XJ GROUP CORPORATION

Outline of Products

Automation Equipment of Power System

- CBZ-8000 Substaion automation system
- TOSCAN-D3000 C Distribution automation system
- PANS-2000 Power network dispatching automation system

Relay Protection of Power System

- WXH-800 Microprocessor based line protection equipment
- WXH-803 Tandem differential protection equipment
- WXH-810 Microprocessor based line protection equipment
- WXH-820 Microprocessor based line protection equipment
- WMH-800 Microprocessor based busbar protection equipment
- WFB-800 Microprocessor based generator&tranformer protection equipment
- WBH-800 Microprocessor based tranformer protection equipment
- WYH-881/882 short distance wire protection equipment
- WDR-820 Microprocessor based capacitor protection equipment
- WBT-820 Back-up power supply auto put-into-operation equipment
- WDLK-860 Micro-processor based circuit-breaker protection equipment
- WDK-800 Micro-processor based reactor protection equipment
- WCB-820 Micro-processor based station service transformer protection equipment

Power System Status Monitoring and Diagnosis System

- CBS2000 main equipment status monitoring and diagnosis system

DC Power Supply Equipment

- PZ61 HF switching DC power supply
- ZYNB13 active inverting batteries discharge equipment
- PTD Series communication power supply

Watt-hour Meter

- DSSD566/DTSD566 Multi-function three phase electronic KWH meter
- DDSF566 Single-phase electronic multi-tariff energy meter
- DSS566/DTS566 Three-phase electric energy meter
- Single-phase electronic carrier energy meter
- DDS566 single-phase electronic energy meter
- DD702 single-phase energy meter
- DD701 single-phase energy meter
- DSSD568/DTSD568 Multi-Function three phase electronic KWH meter

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CBZ-8000 Substation Automation System

1.General

CBZ-8000 Substation Automation System is a new substation automation system designed for 110kV ～ 500kV substation and step-up station of the large-scale power plant.

- Integrating successful design experience for the substation protection and automation system of some famed companies at home and abroad.
- Absorbing XJ's development and engineering experience at the region of automation for many years.
- Adopting the specialist's valued opinion of substation automation at home and abroad.
- Solving the problems at the range of substation automation at home and abroad.

2.The problems that the product may solve

No.	Status Quo at home	Our measure	Reachable result
1	Mismatched protocols, the equipment is hard to connect and upgrade.	Adopting IEC60870-103, 104/61850 international standard protocols and supplying contacts and protocol mode to make other manufacturers' equipment connect reliably to the substation automation system.	The system equipment, without auxiliary switching device, may realize direct connection. The system may upgrade conveniently, without repeat investment, so it may save quantity of capitals for the user.
2	Complex network wiring, numerous auxiliary processes	Adopting fiber self-healing looped Ethernet	It is the first to adopt the technology at the domestic substation range. Simple network wiring, less fiber usage. It may auto stay away the network fault point when the network fails. The router may communicate via the normal channel selected. Strong anti-fault strength and high

			reliability.
3	To be hard to remote visit and maintain through Internet/intranet	Adopting reliable Web technology	It may remote visit reliably and completely the system at any place where it may connect to the Internet/intranet.
4	Complex point-oriented work during the site commissioning.	Adopting complete object-oriented design method	It needs only 40s to set a interval function, which obviously saves commissioning time and ensures engineering process.
5	Complex SCADA operation	SCADA system adopts flexible context concerned on-line help function	In SCADA picture, each operation object even each instance is equipped with detailed help file including detailed function introduce and use guide which may completely substitute the manuals.
6	Hard to find out on-line the primary equipment status in operation in time	Importing America advanced monitoring system to the primary large-sized equipment status	On-line monitoring the operation status of transformer, circuit-breaker and other HV equipment and arranging check and maintenance according to the result.
7	Slow calculation speed, low sampling resolution, Bad person-machine interface	Adopting 32-digit CPU hardware platform based on floating-point DSP technology and super-large color LCD in Chinese	Fast operation speed, high sampling accuracy and high reliability. The main wiring figure may be displayed. On-line help function is provided
8	Not be able to carry out simulating training on-line	Combining on-line simulating function in the monitoring system	It may realize simulating training to the operators in the same operation conditions as the actual monitoring system. The operators may grasp conveniently and quickly the system. The simulating training doesn’t effect on the actual operation of the system.
9	Protection and IED equipment need auxiliary switching device to connect with the system	The equipment is equipped with Ethernet interface that may connect directly to the system	Reducing the auxiliary process of IED equipment information transfer and simplifying protocol transformation work
10	Fixed protection function. The expansion and modification of	The equipment at the space layer adopts RTOS flush multi-task operation system	Complete changing the traditional digital protection program mode. Ensuring the

	function need modify the source program, even the whole frame of the program.	and model software design.	reliability and compatibility of the software module. The protection function module may be combined randomly according to the user's requirement.

3.Solutions to substation automation supplied by XJ

- The system conforms strictly to IEC60870/61850 international protocol standards and has approved the test by the authorized mechanism. The system supports:
  IEC60870-5-104 protocol
  IEC60870-5-103 protocol
  IEC60870-5-103/TCP protocol
  and DNP3.0/TCP protocol, Modbus protocol;
  The system supplies effective connection mode and protocol mode for other manufacturer's equipment to connect to the substation automation system and ensures different manufacturers' secondary equipment to connect reliably within the substation.
- Completely integrating in the same network of automation system.
  Independently protocol transformation mode of protection information.
- Embedding in the substation status monitoring system of monitoring system.
- Complete on-line simulating train function.

4.CBZ-8000 main function and configuration scheme

Main function	Voltage class		
	110kV	220kV	500kV
Fiber self-healing looped Ethernet		√	√
Bus Ethernet (Single, dual)	√	√	
Adopting IEC60870-103, 104 protocol	√	√	√
Adopting Web technology with reliable fire wall	√	√	√
Linux operation platform			√
Win NT/2000 operation platform	√	√	√
Introducing advanced America monitoring platform			√
Introducing Israel WIZCON monitoring platform		√	
XJ's Autop2.0 upgrade monitoring platform	√	√	√
Complete object-oriented SCADA technology			√
Convenient context concerned help function			√
Visible PLC program	√	√	
Special memory technology	√	√	√

Plug and play function module	√	√	√
WYSIWYG report form generation system	√	√	√
Modular software function design	√	√	√
Substation status monitoring system embedded in system			√
On-line simulating system embedded in system			√
Remote visualization function embedded in system			√
Inspection equipment imported from America famed companies			√
Hard platform with 32-digit floating point DSP technology	√	√	√
The space layer device adopts RTOS embedded operation system	√	√	√
Separate A/D technology			
A/D technology without regulating 0-shift and scale	√	√	√
Double-connector scheme with strong and weak isolation	√	√	√
Control and protection equipment may select Ethernet interface	√	√	√
Control and protection equipment may select RS-485 interface	√	√	√
Control and protection equipment may select Lon network interface	√	√	√
Control and protection equipment is equipped with RS-232 interface	√	√	√

TOSCAN-D3000C Power Distribution Automation System

1. Application

TOSCAN-D3000C, based on Toshiba's advanced and ripe power distribution automation system technology, combined the characteristics of power distribution network system in China city, is a complete and applied power distribution automation system. TOSCAN-D3000C features advanced technology, ripe function and high reliability and is suitable for various power distribution network system.

2. Main function

- Monitoring to the power distribution network (SCADA)
- Power distribution network equipment management
- On-line maintenance function
- On-line simulating function
- Interface to other system
- Distribution fault treatment and burden decision shift
- Real-time distribution GIS
- Report form system
- Advanced analysis function

3. Main characteristics

■ Open and distributed system

The system, based on open &distributed structure, adopts open LAN and WAN communication control protocol and network distributed on the UNIX working station to process the client and server.

■ The system adopts master and backup mode with high reliability

The server and working station of the system adopt master and backup mode. The equipments (TCM, TCR, RTU etc.) forming the system adopt industrial micro-processor, so the system has high reliability.

■ Good system structure is convenient to extend

The system is convenient to extend and may establish additionally working station, TCM, TCR, RTU, PVS etc. according to user's requirement.

■ Real-time distribution GIS

The distribution AM/FM/GIS based on real-time GIS has incomparable advantage to the commercial GIS.

- Convenient on-line maintenance function

The system may on-line maintain the equipment data, drawing data of the distribution system and auto produces the report form of equipment.

- Applicable distribution network analysis software

The system has applicable distribution network analysis software, which may realize multi-section load shift.

- Excellent on-line simulating function

The excellent on-line simulating function may carry out various simulating operation and fault repeat display.

- Several phases implement

In the first phase, the system adopts only PVS and RTU to isolate the fault zone and resume the non-fault zone. In the second phase, the distribution automation functions, such as monitoring to the distribution network, load shift calculation and equipment management, may be implemented through constructing distribution master station system, substation system and communication system.

4. Technical data

Item	Index
Average non-fault time of front-located communication equipment	>10 years
Average non-fault time of distribution substation	>10 years
CPU load ratio	<30%
The switching time between the master and backup servers	<10s
Updating period of tele-metering and telecommunication	<3s
Switch control transmission time	<3s
GIS picture access display time	<1s
GIS picture updating time on distribution line fault	<3s
Load shift time on distribution line fault	<6s
System manageable substation	>40 sets
System manageable digit	>10,000 sets

PANS-2000 Power Network dispatch Automation System

1.Application

The maximum stations that PANS-2000 can process may reach 1024 in theory. PANS-2000 is applied widely to provincial dispatch, area dispatch, county dispatch and section dispatch as well as dynamic monitoring of large-sized substation and large &medium-sized enterprises. The real-time information process capacity of each station is 4096.

2.Main function

- Data acquisition and process
- Data communication and remote maintenance
- Remote control and tele-regulation
- Event alarm process and fault memory
- Timing and print access
- Auto data resume and copy
- Advanced and reliable management mechanism
- Equipment status maintenance and defect management
- EMS function
- Substation application: 5-prevention function, VQC etc.
- Web application and advanced function
- Video monitoring and reliable alarm
- Dispatch telephone recording and auto voice dial alarm
- On-line help and simulating train

3.Main characteristics

- Distributed structure based on client/server mode
- Various operation system platforms that may be configured flexibly
- Support widely to database management system
- Application program of object-oriented design
- Compact user interface
- Page layout editor with strong function
- Complete and reliable design

- Quick and real-time display
- Integrated multi-media application
- Open system adopting Web technology
- SCADA/EMS/DMS/GIS integrating application

4.Technical data

Item	Index
Updating period of mostly tele-metering	<2s
Updating period of minor tele-metering	<10s
Updating period of system real-time data	<5s
Tele-communication shift transmission time on fault	<1s
SOE station-to-station resoluation	<1s
Remote control and tele-regulating command transmission time	<20ms
Real-time response time of picture access	<1s
Real-time data refresh time of picture	<1s
Load shift time on distribution line fault	<2s
Correctness of tele-communication process	98.9%
Correctness of tele-control, tele-regulation	100%
MTBF of master station system	>25000 hours
Switching time between the two equipment	<10s

WXH-800 Microprocessor Based Line Protection Equipment

1. Application

WXH-801/802 is complete set digital type protection equipment which is mainly applied in transmission lines at level of 110~500KV. WXH-801 comprises of main protection and back-up protection. Main protection with the whole line quick action is composed of tandem positive-sequence fault directional element and zero-sequence directional element. The back-up protection is composed of three-section phase-to-phase distance protection and six-section zero-sequence directional protection. WXH-802 includes main protection, back-up protection and recloser. Main protection with the whole line quick action is composed of tandem positive-sequence fault directional element and zero-sequence directional element. The back-up protection is composed of three-section phase-to-phase distance protection and six-section zero-sequence directional protection.

2. Functions and characteristics

- 32 digit DSP is used as protection CPU，high data-handling quantity，strong security and high running speed.
- 16 digit A/D is used as data acquisition, high accuracy for protection measurement. Separate A/D for each protection can be check by itself and do not need zero-drift and scale regulation.
- adopts self-adjusting surge criterion and self-adjusting data filter, and protection logic for weak power source side
- 16 times of operation events can be recorded, in which include the receiving, sending and protection operation states. Each record has sampled data of 2 cycles before and 8 cycles after the fault. The report is in Chinese, which has the measured value and settings of the protection operation. The sampled data can be output in wave or sampled value.
- Use 80186 chip as man-machine interaction（MMI），LCD is full Chinese display.
- Hardware with Large memory can memorize event record up to 100 times.

Any operation, such as power on of the device, changing of settings, can all be included in the report.

- Has RS-422/485 or Lonworks bus network. Can connect with microprocessor supervision or protection supervisor.
- Flexible channel interface which connect to carrier channel (special or multi-use), fiber channel, microwave channel and so on and forms permissible or block protection.
- Complete and flexible background analysis software for after fault analysis.
- The configuration of the device box adopts 6U type. CPU adopts advanced SMT; reasonable arrangement of strong and weak circuit and input and output circuit increases the anti-interference ability.

3. Technical parameters

General parameters

- rated AC value
  a. AC voltage Un：
  phase voltage U_{Φ}：100/$\sqrt{3}$ V
  lines drawing out voltage U_{XL}：100/$\sqrt{3}$ V or100V
  b. AC current In：5A or 1A
  c. Frequency：50Hz
- rated DC voltage：220V or 110V
- work voltage of printer：AC 220V、50Hz
- AC circuit over-load quantity
  a. AC voltage：1.2Un—work continuously
  b. AC current：2In—work continuously, 10In—10s, 40In—1s
- power consumption
  a. Each phase of AC voltage circuit: ≤0.5VA
  b. AC current circuit：not larger than 1VA every phase, In=5A; not larger than 0.5VA every phase In=1A.
  c. DC voltage circuit：normal operation ≤40W；action, ≤ 60W
- Output contact
  a. outlet tripping & closing contact：
  In DC inductive load circuit, voltage≤250V， current ≤1A，time constant L/R: 5ms±0.75ms,the breaking quantity of the contact is 50W and permitted passing current for long term is not larger than 5A.
  b. Outlet signal and other contact：
  In DC inductive load circuit, voltage≤250V，current ≤0.5A，time constant L/R: 5ms±0.75ms,the breaking quantity of the contact is 20W

and permitted passing current for long term is not larger than 3A.

Main technical parameters

■ Tandem protection

□ WXH-801 tandem directional protection

Setting range of positive-sequence fault shunt current element: 0.2~2I

Setting error not exceed ±10%

Action time of whole set: not more than 30ms for that with special transmitter, 10ms for the exit short circuit.

□ WXH-801 tandem distance protection

Setting range：0.2Ω~50Ω(In=5A) 1Ω~99.9Ω(In=1A)

Setting error not exceed ±2.5%

Action time of whole set: not more than 30ms for that with special transmitter, 10ms for the exit short circuit.

■ Distance protection

Setting range：0.01Ω~50Ω(In=5A) 0.05Ω~250Ω(In=1A)

Setting error not exceed ±2.5% measurement error not exceed ±2.5%

Accurate work voltage: 0.5V

Accurate work current range: 0.1~20I

Transient exceed for Ⅰ section is not larger than 5%

Time delaying element for Ⅱ、Ⅲ section：0.2s~9.9s，error of the setting value is not larger than±1%

Operation time for full Ⅰ section： ≤25ms within 0.7 times of setting impedance

■ Zero-sequence current (directional) protection

Setting range: 0.1~20In

Setting error not exceed ±5%

Dead zone voltage of zero-sequence power directional element: ≥1V, and ≤2V.

Action range of zero-sequence power directional element: ≥140° and ≤180°

Transient exceed for Ⅰ section is not larger than 5%

Time delaying element for time delay section：0.2s~9.9s，error of the setting value is not larger than±1%

Operation time for full Ⅰ section：≤20ms under the condition of twice setting value; ≤30ms under the condition of 1.2 time setting value.

■ Comprehensive recloser

Four functions: single reclose, three reclose, comprehensive reclose and stop.

Setting range of non-voltage check element: 0.2~0.7Uo

Setting range of synchronistic element: 20° ~60°

Time delay element of recloser: 0.3~9.9s, error not exceed ±1%

■ **Anti-interference**

It can withstand damped oscillation wave (common code 2.5kV, difference mode 1kV is for the first half-wave voltage amplitude) pulse interference test,1MHz and100kHz, stipulated as GB 6162.

It can withstand static discharge interference test, severity class Ⅲ, stipulated as IEC255-22-2.

It can withstand radiant electromagnetic interference test, severity class Ⅲ, stipulated as GB/T 14598.9.

It can withstand quick & transient interference test, severity class Ⅳ, stipulated as GB/T 14598.10.

WXH-803 Microprocessor Based Tandem Differential Protection Equipment

1. Application

WXH-803 consists of whole line quick-break main protection, back-up protection and comprehensive recloser which applies to transmission lines at level of 220~500KV. The whole line quick break main protection is composed of shunt current differential and zero-sequence current differential elements; the back-up protection is composed of three-section phase-to-phase distance protection, grounding distance protection and six-section zero-sequence current directional protection.

2. Functions and characteristics

- 32 digit DSP is used as protection CPU，high data-handling quantity，strong security and high running speed.
- 16 digit A/D is used as data acquisition, high accuracy for protection measurement. Separate A/D for each protection can be check by itself and do not need zero-drift and scale regulation.
- Special fiber channel or multi-use PCM interface are available.
- 96 points per cycle high speed sampling, in vector transmission mode
- adapts to GPS synchronizing mode or synchronization adjusting automatically, errors are less than 1°
- Accurate two-end measurement range
- suitable for special fiber communication mode among the range of 60km and less
- adopt auto-adjusting data filter and auto-adjusting surge criterion
- 16 times of operation events can be recorded, in which include the receiving, sending and protection operation states. Each record has sampled data of 2 cycles before and 8 cycles after the fault. The report is in Chinese, which has the measured value and settings of the protection operation. The sampled data can be output in wave or sampled value.
- Use 80186 chip as man-machine interaction（MMI），LCD is full Chinese display.
- Hardware with Large memory can memorize event record up to 100 times.

Any operation, such as power on of the device, changing of settings, can all be included in the report.

- Has RS-422/485 or Lonworks bus network. Can connect with microprocessor supervision or protection supervisor.
- Complete and flexible background analysis software for after fault analysis.
- The configuration of the device box adopts 6U type. CPU adopts advanced SMT; reasonable arrangement of strong and weak circuit and input and output circuit increases the anti-interference ability.

3.Technical parameters

General parameters

- rated AC value

a. AC voltage Un：

phase voltage U_{Φ}：100/$\sqrt{3}$ V

lines drawing out voltage U_{XL}：100/$\sqrt{3}$ V or100V

b.AC current In：5A or 1A

c.Frequency：50Hz

- rated DC voltage：220V or 110V
- work voltage of printer：AC 220V、50Hz
- AC circuit over-load quantity

a. AC voltage：1.2Un—work continuously

b. AC current：2In—work continuously, 10In—10s,40In—1s

- power consumption

a. Each phase of AC voltage circuit: ≤0.5VA

b. AC current circuit：not larger than 1VA every phase, In=5A; not larger than 0.5VA every phase In=1A.

c. DC voltage circuit：normal operation ≤40W；action, ≤ 60W

- Output contact

a. outlet tripping & closing contact：

In DC inductive load circuit, voltage≤250V， current ≤1A，time constant L/R: 5ms±0.75ms,the breaking quantity of the contact is 50W and permitted passing current for long term is not larger than 5A.

b. Outlet signal and other contact：

In DC inductive load circuit, voltage≤250V，current ≤0.5A，time constant L/R: 5ms±0.75ms,the breaking quantity of the contact is 20W and permitted passing current for long term is not larger than 3A.

Main technical parameters

- Split-phase current differential protection

Setting range of differential current element: 0.1~5In

Setting error not exceed ±2.5%

Action time of whole set: typically 15ms (including relay exit)

■ Distance protection

Setting range：0.01Ω~50Ω(In=5A) 0.05Ω~250Ω(In=1A)

Setting error not exceed ±2.5% measurement error not exceed ±2.5%

Accurate work voltage: 0.5V

Accurate work current range: 0.1~20I

Transient exceed for Ⅰ section is not larger than 5%

Time delaying element for Ⅱ、Ⅲ section：0.2s~9.9s，error of the setting value is not larger than±1%

Operation time for full Ⅰ section： ≤25ms within 0.7 times of setting impedance

■ Zero-sequence current (directional) protection

Setting range: 0.1~20In

Setting error not exceed ±2.5%

Dead zone voltage of zero-sequence power directional element: ≥1V, and ≤2V.

Action range of zero-sequence power directional element: ≥140° and ≤180°

Transient exceed for Ⅰ section is not larger than 5%

Time delaying element for time delay section：0.2s~9.9s，error of the setting value is not larger than±1%

Operation time for full Ⅰ section：≤20ms under the condition of twice setting value; ≤30ms under the condition of 1.2 time setting value.

■ Comprehensive recloser

Four functions: single reclose, three reclose, comprehensive reclose and stop.

Setting range of non-voltage check element: 0.2~0.7Uo

Setting range of synchronistic element: 20° ~60°

Time delay element of recloser: 0.3~9.9s, error not exceed ±1%

■ Anti-interference

It can withstand damped oscillation wave (common code 2.5kV, difference mode 1kV is for the first half-wave voltage amplitude) pulse interference test,1MHz and100kHz, stipulated as GB 6162.

It can withstand static discharge interference test, severity class Ⅲ, stipulated as IEC255-22-2.

It can withstand radiant electromagnetic interference test, severity class Ⅲ, stipulated as GB/T 14598.9.

It can withstand quick & transient interference test, severity class Ⅳ, stipulated as GB/T 14598.10.

WXH-810 Serial Microprocessor Based Line Protection Equipment

1. Application

WXH-810 serial microprocessor line protection equipment is digital line protection equipment based on 32bit float type DSP soft/hard ware platform. This equipment adapts to single or dual-busbar connection mode transmission line protection in the level of 110KV and below.

2. Functions and characteristics

The configuration of WXH-811 line protection equipment is complete with three-section phase-to-phase and grounding distance protection, four-section zero-sequence current (differential) protection, with the functions of double-loop quick action one by one, asymmetrical fault quick action one by one and three phases one shoot recloser. Furthermore, the device possesses the operation exit circuit for dual-busbar voltage shifting circuit and single-trip or dual-trip circuit breaker. WXH-812 line protection device is complete with high-frequency distance protection, and has other configuration the same as that of WXH-811. And besides, the device has the operation exit circuit for dual-busbar voltage shifting circuit and single-trip or dual-trip circuit breaker. The configuration of WXH-813 (fiber) has split-phase current differential, and other configuration is the same as that of WXH-811.

- the starting elements of each protection are the phase current distance mutation quantity starting element and zero-sequence current auxiliary starting element
- correctly reflect each kind of short circuit fault in and out of the protected zones, and safely cut off the fault lines in the protected zones, and operate the three phases one shoot recloser.
- the recloser has three modes: check synchronization, check non-voltage and non-synchronization. The recloser can be started by the tripping order of any protection or other devices. If the device sends no tripping order, the asymmetrization of the switch position will start the recloser; the primiary close impulse of the recloser is fulfilled by a software counter, whose charging time is 15s.

- manual close of distance I, II section and manual close of zero-sequence I, II or reclose post accelerating functions are available.
- No malfunction during the surge in transmission circuits, and still act correctly when the short circuit fault happen at the same time.
- can correct check out the PT breakage, CT breakage and overload, sending out the alarm signal and executing relevant blocking methods.
- possesses starting, exit tripping, recloser act and device abnormal signal circuits
- Chinese LCD, general information and operation can be executed by the keyboard and LCD
- Telecommunication with automation system can be fulfilled by RS422 (485) or Lonworks interface, reports can be printed by local serial interface.
- send tripping impulse to the single or dual tripping coils of the circuit breaker and trip the circuit breaker
- send tripping impulse to the close coils of the circuit breaker and close the circuit breaker
- reliable anti-tripping circuit in operation circuit

3. Technical parameters

- Distance protection
  - Setting range：0.01Ω~50Ω(In=5A) 0.05Ω~250Ω(In=1A)
  - Setting error not exceed ±2.5% each section can be adjusted separately.
  - Max. sensitive angle is 60°~85°(circuit impedance angle)
  - Accurate working voltage: 0.5~60V
  - Range of accurate working current: 0.1~20In
  - Transient exceed for Ⅰ section is not larger than 5%
  - Time delaying element for Ⅱ、Ⅲ section：0.2s~9.9s，error of the setting value is not larger than±1% +20ms
  - Operation time for full Ⅰ section： ≤20ms within 0.7 times of setting impedance
  - Range error not exceed ±2.5%
- zero-sequence current (directional) protection
  - Setting range: 0.1~20In
  - Setting error not exceed ±2.5%
  - Dead zone voltage of zero-sequence power directional element: ≥1V, and ≤2V.
  - Action range of zero-sequence power directional element: ≥140° and ≤180°

- □ Time delaying element: 0.2~9.9s, error not exceed ±1%
- □ Operation time for full Ⅰ section： ≤15ms within 2 times of setting impedance; ≤30ms within 1.2 times of setting impedance
- ■ Three phases one shoot recloser
- □ Two functions: three reclose and stop
- □ Setting range of non-voltage check element: 0.2~0.7Uo
- □ Setting range of synchronistic element: 20°~60°, error not exceed ±2%
- □ Time delay element of recloser: 0.3~9.9s, error not exceed ±1%
- □ Time space of one reclosing: 15s

WXH-820 Microprocessor Based Line Protection Equipment

1. Application

WXH-821 microprocessor line protection device consists of two-section overcurrent protection, three phases one shoot recloser, zero-sequence overcurrent, accelerating (fore-accelerating or post-accelerating are available), overload protection, low cycle load shedding, which is mainly used in the feeder line protection in the level of 10KV and 6KV. WXH-822 microprocessor line protection device consists of three-section voltage & current (directional) protection, three phases one shoot recloser, three-section zero-sequence current (directional) protection, accelerating (fore-accelerating or post-accelerating are available), overload protection, low cycle load shedding, which is mainly used in the feeder line protection in the level of 35KV.

2. Functions and characteristics

- 32 digit DSP is used as protection CPU，high data-handling quantity，strong security and high running speed.
- 16 digit A/D is used as data acquisition, high accuracy for protection measurement. Separate A/D for each protection can be check by itself and do not need zero-drift and scale regulation.
- adapts multi-task system
- 160╳128 LCD, all in Chinese
- Hardware with Large memory can memorize event record up to 200 times. Any operation, such as power on of the device, changing of settings, can all be included in the report.
- Has RS232, RS-422/485 or Lonworks bus network and general C103 protocol, it can connect with microprocessor supervision or protection supervisor.
- Complete and flexible background analysis software for after fault analysis.
- The configuration of the device box adopts 6U type. CPU adopts advanced SMT; reasonable arrangement of strong and weak circuit and input and output circuit increases the anti-interference ability.

3. Technical parameters

General parameters

- rated AC value
  a. AC voltage Un：phase voltage U_Φ：100/$\sqrt{3}$ V
  lines drawing out voltage U_{XL}：100/$\sqrt{3}$ V or100V
  b. AC current In：5A or 1A
  c. Frequency：50Hz
- rated DC voltage：220V or 110V
- work voltage of printer：AC 220V、50Hz
- AC circuit over-load quantity
  a. AC voltage：1.2Un—work continuously
  b. AC current：2In—work continuously, 20In-1s
- power consumption
- Each phase of AC voltage circuit: ≤0.5VA
- AC current circuit：not larger than 1VA every phase, In=5A; not larger than 0.5VA every phase In=1A.
- Zero-sequence current circuit: ≤1.5KA per phase
- DC voltage circuit: ≤12W in normal operation, ≤15W in action.
- Output contact
  a. outlet tripping & closing contact：
  In DC inductive load circuit, voltage≤250V， current ≤1A，time constant L/R: 5ms±0.75ms,the breaking quantity of the contact is 50W and permitted passing current for long term is not larger than 5A.
  b. Outlet signal and other contact：
  In DC inductive load circuit, voltage≤250V，current ≤0.5A，time constant L/R: 5ms±0.75ms,the breaking quantity of the contact is 20W and permitted passing current for long term is not larger than 3A.

Main technical data

- WXH-821 microprocessor feeder protection
- Two-section definite time overcurrent:
- Current setting: 0.1~20In
- Time setting: 0~100s
- Setting error: <5%
- Recloser:
- Recloser time: 0.1~9.9s
- Setting error: <5%
- Low cycle load shedding:
- Setting of low cycle: 45~50Hz
- Voltage blocking: 10~90V

- □ Df/dt blocking: 0.3~10Hz/S
- □ Setting error: <5%
- □ In which, frequency error: <0.01Hz
  Telemeasurement level: 0.2
  Others: 0.5
- □ Telecommunication resolution rate: <2ms
- □ Signal input mode: passive contact
- ■ WXH-822 microprocessor line protection
- □ Definite time directional overcurrent protection with three-section voltage blocking
- □ Current setting: 0.1~20In
- □ Voltage setting: 2~100V
- □ Time setting: 0~100s
- □ Setting error: <5%
- □ Recloser:
- □ Recloser time: 0.1~9.9s
- □ Setting error: <5%
- □ Low cycle load shedding:
- □ Setting of low cycle: 45~50Hz
- □ Voltage blocking: 10~90V
- □ Df/dt blocking: 0.3~10Hz/S
- □ Setting error: <5%
- □ In which, frequency error: <0.01Hz
  Telemeasurement level: 0.2
  Others: 0.5
- □ Telecommunication resolution rate: <2ms
- □ Signal input mode: passive contact
- ■ Anti-interference
- □ It can withstand damped oscillation wave (common code 2.5kV, difference mode 1kV is for the first half-wave voltage amplitude) pulse interference test,1MHz and100kHz, stipulated as GB 6162.
- □ It can withstand static discharge interference test, severity class Ⅲ, stipulated as IEC255-22-2.
- □ It can withstand radiant electromagnetic interference test, severity class Ⅲ, stipulated as GB/T 14598.9.
- □ It can withstand quick & transient interference test, severity class Ⅳ, stipulated as GB/T 14598.10.

WMH-800 Microprocessor Based Busbar Protection Equipment

1. Application

It is suitable for power plant and substations in the level of 500KV and less with each voltage level and main connection mode.

2. Main characteristics

- ■ Split-phase current differential protection scheme
- ■ auto-discrimination of busbar operation mode
- ■ Any CT ratio adjustment
- ■ real data online display
- ■ Perfect debugging software
- ■ New type auto-adjusting anti-CT saturation criterion
- ■ Flexible communication with background, RS-485/422, RS-232 and Lonworks interfaces. Accept communication protocol DL/T667-1999 (IEC60870-5-103)
- ■ Large screen colorful LCD, friendly MMI
- ■ fault record are compatible with COMTRADE

3. Main functions

- ■ Protection configuration
- □ Differential protection
- □ Comprehensive voltage blocking protection
- □ Busbar coupling (section) charging protection
- □ Busbar coupling (section) switch failure and dead zone protection
- □ Circuit breaker failure protection (available)
- ■ Auxiliary functions
- □ PT breakage alarm
- □ CT breakage alarm and blocking
- □ AC quantity online supervision
- □ Handling of fault information
- □ System auto-checking
- □ Switch quantity supervision

4. Technical parameters

- ■ General parameters
- □ DC rated voltage: 220V, 110V
- □ AC rated voltage: 57.7V, 100V
- □ AC rated current: 5A, 1A
- □ Frequency: 50Hz
- □ Ambient temperature: -10~+55℃
- □ Limiting temperature: -25~+70℃
- □ DC circuit power consumption: 100W
- □ AC circuit power consumption: 1VA (In), 1VA (Un)
- ■ Work current level 40In
- ■ Anti-CT saturation ability
- □ Protection reliably act when the CT saturated in the zone
- □ Protection won't misact when the CT fully saturated out of the zone
- ■ Action time of whole set: ≤15ms under the condition of twice setting current and 0.5 time setting voltage
- ■ Anti-interference
- □ It can withstand damped oscillation wave (common code 2.5kV, difference mode 1kV is for the first half-wave voltage amplitude) pulse interference test,1MHz and100kHz, stipulated as GB 6162.
- □ It can withstand static discharge interference test, severity class Ⅲ, stipulated as IEC255-22-2.
- □ It can withstand radiant electromagnetic interference test, severity class Ⅲ, stipulated as in the third part of GB/T 14598.9-1995.
- □ It can withstand quick & transient interference test, severity class Ⅳ, stipulated as GB/T 14598.10-1996.

WFB-800 Microprocessor Based Generator & Transformer Protection Equipment

1. Application

WFB-800 Microprocessor generator & transformer set protection device meets the capacity demands of kinds of generators.

2. Functions and characteristics

- 32 bit high quality DSP processor, strong power and weak power are completely separated which increases the reliabilities of the device.
- Adopts real time multi-use operation system Nucleus Plus, which increases the reliabilities of operation of the software
- Intelligent procession technique with three CPUs paralleled, avoids the malfunction caused by the damage in the elements.
- 16bit high quality A/D with high accuracy.
- meets the requirements of dual-main and dual-backup protection configuration and six sides ratio brakeage differential
- Differential with auto-adjusting ratio brakeage has strong abilities against TA saturation and TA transient feature difference.
- Providing excitation surge discrimination with different principles.
- Completely tally with the over-excitation ability of the transformer, which increases the over excitation protection of the transformer.
- Perfect turn-to-turn protection
- Advanced rotator grounding protection technique
- Large screen colorful LCD
- Protection faults can be sent up, information and reports are compatible with COMTRADE. Fault record function. Online and offline software.
- High compatibility and openness, supports communication protocol IEC60870-5-103.

3. Technical parameters

General parameters

- Rated AC data

  Rated AC current In: 5A or 1A

  Rated AC voltage Un: 100V

  Rated frequency fn: 50Hz

- Rated DC data

  220V or 110V, allowable vibrations range: 80%-110%

  Printer auxiliary AC power source

  220V, 0.7A, 50/60Hz, allowable vibration range: 80%-110%

  Microprocessor protection sampling and wave recorder frequency 1200Hz, system frequency track range47.5-52.5Hz

- Power consumption

  AC voltage circuit not more than 1VA per phase (under rated voltage)

  AC current circuit not more than 1VA per phase (under rated current)

  DC circuit power consumption: ≤50w

- Thermal stability

  Long period operation 2In

  5s 20In

  1s 40In

- Output contact

  Signal contact capacity:

  Long period permissible through current: 5A

  Cut off current: 0.3A (DC 220V, t=5ms)

  Trip exit contact capacity:

  Long period permissible through current: 10A

  Holding current: ≤0.5A

  Cut off current: 0.3A (DC 220V, t=5ms)

  Auxiliary relay contact capacity:

  Long period permissible through current: 5A

  Cut off current: 0.3A (DC 220V, t=5ms)

- Dielectric characteristics

- Dielectric resistance

The dielectric resistances of circuit to case of the device are not less than 100MΩ under the condition of standard test.

- Dielectric strength

The dielectric strength of circuit to case of the device can bear the test with AC 50Hz, voltage 2KV (effective) for 1 min., without any puncture or flashover.

- Impulse voltage

Between the conductive parts and the cases of exposed nonconductive metallic parts, it can withstand an impulse test of 5KV standard lightening wave for short time at regulation testing atmospheric condition.

■ Life

□ Electrical Life: the product can be reliably operated and returned for 10000 times when the voltage is at higher than 250. The current is not higher than 0.5A, 5±0.75ms time constant in the circuit of the output contacts.

□ Mechanical Life: Output contacts can be reliably operated and returned 10000 times without Load.

■ Mechanical Performance

□ Operating requirements: it can withstand a test for vibration response and impact response with class I of severe class.

□ Transport requirements: it can withstand a test for lasting vibration, impact with class I of severity class.

■ Anti-Interference Capability:

□ Anti-radioactive electromagnetic field interference capability: meets the requirements in GB/T 14589.9

□ Anti-quick transition interference capacity: meets the requirements in GB/T 14589.10

□ Impulse group interference test: meets the requirements in GB/T 14589.13

□ Anti-static discharging interference test: meets the requirements in GB/T 14589.14

WBH-800 Micro-processor Based Transformer Protection Equipment

1. Application

WBH-800 Micro-processor based transformer complete protection equipment meets the requirements of various voltage grades.

2. Function features:

- 32 –digit high performance DSP processor, which can completely separate the strong and weak current so that enhanced its reliability.
- The adoption of Nucleus Plus real-time multi-task operation system enhances the operation reliability of software.
- Three CPU parallel intelligent processing technology can avoid mis-operation causing by the damage of equipment elements.
- 16-digit high performance A/D, with high accuracy.
- The protection arrangement requirements of double main protections and double backup protections and six-side percentage braking difference can be met.
- It has the feature of self-regulating percentage braking difference and the high ability of anti-saturation and anti-disagreement of transient performance of TA.
- Can offer different methods how to recognize excitation surge.
- It completely fits the ability of transformer over excitation, so that it can improve the performance of over excitation protection of transformer.
- Large screen graphic colored LCD.
- The protection fault may be transmitted up. The information and report are compatible with COMTRADE. It is equipped with fault record function and supplies on-line and off-line analysis software. It supports IEC60870-5-103 communication protocol.

3. Technical parameters:

- Basic data:
  - Rated AC data:

Rated AC current In: 5A or 1A

Rated AC voltage Un: 100V

Rated frequency fn: 50 Hz

Rated DC data: 220V or 110V, allowable variety range: 80%~110%

Auxiliary AC power resource of printer: 220V, 0.7A, 50Hz/60Hz, allowable variety range: 80%~110%

Micro-processor based protection sampling and wave recording frequency is 1200Hz, tracking range of system frequency is 47.5~52.5Hz

□ Power consumption

AC voltage circuit: not more than 1VA/phase (under the rated voltage)

AC current circuit: not more than 1VA/phase (under the rated current)

DC circuit power consumption: not more than 50W

□ Thermal Stability

Long term operation—2In

5s————————20In

1s————————40In

□ Output contact

Signal contact capacity: allowable long-term current: 5A

Switch off current: 0.3A (DC220V, t=5ms)

Tripping exit contact capacity: allowable long-term current: 10A

Holding current: not more than 0.5A

Switch off current: 0.3A (DC220V, t=5ms)

Auxiliary relay contact capacity: allowable long-term current: 5A

Switch off current: 0.3A (DC220V, t=5ms)

■ Insulation performance

□ Insulation resistance

Under the standard test condition, the insulation resistance between all circuits and shell of equipment shall be not less than 100MΩ

□ Dielectric strength

The dielectric strength of all circuits and shell of equipment can withstand 1 min test with 50Hz frequency and 2KV valid voltage without any insulation breakdown or flashover.

■ Impulsion voltage

Under the stipulated test air condition, the parts between conductive elements and the bare non-conductive metal shell can withstand 5kv amplitude standard lighting wave short time test.

■ Lifetime

Electric lifetime: If the loading condition of equipment output contact circuit is

the following that voltage not more than 250v, current not more than 0.5A, time constant is 5±0.75ms, the product can operate reliably and reset 1000 times.

■ Mechanism lifetime

The equipment can operate and reset 1000 times reliably if there is no load on the output contact.

■ Mechanism performance

Working condition: can withstand I grade vibration and impulse response test

Transportation condition: can withstand I grade vibration withstanding, impulse and impact test

■ Anti-interference feature

Radiation electromagnetic interference test: meets the stipulation of China National Standard GB/T14589.9

Quick and transient change interference test: meets the stipulation of China National Standard GB/T14589.10

Impulse-group interference test: meets the stipulation of China National Standard GB/T14589.13

Anti-static discharging interference test: meets the stipulation of China National Standard GB/T14589.14

WYH-881/882 Microprocessor Based Short Distance Wire Protection Equipment

1. Application

It is suitable for the short distance wire digital protection equipment with 3/2 wiring type, and can also be used as charging protection of circuit.

2. Function and features

WYH-881/882 micro-processor based short distance wire protection equipment is complete digital protection with CPU which mainly composes of 32-digit floating-point-type DSP. It has the following functions:

■ Function arrangement

□ WYH-881 short distance wire differential protection adopts the principle of current percentage difference, so that it has high security; WYH-882 adopts two-zone overcurrent protection.

□ Two-zone circuit charging overcurrent protection

□ The strong/weak current circuits, input/output circuits and so on are all arranged reasonably and divided into different layers and zones, so that it has high reliability and strong anti-disturbance ability.

□ The control power resource of output relay will be put into operation only after the action of starting element.

□ In order to improve the reliability of protection, normally dual-type arrangement with function of reliable operation and safe maintenance will be adopted.

□ Good data processing ability, high reliability and quick operation; adopting 16-digit A/D as data acquisition so as to insure equipment's high precision, safe and reliable functions.

□ It has the operation circuit with single-tripping or double-tripping loop circuit breaker, which offered two starting failure circuits of circuit breaker. The contact equipment that linked to recloser has the function of self-diagnose, so that it can continuously monitor equipment's operation, and if there is abnormal instance, the protection output will be blocked and alarm signal will be sent out in order to avoid mis-operation.

- Technical data
- Under the rated current, AC current circuit is less than 1VA/f when In is 5A; and it is less than 0.5VA/f when In is 1A.
- During normal operation, the DC power resource consumption is not more than 25W and it is not more than 40W when tripping.
- Power resource: the allowable error of ±12V working power resource is ±0.2V, and the allowable error of +5V is ±0.15.
- The allowable error of optical coupling isolation power resource is ±2V.
- The starting value of current power frequency variety is 0.2In.
- The starting value of zero-sequence current Io is 0.2In.
- The starting value of the two ends of circuit and current Ip is 0.3In.
- Short-distance wire differential protection:
- Setting range: 0.1~19In
- Percentage braking coefficient: 0.5~1.0
- Setting error: less than 5%
- The anti-disturbance grade is the same as WXH-800 line protection equipment.

WDR-820 Micro-processor Based Capacitor Protection Equipment

1.Application

WDR-821 Micro-processor Based capacitor Protection equipment consists of stage II definite time over-current protection (three phase type), over-voltage protection, under voltage protection, unbalance voltage, unbalance current, zero-sequence over-current protection/weak current earth line-selecting. The equipment is suitable for capacitor protection monitoring device in the medium &low voltage system of arc-extinguishing coil earth (including small resistance earth) or earth-free. It may be mounted on the switchgear. It is mainly suitable for single Y, double Y, △ wiring capacitor group.

WDR-822 Micro-processor Based capacitor Protection equipment consists of stage II definite time over-current protection (three phase type), over-voltage protection, under voltage protection, bridge difference current protection, zero-sequence over-current protection/weak current earth line-selecting. The equipment is suitable for capacitor protection monitoring device in the medium &low voltage system of arc-extinguishing coil earth (including small resistance earth) or earth-free. It may be mounted on the switchgear. It is mainly suitable for bridge wiring capacitor group.

WDR-823 Micro-processor Based capacitor Protection equipment consists of stage II definite time over-current protection (three phase type), over-voltage protection, under voltage protection, differential voltage protection, zero-sequence over-current protection/weak current earth line-selecting. The equipment is suitable for capacitor protection monitoring device in the medium &low voltage system of arc-extinguishing coil earth (including small resistance earth) or earth-free. It may be mounted on the switchgear. It is mainly suitable for bridge wiring capacitor group.

2.Function and features

- Adopting 32-digit DSP as protection CPU with strong data process ability, high reliability and fast operation speed.
- Adopting 16-digit A/D as data acquisition with A/D auto calibration. There is no need for 0-shift and scale regulation. It features high protection measuring accuracy.

- The protection adopts multi-task system.
- Adopting 160×128 LCD in Chinese.
- Large hardware capacity may memory up to 200 times protection events reporting records. Any operation to the equipment, such as equipment power on, setting modification shall be recorded.
- Equipped with RS232, RS-422/485 or LonWorks bus network. The common C103 protocols adopted may connect directly with the microprocessor based monitoring or protection manager.
- Equipped with perfect and flexible background analysis software that is convenient to analyze after fault.
- The structure of cabinet adopts 6U structure. CPU adopts advanced surface assembly technology. The strong and weak power circuits, input and output circuits are arranged reasonably. The anti-disturbance strength of the equipment is enhanced.

3. Technical data

Basic data

- AC ratings:
  - AC voltage: 110V
  - AC current: In: 5A or 1A
  - Frequency: 50Hz
- DC voltage rating: 220V or 110V
- AC circuit over-load capacity
  - AC voltage: 1.2Un--- continuously
  - AC current: 2In—continuously, 20In-1s
- Power consumption
  - For AC voltage circuit, each phase is not more than 0.5VA
  - For AC current circuit, when In=5A, each phase is not more than 1VA; When In=1A, each phase is not more than 0.5VA
  - For zero-sequence current circuit: each phase is not more than 1.5VA
  - For DC voltage circuit: it is not more than 15W in normal operation and not more than 25W when the protection operates.
- Output contacts

The contact break capacity is 50W and the long-term permissible through current is not more than 5A when the exit trip contact is in the DC inductive load circuit in which the voltage is not more than 250V, current not more than 1A and the time constant L/R is 5±0.75ms. The contact break capacity is 20W and the long-term permissible through current is not more than 3A when the

exit trip contact is in the DC inductive load circuit in which the voltage is not more than 250V, current not more than 0.5A and the time constant L/R is 5± 0.75ms.

■ Main technical index:

□ For two-stage definite overcurrent:

□ Current setting: 0.1～20In

□ Time setting: 0～100s

□ Over voltage protection:

□ Voltage setting: 100～160V

□ Time setting: 0～100s

□ Under voltage protection:

□ Voltage setting: 2～70V

□ Time setting: 0～100s

□ Unbalance voltage protection: (only for WDR-821)

□ Voltage setting: 2～160V

□ Time setting: 0～100s

□ Unbalance current protection: (only for WDR-821)

□ Current setting: 0.1～20In

□ Time setting: 0～100s

□ Bridge difference current protection: (only for WDR-821)

□ Current setting: 0.1～20In

□ Time setting: 0～100s

□ Differential voltage protection: (only for WDR-823)

□ Voltage setting: 2～70V

□ Time setting: 0～100s

□ Tele-metering measure class: 0.2

□ Other: 0.5

□ Tele-communication resolution: <2ms

□ Signal input mode: reactive connector

■ Anti-disturbance strength:

□ It is able to endure the pulse group disturbance test with frequency 1MHz and attenuation vibration wave 100kHz stipulated in GB6162.

□ It is able to endure static discharge disturbance test with class III severity stipulated in IEC255-22-2 standard.

□ It is able to endure radio field disturbance test with class III severity stipulated in GB/T14598.9 standard.

□ It is able to endure quick instantaneous disturbance test with class IV severity stipulated in GB/T14598.10 standard.

WBT-820 Back-up Power Supply Auto Put-into-operation Equipment

1.Application

WBT-820 back-up power supply auto put-into-operation equipment is suitable for the substation with all voltage levels in the power system or enterprise. When the main power supply fails or shutdowns, the back-up power supply shall auto and quick put into operation. If the main wiring in the substation is simple, the basic configuration may be selected directly. If the main wiring in the substation is complex, the self-adaptive enhanced configuration may be selected.

2.Function and features

- Adopting 32-digit DSP as protection CPU with strong data process ability, high reliability and fast operation speed.
- Adopting 16-digit A/D as data acquisition with A/D auto calibration. There is no need for 0-shift and scale regulation. It features high measuring accuracy.
- It may memory 100 times auto put-into-operation records, such as auto put-into-operation mode, operation time and result etc.
- Adopting large screen LCD in Chinese. Convenient keyboard operation and friendly man-computer interface
- Equipped with RS232, RS-422/485 or LonWorks bus network. It may connect directly with the microprocessor based monitoring or communication manager to realize information communication.
- Equipped with perfect and flexible background analysis software that is convenient to analyze after fault.
- The structure of cabinet adopts 6U structure. CPU adopts advanced surface assembly technology. The strong and weak power circuits, input and output circuits are arranged reasonably. The anti-disturbance strength of the equipment is enhanced.
- Auto put-into-operation and self-adaptive function

3.Technical data

- Analog

- □ AC voltage rating: 110V
- □ AC current rating: 5A
- □ Frequency: 50Hz
- ■ Power consumption
- □ For AC voltage circuit, each phase is not more than 0.5VA
- □ For AC current circuit, each phase is not more than 1A
- □ Working power resource: it is not more than 15W in normal operation and not more than 25W when the protection operates
- ■ Output contacts

The contact break capacity is 50W and the long-term permissible through current is not more than 5A when the exit trip contact is in the DC inductive load circuit in which the voltage is not more than 250V, current not more than 1A and the time constant L/R is 5±0.75ms.

- ■ Anti-disturbance strength:
- □ It is able to endure the pulse group disturbance test with frequency 1MHz and attenuation vibration wave 100kHz stipulated in GB6162 (the first half-wave, voltage amplitude common mode is 2.5KV, the differential mode is 1KV).
- □ It is able to endure static discharge disturbance test with class III severity stipulated in IEC255-22-2 standard.
- □ It is able to endure radio field disturbance test with class III severity stipulated in GB/T14598.9 standard.
- □ It is able to endure quick instantaneous disturbance test with class IV severity stipulated in GB/T14598.10 standard.

WDLK-860 Micro-processor Based Circuit-Breaker Protection equipment

1.Application

WDLK-860 Micro-processor Based circuit breaker Protection equipment is a CPU digital circuit breaker protection equipment based on 32-digit floating point DSP. WDLK-861 (863) Micro-processor Based circuit breaker Protection equipment is suitable for single circuit breaker wiring mode with 110kV and above, such as single bus and double buses wiring mode. WDLK-862 Micro-processor Based circuit breaker Protection equipment is suitable for 3/2 circuit breaker wiring mode with 330kV and above.

2.Function and features

- WDLK-861 Micro-processor Based circuit breaker Protection equipment includes comprehensive recloser function, auxiliary protection (start-up circuit breaker failure protection, circuit breaker three phases disagree protection and line charge protection); WDLK-862 micro-processor circuit breaker protection equipment includes comprehensive recloser function, auxiliary protection (circuit breaker failure protection, circuit breaker three phases disagree protection, bus dead zone protection and line charge protection); WDLK-863 micro-processor circuit breaker protection equipment includes start-up circuit breaker failure protection, circuit breaker three phases disagree protection and line charge protection);
- The comprehensive recloser is equipped with optional synchronism check, no voltage and asynchronous. When the line protection equipment sends tripping command, the recloser shall be started. If the line protection equipment doesn't send tripping command and the circuit breaker trips, the recloser shall be started through circuit breaker position disagreement. The three-phase tripping position shall diagnose single-phase trip or three-phase trip; The recloser time may be selected as long time delay or short time delay by the input terminal; The primary closing pulse of the recloser may be realize by a software counter and the primary recloser period is 15s (namely charge time).
- The start-up circuit breaker failure protection is equipped with three current elements, namely phase A, B, C current elements; When the start-up

element operates, the phase current element shall operate after receiving one-phase trip signal to activate the phase failure protection; If three-phase tripping signal is received and any phase current element operates, three phases failure protection shall be activated. The start-up element for activating failure protection is phase current difference mutation quantity start-up element and zero-sequence current auxiliary start-up element.

- The circuit breaker failure protection is equipped with three current elements, namely phase A, B, C current elements; When the start-up element operates and only one-phase trip signal is received, and the phase current element operates, the phase of the switch shall be continuously tripped immediately; If the three-phase trip is accessed at the same time of receiving one-phase trip signal and any phase current element operates, the three phases of the switch shall be continuously tripped immediately. If three-phase trip signal is received and any phase current element operates, the three phases of the switch shall be continuously tripped immediately. The failure protection may select to trip continuously the phase or the three phases of the switch by the control character after short time delay; When the circuit breaker fails, the trip signal input is still existing and the current element operates, then the failure protection shall break after time delay.
- When the trip-position closing of TWJA, TWJB and TWJC disagree and the circuit breaker three phases close disagreeably, the three-phase disagreement protection shall activate. The circuit breaker three phases shall be tripped after time delay.
- Line charge protection

The charge protection consists of over-current stage I and over-current stage II. After the charge protection starts, it shall calculate continuously the three phases current. If any phase current is more than the setting of over-current stage I, it shall trip after 30ms time delay. If any phase current is more than the setting of over-current stage II, it shall trip after time delay setting. Otherwise the charge protection shall auto close after 500ms time delay.

In order to ensure that the charge protection may exit reliably when the line makes recloser, the protection is equipped with a counter. Only when the counter expires, the charge protection is permitted to put into. When the circuit breaker three phases are on the tripping position for over 20s or the circuit breaker is on the tripping position and “manual close” is implemented, the

counter shall expire. When the counter expires and the circuit breaker changes from “break” to “close” or “manual close” is implemented, the charge protection shall activate.

3. Technical data

- ■ Comprehensive recloser
- □ It is equipped with primary recloser, three-phase recloser, comprehensive recloser and shutdown functions.
- □ The setting range of no voltage element:0.2～0.7Un
- □ The setting range of synchronism check element: 10° ～60°
- □ Recloser time delay element:0.3～9.9s, the error is not more than ±1%
- □ The interval of primary recloser is 15s.
- □ WDLK-862 may select recloser priority according to input quantity.
- ■ Activating circuit breaker failure protection
- □ The setting range of phase current: 0.1～2In
- □ The setting range of zero-sequence current: 0.1～2In
- ■ Circuit breaker failure protection (bus dead zone protection)
- □ Failure current setting range
- □ The setting range of phase current: 0.1～2In
- □ The setting range of zero-sequence current: 0.1～2In
- □ When current setting is not less than 0.2In, the mean error is not more than ±2.5%. when current setting is less than 0.2In, the mean error is not more than ±5%.
- □ Setting range of time delay:0.1～9.9s, the error is not more than ±1%.
- ■ Circuit breaker three phases disagreement protection
- □ Three phases disagreement zero sequence current element
- □ The setting range of zero-sequence: 0.2～2In
- □ When zero-sequence current setting is not less than 0.2In, the mean error is not more than ±2.5%. when current setting is less than 0.2In, the mean error is not more than ±5%.
- □ Time setting range
- □ Break time delay: 0.1～9.9s
- □ The time error is not more than ±1%.
- ■ Line charge protection
- □ The setting range of phase current: 0.1～5In
- □ Time setting range: stage II break time delay: 0.1～9.9s, the error is not more than ±1%.

WDK-800 Microprocessor Based Reactor Protection Equipment

1.Application

WDK-800 Micro-processor Based Reactor Protection equipment meets with all-level voltage requirement.

2.Function and features

- Adopting 32-digit high-performance DSP processor. The strong and weak current are separated completely to enhance reliability.
- Adopting real-time multi-task operation system Nucleus Plus to enhance reliable software operation.
- Adopting three parallel CPUs intelligent process technology to avoid malfunction arising from element failure.
- Adopting 16-digit high-performance A/D with high accuracy.
- Equipped with consumption zero-sequence power direction protection to enhance the protection to the turn-to-turn fault.
- Large screen graphical color LCD
- The protection fault may be transmitted up. The information and report are compatible with COMTRADE. It is equipped with fault record function and supplies on-line and off-line analysis software. It supports IEC60870-5-103 communication protocol.

3.Technical data

- Basic data
  - AC ratings:
    AC voltage: 110V
    AC current: In: 5A or 1A
    Rating frequency: 50Hz
  - DC ratings:220V or 110V, permissible variation range: 80%～110%
  - Auxiliary AC power supply for printer:220V, 0.7A, 50Hz/60Hz, permissible variation range: 80%～110%
  - Micro-processor based protection sampling and record frequency: 1200Hz, System frequency detecting range: 47.5～52.5Hz
  - Power consumption
    - For AC voltage circuit, each phase is not more than 1VA (under rated voltage)
    - For AC current circuit, each phase is not more than 1VA (under rated current)

- For DC circuit: not more than 50W
- Thermal stability
- Continously---2In
- 5s---20In
- 1s---40In

- Output contacts
  - Signal contact capacity: permissible long-term through current: 5A
  - Break current: 0.3A (DC220V, t=5ms)
  - Trip exit contact capacity: permissible long-term through current: 10A
  - Keep current: not more than 0.5A
  - Break current: 0.3A (DC220V, t=5ms)
  - Contact capacity of auxiliary relay: permissible long-term through current: 5A
  - Break current: 0.3A (DC220V, t=5ms)
- Insulation performance
  - Insulating resistance: the insulating resistance between all the circuits and case is not less than 100MΩ under the condition of standard test
  - Dielectric strength: the dielectric strength between all the circuits and case can endure the test with AC 50Hz, voltage 2kV (effective value) for 1min, and there is no insulation breakthrough or flashover.

■ Impulse voltage:

The conductive portion and the case of exposed non-conductive metal may endure the standard lightning short-time impulse test with 5kV amplitude under the specified test conditions.

■ Life

Electric life: the product may operate reliably and reset for 1000 times when the output contact circuit is under the load conditions that voltage is not more than 250V, current not more than 0.5A, time constant 5±0.75ms.

Mechanical life: the product the product may operate reliably and reset for 10000 times when the output contact is not connected to load.

■ Mechanical performance:

- Under working condition: It can endure the vibration response and impulse response test with class I severity.
- Under transportation condition: It can endure the vibration withstanding and impulse &collision test with class I severity.

■ Anti-disturbance performance:

- Radio field disturbance test conforms to the stipulation in GB/T14589.9
- Quick instantaneous disturbance test conforms to the stipulation in

GB/T14589.10

- Pulse group disturbance test conforms to the stipulation in GB/T14589.13
- Anti-static discharge disturbance test conforms to the stipulation in GB/T14589.14.

WCB-820 Micro-processor Based Station Service Transformer Protection equipment

1.Application

WCB-820 Micro-processor Based Station Service Transformer Protection equipment consists of definite time over-current protection (three phase type), three-stage zero-sequence definite time over-current protection, weak current earth circuit-selecting. The equipment is suitable for station service transformer/earth transformer protection monitoring device in the arc-extinguishing coil earth system or earth-free system with 6kV or 10kV. It may be mounted on the switchgear.

2.Function and features

- □ Adopting 32-digit DSP as protection CPU with strong data process ability, high reliability and fast operation speed.
- □ Adopting 16-digit A/D as data acquisition with A/D auto calibration. There is no need for 0-shift and scale regulation. It features high protection measuring accuracy.
- □ The protection adopts multi-task system.
- □ Adopting 160×128 LCD in Chinese.
- □ Large hardware capacity may memory up to 200 times protection events reporting records. Any operation to the equipment, such as equipment power on, setting modification shall be recorded.
- □ Equipped with RS232, RS-422/485 or LonWorks bus network. The common C103 protocols adopted may connect directly with the microprocessor based monitoring or protection manager.
- □ Equipped with perfect and flexible background analysis software that is convenient to analyze after fault.
- □ The structure of cabinet adopts 6U structure. CPU adopts advanced surface assembly technology. The strong and weak power circuits, input and output circuits are arranged reasonably. The anti-disturbance strength of the equipment is enhanced.

3.Technical data

- □ **Basic data**
- □ AC ratings:
- □ AC voltage: 110V
- □ AC current: In: 5A or 1A
- □ Frequency: 50Hz
- ■ DC voltage rating: 220V or 110V
- ■ AC circuit over-load capacity
- □ AC voltage: 1.2Un--- continuously
- □ AC current: 2In—continuously, 20In-1s
- ■ Power consumption
- □ For AC voltage circuit, each phase is not more than 0.5VA
- □ For AC current circuit, when In=5A, each phase is not more than 1VA; When In=1A, each phase is not more than 0.5VA
- □ For zero-sequence current circuit: each phase is not more than 1.5VA
- □ For DC voltage circuit: it is not more than 15W in normal operation and not more than 25W when the protection operates.
- ■ Output contacts

The contact break capacity is 50W and the long-term permissible through current is not more than 5A when the exit trip contact is in the DC inductive load circuit in which the voltage is not more than 250V, current not more than 1A and the time constant L/R is 5±0.75ms. The contact break capacity is 20W and the long-term permissible through current is not more than 3A when the exit trip contact is in the DC inductive load circuit in which the voltage is not more than 250V, current not more than 0.5A and the time constant L/R is 5± 0.75ms.

- ■ Main technical index:
- □ For two-stage definite overcurrent:
- □ Current setting: 0.1～20In
- □ Time setting: 0～100s
- □ Setting error: <5%
- □ For three-stage zero-sequence over-current protection:
- □ Current setting: 0.02～12A
- □ Time setting: 0～100s
- □ Setting error: <5%
- □ Tele-metering measure class: 0.2
- □ Other: 0.5
- □ Tele-communication resolution: <2ms
- □ Signal input mode: reactive connector

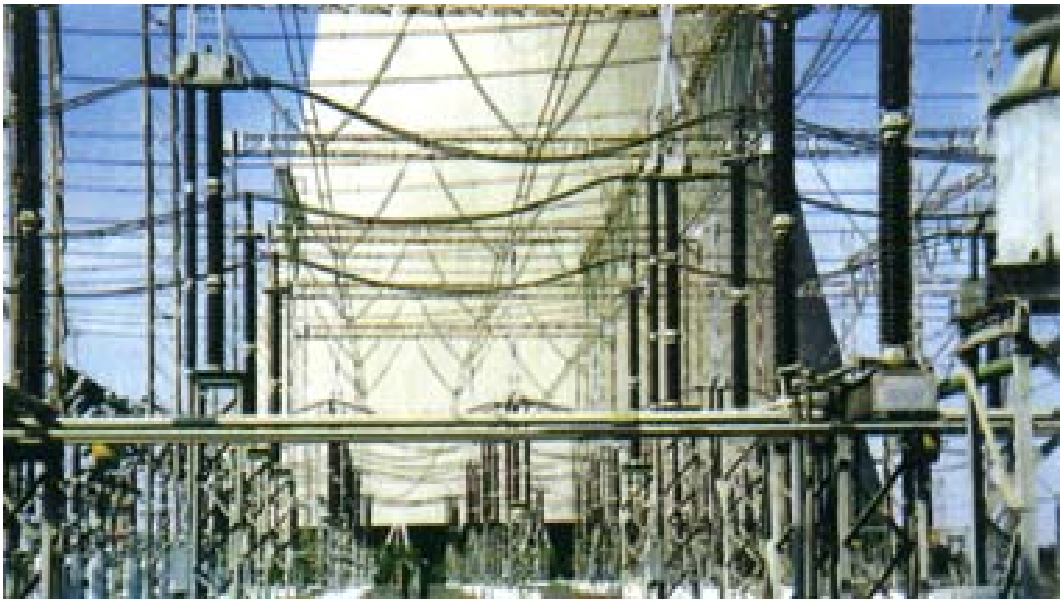
- Anti-disturbance strength:
- It is able to endure the pulse group disturbance test with frequency 1MHz and attenuation vibration wave 100kHz stipulated in GB6162.
- It is able to endure static discharge disturbance test with class III severity stipulated in IEC255-22-2 standard.
- It is able to endure radio field disturbance test with class III severity stipulated in GB/T14598.9 standard.
- It is able to endure quick instantaneous disturbance test with class IV severity stipulated in GB/T14598.10 standard.

CBS-2000 Main Equipment Status Monitoring and Diagnosis System

1. Application

It is suitable for the power plant and substation with 110kV and below. According to the equipment monitored, the system may be divided into the following sub-systems:

- Monitoring system to the working status of switch
- Monitoring system to HV equipment insulation
- Monitoring system to transformer insulation oil and temperature
- Monitoring system to tap changer load voltage-regulating equipment
- Monitoring system to motor, compressor, oil pump



2. Function and features

- Completely importing foreign ripe product, using various transducer and inspecting technology to realize on-line monitoring.
- The system is completely open. The subsystem may be sold to operate separately as well as a system.
- Advanced software technology is adopted. The subsystems are based on uniform background management.
- To supply all solutions to main equipment status monitoring.

3. Technical data

Basic data:

- Voltage rating: 220V, 110V
- Frequency: 50Hz
- Please refer to relevant information for the details.

PZ61 Intelligent High-Frequency Switch DC Power Supply

1. Application

It is suitable for thermal power plant, hydropower station, electrification railway and various substation to supply DC operation power supply.

2. Function and features

- The rectifier is composed of some high frequency switch rectifying modules in parallel. They operate in the mode of N+1 heat back-up and may be live plug or drawn out to replace. The system operation is reliable.
- The valve-control lead-acid maintenance-free batteries concerned has the characteristics of high discharge rate, less maintenance and safe operation. It meets unattended requirement.
- The control bus voltage may be auto regulated and has auto interlock function when the voltage-reducing silicon fails to ensure DC bus may be supplied power uninterruptedly.
- The distribution switch adopts special DC circuit breaker with plastics case from Siemens and Schneider. It features high break strength, clear marking and convenient operation.
- Equipped with DC system monitoring unit to real-time supervise the equipment working status in the DC system, to control the output voltage and current of the rectifier, to realize the intelligent management to the batteries and “four remote” functions.

3. Technical data

- Rated voltage of system: 220V and 110V
- Control bus current: 20A, 30A, 40A, 50A, 60A;
- Dynamic bus current: 200A, 400A, 630A, 800A, 1000A;
- Capacity of batteries: 50～2000Ah
- Switch rectifying module:
- AC input voltage: 220/380V±15%
- DC output current: 5A, 10A, 20A, 30A, 50A
- Range of voltage regulation: 180～300V for 220V system

90～150V for 110V system

- Accuracy 0f voltage stabilization: ≦±0.3%;
- Accuracy 0f current stabilization: ≦±0.5%;
- Ripple factor: ≦0.3%;
- Peak voltage: ≦2V;
- Unbalance of average current: ≦±5%;
- Power factor:>0.97(single phase); 0.93 (three phases)
- Full-load efficiency:>90%;
- Overall dimension: 2260×800×600(mm)
- Protection class: IP30 and above
- Structure type: full-closed cubicle

ZYNB13 Active Inverting Batteries Discharge Equipment

1.Application

It is suitable for batteries discharge test or activating batteries of electric power system, communication system, motor mobile etc. and is acted as electronic load to commission the phase-controlling DC voltage-stabilizing power supply or high frequency switch DC voltage-stabilizing power supply of power system, communication system and other industries.

2.Function and features

- Adopting high frequency PWM rectifying technology and micro-processor based control technology with advanced technology and good quality.
- Adopting energy feedback technology that returns energy to the power network with convenient operation and energy-saved.
- The current to the power network is sine, which reduces greatly the equipment's harmonic pollution to the power network.
- The discharge energy is distributed averagely to the three phases of the power network with less effect on the network.
- The batteries discharge is constant current discharge, so the discharge capacity of batteries may be calculated accurately.
- The discharge process is controlled by computer, so the unattended may be realized.
- LCD displays the working status in Chinese with convenient operation and monitoring.
- Complete protection functions and high reliability
- Equipped with report form printing function.

3.Technical data

- Rated Input voltage: DC220V、DC110V
- Rated input current: DC60A, 80A, 100A, 120A, 160A, 200A
- Input voltage regulation range: 170～264V for 220V system
  90～132V for 110V system
- AC output voltage: 380V, permissible variation range: 330～430V, 50Hz

PTD Communication Power Supply Panel

1.Application

It is used to supply power for the communication equipment of post, electric power, railway and other sites.

2.Function and features

- High factor coefficient: rectifier factor coefficient: >0.99
- Wide voltage input range: 380V±25%
- New structure and beautiful appearance: the panel structure adopts high-intension aluminum materials with the feature of convenient assembly and extension.
- High reliability: Double-channel AC incomings adopt electrical interlock and mechanical interlock. N+1 redundancy rectifying modules operate simultaneously. MTBF>100000 hours
- Simple operation and convenient usage: LCD digit setting and micro-processor based monitoring unit with intelligent management function provide greatly convenience for the users to operate.
- Communication function: with RS232 communication interface and MODEM communication mode.

3.Technical data

- AC input voltage range: single phase: 165～275V
  Three phases: 300V～470V
- AC input frequency range: 45～60Hz
- DC output voltage range: 43～58V
- Factor coefficient: >0.99
- Equalizing current unbalance degree: <5%
- Peak-peak value noise: <60mV
- Balanced weight noise: <1mV
- Noise: <50dB
- Dimension: 2000mm×600mm×600mm(height×width×depth)

DSSD 566 (DTSD566)
Multi-Function Three Phase Electronic KWH Meter

1. Application range

It can implement the active and reactive electric energy measurement, pre-payment, dual fee rates and load control functions.

The product satisfies IEC687, IEC1036, IEC1268, JB/T7656, DL/T614 and DL/T645.

2. Functions & Features

- Electric energy measurement function

  Enable to measure and display positive and negative directional active & reactive electric quantity, inductive reactive quantity. Output interface for mutually independent active & reactive pulse signal is provided.

- Dual fee rates function
  - Four fee rates, eight-time section.
  - Calendar and leap year automatically switching over, real time display second, minute, day, week, month and year. The clock of meter can be calibrated by program.
  - Enable to record and store accumulated active & reactive electric quantity and active, reactive quantity under all kinds of rates.
- Demand quantity measuring function
  - Enable to measure active maximum required quantity of positive and negative direction, and occurred time of maximum demand quantity. It also can store the maximum demand quantity and occurred time of this month and last month.
  - Measurement of the demand quantity adopts slide differential stepping type. The sliding interval is 15min., the sliding differential time can be selected freely among 1,3,5,15 min.
  - The maximum demand quantity is stored according to month; the last month's maximum demand quantity can be cleared automatically by setting month or date. It also can be cleared manually at any time with removing the lead sealing.
  - It has over load alarming and tripping function (optional).
- Voltage-loss recording function

- Enable to record the total lose voltage and power off time or record per phase, and record the starting and recovering time.
- Enabled to have voltage-loss alarming and tripping functions (optional)
- Enabled to record active, reactive total electric quantity of un-lose phase voltage.

■ Pre-payment function (optional)

- Prepaid IC card adopts one card for one household.
- The electricity price with different rate can be respectively preset by program.
- RS485 interface is available for buying electricity and changing the price.

■ Monitoring function (optional)

The meter has two channels of relay output to act as the control signal of alarming & tripping. It can alarm and control against the remained amount, permissible load and loss of voltage (the mode is programmable).

■ Programming and reading function.

- RS485 communication interface is provided and DL/T645 communication protocol is adopted.
- Programming and reading of meters may use RS485 communication interface or IC card. Meanwhile, it can implement reading via the remote controller or circulated displaying mode.
- Programming cipher and programming control button are provided to prevent from unauthorized operation.
- Presentation function for successful programming operation is provided.

■ Zero o'clock meter-reading function

- The meter-reading day is any day between 1^{st} and 28^{th}. It will implement settlement automatically on 00:00 of the preset date and store all data occurred in previous month.
- The meter-reading day can be set 0, which means the settle time is 00:00 at the end of each month.
- Enable to store and display simultaneously at least two months' data.

■ Power off meter-reading function (optional)

It has special-purposed communication interface for meter reading in case of power-off.

■ Other functions

- It has circulated display function, maximum 93 items' data can be selected and displayed in sequence, it also can select and display one

item or multi items by programming.

- □ Data storing time≥10 years
- □ Lithium battery continuous power off working life≥3 years
- □ Event record function can record programming history, loss of voltage events, voltage recovery events, power off events, resetting events, maximum demand quantity clearing events, alarming events, tripping events, purchase electricity events, setting initial electricity quantity events and happening time of the latest 5 events. It is very convenient for supervision and administration implemented by electricity administration department.
- □ The meter adopts three-phase power supply mode. It can work if only any phase has electricity.
- □ The meter has independent active, reactive pulse output signal via photo electricity isolation, which can be used in remote terminal unit (RTU)

3. Main technical data

- ■ Specification: Please see the following table
- ■ Power loss: voltage circuit ≤2W/8VA, current circuit≤4VA
- ■ Clock error:<0.5s/day
- ■ Data protection: Data can be preserved for 10 years after power is off
- ■ Relay output contact capacity: AC250V 1A
- ■ Rated working termperature:-10-45℃

Type	Specification	Accuracy class		Rated voltage	Meter constant	Current specification
		Active	Reactive			
DTSD 566	Three phase Four wire	0.5,1.0	2.0	3X57.7V/100V	5000	3X1(2)A 3X1.5(6)A
				3X220V/380V	2000	
DSSD 566	Three phase Three wire	0.5,1.0	2.0	3X100V	5000	3X5(6)A 3X5(20)A

DDSF566

Single-phase Electronic Multi-Tariff Energy Meter

1. Application:

This product is produced with low loss, solid-state integrate techniques and SMT technology. It features high reliability, wide range of load, high precision, and low loss. It is used to measure 50 Hz, single-phase A.C. active energy.

This product can completely meet the requirements of GB/T17215-1998 (idt IEC1036: 1996), DL/T645-1997, DL/T614-1997 standards.

2. Main features and functions

- Measuring of active energy. No adjustment is needed during long time working.
- Multi-tariff function.
- 3 kinds of tariff and 8 intervals.
- Calendar and leap year can be changed over automatically. Real-time Displaying of second, minute, hour, date, month, year.
- Programming and meter-reading function.
- Programming and Meter-reading by handheld computer. Meter-reading also can be done through circle-display method.
- Password will be set in energy meter and that can prevent illegal operating.
- Other functions
- The data storage time≥10 years.
- Continuous working life of Li battery ≥3 years
- Event recording function: It can record the times of programming and time of lasted programming; record the demand reset times, time of last resetting and working time of battery.

3. Main technical data:

- Accuracy class: class 2.0
- Rated voltage: 220V, 50Hz
- Specification of current: 2.5(15) A, 5(30) A, 10(60) A
- The error of clock: < 0.5 second/day
- Data storage: storage time after power outage ≥10 years
- Working temperature: -10℃- +60℃

DSS 566 (DTS566)

Three- Phase Electric Energy Meter

1. Application range

It adopts advanced low power loss solid-state integrated technology and SMT technology, featuring high reliability, wide load, high accuracy and low power loss. It is used for measuring 3-ph active power energy of 50HZ rated frequency and it is a new generation of traditional inductive watt-hour meter.

The product satisfies GB/T 17215-1998 (idt IEC 1036:1996), GB/15283-1994 (IEC 521-1998)

2. Functions & Features

- Active electric energy measuring, no need to calibrate.
- The product uses special-purposed single-chip integrated circuit. The elements are of simple configuration and can ensure continuously stable working of the meter.
- Optical coupling impulse interface is provided for convenient error test.
- High on-line accuracy, subject to little effect of frequency, temperature, voltage high harmonic wave.
- 3-ph power supply, meter can work with loss of 1 ph or 2-ph .
- Low power loss, less than 6VA.
- Wide ambient temperature range, good temperature characteristics.
- Little requirement for transportation. The meter will not occur error change during various transportation means. Customer does not need to calibrate the meter after it is delivered to site and it is also not affected by the installation position.

3. Main technical data

- Specification

Type	Specification	Accuracy class	Rated voltage	Current specification
DTS566	3-ph 4-wire	1.0	3×57.7/100V	3×1.5(6)A

			3× 220V/380V	3×3(6)A 3×5(25)A 3×10(50)A 3×20(100)A
DSS566	3-ph 3-wire	1.0	3×100V	

- Rated frequency: 50HZ
- Ambient temperature: -25~+55℃

Single-phase Electronic Carrier Energy Meter

1. Introduction

DDSI566 Single-phase electronic carrier Energy meter is used in XJ Remote Centralized Meter Reading System as the system's low side equipment to realize electric energy measuring, electric data power line carrier & communication function for individual user. The meter adopts special large-scale integrated circuit as its core element and has a few peripheral elements. It is of compact structure and high reliability, with the advantage of tamper-proof, high multiple overload, high accuracy, and strong communication capability. Acting as the system's expanding equipment, the acquisition terminal is used to implement measuring electric energy, electric energy data power line carrier and communication function for 4 ways users. Especially, the meter adapts to cooperate with the single-phase electronic energy meter to realize remote centralized meter reading.

The meter is based on power line carrier and communication technique. It uses LV power line as its communication channel. Its core technique is software technique and power frequency modularized technique. Consumed electric energy data can be transmitted to the remote centralized meter reading system of upper level in the mode of power line carrier style by using the mode identification and fuzzy processing technique.

2. Main Functions

- It features simple erection. Because it transmits signals via LV power line, special line is not needed so as to save investment.
- The expanding frequency carrier and power frequency modularized technique to realize power line carrier communication. It features high

accuracy, high reliability and strong reading capability.

- It has function of relaying for each other.
- Enable to store electric energy and realize meter reading at any pointed time.
- External acquisition terminal can be mounted with different ENERGY meter and assembled with the existing meter to save the user's expenses. It has adaptability and expansibility.
- The main station can communicate with the centralizer through telephone line. Serial interface line can be used to cascade centralizers. It is at most 15 cascades. That's, one telephone line can realize 15 pieces meter reading. Special switchgear can be adopted to realize the same function.
- Real-time reading data. It also can be used to calculate liner loss as evidence to implement tamper proof, creepage and optimize power network. It also can judge power supply fault.

3. Main Technical Parameter For Carrier Meter

- Class of Accuracy: 2.0 class
- Basic Current: 2.5(15) A, 5(20) A, 5(30) A, 10 (40) A, 10(60) A
- Rated Voltage: 220V, 50Hz
- Power Loss: The unit power loss is not more than 1.5W/5VA.
- Validity Period for Storage Data: 15 years
- Over-load Capability: The meter can over load 6 times with accuracy range.
- Working Temperature: -25℃~+55℃
- Dimension: 155X110X60mm

4. Main Technical Parameter For Acquisition Terminal

- Basis Configuration: To be connected with 4 pcs of impulse ENERGY meter.'
- Reading Accuracy: Absolute error between manual reading and display value is not more than 0.02%.
- Power Loss: The unit power loss is not more than 2.0W/7VA.
- Dimension: 155X110X60mm

5. Main Technical Parameter For Centralizer

- Basic Capacity: Basically configured with 1000 users.
- Clock Error: Less than ±1second / 24hours (23 degree)
- Power-off Protection: 4 years

- Data Storage: Enable to storage 24 pcs of setting time's display value within a day. Enable to display a setting time value for every day in a month.
- Enable to communicate with carrier meter in power line three-phase or acquisition terminal at the same time.
- Dimension: 290X170X100mm

DDS566 Single-phase Electronic Energy Meter

1.Introduction

DDS566 Single-phase Electronic Energy meter adopts large-scale integrated circuits as its key elements. It features high reliability, high accuracy, beautiful design, electricity steal-reliability, high overload, high stability, and low power loss. It is used for measuring single-phase AC active electric energy with the frequency of 50Hz. It is the upgrading and updating product for traditional inductive energy meter.

The product meets all the technical requirements for single-phase electronic energy meter in China National Standard GB/T17215-1998 (idt IEC 1036:96)

2.Main features:

- The product adopts design scheme of large redundancies; strictly controls production technology and adopts high & low temperature recycling shock and long-time power-on ageing to delete early failure factors.
- Good error stability and linearity, no need to adjust and calibrate it during the service life.
- Good temperature characteristic and wide working temperature range.
- Good light-load performance. The product has high accuracy in lower load.
- Strong overload ability. The overload in accuracy range can reach 6~12 times.
- Low power consumption. Self-power consumption of voltage circuit is less than 0.5W at the rated voltage.
- With many kinds of tamper proof function.

- The error will not be resulted from normal transportation. The user does not need to adjust it after opening the box .It will not be influenced by mounting positions.
- Strong anti-interference capability.

3.Main technical parameters:

Accuracy Class	Rated current	Rated voltage	Rated frequency	Working temperature	Working life	Relative humidity
1.0	1.5(9)A,2.5(15)A 5(30)A	220V	50Hz	-30 ℃ ~+60℃	10 years	≤75% (annually mean)
2.0	1.5(6)A ,1.5(9)A, 2.5(10)A,2.5(15)A,5(20)A,5(30)A, 10(40)A,15(60)A					

DD702 Single-phase Energy Meter

1. Introduction

DD702 Single-phase Energy Meter adopts advanced design schemes. It features good performance-price ratio, high reliability, high stability and low loss etc. It is used for measuring single A.C. active energy with 50hz frequency.

This product meets the requirements of GB/T15283-94 (IEC521-1998).

2. Main features:

- Error curve is smooth and with good performance
- Low loss: Self-consumption on the voltage circuit at rated voltage ≤1 W
- Rotation element adopts integrated structure combined the worm with bearing, which makes

rotation more reliable.

- Adopts integrated magnet repulsion bearing, which has longer working life and better performance than double diamond bearing.
- Adopts new technology of on-line demagnetization, so the meter has perfect stability and anti-seismic performance.
- Adopts inspecting tester of meshing, which ensure the meshing consistency between worm and worm gear.
- The spring washers are used in the connection place of energy meter's elements that are connected by bolts. The method of connection between current connector and current coil is crimping, which ensure the reliability during the long-term working.

3. Main technical data

- Accuracy class: 2.0 class
- Rated voltage: 220V
- Basic current: 2.5(10) A, 5(20) A
- Rated frequency: 50Hz
- Reliable working life: 15 years

DD701 Single-phase Energy Meter

1. Introduction

DD701 single-phase energy meter is manufactured with the advanced techniques and optimized structure. The meter features high reliability, high stability, low power loss, and long working life. The meter can be used to measure 50HZ single-phase AC active electric energy.

The meter meets all technical requirements for single-phase energy meter according to GB/T15283-94 (IEC521-1998).

2. Main Characteristics

- Accuracy class is 2.0, overload multiple is 6, the design life is 25 year, working consumption is lower than 1W.
- The damping magnet steel adopts high stability Aluminum Nickel Cobalt 6^{th} magnet steel, double pole structure, and adopts the new crafts of on line demagnetization. This characteristic enables the energy meter to have

good stability and anti-vibration performance.

- Adopting magnet-pushing bearings, the rotation components will be at non-connection status. The magnet pushing bearings are made of 8th Aluminum Nickel Cobalt magnet powder. The up and down guide pins mount black lead bearing with self-lubrication characteristic and smaller friction ratio.
- The counter adopts newly developed counter with smaller friction, the friction torque is smaller. Worm wheel engagement inspection tester is provided to ensure the engagement consistency between worm and worm wheel.
- The worm and axle adopt integrated structure, so that the friction between the worm and worm wheel is decreased.
- It not only adopts the rivet connection for the assembling, but also adopts spring washer for bolt connection. Pressure welding is provided for connection of current pillar with current coils so as to increase the reliability during long-time work.

3. Main technical data

- Accuracy: 2.0 class
- Rated voltage: 220V
- Basic current: 5(30) A 10(60) A
- Rated frequency: 50Hz
- Reliable working life: 25 years

DSSD 568 (DTSD568)

Multi-Function Three Phase Electric Energy Meter

1. Application range

It, adopting advanced micro-electronic technology, computer technology and SMT technology, is multi-function composite energy meter designed by Toshiba, Japan according to China standards (DL/T614-1997 and DL/T645-1997), and can implement the active and reactive electric energy measurement, multi-rates and many other functions.

The product satisfies IEC687, IEC1036, IEC1268, JB/T7656, DL/T614 and DL/T645.

2. Technical data

Type	Specification	Accuracy class		Rated voltage	Current specification
		Active	Reactive		
DTSD 568	Three phase Four wire	0.5	2.0	3X57.7V/100V	3X1(2)A
				3X220V/380V	3X1.5(6)A
DSSD 568	Three phase Three wire	0.5	2.0	3X100V	3X5(6)A 3X5(20)A

3. Functions & Features

- It may measure import & export of active electric quantity, reactive quantity, visual quantity and maximum demand.
- It has 15 time intervals, 10 time sections and 6 tariffs.
- It may display instantaneous active power & reactive power, voltage, current, power factor and frequency.
- The event recording function may count numbers of resetting, programming, interrupted phase and outage.
- Photoelectric communication interface (used for communication between hand-held devices) and RS-485 communication interface.
- Lithium battery continuous power off working life≥5 years.
- It has outage reading function.
- Satisfy with DL/T645-1997 communication protocol.