TY8663 Intelligent Transformer Protection and Control Equipment

Operation Manual

Tunanrz Electric Power Technology(Nanjing) Co,Ltd

Table of contents

Chapter 1 Overview

1.1 Product coverage

In recent years, China's new energy industry has developed rapidly, solar and wind energy is standing in the forefront. With the strong support of national policy, photovoltaic power plants and wind power plants have entered a rapid development stage. The intelligent box transformer monitoring and control device is an important supporting facility of new energy power station, which has the functions of monitoring and controlling the box transformer and ensuring the safe operation of new energy power station, and has become the core part of the monitoring and control system of new energy power station, and other equipment to achieve intelligent management of new energy power plants.

In the wind power station, the distance between each fan box transformer and the central control room is far and scattered, and each inverter in the photovoltaic power station is far away from the central control room, and the step-up transformers are all in the open field, because of the bad natural environment, it is not convenient for daily patrol, which makes the monitoring and control of box transformer become the difficult point of wind power or photovoltaic power station, and forms information island and blind area.

In view of the above situation, our company has designed the TY8663 intelligent box transformer protection measurement and control integrated device, in order to solve the existing problems. The device can protect and remote monitor the box transformer and realize the four remote functions of“Remote signal, remote measurement, remote control and remote adjustment” The bus box, DC Cabinet and inverter in the PV array can also realize the four remote functions of“Remote signal, remote measurement, remote control and remote adjustment”, it can realize the remote management of photovoltaic power unit and wind farm by step-up station, and satisfy the demand of“Few people on duty”.

1.2 Product overview

In traditional wind power or photovoltaic power plants, decentralized equipment such as PT, current transmitter, voltage transmitter, PLC, lightning protection module are usually used to protect, measure and control box transformers and upload information, however, due to the use of a variety of auxiliary equipment, the entire system wiring failure rate is high, debugging, operation, maintenance is difficult, and involves a number of equipment manufacturers, as a result, the system in the commissioning, commissioning and maintenance process coordination difficult, low efficiency, high cost.

The integrated device of TY8663 intelligent box transformer protection, measurement and control adopts an integrated design, which integrates many functions such as protection, measurement and control, non-electricity protection, communication management machine, optical fiber switch, remote/local control, etc. , a single device can accomplish the task that multiple devices can accomplish, reducing the failure rate,

reducing the difficulty of product use and operation and maintenance costs.

■ Centralized monitoring

The device can monitor the current, voltage, oil level, oil temperature and other electric and non-electric quantities of the wind power or photovoltaic box transformer in real time, the data is uploaded to the main station through the optical fiber ring network composed of two optical fiber components.

■ Enhance the protection function to the transformer

The device integrates the functions of transformer relay protection: differential protection, non-electric protection, three-stage over-current protection, zero-sequence current protection, over-voltage and low-voltage protection, etc. , the protection function can be dropped by fixed value control word, which is convenient for users to choose and use.

■ Accident recording and storage function

The device records the operation status of the transformer, and records the SOE events of the transformer such as protection trip, remote control event, switch shift, non-power shift etc. .

■ Operation on site

The device is equipped with a display, keyboard and indicator light, which is convenient for the inspection staff to consult the monitoring, protection, switch shift, historical record and communication information of the transformer.

■ Fiber-optic Ethernet communication

The device adopts self-healing ring optical fiber Ethernet, which solves the communication difficulties such as over-dispersion and long distance between wind farm and photovoltaic field. The characteristics of self-healing ring optical fiber Ethernet are simple wiring, high communication speed, long distance and self-healing to network fault.

■ Easy maintenance, low operating costs

The device adopts the integrated design, relative decentralized device and instrument combination monitoring mode, simplifies the wiring complexity and reduces the operation and maintenance costs.

1.3 Introduction to product classification and functions

Category	Main functions	Category 1	Category 2	Category 3
Telemetry	Communication Measurement: Three-phase current, three-phase voltage, frequency, power factor, active power, reactive power, active power, reactive power;	√	√	√
	6-way current, 6-way voltage	√	√	√
	DC measurements: 6 channels Standard 3-way 4-20mA input, standard 3-way thermal resistance measurement	√	√	√

Remote	There are 42 entries, 17 of which are fixed as non-electric-protected signal inputs	√	√	√
Remote control	9-way relay output, for protection output or ordinary remote control output	√	√	√
Protection	Non-electric protection: Light gas, heavy gas, high temperature, super high temperature, low oil level, high oil level, pressure relief valve, high pressure fuse a phase, B phase, C phase, nET gate tripping, smoke alarm, door opening alarm, non-electricity 1-4 General protection: Differential protection, ratio differential protection, three-section current protection， Restricted grounding protection ， Overload protection ， over-voltage protection，under-voltage protection	√	√	√
Communication	Two self-healing fiber optic communication interfaces, three self-healing electrical outlets, can be set up fiber optic ring network		√	√
	2-way Ethernet communication interface (with CPU)			√
	2485 ports (CPU)	√	√	√
Statute Conversion	Standard 10-way RS485 interface 2-way Ethernet communication interface			√
Record	Record 1024 recent accidents and 1024 operations 16 fault recorder functions	√	√	√

1.4 Product characteristics

■ Adopting 4U half-layer standard aluminum alloy cabinet, designed according to strong vibration resistance and strong interference, it is especially suitable for working in harsh environment, wide temperature environment of -40 ° C ~ 70 ° C, simple installation and convenient wiring.

■ Using 32-bit ARM processor, professional 16-bit high-precision AD sampling chip, large capacity memory chip, information power-down preservation, Industrial Ethernet design. The main components are all imported industrial-grade components, which ensure high stability and reliability in the electrical design of the device. The product has passed the strict national standard type test and electromagnetic compatibility test to ensure that the product can work normally and reliably under harsh environment.

■ The analog signal is sampled by 64 points per week. After digital filtering and FFT algorithm optimization, high precision real-time data are obtained. The precision of measuring current and voltage is 0.5% , the anti-jamming performance of data acquisition is greatly enhanced.

■ Digital tube display/liquid crystal display, adapt to the limit of high and low temperature (-40 ° C ~ 80 ° C normal working) environment.

■ 42-way customizable switching power input (including non-power input) .

■ 9-way relay switch output with custom matrix.

■ Optional 6-way DC measurement, 6-way thermal resistance input, 6-way 4-20mA input, for the

collection box variable correlation temperature.

■ AC/DC dual-purpose wide range of auxiliary power supply, working range is AC/DC 176 ~ 600V, dedicated to resist photovoltaic and wind voltage shocks.

■ High communication reliability, multi-ethernet redundancy, 10/100M self-adaptive, built-in rich communication protocol library, with good third-party system and equipment protocol interoperability, equipped with Modbus, IEC 60870-5-103/104/61850(optional) and other communication protocols.

■ B code timing and SNTP are supported.

■ The protocol conversion module can be configured to support the access and protocol conversion of many kinds of equipment on site, and it is convenient for all kinds of local equipment to upload information by optical fiber and to merge into the monitoring system of power plant.

■ Multi-ethernet multi-cascaded working mode, with flexible online and offline debugging means, reliable upgrade procedures, download parameters and achieve data query, message monitoring and other functions; At the same time, it has powerful function of self-diagnosis and self-recovery, and the system can recover itself in a very short time when it is disturbed by outside or other reasons. The device panel is designed with a module communication indicator for easy viewing of the communication status.

■ The device provides a variety of ports for communication with computers, with professional PC terminal debugging and configuration software, electric parameters such as current and voltage, protection signals and switching input signals, all can be monitored and set by debugging configuration software.

■ PCB multilayer board technology and SMT production process are adopted to make the products have high electrical performance.

■ High anti-interference, through 10 EMC certification, indicators are the highest level.

Chapter 2: Main parameters and technical specifications

2.1 Technical parameters

Technical requirements	Functional requirements	Application parameters
Auxiliary working power supply	Power input	AC/DC 176 ~ 600V
	Frequency	50 Hz, ± 5 Hz
	Power consumption	Normal operation ≤5W; device operation ≤11W
Current input	Rating In	5A (1A)
	Measurement range	0.01 In-1.2 In
	Measurement error	≤0.5%
	Power consumption	Not greater than 0.5 VA
Voltage input	UN rating	380V/690V/800V
	Measurement range	0.1 Un-1.2 Un
	Measurement error	≤0.5%
	Power consumption	Not greater than 0.5 VA
Other measurement accuracy	Frequency	± 0.03 Hz
	Power Factor	± 0.5%
	Active/reactive power	± 0.5%
Switch quantity input	Number of channels	Route 42
	Input	Power input
	Isolation Mode	Photoelectric isolation, Isolation voltage 2500V
Contact output	Number of channels	9 ways
	Operating voltage	AC250V,8A; AC380V, 1.9 A DC220,1.5A
	Input	Empty Contact Point
	Isolation Mode	Photoelectric isolation, isolation voltage 2500V
Communication interface	Communication interface	2 Road Optical Junction, 2 Road Ethernet, 10 Road 485
	Isolation type	Photoelectric isolation
	Baud rate	RS485:2400bps-19200bps Aperture: 155M, 1310nm, single mode 50KM ST Ethernet: 10M/100M adaptive
	Protocol	Modbus/IEC 60870-5-103/104/61850(optional)

2.2 Normal operating atmospheric parameters

Working conditions	Non-explosive hazard, non-conductive dust, non-corrosive site.
Working environment temperature	-40 ° C ~ + 70 ° C, not suitable for storage in alkaline, acidic or explosive gas environment.
Humidity of working environment	The relative humidity does not exceed 50% at a maximum temperature of 70 ° C, and it can be higher at lower temperatures, such as 90% at 20 ° C; Special measures should be taken for occasional condensation due to temperature changes.
Atmospheric pressure	80 KPA ~ 110 kpa
Protection level	IP50

2.3 Insulation performance

Insulation resistance

Measuring the insulation resistance of the device with an open-circuit voltage of 500 V Megohm between the live and non-live parts and the enclosure, and between circuits that are not electrically connected, under normal test atmospheric conditions, the insulation resistance of each circuit of each grade shall not be less than 100 MΩ.

Medium strength

Under normal test atmosphere, the device can withstand power frequency withstand voltage test with frequency of 50Hz and voltage of 2000V lasting 1 minute without breakdown flashover and component damage. During the test, when the voltage is applied to any circuit, the other circuits are connected to ground with equal potential. **The communication circuit has the lightning protection circuit, may not carry on any AC or DC withstand voltage test, otherwise will damage the lightning protection device!**

Impulse voltage

Under normal test atmosphere conditions, the power supply input loop, AC input loop, output contact loop of the device to the ground, and between the loops, can withstand the short-term impulse voltage test of standard lightning wave of 1.2/50 μs, open circuit test voltage 5 kv.

2.4 EMC

	Item	Request
1	RF radiated electromagnetic field immunity	The protection conforms to radiated, RF electromagnetic field immunity test class III stipulated in the standard GB/T 14598.9 — 2002(IEC 60255-22-3:2000，IDT).
2	Electric fast transient pulse group immunity	The protection conforms to electrical fast transient/burst immunity test class IV stipulated in the standard GB/T 14598.10 — 2007(idt IEC 60255-22-4:2002).
3	1MHz pulse group immunity	The protection conforms to 1MHz pulse group immunity test class III stipulated in the standard GB/T 14598.13 — 2008(eqv IEC 60255-22-

		1:2007).
4	Electrostatic discharge anti-interference	The protection conforms to the electrostatic discharge immunity test class 4 stipulated in the standard GB/T 14598.14 — 1998(idt IEC 60255-22-2:1996).
5	Radiated emission value limiting test	The protection conforms to radiated emission value limiting test class A stipulated in the standard GB/T 14598.16 — 2002(IEC 60255-25:2000，IDT).
6	Surge (impulse) immunity	The protection conforms to surge (impulse) immunity test class 4 stipulated in the standard GB/T 17626.5 — 2008(idt IEC 61000-4-5:2006).
7	RF induction conduction degree harassment	The protection conforms to immunity to conducted disturbances, induced by radio-frequency fields class 3 stipulated in the standard GB/T 17626.6—2008(idt IEC 61000-4-6:2006).
8	Power frequency magnetic field immunity	The protection conforms to power frequency magnetic field immunity test class 4 stipulated in the standard GB/T 17626.8 — 2006(idt IEC 61000-4-8:2001).
9	Pulsed magnetic field immunity	The protection conforms to pulse magnetic field immunity test class 4 stipulated in the standard GB/T 17626.9 — 1998(idt IEC 61000-4-9:1993).
10	DC power supply voltage dips and voltage interruptions influence	Allow GB/T8367-1987 (eqv IEC 60255-11:1979) called for 100ms voltage interruption, 30% voltage dips 0.5s

2.5 Mechanical performance

	Item	Request
1	Vibration	The system can tolerate the vibration response test of severity Class I stipulated in 3.2.1 of GB/T 11287-2000. The system can tolerate the vibration endurance test of severity Class I stipulated in 3.2.2 of GB/T 11287-2000.
2	Impulse	The system can tolerate the impulse response test of severity Class I stipulated in 4.2.1 of GB/T 14537-1993. The system can tolerate the impulse endurance test of severity Class I stipulated in 4.2.2 of GB/T14537-1993.
3	Collision	The system can tolerate the collision test of severity Class I stipulated in 4.3 of GB/T 14537-1993.

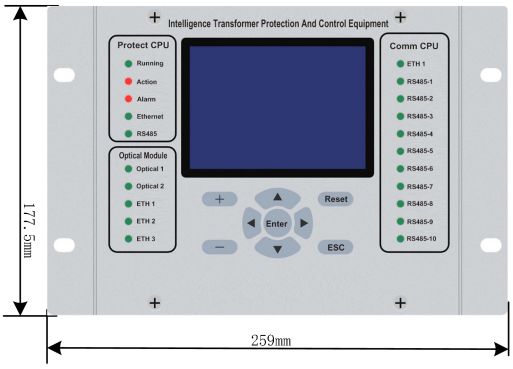
2.6 Implementation criteria

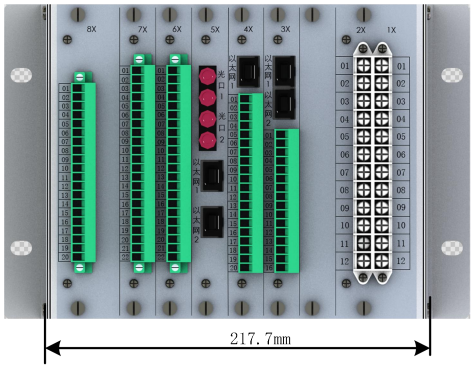
Standard number	Standard content
GB50062-2008	Code for design of relay protection and automatic devices for power installations
GBT 14285-2006	Technical specification for automatic relay protection and safety devices
GB/T 2423.9-2001	Constant damp heat test
GB/T 11287-2000	Vibration endurance test
Methods of analysis for chemical substances in water	Shock response test
Methods of test and analysis	Impact test
”water quality monitoring system”	Electrostatic discharge immunity test
Methods of test and analysis for	Immunity test for radiated (RF) electromagnetic fields

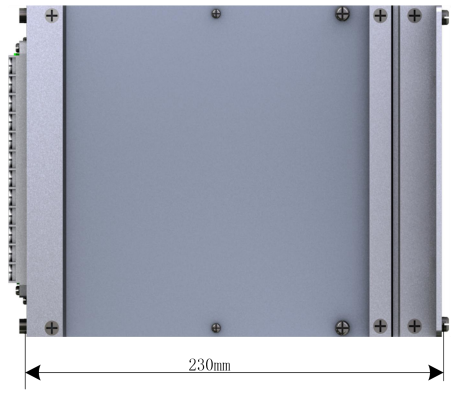
chemical composition and chemical composition	
10-2007	Fast Transient Pulse Group immunity test
13-2008	Pulse group immunity test
GB/T 17626.5-2008	Surge immunity test

Chapter 3: Appearance and installation of the device

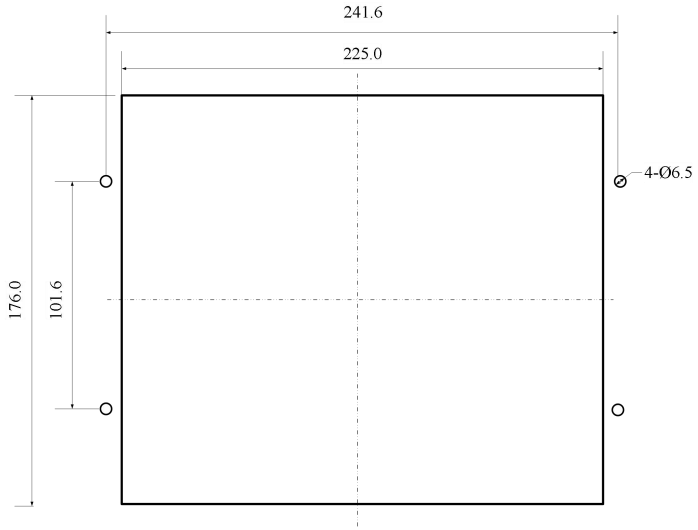
3.1 Schematic diagram of product appearance







3.2 Opening mounting dimension drawing (in: mm)



Note: rectangular holes are made in the screen cabinet and fixed by screws. ø5 bolt is recommended

Chapter 4: Protection function

4.1 Protection function

4.1.1 Secondary current value I calculation and CT ratio balance on low voltage side of main transformer

The principle of the differential protection is to convert the current value of the low voltage side of the main transformer into the value of the high voltage side, so as to achieve the balance of CT ratio and realize the differential protection.

The Y/δ conversion is carried out inside the protection device on both sides of the main transformer, which can be divided into Y side and δ side. The main transformer capacity is recorded as S, the rated primary voltage on the high voltage side is UN1, the rated primary current is CT11, the rated secondary current is CT21, the rated primary voltage on the low voltage side is UN2, the rated primary current is CT12, rated secondary current value is CT22. The secondary current rating on each side of the device is calculated.

Secondary current rating on first side: IEH = (S/UN1) * (CT21/CT11)/ $\sqrt{3}$

Second side rated secondary current: IEL = (S/UN2) * (CT22/CT12)/ $\sqrt{3}$

Equilibrium coefficient: KPH = IEH/IEL

4.1.2 Calculation of differential current and braking current

The input current on both sides of the device points to the transformer. The current on the high-voltage side is IH, and the current on the low-voltage side is converted to the current on the high-voltage side and is recorded as IL. The two-phase differential current ID is composed of the phasor of the two-side current and the phase, and is used as the action quantity of the differential speed-off and the ratio differential relay, see formula (3) . The two-phase brake current IR, which is composed of two-phase and one-half of the amplitude of the two-side current, is used as the brake quantity of the ratio differential relay, see formula (4) .

$$Id = (IL + IH) \quad (3)$$

$$IR = (|IL| + |IH|)/2 \quad (4)$$

The difference current and brake current are calculated as follows:

Y/Y connection, differential current and braking current calculation:

Difference current calculation: Ida = (IA + Ia * Kph) ; Idb = (IB + Ib * Kph) ; Idc = (IC + Ic * Kph) ;

Braking current calculations: IRa= (| IA | + | Ia | * Kph)/2; IRb = (| IB | + | Ib | * Kph)/2; IRc = (| IC| + | Ic | * Kph)/2;

△/Y -11 o'clock wiring, differential current and braking current calculations:

Difference current calculation: Ida=IA+(Ia-Ib)/$\sqrt{3}$ * Kph；

Idb=IB+(Ib-Ic)/$\sqrt{3}$ * Kph； Idc=IC+(Ic-Ia)/$\sqrt{3}$ * Kph；

Braking current calculations: IRa=(|IA|+|Ia-Ib|/$\sqrt{3}$ * Kph)/2；

IRb=(|IB|+|Ib-Ic|/$\sqrt{3}$ * Kph)/2； IRc=(|IC|+|Ic-Ia|/$\sqrt{3}$ * Kph)/2；

△/Y-1 o'clock wiring, differential current and braking current calculations:

Difference current calculation: Ida=IA+(Ia-Ic)/$\sqrt{3}$ * Kph；

Idb=IB+(Ib-Ia)/$\sqrt{3}$ * Kph； Idc=IC+(Ic-Ib)/$\sqrt{3}$ * Kph；

Braking current calculations: IRa=(|IA|+|Ia-Ic|/$\sqrt{3}$ * Kph)/2；

IRb=(|IB|+|Ib-Ia|/$\sqrt{3}$ * Kph)/2； IRc=(|IC|+|Ic-Ib|/$\sqrt{3}$ * Kph)/2；

Y/△ -11 o'clock wiring, differential current and braking current calculations:

Difference current calculation: Ida=(IA-IB)/$\sqrt{3}$ +Ia* Kph；

Idb=(IB-IC)/$\sqrt{3}$ +Ib* Kph； Idc=(IC-IA)/$\sqrt{3}$ +Ic* Kph；

Braking current calculations: IRa=(|IA-IB|/$\sqrt{3}$ +|Ia|* Kph)/2；

IRb=(|IB-IC|/$\sqrt{3}$ +|Ib|* Kph)/2； IRc=(|IC-IA|/$\sqrt{3}$ +|Ic|* Kph)/2；

Y/△ -1 o'clock wiring, differential current and braking current calculations:

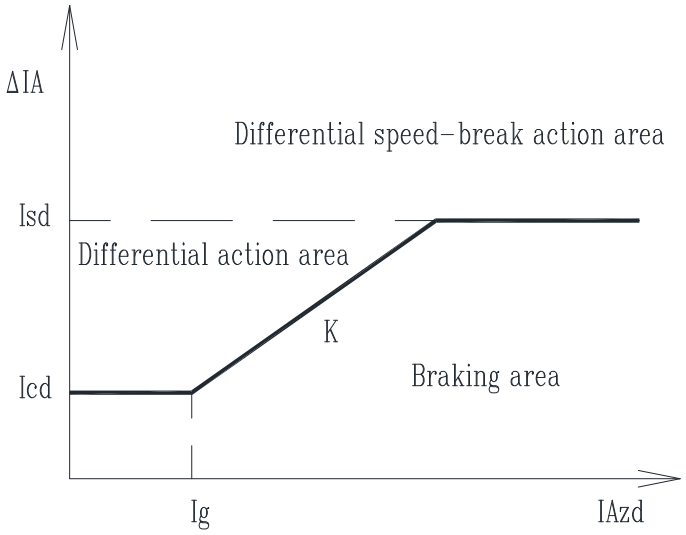
Difference current calculation: Ida=(IA-IC)/$\sqrt{3}$ +Ia* Kph；

Idb=(IB-IA)/$\sqrt{3}$ +Ib* Kph； Idc=(IC-IB)/$\sqrt{3}$ +Ic* Kph；

Braking current calculations:IRa=(|IA-IC|/$\sqrt{3}$ +|Ia|* Kph)/2；

IRb=(|IB-IA|/$\sqrt{3}$ +|Ib|* Kph)/2； IRc=(|IC-IB|/$\sqrt{3}$ +|Ic|* Kph)/2；

4.1.3 Differential protection for second harmonic braking



IAzd—A phase braking current;

IAcd—A phase difference current;

IAF2cd－A phase difference current second harmonic amplitude;

K2—second harmonic braking coefficient (constant) ;

Icd—differential rating (rating) ;

Ig—fixed value of inflexion current.

Brake coefficient K is adjustable.

A proportional differential protection action equation:

If the braking current IAzd is less than the inflexion current Ig, the phase A action equation is IAcd > Icd

If the braking current IAzd is greater than the inflexion current Ig, the A-phase action equation is IAcd＞Icd ＋（IAzd－Ig）＊K

Phase A second harmonic and third harmonic braking differential protection action equation:

$$\frac{\text{IAF2cd}}{\text{IAcd}} < K2$$

The proportional differential protection adopts split-phase differential protection. So the principle of phase B and phase C differential protection is the same as that of Phase A.

4.1.4 Differential quick break protection

When any differential current is greater than the differential speed determination value, the device trips.

4.1.5 Differential current limit warning

When any differential current is greater than the differential current limit, the device sends a signal after a delay.

4.1.6 TA disconnected

When the transformer runs under the rated current and any phase TA on either side breaks, the device can send signal or lock differential according to the control word.

4.1.7 Differential protection setting calculation

1. The operating value of the differential element is usually 25% ~ 50% of the TA balance current (IHb) .

2. For the setting of differential quick-break components, the action value should satisfy three conditions:

A) less than the saturation current of the intermediate converter and current transformer;

B) no maloperation under steady unbalanced current of the most serious external faults;

C) avoid the inrush current of the transformer, do not adjust more than 12 times the rated current of the transformer when there is not enough basis, generally adjust the rated current of the Transformer 8 ~ 9 times.

3. The adjustment of proportional braking coefficient

Usually between 0.5 and 0.7.

4. Setting of harmonic brake ratio

The second harmonic braking coefficient is usually set between 0.12 and 0.15.

4.1.8 Two sets of three-stage over-current protection

Each section is equipped with a soft pressure plate for protection function, and each section of protection has an action current and action time fixed value, each section of protection is independent of each other.

4.1.9 Restricted grounding protection(64R)

When the zero-sequence current is greater than the set current, a delay trip or alarm occurs.

4.1.10 Non-electrical protection

This protection feature is standard. Provide heavy gas, light gas, over-temperature trip and high temperature alarm and low oil level, SF6 abnormal protection of the direct jump interface. And through the control word to select delay trip/alarm, while collecting remote signal.

4.1.11 Overvoltage protection

Put in the overvoltage protection plate and control word, when the line voltage is greater than the set value, by delay trip or alarm.

4.1.12 Undervoltage protection

Put in the low-voltage protection plate and control word, low-voltage set the minimum action threshold, when the three-phase line voltage is less than 57V, low-voltage protection no longer action, delay tripping or warning.

4.1.13 PT disconnected

The voltage difference between any two-phase wires is > 18V, Umin < 0.1 Un, I has current (>0.8In),when the above criteria are satisfied, it is judged as TV disconnection, delay 10s warning, report“TV disconnection warning”.

4.2 Description of fixed values

1) List of fixed values

Serial number	Abbreviation	The name of the specified value	Range	Factory Default
1	TV DISCON ALM SW	TV disconnection alarm switching on/off	0-Exit/1-Input	0-Exit
2	PT1	PT1 ratio	1 ~ 9999	1
3	PT2	PT2 ratio	1 ~ 9999	1
4	CT1	CT1 ratio	1 ~ 9999	1
5	CT2	CT2 ratio	1 ~ 9999	1
6	B1 OC-I switch	Busbar 1 overcurrent I-segment control word	0-Exit/1-Input	0-Exit
7	B1 OC-I current	Busbar 1 overcurrent I segment current	0.10-99.99 A	10.00 a
8	B1 OC-I time	Busbar 1 overcurrent I period of time	0 ~ 99.99 s	0.00s
9	B1 OC-II switch	Busbar 1 overcurrent II-segment control word	0-Exit/1-Input	0-Exit
10	B1 OC-II current	Busbar 1 overcurrent II current	0.10-99.99 A	7.50 a
11	B1 OC-II time	Busbar 1 over flow II period	0 ~ 99.99 s	0.50 s
12	B1 OC-III switch	Busbar 1 overcurrent III control word	0-Exit/1-Input	0-Exit
13	B1 OC-III current	Busbar 1 Overcurrent III	0.10-99.99 A	5.00A
14	B1 OC-III time	Busbar 1 overcurrent III period of time	0 ~ 99.99 s	1.00 seconds
15	B1 ZOC switch	Busbar 1 zero-sequence overcurrent control word	0-Exit/1-Trip/2-Alarm	0-Exit
16	B1 ZOC current	I bus zero sequence overcurrent	0.10-99.99 A	1.00A
17	B1 ZOC time	I zero sequence overcurrent time	0 ~ 99.99 s	0.50 s

18	B1 OV switch	I bus overvoltage protection control word	0-Exit/1-Trip/2-Alarm	0-Exit
19	B1 OV setting	Overvoltage protection	57.00-999.9V	450.00 V
20	B1 OV time	Busbar 1 over-voltage protection time	0.05 ~ 99.99 s	1.00 seconds
21	B1 UV switch	Busbar 1 Low voltage protection control	0-Exit/1-Trip/2-Alarm	0-exit
22	B1 UV setting	I bus low voltage protection voltage	57.00-999.9V	300.00 V
23	B1 UV time	low voltage protection time	0.05 ~ 99.99 s	1.00 seconds
24	B2 OC-I switch	Busbar 2 overcurrent I control	0-Exit/1-Input	0-exit
25	B2 OC-I current	Busbar 2 overcurrent I	0.10-99.99 A	10.00 a
26	B2 OC-I time	Busbar 2 overcurrent I period of time	0 ~ 99.99 s	0.00s
27	B2 OC-II switch	Busbar 2 control of secondary overcurrent	0-Exit/1-Input	0-exit
28	B2 OC-II current	II bus overcurrent II current	0.10-99.99 A	7.50 a
29	B2 OC-II time	Busbar 2 time of passing flow	0 ~ 99.99 s	0.50 s
30	B2 OC-III switch	Busbar 2 overcurrent III control word	0-Exit/1-Input	0-exit
31	B2 OC-III current	Busbar 2 overcurrent III current	0.10-99.99 A	5.00A
32	B2 OC-III time	Busbar 2 overcurrent III period	0 ~ 99.99 s	1.00 seconds
33	B2 ZOC switch	II. Zero flow control	0-Exit/1-Trip/2-Alarm	0-exit
34	B2 ZOC current	Busbar 2 zero current	0.10-99.99 A	1.00A
35	B2 ZOC time	Busbar 2. Zero flow time	0 ~ 99.99 s	0.50 s
36	B2 OV switch	Busbar 2 overvoltage control word	0-Exit/1-Trip/2-Alarm	0-exit
37	B2 OV setting	Busbar 2 overvoltage	57.00-999.9V	450.00 V
38	B2 OV time	Busbar 2 overpressure time	0.05 ~ 99.99 s	1.00 seconds
39	B2 UV switch	Busbar 2 Low-voltage control word	0-Exit/1-Trip/2-Alarm	0-exit
40	B2 UV setting	II bus low voltage	57.00-999.9V	300.00 V
41	B2 UV time	Busbar 2 low pressure time	0.05 ~ 99.99 s	1.00 seconds
42	Heavy_Gas	Heavy gas protection control word	0-Exit/1-Trip/2-Alarm	1-trip
43	UP_Hi_TEMP	Ultra-high temperature protection control word	0-Exit/1-Trip/2-Alarm	1-trip
44	Pressure_Relief	Pressure release valve control word	0-Exit/1-Trip/2-Alarm	1-trip
45	FUSE_A	High-voltage fuse a control word	0-Exit/1-Trip/2-Alarm	1-trip
46	FUSE_B	High-voltage Fuse B control word	0-Exit/1-Trip/2-Alarm	1-trip
47	FUSE_C	High-voltage fuses C control word	0-Exit/1-Trip/2-Alarm	1-trip
48	Light_Gas	Light gas warning control word	0-Exit/1-Alarm	1-alert
49	Hi_TEMP	High temperature protection control word	0-Exit/1-Alarm	1-alert
50	Oil_Level	Oil level abnormal protection control word	0-Exit/1-Alarm	1-alert
51	SF6_Level	SF6 warning control word	0-Exit/1-Alarm	1-alert

52	N0_ELE1	Non-electric quantity 1 control word	0-Exit/1-Trip/2-Alarm	0-exit
53	N0_ELE2	Non-battery 2 control word	0-Exit/1-Trip/2-Alarm	0-exit
54	N0_ELE3	Non-power 3 control word	0-Exit/1-Trip/2-Alarm	0-exit
55	INS DIF switch	Differential instantaneous current switching on/off	0-Exit/1-Input	0-exit
56	INS DIF CURT	Differential instantaneous current	1.00-99.99 A	5.00A
57	DIF CURT switch	Differential protection control word	0-Exit/1-Input	0-exit
58	DIF START-UP	Differential start setting	0.20 ~ 99.99 a	1.00A
59	DIF BRAKING	Differential brake setting	0.20 ~ 99.99 a	3.00 A
60	RT-BRK factor	Ratio differential braking coefficient	0.30 to 1.00	0.50
61	SHB	Second harmonic braking coefficient	0.10 to 0.30	0.15
62	LP Balance factor	Low pressure side equilibrium coefficient	0.10.10.00	1.0
63	Transformer wiring	Transformer wiring	0: Y/y 1: YD11 2: YD1 3: DY11 4: Dy1	0: Y/y
64	CT DISCON ALM SW	Differential CT broken line control word	0-Exit/1-Input	0-exit
65	DIF OR ALM SW	Flow limit alarm control word	0-Exit/1-Input	0-exit
66	DIF CURT OR alm	Differential current alarm threshold	0.10-99.99 A	7.50 A
67	DIF CURT time	Poor flow alarm time	0.1 ~ 99.99 s	0.50 s
68	Temp limit	Temperature limit	0 to 200	100
69	Lower Temperature limit	Lower temperature limit	0 to 200	50
70	Lower limit negative	The lower bound is negative	0: No/1: Yes	1: Yes

2) parameter list

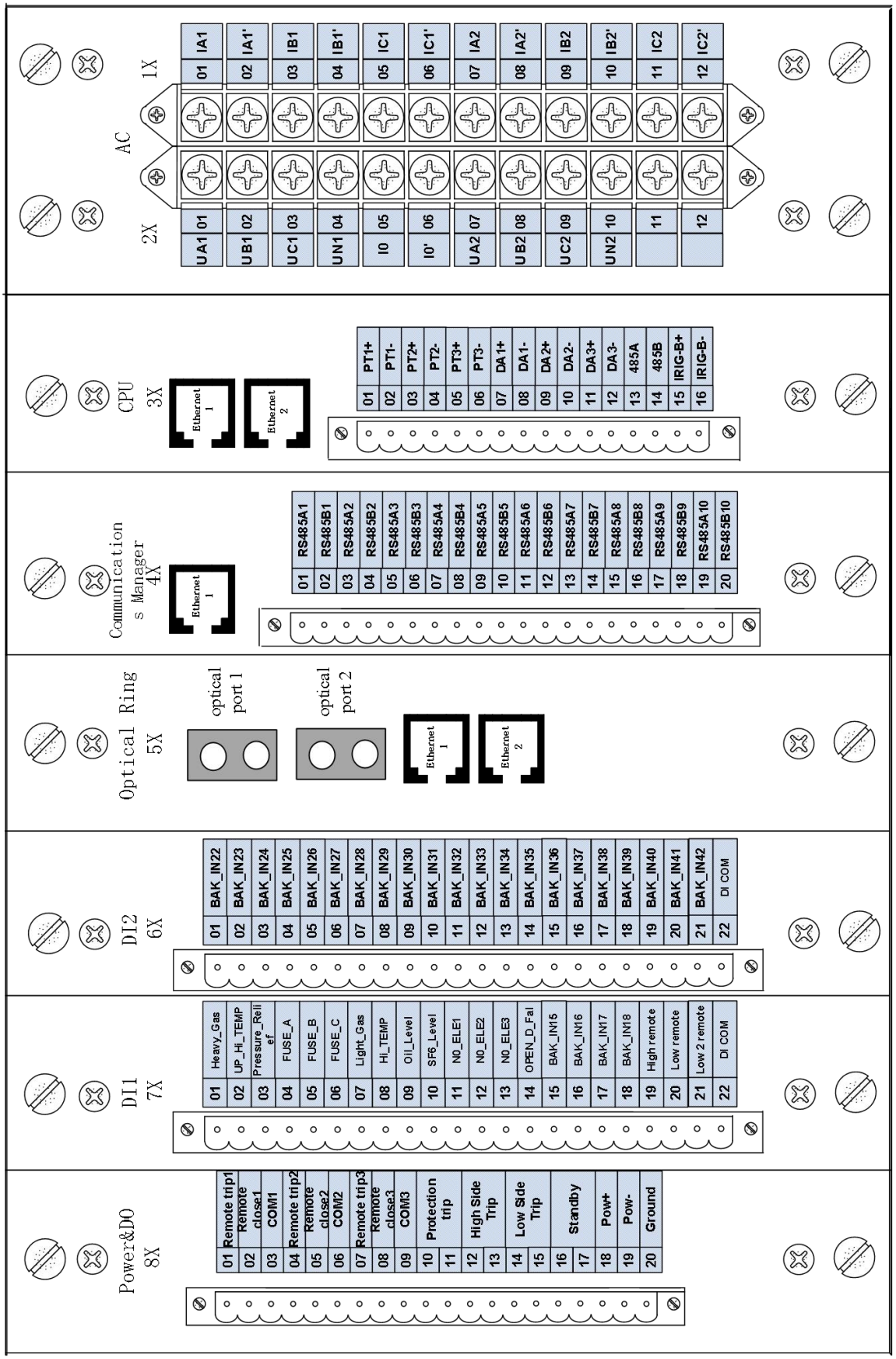
Serial number	The name of the specified value	Set Range	Factory default
1	Ethernet 1 address 1	0 to 255	192
2	Ethernet 1 address 2	0 to 255	168
3	Ethernet 1 address 3	0 to 255	1
4	Ethernet 1 address 4	0 to 254	10
5	Ethernet 1 Mask 1	0 to 255	255
6	Ethernet 1 Mask 2	0 to 255	255
7	Ethernet 1 Mask 3	0 to 255	0
8	Ethernet 1 Mask 4	0 to 255	0
9	Ethernet 2 address 1	0 to 255	192
10	Ethernet 2 address 2	0 to 255	168
11	Ethernet 2 address 3	0 to 255	11
12	Ethernet 2 address 4	0 to 254	10
13	Ethernet 2 Mask 1	0 to 255	255
14	Ethernet 2 Mask 2	0 to 255	255
15	Ethernet 2 Mask 3	0 to 255	0
16	Ethernet 2 Mask 4	0 to 255	0

17	RS485 address	1-99	1
18	RS485 baud rate	0-6	2
19	Method of measurement	0: no change/1: agree to change	0
20	Password modification	0 ~ 9999	0
21	Modify electrical measurements	0-1	0
22	IEP + total power	0-65535	0
23	IEP + low total power word	0-65535	0
24	Ip-total power	0-65535	0
25	Ip-low total power word	0-65535	0
26	IEQ +	0-65535	0
27	IEQ + low total power word	0-65535	0
28	Ieq-total power	0-65535	0
29	IEQ-low total power word	0-65535	0
30	IIEP + total power	0-65535	0
31	IIEP + low total power word	0-65535	0
32	Iep-total power	0-65535	0
33	Iep-low total power word	0-65535	0
34	IIEQ + total power	0-65535	0
35	IIEQ + low total power word	0-65535	0
36	IIEQ-total power	0-65535	0

3) parameter setting interface

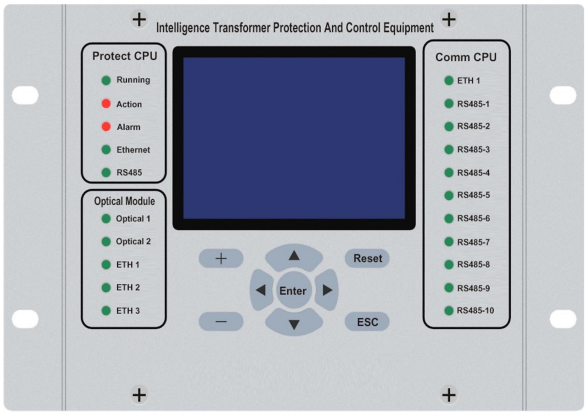
Serial number	The name of the specified value	Set Range	Factory default	Notes
1	High side measurement	0: Y/y; 1: V-V	0: y/Y	
2	Low side measurement method	0: Y/y; 1: V-V	0: y/Y	
3	Password modification	0 ~ 9999	1	
4	Turn-in jitter delay	0.001 to 0.25	0.02	
5	Remote control switch pulse delay	0.01 ~ 3	0.5	
6	Remote control merge and surrender	0-1	0	

4.3 Backplane terminal definition diagram



Chapter 5: Operation Instructions

5.1 Plant panel layout and description



The device adopts man-machine dialogue design: configuration of digital tube/liquid crystal display (order description) , step by step operation of the menu pages, according to the menu prompt, it can monitor and record all kinds of data and events collected by the device, and can directly modify the parameters of the device, protect and debug the device, etc. , operators can intuitively understand the working state of the power supply, the running state of the device, the running state of communication, etc. .

5.2 Signal light instructions

A) the“Running” light is green. When the device is running normally, it will flash once per second. If the flash is abnormal, it means the CPU is in an abnormal state

B) the“Warning” light is a red light, which will be turned off in normal operation, and will be turned on when any protective function warning or device self-checking error occurs;

C) the“Action” light is a red light, which will be turned off during normal operation and lit when any protection function is tripped;

D) the status of each“RS485” indicator lamp indicates the communication status of each serial port in the module

The letter was interrupted.

E) the“Light port” indicator indicates the communication status of the module optical fiber; flicker is in communication, and no flicker is communication interrupt.

E) each“Ethernet” indicator indicates the communication status of the module Ethernet; Flicker is in communication, non-flicker is communication interrupt.

5.3 Key-press instructions

The control keys on the keyboard include“Revert”, “Confirm”, “Cancel”, “↑”、“↓”、“←”、“→”、“＋”、“－” function keys, and when the parameters or fixed values need to be modified,

switch their reuse functions by clicking“Confirm” and“Cancel”, which are grouped as follows:

Return Button: Manual return signal (indicator, LCD) , return signal relay;

“OK” key: confirm the current modification or implementation of the current selection, or to the next level menu;

“Cancel” key: Exit a certain menu or window and return to the next level of its menu, or cancel a change;

《∧》: the cursor moves up one line or the value increases;

《∨》: move the cursor down one line or decrease the value

《<》: Cursor left shift a column or turn a page;

《>》: move the cursor one column to the right or turn down a page.

《+》: value increased.

《-》: number decreased.

5.4 Menu interface display and operation instructions

The device uses Chinese menu display to realize man-machine interface interaction. The structure of the menu is as follows:

First-class menu	Second-level menus	Third level menu	Functional description
Operating conditions	Protection display		Browse to protect the value of the analog quantity, including amplitude and angle
	Measurement display		Browse to measure the value of the analog quantity, including amplitude and angle
	Power Indicator		Browse the value of the device's cumulative electrical measurement
	Remote status		View the current status of incoming and warning remote messages
	Pressure Plate		Browse the drop state of the pressure plate
	Operating area code		Browse for the currently running, rated area code
	Value display		Browse the values for the corresponding area codes
Event Managemen t	SOE events		View the sequence of events that occur on the device
	Action events		Displays the time and action value when the protection action is taken
	Fault recording		Display the recorded sample values and record the waves
	Operate on events		View device operation events (remote control, setting)
	Record clearing	Delete action events	Delete all protection action events
		Delete the SOE event	Delete all SOE events
		Delete an action event	Delete all action events (remote control, set value)
		Remove Fault Recorder	Delete all fault recordings
		The electrical	Zero all electrical measurements accumulated

		measurement is zero	by the device
		Delete all records	Delete all action events, SOE events, action events, and recordings
Print Management	Fixed value printing		Prints the value of the current run
	Platen printing		Print the current running platen
	Report printing		Print the action event
Run the settings	Area code switching		Toggles the fixed run range
	Set values		Modify the fixed value of the current operation of the device
	Constant replication		Copies the entered value to another value area that needs to be fixed
	Press release		Carry out the return of the protection function
	Exit properties		Modify tripping or signaling properties for each exit of the device
	Trip matrix		Modify the exit configuration of the protection function
Device settings	LCD contrast		Adjust the contrast of liquid crystal display in the device
	Serial port settings		Set 485 port communication parameters
	Network settings		Set Ethernet communication parameters
Device testing	Lighting test		Test device signal light
	Open for testing		Test device outlet relay
	Remote test	Action events	Send the action event point of the test state to the main station
		Warning event	Sends a test state warning event point to the main station
		Point-to-point	Send the test state's open remote point to the main station
		Telemetry test	The default telemetry value of the device that sends the test state to the main station (not full scale value)
Parameter settings	Password settings		Password settings
	TV once value		Set the TV primary value (the TV secondary value defaults to 100V)
	Ta primary value		Set the TA value once
	Ta quadratic value		Set the TA quadratic value
	Turn-in jitter delay		Drive-in de-jitter delay
	4 ~ 20ma maximum correction		4 ~ 20ma maximum channel coefficient
	4 ~ 20ma minimum correction		4 ~ 20ma minimum channel coefficient
	4-20ma channel selection		Select which specific analog output 4 ~ 20ma
	4-20ma max		The percentage of the maximum analog output at 20ma
	Remote control switch pulse delay		Remote control switch pulse delay
Factory	Time setting		View or modify the current time of the device

setting	Default settings		Recovery device fixed value, pressure plate, tripping matrix, export attributes, communication parameters and other default values
	Channel calibration		Calibrating the channel coefficients of analog measurements
	Set the number of electric power		Set up the cumulative electrical measurement manually
Version information			Display the program version number and checksum results

When the device runs normally, press“OK” to enter the menu interface, press“Cancel” to return to normal operation in the main menu display interface. The device menu consists of the main menu and multiple submenu items. There are different levels of menu access, when entering the sub-menu [run settings] , [area code switching] , [setting the value] , [pressure plate throwing back] , [tripping matrix] , [exit attributes] , [parameter settings] , and so on, to modify the parameters, password verification is required to prevent accidental modification of important operating parameters of the device, resulting in abnormal operation of the device or protection maloperation.

5.5 Operating instructions

5.5.1 Operation status check

Enter the main menu, select the sub-menu item [operating conditions] press the“OK” key to enter the operating conditions menu interface, the protection value, measurement value, electric power value, remote signal state, Operation Area code, protection pressure plate state and protection fixed value can be checked in the operating condition.

The protected value shows the following steps:

1,Enter the main menu.

2,From the main menu, select the run condition sub-menu item, press OK to enter the run condition menu interface, and then move the cursor to the protect display sub-menu item.

3,Press OK to enter the protection value display window.

Name	Value	Phase
Hia	5.01A	0°
Hib	5.02A	240°
Hic	5.01A	120°
Ua1	57.712 V	30°
Ub1	57.709 V	270°
Uc1	57.713 V	150°

Protected value

4,In the protection value display window, scroll the content to be displayed by using the key of 《 ∧ 》 Or 《∨》 .

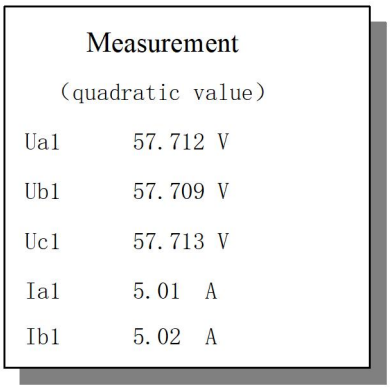
5,Press cancel to go back to the main menu.

The action shown by the salient measure is as follows:

1,Enter the main menu.

2,From the main menu, select the run condition sub-menu item, press OK to enter the run condition menu interface, and then move the cursor to the measure display sub-menu item.

3,Press OK to enter the measurement value display window.



Measurement display

4,In the measurement display window, scroll through the content to be displayed using the key"∧" or key"∨"

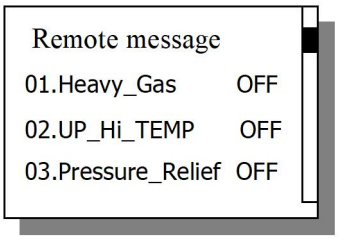
5,Press cancel to go back to the main menu.

The action steps for the remote message status display are as follows:

1,Enter the main menu.

2,From the main menu, select the run condition sub-menu item, press OK to enter the run condition menu interface, then move the cursor to the run condition sub-menu item.

3,Press OK to enter the remote message status display window.



Remote message

4,In the remote message status display window, scroll the content to be displayed by using the key of! Or.

5,Press cancel to go back to the main menu.

5.5.2 Event sequence view (SOE)

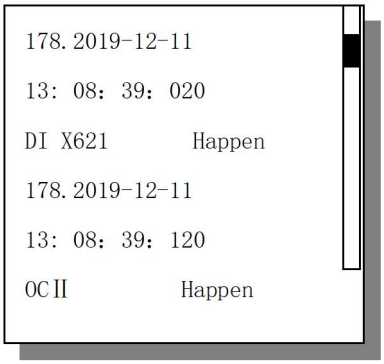
Up to 1,000 recent events can be recorded in the case protection of TY8663, which is stored in the RAM of the protection module by means of circular pointer recording, visible at the next restart after the device is powered down. The steps for sequential event viewing are as follows:

1,Enter the main menu.

2,From the main menu, select the event management submenu item, press OK to enter the report

management menu interface, and then move the cursor to the SOE events submenu item.

3,Press OK to enter the time sequence events window.



SOE Events

4,In the order event display window, use the key"∧" or key"∨" to scroll the content to be displayed.

5,Press cancel to go back to the main menu.

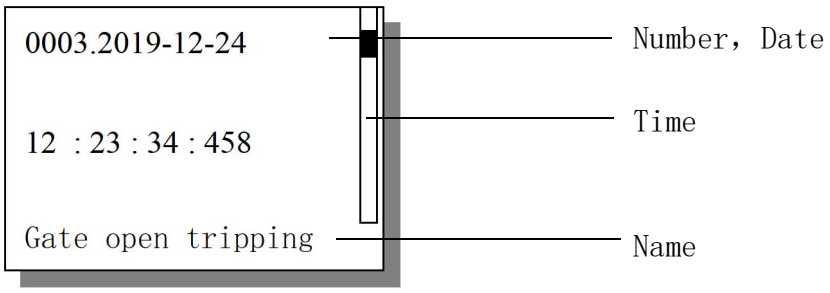
5.5.3 Action events

The TY8663 box transformer protection can record the last 16 system failure protection action generated event report, the report of the event shows with the relative time identification. The operation steps for action report viewing are as follows:

1,Enter the main menu.

2,Select the event management submenu item in the main menu, press OK to enter the report management menu interface, and then move the cursor to the action events submenu item.

3,Press"OK" key to enter the action events list window, the list window shows the system fault recorder protection components action absolute time also shows the action of the fault number. The fault sequence number is used to identify an event related to the relay protection function, and the fault sequence number is increased by 1 each time the protection action component starts, the value does not need to be reset or preset.



4,In the action event list window, scroll through the content to be displayed using the key"∧" or key"∨"

5,Press OK to enter the report's order of events window.

6,Press cancel to go back to the main menu.

5.5.4 Record view

Due to too many recording points, viewing more cumbersome, recommended in the upper computer through the recording analysis software to see, draw a waveform diagram, more intuitive, convenient analysis.

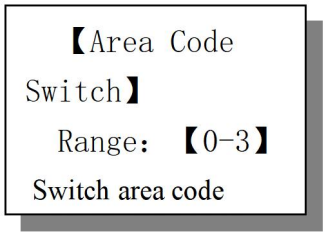
5.5.5 Area code switching

TY8663 box transformer protection contains up to 4 sets of fixed value, users can choose different fixed value area according to different operation mode. The operation steps of area code switching are as follows:

1) Enter the main menu.

2) Select the run settings submenu item in the main menu, press OK to enter the run settings menu interface, and then move the cursor to the area code switch submenu item.

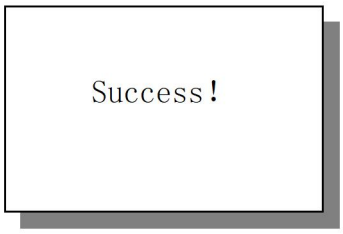
3) Press“OK” key and enter the password to enter the area code switch window.



Area code switch

4) Enter the area code of the valid destination range in the area code switching window. Use the “<” or”>” key to move the cursor, and use the” +” or”-”key to add or subtract the area code.

5) Press the“OK” key to switch the area code, the device shows that the fixed value switch successfully! Press cancel to return to step 2) .



6) Press cancel to go back to the main menu.

As you go through these steps, notice the following:

● in step 5) , if the area code is not correct, a fixed area code error message window will pop up and the operation will skip to step 3) .

● in step 3) , if you enter the wrong password, the liquid crystal display will prompt you for the wrong password and you need to re-enter the correct password. Repeat step 6) , and continue with the solidification command after entering the password.

: : the area code will not be fixed in the protected module until the correct password is entered and the OK key is pressed. Pressing the cancel key will allow you to step back to the main menu and discard your

changes. Again, if you have not done so before, if you stop the keyboard for 3 minutes, you will automatically give up the area code switch and go back to the normal screen.

5.5.6 Fixed value setting

A fixed setting modifies the fixed value. In the setting setting, the setting displays both browse and modify states. In the browse state, by pressing the“OK” key to switch to the modified state; in the modified state press“Cancel” key to return to the browse state. The operation steps of setting the fixed value are as follows:

1 Enter the main menu.

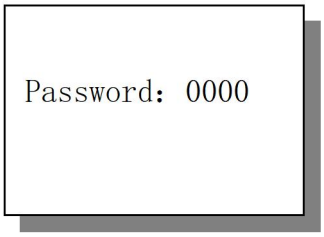
2 Select the run settings submenu item in the main menu, press OK to enter the run settings menu interface, and then move the cursor to the set settings submenu item.

3 Press the“OK” key and enter the password to enter the fixed value setting window.

4 In the browsing state, use the key”∧” or key”∨” to scroll to select the fixed value item to be modified, if the selected fixed value item needs to be modified, press the key”∧” or”∨” to to switch the fixed value item that needs to be modified to the modified state. In the modified state, use”<” key or”>” key to change the position of the cursor, and use”+” key or”-” key to add or subtract Arabic numerals, after the modification, press” OK” key to save the current fixed value changes, and return browse state; if press“Cancel” key to cancel the current fixed value changes, and return browse state.

5 Repeat step 4 until the value is changed.

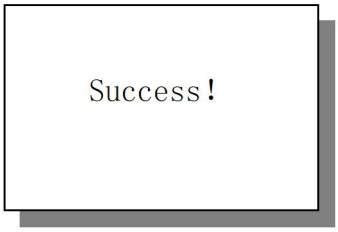
6 After the fixed value is modified, press the cancel key to exit the fixed value setting window and pop-up password verification window.



Password Authentication Schematic

7 Enter the password“1000” in the password window, the < or > key can be used to move the multi-digit input location, the + key or-key input password.

8 Press“OK” key fixed value, the device shows fixed value curing success! If you press “cancel”, you will give up setting and return to step 2) .



Fixed value curing success

9 Press OK or cancel to exit the message window and return to step 2) .

10 Press the “cancel” button to step back to the main menu.

As you go through these steps, notice the following:

● In Step 4) , in the modified state, after modifying the fixed value, press the“OK” key to save the modification of the fixed value term, press the“Cancel” key to cancel the modification of the fixed value term.

● in step 7) , if you enter the wrong password, the liquid crystal display will prompt for the wrong password and you need to re-enter the correct password. Repeat step 7) , and continue with the solidification command after entering the password.

before entering the correct password and pressing the OK key, the value will not be fixed in the protection module, and pressing the cancel key will allow you to step back to the main menu and discard the changes you have made, if you stop the keyboard for 3 minutes, you will automatically give up your settings and go back to the normal screen.

5.5.7 Fixed-value replication

TY8663 box transformer protection can copy the whole fixed value of the current running fixed value area stored in the protection module to another fixed value area, the input value can be copied to another fixed value area, and then modified, so that it is convenient to enter multiple sets of fixed values for different operation modes. The procedure for copying a set value is as follows:

1 Enter the main menu.

2 Select the run settings submenu item in the main menu, press OK to enter the run settings menu interface, and then move the cursor to the value copy submenu item.

3 Press the“OK” key to enter the password after the value of the replication window.

4 Enter the area code of the valid target replication region in the custom replication window. Use the < or > key to move the cursor, and use the + or-key to add or subtract the area code.

5 Press“OK” key for fixed value copy, the device shows fixed value curing success! Press cancel to return to step 2) .

6 Press cancel to exit the message window and return to step 2.

7 Press cancel to go back to the main menu.

As you go through these steps, notice the following:

● in step 3) , the source area code is on the left and the target area code to be copied is on the right.

● in step 5) , if the area code is not correct, the fixed area error message window will pop up and the operation will skip to step 3) .

Until the correct password is entered and the OK key is pressed, the set value will not be copied and solidified in the protected module, and the cancel key can be used to step back to the main menu and give up copying, again, if before this, stop keyboard operation 3 minutes will automatically give up fixed value copy and back to normal display screen.

5.5.8 Tripping matrix

The outlet of all protection functions of TY8663 box transformer can be adjusted through the“Trip matrix” menu to flexibly determine which outlet closed trip switch is a particular protection function. Note:

The default export mode is used to protect the factory (the default export is consistent with the manual) , general site users do not need to set, if there is a need for this, please contact our technical support!

A protection function consists of several export setting items, corresponding to the specific terminal number (that is, specific export relay) , the export setting items of each protection function are completed by a control word. When an exit of a protection function needs to be closed, change its corresponding position to“Start”, when not in use, change the exit to“Do not start”.

Export relay corresponding terminal: Export 1(801,803) , Export 2(802,803) , Export 3(804,806) , Export 4(805,806) , action lamp, warning lamp. Etc. .

The tripping matrix is as follows:

Setting method: select“Start” at the space of the terminal and signal lamp of the exit relay with the protection function, and select“Don't start” at other spaces, then the trip mode can be obtained. The binary bit string corresponding to the tripping matrix above is:

Differential speed break 0X0BC0

Ratio differential 0X0BC0

I female overcurrent I segment action 0X0AC0

I Mother Flow II segment action 0X0AC0

Part III is 0X0AC0

I bus zero sequence protection action 0X0AC0

In the TY8663 case transformer protection, each protection function export according to the hexadecimal format storage, in order to make the setting intuitive, convenient, setting into the bit-by-bit setting mode. In the tripping matrix bit-by-bit setting mode, the tripping matrix displays two states: browsing and modifying. In the browse state, by pressing the“OK” button to change to the modified state; in the modified state press“OK” or“Cancel” button to return to the browse state. The steps for setting the trip matrix are as follows:

1 Enter the main menu.

2 Select the run settings submenu item from the main menu, press OK to enter the run settings menu interface, and then move the cursor to the trip matrix submenu item.

3 Press the OK key to enter the component export setting window.

4 Scroll the guard element with the! Or V key to move the cursor to the guard element item that you want to modify.

5 Press OK to enter the tripping matrix bitwise setting mode window.

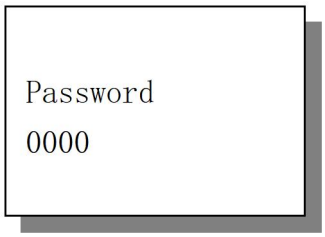
6 In the browse state of the tripping matrix mode, use the key of”!” or”!” To scroll the exit bit of the component that needs to be modified. If the selected exit item needs to be modified, press OK to switch the exit to the modified state. In the modified state, change the exit to be set by the key of”””””””””” or”” key of””. After the modification is finished, press” confirm” key to save the modification of the current component exit item, and return to browse state; If you press the cancel key to cancel the changes of the current export item, and return to the browse state.

7 Repeat step 6 until all exits have been modified.

8 In the trip matrix browse state, press the“Cancel” key to exit the trip matrix setting window, and return to step 2) .

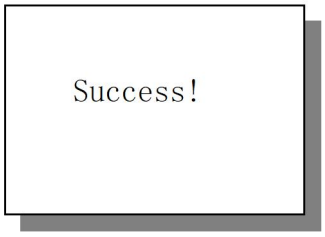
9 Repeat steps 3 to 8.

10 After modifying all the exits, press cancel to exit the tripping matrix setting window and pop up the password verification window.



11 Enter the password“1000” in the password window. The < or > key can be used to move the input position of multiple digits, and the! Or V key to enter the password.

12 Press OK to solidify the tripping matrix, the device displays the solidified tripping matrix message window; press cancel to abandon tripping matrix setting and return to step 2) .



Schematic of curing process

13 Press OK or cancel to exit the message window and return to step 2) .

14 Press the cancel button to step back to the main menu.

As you go through these steps, notice the following:

● in step 6) , in the modified state, after modifying the tripping matrix, press OK to save the export modification, press cancel to cancel the export modification.

● in step 10) , if the export has not changed, press cancel to skip to step 2) .

● in step 11) , if you enter the wrong password, the liquid crystal display will prompt you for the wrong password and you need to re-enter the correct password. Repeat step 11) , and continue with the solidification command after entering the password.

the trip matrix does not solidify into the protection module until the correct password is entered and the OK key is pressed, and the cancel key allows you to step back to the main menu and discard the changes made, again, if before this, stop keyboard operation 3 minutes will automatically give up tripping matrix setting and back to normal display screen.

5.5.9 Export attribute setting

In TY8663 case transformer protection, the export of protection can be defined, and the action attribute

of export can also be defined, that is, whether the export is tripping or sending signals can be defined. In the export property setting, the export property displays both browse and modify states. In the browse state, by pressing the“OK” button to change to the modified state; in the modified state press“OK” or“Cancel” button to return to the browse state. The steps for setting the export properties are as follows:

1 Enter the main menu.

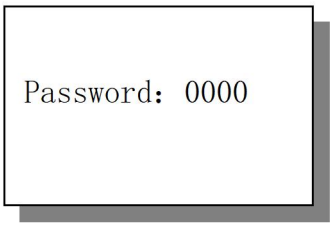
2 Select the run settings submenu item from the main menu, press OK to enter the run settings menu interface, and then move the cursor to the exit properties submenu item.

3 Press the“OK” key and enter the password into the export property setting window.

4 In the browsing state, scroll the exit property items to be modified by using the key of”!” Or” x”. If the exit property items need to be modified, press OK to switch the exit property item to the modified state. In the modified state, use”+” key or”-” key to change the value of the export property to be set, after the modification, press” OK” key to save the current export property changes, and return to browse state; If you press the cancel key to cancel the modification of the current export property item, and return to the browsing state.

5 Repeat step 4 until you have finished modifying the export properties.

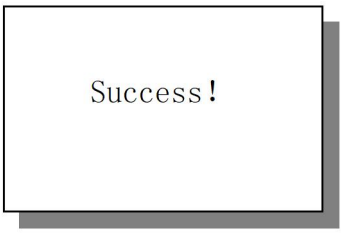
6 In the export property browse state, press“Cancel” key exit export property setting window and pop-up password verification window.



Password Verification Diagram

7 Enter the password“1000” in the password window, the < or > key can be used to move the multi-digit input location, the + key or-key input password.

8 After entering the password, press the OK key and the device will prompt to save the parameters successfully! The modification was successful. If you press cancel, you will lose the export attribute and return to step 2.



Parameter saving success diagram

9 Press OK or cancel to exit the message window and return to step 2) .

10 Press the cancel button to step back to the main menu.

As you go through these steps, notice the following:

● In Step 4, in the modified state, after modifying the export attribute, press OK to save the modification of the export attribute item, press cancel to cancel the modification of the export attribute item.

● in step 7) , if you enter the wrong password, the liquid crystal display will prompt you for the wrong password and you need to re-enter the correct password. Repeat step 7) , and continue with the solidification command after entering the password.

The Export attribute is not solidified in the protection module until the correct password is entered and the OK key is pressed, and the cancel key allows you to step back to the main menu and discard the changes made, again, if before this, stop keyboard operation for 5 minutes will automatically give up export property setting and back to normal display screen.

5.5.10 Parameter setting

"Parameter settings" menu contains settings password, TA, TV ratio, input jitter time, remote control switch pulse width and other parameters.

Table of device parameters:

Serial number	Parameter setting name	Functional description
1	Method of measurement	
2	Password modification	Change the device password
3	Drive-in de-jitter delay	Turn-in time to jitter, in seconds, with a minimum of 0.001 seconds
4	Remote control switch pulse delay	Set the remote control switch pulse delay time, unit second, minimum 0.001S

5.5.11 Communication parameter setting

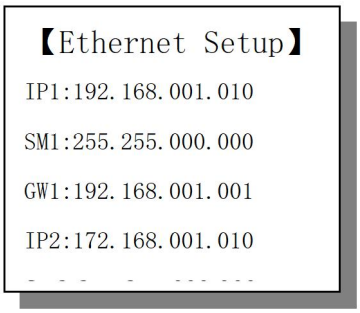
When entering the main menu, select the sub-menu item -LSB- device settings] and press OKe"Ok" key to enter the device menu interface, then select [serial port settings] , RS485S485 serial port parameter in the device can be set, when you select network settings, you can set the Ethernet parameters of the device.

Communication parameters display divided browse and modify two states, in the browse state, by pressing the"OK" key can switch to the modified state, in the modified state press"Cancel" key can return to the browse state.

In the browsing state, the subitems of the communication parameters to be modified are scrolled by the key"∧" or key"∨".

In the modified state, use the key of"<",">" to change the position of the cursor, use the key of"+","-" to change the value of the communication parameters Press cancel to cancel the modification of the current communication parameters.

After modifying the communication parameters, press the"Cancel" key to exit the communication parameters setting interface and pop up the password verification window. After entering the password verification window, enter the correct password, then press the"OK" key to solidify the communication parameters, if you give up the solidified communication parameters then press the"Exit" key.



Network Setup Diagram

5.5.12 Calibration of channel coefficients

Enter the main menu, select the sub-menu item [factory settings] press the“OK” key to enter the factory settings menu interface, then select channel calibration and press OK to enter the channel coefficient calibration display.

Calibration method: The Measuring Circuit of the device plus rated voltage, rated current, power angle-45 ° , to ensure that active and reactive power sampling error is not large, according to“Determine” key device directly calibration measurement channels, no manual input of correlation coefficient is required. After calibration, press the“Cancel” key, exit the menu and enter the password to save the channel coefficient, return to the measurement menu to observe whether the sampling deviation with the tester within a reasonable range.

Note that each channel needs to be calibrated at a rating of ± 5% , and external wiring needs to be checked for large deviations. Otherwise, calibration accuracy is not possible.

Note: When leaving factory, the device has been calibrated by high-precision meter, please operate carefully on site! !! If you need calibration, please contact our technical support!

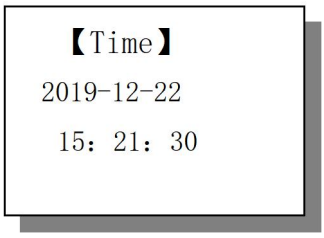
5.5.13 Time setting

In time settings, the time display is divided into browse and modify state. In the browse state, by pressing the“OK” key to switch to the modified state; in the modified state press the“OK” key to return to the browse state. The operation steps of the time setting are as follows:

1 Enter the main menu.

2 Select the factory settings submenu item in the main menu, press OK to enter the factory settings menu interface, and then move the cursor to the time settings submenu item.

3 Press OK to enter the time settings window.



Current Time Schematic

4 In the browsing state, press“OK” key to enter the time settings state. In the modified state, move the cursor position with the key < or > , and add or subtract values with the key + or-; press the key”∧” or key” ∨”to switch between the date setting and the time setting.

5 Press OK to save the set time; press cancel to cancel the set time. Go back to step 3.

6 Press cancel to go back to the main menu.

As you go through these steps, notice the following:

● in step 3, the time shown is the current run time.

● In Step 4) , after pressing OK, first position the cursor on the date-set line. To switch to the time-set line, press < or > to switch to the time-set line.

5.5.14 Password modification

To prevent unauthorized personnel using the default password“1000” to modify the device important operating parameters, the device operation password can be reset.

Here's how to change your password:

1 Enter the main menu.

2 In the main menu, select the [settings] sub-menu item, enter the password, press the“OK” key to enter the settings menu interface, and then move the cursor to the [password settings] sub-menu item.

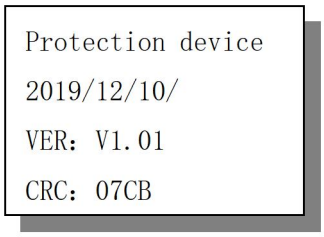
3 Press“OK” key to enter the password modification login window.

4 Enter your current password in the password settings window. The < or > key can be used to move the multi-digit input location, and the + or-key to enter your password.

5 After the password is set, press OK to save the password, then press cancel. After entering the new password, the save parameter is displayed and the password is changed successfully.

5.5.15 Version

Enter the main menu, select sub-menu item -LSB- version information] press OKe“Ok” key to enter the version information menu interface, you can display the program version number and checksum results.



Version Information Display