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DTSD3366D-1P10 Series Three-Phase Smart Energy Meter Operation Manual



Guangdong Yada Electronics Co., Ltd.



DANGER AND WARNING

Before installing, operating or maintaining the equipment, please read this manual carefully, get it and gradually get familiar with the equipment. This document is not an operating manual for non-trainees, and YADA is not responsible for any problems arising out of its normal use.



Risk of electric shock, fire or explosion

- There is a power hazard in some parts of this equipment. Please operate in strict accordance with the specifications.
- Before maintenance and overhaul, the equipment must be powered off and grounded.
- All mechanical parts, doors and covers should be returned to their original position before the equipment is energized.
- Equipment maintenance and installation work can only be performed by qualified personnel.

If you do not pay attention to these precautions, it may cause serious injury.

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Chapter 1 Product Introduction

1.1 Overview

The DTSD3366D-1P10 Series Three-Phase Smart Energy Meter is a miniaturized three-phase meter with a 1P modular width. It is a multi-functional meter integrating measurement, monitoring and digital communication, featuring three-phase electrical measurement, high-precision energy metering and harmonic measurement functions. As a reliable, multi-functional and low-power monitoring device, it is equipped with RS485 (Modbus-RTU) communication interface.

It is mainly applied to monitoring and metering in intelligent distribution boxes and power distribution cabinets. All wiring terminals support pluggable connection. It can be matched with external open-type or closed-type current transformers (CT), and adopts DIN rail mounting.

1.2 Function Introduction

Table 1-1 Basic Functions

Real-Time Measurement	
Current	Three-phase currents
Phase Voltage	Three-phase phase voltages
Line Voltage	Three-phase line voltages

Active Power	Per-phase active power, total three-phase active power
Reactive Power	Per-phase reactive power, total three-phase reactive power
Apparent Power	Per-phase apparent power, total three-phase apparent power
Power Factor	Per-phase power factor, system total power factor
Frequency	System frequency
Phase Angle	Angle between corresponding phase volt three-phase voltages, angle between three
Energy Metering	
Energy	Total forward active energy, total reverse active energy, combined total active energy (forward + reverse) Per-phase forward & reverse active energy metering, combined per-phase active energy (forward + reverse) Total combined reactive energy 1 & 2, per-phase reactive energy metering
Power Quality	
Harmonics	Total harmonic distortion rate of three-phase voltage (2nd ~ 31st order) Total harmonic distortion rate of three-phase current (2nd ~ 31st order)
Real-Time Alarms	
Over-voltage Alarm	Trigger when voltage of any single phase exceeds the set lower threshold for Over-voltage event (0V = function

	disabled, default 0V), and the duration exceeds the set Over-voltage judgment delay (default 60s)
Under-voltage Alarm	Trigger when voltage of any single phase falls below the set upper threshold for under-voltage event (0V = function disabled, default 0V), and the duration exceeds the set under-voltage judgment delay (default 60s)
Phase Loss Alarm (Switch Status)	Trigger when voltage of any single phase is lower than the set upper threshold for phase loss event (0V = function disabled, default 0V), meanwhile the current of this phase is less than the set upper current threshold for phase loss event (default 0V), and the duration exceeds the set phase loss judgment delay (default 60s)
System Frequency Lower Limit Exceed Alarm	Trigger when system frequency is lower than the set lower threshold (0Hz = function disabled, default 0), and the duration exceeds the set frequency lower-limit judgment delay
System Frequency Upper Limit Exceed Alarm	Trigger when the system frequency is higher than the set upper threshold for frequency over-limit (0Hz = function disabled, default 0), and the duration exceeds the set judgment delay for system frequency upper-limit violation.
Communication	

RS485	1 channel RS485 interface
Operation & Communication Indicator	Equipped with 1 green panel indicator light shared for Run and Comm status. - Flashing cycle: 1000ms during normal running; - Flashing cycle: 100ms when communication link is established.

1.3 Model Description

Model	Functions
DTSD3366D-1P10	Supports three-phase voltage & current measurement, energy metering and harmonic measurement; DIN rail mounting, 1P modular width, matched with external current transformers.

Chapter 2 Installation

2.1 Installation prevention,preparation

Please read before starting the installation

This chapter contains important safety precautions that you must follow before installing, servicing,or servicing electrical equipment.Read and follow the following safety precautions carefully.



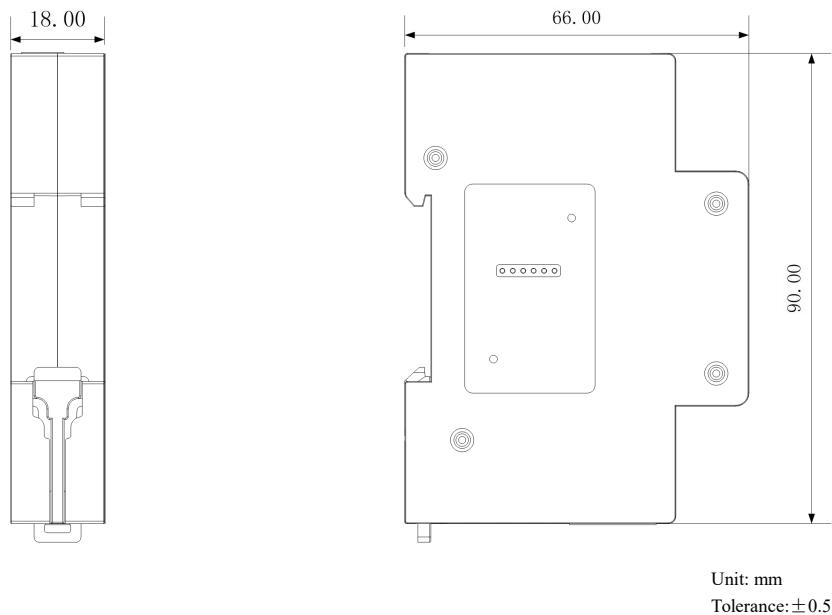
Danger of electric shock,burn or explosion,so only qualified operators can install this equipment.This should be done after reading all the instructions.Disconnect all power connections prior to visual inspection,testing,or maintenance.

2.2 Installation Information

2.2.1 Installation environment and location

The meter should be installed in dry,clean,away from heat and strong electromagnetic fields,The meter location is usually installed in the switch cabinet,which can protect the device from oil,dirt,dust,corrosive gas or other harmful substances.During installation,please pay attention to the convenience of maintenance.There is enough space to place the relevant lines, terminal blocks,short boards and other necessary equipment.

2.2.2 Installation Dimensions



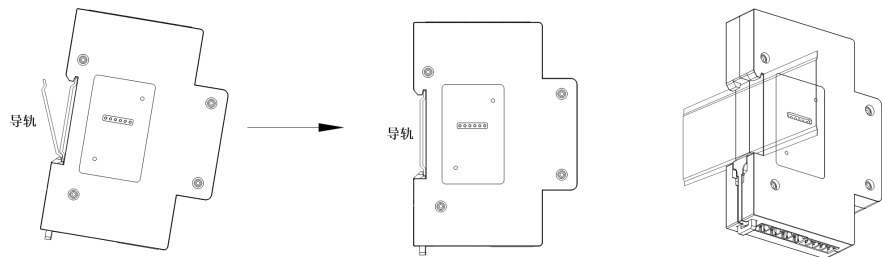
Overall Dimensions: Length × Width × Height

90 $\pm$ 0.5mm×18 $\pm$ 0.5mm×66 $\pm$ 0.5mm(excluding wiring terminals)

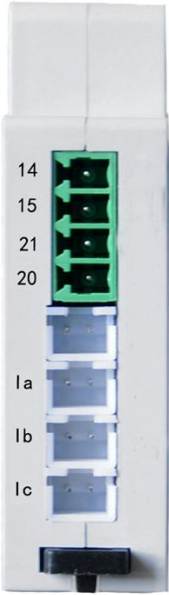
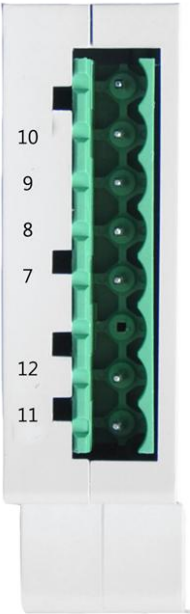
Weight: Approx. 0.08kg

2.2.3 Installation Method

Mounting on standard 35 mm DIN rail



2.3 Terminal Definition



Terminal No.	Definit ion	Remark	Terminal No.	Definiti on	Remark
1、 2	1a	Phase A Current	11	L	AC Live Line
3、 4	1b	Phase B Current	12	N	AC Neutral Line
5、 6	1c	Phase C Current	14	A	RS485-A
7	Ua	Phase A Voltage Input	15	B	RS485-B
8	Ub	Phase B	20	AP+	Active

		Voltage Input			Pulse Output Positive
9	Uc	Phase C Voltage Input	21	AP-	Active Pulse Output Negative
10	Un	Neutral Voltage Input			

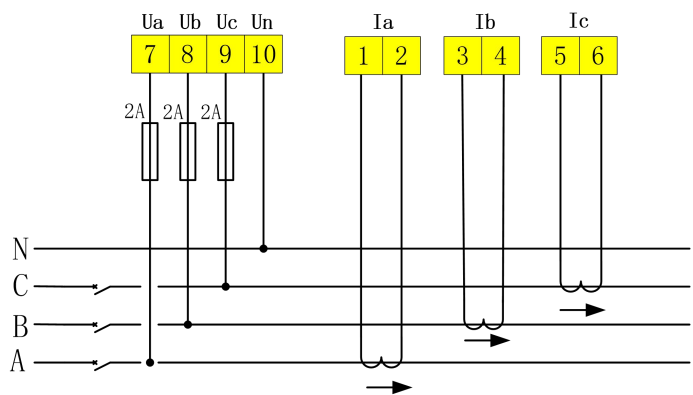
2.4 Wiring Method

2.4.1 Power Supply

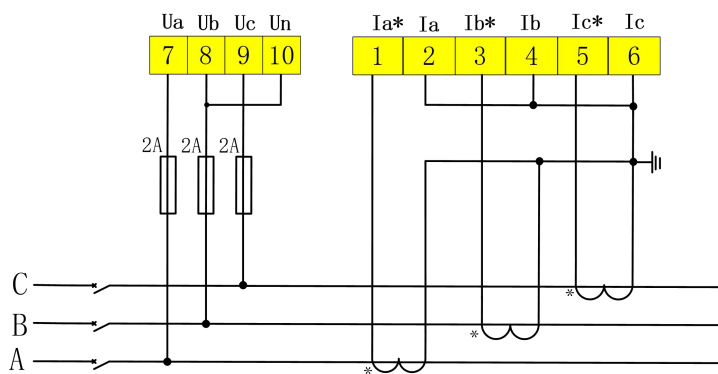
Two optional operating power supply specifications for the meter:

1. AC power supply: Connect live wire to terminal L, neutral wire to terminal N. Power range: AC220V $\pm$ 20%, 50Hz/60Hz.
2. DC power supply: Connect positive pole to terminal L, negative pole to terminal N. Power range: DC24V $\pm$ 20%, DC110–330V.

2.4.2 Voltage & Current Wiring



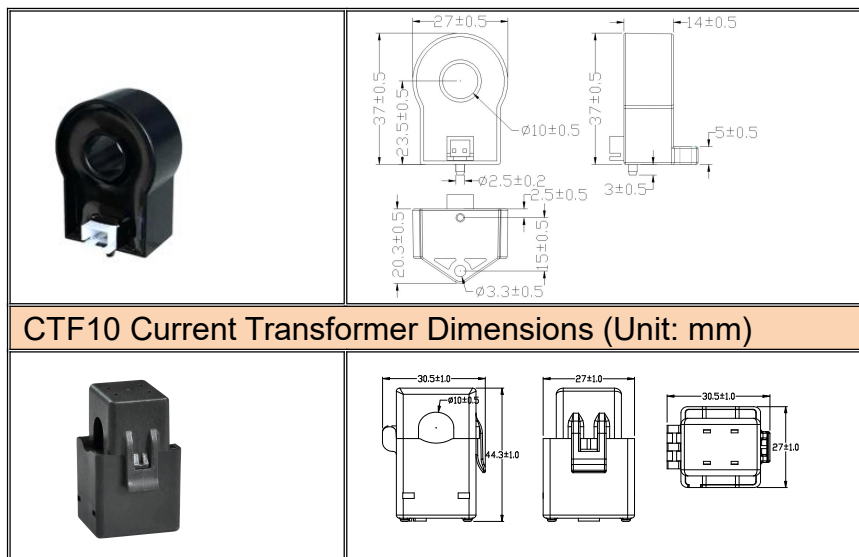
Three-phase four-wire system, direct connection with primary (CT)



Three-phase three-wire system, direct connection with primary CT

Available Transformer Models for Configuration:

CT10 Current Transformer Dimensions (Unit: mm)
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2.4.3 Communication

The RS485 communication port is marked with terminals A and B.

The RS485 communication bus supports a maximum of 32 meters connected on one single trunk line, which connects to the upper computer via an RS485 converter. Ordinary shielded twisted pair cable can be used for communication wiring, and the total cable length shall not exceed 1200 meters. The positive and negative polarity of the RS485 port for each device must be wired correctly.

2.5 Wiring Precautions



- 1) Please comply with the operating power supply range.

Voltage lower or higher than the specified range may cause malfunction or permanent damage to the power circuit.

- 2) The power supply incoming circuit must be protected by a circuit breaker or fuse; a 2A fuse is recommended for series connection.
- 3) CT outputs safety extra-low voltage signals, and its secondary side does not require grounding.
- 4) The input voltage must be kept within the rated voltage range of the device.

Chapter 3 Technical Specifications

3.1 Measurement Accuracy

Parameter	Accuracy Class	Measuring Range
Current	0.5 class for closed-core CT; 1 class for split-core CT	0.05I _b ~1.2I _{max}
Phase Voltage	0.5 class	AC80V~300V
Frequency	±0.02Hz	45Hz~65Hz
Power	1 class for active power; 2 class for reactive power	
Power Factor	±0.02	0~±1.0
Harmonics	Class B for voltage harmonics & current harmonics	2nd ~ 31st order
Energy	1 class for active energy; 2 class for reactive energy	

3.2 Ambient Conditions & Power Supply

Ambient Conditions		
Storage Temperature:-40℃~70℃		Operating Temperature :-10℃~50℃ Limit Temperature :-20℃~55℃
Humidity :5%~95%		
Operating Power Supply		
Max Power Consumption	≤1W	Input Voltage :AC220V±20%,DC24V±20% ,DC110-330V

3.3 Specification Parameters (All parameters subject to nameplate marking)

Reference Voltage (Un)	3×220/380V				
Reference Current Ib (Imax) (A)	3×1.5(6)	3×10(60)	3×20(100)	3×50(200)	3×100(300)
Pulse Constant (imp/kWh)	6400	800	400	200	100
Reference Current Ib (Imax) (A)	3×100(400)	3×150(600)	3×100(800)		
Pulse Constant (imp/kWh)	100	100	50		
Accuracy Class (Energy)	Class 1 for active energy, Class 2 for reactive energy				

Phase Voltage Input	
Per-phase circuit power loss:≤0.2VA	
Current Input	
Per-phase circuit	Continuous overload capacity: 1.2

power loss: ≤0.5VA	times maximum rated current
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Note: Input voltage/current exceeding the rated range will cause permanent damage to the meter. Long-term full-scale operation will also damage the device. Our company shall not be liable for accuracy deviations caused by over-range operation.

3.4 Communication

Communication Parameters	
Communication Port :RS485 2-wire half-duplex	Optional:1200/2400/4800/9600bps; default 9600bps, subject to actual product if customized
Parity Bit : None / Odd / Even;	Default: No parity
Communication Protocol: Modbus-RTU	

3.5 Electrical Characteristics

Electrical Characteristics	
Creepage Test	When 115% of reference voltage is applied with zero current on current circuits, the meter shall output no more than one pulse within the specified test duration
Starting Current	Class 1:0.004Ib
Insulation Resistance	100MΩ/500V
Dielectric Strength (Power Frequency Withstand Voltage)	2kv(r.m.s),50Hz,1min(Voltage, Current, Power supply terminals) 1kv(r.m.s),50Hz,1min(RS485 communication port)

3.6 Electromagnetic Compatibility (EMC)

Electromagnetic Compatibility (EMC)	
Electrical Fast Transient Burst Immunity Test	Standards: GB/T 17626.4; IEC 61000-4-4 Level IV: 2kV for communication

	ports, 4kV for all other ports
Electrostatic Discharge (ESD) Immunity Test	Standards: GB/T 17626.2; IEC 61000-4-2 Level III: 6kV contact discharge, 8kV air discharge
Surge (Lightning Impulse) Immunity Test	Standards: GB/T 17626.5; IEC 61000-4-5 Level IV: 4kV for voltage, current, power & DO ports; 1kV for DI input and RS485 ports
Radiated Radio-Frequency Electromagnetic Field Immunity Test	Standards: GB/T 17626.6; IEC 61000-4-6 Level III: 10V/m

Chapter 4 Maintenance & Troubleshooting

4.1 Troubleshooting

Possible Fault	Possible Cause	Recommended Solution
Indicator light works abnormally after power-on	No power supplied to the device	Check if the correct operating voltage is connected to terminals L and N of the device
Inaccurate measured data after signal input	Incorrect voltage measurement	1. Check if voltage signals are properly wired to the device 2. Verify voltage signals are within the meter's measuring range
	Inaccurate current measurement	1. Check if current signals are properly wired to the device 2. Verify current signals are within the meter's measuring range
	Inaccurate power measurement	1. Confirm phase sequence matching of voltage and current 2. Check if current wiring polarity is correct
Upper computer fails to communicate with the meter	Wrong communication wiring	Inspect whether communication cables are connected correctly
	Incorrect communication parameters	1. Confirm the communication address is correct 2. Verify baud rate and parity bit settings

	Communicati on link interference	1. Check for duplicate device addresses on the same bus 2. Inspect if communication cable is broken
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Note: If any unresolved faults occur, please contact our after-sales service department promptly.

Chapter 5 Quality Warranty

5.1 Warranty Terms

For all new meters sold to customers, we provide free quality warranty against failures caused by defects in design, materials and workmanship within either 12 months after initial power-on operation or 18 months after delivery receipt, whichever comes first. If the product is verified to meet the above warranty criteria, our company will provide free repair service.

5.2 Warranty Exclusions

The following damages or malfunctions are NOT covered by the free warranty:

- Damage caused by improper installation, operation or storage.
- Operation and application conditions exceeding the rated specifications of the product.
- Meters disassembled or repaired by institutions or personnel without official authorization from our company.
- Meters whose free warranty period has expired.

Note: All figures shown herein are for reference only; the actual product shall prevail.



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