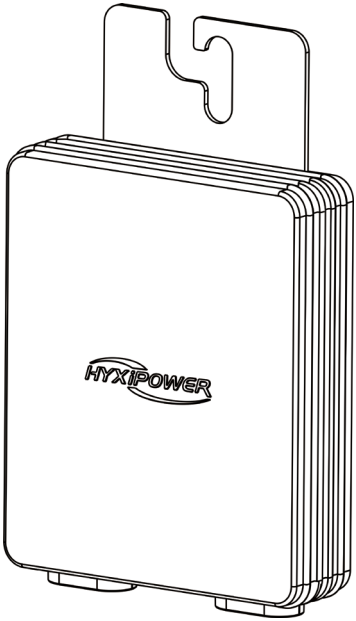
HYXiPOWER

User Manual

OP400/OP500/OP600/OP700

Smart PV Optimizer



Carefully read this inverter user instructions before using.
Read and save these instructions.

TRADEMARKS

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Preface

Overview

This manual mainly contains product information and installation, operation and maintenance instructions. This manual does not contain complete information about photovoltaic (PV) systems. Unless otherwise specified, these are collectively hereinafter referred to as "optimizer".

Scope of application

This manual is intended for the following devices:

- HYX-OP400
- HYX-OP500
- HYX-OP600
- HYX-OP700

For readers

This manual is intended for professional technicians who need to install, operate and maintain the inverter and for users who need to check the optimizer parameters.

All installation operations must be carried out by professional technicians and only by professional technicians.

Use of the manual

Please read the manual carefully before using the product, the content of the manual will be updated and corrected, but it is inevitable that there is a slight discrepancy or error with the actual product.

Users should refer to the actual product purchased and obtain the latest version of the manual by downloading from www.hyxipower.com or through sales channels.

The latest version of the manual is available for download at or through sales channels.

Use for symbols

In order to ensure the safety of the user's person and property when using the product, relevant information is provided and highlighted using the following symbols.

⚠ DANGER

- Indicates a hazard representing a high risk of death or serious injury which, if not avoided, will result in death or serious injury.

⚠ WARNING

- Indicates a medium risk hazard which, if not avoided, could result in death or serious injury.

⚠ CAUTION

- Indicates a hazard with a low level of risk that may result in minor or moderate injury if not avoided.

NOTICE

- Indicates a potential hazard which, if not avoided, will result in equipment failure or property damage.

1. Safety Precautions

In order to ensure safe installation and operation of the optimizer and reduce the risk of electric shock, this manual uses the following safety symbols to mark some hazard instructions and safety precautions. The guarantees and warnings during specific operations will also be described in detail in the corresponding chapters.

This manual contains important instructions that should be followed when installing and maintaining the optimizer. Users should read this manual carefully before installing or debugging the optimizer.

1.1 Important Safeguards and Warnings

For safety reasons, technicians responsible for the installation, operation and maintenance of this optimizer must be appropriately qualified, trained and skilled. Installation, operation and maintenance must strictly follow the instructions in this manual.

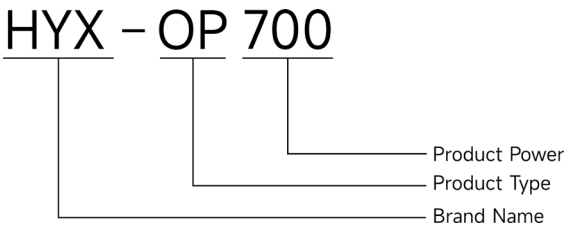
Installation, maintenance, troubleshooting, and replacement of the optimizer must be completed by professionals. Professionals must:

- After receiving professional training.
- Read this document carefully and observe all precautions.
- Be familiar with safety regulations for electrical systems.
- Be fully familiar with the composition and working principles of the entire photovoltaic power generation system as well as local regulations.
- Personal protective equipment must be worn.

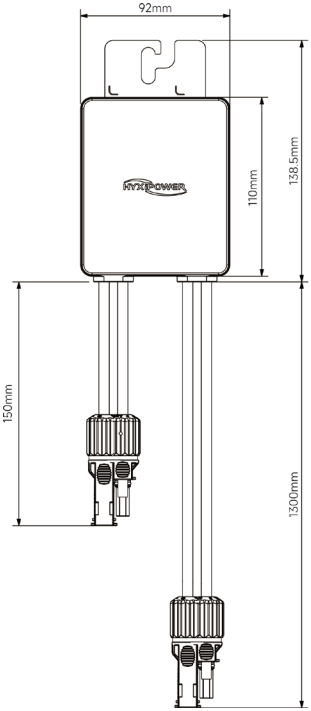
2. Product Overview

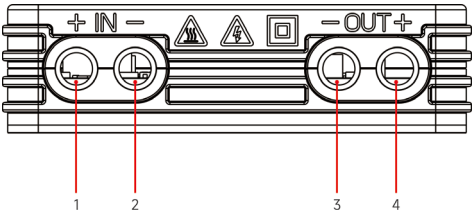
HYXiPOWER Intelligent Photovoltaic Optimizer is a DC/DC conversion power supply installed on the back of the photovoltaic module, which adjusts the voltage and current of each photovoltaic module in real time. It improves the power generation of the photovoltaic system by continuously tracking the maximum power point (MPPT) of each photovoltaic module. It also has functions such as module-level shutdown, module-level monitoring, module-level IV curve scanning, and support for long string design.

2.1 Product Description



2.2 Product Appearance





1: Input positive electrode
2: Input negative electrode
3: Output negative electrode
4: Output positive electrode

2.3 Symbol Introduction

Symbol	Description
	High Voltage ! The high voltage generated by optimizer can endanger life.
	High Temperature ! The optimizer will generate heat during operation. Do not touch the metal surface.
	Equipment protected by double insulation or reinforced insulation.
	Comply with RCM certification.
	Read the manual.
	CE mark of conformity.
	Do not dispose of the optimizer as household waste.

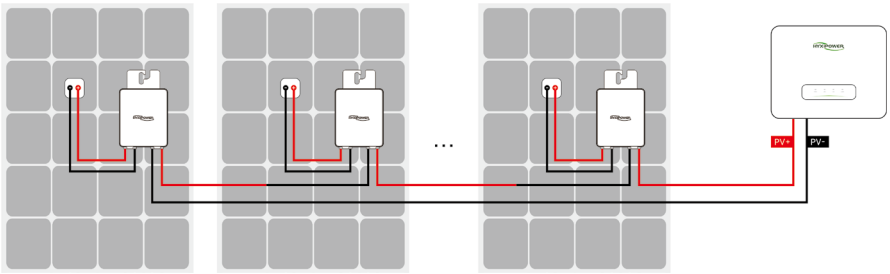
2.4 Configuration Principles

Supported Inverter Models	Number of Optimizers Supported in a String	Upper Limit of String Power
HYX-S7K/8K/9K/10K/12K-S	3-25	10kW
HYX-S8K/10K/12K-T	6 - 35	16kW
HYX-S15K/17K/20K/25K-T	6 - 35	16kW
HYX-S30K/33K/36K/40K/50K-T	6 - 35	16kW
HYX-5K/6K/8K/10K/12K-HT	4 - 35	16kW
HYX-15K/20K/25K-HT	6 - 35	16kW

2.5 Application Scenarios

2.5.1 Fully equipped optimizer scenarios

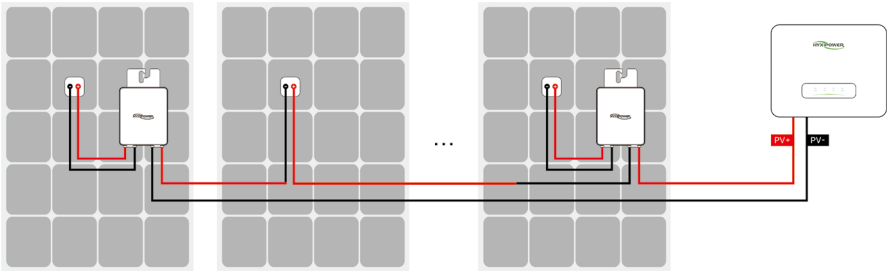
All photovoltaic modules connected to the inverter are connected to the optimizer. In the fully equipped optimizer scenario, it has MPPT function, can realize module-level shutdown and monitoring functions, and supports long string design.



2.5.2 Optional optimizer application scenarios

Only modules with shadow blocking are equipped with the optimizer.

Optional optimizer application scenario, the optimizer does not communicate with the inverter, does not support rapid shutdown, does not support long string design, and does not support module-level IV curve scanning and diagnosis.



3. Unpacking and Storage

3.1 Unpacking and inspection

This equipment is thoroughly tested and rigorously inspected before delivery. Nonetheless, damage may occur during transit. Therefore, please inspect the device thoroughly upon receipt.

- Check the box for visible damage
- After unpacking, please check whether the optimizer is damaged and whether the accessories are complete.

If it is damaged or incomplete, please contact HYXIPOWER or the shipping agent and provide photos to activate service.

Do not throw away the original box. When a product is discontinued, it is recommended that the device be stored in the original packaging box.

NOTICE

- After receiving the product, check whether the appearance and structural parts of the device are damaged, and check whether the packing list is consistent with the actual order. If there are problems with the above inspection items, please do not install the equipment and contact HYXiPOWER in time.
- If you use any tools to open the package, be careful not to damage the product.

3.2 Storage

If the optimizer is not put into operation immediately, store it under specific environmental conditions.

- Repackage in original carton.
- Storage temperature range -40 to +85° C, relative humidity range 0 to 95%, non-condensing.
- The stacking levels of the optimizer must not exceed the "Stacking Level Limit" marked on the casing.
- Cartons cannot be tilted or turned upside down.
- Do not store the product in a place susceptible to direct sunlight, rain, and strong electric fields.
- Do not place the product where there are items that may affect or damage the product
- Store the product in a clean, dry, well-ventilated place to protect it from dust and water vapor.
- Do not store the product in areas with corrosive substances or where it is susceptible to rodents and insects.
- Carry out regular inspections. Inspections should be carried out at least every six months. If insect or rodent bites are found, the packaging materials should be replaced promptly.
- If the product is stored for more than one year, it requires inspection and testing by professionals before it can be put into operation.

NOTICE

- Please store product according to storage requirements. Product damage caused by failure to meet storage requirements is not covered by the warranty.

4. Installation

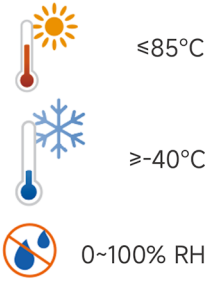
4.1 Installation Location Selection

In order to ensure the safe operation of the optimizer and ensure its service life and performance, choose an optimal installation location.

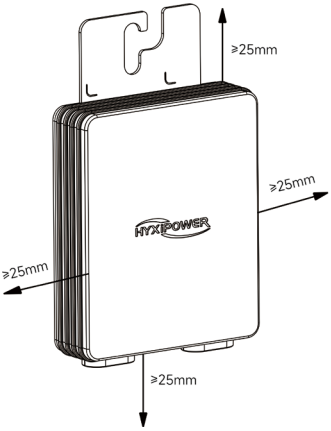
- The optimizer's protection level is IP68.
- Should be installed in a location that facilitates electrical connections, operation and maintenance.

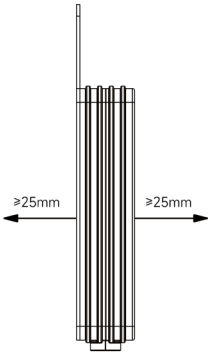
4.2 Installation Environment Requirements

- The installation environment must be free of flammable or explosive materials.
- The product must be kept out of the reach of children.
- The allowable temperature and humidity ranges at the installation site are as follows:



- The product should be protected from direct sunlight, rain and snow to extend its service life. A sheltered installation location is recommended.
- Install the device in a well-ventilated area to ensure good heat dissipation.

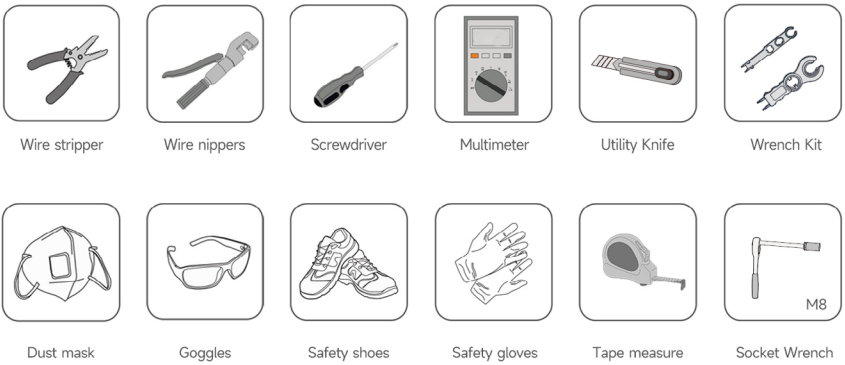




4.3 Pre-Installation Preparation

4.3.1 Installation Tools

Installation tools include, but are not limited to, the following recommended tools and, if necessary, other auxiliary tools can be used in the field.

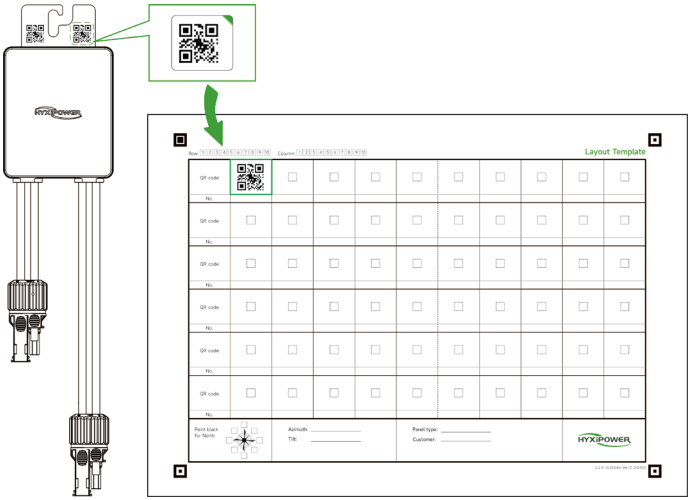


4.4 Optimizer Installation

The optimizer supports photovoltaic mount installation and photovoltaic module frame installation. Please choose the appropriate installation method according to the site conditions.

Reasonably arrange the installation location of the optimizer to ensure that the optimizer cable can be properly connected to the photovoltaic module and adjacent optimizer. The communication distance between the optimizer and the inverter should not exceed 300m.

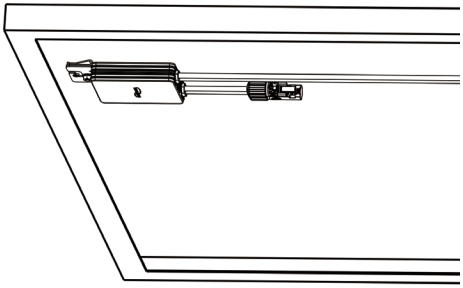
After determining where to install the optimizer, remove the QR code label on the optimizer and adhere it to the physical layout template as directed. (Please refer to the physical layout template guidance for details.)

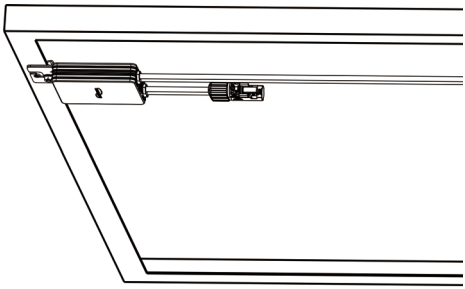


4.4.1 Installed on Photovoltaic Frame

Use the quick clamp to clamp the optimizer parallel to the back frame of the PV module.

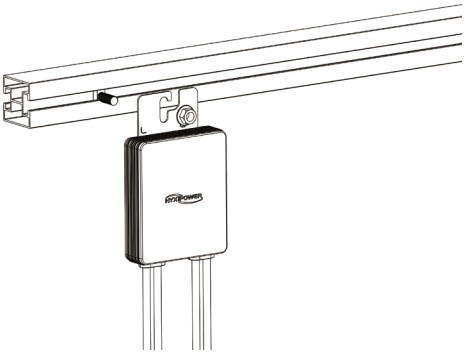
Quick clamp needs to be purchased separately.

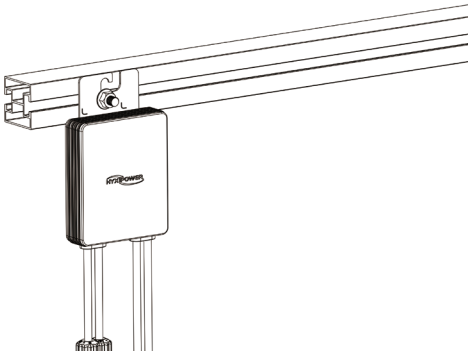




4.4.2 Installed on Aluminum Rails

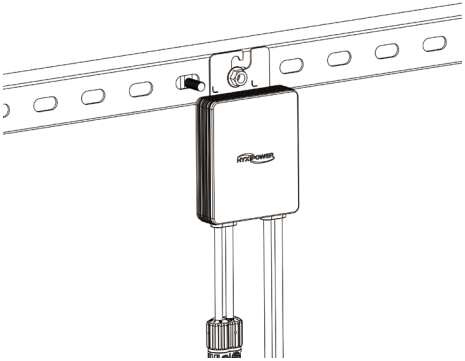
It is recommended to use M8*25 T-head bolt assembly (customers should purchase by themselves).

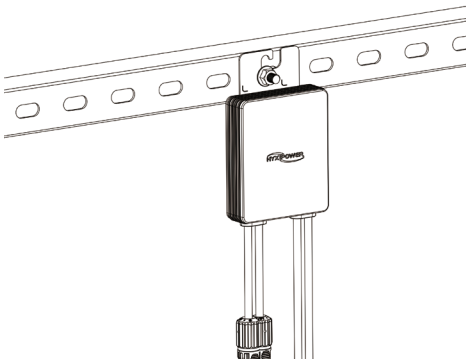




4.4.3 Installed on Steel Rails (T-head bolts)

It is recommended to use M8*25 T-head bolt assembly.





5. Electrical Connection

5.1 Safety Precautions

⚠ DANGER

Photovoltaic strings can produce lethally high voltages when exposed to sunlight.

- The operator must wear appropriate personal protective equipment when making electrical connections.
- Before touching the DC cable, you must use a measuring instrument to ensure that the cable is voltage-free.
- Adhere to all safety instructions listed in the documentation related to the PV string.

⚠ DANGER

- Before making electrical connections, make sure the optimizer is not damaged, otherwise, it may cause danger !
- Before making electrical connections, make sure all switches connected to the optimizer are set to "OFF". Otherwise, electric shock may occur!
- The optimizer does not support hot plugging. Do not plug in and unplug the optimizer while the computer is powered on. Otherwise, the optimizer may damage!
- Please check whether the input and output cables of each optimizer are not connected correctly, i.e. whether the output is connected to the PV module and the input is connected to the inverter or other optimizer in the system. If so, please correct the connection in time and confirm that the connection is correct before creating the plant and activating it. Otherwise, it may cause damage to the optimizer that is incorrectly connected after plant activation, and the resulting damage will not be covered by the warranty.

⚠ WARNING

Product damage due to incorrect wiring is not covered by the warranty.

- Electrical connections must be made by professionals.
- The operator must wear appropriate personal protective equipment when making electrical connections.
- All cables used in photovoltaic systems must be securely connected, properly insulated, and appropriately sized.

NOTICE

All electrical connections must comply with local and national electrical standards.

- The cables used by users should comply with local laws and regulations.
- Observe the safety instructions related to the PV string and the regulations related to the local power grid.

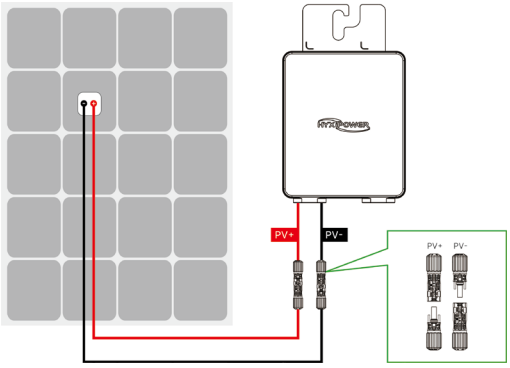
5.2 Electrical Connection Overview

DANGER

- Before connecting the optimizer to the PV module, ensure that the PV array is well insulated from the ground
- Connect the PV+ and PV- of the optimizer to the positive and negative terminals in the PV module junction box respectively.

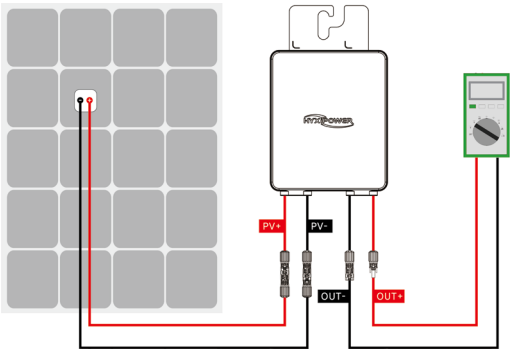
NOTICE

- Do not connect the PV module to the optimizer's OUT+ and OUT-. Otherwise, the optimizer or PV modules will be damaged and the damage will not be covered by the warranty.



NOTICE

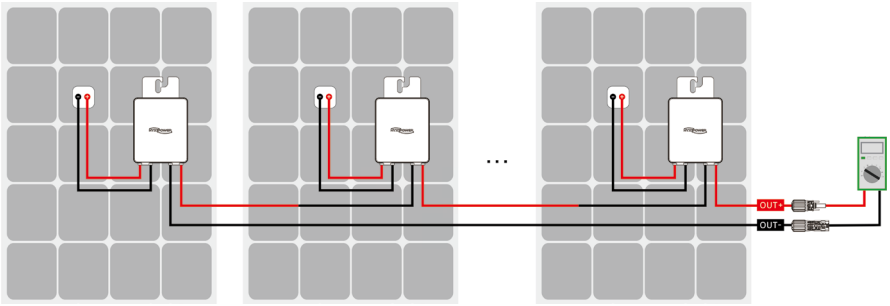
- Connect the positive test lead of the multimeter to the OUT+ of the optimizer, and connect the negative test lead of the multimeter to the OUT- of the optimizer to check whether the optimizer is faulty. The optimizer will not malfunction if the typical value of the output voltage is 1V.



NOTICE

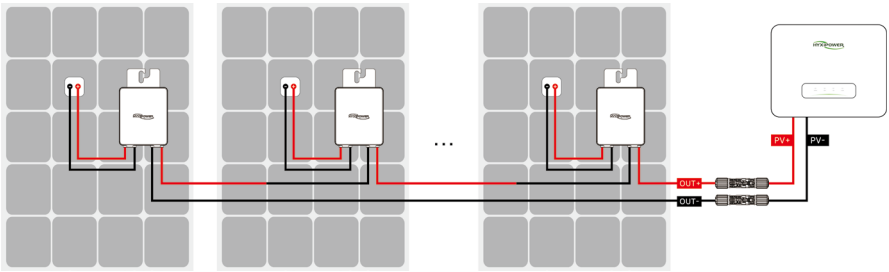
1. After wiring, measure the output voltage of each optimizer with a multimeter.
2. Considering the impact of the multimeter's accuracy on the actual measurement on site, the optimizer can work normally as long as the output voltage is within the range of 0.9~1.1V.
3. If the output voltage is less than 0.9V, check the following items:
   - Check whether there is enough sunlight.
   - Check whether the input side of the optimizer is connected to the PV module.
   - If the fault is not caused by the above reasons and still exists, replace the optimizer.
4. If the output voltage is greater than 1.1V, the optimizer is faulty. Please change the optimizer.
5. If voltage is not detected, replace the optimizer or module.

When connecting multiple optimizers, connect the OUT- of the first optimizer to the OUT+ of the second optimizer, and so on. Use a multimeter to measure the optimizer voltage. If the typical value of the output voltage is 1V*N (N is the number of optimizers), the system will not malfunction.



NOTICE

- Connect OUT+ of the first optimizer and OUT- of the last optimizer to the PV input terminals of the inverter.



WARNING

- If each PV module is equipped with an optimizer, the total power of the PV modules in the PV input must not exceed the maximum input power of the individual PV input of the inverter.
- To minimize electromagnetic interference, it is recommended to minimize the distance between the positive and negative optimizer cables.

6. Debugging

6.1 Checks Before Debugging

Before activating the optimizer, please check the following items:

- All equipment has been installed reliably.
- All cables are connected correctly.
- Please check all optimizer input and output terminals for incorrect connections.
- Make sure the QR code label is correctly affixed to the corresponding square cell on the physical layout.
- All warning signs and labels are intact and legible.

7. Troubleshooting

Alarm name	Cause	Handling suggestions
Input overvoltage	Optimizer input overvoltage	Check whether the open circuit voltage of the PV module connected to the optimizer exceeds the maximum input voltage allowed by the optimizer.
Over temperature warning	The internal temperature of the optimizer is too high	1. Check whether the ventilation at the optimizer installation location is good and whether the ambient temperature exceeds the maximum allowable ambient temperature range. If there is no ventilation or the ambient temperature is too high, please improve ventilation and heat dissipation condition. 2. If ventilation and ambient temperature are normal, please contact the installer.
Internal hardware failure	There is a fault within the optimizer	Please contact the installer
Abnormal output voltage	Optimizer output voltage abnormality	1. When the lighting is normal, re-execute the optimizer search function. 2. Use an extension cable for the optimizer output and check whether the extension cable is made correctly (one end is a positive connector and the other end is a negative connector). 3. Check whether the string is correctly connected to the inverter or whether there are breakpoints in the string. 4. If the fault persists, please contact the installer.
Upgrade failed	Optimizer upgrade software failed	1. When the lighting is normal, re-execute the optimizer upgrade function. 2. If the fault persists, please contact the installer.

8. Appendix

8.1 Parameters Table

Product Model	HYX-OP400	HYX-OP500	HYX-OP600	HYX-OP700
Input				
Rated Input DC Power	400W	500W	600W	700W
Absolute maximum input voltage	80V			
MPPT operating voltage range	10~80V			
Maximum Short Circuit Current (Isc)	25A			
MPPT efficiency	99.50%			
Weighted efficiency	99.00%			
Overvoltage category	II			
Output				
Maximum output voltage	80V			
Maximum Output Current	20A			
Output bypass	Yes			
Shutdown output voltage per optimizer	1V			
Communication				
Communication Method	PLC			
Standard Compliance				
Safety	IEC62109-1 (class II safety)			
EMC	IEC61000-1 / -2 / -3 / -4			
RoHS	Yes			
General Data				
Dimension (W*H*D)	92*148.5*25mm			
Weight (including cables)	850g			
Input Connector	Amphenol / Staubli MC4			
Input Wire Length	0.15m			
Output Connector	Amphenol / Staubli MC4			
Output Connector	1.3m			
Operating Temperature Range	-40 ~ +85 °C			
Relative Humidity	0 % ~ 100 %RH			
Max. operating altitude	4,000m			
Degree of protection	IP68			
Installation part (optional)	Frame Mounting Bracket / T-shaped Bolt			

8.2 Contact Information

If you have any questions about this product, please contact us.

In order to provide you with faster and better after-sales service, we need your assistance in providing the following information.

- Equipment model: _____
- Serial number of the device: _____
- Fault code / name: _____
- A brief description of the fault phenomenon:

_____

_____

_____

Version: UM_HYX-OP700_V1.0-202401_EN
The manual is subject to change without notice while the product is being improved.

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