

Zhejiang Yongtailong Electronic Co., Ltd.

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YTL72 / YTL96 Series Specification

Multifunction Digital Panel Meter

YTL72-320S / YTL72-220S / YTL72-200S / YTL96-323S / YTL96-322S / YTL96-202S

YTL72-320D / YTL72-220D / YTL72-200D / YTL96-323D / YTL96-322D / YTL96-202D

Three-phase high-accuracy power monitoring • Multi-parameter measurement • RS485 / Y-Bus communication • CE certification (pending)



Applicable to HV/LV distribution monitoring, power quality monitoring, PV systems, industrial automation, and energy management for commercial buildings.

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Revision Date	Revision Description	Revised By
2026.07.02	Initial specification	Product Department

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1. Product Overview

The YTL72 / YTL96 series multifunction digital panel meters are three-phase high-accuracy monitoring instruments. They support multiple voltage systems and 50Hz/60Hz operation, and support three-phase four-wire wiring compatible with three-phase three-wire (ARON) wiring for HV/LV distribution systems.

The meter delivers high metering accuracy and supports multiple metering modes, including absolute-value metering, algebraic-sum metering, and separate import/export metering. It comprehensively measures electrical parameters such as voltage, current, energy, power, and power factor, and provides 2nd to 63rd voltage/current harmonic analysis for professional power-quality monitoring.

The device is equipped with a segment LCD (S) or dot-matrix LCD (D) with white backlight and supports multi-tariff metering. It adopts a dual communication architecture of RS485 and Y-Bus, is compatible with Modbus and DL/T645-2007 protocols, supports flexible networking, and can connect external sensors. It also provides event alarms, SOE event records, digital input/output, and local firmware upgrade functions, making it suitable for distribution monitoring and energy management applications.

2. Key Features

- **Three-phase high-accuracy monitoring:** Supports multiple voltage systems and 50Hz/60Hz operation for HV/LV distribution monitoring.
- **Multiple metering modes:** Supports absolute-value, algebraic-sum, and separate import/export metering for different energy-management and billing logic.
- **Full-parameter measurement:** Measures voltage, current, energy, power, power factor, and other electrical parameters.
- **Harmonic analysis:** Supports 2nd to 63rd voltage harmonics and 2nd to 63rd current harmonics for power-quality monitoring.
- **Dual communication architecture:** Supports RS485 and proprietary Y-Bus communication, compatible with Modbus and DL/T645-2007.
- **Events and alarms:** Supports alarms for current imbalance, overcurrent, overload, overvoltage, undervoltage, low battery, voltage imbalance, phase-sequence error, low power factor, and voltage/current circuit faults.
- **DI/DO and SOE:** Supports dry-contact inputs, digital outputs, and SOE event records for

on-site status monitoring and linkage control.

- **Wide-temperature operation:** Operating temperature -40°C to $+70^{\circ}\text{C}$ for demanding distribution environments.
- **CE certification:** Complies with GB/T 17215.211, GB/T 17215.321, IEC 62052-11, IEC 62053-22, IEC 61557-12, and related standards.

Model	RS485 Comm.	Y-Bus Comm.	DI Input	DO Output	Event Alarm	Event Record	SOE Event	Tariff	Harmonics	Electrical Measurements
YTL72-320S/D	✓	✓	✓	✓	✓	✓	✓	-	-	✓
YTL72-220S/D	✓	-	✓	✓	✓	✓	✓	-	-	✓
YTL72-200S/D	✓	-	-	-	✓	✓	-	-	-	✓
YTL96-323S/D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
YTL96-322S/D	✓	✓	✓	✓	✓	✓	✓	-	✓	✓
YTL96-202S/D	✓	-	-	-	✓	✓	-	-	✓	✓

3. Specifications

3.1. Electrical Parameters

Voltage Connection	Direct / PT
Rated Voltage	AC3×57.7/100V, AC3×63.5/110V, AC3×230/400V, AC3×400/690V (96 series only)
Voltage Tolerance	0.8 to 1.15 Un
Current Connection	CT
Basic Current (Ib)	5A
Minimum Current (Imin)	0.05A
Maximum Current (Imax)	6A
Operating Frequency	50Hz / 60Hz
Meter Constant	10000imp/kWh, 10000imp/kvarh
Auxiliary Power Supply	AC85~276V, DC95~350V
Power Consumption	≤1VA per phase; auxiliary power ≤2W, ≤10VA

3.2. Measurement Accuracy

Voltage	±0.2%
Current	±0.2%
Frequency	±0.02Hz
Active Power	±0.5%
Reactive Power	±1%
Active Energy	Class 0.5S (Class C)
Reactive Energy	Class 2 (Class A)
Voltage / Current Harmonics	±1%

3.3. Communication Parameters

Communication Mode	RS485, Y-Bus
Protocol	RS485 compatible with Modbus RTU and DL/T645-2007; Y-Bus supports Modbus protocol
Communication Type	Bidirectional
RS485 Configuration	Default: 115200bps, 8, 2, N; max. 64 connections; 2-wire
Communication Response Time	≤100ms
Y-Bus Configuration	Default: 9600bps, 8, 1, N; supports up to 5 downstream sensors

3.4. Functional Parameters

Metering Function	Monitors energy consumption and key electrical variables, including active/reactive power and power factor, and calculates current/voltage harmonic content.
Metering Mode	1. Absolute-value metering; 2. Algebraic-sum metering; 3. Separate import/export metering.
Tariff Function	Multi-tariff (6 tariffs, 10 time periods)
Measured Data	Voltage, current, energy, power, power factor, etc.
Harmonic Measurement	Voltage harmonics 2nd-63rd; current harmonics 2nd-63rd
Event Alarm	Current imbalance, overcurrent, overload, overvoltage, undervoltage, low battery, voltage imbalance, phase-sequence error, low power factor, voltage/current circuit fault
Event Record	SOE event records with millisecond timestamps; records electrical parameters when DI/DO is triggered
Digital Input	4 dry-contact inputs, built-in power supply, response time <300ms
Digital Output	2 digital outputs; normally open contacts, AC250V/5A, DC30V/5A
Firmware Upgrade	Local upgrade

3.5. General Parameters

LCD Display	Segment LCD (S) / dot-matrix LCD (D), white backlight
Backlight Type	White
Keys	Menu key, left key, right key, confirm key
IP Rating	Panel IP54; housing IP20
Protection Class	Class II protection
Wiring Method	Three-phase four-wire, compatible with three-phase three-wire (ARON)
Altitude	< 2000m
Impulse Withstand Voltage	6kV (72 frame); 8kV between current circuit and ground, each unconnected terminal and ground, and line and ground (96 frame only)
AC Withstand Voltage	Grid-to-ground 4kV; line-to-line 2.5kV
Lightning Surge	4kV

3.6. Wiring Parameters

Terminal Description	1, 2, 3, 4 are voltage signal input terminals; 5, 6, 7, 8, 9, 10 are current signal input terminals; 11, 12 are RS485; 13, 14 are Y-Bus; 15-20 are digital inputs; 21, 22 are auxiliary power; 23, 24 are active pulse outputs; 25-28 are digital outputs.
Conductor Cross-section	2. 5mm ²
Stripping Length	7-8mm ²
Screwdriver Size	Phillips Φ3mm
Tightening Torque	0. 5N. m

3.7. Environmental Parameters

Operating Temperature	-40°C~+70°C
Storage/Transport Temperature	-40°C~+70°C
Reference Temperature	25±2°C
Relative Humidity	≤95% RH
Altitude	< 2000m

3.8. Standard Measurement Conditions

Ambient Temperature	25 ± 2°C
Frequency	50Hz / 60Hz ± 5%
Current	5A
Voltage	Test according to the actual system within rated input ranges of 100V, 110V, 400V, and 690V

3.9. Standards and Regulatory Certification

Compliant Standards	GB/T 17215.211—2021
	GB/T 17215.321—2021
	IEC 62052-11:2020
	IEC 62053-22:2020
Product Certification	IEC 61557-12:2021
	CE (pending certification)

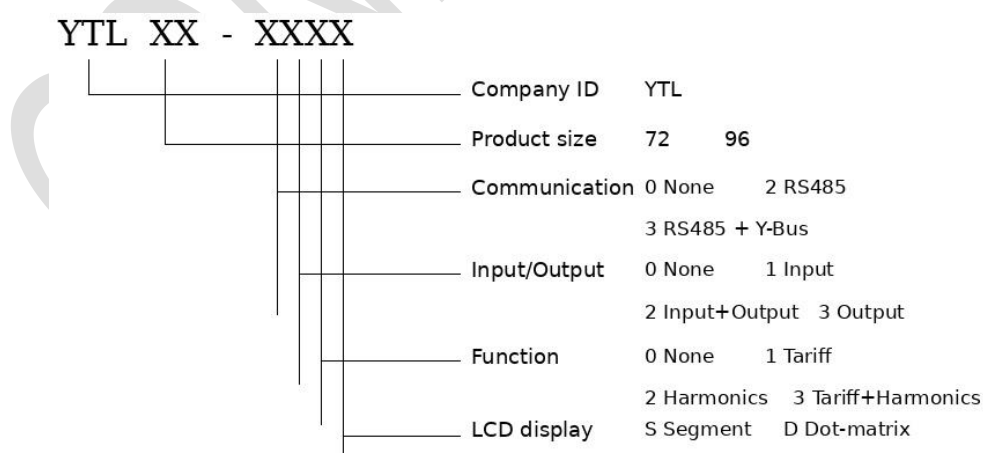
4. Structure

4.1. Product Appearance



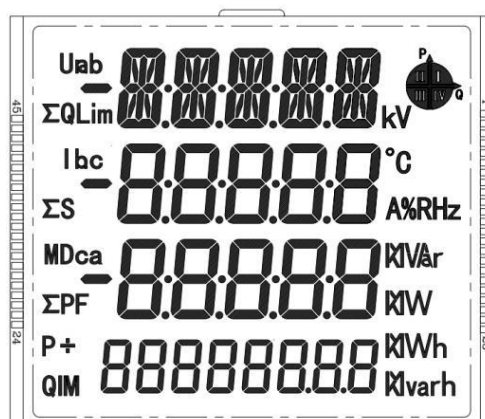
Area No.	Structure Description
A	Menu key
B	Left key
C	Right key
D	Confirm key
E	Display screen
Material	Front cover: PC; bottom housing: PC; clip: PC; keys: flame-retardant silicone rubber

4.2. Product Model Naming



Product model specification and function code description

4.3. Display and Menu Description

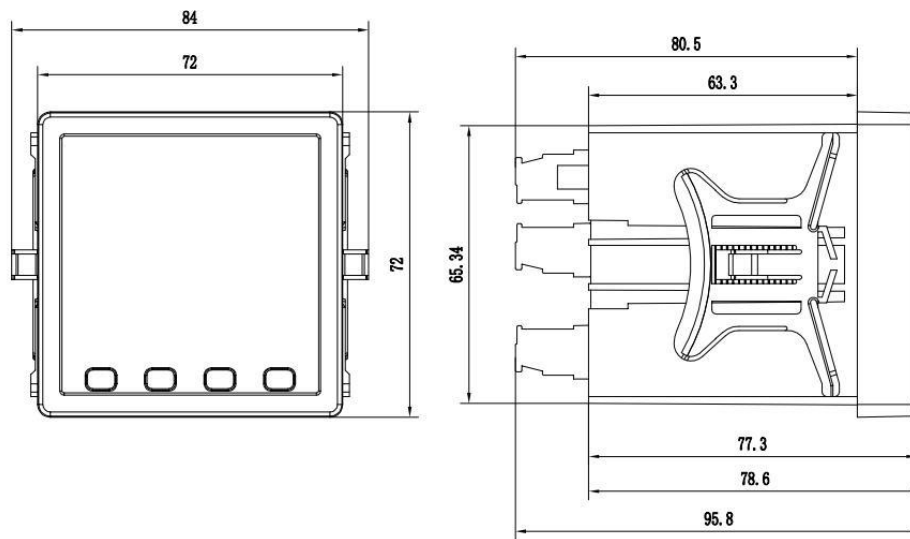


LCD display area diagram

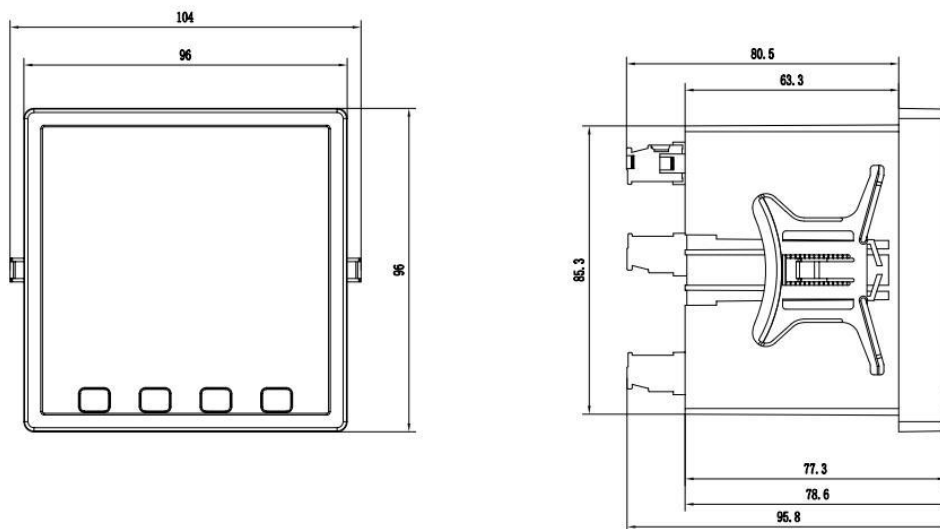
Interface Type	Segment Display / Setting Content
Summary Parameter Interface (Home Page)	The upper half displays instantaneous parameters and can be paged using the left/right keys. The lower half displays energy parameters and can be paged using the confirm key (EP+, EP-, EQ I, EQ II, EQ III, EQ IV). Press Menu or stop operation for 5 seconds to return to the home page.
Operating Parameter View	Total frequency/total power factor, phase voltage, instantaneous line voltage, phase current, vector-sum voltage/current, phase active/reactive/apparent power, total power, phase power factor, power demand, current demand, sensor temperature, and sensor humidity.
Device Information View	Press the Menu key to return to the home page. On the home page, press the Menu key to enter the parameter view interface. Use the left/right keys to page through the information. Press the Menu key again or stop operation for 5 seconds to return to the home page. Hardware version, software version, year of manufacture, product model, serial number, Modbus address, communication parameters, CT ratio, PT ratio, upper voltage threshold, lower voltage threshold, current threshold, and sensor low-temperature/high-temperature/humidity judgment and switch status.
Parameter Setting	Press and hold the Menu key for 3 seconds on any page to enter the parameter setting interface. After entering the password, press the confirm key. If incorrect, ERROR is displayed for 1 second and the current page remains; if correct, the parameter setting page opens. Supports settings such as password input, Modbus address, baud rate, parity bit, CT/PT, upper/lower voltage thresholds, current threshold, sensor address add/delete, and sensor low-temperature/high-temperature/humidity judgment and switch settings.

5. Dimensions

Meter Frame	Front Frame Size	Housing Size	Cutout Size
72 Frame	72mm×72mm	65.3mm×65.3mm×80.5mm	66mm×66mm
96 Frame	96mm×96mm	85.3mm×85.3mm×80.5mm	86mm×86mm



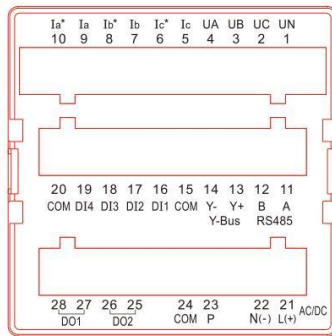
YTL72 Series Dimensions



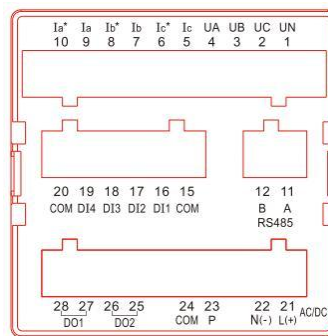
YTL96 Series Dimensions

6. Wiring

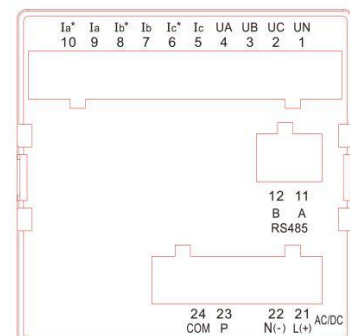
- "1, 2, 3, 4" are voltage signal input terminals;
- "5, 6, 7, 8, 9, 10" are current signal input terminals;
- "11, 12" are RS485 communication terminals;
- "13, 14" are Y-Bus communication terminals;
- "15, 16, 17, 18, 19, 20" are digital input terminals;
- "21, 22" are auxiliary power terminals;
- "23, 24" are active pulse output terminals;
- "25, 26, 27, 28" are digital output terminals.



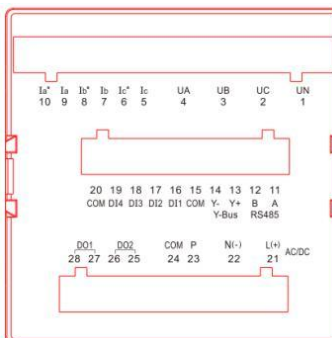
YTL72-320S



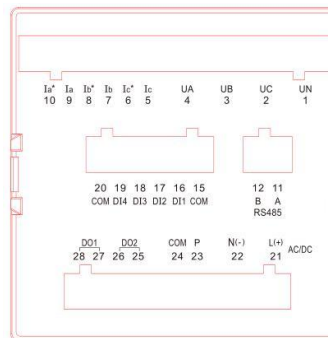
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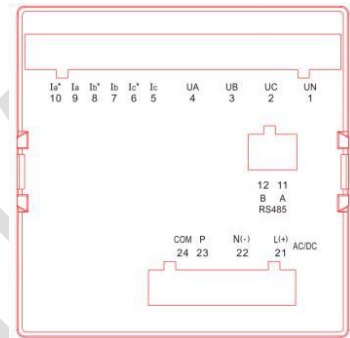
YTL72-200S



YTL96-320S



YTL96-223S



YTL96-202S

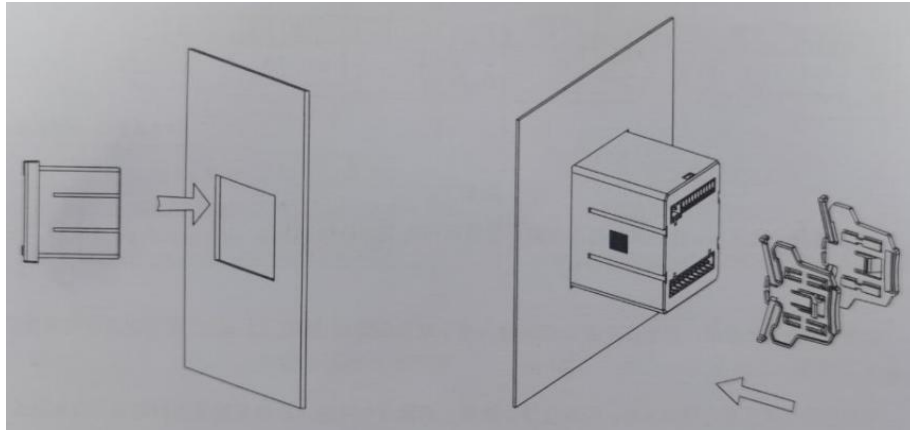
7. Installation Instructions

Important Warning: Installation, wiring, and communication configuration must be performed by qualified electrical professionals. Before wiring, disconnect all voltage inputs and the auxiliary power supply to prevent electric shock, short circuit, and equipment damage.

- The meter must be installed by an experienced electrician or qualified professional, who must confirm that the complete user guide has been read.
- If the device is severely impacted or dropped during installation and the housing shows obvious damage, do not install or power it on. Contact after-sales service promptly.
- The meter should be installed in an environment free of corrosive gases.
- Wire the meter according to the wiring diagram on the terminal box. Copper wires or copper terminals are recommended.

7.1. Installation Method

- Make a cutout in the fixed distribution cabinet.
- Take out the meter and remove the clips.
- Insert the meter into the installation opening from the front.
- Insert the meter clips to secure the meter.

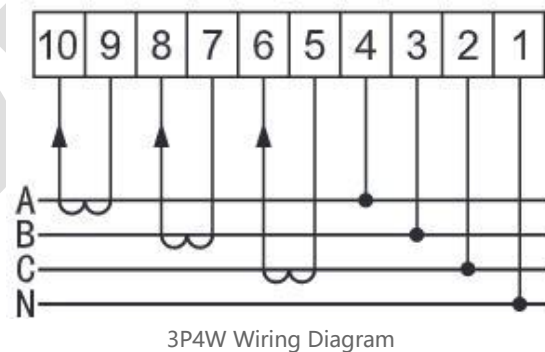
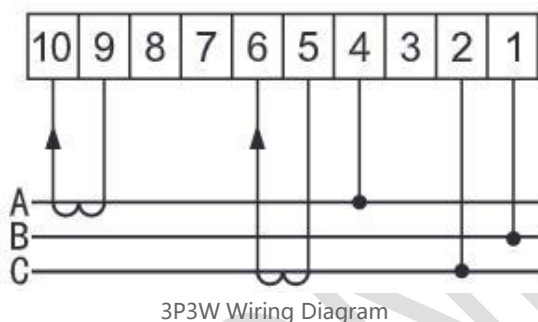


Panel installation diagram

7.2. Precautions

Voltage input: The input voltage must not exceed 120% of the product rated input voltage (100V / 110V / 400V / 690V). Otherwise, use a PT.

Wiring Method	Selection	Wiring Diagram
2-element	Three-phase three-wire 3P3W	See diagram below
3-element	Three-phase four-wire 3P4W	See diagram below



Current input: The rated input current is 5A and an external CT is required. Ensure that the input current corresponds to the voltage and that the direction is consistent. If other instruments are connected to the CT circuit, use series wiring. Before removing the product current input wiring, disconnect the CT primary circuit or short-circuit the secondary circuit.

Communication wiring: The meter provides an RS485 communication interface and supports both Modbus and DL/T645-2007 protocols. Shielded twisted-pair cable with a cross-section of at least 0.5mm² is recommended for RS485 communication. Route communication cables away from power cables or strong electromagnetic fields. Connect RS485 A and B terminals in series correspondingly and ground the shield.

7.3. Common Troubleshooting

Common Fault	Troubleshooting Method
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No Display / Black Screen	Check whether the auxiliary power supply is normal, whether wiring is loose, and whether the backlight is off.
Abnormal Voltage / Current Display	Check CT/PT ratio, wiring phase sequence, line disconnection, and phase-sequence error.
Inaccurate Metering	Check metering mode, tariff settings, CT ratio, and accuracy calibration.
RS485 Communication Failure	Check 2-wire wiring, shield grounding, baud rate / parity / protocol, and address conflict.
Y-BUS Cannot Connect to Sensor	Check wiring, baud rate 9600-8-1-N, slave quantity ≤ 5 , and duplicate addresses.
Frequent Alarm Triggering	Check threshold settings, line overload / imbalance, and voltage fluctuation.
Digital I/O No Action	Check wiring, contact capacity, input level, and whether the output relay is damaged.
Abnormal Harmonic Data	Check CT/PT matching, line interference, and whether wiring is correct.

8. Safety Instructions

8.1. Storage and Transportation

The energy meter must not be subjected to severe impact during transportation and storage. It must be transported and stored in accordance with GB13384-2008 General Technical Requirements for Packaging of Instrumentation. The meter should be kept in its original packaging. The storage environment temperature should be 0-40°C, relative humidity should not exceed 85%, and the air should contain no corrosive gases. In a warehouse, the meter should be placed on shelves, with a stacking height of no more than 10 cartons. After unpacking, individually packaged meters should be stacked no more than 5 layers high.

8.2. Personal Safety Information

This manual does not include all safety measures for operating this equipment (module/device), because special operating conditions, local code requirements, or local regulations may require additional measures. However, the information included must be observed to protect personal safety and prevent equipment damage. Depending on the severity of the warning, it is highlighted with a warning triangle containing an exclamation mark or lightning symbol.



Indicates that failure to follow the instructions may result in death, serious injury, or major damage.

8.3. Precautions



Indicates electric shock hazard; failure to take necessary safety precautions may result in death, serious injury, or considerable property damage.

8.4. Qualified Personnel

Installation and operation of the equipment described in this manual may only be performed by qualified personnel.

Only persons authorized to install, connect, and use this equipment, and who have appropriate knowledge of electrical equipment, grounding, and circuits, may be regarded as qualified personnel under safety and regulatory standards.

8.5. Intended Use

The equipment (device/module) may only be used for the applications specified in the catalog and user manual, and only in connection with devices and components approved by YTL.

8.6. External Protection Requirements

This product does not integrate internal overcurrent protection. The user or installer is responsible for providing suitable external overcurrent protection on the power-supply side. Selection and installation of the protection device must comply with local electrical installation codes and the expected short-circuit current conditions at the installation point.

8.7. Disclaimer

We have reviewed the contents of this publication and made every effort to ensure that the descriptions are as accurate as possible. However, deviations from the description cannot be completely excluded, and no liability can be accepted for any errors or omissions in the information provided.

The data in this manual is checked regularly, and necessary revisions will be made in subsequent versions.

Please let us know if you have any suggestions.

Subject to technical modification without prior notice.

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8.8. General Warnings

After unpacking, make sure that the device is complete. If in doubt, do not use the device and contact technical personnel. Electrical installation must be performed only by skilled electricians. Generally applicable safety measures must be observed.

If the device malfunctions and/or fails, switch it off immediately. Be sure to contact technical personnel for repair. Failure to comply with the above may compromise device safety.

8.9. Additional Safety Installation Instructions

- During installation, all clamps should be correctly tightened to ensure that wires can be properly inserted into the terminal clamps.
- If the conductor is too thin, poor contact may occur, possibly causing sparks and damaging the meter and its surroundings.
- Ensure that the conductors used are suitable for the maximum current of the meter.
- Before powering the meter / applying voltage, make sure the AC wires are correctly connected.
- Other rules not mentioned in this section that may affect normal and safe use of the meter should also be observed. To avoid accidents, installation must be performed by qualified technical personnel.

9. Warranty

If the product is found not to conform to the technical specifications within 18 months, the manufacturer will

repair and return products with intact seals.

9.1. Warranty Period Calculation

Warranty is handled according to the commercial invoice issued by our company. It is calculated from the date the meter leaves the warehouse and lasts for 18 months, excluding repair time without spare parts and delivery lead time.

9.2. Warranty Scope

If the user strictly follows the transportation, storage, installation, and operating procedures for the energy meter, and the company seal remains intact (that is, the meter seal has not been removed), but the meter fails to meet quality requirements, the user should provide valid supporting documents, such as meter photos, certificate photos, local user feedback documents, relevant government documents, etc.

In the following cases, we will repair, replace, or return the meter:

- No demonstration and no prior explanation were provided;
- The product does not comply with the implementation standards indicated on the product or its packaging;
- (If the standard on the product/packaging is required by the customer but does not comply with the company product implementation standard, the customer should make the corresponding liability commitment);
- The quality condition does not comply with that indicated in the product manual, physical sample, etc.

Nonconforming meters should be handled through consultation with the user. In general, we will repair or replenish them in the next order. Special cases shall be determined by mutual agreement.

Note: The warranty does not apply if there is no valid invoice, if evidence corresponding to the order quality issue cannot be provided, or if the damage is caused by force majeure or the warranty has expired. Repair may still be accepted, but transportation and other related costs shall be borne by the customer.

9.3. Technical Support

If you have any issues with our products, please contact:

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