PD600-S Series Digital Multi-function Meter

User Manual

ZTW0.464.1916EN

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1．Overview

1.1 Application

The PD600 series three-phase digital multifunction meter (hereinafter referred to as the meter) is designed for real-time measurement and display of key electrical parameters, including voltage, current, active power, reactive power, frequency, power factor, forward/reverse active energy, four-quadrant reactive energy, harmonic content, and demand.

It is widely applied in low-voltage power distribution systems such as incoming switchgear and feeder panels. With integrated measurement, communication, and alarm functions, the meter is suitable for power monitoring applications in power systems, telecommunications, and building infrastructure

Compliance with International Standards:

- IEC 61557-12: Electrical safety in low voltage distribution systems up to 1,000 V AC and 1,500 V DC - Equipment for testing, measuring or monitoring of protective measures - Part 12: Power metering and monitoring devices (PMD)
- IEC 62052-11: Electricity metering equipment - General requirements, tests and test conditions - Part 11: Metering equipment
- IEC 62052-21: Electricity metering equipment (AC) - General requirements, tests and test conditions - Part 21: Tariff and load control equipment
- IEC 62053-23:2020 Electricity metering equipment - Particular requirements - Part 23: Static meters for reactive energy (classes 2 and 3)

1.2 Features

1)Electrical Parameter Measurement: Voltage, current, power, frequency, power factor, and total harmonic distortion (THD).

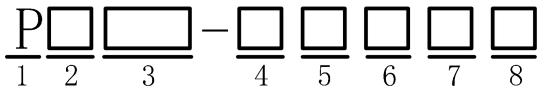
2)Energy Measurement and Storage: Forward and reverse active energy, four-quadrant reactive energy,

and multi-tariff energy measurement (for PD600 3H).

3)RS485 Interface: Supports Modbus RTU and DL/T 645 communication protocols.

4)Digital Input/Output: Supports digital input and output (alarm) and relay output.

1.3Naming rules



① Product category: CHINT mounted digital display electrical measuring instrument

② Group Code: D - Multifunction Meter

③ Model number: 600

④ Panel size code:

2-72mm×72mm, 3 - 96mm×96mm, 6 - 80mm×80mm

⑤ Wiring method: S: three-phase AC

⑥ Auxiliary feature selection

K - Switching input/output, T-Dual RS485

⑦ Display mode: 3 - LCD display, 4 - segment numeric display

⑧ Tariff function: Blank- Without Tariff, H - 8 tariffs

1.4 Environmental Conditions

Rated operating temperature range: -25 ℃~ + 55 ℃

Storage temperature limit: -30 ℃~ + 70 ℃

Relative humidity: annual average < 93%, non-condensing, no corrosive gases

Atmospheric pressure: 86kPa to 106kPa.

2． Working principle

2.1 Overview

The meter adopts a modular design. Optional auxiliary functions can be configured as required. The unit is panel-mounted and secured by mounting clips, allowing convenient installation.

The dedicated metering chip samples the voltage and current signals and performs real-time calculation. The MCU processes the metering data and drives the display.

Based on the user configuration, the meter supports alarm output when the measured value exceeds the preset upper or lower limit. Communication with the host system is supported via the RS485 interface for data acquisition and network integration.

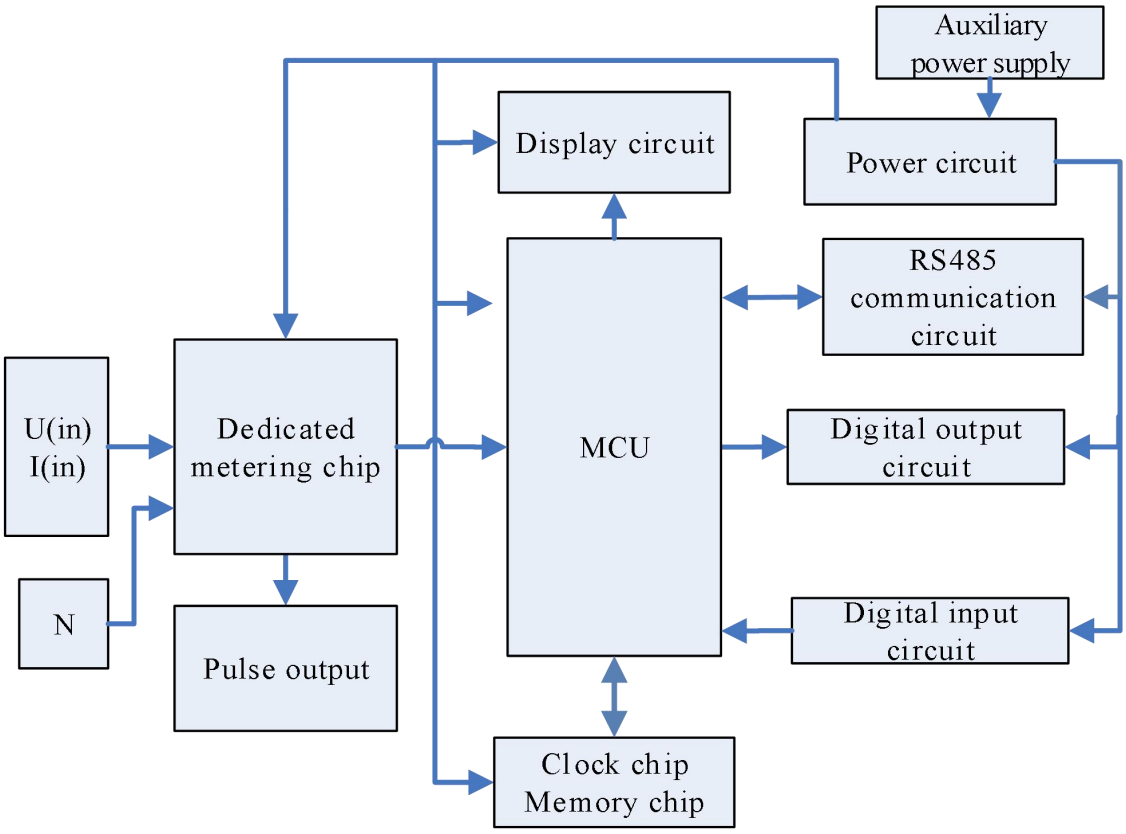


Figure 1 Working Principle

2.2 Main function module principle

2.2.1 Metering Module

The metering ASIC (Application-Specific Integrated Circuit) integrates six-channel, second-order Σ-Δ (Sigma-Delta) A/D converter, a reference voltage circuit, and digital signal processing (DSP) for measuring power, energy, RMS values, power factor, and frequency. This metering chip supports meaurement of active power, reactive power, apparent power, active energy, reactive energy, and apparent energy of each phase and the total (combined) system.

In addition, it measures electrical parameters such as the RMS voltage and current, power factor, phase angle, and frequency for each phase, meeting the requirements of electric energy meters metering applications. The chip provides an SPI interface for communication with the management MCU, enabling transfer of metering data and calibration parameters.

2.2.2 Data processing Module

The management MCU periodically reads electrical parameters such as current, voltage, and power from the metering chip. Based on the acquired data, it determines the current energy quadrant and identifies the active tariff according to the configured time-of-use (TOU) schedule.

The MCU accumulates energy data into the corresponding quadrant registers and total energy registers according to the applicable tariff and quadrant classification. It also calculates combined energy values based on the configured energy combination method, and performs data storage and backup functions.

In addition, the management MCU controls the display and communicates with external devices via the RS485 communication interface.

Note:

The tariff-related functions are only supported by PD600-S3H.

3．Main Technical Parameters

Table 2 Main Technical Parameters

Technical Parameters		Specification
Electrical Characteristics	Wiring system	Three-phase four-wire, three-phase three-wire
	Voltage rating	AC 3×600V, (Customizable) , 50Hz/60Hz
	Voltage overload capacity	Continuous: 1.2 × Un Instantaneous: 2 × Un for 5s
	Voltage input power consumption	≤ 1VA per phase
	Voltage input impedance	> 500kΩ
	Current rating	AC 5A
	Current overload capacity	Continuous: 1.2 × In Instantaneous: 10 × In for 5s
	Current input power consumption	≤ 1VA per phase
	Current input Impedance	＜ 20mΩ per phase
	Frequency range	45Hz to 65Hz
Power Supply	Supply voltage range	AC/DC 85V to 264V, 50Hz/60Hz
	Power consumption	Active power ≤ 3W,

Technical Parameters		Specification		
		Apparent power ≤ 15VA		
Clock (Optional)	Backup battery capacity	/		
	Clock accuracy (daily error)	/		
Measurement Accuracy	Display	Segment code LCD or 7-segment LED display		
	Voltage	Class 0.5	Resolution 0.1V	IEC 61557-12
	Current	Class 0.5	Resolution 0.001A	
	Frequency	Class 0.5	Resolution 0.001Hz	
	Active power	Class 0.5	Resolution 0.1W	
	Reactive power	Class 1	Resolution 0.1Var	
	Power factor	Class 0.5	Resolution 0.001	
	Active energy	Class C	Resolution 0.01kWh	IEC 62052-21
	Reactive energy	Class 2	Resolution 0.01kVarh	IEC 62053-23
	Energy accumulation	Support positive and reverse active energy metering, four-quadrant reactive energy Measurement		
	Multi-tariff energy (Optional)	Support multi- tariff energy measurement, up to 8 tariff.		
	Maximum Demand Recording	Support positive, negative and total maximum demand records, demand period and. integration time configurable		
	Pulse output	Active energy pulse: 3200 imp/kWh, Reactive energy pulse: 3200imp/kVarh		
	Multi-function output	Provide active power, reactive power, and open-collector pulse output with optocoupler isolation, power pulse width: 80±16ms.		

Power Quality	Total harmonic distortion (THD)	Voltage THD	Condition	Accuracy
			Uh≥3%Un	±5% of Uh
			Uh＜3%Un	±0.15% of Uh
		Current THD	Ih≥10%In	±5% of Ih
			Ih＜10%In	±0.15% of Ih
		UN is the nominal voltage and IN is the nominal current Uh is the harmonic voltage and Ih is the harmonic current		
Auxiliary Functions	Communication Protocol		Modbus-RTU or DL/T645-2007	
	Digital Input (DI)(Optional)		Supports 4 channels of passive dry contact inputs.	
	Digital Output (Alarm)(Optional)		Supports relay status output Relay contact capacity: AC250V/2A, DC30V/2A	

Note:

- For other performance indicators, refer to the indoor Table requirements of IEC 61557-12.
- Additional functions for PD600-3S: 4 channels of digital input and 2 channels of alarm output.

Table 3 Electromagnetic Compatibility and Safety

Electrical Safety	Dielectric Withstand Voltage (AC)	2 kV AC, 50/60 Hz, 1 minute, leakage current ≤ 5 mA (between circuits > 40 V and ≤ 40 V)
	Impulse withstand Voltage	±4kV 1.2/50μs impulse voltage (10 pulse per polarity)
	Insulation Resistance	>100MΩ. ≥ 100 MΩ (500 V DC), between input/output circuits and enclosure
	Data Retention During Power Failure	≥10 years
Electromagnetic Compatibility (EMC)	Electrostatic Discharge (ESD)	IEC 61000-4-2, Level 4 – 8 kV contact, 15 kV air
	Radiated RF Electromagnetic Field Immunity	IEC 61000-4-3 Level 3 (10V/m)
	Electrical Fast Transient/Burst (EFT/Burst)	IEC 61000-4-4 Level 4 - 4kV, 5kHz
	Surge Immunity	IEC 61000-4-5 Level 4 - 4kV (1.2/50 μs)
	Conducted RF Immunity	IEC 61000-4-6 Level 3 - 150kHz to 80MHz, 10V
	Damped Oscillatory Wave Immunity	IEC 61000-4-18 Level 3 - Common mode 2.5kV, differential mode 1kV
	Radiated and conducted emissions	CISPR 32, Class B

4. Functions

4.1 Display

The display provides real-time electrical measurements and energy data.

The display layout and available parameters may vary depending on the product mode

4.1.1 segment LED display Interface

Use the "∨" or "∧" key to switch the display interface. The negative sign indicates reverse direction.

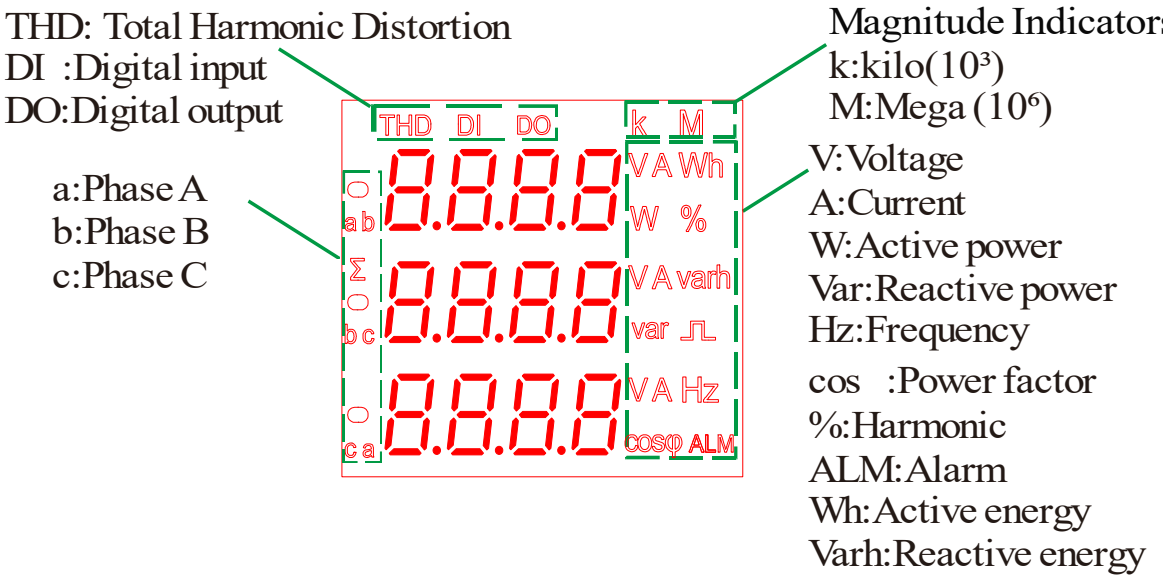


Figure 2 Display Interface

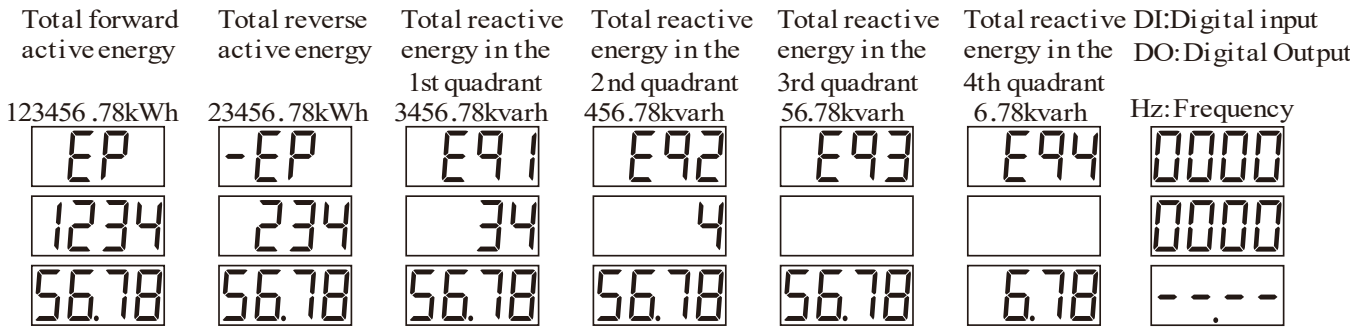


Figure 3 Segment LED display interface

Table 4 Description of 7-segment LED display pages

Interface Number	Display Reading	Unit Indicator	Symbol Indicator	Description
1	5	A	/	Phase A current 5.000A
	5	A	/	Phase B current 5.000A
	5	A	/	Phase C current 5.000A
2	220.1	V	/	Phase A voltage 220.1V
	220	V	/	Phase B voltage 220.1V

Interface Number	Display Reading	Unit Indicator	Symbol Indicator	Description
	220	V	/	Phase C voltage 220.1V
3	550.1	W	-	Total active power -500.1W
	952.6	Var	/	Total reactive power 952.6Var
	0.501	Cosφ	-	Total power factor -0.501
4	550.1	W	/	Phase A active power 550.1W
	550.2		/	Phase B active power 550.2W
	550.3		/	Phase C active power 550.3W
5	550.1	Var	/	Phase A reactive power 550.1Var
	550.2		/	Phase B reactive power 550.2Var
	550.3		/	Phase C reactive power 550.3Var
6	1	Cosφ	-	Phase A power factor -1.000
	0.501		-	Phase B power factor -0.501
	1		/	Phase C power factor 1.000
7	0	/	/	Digital input
	0	/	/	Digital output
	50	Hz	/	Frequency

4.1.2 Segment LCD Display Interface

Use the "∨" or "∧" key to switch the display interface. Press the Esc key to switch to the energy display page.

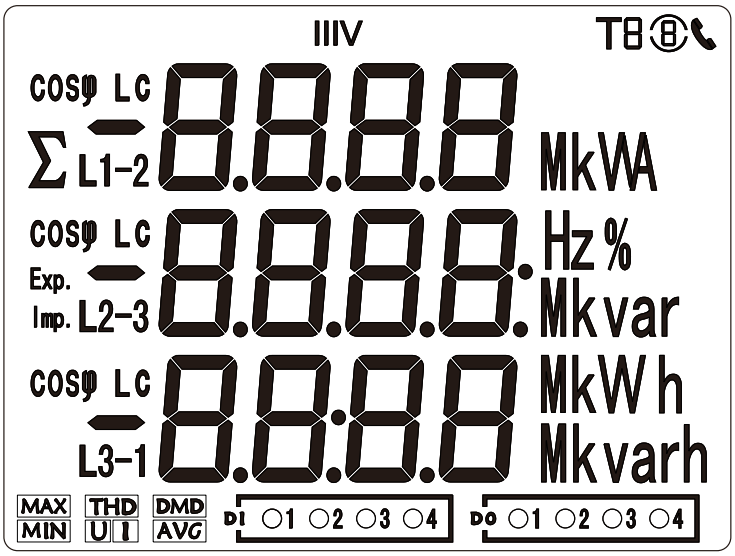


Figure 4 Segment LCD display overview

Table 5 - Meaning of segment LCD symbols

Number	Symbol	Meaning	Number	Symbol	Meaning
1	V	Voltage	15	MWh	Megawatt-hour (active energy)
2	A	Current	16	Mvar	Megavolt-ampere (reactive energy)
3	W	Active power	17	Imp	Import
4	var	Reactive power	18	Exp	Export
5	Hz	Frequency	19	THD	Total harmonic distortion
6	k	Kilo (10^3)	20	DMD	Demand
7	M	Mega (10^6)	21	AVG	Average value
8	L	Inductive power factor	22	MAX	Maximum value
9	C	Capacitive power factor	23	MIN	Minimum value
10	Cosφ	Power factor	24	DI	Digital input
11	Σ	Total (Three-phase)	25	DO	Digital output
12	L1 , L2 , L3	Phase indicators	26	T	Tariff
13	kWh	Kilowatt hour (active energy)	27	IV	Four-quadrant energy
14	kvar	Reactive energy			

4.2 Programming

4.2.1 Parameter Description

In programming mode, the meter menu is organized in a three-level hierarchical structure. The default password is 701. If an incorrect password is entered, parameters can be viewed but cannot be modified. The password can only be changed via communication.

Table 6 Programming menu

Level1Menu	Level2Menu	Level3Menu	Description
SYS	IrAt	1～9999	**Current ratio (CT ratio)** Sets the current transformer (CT) ratio. When a CT is used: IrAt = Rated primary current / Rated secondary current When directly connected (no CT), set IrAt = 1.

Level1Menu	Level2Menu	Level3Menu	Description
	UrAt	0.1~ 999.9	**Voltage ratio (VT/PT ratio)** Sets the voltage transformer (VT/PT) ratio. When a VT/PT is used: UrAt = Rated primary voltage / Rated secondary voltage When directly connected (no VT/PT), set UrAt = 1.
	nEt	n.34 n.33	Wiring method selection: n.34: represents three-phase four-wire, n.33: represents three-phase three-wire
	codE	701	Programming password Used to access programming mode.
	d ISP	0～30	Display auto-rotation time (seconds) 0: Fixed display, 1~ 30 : Automatic page rotation interval
	bLCd	0～30	Backlight timeout (Minutes) 0: Always on, 1~ 30: Backlight turns off after the set time without key operation
	PLuS	0～4	Pulse output selection: 4-Active Energy pulse, 3-Reactive Energy pulse
ALnn	ALxP	0～26	OUTx (Alarm output object selection)Select the measurement parameter assigned to alarm output x. Refer to the table “Alarm and Transmission Output Mapping”.
	ALxL	0～100.0	OUTx (Lower limit alarm) Sets the lower alarm threshold as a percentage of the measurement range. The configured value must be less than the corresponding upper alarm limit. Condition:ALx.L ≤ ALx.H
	ALxH	0～150.0	OUTx (Upper limit alarm): This parameter sets the upper limit alarm threshold of output OUTx. It shall be configured together with the corresponding lower limit alarm threshold (ALxL). The alarm threshold is defined as a percentage of the measurement full-scale range. The following condition shall be satisfied:ALxH ≥ ALxL + dF Where: ALxH – Upper limit alarm threshold ALxL – Lower limit alarm threshold

Level1Menu	Level2Menu	Level3Menu	Description
			dF – Hysteresis value When the measured value exceeds ALxH and the delay time (dt) elapses, OUTx generates an upper limit alarm. When the measured value falls below (ALxH – dF), the upper limit alarm is cleared. Setting ALxH to the maximum allowable value disables the upper limit alarm function of OUTx.
	dF	0～50.0	Alarm hysteresis: To prevent frequent alarm output switching near the alarm threshold, a hysteresis value can be set. The setting value is defined as a percentage of the measurement full-scale range. Refer to the ALxL and ALxH parameter descriptions.
	dt	0～99.9	Alarm delay time (seconds): To prevent false alarms caused by short-term fluctuations of the input signal, a delay time can be configured for the alarm action. Refer to the ALxL and ALxH parameter descriptions.
Conn	Adr1	1～247	Communication address: Sets the RS485 communication address of the meter. The address must be unique on the communication bus.
	bPS1	1.200 2.400 4.800 9.600 19.20	Baud rate: 1.200: 1200bps, 2.400: 2400bps, 4.800: 4800bps, 9.600: 9600bps, 19.20: 19200bps
	PtL1	MrtU 645	Communication protocol: MrtU: Modbus-RTU 645: DL/T 645-2007
	PAr1	n.1 n.2 E.1 o.1	Parity and stop bit setting n.1: No parity, 1 stop bit n.2: No parity, 2 stop bits E.1: Even parity, 1 stop bit o.1: Odd parity, 1 stop bit
	Adr2	1～247	Communication address: Sets the RS485 communication address of the meter.

Level1Menu	Level2Menu	Level3Menu	Description
			The address must be unique on the communication bus.
	bPS2	1.200 2.400 4.800 9.600 19.20	Baud rate: 1.200: 1200bps, 2.400: 2400bps, 4.800: 4800bps, 9.600: 9600bps, 19.20: 19200bps
	PtL2	MrtU, 645	Communication protocol: MrtU: Modbus-RTU 645: DL/T 645-2007
	PAr 1	n.1 n.2 E.1 o.1	Parity and stop bit setting n.1: No parity, 1 stop bit n.2: No parity, 2 stop bits E.1: Even parity, 1 stop bit o.1: Odd parity, 1 stop bit

Note:

- x represents channel numbers 1 to 4 (corresponding to the 1st to 4th channels).
- The product of the voltage transformer (VT) ratio and current transformer (CT) ratio shall not exceed 2,500,000.
- If "----" is displayed, it indicates that the configured transformer ratio exceeds the allowable limit. Adjust the external transformer ratio accordingly.
- The second RS485 interface is optional. If not provided, the corresponding serial communication settings will not be available.
- Available functions may vary depending on the model. Refer to the specific product configuration.

Table 7 Alarm and Transmission Output Mapping

AL1P～AL4P Sd1P～Sd4P		Output Object	Measurement Value Formula	
No	Code		For 3P4W (n.34)	For 3P3W (n.33)
0		No alarm or transmission output	/	/
1	UA	Phase A voltage (Ua)	U×UrAt	/
2	Ub	Phase B voltage (Ub)	U×UrAt	/

AL1P～AL4P Sd1P～Sd4P		Output Object	Measurement Value Formula	
No	Code		For 3P4W (n.34)	For 3P3W (n.33)
3	UC	Phase C voltage (Uc)	U×UrAt	/
4		Line voltage between phases A and B (Uab)	/	U×UrAt
5		Line voltage between phases B and C (Ubc)	/	U×UrAt
6	UCA	Line voltage between phases C and A (Uca)	/	U×UrAt
7	IA	Phase A current (Ia)	I×IrAt	I×IrAt
8	Ib	Phase B current (Ib)	I×IrAt	I×IrAt
9	IC	Phase C current (Ic)	I×IrAt	I×IrAt
10	PA	Phase A active power (Pa)	U×UrAt×I×IrAt	U×UrAt×I×IrAt× $\sqrt{3}$ ÷2
11	Pb	Phase B active power (Pb)	U×UrAt×I×IrAt	/
12	PC	Phase C active power (Pc)	U×UrAt×I×IrAt	U×UrAt×I×IrAt× $\sqrt{3}$ ÷2
13	Pt	Total Active Power (Pt)	U×UrAt×I×IrAt×3	U×UrAt×I×IrAt× $\sqrt{3}$
14	qA	Phase A reactive power (Qa)	U×UrAt×I×IrAt	U×UrAt×I×IrAt× $\sqrt{3}$ ÷2
15	qb	Phase B reactive power (Qb)	U×UrAt×I×IrAt	/
16	qC	Phase C reactive power (Qc)	U×UrAt×I×IrAt	U×UrAt×I×IrAt× $\sqrt{3}$ ÷2
17	qt	Total reactive power (Qt)	U×UrAt×I×IrAt×3	U×UrAt×I×IrAt× $\sqrt{3}$
18	SA	Phase A apparent power (Sa)	/	/
19	Sb	Phase B apparent power (Sb)	/	/
20	SC	Phase C apparent power (Sc)	/	/
21	St	Total apparent power (St)	/	/
22	PFA	Phase A power factor (PFA)	1	/
23		Phase B power factor (PFB)	1	/
24		Phase C power factor (PFC)	1	/

AL1P～AL4P Sd1P～Sd4P		Output Object	Measurement Value Formula	
No	Code		For 3P4W (n.34)	For 3P3W (n.33)
25	PFt	Total power factor (PFT)	1	1
26	FrEq	Frequency (Freq)	65Hz (upper limit of range) -45Hz (lower limit of range) = 20Hz	

Note:

U is the measured voltage, I is the measured current, UrAt is the voltage transformer ratio, IrAt is the current transformer ratio.

The measurement value is calculated using the corresponding scaling factors.

For alarm comparison, the absolute value of the measured parameter is used (except for power factor).

The sign of the measured value is ignored unless otherwise specified.

Power Factor (PF) Alarm Setting

For power factor alarms:

- ALxH – Upper limit setting for relay alarm output,Effective when PF > 0 (quadrants I and III, inductive).
- ALxL – Lower limit setting for relay alarm output,Effective when PF < 0 (quadrants II and IV, capacitive).

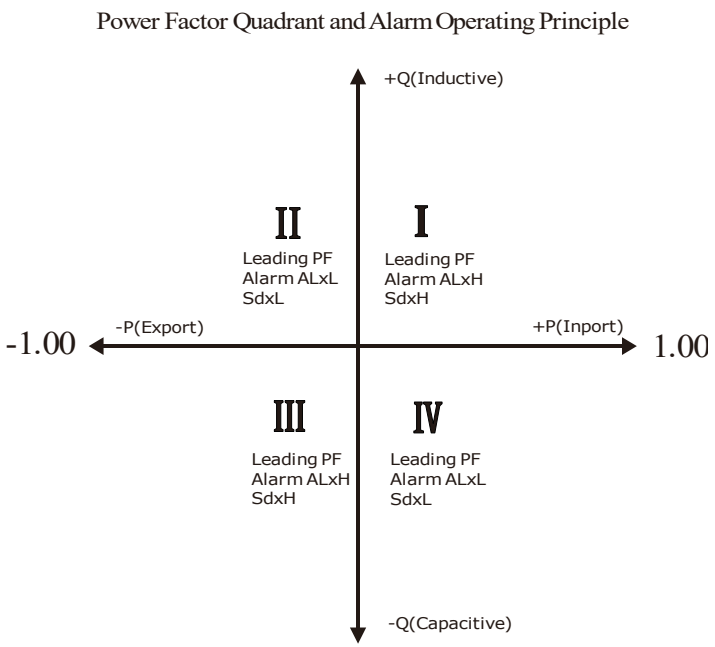


Figure 5 Power factor quadrant and Alarm operating Principle

Single Relay Alarm Explanation

The relay alarm operates according to the power factor (PF) value in each quadrant.

- Quadrant I (+P, +Q – Lagging PF):When PF < ALxH, the relay operates (closes).
- Quadrant II (−P, +Q – Leading PF):When PF < ALxL, the relay operates (closes).
- Quadrant III (−P, −Q – Lagging PF):When PF < ALxH, the relay operates (closes).
- Quadrant IV (+P, −Q – Leading PF):When PF < ALxL, the relay operates (closes).

Alarm Reset Condition

A hysteresis value dF is applied to prevent frequent switching.

- When PF > ALxL + dF, the lower limit alarm is cleared.Setting ALxL to the minimum value disables the lower limit alarm.
- When PF > ALxH + dF, the upper limit alarm is cleared.Setting ALxH to the maximum value disables the upper limit alarm.

4.2.2 Programming Operation

Key functions

- SET – Confirm (OK) or move the cursor when entering numbers
- ESC – Exit
- ▼ – Decrease value

- ▲ – Increase value

Enter the password (default: 701) to access the System Settings menu.

For meters with only two display rows, the first row is temporarily hidden when the third row is used for parameter editing.

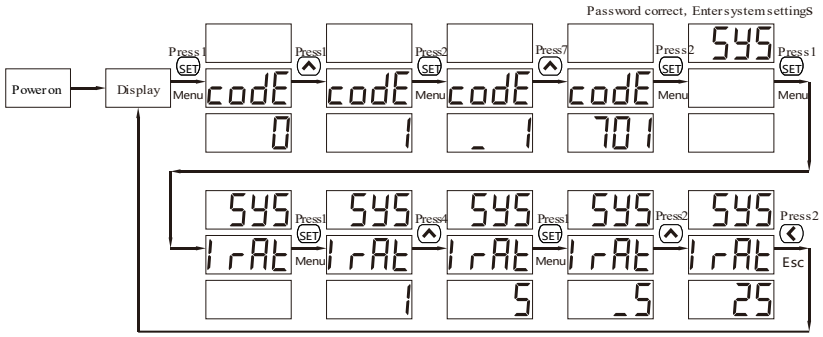


Figure 6 Current transformation ratio setting (example: Setting the CT ratio to 25)

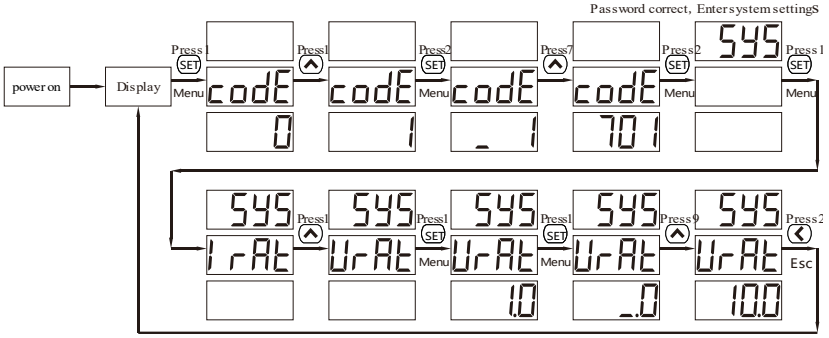


Figure 7 Voltage ratio setting (example: Setting the voltage ratio to 10.0)

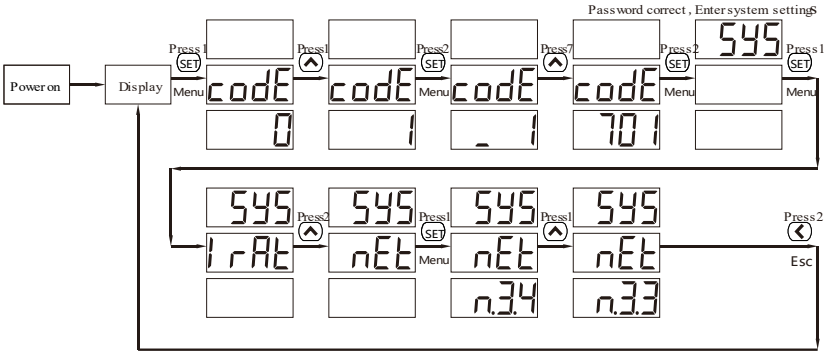


Figure 8 Wiring configuration setting (example: three-phase three-wire)

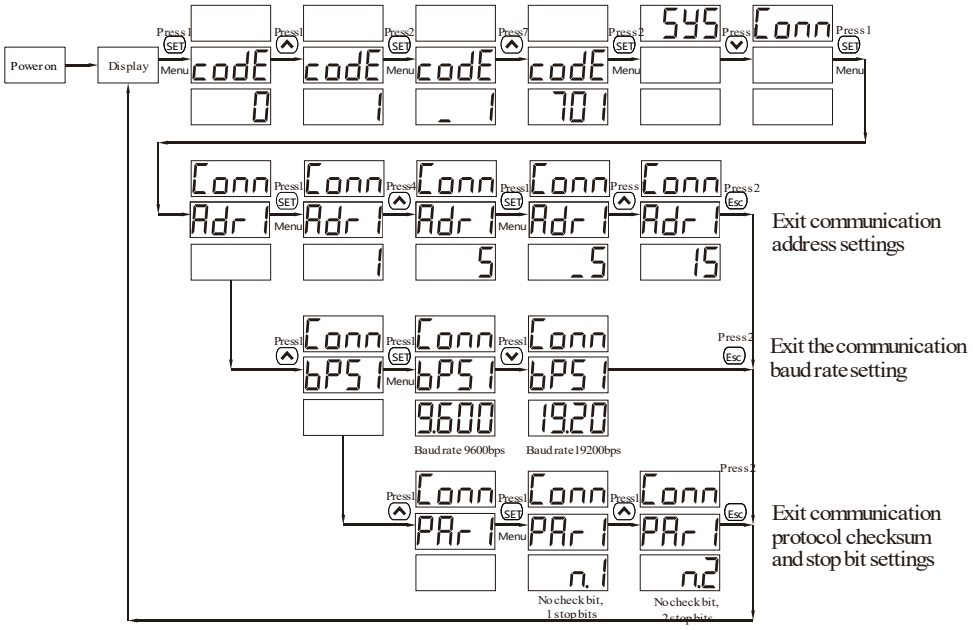


Figure 9 Communication parameter setting

4.3 Communication Functions

The meter supports two communication protocols: Modbus RTU and DL/T 645, which can be selected through programming.

Features of the DL/T 645 protocol

- Supports reading and writing of the identification code, communication address, and baud rate.
- Supports reading forward and reverse active energy, four-quadrant reactive energy, and total active energy.
- Supports reading voltage, current, active power, reactive power, power factor, frequency, and time.
- Supports configuration of the communication address, meter number, time zone, and tariff period parameters.

Event recording is not supported. For details, refer to the DL/T 645 protocol specification.

Refer to the following tables for communication protocol details. The Modbus register table lists the commonly used register addresses.

Factory default settings:

- Protocol: Modbus RTU
- Parity/Stop bit: N,1
- Baud rate: 9600 bps
- Device address: 1

In the Modbus RTU protocol, the read command is 03H and the write command is 10H.

Table 8 Modbus Protocol Address Table

Address	Code	Description	Type	Unit	Length	Access
Keyboard parameters (see the description of programming parameters for specific functions, the actual value of the parameter with (*) = the value of the communication parameter × 0.1)						
0x0000	REV.	Version number	INT16	/	1	R
0x0001	UCode	Programming password codE (1~ 9999)	INT16	/	1	R/W
0x0002	ClrE	Power zero CLr. E (1: Power zero)	INT16	/	1	R/W
0x0003	net	Network selection 0 = 3-phase 4-wire 1 = 3-phase 3-wire	INT16	/	1	R/W
0x0006	IrAt	Current Transformer Rate IrAt (1~ 9999)	INT16	/	1	R/W
0x0007	UrAt	Voltage Transformer Ratio UrAt (*) (1~ 9999 indicates voltage conversion ratio 0.1~ 999.9)	INT16	/	1	R/W
0x0009	PLUS	Pulse output	INT16	/	1	R/W
0x000A	Disp	Rotation time (Seconds)	INT16	/	1	R/W
0x000B	B.LCD	Backlight time control (Minutes)	INT16	/	1	R/W
0x000D	AL1P	OUT1 Single relay alarm output object selection AL1P	INT16	/	1	R/W
0x000E	AL1L	OUT1 lower limit alarm point AL1L (*)	INT16	/	1	R/W
0x000F	AL1H	OUT1 upper limit alarm point AL1H (*)	INT16	/	1	R/W
0x0010	AL2P	OUT2 Single relay alarm output object selection AL2P	INT16	/	1	R/W
0x0011	Al2L	OUT2 lower limit alarm point AL2L (*)	INT16	/	1	R/W
0x0012	AL2H	OUT2 upper limit alarm point AL2H (*)	INT16	/	1	R/W
0x0013	AL3P	OUT3 Single relay alarm output object selection AL3P	INT16	/	1	R/W
0x0014	AL3L	OUT3 lower limit alarm point AL3L (*)	INT16	/	1	R/W
0x0015	AL3H	OUT3 upper limit alarm point AL3H (*)	INT16	/	1	R/W
0x0016	AL4P	OUT4 Single relay alarm output object selection AL4P	INT16	/	1	R/W
0x0017	AL4L	OUT4 lower limit alarm point AL4L (*)	INT16	/	1	R/W
0x0018	AL4H	OUT4 upper limit alarm point AL4H (*)	INT16	/	1	R/W
0x0019	dF	Alarm hysteresis difference dF (*)	INT16	/	1	R/W

Address	Code	Description	Type	Unit	Length	Access
0x001A	dt	Alarm delay time dt (*)	INT16	/	1	R/W
0x001B 0x0027	REV.	Reserved	INT16	/	1	R/W
0x0028	DI	Digital input status. Bits 0–3 correspond to DI1–DI4 respectively (Actual number of channels depends on the product). 0 = input open 1 = input active.	INT16	/	1	R
0x0029	REV.	Reserved	INT16	/	1	R
0x002A	DO	Single relay output status. Bits 0–3 correspond to alarm outputs 1–4. 0 = relay open 1 = relay closed. When ALxP (x = 1–4) = 0, bits 0–3 can be written via communication (remote control mode).	INT16	/	1	R/W
0x002B	REV.	Reserved	INT16	/	1	R/W
0x002C	Protocol1	Communication protocol selection for serial port 1: 0 = Modbus 1 = DL/T 645-2007	INT16	/	1	R/W
0x002D	bAud1	Baud rate of serial port 1: 0 = 1200 1 = 2400 2 = 4800 3 = 9600 4 = 19200	INT16	/	1	R/W
0x002E	Addr1	Communication address of serial port 1 (1–247)	INT16	/	1	R/W
0x002F	Second	Time (seconds)	INT16	/	1	R/W
0x0030	Minute	Time (minutes)	INT16	/	1	R/W
0x0031	Hour	Time (hours)	INT16	/	1	R/W
0x0032	Day	Time (day)	INT16	/	1	R/W
0x0033	Month	Time (month)	INT16	/	1	R/W
0x0034	Year	Time (year)	INT16	/	1	R/W

Address	Code	Description	Type	Unit	Length	Access
0x0035	SN_L	Serial Number For example: SN –202603110123 SN_H –2026 SN_M –0311 SN_L –0123	INT16	/	1	R
0x0036	SN_M		INT16	/	1	R
0x0037	SN_H		INT16	/	1	R
0x0040	Parity1	Serial port 1 parity and stop bit configuration 0 = None, 1 stop bit (N,1) 1 = None, 2 stop bits (N,2) 2 = Even parity, 1 stop bit (E,1) 3 = Odd parity, 1 stop bit (O,1)	INT16	/	1	R/W
0x0041	Protocol2	Serial port 2 protocol selection 0 = Modbus 1 = DL/T 645-2007	INT16	/	1	R/W
0x0042	Parity2	Serial port 2 parity and stop bit configuration 0 = None, 1 stop bit (N,1) 1 = None, 2 stop bits (N,2) 2 = Even parity, 1 stop bit (E,1) 3 = Odd parity, 1 stop bit (O,1)	INT16	/	1	R/W
0x0043	bAud2	Baud rate of serial port 2: 0 = 1200 1 = 2400 2 = 4800 3 = 9600 4 = 19200	INT16	/	1	R/W
0x0044	Addr2	Serial port 2 communication address (1–247)	INT16	/	1	R/W
Secondary-side electrical measurements						
0x2000	Uab	Line voltage Uab	FLOAT32	0.1V	2	R
0x2002	Ubc	Line voltage Ubc	FLOAT32	0.1V	2	R
0x2004	Uca	Line voltage Uca	FLOAT32	0.1V	2	R
0x2006	Ua	A-Phase voltage Ua	FLOAT32	0.1V	2	R
0x2008	Ub	B-Phase voltage Ub	FLOAT32	0.1V	2	R
0x200A	Uc	C-Phase voltage Uc	FLOAT32	0.1V	2	R

Address	Code	Description	Type	Unit	Length	Access
0x200C	Ia	A-Phase current Ia	FLOAT32	0.001A	2	R
0x200E	Ib	B-Phase current Ib	FLOAT32	0.001A	2	R
0x2010	Ic	C-Phase current IC	FLOAT32	0.001A	2	R
0x2012	Pt	Combined active power	FLOAT32	0.1W	2	R
0x2014	Pa	A-phase active power	FLOAT32	0.1W	2	R
0x2016	Pb	B-phase active power (Invalid when three-phase three-phase)	FLOAT32	0.1W	2	R
0x2018	Pc	C-phase active power	FLOAT32	0.1W	2	R
0x201A	Qt	Combined reactive power	FLOAT32	0.1Var)	2	R
0x201C	Qa	A-phase reactive power	FLOAT32	0.1Var)	2	R
0x201E	Qb	B-phase reactive power (Invalid when three-phase three-phase)	FLOAT32	0.1Var)	2	R
0x2020	Qc	C-phase reactive power	FLOAT32	0.1Var)	2	R
0x2022	St	Combined apparent work power	FLOAT32	0.1VA	2	R
0x2024	Sa	A phase at work power	FLOAT32	0.1VA	2	R
0x2026	Sb	B phase at work power	FLOAT32	0.1VA	2	R
0x2028	Sc	C phase at work power	FLOAT32	0.1VA	2	R
0x202A	PFt	combined power factor (Positive: Perceptual, Negative: Compatible)	FLOAT32	0.001	2	R
0x202C	PFa	A phase power factor (Positive: Perceptual, Negative: Compatible) (Invalid when three-phase and three-wire)	FLOAT32	0.001	2	R
0x202E	PFb	B phase power factor (Positive: Perceptual, Negative: Compatible) (Invalid when three-phase and three-wire)	FLOAT32	0.001	2	R
0x2030	PFc	C phase power factor (Positive: Perceptual, Negative: Compatible) (Invalid when three-phase and three-wire)	FLOAT32	0.001	2	R
0x2038	UWDa	A phase voltage total harmonic content	FLOAT32	0.01%	2	R
0x203A	UWDb	B phase voltage total harmonic content	FLOAT32	0.01%	2	R
0x203C	UWDc	C phase voltage total harmonic content	FLOAT32	0.01%	2	R

Address	Code	Description	Type	Unit	Length	Access
0x203E	IWDa	A Phase current total harmonic content	FLOAT32	0.01%	2	R
0x2040	IWDb	B Phase current total harmonic content	FLOAT32	0.01%	2	R
0x2042	IWDc	C Phase current total harmonic content	FLOAT32	0.01%	2	R
0x2044	Freq	Frequency in Hz	FLOAT32	0.01 Hz	2	R
0x2050	DmPt	Total active power demand	FLOAT32		2	R
Electric energy secondary side data						
0x101E	ImpEp	(Current) total forward active energy	FLOAT32	kWh	2	R
0x1020	ImpEpT1	(Current) Forward Active Rate 1 Electricity	FLOAT32	kWh	2	R
0x1022	ImpEpT2	(Current) Forward Active Rate 2 Electricity	FLOAT32	kWh	2	R
0x1024	ImpEpT3	(Current) Forward Active Rate 3 Electricity	FLOAT32	kWh	2	R
0x1026	ImpEpT4	(Current) Forward Active Rate 4 Electricity	FLOAT32	kWh	2	R
0x1028	ExpEp	(Current) Total reverse active power	FLOAT32	kWh	2	R
0x102A	ExpEpT1	(Current) Reverse Active Power Rate 1 Electricity	FLOAT32	kWh	2	R
0x102C	ExpEpT2	(Current) Reverse Active Power Rate 2 Electricity	FLOAT32	kWh	2	R
0x102E	ExpEpT3	(Current) Reverse Active Power Rate 3 Electricity	FLOAT32	kWh	2	R
0x1030	ExpEpT4	(Current) Reverse Active Power Rate 4 Electricity	FLOAT32	kWh	2	R
0x1032	Q1Eq	(Current) Total reactive energy in the first quadrant	FLOAT32	kvarh	2	R
0x1034	Q1EqT1	(Current) 1st Quadrant Reactive Power Rate 1 Electricity	FLOAT32	kvarh	2	R
0x1036	Q1EqT2	(Current) 1st Quadrant Reactive Power Rate 2 Electricity	FLOAT32	kvarh	2	R
0x1038	Q1EqT3	(Current) 1st Quadrant Reactive Power Rate 3 Electricity	FLOAT32	kvarh	2	R
0x103A	Q1EqT4	(Current) 1st Quadrant Reactive Power Rate 4 Electricity	FLOAT32	kvarh	2	R
0x103C	Q2Eq	(Current) Second Quadrant Total Reactive Energy	FLOAT32	kvarh	2	R
0x103E	Q2EqT1	(Current) Second Quadrant Reactive Power Rate 1 Electricity	FLOAT32	kvarh	2	R
0x1040	Q2EqT2	(Current) Second Quadrant Reactive Power Rate 2 Electricity	FLOAT32	kvarh	2	R
0x1042	Q2EqT3	(Current) Second Quadrant Reactive Power Rate 3 Electricity	FLOAT32	kvarh	2	R
0x1044	Q2EqT4	(Current) Second Quadrant Reactive Power Rate 4 Electricity	FLOAT32	kvarh	2	R
0x1046	Q3Eq	(Current) Third Quadrant Total Reactive Energy	FLOAT32	kvarh	2	R
0x1048	Q3EqT1	(Current) Third Quadrant Reactive Power Rate 1 Electricity	FLOAT32	kvarh	2	R
0x104A	Q3EqT2	(Current) Third Quadrant Reactive Power Rate 2 Electricity	FLOAT32	kvarh	2	R

Address	Code	Description	Type	Unit	Length	Access
0x104C	Q3EqT3	(Current) Third Quadrant Reactive Power Rate 3 Electricity	FLOAT32	kvarh	2	R
0x104E	Q3EqT4	(Current) Third Quadrant Reactive Power Rate 4 Electricity	FLOAT32	kvarh	2	R
0x1050	Q4Eq	(Current) Fourth Quadrant Total Reactive Energy	FLOAT32	kvarh	2	R
0x1052	Q4EqT1	(Current) Fourth Quadrant Reactive Power Rate 1 Electricity	FLOAT32	kvarh	2	R
0x1054	Q4EqT2	(Current) Fourth Quadrant Reactive Power Rate 2 Electricity	FLOAT32	kvarh	2	R
0x1056	Q4EqT3	(Current) Fourth Quadrant Reactive Power Rate 3 Electricity	FLOAT32	kvarh	2	R
0x1058	Q4EqT4	(Current) Fourth Quadrant Reactive Power Rate 4 Electricity	FLOAT32	kvarh	2	R
Primary side power data						
0x150A	Uab	Three-phase line voltage data	FLOAT32	0.1V	2	R
0x150C	Ubc		FLOAT32	0.1V	2	R
0x150E	Uca		FLOAT32	0.1V	2	R
0x1510	Ua	Three-phase voltage data (Invalid when three-phase three-wire)	FLOAT32	0.1V	2	R
0x1512	Ub		FLOAT32	0.1V	2	R
0x1514	Uc		FLOAT32	0.1V	2	R
0x1516	Ia	Three-phase current data	FLOAT32	0.001A	2	R
0x1518	Ib		FLOAT32	0.001A	2	R
0x151A	Ic		FLOAT32	0.001A	2	R
0x151C	Pt	Combined active power	FLOAT32	0.1W	2	R
0x151E	Pa	A-phase active power	FLOAT32	0.1W	2	R
0x1520	Pb	B-phase active power (Invalid when three-phase three-phase)	FLOAT32	0.1W	2	R
0x1522	Pc	C-phase active power	FLOAT32	0.1W	2	R
0x1524	Qt	Combined reactive power	FLOAT32	0.1Var	2	R
0x1526	Qa	A-phase reactive power	FLOAT32	0.1Var	2	R
0x1528	Qb	B-phase reactive power (Invalid when three-phase three-phase)	FLOAT32	0.1Var	2	R
0x152A	Qc	C-phase reactive power	FLOAT32	0.1Var	2	R
0x152C	St	Combined apparent work power	FLOAT32	0.1VA	2	R
0x152E	Sa	A phase at work power	FLOAT32	0.1VA	2	R
0x1530	Sb	B phase at work power	FLOAT32	0.1VA	2	R

Address	Code	Description	Type	Unit	Length	Access
0x1532	Sc	C phase at work power	FLOAT32	0.1VA	2	R
Primary side electrical energy data						
0x181E	ImpEp	(Current) total forward active energy	FLOAT32	kWh	2	R
0x1820	ImpEpT1	(Current) Forward Active Rate 1 Electricity	FLOAT32	kWh	2	R
0x1822	ImpEpT2	(Current) Forward Active Rate 2 Electricity	FLOAT32	kWh	2	R
0x1824	ImpEpT3	(Current) Forward Active Rate 3 Electricity	FLOAT32	kWh	2	R
0x1826	ImpEpT4	(Current) Forward Active Rate 4 Electricity	FLOAT32	kWh	2	R
0x1828	ExpEp	(Current) Total reverse active power	FLOAT32	kWh	2	R
0x182A	ExpEpT1	(Current) Reverse Active Power Rate 1 Electricity	FLOAT32	kWh	2	R
0x182C	ExpEpT2	(Current) Reverse Active Power Rate 2 Electricity	FLOAT32	kWh	2	R
0x182E	ExpEpT3	(Current) Reverse Active Power Rate 3 Electricity	FLOAT32	kWh	2	R
0x1830	ExpEpT4	(Current) Reverse Active Power Rate 4 Electricity	FLOAT32	kWh	2	R
0x1832	Q1Eq	(Current) Total reactive energy in the first quadrant	FLOAT32	kvarh	2	R
0x1034	Q1EqT1	(Current) 1st Quadrant Reactive Power Rate 1 Electricity	FLOAT32	kvarh	2	R
0x1036	Q1EqT2	(Current) 1st Quadrant Reactive Power Rate 2 Electricity	FLOAT32	kvarh	2	R
0x1838	Q1EqT3	(Current) 1st Quadrant Reactive Power Rate 3 Electricity	FLOAT32	kvarh	2	R
0x183A	Q1EqT4	(Current) 1st Quadrant Reactive Power Rate 4 Electricity	FLOAT32	kvarh	2	R
0x183C	Q2Eq	(Current) Second Quadrant Total Reactive Energy	FLOAT32	kvarh	2	R
0x183E	Q2EqT1	(Current) Second Quadrant Reactive Power Rate 1 Electricity	FLOAT32	kvarh	2	R
0x1840	Q2EqT2	(Current) Second Quadrant Reactive Power Rate 2 Electricity	FLOAT32	kvarh	2	R
0x1842	Q2EqT3	(Current) Second Quadrant Reactive Power Rate 3 Electricity	FLOAT32	kvarh	2	R
0x1844	Q2EqT4	(Current) Second Quadrant Reactive Power Rate 4 Electricity	FLOAT32	kvarh	2	R
0x1846	Q3Eq	(Current) Third Quadrant Total Reactive Energy	FLOAT32	kvarh	2	R
0x1848	Q3EqT1	(Current) Third Quadrant Reactive Power Rate 1 Electricity	FLOAT32	kvarh	2	R
0x184A	Q3EqT2	(Current) Third Quadrant Reactive Power Rate 2 Electricity	FLOAT32	kvarh	2	R
0x184C	Q3EqT3	(Current) Third Quadrant Reactive Power Rate 3 Electricity	FLOAT32	kvarh	2	R
0x184E	Q3EqT4	(Current) Third Quadrant Reactive Power Rate 4 Electricity	FLOAT32	kvarh	2	R
0x1850	Q4Eq	(Current) Fourth Quadrant Total Reactive Energy	FLOAT32	kvarh	2	R
0x1852	Q4EqT1	(Current) Fourth Quadrant Reactive Power Rate 1 Electricity	FLOAT32	kvarh	2	R

Address	Code	Description	Type	Unit	Length	Access
0x1854	Q4EqT2	(Current) Fourth Quadrant Reactive Power Rate 2 Electricity	FLOAT32	kvarh	2	R
0x1856	Q4EqT3	(Current) Fourth Quadrant Reactive Power Rate 3 Electricity	FLOAT32	kvarh	2	R
0x1858	Q4EqT4	(Current) Fourth Quadrant Reactive Power Rate 4 Electricity	FLOAT32	kvarh	2	R

Primary-side measurement values include the voltage transformer ratio (UrAt) and current transformer ratio (IrAt).

Secondary-side data does not include these ratios and must therefore be converted using the corresponding conversion coefficients.

Negative numbers are represented by complementary codes.

The conversion method for secondary-side data is shown in the table below.

Table 9 Electric quantity data conversion method

Parameter	Conversion Formula	Unit	Parameter Code
Voltage	U = URMSx(x=a , b , c)×(UrAt×0.1)×0.1	V	Ua,Ub,Uc,Uab,Ubc,Uca
Current	I = IRMSx(x=a , b , c) ×IrAt×0.001	A	Ia,Ib,Ic
Active power	P = Px(x=t , a , b , c)×(UrAt×0.1)×IrAt×0.1	W	Pt,Pa,Pb,Pc
Reactive power	Q = Qx(x=t , a , b , c)×(UrAt×0.1)×IrAt×0.1	Var	Qt,Qa,Qb,Qc
Power factor	PF = PFx(x= t , a , b , c)×0.001		PFt,PFa,PFb,PFc
Frequency	F = Freq×0.01	Hz	F
Electric energy	Ep = E× (UrAt×0.1)×IrAt	kWh/ kVarh	ImpEp, ExpEp, Q1Eq, Q2Eq, Q3Eq, Q4Eq

Note:

- When the voltage transformer ratio is 1, the UrAt register value of the voltage transformer ratio register ~~is~~ should be set to10.
- Single-precision floating-point data uses the IEEE-754 standard format (32 bits / 4 bytes).
- The RTC (Real-Time Clock) is optional. If RTC hardware is not installed, time setting and reading functions are not supported.
- Functions may vary depending on the model and specification. Please refer to the actual product.

5．Dimensions and Mounting

Table 10 - Installation Dimensions

Model	Panel Size (L×W)	Housing Size (M × N × D)	Panel Cut-out (Length × Width)
PD600-3S	96 × 96 mm	90 × 90 × 46.75 mm	92 × 92mm

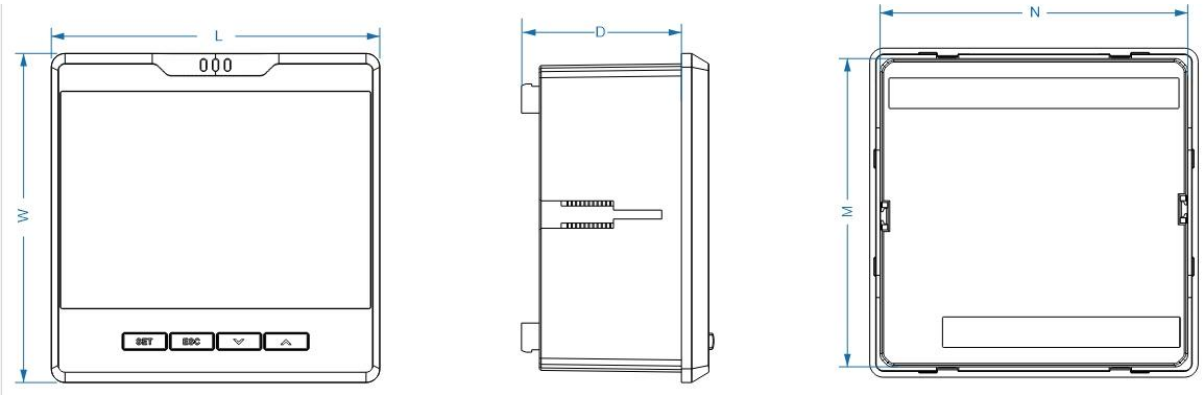


Figure 10 Dimension Drawing

Note: The outline dimensions may vary depending on the model. Refer to the actual product.

6．Installation Instructions

6.1 Pre-installation Check

1) Before installation, verify that the model and specifications indicated on the package match the actual product.

2) Check whether the product enclosure is damaged during transportation. If any damage is found, contact the supplier.

6.2 Installation

The meter is designed for panel-mounted installation and is secured using clip-type mounting bracket

1. On the panel or switchboard, cut an installation opening according to the specified panel cut-out dimensions.
2. Insert the meter into the panel opening from the front side of the panel.
3. Insert the mounting clips into the slots on both sides of the meter from the rear, and push them forward until the meter is firmly secured to the panel.

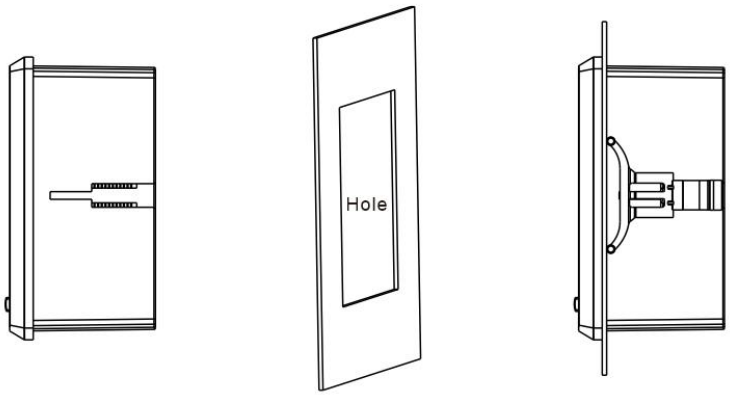


Figure 11 Installation Diagram

6.3 Typical wiring Diagram

Before wiring the instrument, disconnect the input signals and auxiliary power supply.

Before powering on, verify that the wiring is correct and consistent with the wiring diagram on the instrument housing

6.3.1 Auxiliary power supply Wiring

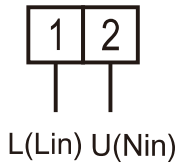


Figure 12 Auxiliary Power Supply

Terminal 1 and Terminal 2 are for auxiliary power supply input.

6.3.2 Signal input

Typical signal input wiring methods are shown in Figures 13 and 14.

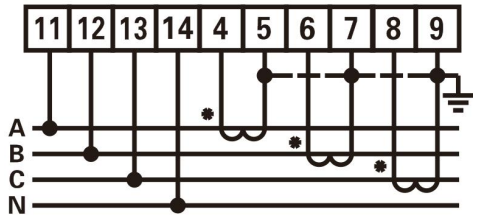


Figure 13 Three-phase four-wire Wiring

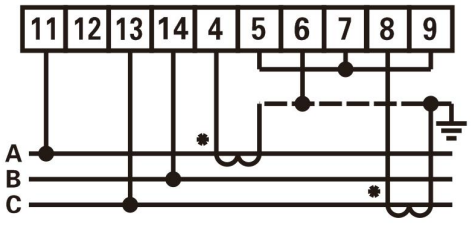


Figure 14 Three-phase three-wire Wiring

Current Input Terminals

Terminal connections for current inputs are as follows:

- Terminal 4 → IA* (Phase A current input, +)
- Terminal 5 → IA (Phase A current return, −)
- Terminal 6 → IB* (Phase B current input, +)
- Terminal 7 → IB (Phase B current return, −)
- Terminal 8 → IC* (Phase C current input, +)
- Terminal 9 → IC (Phase C current return, −)

Voltage Input Terminals (Three-phase Four-wire)

- Terminal 11 → Phase A voltage (UA)
- Terminal 12 → Phase B voltage (UB)
- Terminal 13 → Phase C voltage (UC)
- Terminal 14 → Neutral (UN)

Voltage Input Terminals (Three-phase Three-wire)

- Terminal 11 → Phase A voltage (UA)
- Terminal 13 → Phase C voltage (UC)
- Terminal 14 → Phase B voltage (UB)

Important Note

The input signal must not exceed the rated input value of the instrument.

If the measured voltage or current exceeds the rated input range:

- The AC voltage must be connected through a voltage transformer (PT).
- The AC current must be connected through a current transformer (CT).

Warning:

Ensure that CT secondary circuits are not open-circuited during operation.

6.3.3 Auxiliary Function ~~ports~~ Terminals (Communication and Alarm Output)

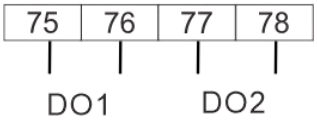


Figure 15 Digital Output (DO)

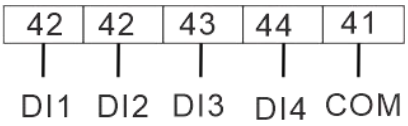


Figure 16 Digital Input (DI)

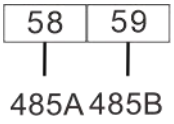


Figure 17 Communication Interface

The type and number of auxiliary functions depend on the specific model.

Refer to the wiring diagram on the instrument housing for details.

6. Troubleshooting

Table 11 Common Faults

Fault phenomenon	Cause analysis	Exclusion method	Remarks
Instrument does not power on	Incorrect wiring	Check whether the wiring matches the wiring diagram. Use a multimeter to verify that the auxiliary power supply voltage is within the rated range.	Ensure all signal inputs and auxiliary power supplies are disconnected before inspection.
Communication failure	Communication parameters of the host computer do not match the instrument settings	Check whether the communication parameters (address, baud rate, parity) match the instrument settings. If the problem persists, install a termination resistor (510 Ω recommended) on the RS485 bus.	

If the problem persists, please contact technical support.

8. Transportation and Storage

The instrument should be packed using environmentally compliant packaging materials.

The instrument and its accessories should be stored in a dry and well-ventilated environment and kept in their original packaging to prevent damage from moisture or corrosive gases.

The allowable storage temperature range is −40 °C to +70 °C, and the relative humidity should not exceed 75%.

The packaging and environmental requirements for storage and transportation comply with IEC 60068 standards

9．Maintenance and Service

The manufacturer provides warranty service for product quality.

Within 18 months from the date of delivery, if the user operates the instrument in accordance with this manual and the factory seal remains intact, the manufacturer will provide free repair or replacement for damage caused by product quality issue

Environmental Protection

When this product or its components reach the end of their service life, they should be disposed of in accordance with local environmental regulations.

The product may be treated as industrial electronic waste or delivered to an authorized recycling facility for classification, dismantling, recycling, and reuse.

Proper disposal helps protect the environment and conserve resources.

Disclaimer

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