

1. Overview

TC-DH230 Combined Electrical Fire Monitoring Detector (the Detector) is a production researched and developed by our company to meet the demand of market. The Detector builds up an electrical fire monitoring system with our productions of JB-DH-TC5600 Electrical Fire Monitoring Equipment, TC-DH12A Combined Electrical Fire Monitoring Detector and TC-DH01B series of Residual Current Electrical Fire Monitoring Detector. The Detector can realize the function of leakage test, temperature test and output controlling by connecting with JB-DH-TC5600 Electrical Fire Monitoring Equipment through two-line loops. It can also connect with many other kinds of residual current transformers to realize stable and reliable operating.

Electrical fire monitoring system can effectively prevent electrical fires and reduce losses.

2. Features

2.1 The Detector and the Electrical Fire Monitoring Equipment use non-polarized two-line system to connect. With mature technology, it is reliable in communication and convenient in cabling.

2.2 The Detector uses a high-performance CPU, intelligent algorithm and watchdog technology, highly efficient and reliable.

2.3 The Detector has a built-in passive output control which can connect with one or two loops to alarm leakage.

2.4 The Detector has the function of self-test which can test the screen and squealers working normally or not.

2.5 The Detector can set the residual current from 200mA to 1000mA of residual current transformers, which is high-precision detecting and widely used. It can be programmed with address and convenient for commission and maintenance.

2.6 The alarming temperature can be set from 45°C to 140°C, high-precision detecting and widely used. It is convenient for commission and maintenance by the setup of addressable code and temperature.

2.7 The Detector has a good-looking appearance with intuitive showing of LCD information, simple operation and powerful functions, scalability and easy to installation.

3. Technical Features

3.1 Operating voltage: AC 220V

3.2 Operating current: $\leq 10\text{mA}$

3.3 Alarming current: $\leq 25\text{mA}$

3.4 Rated alarming current: 200mA~1000mA, step 1mA

3.5 Rated alarming temperature: 45°C~140°C, step 1°C

3.6 Loop interface: Loop 24V, non-polarized

3.7 Capability of output terminal: 1A/AC125V, 3A/DC24V

3.8 Response time: $\leq 10\text{s}$

3.9 Rated frequency through the line: 50Hz/60Hz

3.10 The parameters of residual current transformer can be seen in chapter 5.3

3.11 Operating environment:

Temperature: $-10^{\circ}\text{C} \sim +50^{\circ}\text{C}$

Relative Humidity: $\leq 95\%$, no condensation

Altitude: $< 5000\text{m}$

3.12 IP Grade: IP30

3.13 Weight: about 420g

3.14 Standard:

GB 14287.2-2014 "Electrical fire control system - Part 2: residual current electric fire detectors"

GB 14287.3-2014 "Electrical fire monitoring systems - Part 3: The temperature electric fire detectors"

4. Structure and Working Principle

4.1 Refers to Fig.1 for the appearance of detector

4.2 Working principle

The Detector receives the information from the sensor. When the information sent by the sensor reaches the setup value of threshold, the detector will send audible and visual alarm, and the screen will display the current alarm at the same time. If the Detector has been connect with the loop, the detector can upload alarm, faults and some other information to the electrical fire monitoring equipment and execute the order of the equipment.

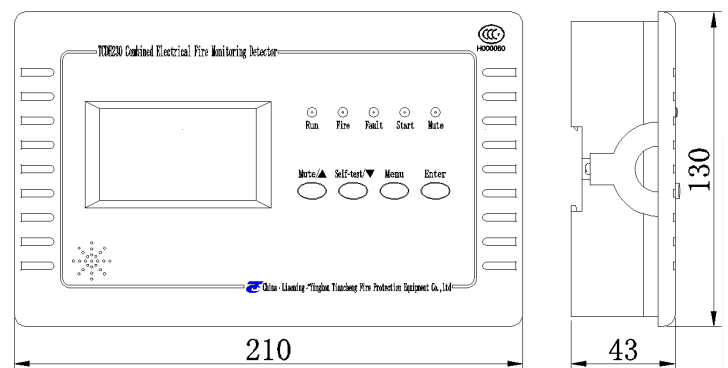


Fig. 1 Diagrammatic

5. Installation and Cabling

5.1 Installation

Check intact shell and complete markings is necessary before installation.

There are three ways to install the detector, wall-mounted, rail-type and embedded. These three types show as below:

5.1.1 Wall-mounted installation:

First: according to the dimension of the detector (showing in Fig.2), punch two parallel holes of $\phi 5\text{mm}$ on the installation board. The distance of those two holes is 104mm (punching two screwed holes of M4mm is also available).

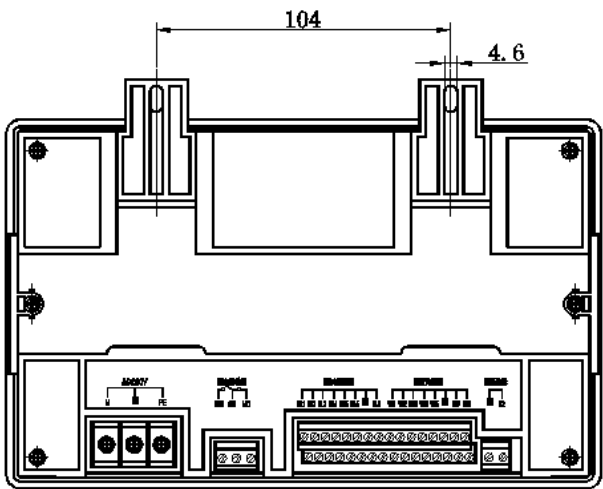


Fig. 2

5.1.3 Embedded installation

First: according to the dimension of the detector (showing in Fig.5), punch one quadrate hole of 202.5mm×122.5mm on the installation board. The detector is loaded from the front and the shell is fixed with two pieces from the rear of the installation board.

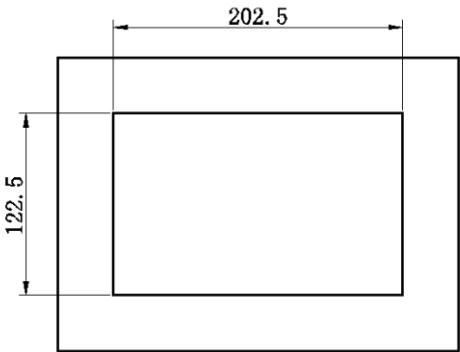


Fig. 5

Second: the detector is loaded from the front of installation board and is fixed from the rear of the installation board by 2 installation fasteners. Show as Fig. 6

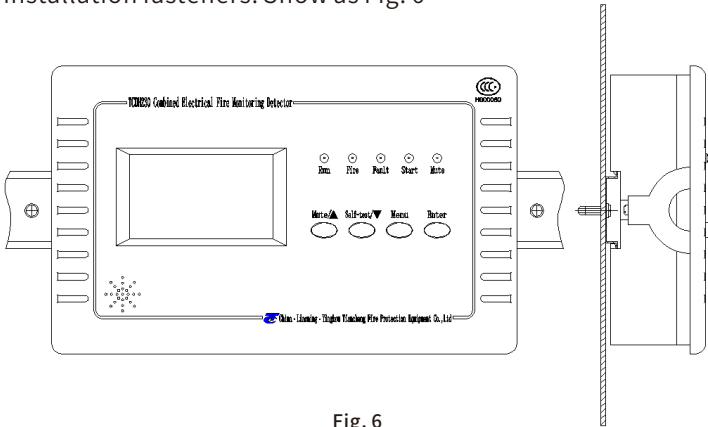


Fig. 6

Second: pull out the moveable mount of both sides on the bottom of the product firmly until the limit position.
Third: align the detector mounting holes with holes on the installation board. Use M4 × 12mm screws to screw the two parts together and use M4mm nuts to screw tight in the back of the board (If they are screwed holes, use M4mm nuts to tight them up). As Fig. 3 shows:

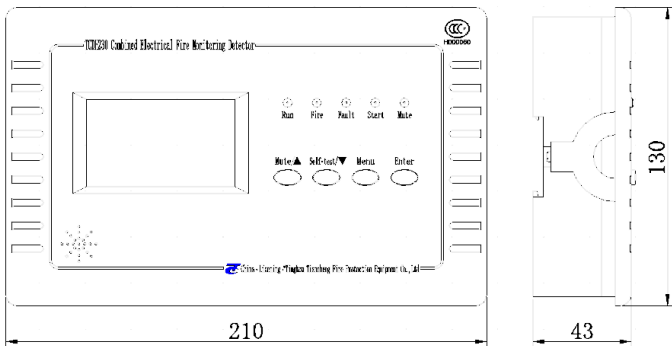


Fig. 3

5.1.12 Rail installation:

First: mount the standard rail on the installation board of distribution box.
Second: pull the moveable mount on the bottom of the detector out 3-4mm. then install the detector on the standard rail.
Third: after installation, pull the moveable mount inside so that the detector could slide on the rail and won't loosen. As Fig.4 shows:

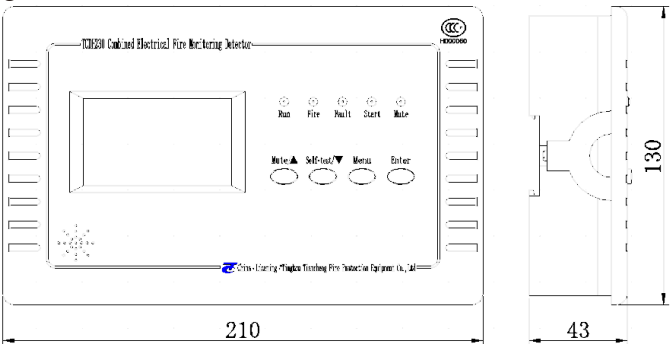


Fig. 4 Rail installation diagrammatic

5.2Cabling

Refer to Fig.7 for block terminals of the detector. And the details is displayed in Table 1

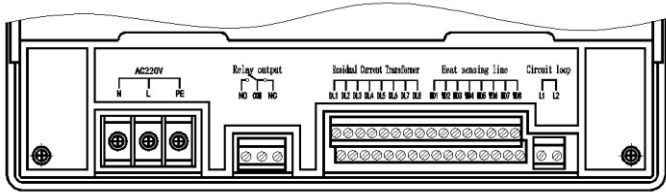


Fig. 7 Diagrammatic of connecting terminals

(Table on next page→)
Table 1: Description of block terminals
Cabling requirement:
1)Power lines N, PE, L: use fire-retarded BVR lines, the sectional area is no less than 1.0mm²
2)Lines of normally open terminal: use fire-retarded BVR lines, the sectional area is no less than 1.0mm²
3)Lines DLn/WDn of leakage and temperature sensor: use shielding and fire-retarded RVS twist pair, the sectional area

is no less than 0.5 mm^2 , length less than 3m.

4)Signal loop lines L1, L2: use shielding and fire-retarded RVS twist pair, the sectional area is greater than 1.0 mm^2 , the length should be limited by the resistance of a single wire which is no more than 20Ω . Otherwise the sectional area of wire should be increased.

Cabling requirement: cross metal pipe (trough) or lay flame-retardant PVC pipe.

Terminal Name	Terminal definition	Line system	Cabling	Function
AC220V	N、PE、L	3	N accesses to the zero line, L accesses any input terminals A, B, or C of breaker, PE connects the earth.	Input terminal of power supply
Relay output	NO、CM、NC	3	NO is normally open terminal, NC is normally close terminal, CM is sharing terminal.	Control the release
Residual current transformer	Up line 1: Leakage terminal DLn Down line 1: sharing terminal	2	Leakage terminal: connect one side of the residual current transformer Sharing terminal: connect the other side of residual current transformer	Connect terminals of residual current transformer
Temperature sensor	Up line 1: temperature terminal WDn Down line 1: sharing terminal	2	Temperature terminal: connect one side of temperature sensor. Sharing terminal: connect the other side of temperature sensor	Connect terminals of temperature sensor
Loop	L1、L2	2	Outside loop, connect with electrical fire monitoring equipment	Communicate with control pannel

Type	Dimension	Current through wire
CTZ6-045	45mm	100A
CTZ6-065	65mm	250A
CTZ6-080	80mm	315A
CTZH61F-2550	250mm×50mm	630A
CTZH61F-3260	325mm×60mm	1000A

5.1Connecting details of detector and residual current transformer→

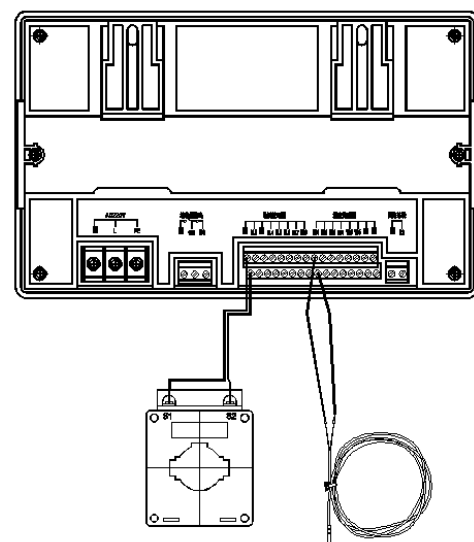


Fig. 8

6. Usage and operation

6.1 Description of LEDs

Running: Green. It flashes when the detector runs normally.
Fire: Red. If there is no alarm, it goes out. If there is an alarm, it lights on.

Fault: Yellow. If the detector runs normally, it goes out. It flashes when there is any fault about the detector or sensor.

Start: Red. It illuminates when there is any output control operation.

Mute: Green. It illuminate when it is in mute status.

6.2 Description of keys

The key pad includes four keys: Mute/▲, Self-test/▼, Function and Enter. Through these four keys, we can realize operations of the detector. Press the key of “Mute/▲” longer than 3 seconds to realize the function of exit.

6.3 Mute

When an alarm occurs, the detector will start to alarm. In this situation, press “Mute” to stop alarming and the light will illuminate at the same time. If another alarm or fault occurs again, the detector will start to alarm again.

6.4 Self-test

On the interface of main menu, press “Self-test” and input the password, the detector will enter self-test to test the status of LCD, LEDs and loudspeakers.

6.5 Switch function

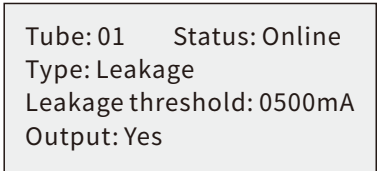
Press “Function” to switch among “Main menu”, “Fire” and “Fault”

6.6 Reset

On the interface of main menu, press “Function” to enter function menu. Then press “Self-test/▼” to choose “Reset”. Press “Enter” and input the user password to reset the detector. The initial password is “Mute, Mute, Mute, Mute”. Notice: When the Electrical Fire Monitoring Equipment sends reset order to it, the detector can also realize the reset function.

6.7 Device information inquiry

On the interface of main menu, press “Function” and enter functional menu. Press “Self-test/▼” to choose “Device info inquiry”, and press “Enter”. Show as Fig. 6.7.1:



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Tube: 01    Status: Online
Type: Leakage
Leakage threshold: 0500mA
Output: Yes
  
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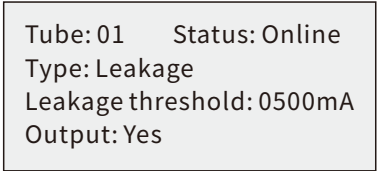
Fig. 6.7.1

Press “Self-test/▼” or “Mute/▲” to choose the tube number need to query.

6.8 Sensor edit

On the interface of main menu, press “Function” and enter

functional menu. Press “Self-test/▼” to choose “Sensor edit”. Then press “Enter” and input the user password. Show as Fig. 6.8.1:



```


Tube: 01    Status: Online
Type: Leakage
Leakage threshold: 0500mA
Output: Yes
  
```

Fig. 6.8.1

Press “Self-test/▼” or “Mute/▲” to change all kinds of parameters. Press “Function” to switch items and “Enter” to save

6.9 Local parameter setup

On the interface of main menu, press “Function” and enter functional menu. Press “Self-test/▼” to choose “Local parameter setup”. Then press “Enter” and input the user password. Show as Fig. 6.9.1:



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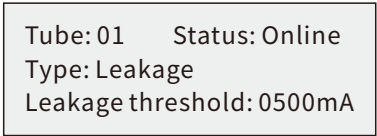
Address: 001
Correction: 64
  
```

Fig. 6.9.1

Press “Self-test/▼” or “Mute/▲” to change all kinds of parameters. Press “Function” to switch items and “Enter” to save. The correction value has been set at the factory to calibrate the test values.

6.10 Field data monitoring

On the interface of main menu, press “Function” and enter functional menu. Press “Self-test/▼” to choose “Field data monitoring” and press “Enter”. Show as Fig. 6.10.1:



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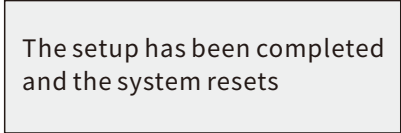
Tube: 01    Status: Online
Type: Leakage
Leakage threshold: 0500mA
  
```

Fig. 6.10.1

Press “Self-test/▼” or “Mute/▲” to change the tube needing to monitor.

1.1 Factory default

On the interface of main menu, press “Function” and enter functional menu. Press “Self-test/▼” to choose “Factory default”. Then press “Enter” and input the user password. Show as Fig. 6.11.1



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The setup has been completed
and the system resets
  
```

Fig. 6.11.1

After completing the setup, the detector will reset automatically.

Notice: This operation is to reset all the parameters and

passwords to factory default.

6.12 Password modify

On the interface of main menu, press “Function” and enter functional menu. Press “Self-test/▼” to choose “Password modify”. Then press “Enter” and input the user password. Show as Fig. 6.12.1



Fig. 6.12.1

Input a password of four digits and press “Enter” to finish the operation.

7.Common faults and troubleshooting

Common faults	Troubleshooting
No transformer tube alarming	Connect the transformer onto the tube, or set the tube as offline.
No test value, no alarming	Set the status of tube as online in the sensor edit
The detector shows temperature fault	After power off, check the fault tube is open circuit or short circuit or not. Power on again after troubleshooting.

8.Accompanying Documents and Warranty

8.1Accompanying documents:

Installation and Operation Manual: 1 piece

8.2Components

Residual current transformer

Temperature sensor

8.3Warranty:

Manufacturers are responsible for the life-long maintenance of productions

Maintenance location: Yingkou, Liaoning, China