

JYZ-FF

Remote Overhead Line Fault Indicator

For MV Power Distribution Network

Datasheet

Version 1.0



JYZ-FF-C



JYZ-FF-HD

1. Description

The JYZ-FF-C (indicator) & JYZ-FF-HD (data concentrator) Remote overhead fault indicator (RFI) is used in 5~38KV overhead line networks, enable the electricity distribution network engineers to quickly identify the faulty section of network and restore power supplies to customers on healthy sections in the shortest time possible.

A high accuracy current sensor in the JYZ-FF-C, monitors the phase current flowing. When detecting current level exceeds a user-selectable threshold (as a result of a phase-to-phase or phase-to-ground fault), the fault is indicated by mechanical Flag and flashing, high-power LED, and at the same time send the fault message to the JYZ-FF-HD. The JYZ-FF-HD will transmit the data to the central monitoring station over the cellular network. Combined with GIS and SCADA, the central monitoring station could accurately locate the faulty section and send the maintenance crew man to the faulty section for troubleshooting.

The fault is located between the last indicator that has been triggered and the first indicator which is still inactive. The path of the fault current from the feeding point to the fault location is marked by the triggered indicators.

The unit resets is optional either automatically when power to the line is restored, or after a user-selectable timer period, or could manual remote reset from ground level.

The indicator can be mounted under live conditions with the help of an adapter and a hot stick. The indicator could be self-sustained by the monitored network from a current flow of 10A upwards. The indicator also with built-in lithium battery that could powered the indicator for more than 10 years.

2. Product Features

- Real time remote monitoring the current status
- Remote management of indicator and data concentrator
- LED indication with 360 degrees of visibility
- Dual indication (High-Visibility Flag & High-Power LEDs)
- Remote monitoring the line current status
- Mounting can be performed while equipment is energized
- Hot-stick Line-mountable
- User-selectable fault trip level
- User-selectable fault response time
- User-selectable reset time after power return
- Manual remote reset from ground level

3. System Composition

The system is composed of indicator(JYZ-FF-C), Data Concentrator Unit(JYZ-FF-HD), Monitoring central Station.

3.1. Overhead Installed part include:

3.1.1 Indicator : 3pcs/SET. Respectively installed in A,B,C three phase overhead cable, can send and receive signals of line fault.

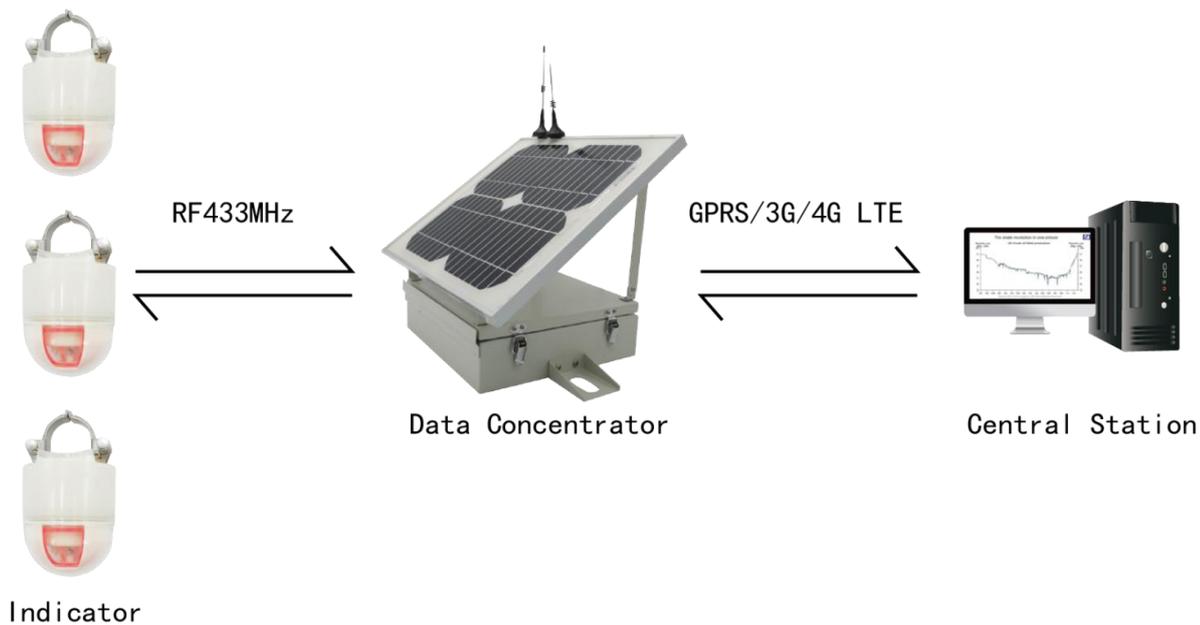
When detect the short-circuit or earth fault, the indicator will trigger mechanical flag, flashing LED and at the same time send out the fault message to data concentrator unit via wireless RF 433MHz .

3.1.2 Data concentrator Unit: Installed on the wire pole, one data concentrator unit can receive data from nearby three line fault indicator and send to central station by GPRS/3G/4G LTE cellular network. The data concentrator Unit is mainly composed of the solar panel and industrial modem.

3.2. Monitoring central station include:

One set data server with software system. Monitoring central station usually setup in power utility office, power substation, etc. When receiving the fault message from the data concentrator unit, combined with GIS system, the maintenance crew man could quickly locate the fault site and trouble-shoot.

The software system could be SCADA or other software platform, usually power utility companies have their own software system. Four-faith also have our own-developed software system.



Note: If customers use their own software system, then should offer Four-faith the software data communication protocol format, so that the FOURFAITH data concentrator could be able to communicate with the software system.

4. Operation worked example

4.1 Local indication

On detection of fault current above the fault sensitivity threshold and for the minimum required duration the JYZ-FF-C indicator will respond both by mechanical Flag Indicate, and flashing, high-power LED indicate.



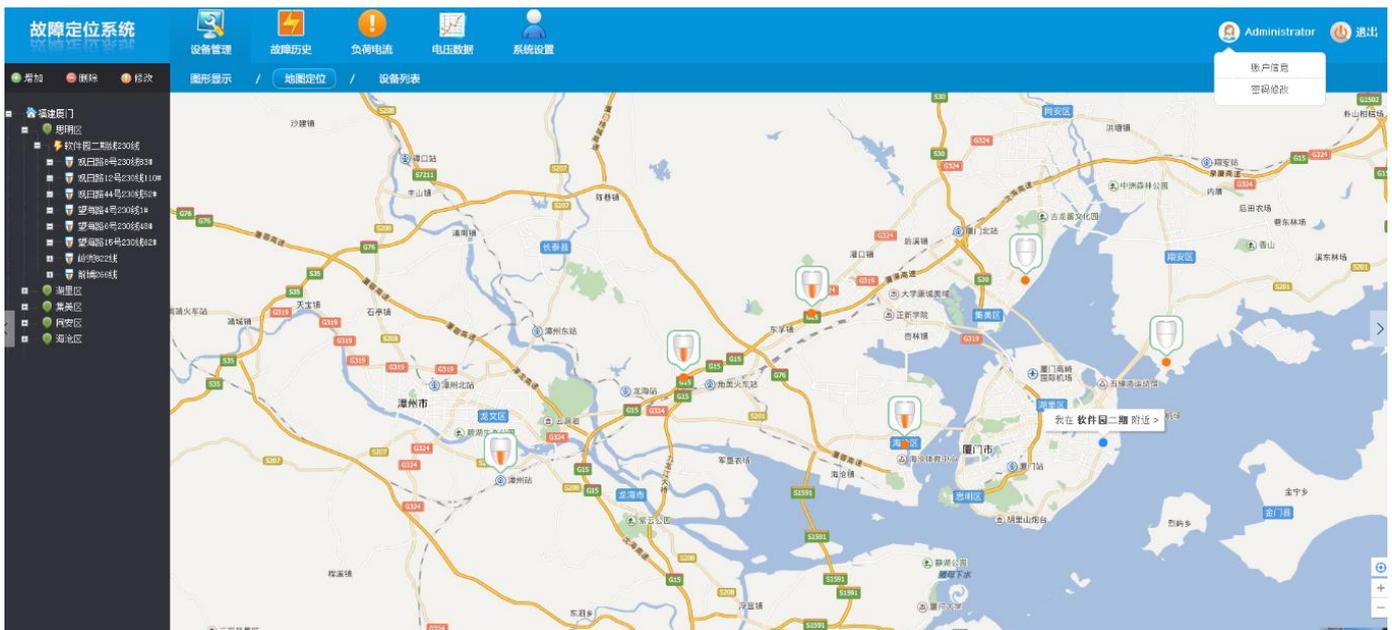
Indicator in ready status



Indicator in flag & flashing status

4.2 Remote Indication

With the monitoring central station, the maintenance crew man could be able to accurately locate the fault section via the GIS in the software system, thus save a lot of time for troubleshooting.



Locate the fault section in the FOURFAITH software which embedded with Google map

4.3 Indication period & reset

The indication period is user-selectable. The default value is 12 hours flag&flashing when a fault is detected.

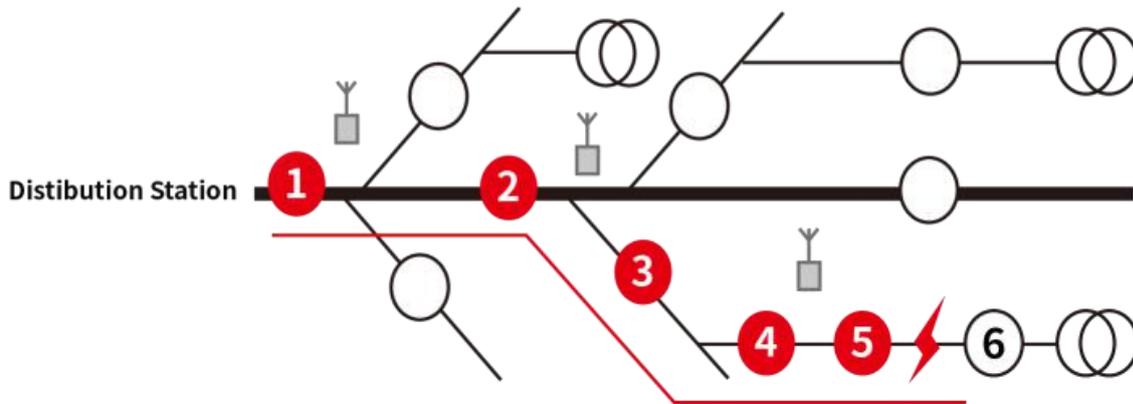
If the fault section restore power sooner than the default value (let's say, 12 hours), then the indicator will return to the ready state (flag return from red to white, LED not flash) ; If the fault section still not be able to restore power after the default value (12 hours), then the indicator still will return to the ready state.

Also, the reset could be manually achieved by the software system.

4.4 Identify the fault section

4.4.1 local identification

The fault is located between the last indicator that has been triggered and the first indicator which is still inactive. The path of the fault current from the feeding point to the fault location is marked by the triggered indicators.



Note: The diagram above indicate that the fault section is between the point 5 and point 6.

4.4.2 Remote identification

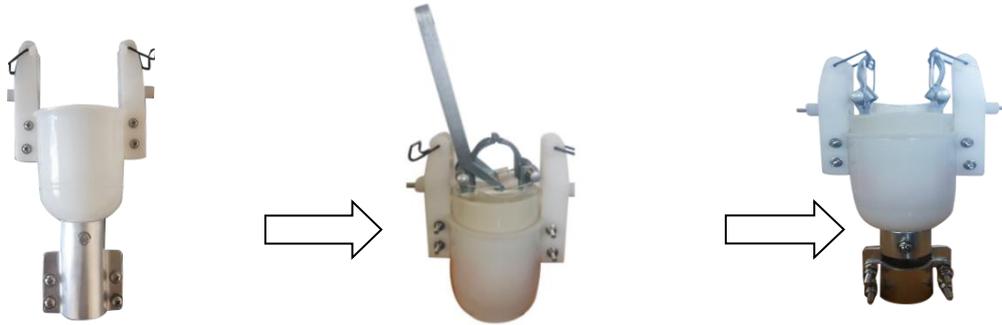


localized the fault section showing in the software system

5. Installation

5.1 Indicator installation

The indicator can be mounted under live conditions with the help of an adapter and a hot stick. Four-faith offer the adapter like below. Hot stick not offer since it is universal.



Put the indicator into the adapter and fix the the spring of the indicator with the hook of the adapter.

6. Specification

6.1 General

6.1.1 JYZ-FF-C (indicator)

Applicable voltage range	5~38KV
Applicable current range	0~600A
Applicable power frequency range	45~60Hz
Angle of visibility	360° flashing insight
Fault flashing interval	5s
Duration of flashing	50ms
Sensitivity&accuracy	0A~100A: ±3A
	100A~600A: ±3%
Static power consumption	less than 20uA
Auto reset time	1~48h user-selectable
Identification of fault current duration	20ms~40ms
MTBF	more than 70000h
Impulse current withstand	31.5kA for 2s
Degree of protection	IP67
Weight	less than 500g
Outline dimension	Φ75mm * 115mm

6.1.2 JYZ-FF-HD (data concentrator)

Short circuit fault upload	Receiving and upload fault information and fault current
Ground fault upload	Receiving and upload fault information and fault current
Load current	Upload load current value, Timing or out-of-limit upload
Low battery alarm	Receiving and upload Low battery alarm function
Heartbeat function	Timing upload heartbeat information
Fault indicator Status measurement	Active measurement switch status and load current
Remote management	Remote management fault indicator, such as parameters, reset etc
Local and remote maintenance	Have local and remote upgrade function

Stability mechanism	WDT design, to ensure the stability of system
Identification of fault current duration	20ms~40ms
IEC support	Support IEC60870-5-101
Shell	304 stainless steel+ RAL7305
protection class	IP67
Outline dimension	Φ 355*293*255mm
Weight	5Kg

6.2 EMC

Electrostatic discharge	Can withstand the GB/T 17626.2 of the IV level of electrostatic discharge interference test Contact discharge: + 8KV Air discharge: + 15KV
EFT/B immunity test	Can withstand the GB/T 17626.12 of the IV class fast pulse group interference test Voltage peak value: 2KV Frequency: 5KHz & 100KHz
Radiated susceptibility	Can withstand the GB/T 17626.3 of the IV level RF electromagnetic field immunity Field strength: 30V/m
Surge immunity	Can withstand the GB/T 17626.5 of the IV level surge (impact) interference test Common mode voltage: 4KV ± 10% Differential mode voltage: 2KV ± 10%
Power frequency magnetic field immunity	Can withstand the GB/T 17626.8 of the V level power frequency magnetic field immunity interference test Magnetic field intensity: 100A/m
Damped oscillatory magnetic field immunity	Can withstand the GB/T 17626.10 of the V level damping oscillation magnetic field immunity test Damped oscillatory magnetic field intensity peak value: 100A/m

6.3 Environmental

Environment temperature	Operation temperature : -35℃~80℃(-31~+176°F) Storage temperature : -40℃~85℃(-40~+185°F)
Relative humidity	5~95%(No condensing)
Altitude	≤4000m