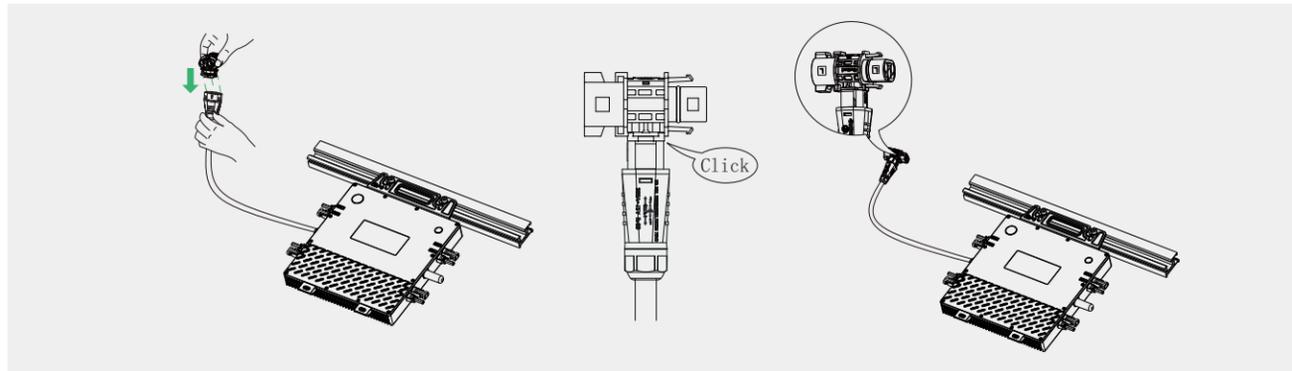


NOTE: There is a ground wire in the AC cable which can be directly connected to the ground. For areas with special requirements, customers can complete external grounding through grounding brackets. The ground wire can be connected to AC ground through the ground bracket of each microinverter according to local regulations.



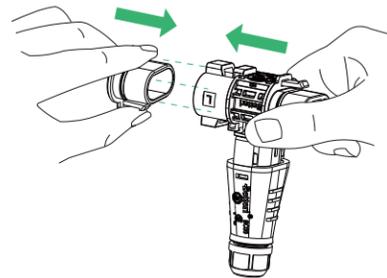
Step 2.1

Connect the Trunk Connector to the microinverter. Listen for a click as the connectors engage.



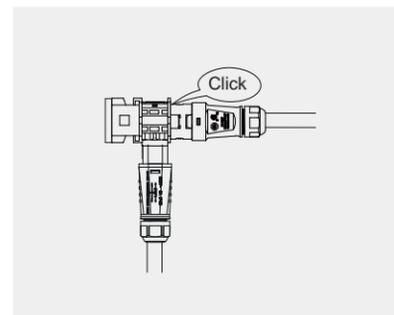
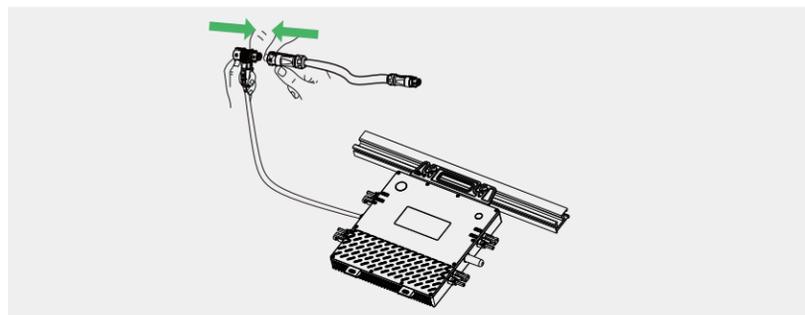
Step 2.2

Cover the unused port on the Trunk Connector (located at the beginning of the AC Trunk) with SealingCap. Listen for a click as the sealing cap engages.



Step 2.3

Use the Connection Cable to connect the adjacent Trunk Connectors. Listen for a click as they engage.



NOTE:

If your microinverters are installed too far apart, Beny provides two solutions.

(1) use a longer Connection Cable.



(2) Two connecting cables are used together.

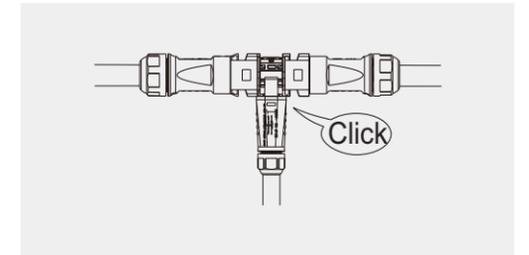
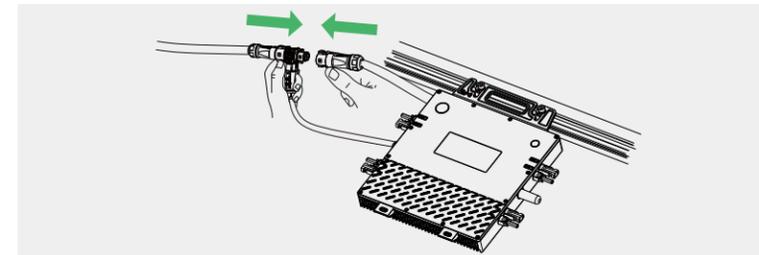


cable lengths: 1.1 m/2.0 m/2.3 m/ 4.6 m/Contact BENY for customization

Step 3 Connect the AC End Cable to the AC Trunk

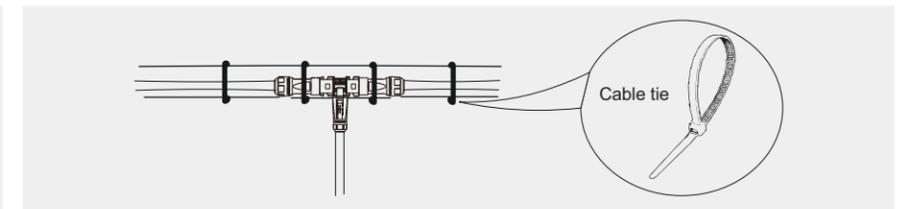
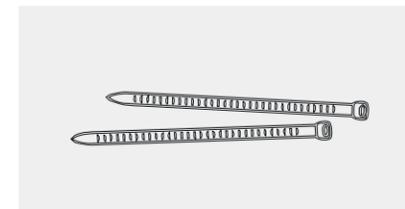
Step 3.1

Connect the AC End Cable to the last Connector in a series of cables. Listen for a click as they engage.

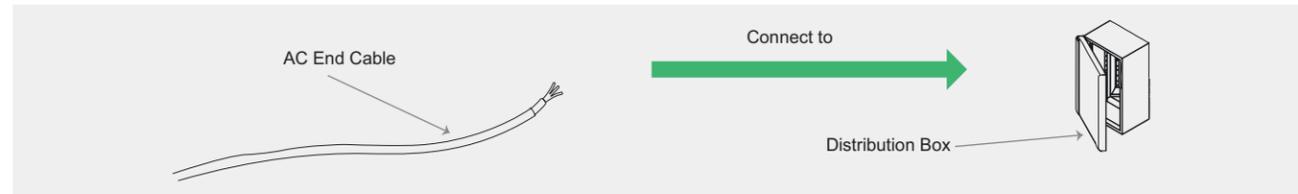


Step 3.2

Use the cable ties to attach all cables to the racking.

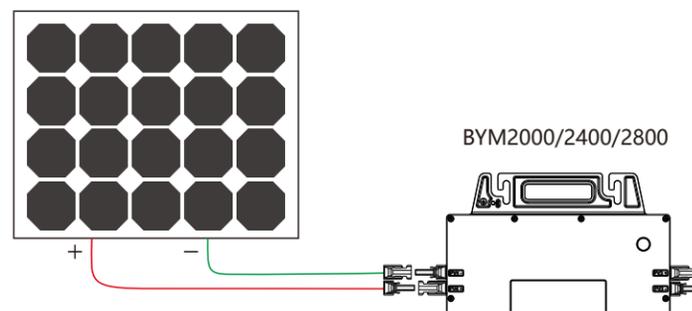


Step 4 Connect the other end of the AC End Cable to the Distribution Box.



Step 5 Connect the solar modules

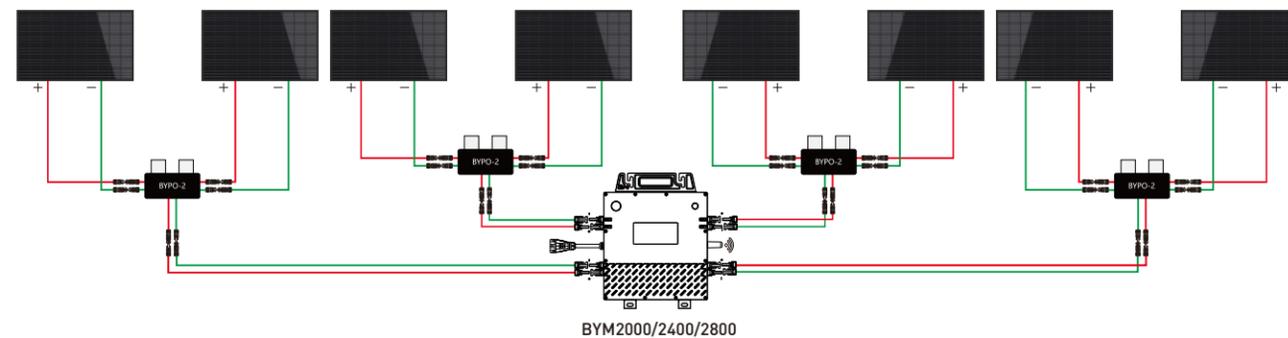
Connect each BYM2000/2400/2800 to the PV modules.



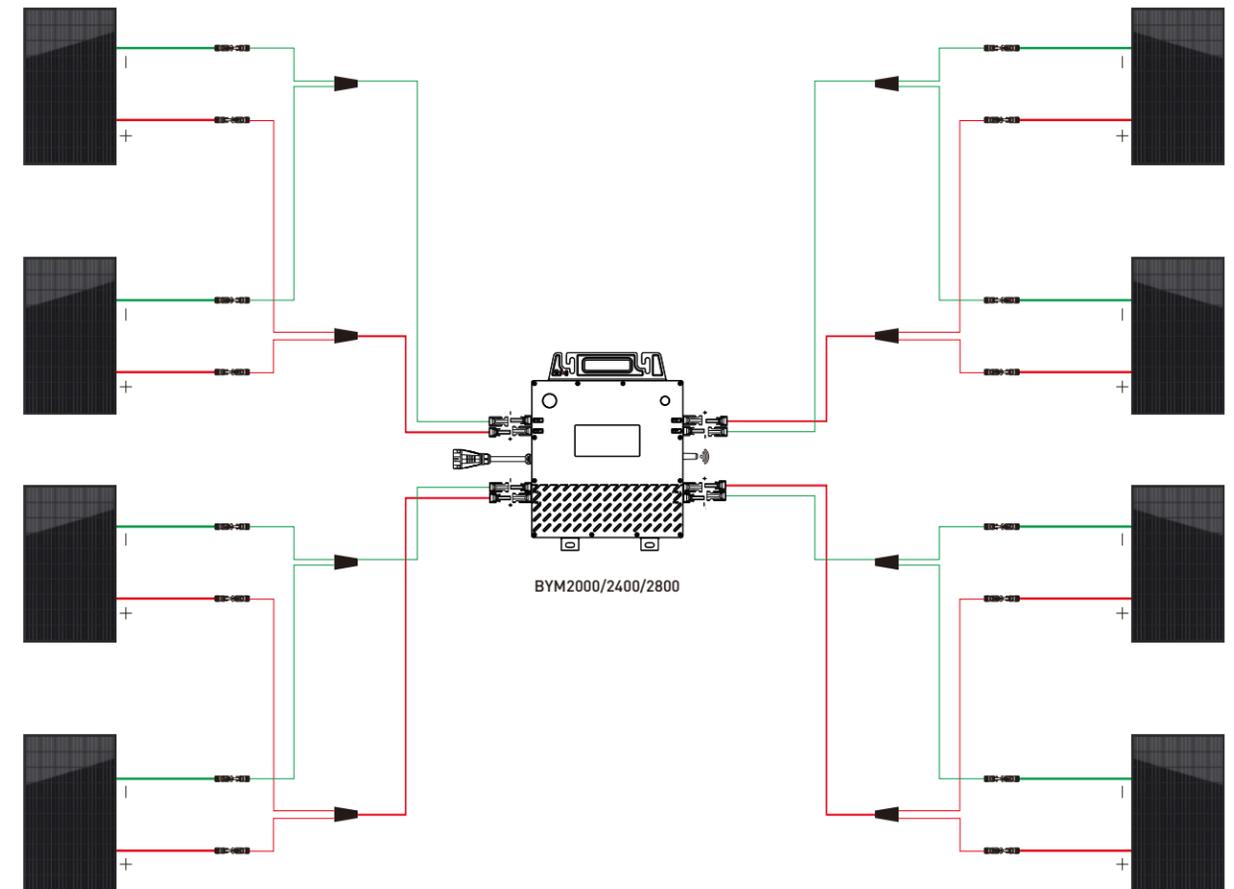
NOTE:

1. The series open circuit voltage of the components cannot be greater than 60V.
2. Two identical PV modules can be connected in parallel using a Y type MC4 set, but two different can only be connected in parallel using a Paralleling Optimizer.

Application of Paralleling Optimizer



Applications for Y type Mc4 set



Step 6 Complete the installation diagram of the BENY microinverter system.

The installation diagram of the microinverter system refers to the schematic diagram of the physical location of each microinverter in the solar system. Customers can use the blank diagram in the appendix of this manual to record the installation position of the microinverter in their own system or they can draw the system installation diagram yourself.

Paste the two tear-off serial numbers on the corresponding positions of the BENY system installation diagram and the frame of the solar module respectively for easy viewing and subsequent APP scanning to quickly add corresponding equipment.

Step7 Start operating the BENY microinverter PV system

Close the AC main circuit breaker connecting the microinverter system.
 Close the on-grid main circuit breaker and the system will generate electricity in about 1 minute.
 Always pay attention to the flashing status of the indicator light. When the microinverter is connected to the solar module and the DC side is powered on for the first time, the indicator light will flash red and green at the same time.

Red LED light	Green LED light	Status
Short red-Light blinks	Blinks 1 time	Start up
Not bright	flashes	Normal operation status

- When MI starts power output, green light flashes cycle by cycle.A cycle is 8s.
- During normal operation, the green indicator flashes every second with 0.5s ON,and 0.5s OFF.
- The higher the power output, the more times the green light flashes in a cycle, up to 8 times at most.
- When output is equal to or above the rated power, green light flashes constantly.

NOTE:Once the microinverter is powered on correctly, until it starts to work normally, the start-up time will vary slightly according to the regulations of different regions.

Step 8 Download BENY Microinverter monitoring APP to check the working status of the microinverters.

Please search for "BYM Cloud" in the Apple App Store (IOS) or Google Store (Android), or scan the following QR code to download Beny Microinverter monitoring APP.



4.Troubleshooting

WARNING Ensure that the DC side and AC side are properly connected

4.1 Troubleshooting microinverter indicator light abnormalities

Red LED light	Green LED light	Status
Continuously flashing	Not bright	Disconnect DC input power for 10 seconds, Reconnect and check if it is back to normal after 5 minutes.
Not bright	Not bright	1.DC side reconnect. 2.Measure the output voltage of the PV module to see if it is within the working range of the microinverter. 3.Detect DC input and AC input to see if it's a microinverter or a PV module issue.

4.2 Platform troubleshooting

Alert Reason	Solutions and Recommendations
PV overvoltage	Please ensure that the open circuit voltage of the photovoltaic module is less than or equal to the maximum input voltage of the microinverter. Disconnect the DC side, and measure whether the voltage of the module meets the requirements.
PV undervoltage	Check the status of the photovoltaic modules (whether there is dust or fallen leaves - if so, clean them). check whether the specifications of the photovoltaic modules match the microinverter and whether the connections are reliable.
DC/DC overvoltage	Check whether the voltage parameters of the machine are normal through BYM Cloud and you can disconnect the DC power supply and restart the microinverter.
DC/DC overcurrent	Check whether the corresponding parameters of the machine are normal through BYM Cloud and you can disconnect the DC power supply and restart the microinverter.
DC/DC overtemperature	Please check the temperature of the microinverter through BYM Cloud or use a thermometer to measure the microinverter temperature to see if the microinverter temperature is too high. If the temperature is too high, an alarm will sound. The microinverter can be disconnected for a period of time until it cools down and then the microinverter can be allowed to work.

Inverter island	Check whether the AC side is well connected and whether the power grid is normal. If the power grid is normal, restart the microinverter and check whether the microinverter is working normally. If the power grid is not normal at this time, please wait until the power grid becomes normal and the microinverter will resume work.
Remote poweroff enabled	1. Check whether the temporary power is set to 0 during microinverter control; or whether the microinverter is under zero-feed network control and whether there is any electrical load. 2. The microinverter is in the off state, just turn it on; or please disconnect the DC power supply and let the microinverter restart.
Low Insulation Res	Check whether the microinverter is immersed in water or accumulating water; also check the grounding condition of the microinverter and the photovoltaic modules.
Sync signal error	Please disconnect the DC power supply and allow the microinverter to restart; then check whether the microinverter is normal.
Safety chain error	Please disconnect the DC power supply and let the microinverter restart. Repeat this several times to see if the microinverter is normal.
PRI2/SEC communication error	Check whether the DC input ports PV3 and PV4 are connected to the photovoltaic modules, and whether the specifications and status of the photovoltaic modules are good. It is normal for the alarm not to be connected.
PRI1/SEC communication error	Check whether the DC input ports PV1 and PV2 are connected to the photovoltaic modules, and whether the specifications and status of the photovoltaic modules are good. It is normal for the alarm not to be connected.
Grid overvoltage	1. In the event of an unexpected alarm, the grid voltage may be temporarily abnormal. The microinverter will automatically recover after the grid voltage returns to normal. 2. If alarms occur frequently, please check whether the grid voltage is within the range that the microinverter can withstand. If not, please change the grid overvoltage protection limit through the BENY remote monitoring system after obtaining the consent of the local power operator.
Grid undervoltage	1. In the event of an unexpected alarm, the grid voltage may be temporarily abnormal. The microinverter will automatically recover after the grid voltage returns to normal. 2. If alarms occur frequently, please check whether the grid voltage is within the range that the microinverter can withstand. If not, please change the grid undervoltage protection limit through the BENY remote monitoring system after obtaining the consent of the local power operator.

Grid overfrequency	1. If an unexpected alarm occurs, the grid frequency may be temporarily abnormal. The microinverter will automatically recover after the grid frequency returns to normal. 2. If alarms occur frequently, please check whether the grid frequency is within the acceptable range of the microinverter. If not, please change the grid overfrequency protection limit through the BENY remote monitoring system after obtaining the consent of the local power operator.
Grid underfrequency	1. If an unexpected alarm occurs, the grid frequency may be temporarily abnormal. The microinverter will automatically recover after the grid frequency returns to normal. 2. If alarms occur frequently, please check whether the grid frequency is within the acceptable range of the microinverter. If not, please change the grid underfrequency protection limit through the BENY remote monitoring system after obtaining the consent of the local power operator.
Phase lock error	Please make sure that the power supply of the photovoltaic module is normal. If it is normal, please disconnect the DC power supply and let the microinverter restart. Repeat this several times to see if the microinverter is normal.
Grid Surge	In the event of an unexpected alarm, the power grid may be temporarily abnormal. The microinverter will automatically recover after the grid surge disappears.
SEC MCU undervoltage	Check whether the power supply is normal through BYM Cloud. If it is normal, please disconnect the DC power supply and let the microinverter restart. Repeat this several times to see if the microinverter is normal.
H bridge overcurrent	Check whether the power supply is normal through BYM Cloud. If it is normal, please disconnect the DC power supply and let the microinverter restart. Repeat this several times to see if the microinverter is normal.
Grid frequency out of range	Check the grid frequency sampling through BYM Cloud to check whether the grid frequency reaches the frequency recovery interval.
Grid voltage out of range	Check the grid voltage sampling through BYM Cloud to check whether the grid frequency reaches the frequency recovery interval.

If the fault still cannot be solved according to the above methods, please contact your dealer or BENY after-sales service center.

4.3 On-site inspection-professionals

Verify that the utility voltage and frequency are within the ranges shown in the technical data of this microinverter.

Check the connection to the grid. When the inverter is still working, disconnect the AC side first, then the DC side.

Check AC branch circuit interconnections between all microinverters. Verify that each microinverter is powered by the utility grid.

Verify that the AC circuit breaker is functional and closed.

Check the connection between the microinverter and the DC side of the solar module.

Verify that the PV module DC voltage is within the allowable range shown in the technical data of this manual.

4.4 Microinverter product replacement process

Follow the steps below to replace a failed BENY microinverter.

Disconnect the BENY microinverter from the solar module in the following order:

- a. Disconnect the circuit breaker on the AC side of the branch circuit.
- b. Disconnect the AC bus from the inverter AC connector.
- c. Disconnect the solar module and microinverter DC connectors.

Install and replace the microinverter on the rack, use a multimeter to measure and make sure there is no current in the DC line between the module and the microinverter when making connections on the DC side of the new machine.

Please ensure that the AC branch circuit breaker is disconnected and strictly follow the microinverter installation steps to install and replace the unit. After the replacement is completed, close the branch circuit breaker and verify the operating status of the replaced microinverter.

Please put the damaged microinverter into its original packaging. If the original packaging cannot be reused, it is recommended to use a cardboard box that can hold 5 kg and can be closed correctly to place the microinverter to be replaced.

5. Microinverter maintenance

1. Maintenance operations can only be performed by authorized professionals and professional personal protective equipment must be used.

2. During normal operation, the working environment should be ensured to meet the technical requirements of the microinverter. Make sure these conditions have not changed over time and that the device has not been exposed to harsh weather conditions or covered with foreign objects.

3. When cleaning, do not use rags that contain filamentous materials or that may corrode equipment parts or corrosive products that generate static electricity.

4. Do not attempt to disassemble the microinverter or perform any internal repairs! In order to maintain safety and insulation integrity, the design of the microinverter does not allow for in-house servicing.

5. If the wires are damaged, the equipment should be scrapped if the cables cannot be replaced, and the replaced cables must meet the working specifications of the BENY microinverter.

6. Maintenance operations must be carried out with the equipment disconnected from the grid (if the grid power switch is on) and when the PV modules are shaded or isolated.

6. Microinverter storage

If the device is not used immediately or has been stored for a long period of time, first make sure that everything is packaged correctly. The device must be stored indoors with good ventilation; ensure that the storage environment has no potential to damage any parts of the device.

NOTE: After the device has been out of operation for a long time, perform a thorough check when restarting.

Discarded microinverters are harmful to the environment. Please handle them properly according to local regulations.

7. Warranty

In order to ensure the normal service life of the microinverter and reduce the risks during use, maintenance must be performed by professionals using approved safety maintenance tools within the specified time.

• Standard warranty period:

Microinverter — 12 years/ 25 years(optional)

Monitoring Device — 3 years

The valid warranty period starts from the earlier date of the two dates:

(1) 3 months later from the date of delivery of product

(2) The date of complete product installation

• Damage caused by operation failure, natural force majeure, incorrect installation or instructions for use is not covered

• Repair can only be performed by professionals. If any problem occurs during installation or use, contact your dealer first.

• For detailed warranty terms, please refer to "Warranty Provision"