



## GDF-3000A DC System Earth Fault Tester



### General Information

DC system insulation faults, DC mutual faults and AC power failures are faults that are prone to occur and are harmful to the power system, and endanger the normal operation of the power system.

In order to better help field maintenance personnel to quickly and accurately find DC faults, our company has developed a DC fault finder by years of efforts and summing up a large number of field experiences.

The DC grounding finder uses a high-precision current clamp meter to detect and locate faults using the DC current difference in the fault loop. The fast FFT transform technology is introduced into the DC fault finding device, to detect various types of

insulation faults, DC mutual faults, and AC power failures in DC systems with different voltage level (24V,48V,110V,220V).

### **Main Functions**

- (1) System-to-ground voltage measurement function, the instrument can measure the system-to-ground voltage, negative-to-ground voltage, system voltage, and can realize the voltage monitoring range of 0-300V;
- (2) System insulation impedance measurement function, the instrument can measure the insulation resistance of the system to ground, the negative insulation resistance to the ground, the balance bridge size detection, the measurement range is 0-999.9K $\Omega$ ;
- (3) AC power detection function, the instrument can judge the AC power failure in the DC system, and can measure the AC voltage value in the DC system, the AC voltage measurement range is 0-280V;
- (4) System distributed capacitance measurement function, the instrument can measure the distributed capacitance of the system and display in real time;
- (5) Ring network detection and positioning function, the instrument can detect various ring network faults in the two bus bars, including positive ring, negative ring, bipolar ring and bipolar ring, etc., and can be realized by waveform display and direction display to locate the fault point of the ring network;
- (6) The device has amplitude modulation, reset, current waveform selection and working mode selection function, which can realize the search and location of high resistance ring network faults.
- (7) Branch insulation resistance measurement and insulation fault location function, the instrument measures the insulation resistance of each branch to ground, and can realize the location of insulation fault points through waveform display and direction display;
- (8) Fault current spectrum analysis function, the device effectively extracts the signal amplitude of the measured current frequency point, and improves the detection precision by spectrum analysis function of current change with fast FFT transform ;

(9) Ammeter function, the device can be used as a high-precision ammeter, and the current measurement resolution can reach 0.01mA;

(10) Waveform curve display and direction display function. When using the detector to detect the measured branch, it will display the current change of the measured branch in the form of a waveform curve on the screen, which is convenient for the user to realize the fault point quickly and accurately. Find the direction of the fault point when there is a ring fault and a ground fault.

## **Features**

### **I High reliability design**

The device adopts imported 32-bit microcontroller as the main system, and the hardware design strictly follows the power and electromagnetic compatibility related standards. The internal redundancy mode is adopted to ensure the reliability of the device and the device under test.

### **I Precision material selection**

The device adopts high-precision collector as the signal acquisition unit, and the voltage sampling adopts high-precision imported analog-digital conversion chip, voltage and impedance are measured accurately;

### **I Humanized human-computer interaction interface**

Both the analyzer and the detector use a TFT liquid crystal display for users to view information;

The operation is simple and fast, and when the detection of different branches is realized, only one start button can be completed;

The test results are straightforward and the test results can be presented to the user in a variety of display formats, including grounding or not waveform, insulation levels, insulation resistance, leakage current, and direction information.

### **I Intelligent detection and recognition system**

The analyzer automatically recognizes the system voltage level;

The analyzer can determine the ring fault category;

After the detector and analyzer information are synchronized once, it will not be affected by the detection distance;

When the detector is inspecting, the collector can clamp a single power cord or clamp multiple power cords to improve detection efficiency;

After the detector test is completed, if the tested branch has a ring network or insulation fault, the direction information of the fault point relative to the test point is determined.

#### I Complete testing function and ability to handle faults

The wireless data transmission module is built in between the analyzer and the detector for communication. The test function and display information are complete, and can deal with various ring networks and insulation faults in the DC system.

The analyzer has a variety of combined working mode by selecting functions of “Amplitude Modulation”, “Waveform” and “Mode”, which can adapt to various complex application environments.

#### I High security

The device adopts the micro-amplitude detection signal and the high-resolution DC detection collector to realize fault detection and positioning, and has no influence on the DC system.

### Specification

| Specifications of Analyzer        |             |
|-----------------------------------|-------------|
| Working Voltage                   | DC 40-300V. |
| Environment temperature           | -20℃—55℃    |
| Relativity humidity               | 0—90%       |
| DC voltage measurement            |             |
| DC voltage measurement range      | 0-300V      |
| DC voltage measurement resolution | 0.1V        |

|  |                           |
|--|---------------------------|
| DC voltage measurement accuracy                  | 0.2%                      |
| AC voltage measurement                           |                           |
| Measurement AC and DC string voltage             | 0-280v                    |
| AC voltage measurement resolution                | 0.1V                      |
| AC voltage measurement accuracy                  | 0.5%                      |
| Insulation resistance measurement                |                           |
| Insulation resistance measurement range          | 0-999.9K $\Omega$         |
| Insulation resistance measurement resolution     | 0.1K $\Omega$             |
| Insulation resistance measurement accuracy       | $\leq \pm 5\%$            |
| Detect bridge amplitude adjustment range         | 0mA,0.25mA,0.5mA ,1mA,2mA |
| Detect ring network resistance range             | less than 50K $\Omega$    |
| System distributed capacitance measurement       |                           |
| System distributed capacitance measurement range | 0-999.9uF                 |

|  |   |
|--|---|
| System ground resistance measurement         | 0-1000k $\Omega$                            |
| Detection waveform type selection            | sine wave, square wave                      |
| Working mode                                 | forced signal start, automatic signal start |
| Display media and resolution                 | TFT, 320x240                                |
| Specifications of Detector                   |   |
| Insulation resistance measurement            |   |
| Insulation resistance measurement range      | 0-500K $\Omega$                             |
| Insulation resistance measurement resolution | 0.1K $\Omega$                               |
| Insulation resistance measurement accuracy   | $\leq \pm 10\%$                             |
| Spectrum analysis range                      |   |
| Number of spectrum analysis channels         | 1   |
| Spectrum analysis frequency range            | 0.125-12.5Hz                                |
| Frequency resolution                         | 0.125Hz                                     |

|   |   |
|---|---|
| Current waveform display period             | 8s;   |
| Detectable feeder current range             | 0-2A;   |
| Current measurement range                   | -100-+100mA;  |
| Current measurement resolution              | 0.01mA  |
| Display media and resolution                | TFT, 320x240  |
| Wireless communication technical indicators |   |
| Rate  | 2Mbps, because the air transmission time is very short, the collision phenomenon in wireless transmission is greatly reduced. |
| Multi-frequency point                       | 125 frequency points, meeting the needs of multi-point communication and frequency hopping communication                      |
| Ultra-small                                 | built-in 2.4GHz antenna, small size, 15x29mm  |
| Low power consumption                       | When operating in the answer mode , fast air transmission and start up time greatly reduce current consumption                |