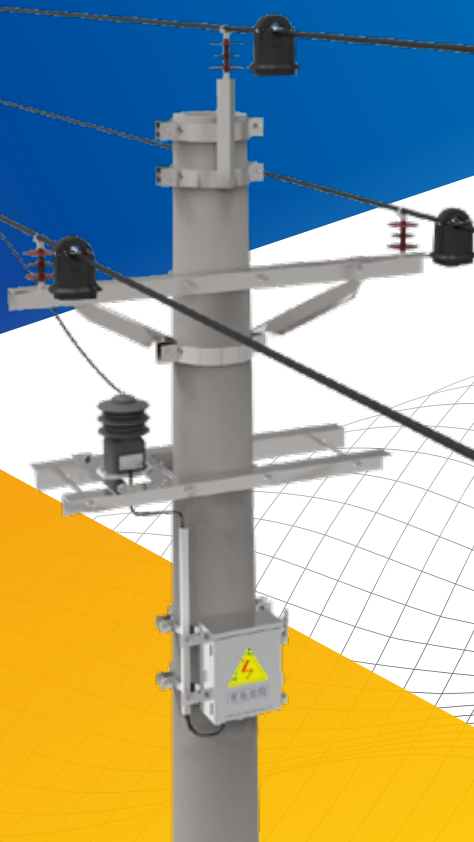


THE APPLICATION
OF TECHNOLOGY



PZG-200J
INTELLIGENT OVERHEAD LINE
FAULT PASSAGE INDICATOR

Kehui International

Kehui International,
Ware, UK



The word Kehui, literally means the Application of Technology in the Chinese language. This phrase perfectly defines the company's commitment to technological innovation, which it achieves whilst achieving the highest levels of quality.

The company was founded in 1991 as a joint venture with a major US organisation, before becoming independent in 2005. It has utilised the best of Asian, European and American expertise to develop a selection of cable and transmission line fault locators, as well as equipment for the automation of electrical distribution systems and its range of switched reluctance motors.

Kehui factory,
Zibo, China



PZG-200J Intelligent Overhead Line Fault Passage Indicator

The PZG-200J fault passage indicator has been developed from Kehui's extensive experience of distribution network automation systems, based on its PZK series. The PZG provides a visual indication of the fault path, to help identify the fault location. In addition, it measures AC current and voltage data which can be recorded and accessed remotely.

The system consists of three wireless acquisition units (one per phase) and a collection unit. The acquisition units are suspended on the overhead line and provide a visual indication if fault current is detected. They also gather current and voltage data which is communicated to the collection unit through short-range wireless radio; the collection unit transmits data to a remote master station using 3/4G communication, which also allows configuration and upgrading.



Benefits

- Detection of low current earth faults (such as downed conductors), based on transient zero sequence current
- Suitable for up to 35kV distribution networks
- Works with high resistance earthed systems and arc suppression coils
- Fault measurements immune to line load fluctuations
- Event logging with accurate time tags
- Fault records stored in Comtrade file format
- Immune to cold starts, transformer inrush and motor starting currents
- High-precision three-phase synchronous synthesis of zero-sequence currents



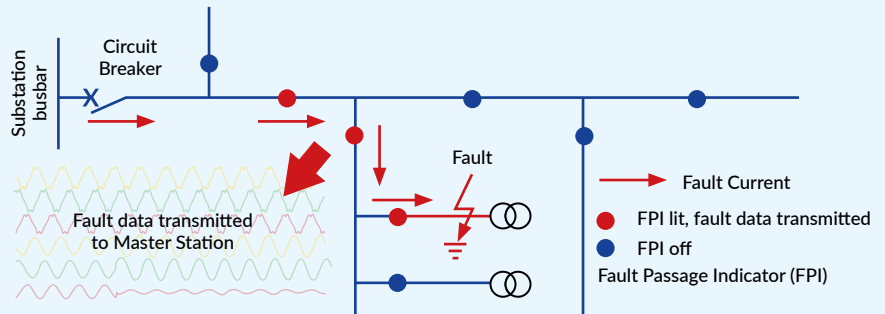
Construction

The acquisition units are designed for long-term, outdoor operation and their latching arrangement makes them convenient to deploy on live lines. Their red LED fault indications provide clear 360° visibility. They use efficient self-powered technology combined with a high-performance lithium battery and ultra-low power design.



The pole-mounted collection unit is powered by a combined power and voltage sensing device, and is equipped with a high-density supercapacitor; it can also be powered by solar energy if required.

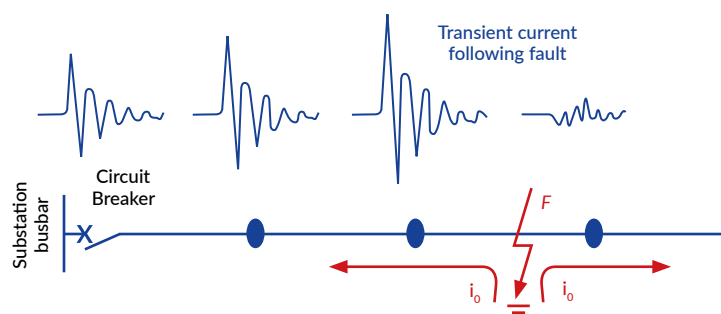
Operation



During normal operation of the line, the acquisition units provide current and voltage data to the concentrator, which transmits it wirelessly to the Master Station. When a fault occurs, the Indication on the affected acquisition unit illuminates and a record containing pre- and post-fault data is stored and transmitted.

Low current earth fault detection

If a high resistance earth fault occurs, the current may be insufficient to be recognised as a fault. In this case, the faulty section can be identified from the direction of the transient zero-sequence currents. These will have opposite polarities at either end of the faulty section, and the amplitude and waveform are different. In contrast, the transient zero-sequence currents of the healthy sections have the same polarity and similar amplitudes and waveforms. Hence, the master station can identify the section in which the fault has occurred.



Technical data

Wireless Acquisition Unit

| | |
|--|--|
| Rated operating voltage | ≤ 35kV |
| Rated operating frequency | 50/60Hz |
| Accurate current measurement | 5 - 600A (Maximum measured current 1200A) |
| Measurement accuracy | 0-300A : ±3A, 300 - 600A : ±1% |
| Fault current recording accuracy | 0 - 600A, ±10% |
| Recording length | 12 cycles, 80 points per power frequency cycle |
| Cyclic storage | 64 groups, following the Comtrade standard |
| Self-acquisition load current (normal working) | > 5A load current |
| Super capacitor capacity | Independently maintain fully-featured operation when fully charged ≥12h |
| Non-rechargeable battery | 3.6VDC, 8.5Ah |
| Power consumption | Minimum average operating current ≤ 80uA |
| error indication | Red LED; flashing period: 5s, lighting time ≤ 50ms; 360° omnidirectional. |
| Reset time | Power-on reset time < 5 mins. Timing reset time settable ≤48hrs |
| Micropower communication | 433 - 470MHz, ≤10mW (10dBm) |
| Communication distance | >50m |
| Adaptive line diameter | 8-32mm (Ø), horizontal tension >50N, overhead line suspension installation |
| Dimensions | 118mm × 176mm × 118mm (width × height × depth) |
| Weight | 0.85kg |
| Loading and unloading life | >50 times without damage |
| Mechanical strength | Vibration level I, tilt drop 1m |
| Ingress protection level | IP67 |
| Normal operating temperature | -40 to +75°C |
| Environment humidity | 5-100% |
| Storage temperature | -40 to +80°C |

Collection Unit

| | |
|-------------------------------|---|
| Power supply voltage source | 15VDC, ±20%; 20W (solar panel) 60VAC, ±20% (line power/voltage device) |
| Power consumption | <0.2VA (online, no communication) |
| Back-up power | 7Ah/12V (battery) |
| Access acquisition unit | 3 groups, 3 units per group |
| Access mode | Micro-power wireless communication |
| Communication distance | >50m |
| 4G/3G wireless communication | 1 way serial |
| Serial port | 1, EIA/RS232 (1200-19.2kbps) |
| Dimensions | 246mm × 185mm × 95mm (width × height × depth) |
| Weight | 5.5kg |
| Installation method | Pole mounted |
| Protection level | IP55 |
| Electromagnetic compatibility | IEC standard level IV |
| Normal operating temperature | -40 to +75°C |
| Ambient humidity | 5-100% |



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