GQH-SPC
Manual of low-voltage power distribution system for intelligent module

Rapid assembly system like building cordwood
Secondary wiring circuit board technology
Convenient and efficient maintenance
TIEON was established in 2001, with the registered capital of RMB 50 million, and is a domestic and main professional service provider of solutions for power supply and distribution. Its headquarters is located in the 4th and 6th floor, No. 1 Building, Honghua Industry Zone, Liuxian Road, Bao'an District, Shenzhen, Guangdong, China. It is the research and development center and marketing management center of the company. The production base is located in Jiexi eco-industrial park in southern Anhui, with the floor space of more than 600,000 m². There are more than 400 employees in the company, including professionals of above 35%. It is national-level new and high-tech enterprise which combines research, production, sales and service.

As for technical innovation, according to the concept of "Safety • Reliability • Convenience • Intelligence" and based on technological development of proprietary intellectual property, the company has an excellent research team with comprehensive development ability on software and hardware. Its AC/DC integrative power system, DC power system, intelligent modular power distribution system and related products have won 3 national invention patents and 35 patents for utility models, and 11 invention patents have entered into the substantive review stage. Relevant products have passed TUV, type tests, 3C and certified by TLC.

For over ten years, the company has been pursuing the development vision of "making power consumption more convenient" and is always on a mission to "provide solutions for safe and intelligent power supply and service". It concentrates on research & development, production and service of the power supply and distribution system products.

By the end of 2013, the power source products have reached product operation performance of more than 4000 transformer substations in total, including 7 extra-high voltage transformer substations of 1000KV, 33 converter stations of ±800KV, 3 and ±660KV, ±500KV and ±400KV, 4 transformer substations of 750KV, more than 150 transformer substations of 500kas, more than 1000 transformer substations of 220kas, more than 2360 transformer substations of 110kas. Its performance of overall power solutions spreads all over all provinces, cities and autonomous regions in mainland China, and other overseas countries.

Contents

I. System Description
1. Brief Introduction
2. Characteristics
3. Comparison between GQH-SPC and common power distribution
4. System parameter

II. System Composition Design

III. Assembly Adjustment
1. Cabinet installation
2. Intelligent feeder cabinet assembly
3. Adjustment and operation

IV. Troubleshooting and Precautions
1. Common fault treatment
2. Precautions

V. Appendix
1. Electrical symbol description
2. Safety test
3. Certified qualification
I. System Description

1. Brief Introduction

Through the application experience of various switches for ten years, TIEON reasonably designs the AC incoming switch, drawer type class PC ATS automatic change-over switch with bypass, mutual inductor, indicator light and AC intelligent monitoring device and assembles them into a combined substance - iTAC110 intelligent dual-power switch component; innovatively designs the feeder switch, transducer and intelligent circuit into a modular assembly - iTAC120 intelligent feeder switch component; develops a new GQH-SPC intelligent modular low-voltage power distribution system, which is applicable to AC/DC scheme of 630A and below. Through digital design, the company has realized functions of three-phase current, three-phase voltage, power, power factors, electric degree, dual power cut-in, overload and overcurrent protection and zero-sequence protection for monitoring incoming switch; has reached three-phase current, three-phase voltage, power, power factors, electric degree and other electric quantity for monitoring incoming switch; and the switches of national and overseas famous brands can be selected, such as ABB/Schneider/Nader/People Electric.

The system is designed in module, which integrates safety, convenient maintenance, economical efficiency and reliability; can realize both standard customized production and rapid factory assembly. When the condition allows, bulk items shall be delivered and assembled on site and order and shipment can be made at the same time.

2. Characteristics

GQH-SPC intelligent modular low-voltage power distribution system is an integration of low cost and high reliability of fixed switchgear and easy maintenance of drawer unit and is a piece of intelligent power distribution equipment which can realize standard flow line production and meet fast delivery.

Safety

The key parts of switch block are produced by model and insulating material P66+GF25+V1 (fireproof nylon+glass fiber) as the same as the switch with molded case to improve its capabilities of insulation, voltage resistance, fire protection, and anti-oxidation. Relevant short-circuit arcing test has been made for the insulating material.

Primary copper bar is connected by insulating screw technology (the upper and lower are of metallic material and the middle is of insulating material): Connection by screws is safer and more reliable than connection by connector clips.

Primary cable terminal is equipped with protecting cover to prevent it from touching charged body by mistake.

Cutaway view of insulating screw

High-performance insulating material

Metal hexagon socket head
Metal plate head
Metal spring washer

Primary connector is equipped with protecting cover to prevent it from touching charged body by mistake.

Convenient

All standardized design can reduce design confirmation time for electric structure and reduce communication time among customers, design institutions and manufacturers.

It is compatible with domestic and overseas switches, such as ABB, Schneider, People Electric, and Nader, enabling flexible model selection.

Intelligent feeder switch integrates fixed feeder switch, current and voltage transducer, intelligent gathering module, primary and secondary circuits and indicator light by modular design. Fast installation and easy maintenance is enabled.

All feeder components are standardized and the cordwood system is arranged from top to bottom as well, and reserved space can be expanded flexibly.

Reliability

All components are of standard model design. Despite of the different technical level of the workers, standard products can be fabricated, so the product quality stability is promoted.
Rapid installation and flexible layout is enabled by adopting no-punching bus bar clamp connection technology.

Streamline production is enabled for module due to modularization and standardization to improve production efficiency and product quality. In addition, all standard parts can be stocked up and installed in advance, which changes the situation of stock-up and out-of-stock of vast non-standard components, and reduces stock-up varieties and delivery period.

Indicator light can be replaced without failure of power, the indicator light is energized by compression type and free of secondary connecting lead, and easy maintenance in energized state is enabled.

The plug-in type sampling is adopted. In case of failure of the collection module, the intelligent collection module may be replaced quickly.

For maintenance in energized state of the feeder switch module, just loosen the 6 insulating screws. For fast maintenance in energized state of the drawer cabinet, fixed switch is also used, without affecting the normal operation of other loops, thus ensuring the reliability of continuous power supply.

The intelligent circuits are all circuit boards, in addition to power and communication wires of intelligent gathering module, there is no secondary circuit, production, maintenance and positioning of fault can be done quickly.

- Highly intelligent: Each loop can be checked for three-phase current, three-phase voltage, active power, reactive power, active electrical degree, reactive electrical degree, frequency and power factors, and also can be tested for ON/OFF state of switch, fault state, electric operating ON/OFF of control switch, etc.
- Each loop can be displayed by integration monitoring through RS485 signal independent communication.
- And each loop also can be connected through control center of communication line power supply station. If there is no communication line on site, data can be transmitted to control center by GPRS wireless communication to monitor operation situation of electric equipment in real time or relevant data can be checked with mobile app at any time and any place.
3. Comparison between GQH-SPC and common power distribution

<table>
<thead>
<tr>
<th></th>
<th>GQH-SPC</th>
<th>GGD</th>
<th>GCK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characteristics</td>
<td>Function modular power distribution</td>
<td>Conventional power distribution</td>
<td>Draw-out type power distribution</td>
</tr>
<tr>
<td>Installation method</td>
<td>Permanent block, charging component</td>
<td>Fixed-type</td>
<td>Draw-out type</td>
</tr>
<tr>
<td>Maximum loop number of single cabinet</td>
<td>100-250A, molded case switch</td>
<td>24</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>63A3P miniature circuit breaker</td>
<td>52</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>44</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Maintainability</td>
<td>Replacement of switch, Hall sensor, gathering unit and other components can be replaced without affecting normal operation of other loops.</td>
<td>There is great randomness for the installation of the switch box and there is no regularity. The number of loops is relatively large.</td>
<td>Drawer can be replaced on line.</td>
</tr>
<tr>
<td>Intelligent</td>
<td>Single loop can be checked for three-phase voltage, power series and electric degree. Single loop has independent communication function.</td>
<td>No intelligence</td>
<td>Single loop can be checked for three-phase current and three-phase voltage and is free of communication.</td>
</tr>
<tr>
<td>Production model</td>
<td>Streamlined and prefabricated production</td>
<td>Conventional production model of modern distribution cabinet</td>
<td>Standard production of single drawer</td>
</tr>
<tr>
<td>Quality assurance</td>
<td>All components are prefabricated normally with model, and each component has high conformity and stable quality.</td>
<td>Conventional production model, good conformity and unstable quality</td>
<td>Reliable contact of components with great current cannot be determined.</td>
</tr>
<tr>
<td>Cost performance</td>
<td>High</td>
<td>Low</td>
<td>Medium</td>
</tr>
</tbody>
</table>

4. System Parameter

**Mechanical parameter**

- **Height (H):** 2260 mm
- **Width (W):** 800 mm
- **Depth (D):** 600/800/1000 mm
- **Module (E):** E=12, 5mm
- **Enclosure protection:** IP 20 / 30 / 40
- **Weight:** 200-250kg (According to configuration)
- **Nominal insulation voltage (UN):** 690V
- **Nominal working voltage (Un):** Three-phase 400V/3P/4P, single phase 230V/1P+N
- **Rated frequency (F):** 50Hz/60Hz
- **Primary bus:** Rated current (Ie): 4000A
- **Rated withstand current (Icw):** 80KA
- **Distribution bus:** Rated current (Ie): 1000A
- **Rated withstand current (Icw):** 30KA

**Environment parameter**

- **Temperature:** Under 5°C ~ +40°C/6A, maximum mean temperature is 45°C
- **Relative humidity:** Relative humidity is below 50% when maximum temperature is >0°C, higher relative humidity is allowed when the temperature is lower. For example, relative humidity can be 80% when temperature is ≤ 25°C.
- **Altitude:** ≤2000m (Capacity shall be reduced when above 2000m)
- **Other:** Non-dusty environment, occasions with no violent shaking and impact

The system is composed of iTAC120 intelligent dual-power switch component of incoming part, bus system, iTAC120 intelligent feeder switch component and communication monitoring component.

1. iTAC120 Intelligent Dual-Power Switch Component

   iTAC120 intelligent dual-power switch component is an assembly designed with AC incoming switch, drawer type class PC ATS automatic change-over switch with bypass, mutual inductor, indicator light and AC intelligent monitoring device. The component is of modular design and drawer type ATS with bypass is used. It solves the problem of troubleshooting without power cut-off. It is designed based on the concept of fast assembly. It can solve the problem of production standardization of ATS incoming line.

2. iTAC120 Intelligent Feeder Switch Component

   iTAC12 intelligent feeder switch is a leader modular component which is innovatively designed by feeder switch, current and voltage sampling module, and intelligent module IPM-C. Standard installation, maintenance and intelligent monitoring for fixed switch is thus enabled.

Models of components of iTAC120 intelligent feeder switch are described below:

![iTAC120 Intelligent Feeder Switch](image)

**iTAC120 Intelligent Feeder Switch**

Components of intelligent feeder switch can be selected breakers of 630A and below of many brands, such as:

- ABB: 5T series
- Schneider: NMX/CVS series
- Nader: NDM2/NDM3 series
- People Electric: GHM8 series

The product may be compatible with breakers of many brands later.

![Compatible Breakers](image)
Dimension of feeder switch components

Miniature circuit breaker of 63A and below (3P):

![Space diagram](https://example.com/image1)

![Dimensional drawing](https://example.com/image2)

Molded-case circuit breaker of 250A and below (3P):

![Space diagram](https://example.com/image3)

![Dimensional drawing](https://example.com/image4)

400A-630A molded-case circuit breaker (3P):

![Space diagram](https://example.com/image5)

![Dimensional drawing](https://example.com/image6)

Note: 4-pole circuit breaker and 3-pole circuit breaker are only different in height. Refer to the above table for details.

3. Group panel design

Boundary dimension of cabinet

Front dimensional views of GQH-SPC incoming and feeder cabinets are shown below. The height of the cabinet is 2280mm, the width is 880mm, and the depth can be selected as required.

Module specification of Intelligent Feeder Switch Components

12.5mm is considered as standard module of GQH-SPC intelligent power distribution system, namely, H=12.5mm. Each iTAC intelligent feeder switch component is integer times greater than 1E. For customer’s convenience of wiring and maintenance, it is recommended that the height of 250mm shall be reserved from upper surface of installation position to top of cabinet and the height of 300mm shall be reserved from lower surface of installation position to bottom of cabinet. For that reason, installation space of 332E is recommended. Sequence of intelligent feeder switch components can be adjusted as well within effective installation space. In consideration of easy installation and maintenance, high current is usually installed at the upper part and low current is installed at the lower part.

Description on loops to be installed for different switch systems:

- **1# AC incoming line panel P1**: 1 section of AC feeder screen P2
- **GQH-SPC intelligent module low-voltage distribution system**

### Comparison table of modulus height of intelligent feeder switch components

<table>
<thead>
<tr>
<th>Type</th>
<th>Model</th>
<th>Height (E)</th>
<th>Height (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Miniature circuit breaker of 63A and below /2P</td>
<td>iTAC123-63A/2P</td>
<td>5E</td>
</tr>
<tr>
<td>2</td>
<td>Miniature circuit breaker of 63A and below /3P</td>
<td>iTAC123-63A/3P</td>
<td>6E</td>
</tr>
<tr>
<td>3</td>
<td>Miniature circuit breaker of 63A and below /4P</td>
<td>iTAC123-63A/4P</td>
<td>8E</td>
</tr>
<tr>
<td>4</td>
<td>Miniature circuit breaker of 250A and below /3P</td>
<td>iTAC123-250A/3P</td>
<td>13E</td>
</tr>
<tr>
<td>5</td>
<td>Molded-case breaker of 250A and below /4P</td>
<td>iTAC123-250A/4P</td>
<td>14E</td>
</tr>
<tr>
<td>6</td>
<td>Molded-case breaker of 400A-630A/3P</td>
<td>iTAC123-400A3P</td>
<td>19E</td>
</tr>
<tr>
<td>7</td>
<td>Molded-case breaker of 400A-630A/4P</td>
<td>iTAC123-830A/4P</td>
<td>24E</td>
</tr>
</tbody>
</table>

Note: The incoming line is composed of iTAC110 intelligent dual-power switch components. Common electric devices can be used and common layout can be adopted according to the actual demand.
A typical design plan of ITAC110 intelligent dual power switch components is adopted.

- Power distribution system
- Integration monitoring
- Touch screen TPC1363A

Typical design arrangement plan of ITAC110 intelligent dual power switch components is adopted.
5. Monitor communication

1. Installation of cabinet

1.1 Appearance Inspection
- Inspect external packing of cabinet. If evident collision deformation scnt is found, please remain the same and notify the carrier immediately.
- Open cabinet pack and check appearance of cabinet. If damage is found on appearance of cabinet, please notify the carrier immediately.
- Check whether accessories attached with the cabinet is complete. If shortage of accessories is found, please notify the dealer immediately.
- Open cabinet pack and check appearance of cabinet. If damage is found, please remain the same and notify the carrier immediately.
- Inspect external packing of cabinet.

1.3 Schematic Diagram of Cabinet Installation
- Environmental requirements for installation space of the cabinet
- Distance between back of cabinet and wall shall be at least 1000 mm, distance between ceiling and top of cabinet shall be at least 500 mm.
- Distance between two rows of cabinet The minimum distance between two rows of cabinet shall be more than 2000 mm.

1.2 Handle and Fix the Cabinet
- Handle the cabinet to site ready for installation. Forklift and other similar hoisting equipment shall be used during handling.
- After cabinet is put in place, please firm the foot margin of the cabinet or use screw to fix the cabinet tightly. The cabinet is heavy. Please ensure that the cabinet is firmly fastened.
- Note: Installation environment shall meet the requirements in the manual.

2. Assembly of Intelligent Feeder Cabinet

2.1 Cabinet Assembly
- When iTAC120 intelligent feeder switch components are sold separately, seat of components, intelligent module IPM-C and current and voltage gathering module are all standard products. Customers only need to buy circuit breaker and cabinet frame to constitute a system.
- Composition steps of intelligent feeder cabinet:
  1) Install seat of iTAC120 intelligent feeder switch block on the cabinet.
  2) Integrate switch and current & voltage gathering module into a switch module.
  3) Lock switch module on the seat of the component with insulating screw.
  4) Install plastic door.
  5) Install intelligent TPM-C into port on back of the component and connect the data line.

2.2 Wiring of Feeder Cabinet
- Ensure that superior input switch of parts which need to be contacted during the whole operation shall be disconnected before wiring for cable security inspection is selected according to load condition, and that cable and bonding conductor are all uncharged. During installation, necessary protection devices shall be adopted.

2.3 Wiring of Feeder Cabinet
- Application steps:
  1) Open standard panel
  2) Point intelligent switch block to middle guide groove and insert it into middle guide groove.
  3) Lock out insulating screw.
  4) Close standard panel

3. Application of Intelligent Feeder Cabinet

4. Assembly and adjustment

3.1 Inspection before Operation
- The following inspection and tests shall be carried out after installation or maintenance of switch cabinet and before it is put into service (inspection after maintenance shall conform to inspection norms).
- Check whether electrical equipment and wiring inside the switch cabinet are in line with requirements of drawings, line ends are numbered and wiring is regular and firm.
- Check whether all installed electrical equipment is in good contact condition and conforms to the own technical requirements.
- Check whether mechanical interlock and electrical interlock are reliable.
- Check whether actions of switch components are flexible and their contact is good.
- Check and test whether grounding device is firm and whether there are clear signs. And voltage-nilhstand test shall be carried out.
- Check and test whether all signs and operation of relay are normal.
3.2 Intelligent Module Address Set

<table>
<thead>
<tr>
<th>ON</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Binary system</td>
<td>0000X</td>
<td>1000X</td>
<td>0100X</td>
<td>1100X</td>
<td>0010X</td>
</tr>
<tr>
<td>Decimal system</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

3.3 Indicator Description

Definition of panel lamps

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Color</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Running direction</td>
<td>Green</td>
<td>Normally, the flicker frequency is 1Hz. No flickering means CPU crash.</td>
</tr>
<tr>
<td>2</td>
<td>Device failure</td>
<td>Red</td>
<td>Red goes out when running normally and lights up when the device fails.</td>
</tr>
<tr>
<td>3</td>
<td>Abnormal voltage</td>
<td>Red</td>
<td>Red goes out when voltage of incoming bus is normal and lights up when the voltage is abnormal.</td>
</tr>
<tr>
<td>4</td>
<td>Operation indication</td>
<td>Red</td>
<td>Red lights up when the device is switched over and it goes out when the device is switched back.</td>
</tr>
<tr>
<td>5</td>
<td>Local indication</td>
<td>Green</td>
<td>Green lights up in local mode and goes out in remote model.</td>
</tr>
<tr>
<td>6</td>
<td>Remote indication</td>
<td>Green</td>
<td>Green lights up in remote mode and goes out in local model.</td>
</tr>
<tr>
<td>7</td>
<td>Communication indication</td>
<td>Green</td>
<td>Green flashes when the 485 communication port receives effective message.</td>
</tr>
</tbody>
</table>

3.4 Operation Instruction for Adjustment of Integrated Monitoring Unit of System

The function of integrated monitoring unit is to realize communication between the upper computer and the function module and to realize the on-site management functions of the functional module. Namely, the operating data and parameters of the functional module can be browsed on site and parameters of some constant values for system operation can be modified.

The main interface of operation of touch screen is shown below:


Parameter of apparatus

AC parameter source subsystem  (PV parameter)

■ Parameter of apparatus

Click "feeder line" and enter feeder power system, such as:

Remote regulating of 1 section of AC power source subsystem

Blocking/deblocking of over current constant value:

Primary constant value:

Secondary constant value:

Overvoltage alarm constant value:

Charge delay:

Precision coefficient of bus Ib:

Precision coefficient of bus Ic:

Precision coefficient of bus Ia:

Precision coefficient of zero sequence protection:

Effective value of B phase:

Fundamental frequency:

Active electrical degree:

Apparent power:

Reactive power:

Active power:

Voltage

■ Click "feeder line" and enter feeder power system, such as:

Remote regulating of 1 section of AC power source subsystem

Blocking/deblocking of over current constant value:

Primary constant value:

Secondary constant value:

Overvoltage alarm constant value:

Charge delay:

Precision coefficient of bus Ib:

Precision coefficient of bus Ic:

Precision coefficient of bus Ia:

Precision coefficient of zero sequence protection:

Effective value of B phase:

Fundamental frequency:

Active electrical degree:

Apparent power:

Reactive power:

Active power:

Voltage

■ Check relevant information of switch, directly click corresponding switch, such as:

Browse alarm information

Click alarm information in the main interface to enter real-time alarm.

When checking alarms, press the last day, the latest week, or the latest month, and according to the time condition. For example: the last day

Note:

1. In remote model, operation model can be modified in the upper computer and the integrated monitoring unit;
2. In local model, operation model cannot be modified in the upper computer and the integrated monitoring unit;
3. Modification of constant value, recovery of signal and electrical degree shall be carried out in remote mode.
4. Click "feeder line" and enter feeder power system, such as:
A serial port of communication management machine

Click “1#TM104 serial port setup”, enter interface of communication management setup, as shown in the figure:

![Diagram]

Use Help:
Click “use Help” on the main interface and enter the main interface.

![Use Help]

Common Failure Handling

<table>
<thead>
<tr>
<th>No.</th>
<th>Possible failure</th>
<th>Possible failure cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Monitoring display does not respond to the state of power intelligent monitoring device</td>
<td>Communication line is not firm or power intelligence monitoring unit fails</td>
</tr>
<tr>
<td>2</td>
<td>Monitoring display is shown in the form of monitoring display failure</td>
<td>Communication line is not firm or power intelligence monitoring unit fails</td>
</tr>
<tr>
<td>3</td>
<td>Monitoring display is not shown</td>
<td>Communication line is not firm or power intelligence monitoring unit fails</td>
</tr>
<tr>
<td>4</td>
<td>Testing block or monitoring display is not shown</td>
<td>Monitoring display is not shown</td>
</tr>
<tr>
<td>5</td>
<td>Monitoring display is not shown</td>
<td>Monitoring display is not shown</td>
</tr>
</tbody>
</table>

Precautions

1. When working on fully-charged and partially-charged board, servicing equipment and running equipment shall be separated with a clear sign.
2. The secondary winding with mutal inductor and voltage transformer shall be provided with permanent and reliable protective earthing.
3. When working on the secondary loop of the operating current transformer, mind the following:
   - It is forbidden to cut off the secondary loop of current.
4. The following safety measures shall be taken when working on the secondary loop of operating voltage transformer:
   - Short circuit or ground connection shall be prevented strictly.
   - Use insulating tools and wear insulating gloves. When necessary, related relay protective device shall be stopped before working.
   - When temporary load is being connected, special switch and fuse must be installed.
   - When you conduct the power-on test of the secondary loop, in order to prevent the secondary side from transforming voltage to primary side, in addition to cutting off the secondary loop, the primary fuse shall be removed.
   - Before power-on test or voltage-withstand test of the secondary loop, please notify persons on duty or persons concerned, and assign persons to watch the site and check the loop. Add voltage when it is ensured that no one is at work.
   - Without the consent of persons on duty, operators inspecting power-off protection and the secondary loop cannot transfer switch.

2. Safety Test,

ITAC120 series intelligent feeder switch components have passed the short-circuit arc-over test of National Medium and Low-voltage Power Transmission and Distribution Equipment Quality Control and Inspection Center and relevant test report is obtained.

Appendix

<table>
<thead>
<tr>
<th>No.</th>
<th>Type</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Single-phase mutual inductor or hall sensor</td>
<td>[Diagram]</td>
</tr>
<tr>
<td>2</td>
<td>Single-phase hall sensor and DC leakage sensor</td>
<td>[Diagram]</td>
</tr>
<tr>
<td>3</td>
<td>Single-phase mutual inductor or hall sensor</td>
<td>[Diagram]</td>
</tr>
<tr>
<td>4</td>
<td>Breaker</td>
<td>[Diagram]</td>
</tr>
<tr>
<td>5</td>
<td>Insulating screw connection (non-drawer cabinet connector)</td>
<td>[Diagram]</td>
</tr>
<tr>
<td>6</td>
<td>ATSE automatic change-over switch</td>
<td>[Diagram]</td>
</tr>
</tbody>
</table>

Contact us:
Telephone: 400-6755-406
### 3. Test Report

<table>
<thead>
<tr>
<th>Test item</th>
<th>Requirement</th>
<th>Measurement or observation results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage (effective value)</td>
<td>380V</td>
<td>380.2V</td>
</tr>
<tr>
<td>Current (effective value / peak value)</td>
<td>10A / 14A</td>
<td>10.1A / 14.2A</td>
</tr>
<tr>
<td>Power factor (Time constant)</td>
<td>0.95</td>
<td>0.94</td>
</tr>
<tr>
<td>Arc-over fuse</td>
<td>Operating sequence</td>
<td>Check arc-over fuse for blowout and check module for damage during test.</td>
</tr>
<tr>
<td>Number of prospective current oscillogram</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of report chart shown in &quot;0&quot; test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of oscillogram of &quot;CO&quot; test</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 3. Certification

- Mumian 500kV transformer substation of Guangzhou Power Supply Bureau Co., Ltd.
- Wening 500kV transformer substation of Zhejiang Grid Corporation
- Malaixing 500kV transformer substation of Jiangxi Grid Corporation
- Taiyuan 500kV south transformer substation of Shanxi Grid Corporation
- Xuesheng 220kV power transmission and transformation project of Shanghai Power Supply Bureau Co., Ltd.
- Shanghai 220kV power transmission and transformation project of Shanghai Power Supply Bureau Co., Ltd.
- Shanghai 220kV transformer substation project of Shanghai Power Supply Bureau Co., Ltd.
- Guangzhou 220kV transformer substation project of Guangzhou Power Supply Bureau Co., Ltd.
- Zhuhai 110kV transformer substation project of Guangzhou Power Supply Bureau Co., Ltd.
- Transformation of Tianzhu 110kV substation of Daoshan Power Supply Company of State Grid Nanhua Electric Power Company
- Transformation of 110kV transformer substation project of Guangdong Power Supply Bureau Co., Ltd.
- Transformation of 110kV station-purposed AC power device of Guangdong Power Supply Bureau Co., Ltd.
- Transformation of 110kV station-purposed AC power device of Pinghu substation of Shanghai Power Supply Bureau Co., Ltd.
- Transformation of 110kV station-purposed AC power device of Henggang substation of Shanghai Power Supply Bureau Co., Ltd.
- Funing 110kV transformer substation project of Funing Power Supply Bureau Co., Ltd.
- General step-down station of China National Offshore Oil Corporation (Zhuhai)
- Construction project of machine room of Center of Yunnan Branch of Agricultural Bank of China
- Data centre of backoffice service center of Tianjin Huihai Bank
- Dispatch and control project of Jiabei Electric Power Authority
- General step-down station of China National Offshore Oil Corporation (Zhanjiang)
- Construction project of machine room of Center of Yunnan Branch of Agricultural Bank of China
- Data centre of backoffice service center of Tianjin Huihai Bank
- Dispatch and control project of Jiabei Electric Power Authority
- Demonstration project of "Research and Development of Large-scale Wind Farm DC Power Transmission Access Technology" of Shantou Power Supply Bureau of Guangdong Grid Corporation.
- Transformation of 110kV station-purposed AC power device of Guangdong Power Supply Bureau Co., Ltd.
- Transformation of 110kV station-purposed AC power device of Pinghu substation of Shanghai Power Supply Bureau Co., Ltd.
- Transformation of 110kV station-purposed AC power device of Henggang substation of Shanghai Power Supply Bureau Co., Ltd.
- Transformation of 110kV station-purposed AC power device of Pinghu substation of Shanghai Power Supply Bureau Co., Ltd.
Adresse des sièges sociaux: Le 4ème et 6ème étage, Bâtiment No.1, Zone d'Industrie Honghui, 2ème Rue Liuxian, Baoan District, Shenzhen, Guangdong, Chine.

Téléphone: 86-0755-86336066- EXT. 2319
Fax: 86-0755-83572399

Website: www.ontechelectric.com

Base de production: No.1, Route Jinping, Parc d'industrie Eco, Comté de Jixi, Anhui

Téléphone: 86-0563-8156556

TIEON est une filiale de Tieon.

Les noms et les logos de produits sont des marques de commerce ou des marques de commerce enregistrées de TIEON. Les autres noms de produits ou d'entreprises mentionnés dans ce manuel peuvent être des marques de commerce ou des noms de produits de leurs propriétaires. Sans le consentement écrit de TIEON et du propriétaire des marques de commerce ou des noms de produits, les utilisateurs ne peuvent pas avoir la permission de faire usage des marques de commerce mentionnées dans ce manuel de quelque manière que ce soit.

Le produit est conforme aux exigences environnementales et de sécurité des produits. Le stockage, l'application et le rejet du produit doivent être effectués conformément au mode d'emploi du produit, aux contrats relevant ou aux lois et réglementations nationales.

En raison des mises à jour et des améliorations constantes du produit et de la technologie, les informations contenues dans ce manuel peuvent ne pas être complètement conformes à la pratique du produit. Veuillez prendre contact avec le bureau local si vous avez besoin de connaître l'état de mise à jour du produit.

Pour obtenir les informations les plus récentes, veuillez visiter: http://www.ontechelectric.com/