F-PIC800 Multichannel Power Meter User Manual

The user manual is suitable for the following model:

Model	Product Type
F-PIC800	

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Note:Different types of accessories and interfaces may be different,please refer to the actual product.

Content

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Chapter1 Introduction of Product

1.1 General

F-PIC800 multichannel power meter is a kind of 10kV distribution high voltage metering device which is based on voltage/current transformer and electromagnetic transformer. It is an important part of the line loss management system of 10KV distribution line, providing a solution for high-voltage energy measurement and real-time monitoring of equipment nodes such as segment point, branch point, switch devices on the column, ring main unit and so on. It integrates the functions of measurement, metering and communication, and supports RS232 or RS485 communication.

The active power measurement accuracy of the product conforms to the specification in GB/ t17215.322-2008 (Static active power meter: 0.5s); the passive power measurement accuracy of the product conforms to the specification in GB/ t17215.322-2008 (Static passive power meter : class 2) ; the communication complies with the DLT634.5101-2002.

1.2 Product Features

Design for Industrial Application

- High-powered industrial 32 bits CPU
- Embedded Real-Time Clock (RTC)
- Power range: DC 18~72V
- The internal power supply and the communication power supply all adopt the isolated power supply

Stability and Reliability

- Support WDT design, keep the system stable
- RS232/RS485 ports:15KV ESD protection
- Power port: reverse-voltage and over voltage protection.
- Outage detection and low voltage detection
- Built-in mini UPS can save important data in case of outage
- Conforms to the detection accuracy of the national standard
- Some of the ports adopt industrial pluggable terminal interface, which is especially suitable for industrial field application
- Support standard RS232/RS485 ports that can connect to serial devices directly
- Support intellectual mode, enter into communication state automatically when power is on
- Convenient configuration and maintenance interface

High-performance

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- Complete electrical parameter measurement function
- Measurement function of multi-type electrical energy data
- It can detect 2-ways voltage and 8-ways current at most
- A clock circuit with a temperature complement is provided
- Support automatic switching calendar, timing and leap year
- Support multiple measurement data freezing function
- Support multiple data storage
- Support SOE
- Support RS485/RS232 protocol
- Embed with the standard 101 protocol stack, support data transmission transparently

Standards Compliance

- Q/GDW-11-143 Communication protocol of power information acquisition and management system
- Q/GDW 514 Power distribution automation terminal/substation function specification
- DL/T 634.5101-2002 Statute implementation rules
- Insulation performance, vibration performance, anti-interference performance are all complied Q-GDW615-2011
- Immunity test of electrostatic discharge : Able to withstand class 4 test of GB/T 17626.2-2006
- Radio frequency electromagnetic radiation immunity test: Able to withstand class 4 test of GB/T 17626.3-2006
- Immunity test of fast transient pulse group disturbance : Able to withstand class 4 test of GB/T 17626.4-2008
- Surge (impact) immunity test: Able to withstand class 4 test of GB/T 17626.5-2008
- Damping oscillation wave immunity test: Able to withstand class 4 test of GB/T 17626.12
- Monitoring and protection of distribution transformers: Real-time monitoring and make statistics of line power consumption.

1.3 Working principle

F-PIC800 multichannel power meter is mainly consists of current sampling unit, voltage sampling unit, MCU, internal storage unit, calendar clock unit, power and battery units, electrical pulse output interface and communication interface. The principle block diagram is shown in figure 1-2.

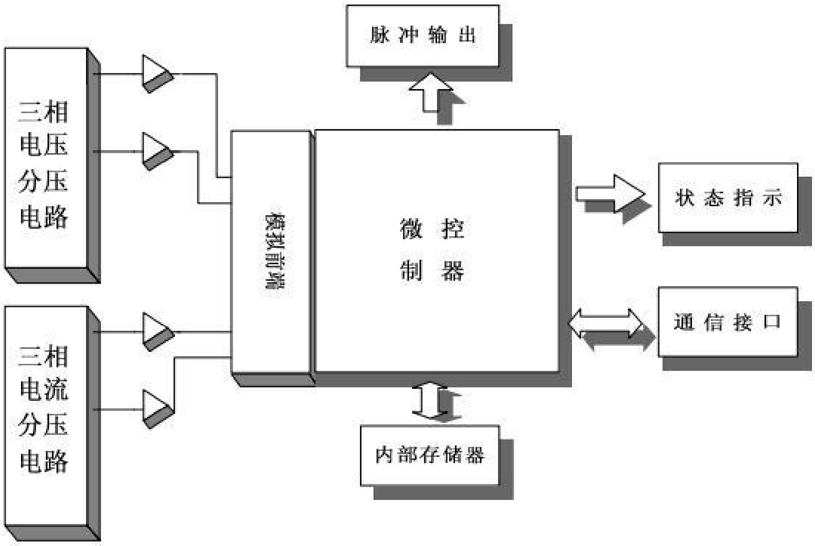

Figure 1-2

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Chapter2 Technical specification

2.1 Measurement and metering

Measurement and metering technical specification of F-PIC800 power meter, showing as table 2.1.

Table 2.1 Measurement and metering technical specification

Item		Specifications
Analog signal access way		Electromagnetic transformer
Voltage	Rated voltage	3X57.7/100V; 3X220V
	Measurement range	0.05UN~1.3UN
	Accuracy	RMS 0.2%
	Resolution	0.001V
Current	Ratio	In:1A; 5A
	Measurement range	0.005In~Imax
	Accuracy	RMS 0.2%
	Resolution	0.00001A
Power (Active power、reactive power、apparent power)	Accuracy	0.5%
	Resolution	0.001W/kVar/kVA
Frequency	Measurement range	45~55Hz
	Accuracy	0.5%
	Resolution	0.001Hz
Factor	Measurement range	0~1.000
	Accuracy	0.5%
	Resolution	0.001
Active power	Accuracy class	0.5S
	Resolution	0.001kWh
Reactive power	Accuracy class	2
	Resolution	0.001kVar

2.2 Operating voltage and consumption

The operating power input is electrically isolated from the internal current, the specific parameters are shown in table 3.2

Table 3.2 Rated operating voltage and power consumption

Model	Rated input	Allowable deviation	Consumption
F-PIC800	DC48V/24V	Support DC18V~72V Ripple is less than 5%	<3W

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2.3 Measuring voltage and current

F-PIC800 multichannel power meter has a built-in electromagnetic transformer, the input voltage and current are isolated from the internal circuit, the specific parameters are shown in table 2.3.

Table 2.3 Input voltage and current

Item	Access way	Parameters
Current	Electromagnetic transformer	Reference current In:1A;5A
Voltage	Electromagnetic transformer	Three-phase four-line: Un:57.5V;220V
		Three-phase three-line Un:100V;220V

2.4 Constant of pulse output

The pulse constant are shown as table 2.4.

Table 2.4 Constant of pulse output

Voltage	Maximum current	Recommend constant imp/kWh、imp/kvarh
3X57.5V/100	1.2	100000
3X57.5V/100	6	20000
3X100	1.2	100000
3X100	6	20000
3X220	1.	30000
3X220	6	6400

2.5 Environmental conditions

2.5.1 Reference Temperature and relative humidity

Reference temperature is 23℃, relative humidity is 45%~75%.

2.5.2 Range of temperature and humidity

Temperature ‘s range of F-PIC800 multichannel power meter is shown as table3.5.

Table 3.5 Temperature’s range

Item	Range
Rated operating temperature’s range	-25℃~+60℃
Limit operating temperature’s range	-40℃~+70℃
Storage and transportation limit temperature’s range	-40℃~+70℃

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Humidity's range F-PIC800 multichannel power meter is shown as table 3.6.

Table 3.6 Relative humidity

Item	Range
Annual mean	<75%
30 days (These days are distributed naturally throughout the year)	95%
It happens on other days	85%

2.5.3 Atmospheric pressure

F-PIC800 multichannel power meter can work normally below the altitude of 4000 m(63.0kPa~106.0kPa). High altitude area require that it can work normally in the range of 4000m~4700m .

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Chapter3 Function description

3.1 Measuring function

F-PIC800 multichannel power meter has complete electric parameter measurement function, showing as below :

- ◆ Voltage value of each phase.
- ◆ Current value of each phase.
- ◆ Active power, reactive power and apparent power of each phase.
- ◆ The phase angle value of voltage and current in each phase.
- ◆ Power factor value of each phase.
- ◆ Power grid frequency and measurement range are 45~55Hz.

3.2 Metering Function

F-PIC800 multichannel power meter can meter multiple types of electrical energy data:

- ◆ Combination of active and reverse active electrical energy.
- ◆ Combination of reactive and reverse reactive electrical energy.
- ◆ Active and reverse active electric energy, combined reactive electric energy of each phase.

3.3 Clock

- ◆ F-PIC800 multichannel power meter has a clock circuit with a temperature supplement, clock signal with a frequency of 1Hz can be output at normal temperature.
- ◆ Clock has calendar, timing and leap year automatic switching function.
- ◆ It uses an environmentally friendly lithium battery as a backup power source for the clock, the backup power source for the clock does not need to be replaced during the life cycle of power meter, it can maintain the normal working time of internal clock for not less than 5 years after outage, the power meter will give an alarm when the battery voltage is low.
- ◆ The power meter can calibrate time by RS232 or RS485.

3.4 Freezing function

- ◆ Examination day freezing : It can store the bidirectional total energy data of 12 examination days.
- ◆ Timing freezing: Freeze the electrical energy data at the agreed time and time interval, each frozen amount can be stored for 60 times.
- ◆ Instantaneous freezing: It can save the data for the last 3 times.
- ◆ Daily freezing: It stores electrical energy at zero o'clock per day, and can store 62 days' data.
- ◆ The frozen contents and marks comply with DL/ t634.5101-2002 and its filing requirements.

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3.5 SOE

◆ Record the total number of changes of power flow's direction and power's direction, record information such as the moment of the last 10 changes of power flow's direction and power's direction and the corresponding electrical energy data.

◆ Record the total times of calibrating time(excluding broadcast calibration) and the moment of last 10 times of calibrating time.

◆ Permanently record the time and the electrical energy data when the power meter reset .

3.6 Communication function

F-PIC800 multichannel power meter has one interface of RS232 or RS485, it can be used for parameter setting and all kinds of data reading. Additional notes on communications are described in the communications section below.

3.7 Digital pulse output function

3.7.1 Pulse output of Electric Quantity

F-PIC800 multichannel power meter provide pulse output of active power and reactive power, and internal optocoupler isolation. Pulse output width is (80±20)ms, maximum allowable current is 10mA(DC), and operating voltage range is 5V~80V(DC). The schematic diagram of its internal circuit is shown in figure 3.1.

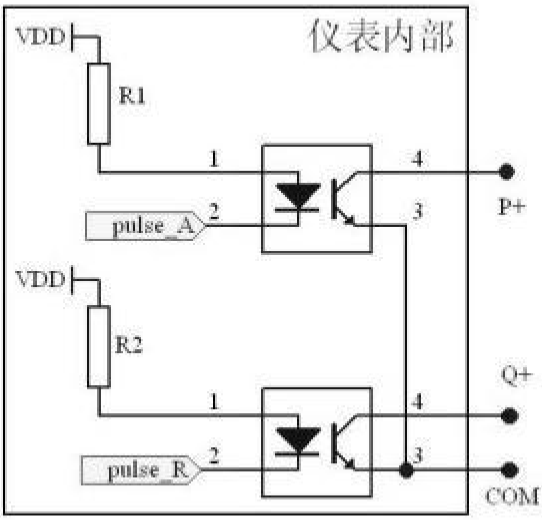

Figure 3.1 Schematic diagram of power pulse output interface circuit

3.7.2 Pulse output of second

The power meter provides pulse output and internal optical coupler isolation. The pulse duty ratio is 50%, the maximum allowable current is 10mA(DC), and the operating voltage range is 5V~80V(DC). The schematic diagram of the internal circuit is shown in figure 3.2 .

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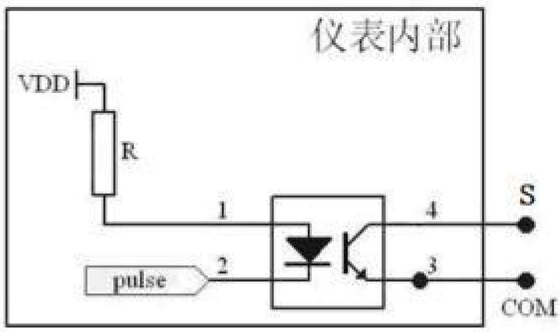

Figure 3.2 Circuit diagram of second pulse output interface

3.8 Indicator

F-PIC800 multichannel power meter provides power indicator, operation indicator, active pulse indicator and reactive pulse indicator , users can judge the status of the current module according to the indicator. The location and definition of the indicator are shown in figure 3.3.

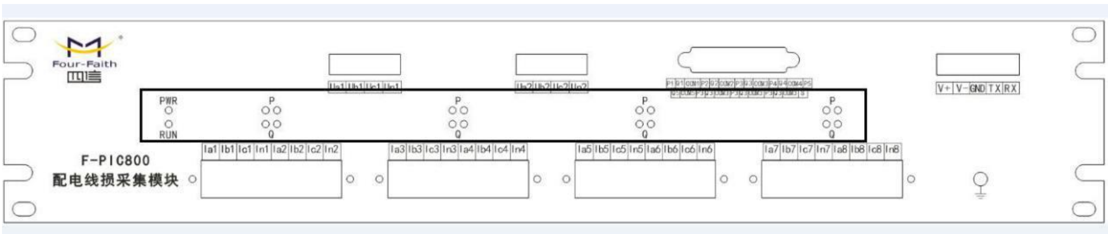

Figure 3.3 Location and definition of the indicator of F-PIC800 power meter

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Chapter4 Structure,installation, and interface definitions

4.1 Installation notes

- Equipment must be installed correctly to achieve the function of the design, usually the installation of equipment must be under the guidance of the company's approved qualified engineers.
- Live working is not allowed.
- The equipment should be installed as far as possible in a dry, well-ventilated place away from heat sources and strong electrical (magnetic) fields.
- Working environment temperature :-25℃~+60℃, humidity ≤95%(no condensation).
- It must be installed firmly to prevent vibration from causing safety accidents.
- The dimensions of the distribution cabinet shall have enough space for accommodating the safety boxes and ease of operation maintained by the power meter products.
- Requirements of electrical connection wire : The current input line shall be made of multi-strand flame retardant copper wire larger than 2.5mm², and the communication line shall be made of 1.0mm² shielded wire.
- Requirements of electrical connection: Working power supply circuit of the power meter shall be connected to a suitable fuse (e.g. 0.5A fuse).

4.2 packing list

Please take good care of the packing materials when you unpack, so that they can be used for future transshipment. List is as below:

- F-PIC800 : 1 pcs (According to customer order)
- User manual: 1pcs
- 4P-5.08 spacing with lock terminal connector: 2 pcs
- 5P-5.08 spacing with lock terminal connector : 1 pcs
- DB25 female : 1 pcs
- Manufacturer's Certificate Card
- Warranty Card

4.3 Dimensions and installation

Dimensions:

This series of products adopts 2U standard shell, as shown in the following figure :(Unit: mm)

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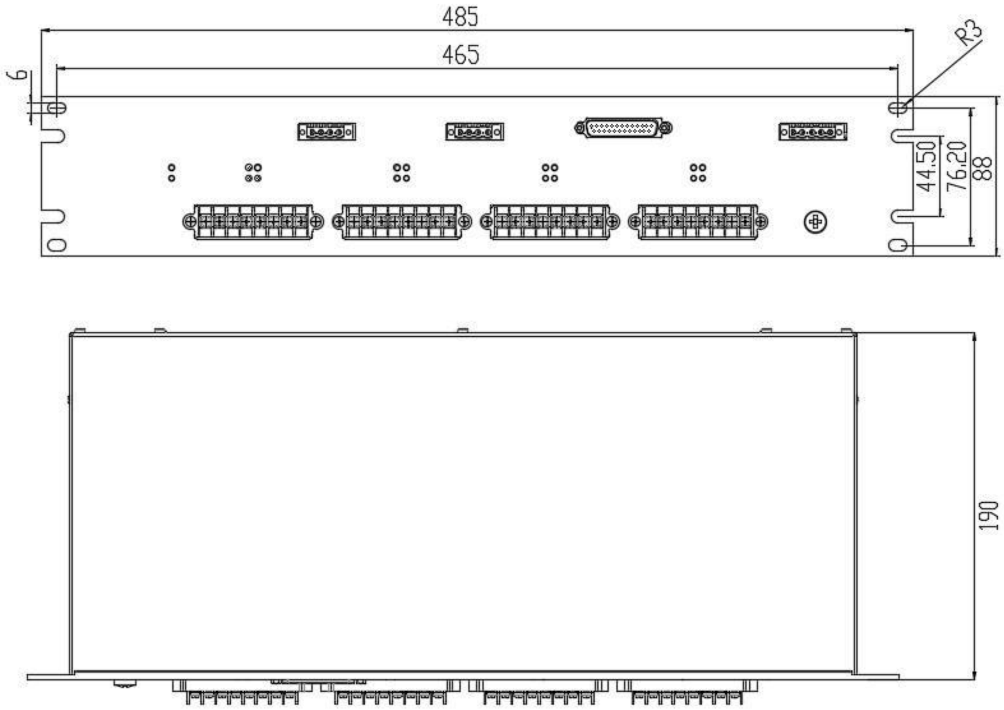

Figure 4.1 Dimensions and mounting drawing of F-PIC800 multichannel power meter

4.4 Interface definition

Current interfaces of F-PIC800 multichannel adopt JP12 high current through wall type terminal (8 core terminal with lock); Voltage interfaces adopt 5.08 spacing plug type terminal (4-core terminal with lock); Communication and power interface adopt 5.08 spacing plug type terminal(5P terminal with lock); pulse interface adopts DB25, definition of the specific interface is shown in figure 4.2 and table 4.1.

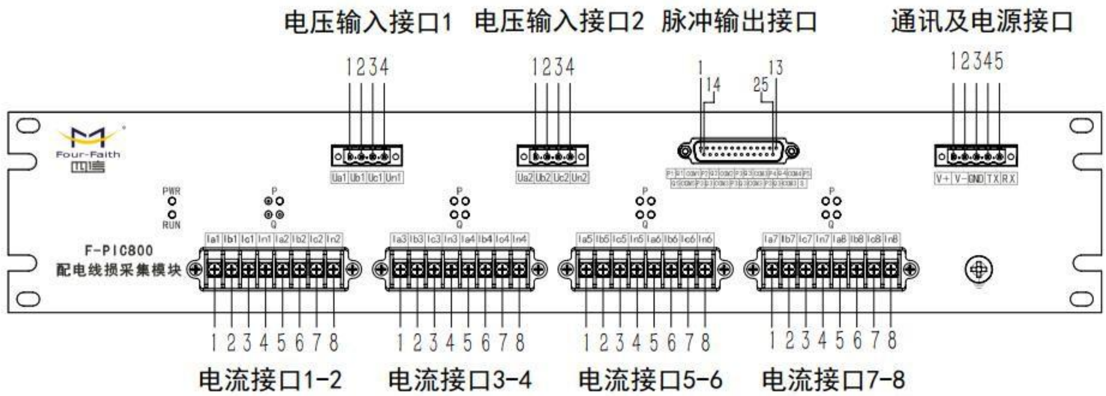

Figure 4.2 Terminal wiring diagram of F-PIC800

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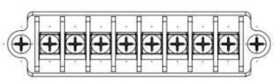
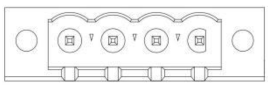
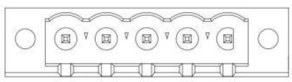
Table 4.1 Interface definition of F-PIC800

Pin definition and wiring requirements of current input interface					
Line 1~2					
PIN No.	Mark	Description	Cable specification	Remarks	Diagram
1	Ia1	Phase current of line 1A	RVVP2.5mm^2		
2	Ib1	Phase current of line 1B	RVVP2.5mm^2		
3	Ic1	Phase current of line 1C	RVVP2.5mm^2		
4	In1	Common terminal of line 1	RVVP2.5mm^2		
5	Ia2	Phase current of line 2A	RVVP2.5mm^2		
6	Ib2	Phase current of line 2B	RVVP2.5mm^2		
7	Ic1	Phase current of line 2C	RVVP2.5mm^2		
8	In2	Common terminal of line 2	RVVP2.5mm^2		
Line 3~4; line 5~6;line7~8, the same with line1~2					
Pin definition and wiring requirements of voltage input interface					
Pin No.	Mark	Description	Cable	Remarks	Diagram
1	Ua	Phase A voltage	RVVP1.0mm^2		
2	Ub	Phase B voltage 【1】	RVVP1.0mm^2		
3	Uc	Phase C voltage	RVVP1.0mm^2		
4	Un	Common terminal 【2】	RVVP1.0mm^2		
Pin definition and wiring requirements of communication and power supply					
Pin No.	Mark	Description	Cable	Remarks	Diagram
1	V+	DC24V/DC48V	RVVP1.0mm^2		
2	V-	DC24V/DC48V	RVVP1.0mm^2		
3	GND	RS232GND	RVVP1.0mm^2		
4	TX/A	RS232 send	RVVP1.0mm^2		
5	RX/B	RS232	RVVP1.0mm^2		
Pin definition and wiring requirements of pulse output					
Pin No.	Mark	Description	Cable specification	Remarks	Diagram
1	YG1	Active output pulse 1	RVVP0.2mm^2		
2	WG1	Reactive output pulse 1	RVVP0.2mm^2		

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3	COM1	Common terminal 1	RVVP0.2mm²		
4	YG2	Active output pulse2	RVVP0.2mm²		
5	WG2	Reactive output pulse 2	RVVP0.2mm²		
6	COM2	Common terminal 2	RVVP0.2mm²		
7	YG3	Active output pulse 3	RVVP0.2mm²		
8	WG3	Reactive output pulse 3	RVVP0.2mm²		
9	COM3	Common terminal 3	RVVP0.2mm²		
10	YG4	Active output pulse 4	RVVP0.2mm²		
11	WG4	Reactive output pulse 4	RVVP0.2mm²		
12	COM4	Common terminal 4	RVVP0.2mm²		
13	YG5	Active output pulse 5	RVVP0.2mm²		
14	WG5	Reactive output pulse 5	RVVP0.2mm²		
15	COM5	Common terminal 5	RVVP0.2mm²		
16	YG6	Active output pulse 6	RVVP0.2mm²		
17	WG6	Reactive output pulse 6	RVVP0.2mm²		
18	COM6	Common terminal 6	RVVP0.2mm²		
19	YG7	Active output pulse 7	RVVP0.2mm²		
20	WG7	Reactive output pulse 7	RVVP0.2mm²		
21	COM7	Common terminal 7	RVVP0.2mm²		
22	YG8	Active output pulse 8	RVVP0.2mm²		
23	WG8	Reactive output pulse 8	RVVP0.2mm²		
24	COM8	Common terminal 8	RVVP0.2mm²		
25	S	Second pulse output	RVVP0.2mm²		

Note【1】：When connection way is three-phase three-wire mode, the secondary terminal can not be connected to phase-B, phase-B is connected to the Un terminal; If the phase-B is connected to the Ub terminal, the Ub terminal needs to be short-circuitedwith

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the Un terminal.

Note【2】：When connection way is three-phase three-wire mode, this terminal is connected to the phase-B; if the phase-B is connected to the Ub terminal, the Ub terminal needs to be short-circuited with it .

Note【3】：Current input of F-PIC800 power meter need to be serial connected after DTU,showing as below:

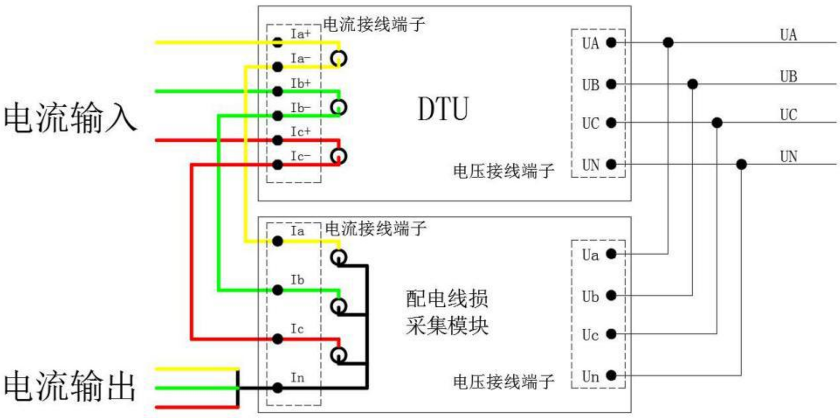

Figure 4.3 F-PIC800 wiring diagram 3PT/3CT

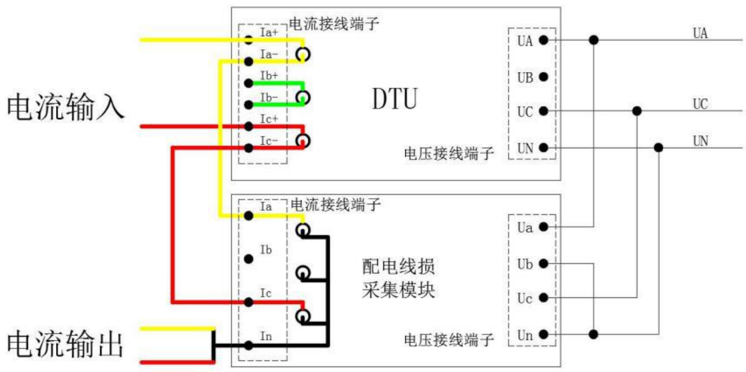

Figure 4.4 F-PIC800 wiring diagram 2PT/2CT

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Chapter5 Communication

5.1 Communication instructions

Power meter's RS232 or RS485 communication interface support the DLT 634.5101-2002 communication protocol. The communication interface is electrically isolated from the internal circuit, and the circuit is effectively protected. Communication rate of RS232/485 can be set, the standard rates are 1200bps, 2400bps, 4800bps, and 9600bps, with a default of 9600bps.

Notes for using RS232/RS485:

- Wiring works shall be constructed strictly accord with the requirements.
- The shield layer of the cable connecting with the upper computer shall be effectively grounded (Protective ground: earth, shielding cabinet, case, etc.) to avoid multi-point grounding.
- Cable of RS232/RS485 must use shielded twisted pair wires and try to use different colors for the two twisted pairs.

5.2 101 Communication protocol

The protocol supports both non-balanced and balanced information transfer ways, protocol communication: Serial, asynchronous, one start bit, one stop bit, one parity bit, eight data bits. Communication message adopts longitudinal and check mode. Both sides shall strictly follow the process of FCB\FCV's validity, invalidity, reverse confirmation and non-reverse resending.

5.3 Link layer

5.3.1 Transmission frame format

The two frames of FT1.2 (Format FT1.2: Hamming distance for 4 frame format) in the GB/ t18657.1-2002 of 6.2.4.2 were used. Fixed frame length and variable frame length. Link layer transmission sequence is low in front, high in the rear; the low byte is in the front, the high byte is behind.

5.3.2 Fixed frame length format

The fixed frame length format is mainly used for link state management, data call and message confirmation. See table 5.1 for the specific format.

Table 5.1 Structural definition of fixed frame length

Seq.	Item	Length
1	Start character (10H)	1 Byte
2	Control domain C	1 Byte
3	Link address domain A	2 Byte

4	Frame checksum CS	1 Byte
5	End character(16H)	1 Byte

Start character: 1 byte, fixed for 10H.

Control domain C:1 byte,upload and download represent different meanings, the specific definition is shown in table 5.2.

Table 5.2 Definition of fixed frame length control domain of non-balanced link transmission mode

bit		D7	D6	D5	D4	D3	D2	D1	D0
Download		RES	PRM	FCB	FCV	Link function code FC			
Upload		RES	PRM	ACD	DFC				

Table 5.3 Definition of fixed frame length control domain of balanced link transmission mode

bit	D7	D6	D5	D4	D3	D2	D1	D0
Download	DIR	PRM	FCB	FCV	Link function code FC			
Upload	DIR	PRM	RES	DFC				

RES: Reserved bits,it's usually set to 0.

PRM: Start flag bit PRM=1: Indicates that this frame message is from the master station; PRM=0: Indicates that the frame message is from the slave station.

DIR: Transmission direction bit. DIR=0: Indicates that this frame message is the download text sent by the master station; DIR=1: Indicates that this frame message is the upload text sent by terminal.

FCB: Frame count bits.

When frame count valid bits FCV=1, represents a continuous send/confirm or request/response service change bit for each station to prevent loss and duplication of information transmission.

When the master station transmits a new send/confirm or request/response transport service to the slave station, the FCB is inverted. The master station saves the FCB value of each slave station. If master station didn't receive the message from the slave station when timeout , or if there is an error in receiving the message, the master station will not change the state of FCB and repeat the original sending/confirming or request/response service. FCB=0 in the reset command, FCB value is 0 after the slave station receives the reset command.

ACD: Request access bit, used in upload response messages. ACD=1: Means the distribution terminal has level 1 data waiting for access. ACD=0: Means the distribution terminal has no level 1 data waiting for access.

FCV: Frame count valid bits. FCV=1: Means FCB is valid; FCV=0: Means FCB is invalid.

DFC: Data flow control bits. DFC＝1: Indicates that the slave station cannot receive subsequent messages; DFC＝0: Indicates that the slave station can receive subsequent messages;

FC: Link function code, Link function codes are defined in accordance with DL/ t634.5101-2002.

Table 5.4 No-balanced link function code

Function codes and services of starting direction	FCV bits status of starting direction	Function codes and services allowed by the slave direction
<0> Reset remote link	0	<0>Confirmation: approval
		<1>Confirmation: no approval
<3> Send/confirm user data	1	<0>Confirmation: approval
		<1>Confirmation: no approval
<4> Send/no response for user data	0	Non response
<8> Access request	0	<11>Response: link status
<9> Request/response link status	0	<11>Response: link status
<10> Request/response level 1 user data	1	<8>Response: user data
		<9>Response: no user data requested
<11> Request/response level 2 user data	1	<8>Response: user data
		<9>Response: no user data requested

Table 5.5 Balanced link function code

Function codes and services of starting direction	FCV bits status of starting direction	Function codes and services allowed by the slave direction
<0> Reset remote link	0	<0>Confirmation: approval
		<1>Confirmation: no approval
<2> Send/confirm link test functionality	0	<0>Confirmation: approval
		<1>Confirmation: no approval
<3> Send/confirm user data	1	<0>Confirmation: approval
		<1>Confirmation: no approval
<4> Send/no response for user data	0	Non response
<9> Request/response request link status	0	<11>Response: link status

Address field A: 2 bytes, range: 0001H～FFFFH(65535 个), and FFFFH is the broadcast address, 0000H is invalid address.

Frame checksum CS:1 byte, is octet arithmetic sum of control domain C and address domain A, do not consider overflow bits. CS＝(C＋A)MOD 256

5.3.3 Variable frame length format

The variable frame length format is mainly used for information message and control command transmission, which is used for information exchange between the master station and the terminal.

Table 6-6 Structural definition of variable frame length format

Seq.	Item	Length
1	Starting character(68H)	1 byte
2	Message length L	1 byte
3	Message length L	1 byte
4	Start character(68H)	1 byte
5	Control domain C	1 byte
6	Address domain A	2 byte
7	Application service data unit ASDU	Variable length
8	Frame checksum CS	1 byte
9	Ending character(16H)	1 byte

Message length L: The total length of the bytes from the control domain to the end of the application service data unit, length of the second message is the same as the first message L.

Frame checksum CS: 1 byte, is octet arithmetic sum of control domain C , address domain A and ASDU, do not consider overflow bits, CS＝(C＋A+ ASDU) MOD 256.

Frame transfer rules:

a) The spare line state is binary 1;

b) There is no spare line interval between the characters of the frame; A minimum of 33 bits is needed between frames;

c) If errors were detected accord to e), a minimum of 33 bits is required for the spare line interval between two frames;

d) Frame checksum (CS) is octet arithmetic sum of control domain C , address domain A and ASDU, do not consider overflow bits.

e) Receiver check:

①For each character: Check start bit, stop bit, and even bit.

②For each frame:

——Check the character and protocol identifier specified at the beginning and end of the fixed header of the frame;

——Identify 2 lengths L;

——The number of characters received per frame is L+6;

——Frame checksum;

——Ending character;

——When an error is checked, check the spare line interval according to c); if one of these checks fails, the frame is discarded. If there is no error, the frame data is valid.

5.4 Link transmission rule

Unbalanced transmission: The distribution master station and the distribution terminal communicate in the way of question and answer, and the distribution terminal can only respond when the power distribution master station calls or it accepts the command from the power distribution master station, it cannot send messages up.

Balanced transmission: In general, the power distribution master station and power distribution terminal communicate by means of question and answer. Under

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certain conditions (Such as event process, terminal local initialization process, etc.), the distribution terminal can actively send messages.

Please refer to DTL634.5101-2002 implementation rules for more detailed communication protocol content.

5.5 Information body address

Body address	Name	Unit
4001	Frequency of loop 1	Hz
4002	Phase A current of loop 1	A
4003	Phase B current of loop 1	A
4004	Phase C current of loop 1	A
4005	Phase A voltage of loop 1	V
4006	Phase B voltage of loop 1	V
4007	Phase C voltage of loop 1	V
4008	Phase A active power of loop 1	W
4009	Phase B active power of loop 1	W
400A	Phase C active power of loop 1	W
400B	Total active power of loop 1	W
400C	Phase A reactive power of loop 1	VAR
400D	Phase B reactive power of loop 1	VAR
400E	Phase C reactive power of loop 1	VAR
400F	The total reactive power of loop 1	VAR
4010	Phase A apparent power of loop 1	VA
4011	Phase B apparent power of loop 1	VA
4012	Phase C apparent power of loop 1	VA
4013	Total apparent power of loop 1	VA
4014	Phase A power factor of loop 1	
4015	Phase B power factor of loop 1	
4016	Phase C power factor of loop 1	
4017	Total power factor of loop 1	
4018	Frequency of loop 2	Hz
4019	Phase A current of loop 2	A
401A	Phase B current of loop 2	A
401B	Phase C current of loop 2	A
401C	Phase A voltage of loop 2	V
401D	Phase B voltage of loop 2	V
401E	Phase C voltage of loop 2	V
401F	Phase A active power of loop 2	W
4020	Phase B active power of loop 2	W
4021	Phase C active power of loop 2	W
4022	Total active power of loop 2	W
4023	Phase A reactive power of loop 2	VAR
4024	Phase B reactive power of loop 2	VAR

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4025	Phase C reactive power of loop 2	VAR
4026	The total reactive power of loop 2	VAR
4027	Phase A apparent power of loop 2	VA
4028	Phase B apparent power of loop 2	VA
4029	Phase C apparent power of loop 2	VA
402A	Total apparent power of loop 2	VA
402B	Phase A power factor of loop 2	
402C	Phase B power factor of loop 2	
402D	Phase C power factor of loop 2	
402E	Total power factor of loop 2	
402F	Frequency of loop 3	Hz
4030	Phase A current of loop 3	A
4031	Phase B current of loop 3	A
4032	Phase C current of loop 3	A
4033	Phase A voltage of loop 3	V
4034	Phase B voltage of loop 3	V
4035	Phase C voltage of loop 3	V
4036	Phase A active power of loop 3	W
4037	Phase B active power of loop 3	W
4038	Phase C active power of loop 3	W
4039	Total active power of loop 3	W
403A	Phase A reactive power of loop 3	VAR
403B	Phase B reactive power of loop 3	VAR
403C	Phase C reactive power of loop 3	VAR
403D	The total reactive power of loop 3	VAR
403E	Phase A apparent power of loop 3	VA
403F	Phase B apparent power of loop 3	VA
4040	Phase C apparent power of loop 3	VA
4041	Total apparent power of loop 3	VA
4042	Phase A power factor of loop 3	
4043	Phase B power factor of loop 3	
4044	Phase C power factor of loop 3	
4045	Total power factor of loop 3	
4046	Frequency of loop 4	Hz
4047	Phase A current of loop 4	A
4048	Phase B current of loop 4	A
4049	Phase C current of loop 4	A
404A	Phase A voltage of loop 4	V
404B	Phase B voltage of loop 4	V
404C	Phase C voltage of loop 4	V
404D	Phase A active power of loop 4	W
404E	Phase B active power of loop 4	W

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404F	Phase C active power of loop 4	W
4050	Total active power of loop 4	W
4051	Phase A reactive power of loop 4	VA
4052	Phase B reactive power of loop 4	VA
4053	Phase C reactive power of loop 4	VA
4054	The total reactive power of loop 4	VA
4055	Phase A apparent power of loop 4	V
4056	Phase B apparent power of loop 4	V
4057	Phase C apparent power of loop 4	V
4058	Total apparent power of loop 4	V
4059	Phase A power factor of loop 4	
405A	Phase B power factor of loop 4	
405B	Phase C power factor of loop 4	
405C	Total power factor of loop 4	
405D	Frequency of loop 5	Hz
405E	Phase A current of loop 5	A
405F	Phase B current of loop 5	A
4060	Phase C current of loop 5	A
4061	Phase A voltage of loop 5	V
4062	Phase B voltage of loop 5	V
4063	Phase C voltage of loop 5	V
4064	Phase A active power of loop 5	W
4065	Phase B active power of loop 5	W
4066	Phase C active power of loop 5	W
4067	Total active power of loop 5	W
4068	Phase A reactive power of loop 5	VA
4069	Phase B reactive power of loop 5	VA
406A	Phase C reactive power of loop 5	VA
406B	The total reactive power of loop 5	VA
406C	Phase A apparent power of loop 5	V
406D	Phase B apparent power of loop 5	V
406E	Phase C apparent power of loop 5	V
406F	Total apparent power of loop 5	V
4070	Phase A power factor of loop 5	

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4071	Phase B power factor of loop 5	
4072	Phase C power factor of loop 5	
4073	Total power factor of loop 5	
4074	Frequency of loop 6	Hz
4075	Phase A current of loop 6	A
4076	Phase B current of loop 6	A
4077	Phase C current of loop 6	A
4078	Phase A voltage of loop 6	V
4079	Phase B voltage of loop 6	V
407A	Phase C voltage of loop 6	V
407B	Phase A active power of loop 6	W
407C	Phase B active power of loop 6	W
407D	Phase C active power of loop 6	W
407E	Total active power of loop 6	W
407F	Phase A reactive power of loop 6	VA
4080	Phase B reactive power of loop 6	VA
4081	Phase C reactive power of loop 6	VA
4082	The total reactive power of loop 6	VA
4083	Phase A apparent power of loop 6	V
4084	Phase B apparent power of loop 6	V
4085	Phase C apparent power of loop 6	V
4086	Total apparent power of loop 6	V
4087	Phase A power factor of loop 6	
4088	Phase B power factor of loop 6	
4089	Phase C power factor of loop 6	
408A	Total power factor of loop 6	
408B	Frequency of loop 7	Hz
408C	Phase A current of loop 7	A
408D	Phase B current of loop 7	A
408E	Phase C current of loop 7	A
408F	Phase A voltage of loop 7	V
4090	Phase B voltage of loop 7	V
4091	Phase C voltage of loop 7	V
4092	Phase A active power of loop 7	W
4093	Phase B active power of loop 7	W
4094	Phase C active power of loop 7	W
4095	Total active power of loop 7	W
4096	Phase A reactive power of loop 7	VA
4097	Phase B reactive power of loop 7	VA
4098	Phase C reactive power of loop 7	VA
4099	The total reactive power of loop 7	VA
409A	Phase A apparent power of loop 7	V

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409B	Phase B apparent power of loop 7	V
409C	Phase C apparent power of loop 7	V
409D	Total apparent power of loop 7	V
409E	Phase A power factor of loop 7	
409F	Phase B power factor of loop 7	
40A0	Phase C power factor of loop 7	
40A1	Total power factor of loop 7	
40A2	Frequency of loop 8	Hz
40A3	Phase A current of loop 8	A
40A4	Phase B current of loop 8	A
40A5	Phase C current of loop 8	A
40A6	Phase A voltage of loop 8	V
40A7	Phase B voltage of loop 8	V
40A8	Phase C voltage of loop 8	V
40A9	Phase A active power of loop 8	W
40AA	Phase B active power of loop 8	W
40AB	Phase C active power of loop 8	W
40AC	Total active power of loop 8	W
40AD	Phase A reactive power of loop 8	VA
40AE	Phase B reactive power of loop 8	VA
40AF	Phase C reactive power of loop 8	VA
40B0	The total reactive power of loop 8	VA
40B1	Phase A apparent power of loop 8	V
40B2	Phase B apparent power of loop 8	V
40B3	Phase C apparent power of loop 8	V
40B4	Total apparent power of loop 8	V
40B5	Phase A power factor of loop 8	
40B6	Phase B power factor of loop 8	
40B7	Phase C power factor of loop 8	
40B8	Total power factor of loop 8	

Body	Name	Unit	Remarks
6401	Active energy of forward direction of loop 1 at present	kWh	Without time mark
6402	Reactive energy of forward direction of loop 1 at present	kvarh	
6403	First-quadrant reactive energy of of loop 1 at present	kvarh	
6404	Fourth-quadrant reactive energy of of loop 1 at present	kvarh	
6405	Active energy of backward direction of loop 1 at present	kWh	
6406	Reactive energy of backward direction of loop 1 at present	kvarh	

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6407	Second-quadrant reactive energy of of loop 1 at present	kvarh	
6408	Third-quadrant reactive energy of of loop 1 at present	kvarh	
6409	Active energy of forward direction of loop 1 for 15-minute freeze	kWh	With time mark
640A	Reactive energy of forward direction of loop 1 for 15-minute freeze	kvarh	CP56Time2a
640B	First-quadrant Reactive energy of loop 1 for 15-minute freeze	kvarh	
640C	Fourth-quadrant Reactive energy of loop 1 for 15-minute freeze	kvarh	
640D	Active energy of backward direction of loop 1 for 15-minute freeze	kWh	
640E	Reactive energy of backward direction of loop 1 for 15-minute freeze	kvarh	
640F	Second-quadrant Reactive energy of loop 1 for 15-minute freeze	kvarh	
6410	Third-quadrant Reactive energy of loop 1 for 15-minute freeze	kvarh	
6411	Active energy of forward direction of loop 1 for daily freeze	kWh	
6412	Reactive energy of forward direction of loop 1 for daily freeze	kvarh	
6413	First-quadrant reactive energy of loop 1 for daily freeze	kvarh	
6414	Fourth-quadrant Reactive energy of loop 1 for daily freeze	kvarh	
6415	Active energy of backward direction of loop 1 for daily freeze	kWh	
6416	Reactive energy of backward direction of loop 1 for daily freeze	kvarh	
6417	Second-quadrant Reactive energy of loop 1 for daily freeze	kvarh	
6418	Third-quadrant Reactive energy of loop 1 for daily freeze	kvarh	
6419	Active energy of forward direction of loop 1 for power flow changing freeze	kWh	
641A	Reactive energy of forward direction of loop 1 for power flow changing freeze	kvarh	
641B	First-quadrant reactive energy of loop 1 for power flow changing freeze	kvarh	
641C	Fourth-quadrant reactive energy of loop 1 for power flow changing freeze	kvarh	
641D	Active energy of backward direction of loop 1 for power flow changing freeze	kWh	
641E	Reactive energy of backward direction of loop 1 for power flow changing freeze	kvarh	
641F	Second-quadrant reactive energy of loop 1 for power flow changing freeze	kvarh	

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6420	Third-quadrant reactive energy of loop 1 for power flow changing freeze	kvarh	
6421	Active energy of forward direction of loop 2 at present	kWh	Without time mark
6422	Reactive energy of forward direction of loop 2 at present	kvarh	
6423	First-quadrant reactive energy of of loop 2 at present	kvarh	
6424	Fourth-quadrant reactive energy of of loop 2 at present	kvarh	
6425	Active energy of backward direction of loop 2 at present	kWh	
6426	Reactive energy of backward direction of loop 2 at present	kvarh	
6427	Second-quadrant reactive energy of of loop 2 at present	kvarh	
6428	Third-quadrant reactive energy of of loop 2 at present	kvarh	
6429	Active energy of forward direction of loop 2 for 15-minute freeze	kWh	With time mark CP56Time2a
642A	Reactive energy of forward direction of loop 2 for 15-minute freeze	kvarh	
642B	First-quadrant Reactive energy of loop 2 for 15-minute freeze	kvarh	
642C	Fourth-quadrant Reactive energy of loop 2 for 15-minute freeze	kvarh	
642D	Active energy of backward direction of loop 2 for 15-minute freeze	kWh	
642E	Reactive energy of backward direction of loop 2 for 15-minute freeze	kvarh	
642F	Second-quadrant Reactive energy of loop 2 for 15-minute freeze	kvarh	
6430	Third-quadrant Reactive energy of loop 2 for 15-minute freeze	kvarh	
6431	Active energy of forward direction of loop 2 for daily freeze	kWh	
6432	Reactive energy of forward direction of loop 2 for daily freeze	kvarh	
6433	First-quadrant reactive energy of loop 2 for daily freeze	kvarh	
6434	Fourth-quadrant Reactive energy of loop 2 for daily freeze	kvarh	
6435	Active energy of backward direction of loop 2 for daily freeze	kW h	
6436	Reactive energy of backward direction of loop 2 for daily freeze	kvarh	
6437	Second-quadrant Reactive energy of loop 2 for daily freeze	kvarh	
6438	Third-quadrant Reactive energy of loop 2 for daily freeze	kvarh	
6439	Active energy of forward direction of loop 2 for power flow changing freeze	kW h	
643A	Reactive energy of forward direction of loop 2 for power flow changing freeze	kvarh	

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643B	First-quadrant reactive energy of loop 2 for power flow changing freeze	kvarh	
643C	Fourth-quadrant reactive energy of loop 2 for power flow changing freeze	kvarh	
643D	Active energy of backward direction of loop 2 for power flow changing freeze	kW h	
643E	Reactive energy of backward direction of loop 2 for power flow changing freeze	kvarh	
643F	Second-quadrant reactive energy of loop 2 for power flow changing freeze	kvarh	
6440	Third-quadrant reactive energy of loop 2 for power flow changing freeze	kvarh	
6441	Active energy of forward direction of loop 3 at present	kW h	Without time mark
6442	Reactive energy of forward direction of loop 3 at present	kvarh	
6443	First-quadrant reactive energy of of loop 3 at present	kvarh	
6444	Fourth-quadrant reactive energy of of loop 3 at present	kvarh	
6445	Active energy of backward direction of loop 3 at present	kW h	
6446	Reactive energy of backward direction of loop 3 at present	kvarh	
6447	Second-quadrant reactive energy of of loop 3 at present	kvarh	
6448	Third-quadrant reactive energy of of loop 3 at present	kvarh	
6449	Active energy of forward direction of loop 3 for 15-minute freeze	kW h	With time mark CP56Time2a
644A	Reactive energy of forward direction of loop 3 for 15-minute freeze	kvarh	
644B	First-quadrant Reactive energy of loop 3 for 15-minute freeze	kvarh	
644C	Fourth-quadrant Reactive energy of loop 3 for 15-minute freeze	kvarh	
644D	Active energy of backward direction of loop 3 for 15-minute freeze	kW h	
644E	Reactive energy of backward direction of loop 3 for 15-minute freeze	kvarh	
644F	Second-quadrant Reactive energy of loop 3 for 15-minute freeze	kvarh	
6450	Third-quadrant Reactive energy of loop 3 for 15-minute freeze	kvarh	
6451	Active energy of forward direction of loop 3 for daily freeze	kW h	
6452	Reactive energy of forward direction of loop 3 for daily freeze	kvarh	
6453	First-quadrant reactive energy of loop 3 for daily freeze	kvarh	
6454	Fourth-quadrant Reactive energy of loop 3 for daily freeze	kvarh	

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6455	Active energy of backward direction of loop 3 for daily freeze	kWh	
6456	Reactive energy of backward direction of loop 3 for daily freeze	kvarh	
6457	Second-quadrant Reactive energy of loop 3 for daily freeze	kvarh	
6458	Third-quadrant Reactive energy of loop 3 for daily freeze	kvarh	
6459	Active energy of forward direction of loop 3 for power flow changing freeze	kWh	
645A	Reactive energy of forward direction of loop 3 for power flow changing freeze	kvarh	
645B	First-quadrant reactive energy of loop 3 for power flow changing freeze	kvarh	
645C	Fourth-quadrant reactive energy of loop 3 for power flow changing freeze	kvarh	
645D	Active energy of backward direction of loop 3 for power flow changing freeze	kWh	
645E	Reactive energy of backward direction of loop 3 for power flow changing freeze	kvarh	
645F	Second-quadrant reactive energy of loop 3 for power flow changing freeze	kvarh	
6460	Third-quadrant reactive energy of loop 3 for power flow changing freeze	kvarh	
6461	Active energy of forward direction of loop 4 at present	kWh	Without time mark
6462	Reactive energy of forward direction of loop 4 at present	kvarh	
6463	First-quadrant reactive energy of of loop 4 at present	kvarh	
6464	Fourth-quadrant reactive energy of of loop 4 at present	kvarh	
6465	Active energy of backward direction of loop 4 at present	kWh	
6466	Reactive energy of backward direction of loop 4 at present	kvarh	
6467	Second-quadrant reactive energy of of loop 4 at present	kvarh	
6468	Third-quadrant reactive energy of of loop 4 at present	kvarh	
6469	Active energy of forward direction of loop 4 for 15-minute freeze	kWh	
646A	Reactive energy of forward direction of loop 4 for 15-minute freeze	kvarh	
646B	First-quadrant Reactive energy of loop 4 for 15-minute freeze	kvarh	
646C	Fourth-quadrant Reactive energy of loop 4 for 15-minute freeze	kvarh	
646D	Active energy of backward direction of loop 4 for 15-minute freeze	kWh	
646E	Reactive energy of backward direction of loop 4 for 15-minute freeze	kvarh	

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646F	Second-quadrant Reactive energy of loop 4 for 15-minute freeze	kvarh	With time mark CP56Time2a
6470	Third-quadrant Reactive energy of loop 4 for 15-minute freeze	kvarh	
6471	Active energy of forward direction of loop 4 for daily freeze	kWh	
6472	Reactive energy of forward direction of loop 4 for daily freeze	kvarh	
6473	First-quadrant reactive energy of loop 4 for daily freeze	kvarh	
6474	Fourth-quadrant Reactive energy of loop 4 for daily freeze	kvarh	
6475	Active energy of backward direction of loop 4 for daily freeze	kWh	
6476	Reactive energy of backward direction of loop 4 for daily freeze	kvarh	
6477	Second-quadrant Reactive energy of loop 4 for daily freeze	kvarh	
6478	Third-quadrant Reactive energy of loop 4 for daily freeze	kvarh	
6479	Active energy of forward direction of loop 4 for power flow changing freeze	kWh	
647A	Reactive energy of forward direction of loop 4 for power flow changing freeze	kvarh	
647B	First-quadrant reactive energy of loop 4 for power flow changing freeze	kvarh	
647C	Fourth-quadrant reactive energy of loop 4 for power flow changing freeze	kvarh	
647D	Active energy of backward direction of loop 4 for power flow changing freeze	kWh	
647E	Reactive energy of backward direction of loop 4 for power flow changing freeze	kvarh	
647F	Second-quadrant reactive energy of loop 4 for power flow changing freeze	kvarh	
6480	Third-quadrant reactive energy of loop 4 for power flow changing freeze	kvarh	
6481	Active energy of forward direction of loop 5 at present	kWh	Without time mark
6482	Reactive energy of forward direction of loop 5 at present	kvarh	
6483	First-quadrant reactive energy of of loop 5 at present	kvarh	
6484	Fourth-quadrant reactive energy of of loop 5 at present	kvarh	
6485	Active energy of backward direction of loop 5 at present	kWh	
6486	Reactive energy of backward direction of loop 5 at present	kvarh	
6487	Second-quadrant reactive energy of of loop 5 at present	kvarh	
6488	Third-quadrant reactive energy of of loop 5 at present	kvarh	

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6489	Active energy of forward direction of loop 5 for 15-minute freeze	kWh	With time mark CP56Time2a
648A	Reactive energy of forward direction of loop 5 for 15-minute freeze	kvarh	
648B	First-quadrant Reactive energy of loop 5 for 15-minute freeze	kvarh	
648C	Fourth-quadrant Reactive energy of loop 5 for 15-minute freeze	kvarh	
648D	Active energy of backward direction of loop 5 for 15-minute freeze	kWh	
648E	Reactive energy of backward direction of loop 5 for 15-minute freeze	kvarh	
648F	Second-quadrant Reactive energy of loop 5 for 15-minute freeze	kvarh	
6490	Third-quadrant Reactive energy of loop 5 for 15-minute freeze	kvarh	
6491	Active energy of forward direction of loop 5 for daily freeze	kWh	
6492	Reactive energy of forward direction of loop 5 for daily freeze	kvarh	
6493	First-quadrant reactive energy of loop 5 for daily freeze	kvarh	
6494	Fourth-quadrant Reactive energy of loop 5 for daily freeze	kvarh	
6495	Active energy of backward direction of loop 5 for daily freeze	kWh	
6496	Reactive energy of backward direction of loop 5 for daily freeze	kvarh	
6497	Second-quadrant Reactive energy of loop 5 for daily freeze	kvarh	
6498	Third-quadrant Reactive energy of loop 5 for daily freeze	kvarh	
6499	Active energy of forward direction of loop 5 for power flow changing freeze	kWh	
649A	Reactive energy of forward direction of loop 5 for power flow changing freeze	kvarh	
649B	First-quadrant reactive energy of loop 5 for power flow changing freeze	kvarh	
649C	Fourth-quadrant reactive energy of loop 5 for power flow changing freeze	kvarh	
649D	Active energy of backward direction of loop 5 for power flow changing freeze	kWh	
649E	Reactive energy of backward direction of loop 5 for power flow changing freeze	kvarh	
649F	Second-quadrant reactive energy of loop 5 for power flow changing freeze	kvarh	
64A0	Third-quadrant reactive energy of loop 5 for power flow changing freeze	kvarh	
64A1	Active energy of forward direction of loop 6 at present	kWh	
64A2	Reactive energy of forward direction of loop 6 at present	kvarh	

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64A3	First-quadrant reactive energy of of loop 6 at present	kvarh	Without time mark
64A4	Fourth-quadrant reactive energy of of loop 6 at present	kvarh	
64A5	Active energy of backward direction of loop 6 at present	kW h	
64A6	Reactive energy of backward direction of loop 6 at present	kvarh	
64A7	Second-quadrant reactive energy of of loop 6 at present	kvarh	
64A8	Third-quadrant reactive energy of of loop 6 at present	kvarh	
64A9	Active energy of forward direction of loop 6 for 15-minute freeze	kW h	With time mark CP56Time2a
64AA	Reactive energy of forward direction of loop 6 for 15-minute freeze	kvarh	
64AB	First-quadrant Reactive energy of loop 6 for 15-minute freeze	kvarh	
64AC	Fourth-quadrant Reactive energy of loop 6 for 15-minute freeze	kvarh	
64AD	Active energy of backward direction of loop 6 for 15-minute freeze	kW h	
64AE	Reactive energy of backward direction of loop 6 for 15-minute freeze	kvarh	
64AF	Second-quadrant Reactive energy of loop 6 for 15-minute freeze	kvarh	
64B0	Third-quadrant Reactive energy of loop 6 for 15-minute freeze	kvarh	
64B1	Active energy of forward direction of loop 6 for daily freeze	kW h	
64B2	Reactive energy of forward direction of loop 6 for daily freeze	kvarh	
64B3	First-quadrant reactive energy of loop 6 for daily freeze	kvarh	
64B4	Fourth-quadrant Reactive energy of loop 6 for daily freeze	kvarh	
64B5	Active energy of backward direction of loop 6 for daily freeze	kW h	
64B6	Reactive energy of backward direction of loop 6 for daily freeze	kvarh	
64B7	Second-quadrant Reactive energy of loop 6 for daily freeze	kvarh	
64B8	Third-quadrant Reactive energy of loop 6 for daily freeze	kvarh	
64B9	Active energy of forward direction of loop 6 for power flow changing freeze	kW h	
64BA	Reactive energy of forward direction of loop 6 for power flow changing freeze	kvarh	
64BB	First-quadrant reactive energy of loop 6 for power flow changing freeze	kvarh	
64BC	Fourth-quadrant reactive energy of loop 6 for power flow changing freeze	kvarh	

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64BD	Active energy of backward direction of loop 6 for power flow changing freeze	kWh	
64BE	Reactive energy of backward direction of loop 6 for power flow changing freeze	kvarh	
64BF	Second-quadrant reactive energy of loop 6 for power flow changing freeze	kvarh	
64C0	Third-quadrant reactive energy of loop 6 for power flow changing freeze	kvarh	
64C1	Active energy of forward direction of loop 7 at present	kWh	Without time mark
64C2	Reactive energy of forward direction of loop 7 at present	kvarh	
64C3	First-quadrant reactive energy of of loop 7 at present	kvarh	
64C4	Fourth-quadrant reactive energy of of loop 7 at present	kvarh	
64C5	Active energy of backward direction of loop 7 at present	kWh	
64C6	Reactive energy of backward direction of loop 7 at present	kvarh	
64C7	Second-quadrant reactive energy of of loop 7 at present	kvarh	
64C8	Third-quadrant reactive energy of of loop 7 at present	kvarh	
64C9	Active energy of forward direction of loop 7 for 15-minute freeze	kWh	With time mark CP56Time2a
64CA	Reactive energy of forward direction of loop 7 for 15-minute freeze	kvarh	
64CB	First-quadrant Reactive energy of loop 7 for 15-minute freeze	kvarh	
64CC	Fourth-quadrant Reactive energy of loop 7 for 15-minute freeze	kvarh	
64CD	Active energy of backward direction of loop 7 for 15-minute freeze	kWh	
64CE	Reactive energy of backward direction of loop 7 for 15-minute freeze	kvarh	
64CF	Second-quadrant Reactive energy of loop 7 for 15-minute freeze	kvarh	
64D0	Third-quadrant Reactive energy of loop 7 for 15-minute freeze	kvarh	
64D1	Active energy of forward direction of loop 7 for daily freeze	kWh	
64D2	Reactive energy of forward direction of loop 7 for daily freeze	kvarh	
64D3	First-quadrant reactive energy of loop 7 for daily freeze	kvarh	
64D4	Fourth-quadrant Reactive energy of loop 7 for daily freeze	kvarh	
64D5	Active energy of backward direction of loop 7 for daily freeze	kWh	
64D6	Reactive energy of backward direction of loop 7 for daily freeze	kvarh	

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64D7	Second-quadrant Reactive energy of loop 7 for daily freeze	kvarh	
64D8	Third-quadrant Reactive energy of loop 7 for daily freeze	kvarh	
64D9	Active energy of forward direction of loop 7 for power flow changing freeze	kW h	
64DA	Reactive energy of forward direction of loop 7 for power flow changing freeze	kvarh	
64DB	First-quadrant reactive energy of loop 7 for power flow changing freeze	kvarh	
64DC	Fourth-quadrant reactive energy of loop 7 for power flow changing freeze	kvarh	
64DD	Active energy of backward direction of loop 7 for power flow changing freeze	kW h	
64DE	Reactive energy of backward direction of loop 7 for power flow changing freeze	kvarh	
64DF	Second-quadrant reactive energy of loop 7 for power flow changing freeze	kvarh	
64E0	Third-quadrant reactive energy of loop 7 for power flow changing freeze	kvarh	
64E1	Active energy of forward direction of loop 8 at present	kW h	Without time mark
64E2	Reactive energy of forward direction of loop 8 at present	kvarh	
64E3	First-quadrant reactive energy of of loop 8 at present	kvarh	
64E4	Fourth-quadrant reactive energy of of loop 8 at present	kvarh	
64E5	Active energy of backward direction of loop 8 at present	kW h	
64E6	Reactive energy of backward direction of loop 8 at present	kvarh	
64E7	Second-quadrant reactive energy of of loop 8 at present	kvarh	
64E8	Third-quadrant reactive energy of of loop 8 at present	kvarh	
64E9	Active energy of forward direction of loop 8 for 15-minute freeze	kW h	With time mark
64EA	Reactive energy of forward direction of loop 8 for 15-minute freeze	kvarh	
64EB	First-quadrant Reactive energy of loop 8 for 15-minute freeze	kvarh	
64EC	Fourth-quadrant Reactive energy of loop 8 for 15-minute freeze	kvarh	
64ED	Active energy of backward direction of loop 8 for 15-minute freeze	kW h	
64EE	Reactive energy of backward direction of loop 8 for 15-minute freeze	kvarh	
64EF	Second-quadrant Reactive energy of loop 8 for 15-minute freeze	kvarh	
64F0	Third-quadrant Reactive energy of loop 8 for 15-minute freeze	kvarh	

64F1	Active energy of forward direction of loop 8 for daily freeze	kWh	CP56Time2a
64F2	Reactive energy of forward direction of loop 8 for daily freeze	kvarh	
64F3	First-quadrant reactive energy of loop 8 for daily freeze	kvarh	
64F4	Fourth-quadrant Reactive energy of loop 8 for daily freeze	kvarh	
64F5	Active energy of backward direction of loop 8 for daily freeze	kWh	
64F6	Reactive energy of backward direction of loop 8 for daily freeze	kvarh	
64F7	Second-quadrant Reactive energy of loop 8 for daily freeze	kvarh	
64F8	Third-quadrant Reactive energy of loop 8 for daily freeze	kvarh	
64F9	Active energy of forward direction of loop 8 for power flow changing freeze	kWh	
64FA	Reactive energy of forward direction of loop 8 for power flow changing freeze	kvarh	
64FB	First-quadrant reactive energy of loop 8 for power flow changing freeze	kvarh	
64FC	Fourth-quadrant reactive energy of loop 8 for power flow changing freeze	kvarh	
64FD	Active energy of backward direction of loop 8 for power flow changing freeze	kWh	
64FE	Reactive energy of backward direction of loop 8 for power flow changing freeze	kvarh	
64FF	Second-quadrant reactive energy of loop 8 for power flow changing freeze	kvarh	
6500	Third-quadrant reactive energy of loop 8 for power flow changing freeze	kvarh	

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