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GWFO2-C16 is used in conjunction with MV underground network system, for detecting two-phase or three-phase short-circuit fault and single-phase earth fault of Isolated-neutral distribution network or small earth current system. It is mounted on the single-phase cable line and can automatically track the load current without having to set the parameters of short-circuit and earth action current curve, but you can set the parameters too. The parameters of short-circuit fault has two separate action current curves: fast curve and slow curve.



With conductive metal part and outside wire, GWFO2-C16 can monitor the changes of cable line single-phase earth voltage and quick capture the single-phase transient earth current for earth fault detecting. After short-circuit or earth fault occurs, it will flash three LEDs and send the action flags to DCU immediately. In addition, GWFO2-C16 can monitor load current, short-circuit current, cable line head -to-earth voltage, earth current of the first half-wave, cable line head temperature(optional function),etc, and send these real-time data to DCU spontaneously or at regular intervals. At the same time, people can use a USB interface's wireless RF and interface software to read the real-time and fault-time data from GWFO2-C16, or use master station SCADA and GPRS to achieve the on-site monitoring and control.

Note:

1. GWFO2-C16 is not used with fiber and separate panel of LEDs.
2. GWFO2-C16 is used in conjunction with a USB interface's wireless TX-module and an interface software to set parameters and to reset indicator.
3. For remote indication, you can order GWFO2-C16 which is used in conjunction with a USB interface's wireless RF and interface software to read the action flag, load current, single-phase earth transient current, single-phase earth voltage, cable head temperature and other real-time data, also to set parameters and to reset indicator.

GWFO2-E16 is used in conjunction with MV underground network system, for detecting cable line earth fault. It is mounted on the three-phase cable line without having to set the parameters of earth action current curve, but you can set the parameters too. The parameters of earth fault has two separate action zero-sequence current curves: fast curve and slow curve.



GWFO2-E16 can monitor the changes of zero-sequence current and quick capture the first half-wave zero-sequence current for earth fault detecting. After earth fault occurs, it will flash three LEDs and send the action flag to DCU immediately. In addition, GWFO2-E16 can monitor steady-state zero-sequence current, Transient zero-sequence current of the first half-wave,etc, and send these real-time data to DCU spontaneously or at regular intervals. At the same time, people can use a USB interface's wireless RF and interface software to read the real-time and fault-time data from GWFO2-E16, or use master station SCADA and

GPRS to achieve the on-site monitoring and control.

Note:

1. GWFOL2-E16 is not used with fiber and separate panel of LEDs.
2. GWFOL2-E16 is used in conjunction with a USB interface's wireless TX-module and an interface software to set parameters and to reset indicator.
3. For remote indication, you can order GWFOL2-E16 which is used in conjunction with a USB interface's wireless RF and interface software to read the action flag, zero-sequence or earth current and other real-time data, also to set parameters and to reset indicator.

GWFOL2-A16 1. The short-circuit fault detecting principle is as follows:

GWFOL2-C16 Step 1: Keep the line-to-earth voltage more than 3kV or load current more than 10A for more than 30S.

Step 2:

Case 1: The fast and slow action current value is set to 700A

If the load current I_L is more than or equal to 200A, it starts to detect short-circuit fault when $\Delta I_L \geq 100A$ for 20ms~10S. If the load current I_L is less than 200A, then $\Delta I_L \geq (I_L * 50\%)$ for 20ms~10S is necessary.

Case 2: The fast and slow action current value is not set to 700A, the fast and slow action current curve is set to (I_1, T_1) and (I_2, T_2) . It starts to detect short-circuit fault when $I_L \geq I_1$ for T_1 or $I_L \geq I_2$ for T_2 .

Note: T_1 and T_2 is the delay time of fast and slow action current curve.

Step 3: After the circuit breaker tripped and the line is power off, it starts to flash three LEDs and turn a red sign.

2. The single-phase earth fault detecting principle is as follows:

Step 1: Keep the line-to-earth voltage more than 3kV and load current more than 10A for more than 30S.

Step 2: If the difference of first half-wave current and last wave current is more than ΔI_F (note: It can be adjusted online, such as 30A) for 0.1~10ms, it starts to detect earth fault

Step 3: Then, the decrease proportion of line-to-earth voltage must be more than $\Delta U\%$ (note: It can be adjusted online, such as 30%) for T_3 (note: It can be adjusted online, such as 30S).

Step 4: At last, if the total of load current and earth current is more than 10A, it starts to flash three LEDs and turn a red sign.

GWFOL2-E16 The zero-sequence or earth fault detecting principle is as follows:

Step 1: Keep the zero-sequence or earth current I_0 less than 3A for more than 30S.

Step 2: When $\Delta I_0 \geq 20A$ for 1S or $\Delta I_0 \geq 30A$ for 500ms, it starts to flash three LEDs.

GWFOL216
series

Specifications:

1. Line voltage: 6~110kV
2. System Frequency: 50Hz or 60Hz
3. Load current range: 0~600A
4. zero-sequence current range: 0~60A
5. Maximum short circuit current impact: 40kA/4S
6. Single-phase Line diameter: 8~40mm
7. Three-phase Line diameter: 90~120mm
8. Auto Reset Time: 1~48h(Previously set at the factory)
9. Smart reset: After the fault occurred for more than 20 minutes and the line re-powered, reset immediately.
10. Minimum short-circuit fault Current Addition: $\geq 100A$
11. Delay of the relay protection: $< 10S$
12. The interval of the reclose operation at the substation: $\geq 100ms$
13. Li-Battery inside: 4.8~6.5Ah/3.6V
14. Power consume: $< 50uA/3.6V$
15. LEDs Flash: 40ms per 4S
16. Action times can be: 3000
17. Volume size:
 - 75×60×140mm(GWFOL2-A16);
 - 70×60×100mm(GWFOL2-C16);
 - 70×60×140mm(GWFOL2-E16);
18. Net weight: $< 500g$
19. Product life: ≥ 10 years
20. Air or conductor temperature: $-35\sim 70^{\circ}C$
21. Relative humidity: $< 100\%$
22. Altitude: $< 2000m$
23. Degree of protection: IP65
24. EMI Tests
 - (1) Surge impulse immunity test: Class4 according IEC61000-4-5 (fixed on naked wire)
 - (2) Electrical Fast Transient/Burst Immunity Test: Class 4 according IEC 61000-4-4 (fixed on naked wire)
 - (3) 100kHz and 1MHz slow damped oscillatory waves immunity test: Class 3 according IEC61000-4-12 (fixed on naked wire)
 - (4) Electrostatic Discharge immunity Test: Class 4 according IEC61000-4-2
 - (5) Power frequency magnetic field immunity test: Class 3 according IEC61000-4-8
 - (6) Radiated electromagnetic field immunity test: Class 3 according IEC61000-4-3
25. Wireless communication distance: 30~300m(can be set)
26. Power supply by open-type CT: 30uA~20mA/3.6V corresponding to 5~600A of load current.
27. Fast short-circuit action current curve: 50~700A/0~9.99S(can be set)
28. Slow short-circuit action current curve: 50~700A/0~9.99S(can be set)
29. Fast action zero-sequence current curve: 3~50A/0~9.99S(can be set)
30. Slow action zero-sequence current curve: 3~50A/0~9.99S(can be set)
31. Falling percentage of line-to-earth voltage: 10%~40%(can be set)

32. Falling delay of line-to-earth voltage: 30~180S(can be set)

33. Timeout time of earth fault: 2~10S(can be set)

34. Wireless RF ID: 0x00000001~0xFFFFFFFFE

GWFO216
series

Features:

1. No rejecting action

With good magnetic materials and large cross-section design and digital processing technology in small signal sampling rapidly, GWFO216 series FCI's current accuracy can be readjusted at the factory. When two phase to earth short-circuit fault occurs or fault current changes slowly, it can also be sensitive and indicate correctly without rejecting action.

2. No error action

By careful program design, GWFO216 series can also prevent error action when no-load closing or reclosing.

3. Plastic shell is made of PC material, which can prevent aging and UV from the sun.

4. Magnetic ring and other metal parts is made of special stainless steel, which can prevent rusting and cracking.

5. Self-powered by open-type CT from the line load current.