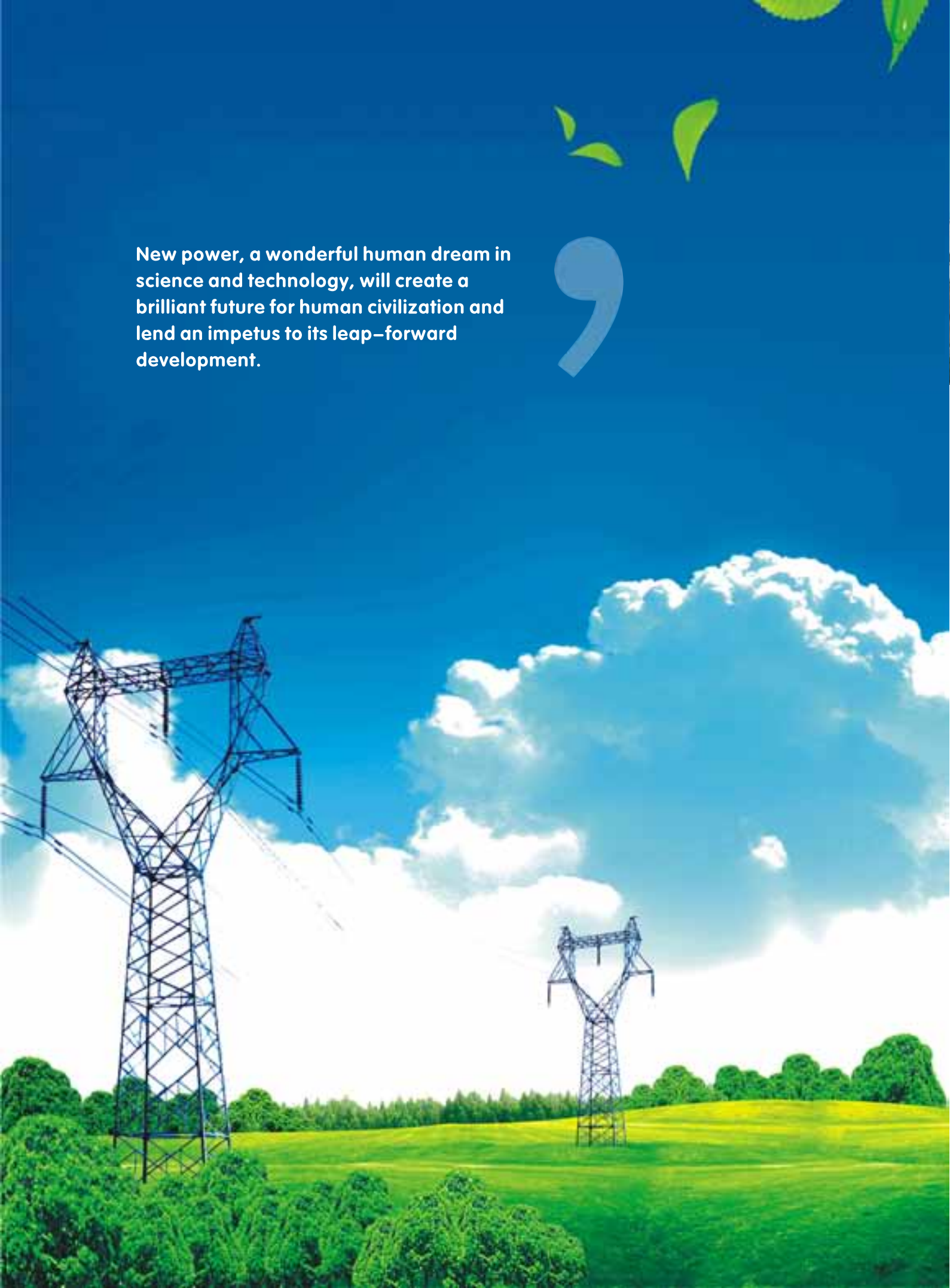


Instrument & Protection Systems

HUAYI ELEC. APPARATUS GROUP CO., LTD.

New power, a wonderful human dream in science and technology, will create a brilliant future for human civilization and lend an impetus to its leap-forward development.





Brief Introduction

Huayi Electrical Apparatus Group Co., Ltd. (hereinafter referred to as HEAG), was founded in 1986 with total investment of RMB 40,000.00, and was promoted to a group company in 1997. HEAG now has become an inter-province, inter-industry enterprise group comprised of 7 core subsidiaries, 5 joint venture companies and over 100 member enterprises, which centers on wind power and high voltage apparatus, and diversifies into areas such as low voltage apparatus, real estate, chemical industry and tertiary industry. The company is national designated manufacturing enterprise of L.V. & H.V. switchgear and the key hi-tech enterprise listed in State Torch Project, also ranks China's Top 500 Private Enterprises, China's Top 500 Enterprises in Machinery Industry, China's Top 100 Growth Enterprises, China's Top 100 Enterprises in Electric Industry, China's Top 10 Leading Enterprises in Electric Apparatus Manufacturing, etc.. It mainly produces 252kV and below switchgears, automation distribution switches and terminal devices, high voltage switch components, static energy meters, wind power equipments and so on. Hereinto, outdoor high voltage vacuum circuit breakers are recommended as "National Key Promoting New Products" by the former Power Ministry, its market share in China is above 25% and its production and sales continuously have been No.1 in the domestic market for seven years. On Feb. 1st, 2007, one of HEAG's core subsidiaries, Huayi Electric Co., Ltd. successfully got listed on Shanghai Stock Exchange, and became the the first private enterprise listed on the Main Board in Wenzhou city.



Huayi Office Block



Huayi Plant in Shanghai



Automatic SMT Assembly Line

Automatic Wave Soldering System

Test & Calibration



Process Facilities

High quality of Huayi's products are powerfully supported by advanced technology and processing facilities, world-leading automatic producing line, strict craftwork managing, experienced worker and precise quality control & testing system.



Test & Calibration



Instrument & Protection Systems

As one of the professional enterprises first engaging in development and production of electronic energy meters in China, HEAG has set up R & D Center with complete full-function labs for testing product characteristics, foreign advanced SMT Automatic Moulder, Automatic Wave Soldering Machine, as well as advanced manufacturing devices imported from Germany for 0.02 grade standard meters. It has become a standing member in instrument and meter industry in China. So far, items of products are identified as software-based products by the Ministry of Information Industry, among which the 3-phase electronic multi-function GPRS network table is reputed as annual high-tech product in 2006. HEAG produces HYP series of numerical protection relays, remote terminal units and Automatic circuit recloser controller as well as SCADA systems for power substation. We also provide the end-users systematic solutions with instrumentation, protection, reporting, monitoring, local and remote control and automation.

Cooperation Projects



A ceremony for signing the contract of technical transfer between TOSHIBA Corporation Japan and HEAG



A ceremony for signing the agreement of technical cooperation between ILJIN company Korea and HEAG



Tender contract signed by BPDP, Bangladesh and HEAG



HEAG Switchgear in Guangzhou university town



HEAG circuit breaker in Neikun railway electrification

Qualification and Certificate



ISO9001 Certificate



ISO14001 Certificate



ISO9001 Certificate



Well-known Mark



Petrochina Membership Certificate

1	DDS3 Single-phase Static Energy Meter
2	DDS3 (LCD) Single-phase Static Energy Meter
3	DSS3/DTS3 Three-Phase Static Active Energy Meter
5	DTS(X)3/DSS(X)3 Three-phase Static Active/Reactive Energy Meter
7	DDSF3 Single-phase Multi-rate Static Energy Meter
9	DSSF3/DTSF3 Three-phase Multi-rate Static Energy Meter
11	DTSD3/DSSD2 Three-phase Multi-function Static Energy Meter
13	FKGA4C2-HY21 Load Management Control Terminal
15	DDSY39(LED) Single-phase Prepayment Static Energy Meter
17	DDSY39(LCD) Single-phase Prepayment Static Energy Meter
19	DSSY3/DTSY3 Three-phase Prepayment Static Energy Meter
21	IC Card Electricity Sales Management System
23	DDSI39 Single-phase PLC Static Energy Meter
25	DS(T)SI39 Three-phase PLC Electric Energy Meter
27	HYJZQ-2 Low-voltage PLC Centralized Controller
28	PLC ARM System
29	DD862 Single-phase Inductive Watt-hour Meter
30	D86 Three-Phase Active and Reactive Watt-hour Meter
31	Other Energy Meters
32	M-BUS/PLC Collection Terminal For Water Meter
33	Heat Meter Reading System
34	HYP100 Microcomputer Protection Relay
36	HYP400 Microcomputer Programmable Protection Relay
37	HYP600S Microcomputer Programmable Protection Relay
39	HYP600 Microcomputer Programmable Protection Relay
41	HYC-2600 Outdoor Automatic Remote Feeder Terminal Unit(FTU)
43	HYC 461Automatic Circuit Breaker Recloser Controller
46	HYP2692 Communication Manager
47	HYS-8000A automatic integration Monitoring System
50	Substation Automation System

DDS3 Single-phase Static Energy Meter

Summary

DDS3 Single-phase static energy meter adopts LSI and SMT technology and industrial components, and the key parts are all international famous long-life components. The product accords with IEC62053, which is suitable for measuring single-phase AC active energy. It has the merits of good stability, wide load, low power consumption, strong anti-interference ability, etc.



Ambient condition

1. Accuracy class: 1.0 class, 2.0 class;
2. Accord standard: IEC62053; IEC61036; GB/T17215-2002;
3. Normal working temperature: $-30^{\circ}\text{C}\sim+50^{\circ}\text{C}$
4. Limit working temperature: $-40^{\circ}\text{C}\sim+70^{\circ}\text{C}$;
5. Relative humidity: annual average $<80\%$;
6. Voltage circuit power consumption $\leq 1.0\text{W}(6\text{VA})$;
7. Current circuit power consumption $\leq 1.0\text{VA}$;
8. Life: 10 years.

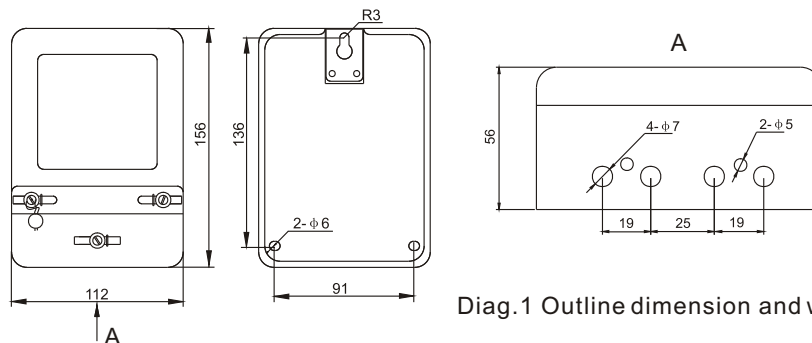
Model

Model	Rated frequency (Hz)	Rated current (A)	Meter constant(imp/kwh)
DDS3(220)	50/60	1.5(6), 2.5(10), 5(20), 10(40), 15(60)	12800, 6400, 3200, 1600

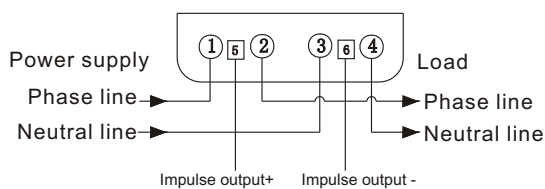
Basic function

1. Measure the positive and negative AC reactive power, negative electricity measured as the positive.
2. Adopting the photoelectric isolation to output the no-power impulse signal, the shape of the wave is quadrate, the width of output impulse is $80\text{ms} \pm 20\text{ms}$, LED indicator.
3. Small in size, light in weight, high in precision, wide load and easy for installation.

Outline dimension and Wiring diagram



Diag.1 Outline dimension and wiring



Diag.2 Wiring diagram

DDS3 (LCD) Single-phase Static Energy Meter

Summary

DDS3(LCD) single-phase static energy meter adopts special large scale integrated circuit and SMT technology with LCD display. The data is able to be saved when the power is failure. It is one of the newest energy measuring products in the world. It meets all technical requirements of IEC62053: class 1 and class 2 static alternating active watt-hour meter.



Technical specification

1. Accuracy class: 1.0 class, 2.0 class;
2. Conformed standards: IEC62053 & GB/T 17215-2002;
3. Normal working humidity: -25°C~+45°C;
4. Limit working temperature: -40°C~+70°C;
5. Relative humidity: annual average $\leq 80\%$;
6. Voltage circuit power consumption $\leq 1.0W(6VA)$;
7. Current circuit power consumption $\leq 1.0VA$;
8. Life: 10 years.

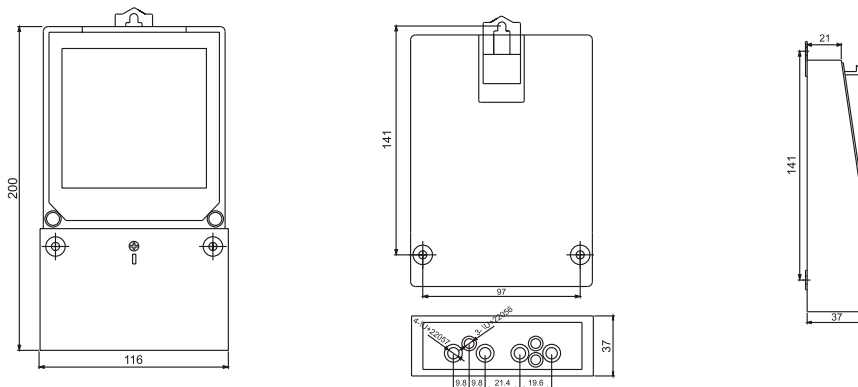
Model

Model	Rated frequency(Hz)	Rated current(A)	Meter constant(imp/kwh)
DDS3(220)	50	1.5(6) 2.5(10) 5(20) 10(40) 15(60)	12800, 6400, 3200, 1600

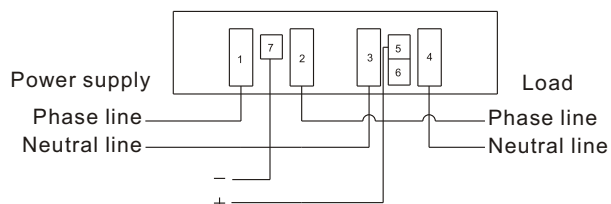
Product function

1. Measure the positive and negative AC reactive power, reverse electricity measured as the positive.
2. Adopting the photoelectric isolation to output the no-power impulse signal, the shape of the wave is quadrate, and the width of output impulse is $80ms \pm 20ms$, use the LED as the indicator.
3. Small in size, light in weight, high in precision, wide load and easy for installation.

Outline dimension and Wiring diagram



Diag 1. Outline dimension



Diag 2. Wiring diagram

DSS3/DTS3 Three-Phase Static Active Energy Meter

Summary

DSS3/DTS3 three-phase static energy meter is based on special large scale integrated circuit and SMT technology; by adopting microelectronic and computer technology as core technology and depending on modern management. we developed this metering product with high dependability and precision. It's one of the newest energy metering products in the world. It meets all technical requirements of IEC 62053-21: class 1 and class 2 static alternating active watt-hour meter, it measures positive and negative active power energy with frequency of 50/60Hz in three-phase electricity network.



Technical specification

1. Electrical condition

Accuracy class: 1.0 class, 2.0 class;

Normal working voltage: 0.9~1.1 reference voltage;

Limit working voltage: 0.8~1.15 reference voltage;

Insulation voltage endurance: $\geq 2000\text{VAC}$;

Power consumption: each phase voltage loop power consumption $\leq 1.0\text{W}$;

Start-up current: direct type is 4‰ reference current, current transformer type-in is 2‰ reference current;

Shunt running: voltage line adding 15% U_n , current loop current is 0, energy meter no measurement;

2. Ambient condition

Normal working temperature: $-30^{\circ}\text{C}\sim+55^{\circ}\text{C}$;

Limit working temperature: $-40^{\circ}\text{C}\sim+70^{\circ}\text{C}$;

Stockpile and transportation temperature: $-45^{\circ}\text{C}\sim+70^{\circ}\text{C}$;

Relative humidity: annual average $< 80\%$;

3. Conformed standards: IEC62053; GB/T 17215-2002;

4. Life: 10 years.

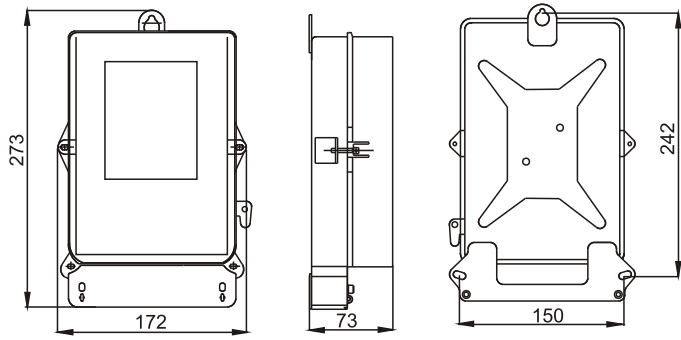
Model

Model	Reference voltage(V)	Rated frequency(Hz)	Nominal current(A)	Meter constant (imp/kwh)
Three phase four wire DTS3	$3 \times 220(240)/380(415)$	50/60	1.5(6),2.5(10), 5(20),10(40), 15(60),20(80), 30(100)	As nameplate
	$3 \times 57.5(63.5)/110$	50/60		
Three phase three wire DSS3	$3 \times 100/110$	50/60		
	$3 \times 380/415$	50/60		

Product function

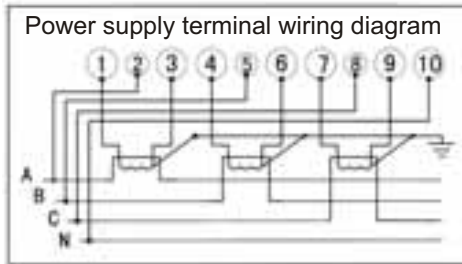
1. Bi-directional measure function, precisely measure positive and negative power, free from checkout in longtime, accumulate electricity energy in one direction.
2. Three-phase power supply, the metering accuracy is out of influence when one or two phase break down, phase shortage state is indicated as light is off.
3. Adopting the photoelectric isolation technology to output impulse signal, LED power indication.

Outline dimension and wiring diagram

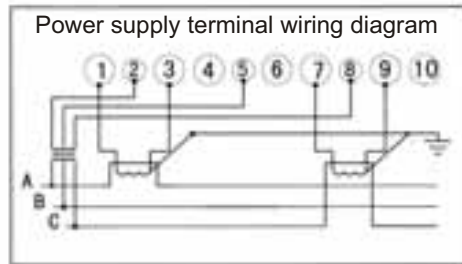


Diag 1 Outline dimension

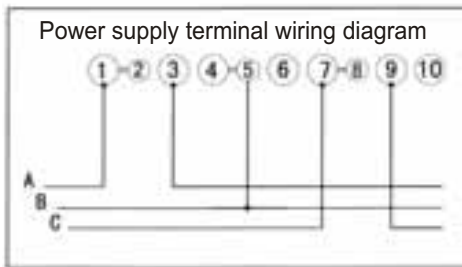
Current transformer type



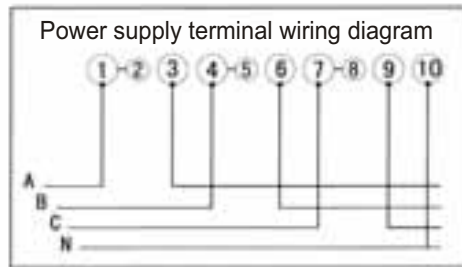
Current/Potential transformer type



Three phase three wire direct type



Three phase four wire direct type



DTs(X)3/DSS(X)3 Three-phase Static Active/Reactive Energy Meter

Summary

DTs(X)3/DSS(X)3 is designed adapting to international national electricity network upgrading and national state. The product is of high dependability and high precision. It adapts the large-scale integrated circuit and SMT technology. The inner key elements are famous trademarks with long life; it improves the reliability and life of the product. It can measure the three-phase active/reactive electrical energy; especially the combined meter can substitute two normal three-phase meters. The product can expand RS485 communications and infrared communication, long-distance reading and it helps the automation management. It uses LCD mode to display the data of active electric energy, reactive quantity of electricity, voltage, current power factor and so on.



Technical specification

1. Electric condition

Accuracy class: active 1.0, reactive 2.0;

Normal working voltage: 0.9~1.1 reference voltage;

Limit working voltage: 0.75~1.15 reference voltage;

Voltage line power consumption: each phase voltage circuit power consumption $\leq 2.0W$ and 5VA;

Power consumption of current line: $\leq 1VA$;

Start-up current: active $0.002I_n(1.0)$, reactive $\leq 0.003I_n(2.0)$;

Shunt running: when add 115% reference voltage to voltage circuit, no current on current circuit, energy indicator light does not shine, no energy pulse output.

2. Ambient condition

Normal working temperature: $-25^{\circ}C \sim +50^{\circ}C$;

Limit working temperature: $-30^{\circ}C \sim +70^{\circ}C$;

Stockpile and transportation temperature: $-40^{\circ}C \sim +80^{\circ}C$;

Relative humidity: annual average $< 80\%$.

3. Communication parameter

Display	LCD
Communication interface	RS485, infrared interface
Communication baud rate	RS485 interface: 1200~9600bps; infrared interface: 1200bps
Communication protocol	IEC1107 & DL/T645-1997 multifunction energy meter communications protocol

Model

Model	Reference voltage(V)	Rated frequency(Hz)	Nominal current(A)	Meter constant (imp/kwh)
Three phase four wire DTs(X)3	$3 \times 220(240)/380(415)$	50/60	1.5(6), 2.5(10), 5(20), 10(40), 15(60), 20(80), 30(100)	As nameplate
	$3 \times 57.5(63.5)/110$	50/60		
Three phase three wire DSS(X)3	$3 \times 100/110$	50/60		
	$3 \times 380/400$	50/60		

Product function

1. Measurement functions

Measure total energy on positive and negative active and storage data;

Measure sensibility, soluble reactive total electric energy and storage data;

Measure A, B, C three phase total quantity of active electricity and storage data;

Measure reverse active energy total (A, B, C), and storage data.

2. Display function

LCD display, 6 integers, 2 decimal fractions;
Automatic rolling display, parameters and time, sequence can be randomly set;
Button display function, displaying content and sequence can be randomly set;
Read random item data by remote device.

3. Communication function

Electric isolation between RS485 interface and meter interior, and designed anti-lightning strike circuit.
Communication protocol refer to IEC1107 & DL/T645-1997 stipulations or other local request.

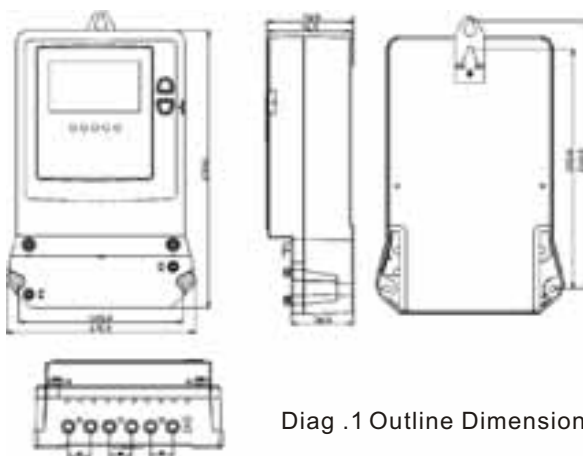
4. Output function

Active, reactive impulse test port and impulse indicator output function;

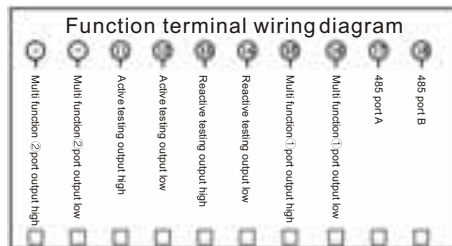
5. Event record function

Real time test three phase (A/B/C) potential, current, power etc. efficiency value and current frequency;
No voltage, phase failure event record function.

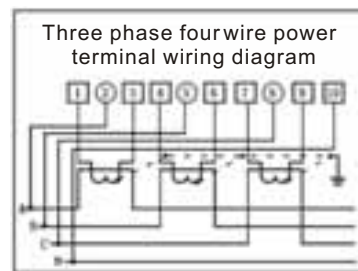
Outline dimension and wiring



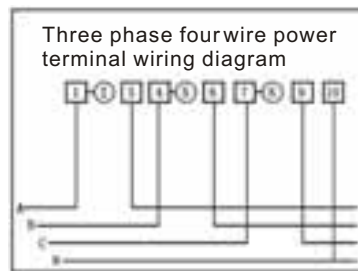
Diag .1 Outline Dimension



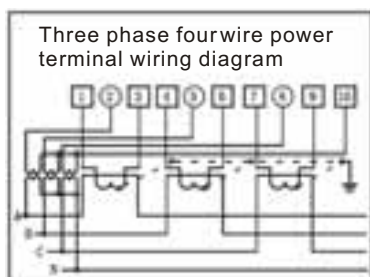
Diag 2-1 Function terminal wiring diagram



Current Transformer Type
($3 \times 220/380V \ 3 \times 1.5(6)A$)

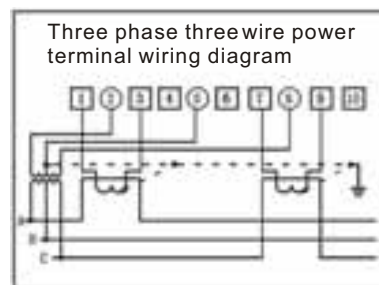


Direct type
($3 \times 220/380V \geq 3 \times 5(20)A$)



Current, voltage transformer type
($3 \times 57.7/100V \ 3 \times 1.5(6)A$)

Diag 2-2 Three phase four wire power terminal wiring



Current, voltage transformer type
($3 \times 100 \ 3 \times 1.5(6)A$)

Diag3 Three phase three wire power terminal wiring

DDSF3 Single-phase Multi-rate Static Energy Meter

Summary

DDSF3 single-phase multi-rate meter is an ideal product for active energy measurement corresponding to different tariffs. It realizes data exchange via RS485 network or by HHU, and the data transmission protocol conforms to IEC1107. The meter has the characteristics of small size, beautiful shape, long life, high accuracy, low power consumption, strong anti-interference ability, etc., and conform to IEC62053 & DL/T645-1997.



Technical specification

1. Accuracy class: 1.0, 2.0;

Normal working voltage: 4 hours' working under 154V~260V, ~440V AC without power consumption;

Power consumption of voltage circuit: $\leq 1.5W(5VA)$;

Power consumption of current circuit: $\leq 1.0VA$;

Clock calendar and battery;

Clock error: $\leq 0.5s/d$ (under the reference voltage); $\leq 1.0s/d$ (standby lithium battery in service);

Batteries voltage: 3.0V, capacitance $\geq 225mAh$;

Batteries life: >10years;

Optocoupler output interface;

Impulse extent: $80 \pm 20ms$;

Working voltage: 5~24V(DC); working current: 5mA(DC);

Life: 10years.

2. Ambient condition

Normal working temperature: $-20^{\circ}C \sim +55^{\circ}C$;

Limit working temperature: $-30^{\circ}C \sim +70^{\circ}C$;

Stockpile and transportation temperature: $-35^{\circ}C \sim +70^{\circ}C$;

Relative humidity: annual average < 80%;

Conformed standards: IEC62053; GB/T17215-2002; GB/T15284-2002; GB/T645-1997.

Model

Model	Rated frequency (Hz)	Nominal current(A)	Meter constant (imp/kwh)
DDSF3(220)	50/60	1.5,(6) 2.5,(10) 5,(20) 10,(40) 15,(60)	As nameplate

We can provide with both Chinese and English display.

Basic function

1. Measurement functions: measure positive & negative active and reactive energy

2. Measurement in different time periods

This energy meter can intercalate three tariffs(peak, flat, valley), 12 day-time section, minimum intervals between time periods is 5 minutes;

Store data of various tariffs in 12 months;

Power transfer storage (auto-reading day) covering 0~23 complete clock for monthly date.

3. Reversal-power computation in time period

Automatic identify the power direction, reversal power saving and added to positive power meter. Record automatically reversal power positive state time and reverse running time;

Have reverse impulse measure and direction function.

4. RS485 and infrared communication

Electric disconnecting RS485 point, communication protocol accord to IEC1107 & DL/T645-1997; adjustable type reverse infrared joint, carrier wave frequency 38KHz;

Automatic identify the power direction, negative power saving and added to positive power meter. Record automatically reversal power positive state time and reverse running time;

Have reverse impulse measure and direction function.

5. Display function

LCD display clearly within $-30^{\circ}\text{C}\sim+70^{\circ}\text{C}$;

Adopt English character LCD display screen, double lines display in simultaneity-six;

Integer and two decimal fraction. The saving capacity of inner meter is 6 integers and 2 decimal fraction;

The display mode can be set in circulation and stop.

6. Other function

Code and program of on-off are dual protection in input data, it automatically record down final programming time and times;

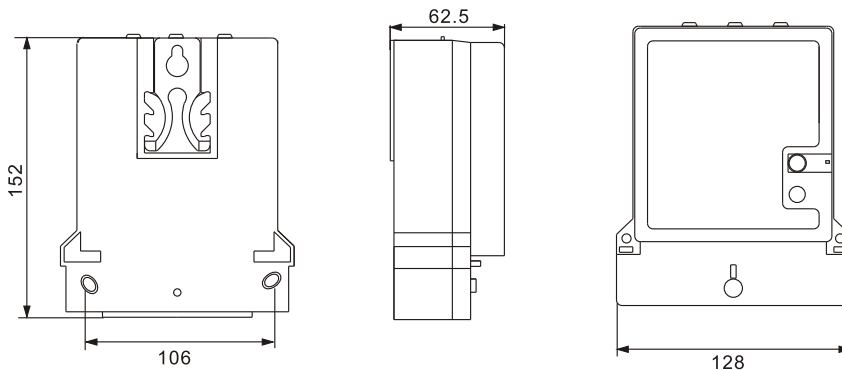
Clock circuit in hardware, low current loss, the spare battery is one-off lithium material;

Set meter mark, bureau number, time section, charge, date, time and automatic meter and circle display and start power;

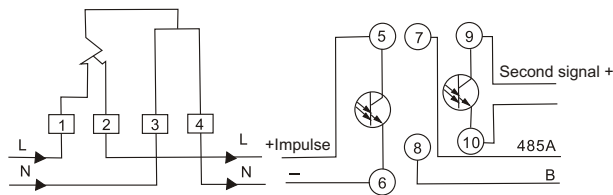
Spare battery under voltage monitor and indication, hardware state monitor, timing state, power direction, time checking and contemporary time section and read the situations from RS485 and portable computer;

Check the power parameters by pushing the blue button on cover of meter.

Outline dimension and wiring



Diag1 Outline dimension



Diag 2 Wiring

DSSF3/DTSF3 Three-phase Multi-rate Static Energy Meter

Summary

DSSF3/DTSF3 three-phase multi-rate energy meter applies to measure 3-phase active energy corresponding to different tariffs. It realizes data exchange via RS485 network or by HHU, and the data transmission protocol conforms to IEC1107. This meter can measure in different time section, set the daily automatic data revert, program and write the data for the mobile and PC, LCD display. The meter has the characteristics of high accuracy, good stability, wide-load, low power consumption, strong anti-interference ability, etc.



Technical specification

- 1. Electric condition**
 Accuracy class: 1.0;
 Normal working voltage: $0.9U_n \sim 1.1U_n$;
 Limit working voltage: $0.7U_n \sim 1.15U_n$;
 Power consumption of voltage circuit: power consumption of each phase in voltage circuit $\leq 2.0W$ and $5VA$;
 Power consumption of current circuit: $\leq 1VA$;
 Start-up current: $0.004I_b$;
 Shunt running: voltage line adding $115\%U_n$, when the circuit current is 0, the output impulse is less than 1.
- 2. Climatic condition**
 Normal working voltage: $-25^\circ C \sim +55^\circ C$;
 Limit working temperature: $-30^\circ C \sim +70^\circ C$;
 Stockpile and transportation temperature: $-35^\circ C \sim +70^\circ C$;
 Relative humidity: annual average $< 80\%$.
- 3. Tariff working parameter**
 Clock accuracy: $\leq 0.5ld (23^\circ C)$;
 Batteries capacity: $\geq 1200mAh$;
 After power cut data save time: $\geq 10years$;
 Tariff numbers: 4, section number: 10, measurement range: $0 \sim 999999.99kWh$;
 Communication baud rate: RS485 \square $1200bps \sim 9600bps$;
- 4. Conformed standards:** IEC62053; GB/T17215-2002; DL/T614-1997;
- 5. Life:** 10 years.

Model

Model	Reference voltage(V)	Rated frequency (Hz)	Nominal current(A)	Meter constant(imp/kwh)
Three phase four wire DTSF3	$3 \times 220(240)/380/(415)$	50/60	1.5(6), 2.5(10), 5(20), 10(40), 15(60) 20(80), 30(100)	As nameplate
	$3 \times 57.5(63.5)/(110)$	50/60		
Three phase three wire DSSF3	$3 \times 100/110$	50/60		
	$3 \times 380/415$	50/60		

Product function

- 1. Measurement function**
 Register positive, reverse of active and reactive energy, and store data;
 Register negative and active energy, and store data;
 Register positive, negative active and reactive maximum demand with its occurred time, and store data.
- 2. Multi-tariff function**
 Programmed with 4 tariffs, 10 daily time section and 2 time-zones.

3. Display function

- LCD display, 6 integers, 2 decimal fraction;
- Automatic rolling display, parameters and time, sequence can be randomly set;
- Button display function, displaying content and sequence can be randomly set;
- Read random item data by remote device.

4. Communication function

- RS485 interface and infrared communication interface;
- Communication stipulations conforms to IEC1107 & DL/T645-1997 or other request.

5. Output function

- Active impulse test output interface;
- Clock output function.

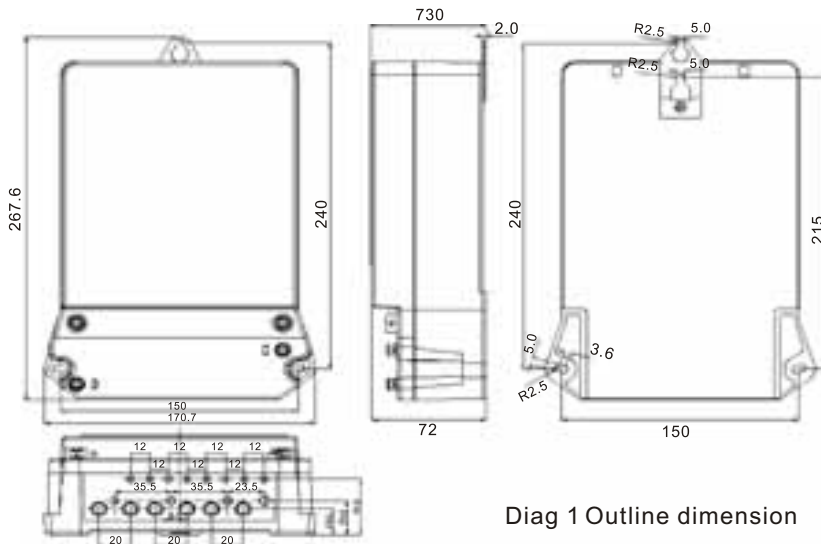
6. Event record function

- Real time test three phase (A/B/C) voltage;
- Power-off record of lately 1~9 times; have real time power register function;
- Event record functions like no voltage, programming, broadcast time checkout etc.

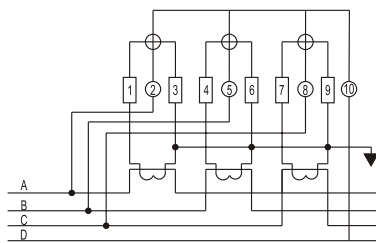
7. Other function

- Power-off key-press arouse function;
- Programming forbid, data reset function;
- Register 1-12 months electricity function (not available of display but by reading) ;
- Freeze data at transfer point between time sections.

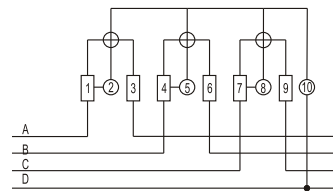
Outline dimension and wiring



Diag 1 Outline dimension



CT type ($3 \times 57.7/100V \leq 3 \times 1.5(6)A$)



Direct type ($3 \times 57.7/100V \leq 3 \times 1.5(6)A$)

DTSD3/DSSD2 Three-phase Multi-function Static Energy Meter

Summary

DTSD3/DSSD2 three-phase multi-function energy meter is the new generation intelligent meter designed by adopting the advanced technology. The product has the merits of high accuracy, good stability, strong function, convenient operation, etc. It meets the standards of IEC62053, IEC1107, IEC687 & IEC1268.



Technical specification

- Electrical performance:
 - Active: 0.5s, 0.5, 1.0 class; Reactive: 2.0 class;
 - Normal working voltage: $0.9U_n \sim 1.1U_n$;
 - Limited working voltage: $0.7U_n \sim 1.15U_n$;
 - Power consumption in voltage circuit: power consumption in every phase voltage loop $\leq 2.0W$ and $5VA$;
 - Power consumption in current circuit: $\leq 2.5VA$;
 - Starting current: active $0.001I_n(0.5s, 0.5)$, $0.002I_n(1.0)$; reactive $0.003I_n(2.0)$;
 - Shunt running: with logical design proof from shunt running;
 - Data backup battery voltage: 3.6VDC;
 - Battery voltage for power cut reading: 6.0VDC.
- Ambient condition
 - Normal working temperature: $-25^\circ C \sim +55^\circ C$;
 - Limited working temperature: $-30^\circ C \sim +70^\circ C$;
 - Stockpile and transportation temperature: $-35^\circ C \sim +70^\circ C$;
 - Relative humidity: annual average 80%.
- Tariff working parameter
 - Clock error: $\leq 0.5S(23^\circ C)$;
 - Batteries capacity: $\geq 1000mAh$;
 - Data storage time in the event of power failure: ≥ 10 years;
 - Tariff number: 4, section number: 10, measurement range: $0 \sim 999999.99KWh$, $0 \sim 999999.99$ kvarh, communication baud rate: RS485 ① \square 1200bps~9600bps, RS485 ② \square 1200bps, infrared: 1200bps.
- Conformed standards: IEC62053; GB/T17215-2002; DT/T614-1997; GB/T17883-1999; DL/T645-1997.
- Life: 10 years.

Model

Model	Reference voltage(V)	Rated frequency(Hz)	Nominal current(A)	Meter constant(imp/kwh)
Three phase four wire DTSD3	$3 \times 220(240)/380(415)$	50/60	1.5(6),2.5,(10), 5(20),10,(40), 15(60),20(80), 30(100)	As nameplate
	$3 \times 57.5(63.5)/110$	50/60		
Three phase three wire DSSD2	$3 \times 100/110$	50/60		
	$3 \times 380/400$	50/60		

Basic function

- Measurement function
 - Measure active power of both directions in separate sections (active measure mode available), and store data;
 - Measure active power of both directions in separate time sections (reactive measure mode available), and store data;
 - Measure maximum quantity and time of active and reactive power of both directions in separate time sections; store the data, measure four quadrant reactive power and store the data;
 - Demand cycle: options 5,10,15,30,60 minutes.
- Multi-tariff function
 - Program 4 tariffs,10 time sections,5 daily time sections time zones and 12 public holidays;
 - Outer clock chips are fixed with functions like calendar, timing, anniversary auto-change and temperature compensation.
- Display function
 - LCD display is able to display clearly within $-30^\circ C \sim +55^\circ C$;
 - Parameter running display function, and the parameter of running display is available to set;
 - Button display function, content and sequence are set by random;
 - Check arbitrary item data by controller.

Optional multi-background light, remote control and button to light the background, the light is settable while power reactive after cut-off.

4. Communication function

The watt-hour meter has two RS485 connectors(option) and one infrared communication connector, three communication interfaces are available by PC and mini computer to communicate with watt-hour meter, thus all are protected from communication interruption in three sides;

RS485 interface is electrically isolated from inner part of meter and equipped with lighting proof function;

Communication protocol: IEC 1107 & DL/T645-1997.

5. Output function

Active and reactive impulse test output function, negative and positive active and reactive remote output function: 1Hz clock output, demand period exchange signal output, time period exchange signals output;

Remote output impulse width programmable(20-250ms).

6. Event record function

Real time measure virtual value of A,B,C phase voltage, current and power as well as present frequency;

Event recording function like: No-voltage, no-current, voltage eligibility rate, power off, programming, demand reset and broadcasting timing.

7. Special function

Wake-up by key and infrared when power off (within 3 days after power off), power-off data reading by infrared;

Fault message indication, alarming and overload trip output;

Electric quantity frozen, electric quantity of December and complete clock energy record at load representative day; Opening record of meter;

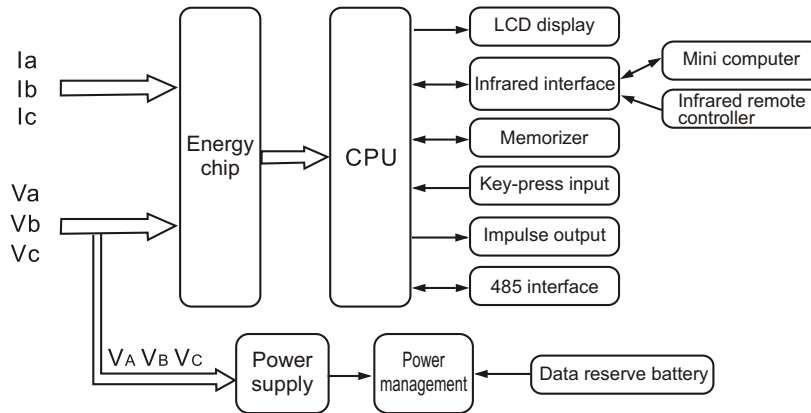
Load profile record;

Complete clock active power record at load representative day;

Positive active electricity freeze when certain time zone is over;

Electricity freeze.

Principle sheet



Outline dimension and wiring

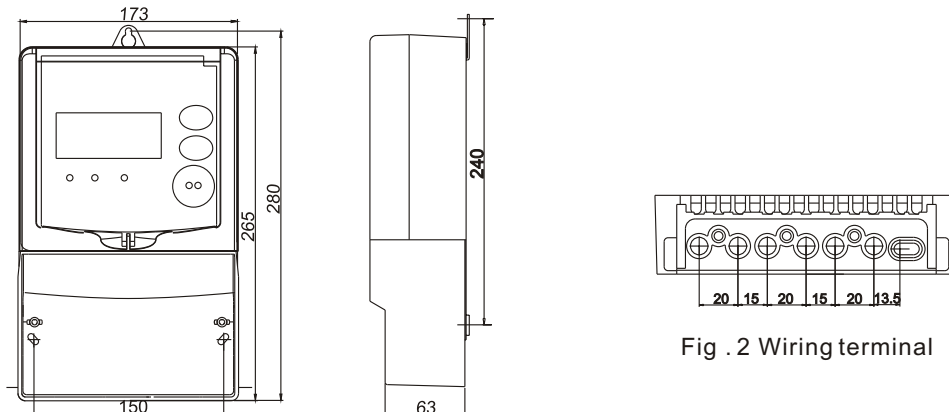


Fig. 1 Outline dimension

Fig. 2 Wiring terminal

FKGA4C2-HY21 Load Management Control Terminal

Summary

FKGA4C2-HY21 load control terminal based on industry-leading 32-bit AMR platform to support three lines and up to 48M primary frequency, high capable, use car-on-chip, very strong anti-interference ability and stability, wide temperature working (-40°C~+70°C); chip is rich in resources; includes 64KSRAM and 256K high-speed FLASH.



Technical specification

Terminal using GRPS / CDMA data communications approach to public GSM mobile communications network as the carrier, auxiliary on-site bus RS485, infrared and other means of communication, will become a key management with the object, to monitor information related to electricity, from a substation to the supply line and then to electricity users an integrated power supply testing, device management, data acquisition, remote meter reading, alarm lamp power exception message multiple functions. The terminal is the power enterprises to modernize the management of choice for electricity equipment, but also to achieve demand-side management is an important means.

Model

Model	Description	Accuracy class	
		Active	Reactive
FKGA4C2-HY21	Load management control terminal	1.0	2.0

Main technical data-parameters

Item	Technical requirement
Basic error of metering function rated	According to IEC62053 & GB/T17215
Reference frequency	50Hz ± 5%
Clock error	< ± 0.5s/d
Average working time without fault	≥ 5 × 104h
Static power consumption	< 10VA
Normal working voltage	3 × 220(± 30%)
Limit working voltage	< 420VAC
Rated current	5(10) A
Impulse constant	3200imp/kwh 3200imp/kvar
Ambient temperature	(-25~55)°C
Limit temperature	(-40~70)°C
Storage and transport temperature	(-40~70)°C
Relative humidity	< 95%
Safety performance	Power supply and ground insulation resistant ≥ 10M Ω
P.F. withstand voltage	2KV/1 min
Standby battery life	300 cycle
Standby battery voltage	Working voltage > 4.8 V
Outline dimension (length*width*height)	300MM*180MM*100MM

Communication Parameters

1. Infrared communication: 1200bps, even parity check, 1 stop bit
2. RS485 communication: You can set the baud rate and check methods
3. GPRS communication: according to TCP / IP protocol, or UDP protocol.
4. GPRS communication rate: 19200-115200.
5. GPRS / CDMA / GSM communications (optional)

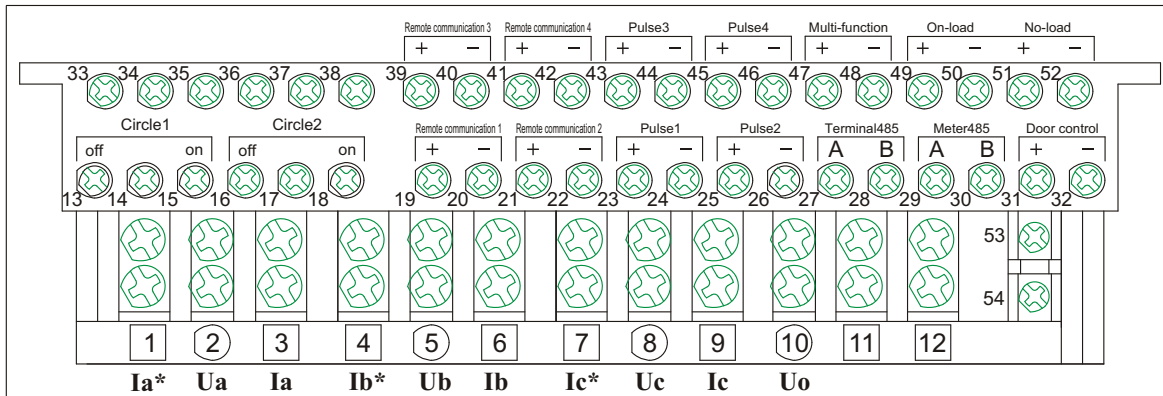
Hardware Interface

1. Switch State: 4-way (passive interface input)
2. RS232 interface: one way (local communication)
3. RS485 interface: 2-way (meter reading communications, cascade and relay)
4. Gate node interface: a way (passive interface input)
5. 12V power supply output: 1 way (for the passive meter to provide 12V power supply, 150mA)
6. GSM Antenna Interface: 1 (Model for SMA Yin head)

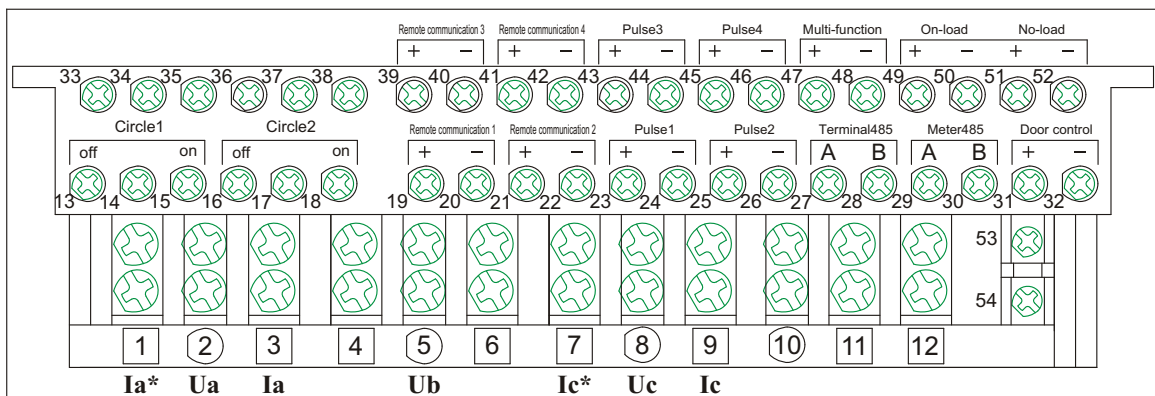
Wiring diagram

Terminal Size: 300mm × 180mm × 100mm

Hanging the terminal on the screw M5 × 10, the installation diagram is as below:



220V Functional terminal wiring diagram



100/110V Functional terminal wiring diagram

DDSY39 (LED) Single-phase Prepayment Static Energy Meter

Summary

DDSY39 (LED) single-phase prepayment static energy meter is which adopts based on special large-scale integrated circuit and SMT technology, adopting industrial elements and components with long lifetime introduced from abroad. It preserves data under power-off situation. This product conforms to IEC62055-21-2005 & GB/T18460: Electricity metering, prepayment systems. and IEC62053 & GB/T18460.3-2001: class 1 and class 2 static AC active watt-hour meter. It mainly applies to the occasions like-as a advancing power purchasing to carry out power prepayment and max. load control. This product has characteristics like-of long service duration, high accuracy, good over-load capacity and small volume.



Technical specification

1. Electrical performance:

Class of accuracy: 1.0, 2.0;

Conformed standards: IEC62053 & IEC62055; GB/T17215-2002; GB/T18460.3-2001;

Normal working voltage: $0.9U_n \sim 1.1U_n$;

Limit working voltage: $0.8U_n \sim 1.15U_n$;

Insulating voltage: $\geq 2000VAC$;

Power consumption: $\leq 2W \& 10VA$;

Power of voltage circuit: $\leq 1.5W(8VA)$;

Power of current circuit: $\leq 3VA$;

Start-up: as reference voltage, reference frequency and power factor are 1, load current is 0.4%I_b and 0.5%I_b, the meter should be metering in continuity.

Shunt running: when voltage circuit is enforced with 115% of reference voltage, without current, the meter light loss indication, meter output no impulse.

Life: 10 years.

2. Ambient condition

Normal working temperature: $-30^{\circ}C \sim +55^{\circ}C$;

Limit working temperature: $-40^{\circ}C \sim +70^{\circ}C$;

Stockpile and transportation temperature: $-45^{\circ}C \sim +70^{\circ}C$;

Relative humidity: annual average $\leq 80\%$.

Model

Model	Rated frequency(Hz)	Nominal current(A)	Meter constant (imp/kwh)
DDSY39(220)	50/60	1.5(6), 2.5(10), 5(20), 10(40), 15(60)	As nameplate

Product function

1. Dual directional metering function:

Metering both negative and positive power accurately, accumulating electric quantity in single direction, anti-tampering function is available.

2. Adopting photoelectric isolation technology to output power impulse signal and LED to indicating electricity power.

3. Advancing purchasing system: the power will be cut-off when there is no more purchased energy.

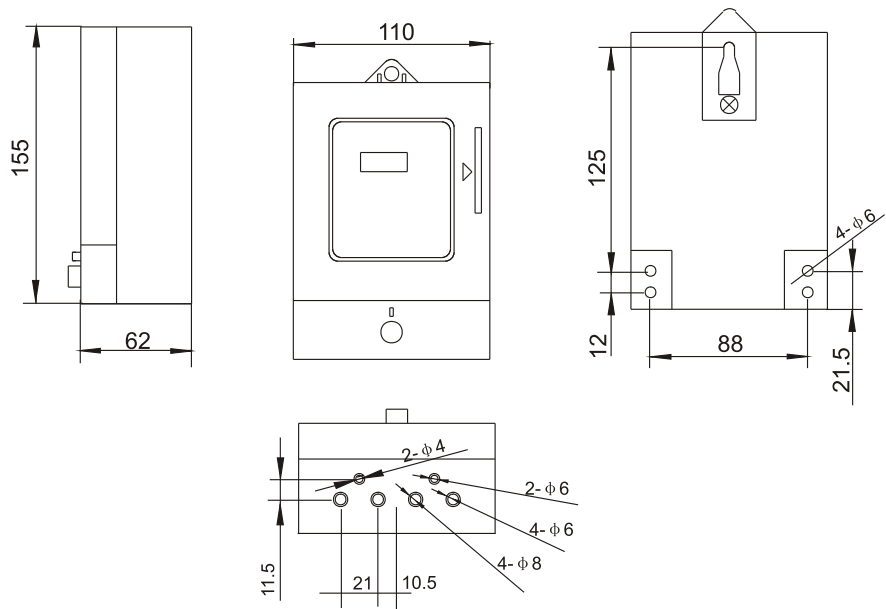
4. Rolling display with the used and the residual quantity on digital screen.

5. Memorizing function: the data preserved well when power is cut-off.

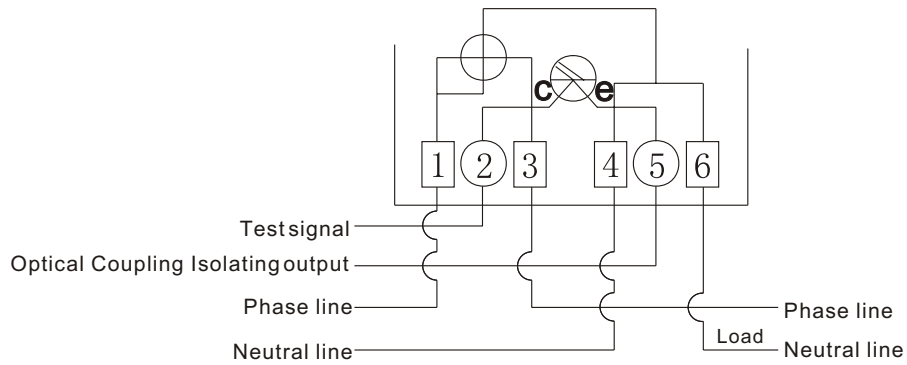
6. Alarming function: the meter will send alarming signal when residual power is lower than settled power.

7. Adopting full solid and integrated circuit technology to protect data, the data can be preserved for over 20 years after power-off.

Outline dimension and Wiring diagram



Diag .1 Outline dimension



Diag .2 Wiring diagram

DDSY39(LCD) Single-phase Prepayment Static Energy Meter

Summary

DDSY39 (LCD) adopts LSI & SMT industry element and long-duration element of international band. It meets the requirement of IEC62055-21-2005 & GB/T18460: Electricity metering, prepayment systems and GB/T17215-2002: Class 1 and class 2 static communication active meter. This product has functions of prepayment, load threshold control. They have the characteristics of small size, long-life high accuracy, good stability, low power consumption etc.



Technical specification

1. Electric performance

Accuracy class: 1.0;

Conformed standards: IEC62053 & IEC62055; GB/T17215-2002; GB/T18460.3-2001;

Normal working voltage: 0.9~1.1 reference voltage;

Limit working voltage: 0.8~1.15 reference voltage;

Insulation voltage: $\geq 2000\text{VAC}$;

Power consumption: $\leq 2\text{W}$ and 10VA ;

Power consumption of voltage line: $\leq 1.5\text{W}$ (8VA) ;

Power consumption of current line: $\leq 3\text{VA}$;

Start-up: under the condition of reference voltage, reference frequency and power factor is 1, when load current is 0.4% I_b (class 1), 0.5%(class 2), energy meter start up and accumulate count.

Shunt running: when adding 115% reference voltage to voltage circuit, no current on current loop,

Energy indicator does not shine, no energy pulse output;

Life: 10 years.

2. Ambient condition

Normal working temperature: $-25^{\circ}\text{C}\sim+50^{\circ}\text{C}$;

Limit working temperature: $-30^{\circ}\text{C}\sim+70^{\circ}\text{C}$;

Stockpile and transportation temperature: $-45^{\circ}\text{C}\sim+70^{\circ}\text{C}$;

Relative humidity: annual average $\leq 80\%$.

Model

Model	Rated frequency(Hz)	Nominal current(A)	Meter constant(imp/kwh)
DDSY39(220)	50/60	1.5(6), 2.5(10), 5(20), 10(40), 15(60),	As nameplate

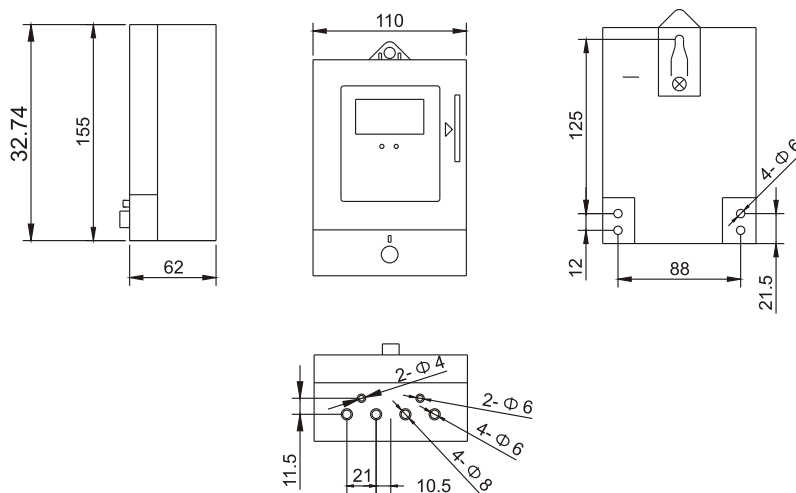
Chinese and English indication options are available for different clients.

Product function

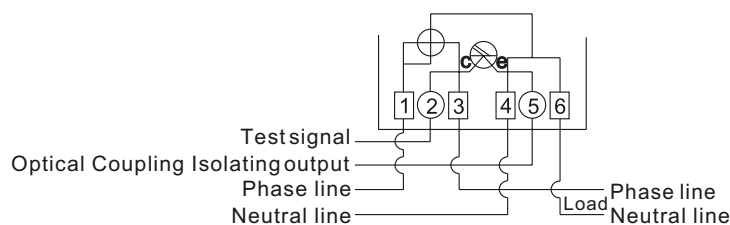
- Bi-directionally measure function: precisely measure positive, reverse energy, and accumulate energy in one forward way, accumulate energy one time at 0.1 degree. Residual energy and accumulating used energy etc. data preserves well at power failure.
- False identification function: when using additional medium, energy meter doesn't accept order, and refuse to operation. electricity prepayment: the meter alarm at low remaining electricity, disconnect itself when the quantity of electricity reaches zero.
- Transfer-writing function: when inserting user's electricity card, residual electricity and operation condition of energy meter and other information will write in return to IC card for the purpose of power supply system management.
- Inspection function: accepting enquiry card inspection made by power supply management system and current information will be written back to inspection card for meter condition inspection.

6. Addendum function: user can get a new card when lost original one, the watt-hour meter can accept it and refuse the original purchasing electricity card;
7. Urgent purchasing electricity function: there is a urgent purchasing electricity agreement between user and electricity sales department, the user can insert card to purchase energy power one time by credit when the electrical quantity finished. If want to get purchasing right again, user should purchase more quantity then by credit.
8. Quantity of electricity setting function: according to reset or used watt-hour meter, take advantage of setting card to set quantity of electricity;
9. Price of electricity rewrite function: the watt-hour meter adopt single price, user can rewrite price of electricity to adjust rest quantity when the price changed in the course of using, to comply with new price.
10. Initialization function: when the user firstly to purchase, the sale system will send archives and relative information to card. The watt-hour meter is initialized and establishes one meter one card relation when user insert to watt-hour meter.
11. Transfer user function: take advantage of transferred card to move data to another one and to bgout the original one, make original meter on rest condition;
12. Reading function: take advantage of reading card collect user number, used quantity, rest quantity to transmit sales management department.
13. LCD display function: the watt-hour meter adopt LCD to display electricity information, working condition, rest quantity, used quantity, relay working condition, purchasing alarm condition, purchasing electricity condition, used quantity and rest quantity display one digit decimal fraction;
14. Monitor using load function: It can cut off power and alarm when exceed to setting value (the alarm value can be set).

Outline dimension



Diag.1 Outline dimension



Diag.2 Wiring diagram

DSSY3/DTSY3 Three-phase Prepayment Static Energy Meter

Summary

DSSY3/DTSY3 series three-phase pre-payment static energy meter is improved and produced on the bases of the static three-phase active watt-hour meter. It has multiple functions: electrical energy measuring and user's information management and so on. The product is an ideal product to solve problems in electrical energy fee in arrears and anti-tampering, as well as commercializing electrical energy and adjusting load in the electric network.



Technical specification

- Electric performance:
 - Accuracy class: 1.0, 2.0;
 - Normal working voltage: 0.9~1.1 reference voltage;
 - Limit working voltage: 0.8~1.15 reference voltage;
 - Insulation voltage endurance: $\geq 2000\text{VAC}$;
 - Power consumption: $\leq 6\text{W}$ and 10VA ;
 - Start-up: Under the condition of reference voltage, reference frequency and power factor is 1, when load current is 0.4%lb (class 1), 0.5% (class 2), energy meter start up and accumulate count.
 - Shunt running: When add 115% reference voltage to voltage circuit, no current on current circuit, energy indicator light does not shine, energy pulse output.
- Ambient condition
 - Normal working temperature: $-30^{\circ}\text{C}\sim+55^{\circ}\text{C}$;
 - Limit working temperature: $-40^{\circ}\text{C}\sim+70^{\circ}\text{C}$;
 - Stockpile and transportation temperature: $-45^{\circ}\text{C}\sim+70^{\circ}\text{C}$;
 - Relative humidity: annual average $< 80\%$.
- Conformed standards: IEC62053 & IEC62055; GB/T 17215-2002; GB/T18460-2001.
- Life: 10 years.

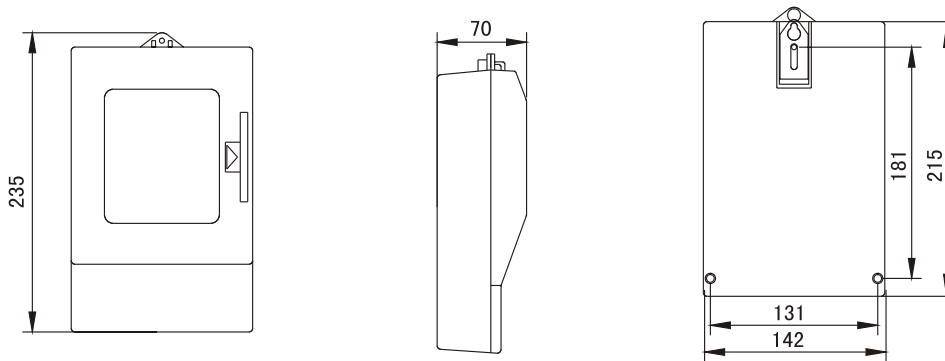
Model

Model	Reference voltage(V)	Rated frequency(Hz)	Nominal current(A)	Meter constant (imp/kwh)
Three phase four wire DTSY3	$3 \times 220(240)/380(415)$	50/60	1.5(6),2.5(10), 5(20),10(40), 15(60),20(80), 30(100)	As nameplate
	$3 \times 57.5(63.5)/110$	50/60		
Three phase three wire DSSY3	$3 \times 100/110$	50/60		
	$3 \times 380/415$	50/60		

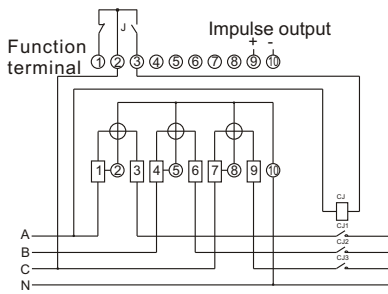
Basic function

- Dual-direction measurement function: measure accurately power on both directions, accumulate power amount in single direction, anti-theft function.
- Adopt photoelectric isolation insulation technical to output impulse signal, LED/LCD display on electricity use.
- Payment before use cut off power when the pre-paid amount is used off.
- Digital rolling display with the used amount and residual amount.
- Memory function: the lost data due to power-off recovers when power is reconnected.
- Warning function: remind the client to purchase when pre-purchased power is lower than certain amount.
- The product adopts full solid integrated circuit technical protection data, the data can be saved for over 20 years without battery power.

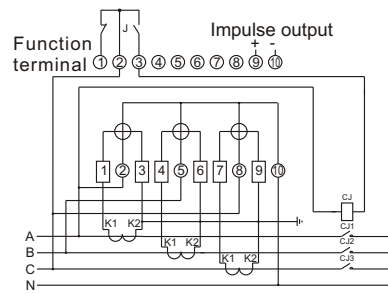
Outline dimension and Wiring diagram



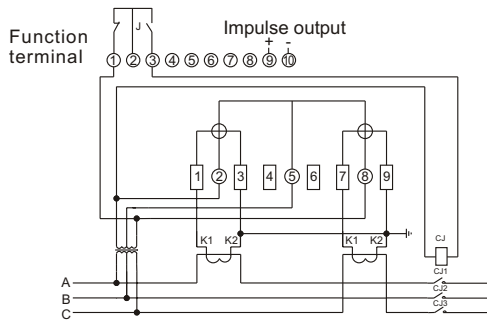
Diag 1. Outline dimension



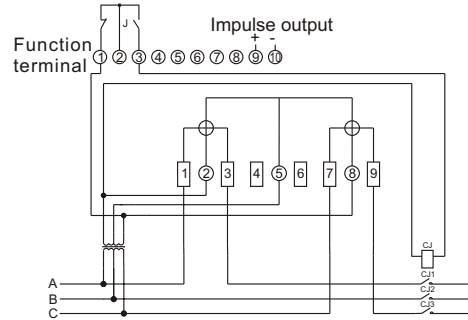
Direct type



CT type



CT type



Direct type

IC Card Electricity Sales Management System

Summary

Pre-payment electricity sales management system is programmed with VC++ and Power Builder language, considering the situations of electricity supply administrator and the functions of pre-payment electricity meters. The system is secure and reliable, friendly operating and has a clear structure. It is an effective promotion of prepayment electricity meters. The system has many functions, such as programming, selecting, recording, demand resetting, delete database, etc. There are two optional editions of the system: single-user system and multi-user system. It completely accords with the international standard IEC62053-21.

The system comprises of four parts:

- a. Single/three phase prepayment meters
- b. Electricity purchase medium: IC card or Radio Frequency technology
- c. Read/write machine
- d. Electricity sales software.

Operation and function

1. Power energy purchase

The meter can't operate without effective power energy. In other words, there should be power energy kept when the meter is expected to work. The sales power management department will record buy-energy information once the user purchases the power with the card.

2. Energy input

Inserting IC card into the meter, its correct direction is that the golden side contacts face to the place which is a narrow opening on the meter. The meter is reading the IC power card with showing [rd], the information will be showed in a second.

①XXXX: the meter reads information in the IC card and transfers the energy from the card into the meter, It shows XXXX kwh. (The power energy is effective.)

②Err: the meter have an error reading IC card, the reasons are :

- a. Inserting IC card without operational side, please insert the card with operational side again.
- b. the meter is affected sometimes, please insert the card again.
- c. It is not the power energy card.(It is the wrong card.)

③OVEL: The power energy overflows in the meter, please wait for a moment and try again.

④8888: the IC card is RESER IC card. This process is done only by sales power management department.

3. IC card pull out

When this process is end up, you can pull out the IC card from the meter. You may consult the sales power department if there is any question.

4. Watt-hour measurement

When the meter is operating, the accumulated electricity quantity used increases progressively, whereas the remained available electricity quantity decreases progressively. The accuracy is 0.1 kwh.

5. Watt-hour display

The meter shows the informations on 4 bit LED, the max limitation is 9999kwh, which does not include decimal.

When the meter is operating, the LED shows two articles of the information, one is "AXXXX", in which, the XXXX means available electricity remained. The other one is "U XXXX", in which the XXXX means used electricity.

6. Display warning

When LED shows "LXX", it means that remained electricity value is lower than warning electricity value. The warning electricity value can be set by sales power department.

7. Power cut-off warning

When remained electricity value is too low to cut the relay, the meter turns the relay off, then you can use any card (except the reset card) to reset it. But you should buy power energy at the sales power department.

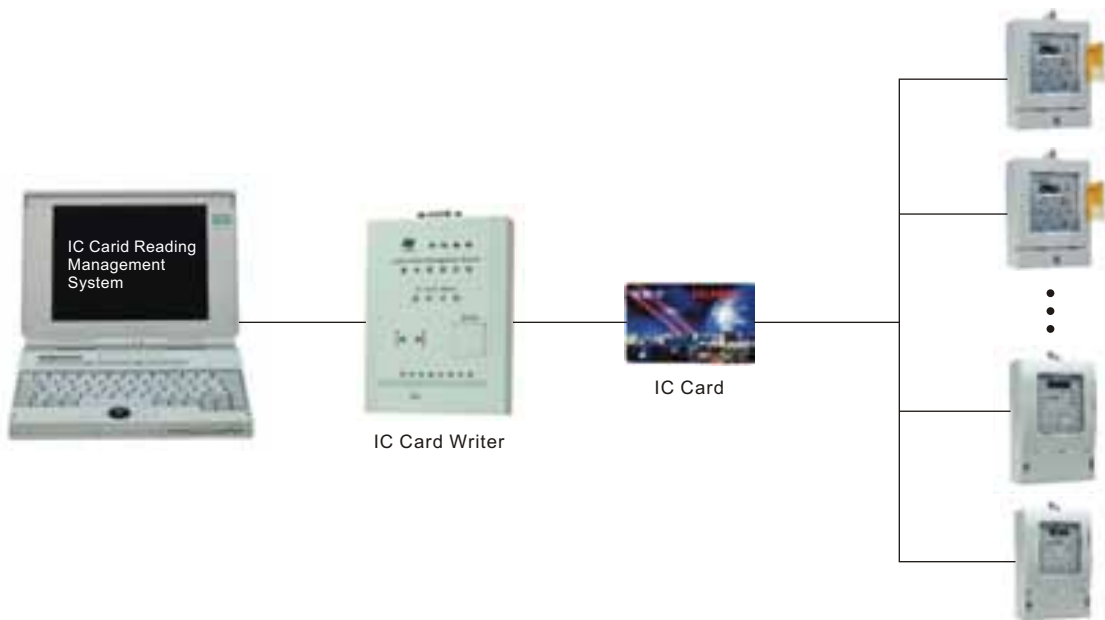
8. Load control

When remained electricity value is 0 kwh, the meter turns off automatically. When LED shows '-0' (or '-XXXX'), which means that the remained-electricity value is negative, and the relay should be turned off. If not, it is that the meter have error, please ask the sales power department for help.

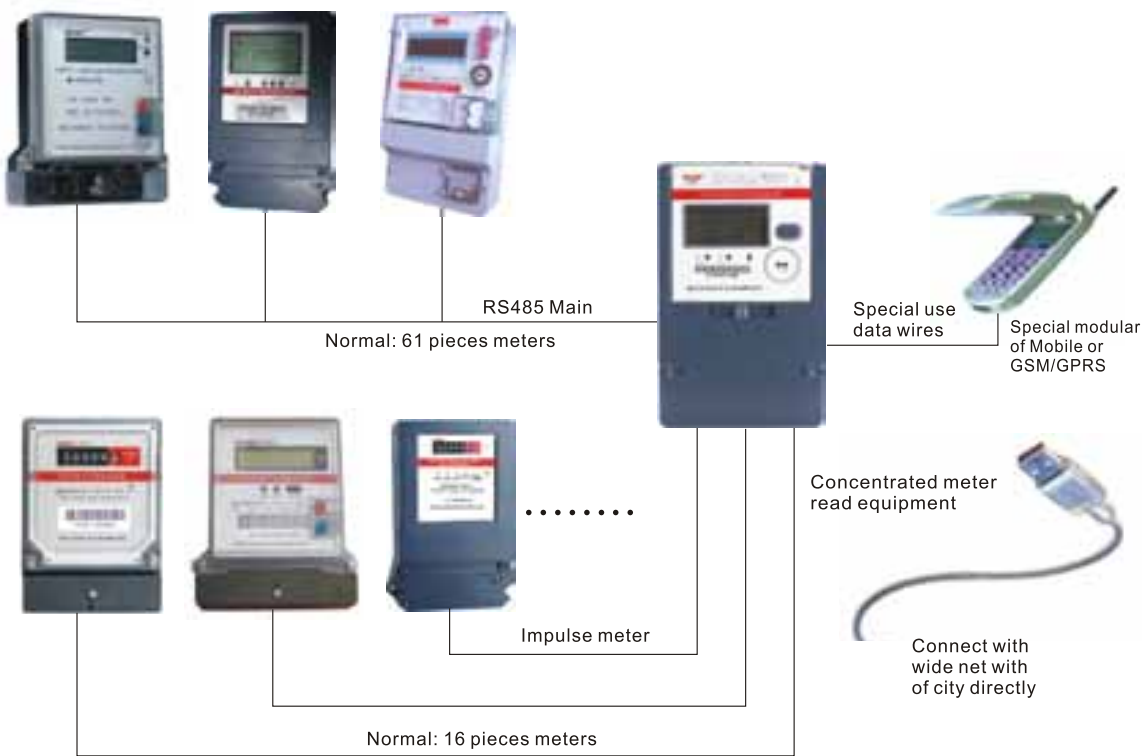
9. Overload control

When the LED shows 'OVLD', the current of the load circuit exceeds the value set (43A or 66A), the meter will automatically cut off the power supply, and then it will turn on again for another 2 minutes. At this moment, if you don't recharge the energy, the power will be cut off.

The products series have adopted the EEPROM solid IC technique to save data and various messages. It is unnecessary to change the battery. The data can be kept for 20 years.



IC Card Reading Management System



GSM/GPRS Automatic meter reading system (AMR)

DDSI39 Single-phase PLC Static Energy Meter

Summary

DDSI39 series PLC static energy meter is a terminal unit of automatic reading system based on special large scale integrated circuit and SMT technology by adopting microelectronic and computer technology as core technology and depending on modern management. simple structure, high reliable performance and security, etc. This meter is adopt power line carrier wave, no need other communication cable, so that to reduce the cost and avoid dangerous when the cable is broken.



Technical specification

1. Electrical condition

Accuracy class: 1.0 class, 2.0 class;

Conformed standards: voltage circuit $\leq 1.5W/5VA$, current circuit $\leq 2.5VA$;

Start-up current: 0.4%(1.0 class), 0.5%(2.0 class);

Shunt running: anti-shunt running design;

Carrier wave signal level: $< 0.6P-P$;

Carrier wave communication distance: 3km;

The difference value between memory data and the data of counter: $< 0.0kWh$;

2. Ambient condition

Normal working temperature: $-25^{\circ}C \sim +55^{\circ}C$;

Limit working temperature: $-40^{\circ}C \sim +70^{\circ}C$;

Relative humidity: annual average $< 80\%$;

3. Accord standard: IEC62053; DL/T689-1999; GB/T 17215-2002;

Relay accuracy: 3 class.

4. Memory life: 30 years.

Model

Model	Rated power frequency (Hz)	Rated current (A)	Meter constant(imp/kwh)
DDSI39(220)	50/60	1.5(6) 2.5(10) 5(20) 10(40) 15(60)	12800, 6400, 3200, 1600

Product function

1. Metering function

AD7755 measure positive and negative active power on same direction to avoid current in reverse;

Metering line have high quality, wide working range, the error less than 0.3% under 5000:1;

The data will keep more than 10 years and it will not lost after current out.

2. Carrier wave communication function

It used for setting the parameter and reading; It can operate the relay of meter;

Communication speed rate: 500bps; communication distance:500m (between tie points);

Can expand communication distance;

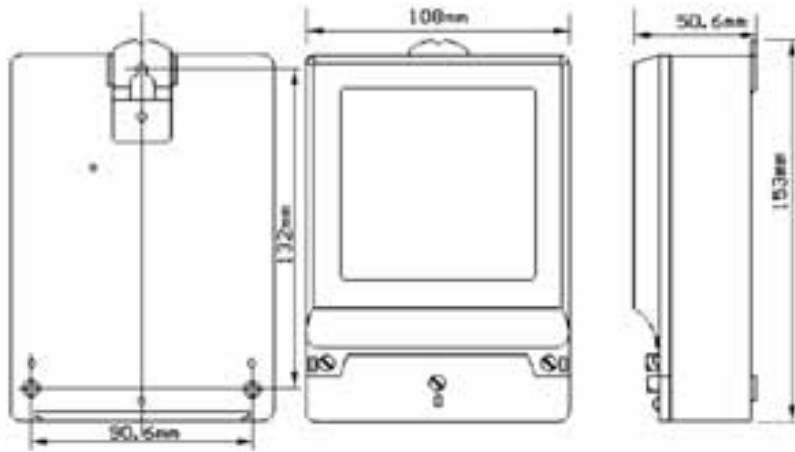
Communication rule: the communication rule of single tariff carrier wave channel;

3. Impulse output function

Used for verify meter and collection power;

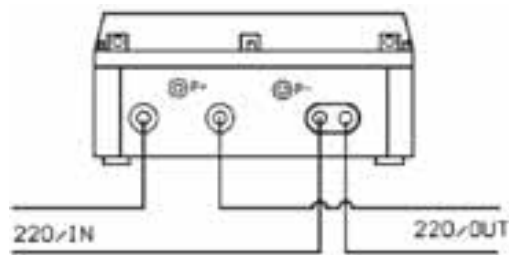
Out of power isolating output port.

Outline dimension and Wiring diagram



Outline dimension

Diag .1 Outline dimension and installation



Diag .2 Wiring diagram

DS(T)SI39 Three-phase PLC Electric Energy Meter

Summary

DS(T)SI39 three-phase PLC electric energy meter is a new intelligent watt-hour meter, which is developed and manufactured by adopting the current international advanced microprocessor as the core, combined with the functions of carrier communication and relay control; as well as adopting ADE7752 chip for power measurement. The meter accords with IEC61036. It has the characteristics of high integration level, stable and reliable, high accuracy, low power consumption, LCD display, abundant communication interface and convenience for installation, etc.



Main functions

The function of collect pulse. Bi-directionally measure active energy and accumulate kW in one direction against wrong connection. Bi-communication. It can communicate from meter to concentrator, as well as from meter to meter.

The function of self-checking through software.

It can communicate with the meter from the infrared port.

LCD display.

With backlight when communicate from the infrared for 20 seconds.

The function of freezing the energy consumption in accordance with the requirement.

The function of controlling the on and off of the meter.

The function of alarming when the power over-exceeds the max. power which has been set.

It can record the date and the time of the opening of the cover.

Expansion design. The design of the circuit and software with other ports of the other functions above.

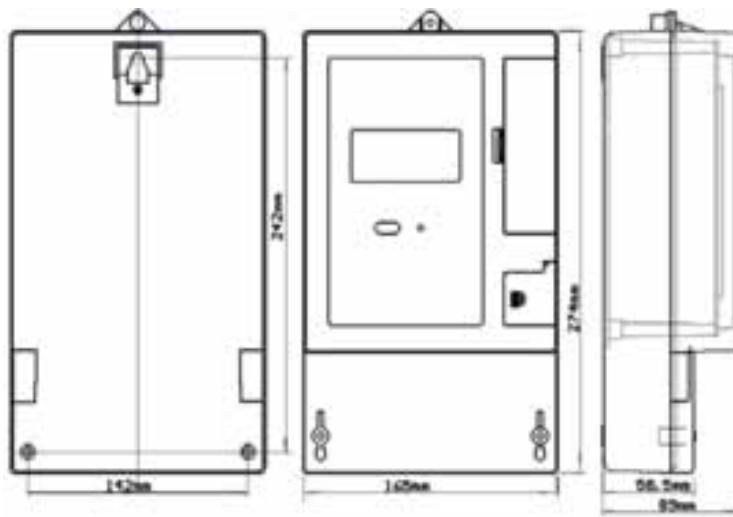
Main technical parameters

Item	Technical requirement
Accuracy error	Meet the requirement of IEC1036-1996 & IEC62053
Reference frequency	50Hz
Measurement range	000000.00 – 999999.99kWh
Clock error	≤0.5s/day
Carrier communication	Expand frequency series is 15 bits, center frequency is 120K, band width is 15KHz
Power consumption	less than 0.5W in static condition, less than 3W in carrier transmission.
MTBF	≥5 × 10 ⁴ h
Outline dimension	L*W*H: 242 mm × 165 mm × 85mm
Power voltage	220V ± 20%
Pulse output	80ms ± 20%(width), external supply of 5-24V DC
Working ambient temperature	-20°C ~ +50°C
Ambient humidity	≤75%
Storage temperature	-25°C ~ +75°C

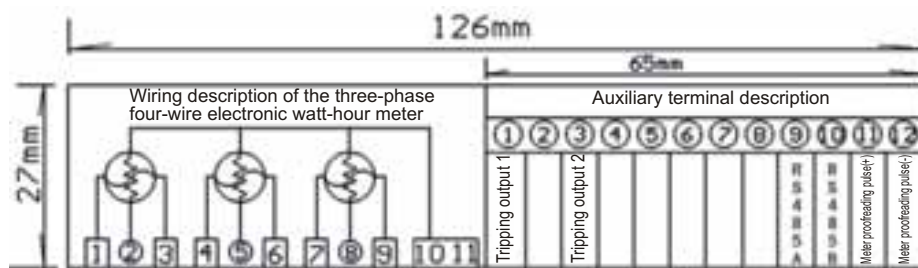
Technical specification

Model	Number of phase	Accuracy class	Rated voltage(V)	constant(imp/kWh)	Rated current(A)
DS(T)SI39	Three phase	1.0	220/380	/	1.5(6)-30(100)

Outline dimension and Wiring diagram



Outline dimension



Wiring diagram

HYJZQ-2 Low-voltage PLC Centralized Controller

Summary

HYJZQ-2 Low-voltage PLC Centralized Controller is the centralized meter reading system in key equipment. The uplink channel with the mainstream GPRS, CDMA, CSD, RS485 and so on, through the uplink channel and the main station (or handheld unit) for data exchange; the downlink channel is a low-voltage power line carrier, which can automatically store a variety of meter reading with a carrier communication function intelligent instruments, collection terminal or acquisition modules and a variety of carrier power data communication terminals.



Main technical data

1. Power supply

Three-phase four-wire power supply: A, B, C, N;

Normal working voltage: normal working and communication when voltage range is +30%~-20%,

Normal working frequency: 50Hz ± 5% ;

Machine power consumption: < 10W/15VA ;

In the off-phase voltage of one phase or two cases, can make normal working and communication;

2. Ambient Conditions

Ambient temperature of +23°C;

According to installation place, temperature and humidity conditions are divided into the following three categories:

Machine room: temperature +5°C~+40°C, relative humidity ≤75%

Indoor: temperature -25°C~+50°C, relative humidity ≤90%

Outdoor: temperature -45°C~+70°C, relative humidity ≤95%

3. Electromagnetic compatibility (EMC):

Electrostatic Discharge: contact discharge 8KV, air discharge 15KV;

High-frequency electromagnetic fields: 10V/m;

Electrical Fast Transient Burst: ± 4.4KV;

Surge voltage: 4KV;

Under the influence of the conduction, radiation and electromagnetic harassment and electrostatic discharge, can normal working.

4. Internal Clock

Clock Accuracy: 0.5s/d;

Battery Voltage: 3.6V;

Battery capacity: 1200mA / h;

Battery Life: >10 years;

5. Downstream Channel

Carrier signal frequency range: 120 ± 15kHz;

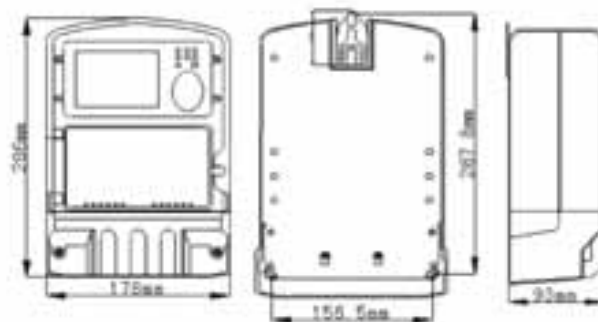
Spread-spectrum communication technology, software correlator and matched filter, 31 codes sequence;

BFSK modulation, half-duplex communications;

Carrier communication transmission range: The entire transformer area 2 kilometers (ideal environment);

Relay accuracy: 5 class

Outline dimension



PLC AMR System

Summary

The HY2000 AMR system automates the collection of all kinds of data from individual meters. It addresses the demand for a cost-effective meter reading system without sacrificing accuracy or reliability by utilizing the proprietary Narrow Band Direct Sequence Spread Spectrum Power Line Communication (PLC) technology, which makes it possible that high anti-interference and low attenuation of signal over transmission.

Functions

The HY2000 AMR system is an efficient system with following functions:

- a. Assurance of data accuracy in transmission;
- b. Improvement of billing efficiency;
- c. Prevention of non-technical losses and tamper;
- d. Real time remote control and management,
- e. Provision of statistic data for analyze;
- f. Reduction of labor costs;
- g. Minimizing of system maintenance.

System Configuration

The AMR system is composed of three main subsystems - the Remote Unit (RU), e.g. multi-function single-phase electrical energy meter and multi-function three-phase electrical energy meter, the Concentrator and the Base Station. The Remote Unit transmits the signals over power lines to a Concentrator located on the low voltage side of the distribution transformer. The Concentrator collects the data from each meter, and performs the data storage and part of the data processing. The results are sent from all Concentrators to the Base Station through telephone/GPRS /CDMA net.

Each Concentrator is located on the low voltage side of the distribution transformer. It collects data every half an hour or as set from distance to 1,024 meters through the power lines.

The Base Station is a desktop PC to collect data from all Concentrators. This can be done either directly from the Base Station desktop PC through a dial-up modem or by transferring data files locally to a portable PC, which connect directly to each Concentrator using a standard serial cable (RS232). Both the Base Station and portable PC used for data collection should run AMRView for Windows software.

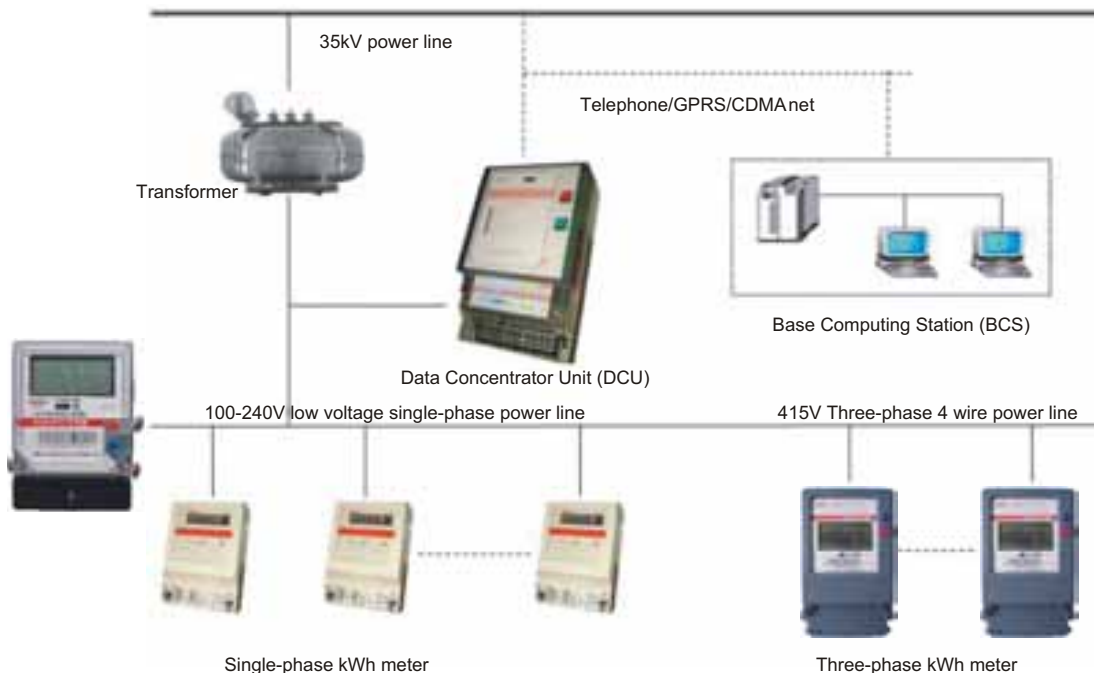


Figure 1 - A Sample Application of AMR System

DD862 Single-phase Inductive Watt-hour Meter

Summary

DD862 Series single-phase inductive watt-hour meter applies to measure single phase active energy. The meter is composed of electromagnetic components, rotating disc, bearing, damping magnet, register and adjustment units etc.



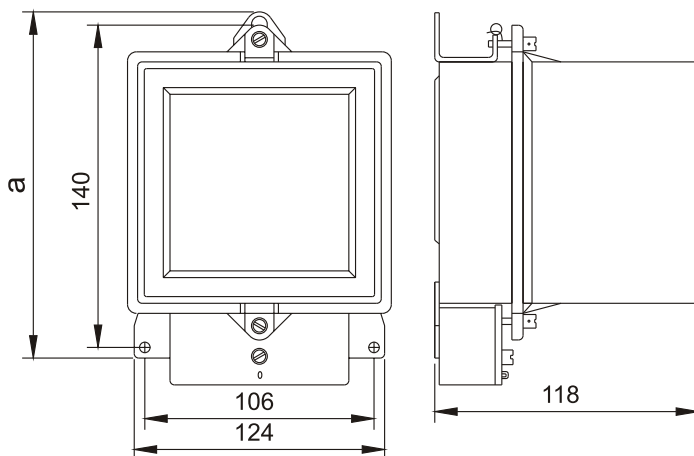
Technical specification

1. The product conforms to national measurement GB/T15283-1994-0.5, 1 and 2 class AC active power watt-hour meter and IEC62053 international standard: complete technical on 2 class single-phase watt-hour meter;
2. The watt-hour meter is made into direct insert type and meter-usage current transformer or meter-usage potential transformer;
3. Specific meters are available according to specific requirement, including different meter in data like reference frequency, reference voltage and various current rating, positive and reverse turning and accumulation.
4. Start: in the meter, the rotor can start and continue when the reference voltage, reference frequency and $\text{COS } \phi = 1$, the negative current is no less than 0.5% of basic current.
5. Shunting running: the dial of watt-hour meter turn at smaller than one turning no current in circuit and voltage of voltage circuit is over than 80% and 110% of reference value.
6. Power loss: power loss of voltage circuit is less than 2W when the reference voltage and reference temperature and reference frequency.
7. Dielectric function: the watt-hour meter can withstand 1.2/50us of standard shock wave, 10 times of 6KV shock wave without damage. The meter line can withstand 2 KV earthing and withstand in actual sine wave of alternate voltage and frequency of 45~60HZ for 1 min.

Model

Model	Reference voltage	Accuracy class	Demarcate current (A)	Over-load capability	Starting current	Insulation feature
DD862-4	220-240V	2.0 class	1.5(6) 2.5(10) 5(20) 10(40) 15(60) 20(80)	400%	0.5%I _b	P.F. alternating voltage 2kV last for 1min impulse voltage 6kV
DD862-4	220-240V	2.0 class	30(100)	200%		

Outline dimension



Diag.1 Outline dimension

I _{max} ≥ 60A	173
I _{max} ≥ 60A	167
Specification(A)	a

D86 Three-Phase Active and Reactive Watt-hour Meter

Summary

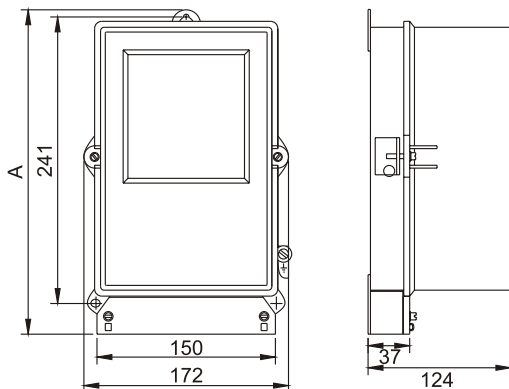
D86 Series Three-Phase Active and Reactive Watt-hour Meter applies to measure three-phase active (reactive) energy. The meter is composed of electromagnetic components, rotating disc, bearing, damping magnet register and adjustment units. Active watt-hour meter conforms to IEC62053 international standard, GB/T15283-1994: 0.5, 1 and 2 class AC active watt-hour meter, reactive watt-hour conforms to national standard -GB/T15282-1994: reactive watt-hour.



Model

Product name	Model	Accuracy class	Refer voltage (V)	Rated current (A)	Wiring mode
Three phase four wire active watt-hour meter	DT862	2.0	3 × 220/380V (230/400) (240/415)	1.5~6 3~6	Input through current transformer
				5~20 10~60 20~100	Directly input
	DT864	1.0		1.5~6 3~6	Input through current transformer
				5~20 10~60 20~100	Directly input
Three phase three wire active watt-hour meter	DS862	2.0	3 × 380V/400V/415V	1.5~6 3~6	Input through current transformer
				5~20 10~60 20~100	Directly input
	DS864	1.0	3 × 100V/110V/120V	1.5~6 3~6	Input through current and voltage transformer
				3 × 380V	Input through current transformer
				3 × 100V	Input through current and voltage transformer
				1.5~6 3~6	Input through current and voltage transformer
Three phase four wire reactive watt-hour meter	DX862	3.0	3 × 380V 3 × 100V	1.5~6 3~6	Input through current transformer
				1.5~6 3~6	Input through current and voltage transformer
	DX864	2.0	3 × 380V 3 × 100V	1.5~6 3~6	Input through current transformer
				1.5~6 3~6	Input through current and voltage transformer
Three phase three wire reactive watt-hour meter	DX865	3.0	3 × 380V 3 × 100V	1.5~6 3~6	Input through current transformer
				1.5~6 3~6	Input through current and voltage transformer
	DX865	2.0	3 × 380V 3 × 100V	1.5~6 3~6	Input through current transformer
				1.5~6 3~6	Input through current and voltage transformer

Outline dimension



3 × 15(60), 3 × 15(60), 3 × 15(60)	279
3 × 15(60), 3 × 3(6), 3 × 5(20), 3 × 10(40)	273
Specification(A)	A

Diag 1 Outline dimension

Other Energy Meters

Din-Rail Meters



Single Cyclometer



1P-2W Multi-rate kWh Meter



1P-2W kWh Meter



3P-4W Multi-rate Electronic Meter



3P-4W kWh Meter



3P-4W kWh Meter

Other Instruments and Meters



DDS3 Single-phase Energy Meter (Weather Proof)



HY-6000 (16) PLC Collector



DTSD3 3phase 4wire Multi-function Energy Meter



HKGA22-HY21 Load Management Control Terminal

Inside Structure



DTSD



DTS(X)



DTSF



DTSY

M-BUS/PLC Collection Terminal For Water Meter

Summary

M-BUS/PLC collection terminal is a communications unit in carrier meter reading system, responsible for rule form parsing of the carrier channels to the M-BUS-channel, but also as a relay point of the carrier channel. Power line carrier communication protocol is single-rate-carrier extended protocol.

Functions and features

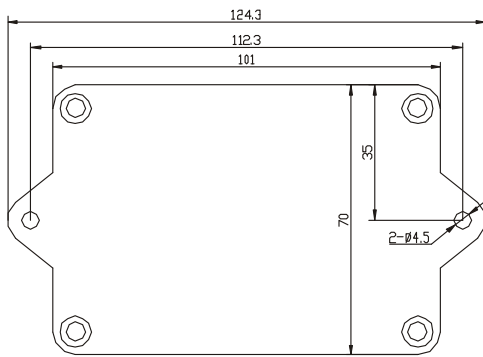
1. Supporting collect the M-BUS water meter data on M-BUS by carrier means.
2. Supporting attached four M-BUS water meter at most.
3. Adopt power line carrier to set terminal equipment number.
4. Adopt safe and reliable circuit designing, can save all settings and recording data in collection terminal. after power outage.
5. The communication effective distance of power line carrier can reach up to 500m without relay.
6. Collection terminals all have relay link function, can support up to seven class relay.



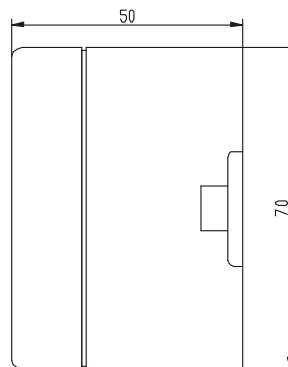
Technical specification

1. Carrier Communications: Direct Sequence Spread Spectrum, DPSK modulation and demodulation
2. Dimension: 124.3mm × 70mm × 50mm
3. Weight: About 0.6Kg
4. Power Supply Voltage: AC 220V ± 20%
5. Consumption of power: ≤ 0.9W (standby)
6. Ambient Conditions: Standard Operating Temperature: -30°C ~ +55°C
Limit working temperature: -40°C ~ +70°C
Relative humidity ≤ 85%

Outline dimension and Wiring diagram



Bottom View



side view



Wiring diagram

1. Wiring diagram (Specific wiring, see enclosure marking)
2. Connection instructions
Power supply cord access AC 220V, M-BUS cable access meter.
3. Installation instructions

Please read instruction carefully before installing, and follow the instructions required to operating, in order to avoid making the wrong connection of power lines and M-BUS cable, resulting in damages. In the lightning places, the installation should be taken the lightning protection measures.

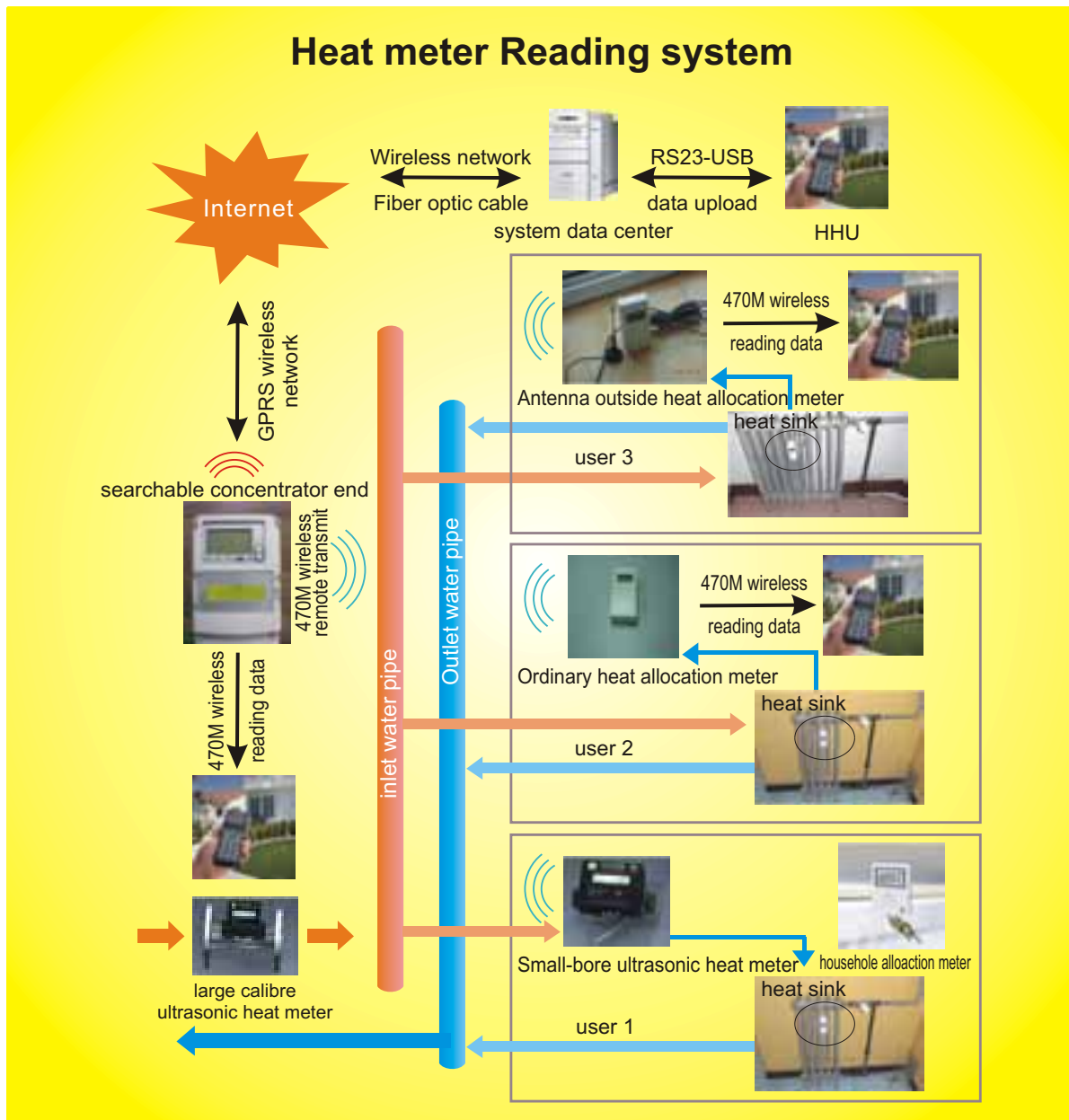
Heat Meter Reading System

Summary

Heat Meter Reading System consists of ordinary type heat allocation meter, household heat allocation system, heat flow meter, searchable concentrator end and HHU. It realizes the automatic remote reading function. The consumers' heat consumption data can be obtained by temperature gap which is displayed both on heat allocation meter and heat flow meter. There are two ways of collecting consumption data from end users to computer system: one is automatic remote-reading, the heat consumption data are first sent to concentrator-end through 470M wireless, then transmitted through wireless network to System Data Center; the other is manual data collection, the operator record the consumption data directly from the household heat meter by HHU, then upload the data by RS232-USB to computer in System Data Center.



Heat Meter



HYP100 Microcomputer Protection Relay

Summary

HYP100 series is a kind of microcomputer monitor and control device which progressed by advanced technology, it is a special design of microcomputer monitor and control device for under 12kV power used of the area of electric power, traffic, petroleum, chemical industry and architecture and so on.



Product feature

1. Dispersion series
2. Standard hardware
3. High dependability
4. Every element adopts the CMOS chip, it is considered as high anti-jamming capability and low error. The design of winding dispose, electromagnetism shield, hardware and software redundancy and transient control make the device have upwards capability.
5. Ultra-low power consumer device
6. It can be used in AC/DC 220V circuit, power consumer is 5W, AC voltage power consumer $\leq 0.1VA$, AC current power consumer $\leq 0.25VA$.
7. High performance/price ratio
It can replace the traditional relay protection, decrease the time of secondary winding distribution and improve the dependability.

HYP100 system classification

HYP100 Protection relay:

HYP101 Disperse microcomputer protection relay

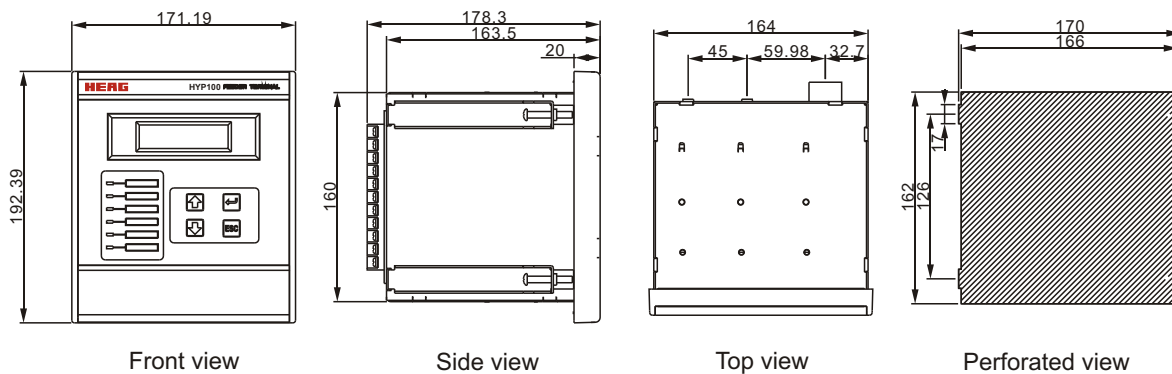
HYP114 Microcomputer transformer protection relay

HYP121 Microcomputer capacitor protection relay

HYP141 Microcomputer motor protection relay

HYP161 Microcomputer feeder protection relay

Outline dimension



Model Function	101	114	121	141	161
Fast break protection		✓	✓	✓	✓
Delay fast break protection					✓
Over current protection		✓	✓		✓
Imbalance current protection (two group capacitor)			✓		
Imbalance current protection (two group capacitor)		✓			
LV side limited time (IDMT) zero sequence current (earthing) protection		✓			
Zero sequence current (earthing) protection					
Over current alarm		✓		✓	✓
Overheat (over load) protection				✓	
Imbalance (break and reverse phase) protection				✓	
Motor self startup control				✓	
Over time protection of startup				✓	
Stop and change protection				✓	
Differential protection				✓	
Over voltage protection		✓			
Low voltage protection		✓		✓	
Zero sequence voltage protection					
Heavy gas protection		✓	✓		
Light gas protection		✓	✓		
Transformer overheat alarm		✓	✓		
Three phase one time reclose					✓
Low frequency load reduce					✓
Interlock trip				✓	
Low voltage blocking protection					✓
Fuse alarm				✓	
PT short current alarm		✓	✓	✓	✓
Fault protection for protect fixed value		✓	✓	✓	✓
Fault alarm for device	✓	✓	✓	✓	✓

HYP400 Digital Microcomputer Programmable Relay

Summary

HYP400 digital microcomputer programmable relay is provided for electricity system of rated voltage 40.5kV and below for protection, controlling, measurement and monitoring purposes. It comprises of circuit, input/output line, capacitor, monitor and protective PT. It is suitable for various systems with different connections, such as non-neuro-earthing system, low resistance earthing system and arc suppression coil earthing system.



Product features

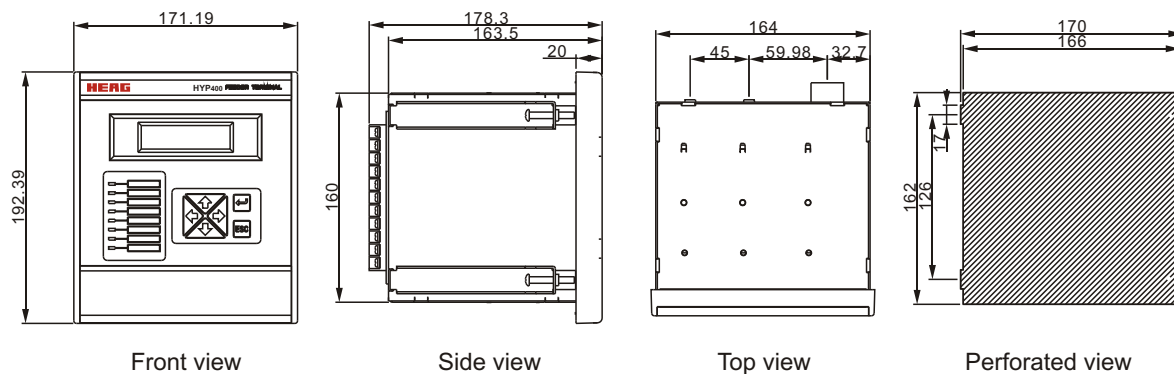
1. Multiple interfaces: 7CT, 4PT, 10DI, 7DO; flexible connection.
2. Updating time precisely and instant communication: supportive updating time in GPS B code, two RS485 channels support double network communication, which assures the highly reliable communication.
3. Precise measurement: the precision of voltage, current, power is 0.2 class, the precision of power and quantity is 0.5 class;
4. Visible and graphic programming: provide rich resources for programming, visible and graphic programming, easy operation, multiple applications, adjustable, made as per customer's requirements.
5. Highly reliable design: comprising components of industrial level, professional EMC design, self detecting, assures the long life expectancy of relay.
6. Integrated fault record and analysis: able to record 100 SOE events.

HYP-400 classified

HYP400 protective relay:

HYP414 station transformer protection relay	HYP442 motor protection relay
HYP421 capacitor protection relay	HYP461 feeder line protection relay
HYP431 PT measurement / shift relay	HYP451 incoming protection relay
HYP432 PT measurement relay	HYP452 busbar section protection relay

Outline dimension



HYP600S Microcomputer Programmable Protection Relay

Product introduction

HYP600S is a kind of programmable protection device, characterized in high-capacity and Resource Redundancy. It is applicable for network protection, control, measuring and monitoring of grid with rated voltage no higher than 40.5kV. It can be configured to protect circuit, capacitor group, electric motors. It also applicable for different main wire connection, like a single bus, dual-bus and multi-bus wiring. It is also available for different type of grids, just as ungrounded neutral contact system, the blow-out coil grounding system and the low resistance grounding system.



Function features

1. High reliability design

All the components of HYP600S are industrial-grade, HYP600S adopts professional EMC design, combined with perfect on-line self-test procedure to have a real-time monitoring towards the input power, analog power and digital power.

2. Flexible AC quantity wiring connection method

There are basic version, intermediate and advanced version of alternate current input, the users are able to make a choice in accordance with their own needs.

3. Powerful programmable logic

It is able to carry graphical programming on internal logic resources of HYP600S in the Windows environment by matching PLPShell® Package, which is simple operation, flexible application and adaptable.

4. High precision measurement and metrology

Protection CT and measurement CT respectively input and ensure the measurement precision and high reliability. Frequency tracking technology is adopted to monitor the changes of system frequency and adjust the time interval of data sampling. The calculation errors caused by fundamental frequency wave are able to be eliminated. The fundamental frequency component, harmonic component, and sequence component of the system can be worked out accurately in the case that the deviation between base band and frequency is 50HZ.

5. Rich I / O interface resources

- 7/4 channel AC current input; respectively access to protection CT, measuring CT or other current.
- 4 channel AC voltage input; respectively access to three-phase AC voltage or other voltage.
- 10/16 channel switch quantity input; AC and DC dual-use, can be used in the state of collecting switch quantity.
- 7 channel switch quantity input; DO1~DO6 both can access to control circuit.

6. Fault recorder

HYP600S is able to save a total of 8 groups recorded wave records with time-scale wave record.

7. Protection fixed value swift

HYP600S can store 4 groups of protection fixed value into non-volatile registers. Groups can switch through panel and communication. HYP600S is adapt to various operating modes quickly and easily due to group switching capability.

8. Software

We provides software PLPShell® for device debugging of HYP600S. This software can help consisting input signals, setup protection logic as well as controlling output relay, indicator or alarm.

9. Sequence events recording

- HYP600S can work out 200 articles of message for fault analysis.

10. Accurate timing

- Artificial device panel timing mode: the coarse timing is generally used in the debugging process.

11. Communication function

- HYP600S is equipped with two standard interfaces: the one on the panel is RS-232 interface, the other on the backplane is RS-485 interface.
- An optional standard Ethernet interface on the backplane can be chosen.
- RS-485 communication protocol: IEC60870-5-103 and Modbus RTU.
- Ethernet communication protocol: Modbus TCP/IP.
- Different communication can set different protocols and can operate simultaneously.

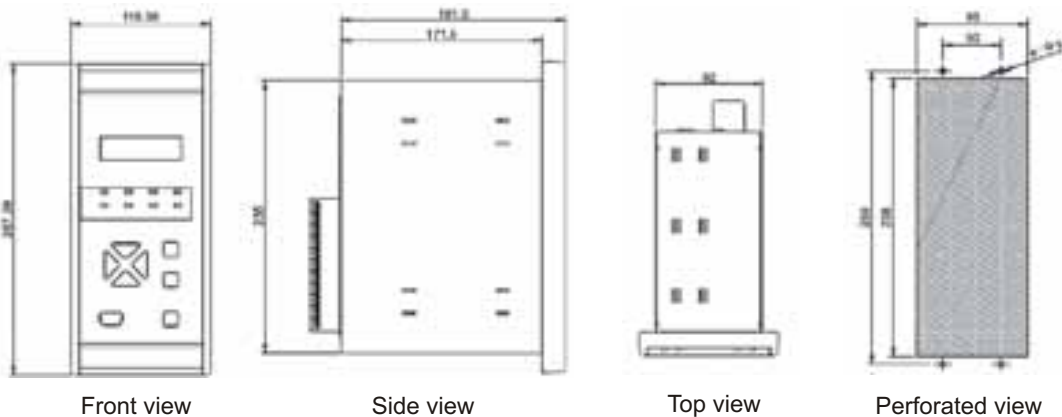
12. Relaying protection function

- In the clearance interruption (IEC 60255-11) and power loss electricity during the 100ms, the device will not lose electricity (220Vdc or Vac).
- After loss power for 50ms, the device will generate loss-electricity SOE and store important data.

Protection function

IEEE code	Function	HYP661S	HYP621S	HYP641S	HYP631S	HYP651S
50P1	Phase transient speed breaking current protection	✓		✓		✓
50P2	Phase limited speed breaking current protection	✓	✓	✓		✓
50P3 (27、47、67)	Phase over-current protection (can choose compound voltage interlock, direction interlock)	✓	✓			✓
51P (27、47、67)	Phase normal inverse over-current protection (can choose compound voltage interlock, direction interlock)	✓	✓	✓		✓
50N1	Zero-sequence definite time first-section protection	✓		✓		✓
50N2(51N)	Zero-sequence definite time second-section protection (can choose normal inverse protection)	✓		✓		✓
59 A	Over-voltage alarming		✓	✓	✓	
59T	Over-voltage tripping		✓	✓		
79	Three-phase one shot recloser	✓				
	Relay accelerating after auto-reclosing	✓				
	Circuit breaking control alarming	✓	✓	✓		✓
	Non-energy protection (3 pieces, can choose alarming or tripping)	✓		✓		
60	PT disconnection alarming	✓	✓	✓	✓	✓
50Q1	Negative-sequence definite time over-current first-section			✓		
50Q2	Negative-sequence definite time over-current second-section			✓		
66	Locked-rotor protection			✓		
48	Over-long starting time protection			✓		
49A	Thermal alarming protection			✓		
49T	Thermal tripping protection			✓		
59N	Zero-sequence over-voltage protection	✓				
59G	Unbalance voltage protection		✓			
50G	Unbalance current protection		✓	✓		
27	Low-voltage protection		✓	✓	✓	✓
	Loss of voltage restart			✓		
	Incoming Bi-throw/ bus bar back-up throw					✓

Outline dimension



HYP600 Microcomputer Programmable Protection Relay

Summary

HYP600 series microcomputer programmable protection relay is suitable for 110/132kV or below circuit as a protector, controller and monitor for the line, fuse group, motor, power transformer, three-phase asynchronism motor and parallel fuse group.



Product feature

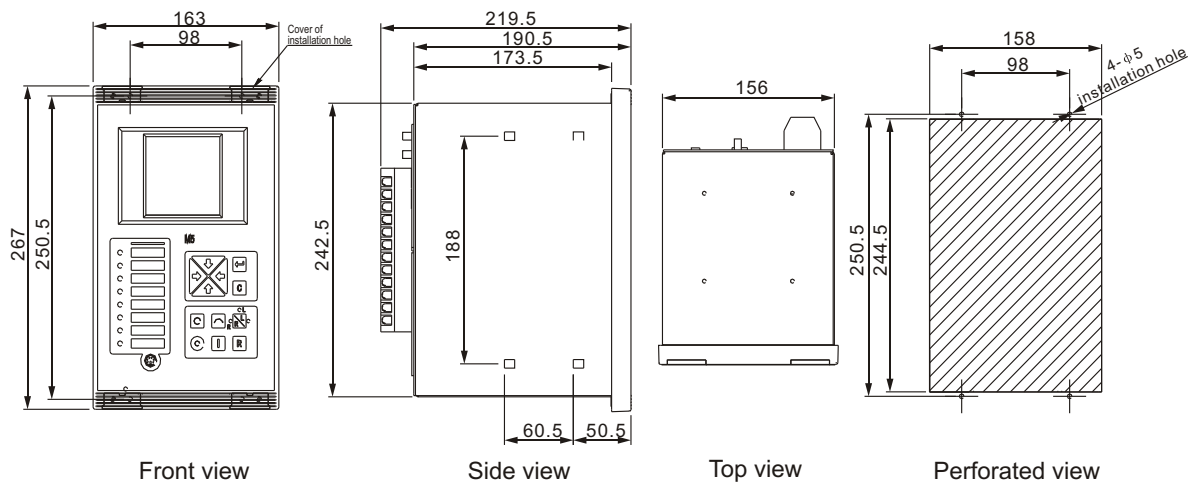
1. Multi-interface: 8CT, 4PT, 3AI, 16/32DI, 11/16DO;
2. Multi-communication interface: 1RS485, 1CAN, 1RS232 adjustment, two ethernet and one set fiber;
3. Flexible connection: suitable for series PT, supply AC power wave and angle to check the pole;
4. Programmable: supply programme resource to make graphics, simple operating;
5. High reliability design: enough electric isolation, professional EMC design, self-checking to ensure high reliability;
6. Accident analyse and record: it can record 8 times accident wave and latest 100 items SOE event;
7. High precision measurement: the precision of voltage, current, power is 0.2 class, the precision of power and quantity is 0.5 class;
8. Accurate time-checking, communication time-checking, TRTG-B code time-checking;
9. Plate: large LCD screen display user-defined connection, operating interface, it can O/C operating in local.

HYP-600 classified

HYP600 series relay:

HYP611 power transformer (2-coil) differential backup protection relay	HYP631 PT measurement parallel relay
HYP612 power transformer (3-coil) differential protection relay	HYP632 PT measurement relay
HYP641 motor differential / backup protection relay	HYP642 motor protection relay
HYP613 power transformer backup protection relay	HYP651 incoming automatic throw-in protection relay
HYP614 station transformer protection relay	HYP652 bus-bar automatic throw-in protection relay
HYP621 capacitor protection relay	HYP661 feeder line protection relay

Outline dimension



Protection function

IEEE code	Function	600F	600T	600C	600M	600B
50,67,27,59,47	Instantaneous quick breaking current protection	√			√	
50,67,27,59,47	DMT quick breaking current protection	√	√	√		√
50,67,27,59,47	DMT over-current protection	√	√	√		√
51	IDMT over-current(low-voltage closedown can be selected)	√	√	√	√	
79	Three-phase reclosing (checking no voltage and homochronous)	√				
051A	Over-load alarm	√	√		√	
51T	Over-load trip	√	√		√	
	Later speed-on	√				√
50N1T	Zero-sequence current protection-first	√			√	
50N2T	Zero-sequence current protection-secondary	√			√	
50N3T	IDMT zero-sequence current protection	√			√	
59	Over-voltage protection		√	√	√	
27	Low-voltage protection	√	√	√	√	
50T	Non-energy protection		√		√	
	Abnormal alarm of control circuit	√	√	√	√	
62BF	Failure alarm of circuit breaker	√	√	√	√	
81U	Low-cycle reduce load(no voltage, no current, slipping closedown)	√				
60	Alam for PT disconnection	√	√	√	√	
59G	Unbalanced voltage protection			√		
50	Unbalanced current protection			√		
	Sectional ready for throw-in					√
	Busbar ready for throw-in					√
	Charging protection					√
50G	Direct zero-sequence over-current		√			
51G	Clearance zero-sequence over-current		√			
	Automatic throw-in & throw-off			√	√	
46T1	Negative sequence over-current definite time-first				√	
46T2	Negative sequence over-current definite time-secondary				√	
46T3	Negative sequence over-current inverse time				√	
51br	Blocked protecion				√	
66	Excessive starting time protection				√	
49	Over-thermal protection				√	
27	Voltage-loss restart				√	
59N	Zero-sequence over-voltage		√			
59	Alarm for over-voltage			√		
32	Adverse power protection	√				
27T	Lost voltage trip			√	√	
	O/C remote of circuit breaker	√	√	√	√	√

HYC-2600 Series Outdoor Automatic Remote Feeder Terminal Unit(FTU)

Summary

The power distribution automation system is consist of the main substation, data communication system and feeder automatic terminal which is the connector of automatic system and primary device.

FTU Power distribution automatic telemetry terminal (HY-PFT2C2W) is the core unit of HYS-8000B power distribution automatac system. It is mainly used to collect AC measurement (voltage, current), statement local (position of switch), and order of remote control. It is widely used in 12kV power distribution system which can monitor and control the LBS, sectionalizer, ring main unit switch.

FTU power distribution automatic remote terminal adopts the principle of the third microcomputer protection hardware.

This device is able to improve the ability of RS232, RS485 wave load and communication. To match to the communication part, it can communicate with main substation to monitor and control the power system.



Product feature

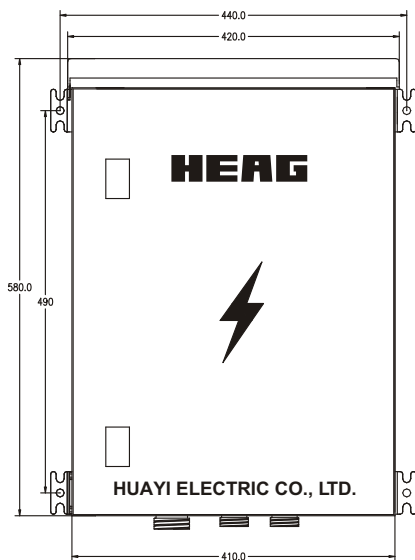
1. FTU Power distribution automatic terminal adopts the design principle (micro-computer protects hardware), which improves the reliability of the hardware. There is 16 bit A/D CMOS chip on the measurement part and high speed and high precision module conversion (A/D) on the protective part. And there is dual-monitoring for the exit signal to make sure the reliability.
2. There is many signal insulated method (electromagnetism insulation, photoelectricity insulation) in the external part of FTU power distribution automatic terminal to improve the capacity of anti-jamming, and it also has the high precision measurement function. The input signal change in the range of 45-55Hz, it can implement the function of information collecting.
3. In the software of the power distribution automatic terminal, there is some intelligent arithmetic which can do fault insulate, network re-form, supply re-connect and so on, when the device has lost it communication ability. It can store various fixed value.
4. The typical configuration of FTU power distribution automatic terminal has two kinds of outgoing method (one or two), it can be set by user.

Technical specification

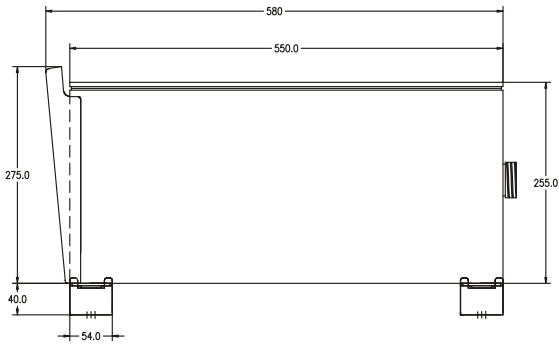
Rated data		Power consumption	
DC voltage	+24V(running voltage)	Power consumption (include fibre-optic signal transmit power)	≤5W
AC voltage	100V or 220V(should be specified in the order)	Whole set power loss	≤7W
Work voltage	220V(PT secondary side)	AC voltage circuit	≤0.03VA/phase
AC current	5A	AC current circuit	≤0.7VA/phase
Frequency	50Hz	AC loop over load capability	
Battery bank data		AC voltage	Continuous work 1.2Un
Voltage	+24V(2*12V DC battery series)	DC current	Continuous work1.2Un it can up to 20In if continuous 1s
Capacity	7AH		

Device accuracy		Anti electromagnetic interfere performance		
Current / voltage	< ± 0.5%	Impulse intereference test	Common mode 2.5kV/100kHz,1MHz	
Active power / reactive power	< ± 0.5%		Differential mode 1.0kV/100kHz,1MHz	
Frequency	< ± 0.02Hz	Transient intereference test	It can afford the 4 class transient interference test	
Fault current test accuracy		Ambient condition		
Fault curent accuracy	3 class	Work temperature		
Current check scope	5A-1 00A	Relative humidity		
Accident sequence record		Mechanical performance		
SOE resolution ratio	5ms	Air pressure		
Two accident treat ability	≤25ms	Work condition	1 serious class of vibrant response, impulse response test	
Insulation performance		Transmit condition	1 serious class of vibrant response, impulse response test	
Insulation resistance	Above 500M			
Power frequency withstand voltage	AC remote loop	2KV/50Hz 1min	Communication protocol	
	Remote communication loop	500V/50Hz 1min	HuaYi 101	
	Power circuit	2.5KV/50Hz 1min	IEC870-5-101	Select
	Between relay winding and connect site	500V/50Hz 1min	Others	
	Between primary and secondary of photoelectricity	500V/50Hz 1min	Total weight	40kg
Impulse voltage	Among each device loop	8KV/0.5J 1.2/50	Total dimension	500x440x250(mm)
	Between each device and earth	8KV/0.5J 1.2/50	Suitable cable	7-10m (it should be specified and select in the order)

Outline demension



Front view



Side view



Top view

HYC461 Automatic Circuit Breaker Recloser Controller

Summary

HYC461 ACR controller is a new generation of digital relaying control terminal produced by HEAG. It can protect, control, measure and monitor the grid with voltage below 40.5kV. It is suitable for a variety of system operating modes, including isolated neutral system, resistance-grounded system and arc suppression coils grounding system.



Main characteristics

Rich interface resources

The interface resources provided by HYC461 are: the input passband of 7 channels AC current and 4 channel AC voltage. 10 channel switching value input passband, 7 channel switching value output; the communication interface has two RS485 and one RS232 maintenance ports.

Flexible and convenient connection method

The four AC voltage inputs of HYC461 can connect with the phase voltage, Line voltage or zero-sequence voltage or unbalanced voltage, which adapt to a variety of PT Connection.

High reliable design

With the design principles of stable, reliable and durable, industrial components are adopted, all connections with the outside world are fully isolated as well as anti-lightning protection circuit and power filter are built in.

Event record in order

HYC461 will provide users 100 pieces of SOE for fault analysis (100 is a circle, namely, the next first SOE will cover the 101 SOE), the resolution of SOE is 1ms.

High-precision measurement

The measurement function of HYC461 can measure IA、IB、IC、IO、Ua、Ub、Uc、Uab、Ubc、Uca、P、Q、F、fs、PF precisely and monitor the protection current Ia、Ib、Ic, as well as measurement towards forward kWh, reverse kWh, forward kVarh, forward kVarh.

Accurate time setting

HYC461 has three types of time setting: time setting of artificial device panel, communication time setting and IIRIG-B code time setting.

Performance index

Rated data

Power: 110/220VDC or VAC, allowable deviation + 15%, - 20%; 24/48 VDC, allowable deviation + 15%, - 20%.

Frequency: 50Hz, the measurement range is 45.00Hz~55.00Hz.

Phase sequence: ABC

Power consumption

Power: normal<7W; exit actuation <10W

AC voltage: <0.3VA/circuit (when it is rated input)

AC current: <0.2VA/phase (when it is rated input)

Output interface capability

Continuous power: 6A (DC)

Switched current: 20A (DC)

Breaking capacity (10,000times of operation, L/R=40ms)

Actuation time: <5 ms

Switching value input

Insulation voltage rating: 5kVDC

Rated voltage value: 110/220VDC or VAC, allowable deviation $\pm 20\%$; 24/48 VDC, allowable deviation $\pm 20\%$.

Current consumption: $<3\text{m A}$ /circuit.

Communication

Insulation voltage rating: 2kV DC (except RS232)

RS485 port: baud rate 1200, 2400, 4800, 9600, 19200, 38400 are optional

Communication protocol: IEC60870-5-103protocol、Modbus

RS232: baud rate 19200, exclusive for PLPSHELL.

Communication media: GSM or GPRS wireless communication.

IRIG-B input

To adopt RS422 apparatus standard or TTL reception level IRIG-B.

Insulation voltage rating: 2kVDC

TTL receiving load: $<2\text{ mA}$ (steady state)

RS422 receiving load: $<0.2\text{ mA}$ (steady state)

Time setting accuracy: $\pm 1\text{ ms}$

AC sampling and processing

Filtering circuit: second-order low-pass filtering, cut-off frequency is 700 Hz.

Software filtering: full-cycle cos frequency

Sampling frequency: 32 point/cycle

Actuation interval of protection and control algorithm: 1/4cycle

Actuation interval of measuring algorithm: 1cycle

Actuation precision of steady-state protection and control

Phase current element: $\pm 3\%$

Voltage element: $\pm 3\%$

Phase angle: $\pm 2^\circ$

Frequency element: $\pm 0.01\text{ Hz}$

Precision of measurement and metrology

Phase current: $\pm 0.2\%$

Voltage: $\pm 0.2\%$

Phase angle: $\pm 0.5^\circ$

Frequency: $\pm 0.01\text{ Hz}$

KWh: $\pm 0.5\%$

Temperature coefficient: $\pm 2\text{ppm}/(^\circ\text{C})^2$

Ambient conditions

Temperature range of operation: $-20^\circ\text{C} \sim +65^\circ\text{C}$

Relative humidity: 15%~95%

Storage temperature testing: IEC60068-2-48

Insulation performance(IEC 60255-5)

2kV, 50 Hz/1minute Dielectric strength

Impulse withstands voltage: $\pm 5\text{kV}$ (1.2/50us, 0.5J)

Insulation resistance: $>100\text{M}\Omega$, 500VDC

Mechanical testing

IEC60255-21-1: 1 stage

Impact testing: IEC60255-21-2: 1stage

Earthquake testing: IEC60255-21-3:2 stage

Electromagnetic compatibility

Anti-interference towards high-frequency: IEC 60255-22-1: 3

Anti-static discharge: IEC 60255-22-2: 4

Anti-frequency magnetic interference IEC 1000-4-8: 5

Anti-radiated electromagnetic field interference IEC 60255-22-3: 3

Anti-fast transient disturbance interference: IEC 60255-22-4: 4

Anti-surge interference: IEC 1000-4-5: 4



HYC461 Layout Drawing of ACR Controller



HYP2692 Communication Manager

Summary

HYP2692 communication manager is one of important part of substation automation system. It is used in applications of micro-computer protection, data communication between electronic devices (eg. automatic devices, detector) and main computer system of substations or grid automation systems. It realizes the wholly distributed mode system.



HYP2692 communication manager can be used as the general-controlling mode substation of integrative automatic system or as the front-computer, being the medium layer of the automation system. It can communicate both in upward with systems (eg. main station) and in downward with end equipments within its administrative district. By collecting and transimiting data of end equipments, the product realizes the functions of mirco-substation and front-computer, making the communication more security and reliable.

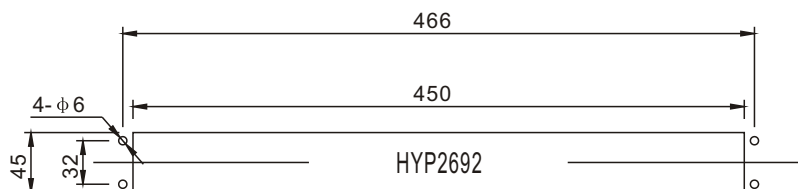
Product features

1. Adopting PHILIPS 32bit-Arm7TDMI-S CPU micro-controller, with strong ability of processing and rich resources;
2. Multi-ways of communication setting, including five RS232/RS485 bus line interfaces, two CAN main line communication interfaces and one TCP/IP communication interface.
3. Supportive communication with main computer through network, many optional communication protocols for each communication interface, including IEC60870-5 series clauses, CDT, MODBUS, TCP/IP, etc.
4. Detecting and monitoring the communication status of all the equipments and devices. Automatically updating time through GPS and uniform system time.
5. Maintenance tool realizes setting and maintenance functions through network.

Technical features

- Communication rate
 - CAN Longest communication distance 10Km/5KB
 - CAN Highest communication rate 1MBPS/40m
 - RS-232/485 communication interface 300/600/1200/2400/4800/9600bits/s
- Internet interface 10MBPS
 - Supply voltage DC5V
 - Power 1W
 - Power supply interruption time allowed is less than 0.1s
- Insulation resistance 100MΩ/500V
- Withstand test 2.0KV/50Hz/1min
- Impulse voltage test ±4KV/1.2/50 μS/0.5J
- Interference (power supply and relay output section)
 - Common mode interference 2.5KV/1MHz/2s
 - Differential mode interference 1.0KV/1MHz/2s
 - Electromagnetic radiation interference 30-500MHz
 - Static electric field interference 8.0KV
- Mechanical test
 - Vibration 10-500Hz 50m/s
 - Impulsion and strike 150m/s
- Normal working temperature range -15~+55°C
 - Storage and transport temperature -40~+70°C
- Relative humidity 95% (Altitude no more than 2000m)
- Weight 1.7Kg
- Dimension 485mm × 45mm × 190mm (width × height × depth)

Outline demension



HYS-8000A automatic integration Monitoring System

System summary



HYS-8000A automatic integration Monitoring System is suitable for industry automatic monitoring system, power automatic monitoring system, residence community automatic monitoring system. The interaction between system and user interface is the Windows graphical to display, graphical interface is clear and intuitive, man-machine interface is friendly and convenient. Use mouse and shortcut keys to control all functions, the operator can operate all kinds of functions intuitively; the function keys of system have the textual description and corresponding operation tips; can monitor comprehensively system operating state and measured values; distributed network structure, to achieve double machine hot standby, automatic switching; having the function of automatic recording the real-time and historical operating data; recording of system running alarm, operating, event, as well as display and print output; in order to prevent the misuse, unauthorized operations, realization of rights management, by giving the operators the different login passwords, different permissions person can complete or dealing with the appropriate personnel to complete within the purview of the things. This system is basic on the windows 2000 operation system.

System components

HYS-8000A automatic integration Monitoring System including "develop environment" and "running environment" two parts, "develop environment" and "running environment" exist at same time, also can running respectively, can changed on any time; complete project in "develop environment", must run in the "running environment", it supply the other auxiliary tools, such as: project management, rules management, management center and so on.

System functions

1. Screen display function

Screen Navigation
 Screen Zoom
 Screen Roaming
 Layer selection
 Display Data
 Show Status
 Show Curve
 Show Table
 Bar graph display
 Show Time
 Color change
 Status flashing
 Artificial location



2. Artificial operation functions

Screen switching
 Remote function
 Remote regulating function
 Parameter tuning
 Opening-closing operation
 Lifting Operation
 Resetting operation
 Setting the number of artificial
 Artificial Set



3. Background language function

Four fundamental operations of arithmetic
 Logical judgement
 Common Functions

4. Equipment management features

Communication enabled
 Correction time enable
 Remote controlling Enable

5. Serial port management features

Multi-Serial Communication
 Multi-threaded communication
 RS232/RS485 communication mixture

System functions

6. Network management functions

Ethernet, TCP / IP protocol, real-time network communication

Network clock synchronization

Communications front-end processor hot backup changeover

The server

(SCADA server, MIS server, database server)

Client

(monitor work stations, engineers work stations, remote maintenance workstation)

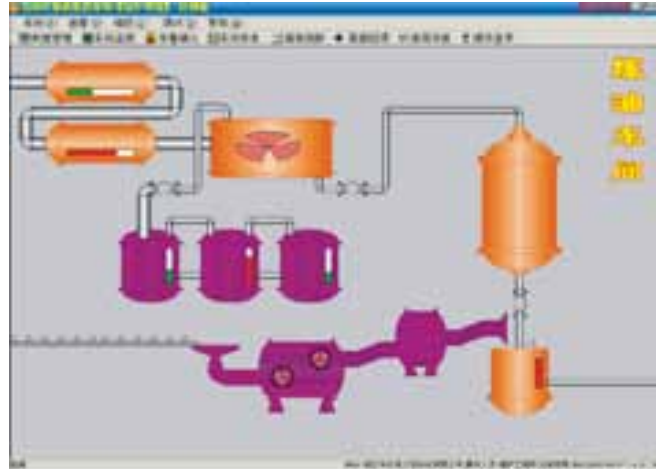
7. Database management function

Support ODBC interface, DAO Database Engine

Database Search

Database Synchronization

Specialized databases and synchronize the use of commercial databases



8. Four remote function support

Telemetry

Telesignalling

Electric degree impulse

Correction time for equipment

Remote Control opening-closing

Remote lifting

Equipment resetting

Parameter tuning

Protection Events

Fault oscillograph

9. Other auxiliary function

Acoustic Alarm

Run Log

Online Maintenance

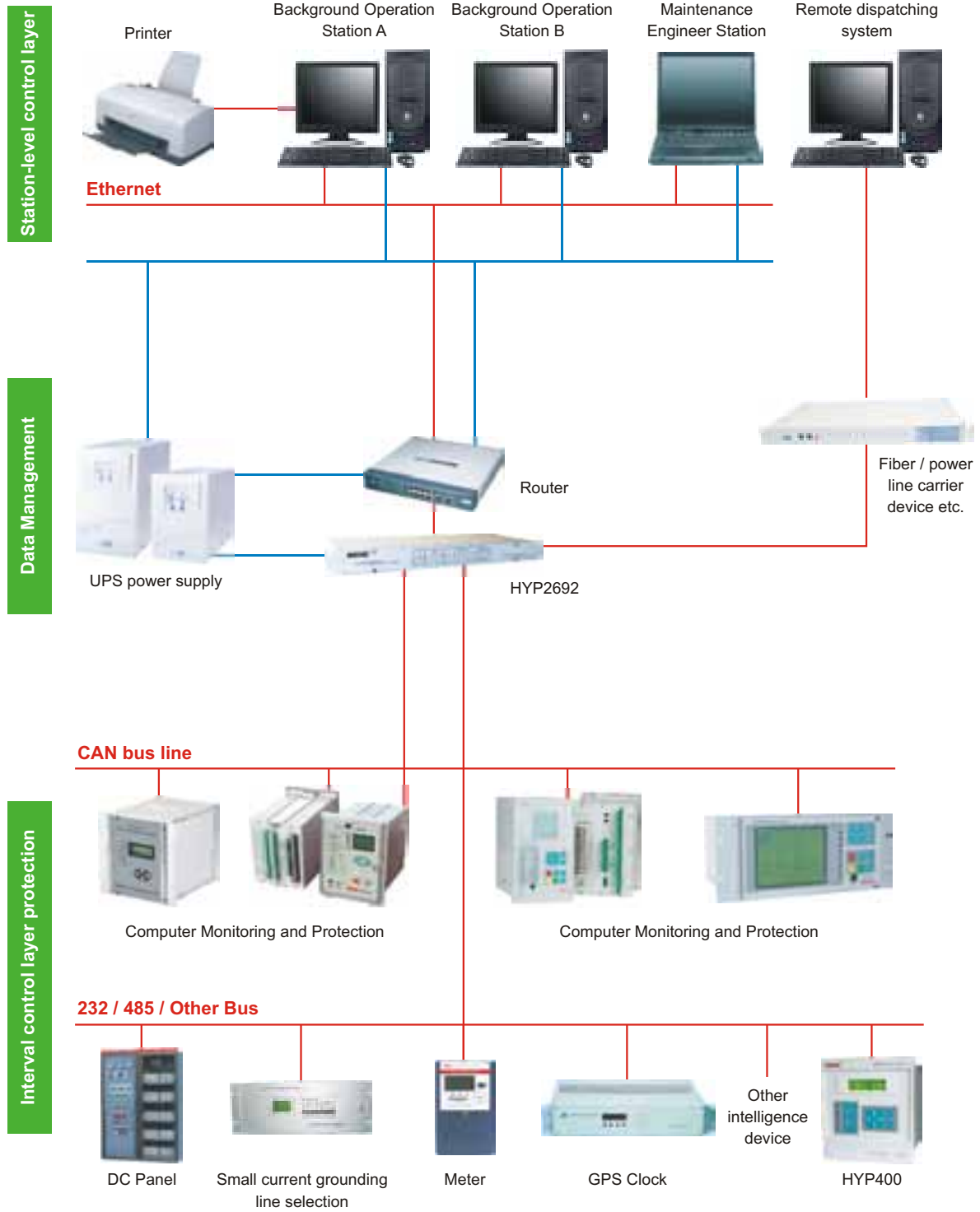
Security Login

System Detection



Substation Automation System

Substation Automation System Structure



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