IKI-23

Universal fault indicator

The complete fault detection with all proven fault detection algorithms for all network types and independent of auxiliary power makes the IKI-23 the universal fault and load monitor for standard ring cable switchgear. It combines all the functionalities of the IKI-2x series in one auxiliary power independent device.

Properties

The IKI-23 can be used in distribution network stations with and without connection to the telecontrol level.

Directional and non-directional load flow and fault detection

For directional fault and load flow measurement, connect a capacitive divider or a CAPDIS-Sx to the IKI-23.

- directional short-circuit detection
- directional ground short-circuit detection
- directional static ground fault detection (wattmetric method), directional transient ground fault detection (wiper method), earth fault detection via pulse locating
- suitable for all neutral point treatments
- no summing transformer required

Auxiliary power independent

The IKI-23 does not require auxiliary power for fault detection; an auxiliary power connection is only required for remote transmission via Modbus.

Integrated Diagnostic Function

For correct directional fault indication, verification of the correct rotating field or transformer installation is essential. The IKI-23 displays the rotating fields self-explanatory.

Basic setting with DIP switch or USB

The basic settings can be made via DIP switches behind the maintenance flap. With the software KriesConfig the complete parameterization can be done via USB interfaces.

Early fault detection

- Early fault detection by transient fault detection
- Partial discharge trend detection together with CAPDIS-S2_55 (R5). This function is available in the version with Modbus.

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Event memory
The device has an event memory with indication of the time duration, that has passed since the fault event. The event memory can be read out via Kries-Config and Modbus.

Step voltage warning
The voltage difference between switchgear ground and a second (grounded) point is continuously monitored by the IKI-23. If a dangerous potential difference occurs between these points during, for example, an earth fault, a warning message is displayed and reported. Step voltage monitoring increases protection for personnel and animals and provides an indication of insufficient or disturbed station grounding.

Retrofit of RMUs with installed IKI-22
RMUs with installed IKI-22 can easily updated by the IKI-23 for directional fault detection. Already installed current transformers of type IKI-LUG can be further used. Load monitoring is only possible with current transformers of type IKI-LUM.

Integrated LRM measuring point (optional)
The device has a three-phase LRM measuring point LRM module"" for retrofitting future expansion modules, phase comparison and rotating field direction measurement [e.g. using CAP phase)."

Technical Data

Device data

Article number	IKI-23
Product designation	IKI-23 Universal fault indicator | directional
Number of feeders	1
Firmware	V13.0.2 or higher
Parameterization software	KriesConfig
Configuration	Via software Kries-Config (download at kries.com), Via DIP-switches behind front panel
Applicable current transformers	The IKI-23 can be used with current transformers of type IKI-LUG as well as of type IKI-LUM. With the IKI-23 with Modbus, load flow values can only be transmitted if current transformers of type IKI-LUM are used.

Controls and display

Front display	LC-Display and LEDs

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Controls and display

Test button	✓
Red LED (1)	Error in direction of cable
Yellow LED (2)	Fehler in Richtung Sammelschiene
Buffer of power supply	Battery

Dimensions and installation instructions

Case height x width x depth	50 x 98 x 97 mm
Cutout height x width	45 x 92 mm
Norm cutout dimensions	DIN IEC 61554:2002-08
Installation type	Panel mounting
Sheet thickness	1.5 ... 2.5 mm

Operating conditions

Operating temperature	-25°C ... 55°C
Storage temperature	-25°C ... 70°C
Humidity	max. 95 % relative humidity at 40° C
Protection class	IP54 (Front)

Fault detection and failure forecast

Fault detection	Individually selectable, any combinations possible
Star point types	Short-term low-ohmic terminated neutral, Low-ohmic terminated neutral, Inductive terminated neutral, Isolated neutral
Short circuit detection I>>	✓
Directional short-circuit detection I>>	✓
Threshold current short-circuit detection I>> [A]	100, 200, 300, 400, 600, 800, 1000, 2000
Threshold current short-circuit detection (I>>) adjustable via DIP [A].	400, 600, 800, 1000
Automatic response threshold Short circuit detection	✓
Threshold time short-circuit detection I>> [ms]	40, 60, 80, 150, 200
Threshold time short-circuit detection (I>>) adjustable via DIP [ms]	60
Waiting time after current switch-off (short-circuit detection) [ms]	0, 100, 400, 1200, 2000, 6000
Waiting time voltage switch-off (short-circuit detection) [ms]	0, 100, 400, 1200, 2000, 6000
Earth short-circuit detection Ie>>	✓
Directional earth short-circuit detection Ie>>	✓

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Fault detection and failure forecast

Threshold current earth short-circuit detection Ie>> [A]	40, 80, 100, 200
Threshold time earth short-circuit detection Ie>> [ms]	40, 60, 80, 150, 200
Directional static earth fault detection Ie>;	✓
Threshold current static earth fault detection Ie>	5 ... 30 A
Auxiliary power supply for directional static earth fault detection Ie>	• with auxiliary power supply: no Balanced Core CT necessary • without auxiliary power supply: Balanced Core CT necessary
Directional transient earth fault detection Ie>	✓
Threshold current transient earth fault detection 3I0 [A]	100, 200, 300, 500
Threshold voltage transient earth fault detection 3U0 [%]	20, 30, 50
Earth fault detection via pulse locating	✓
Pulse length of pulse locating	symmetrical / asymmetrical
Transient fault detection IIe>	✓
Step voltage monitoring	✓
TE trend monitoring	Execution with Modbus: • in connection with CAPDIS-S2_55 (R5) • Transmission via Modbus-RTU • Partial discharge trend via frequency distribution; integration over 24h, trend over 72h .
Fault reset	Auto, After 2h, 4h, Manually on the device, External potential-free normally open contact
Earth fault transient detection	✓
Directional earth short-circuit detection	✓

Interfaces and communication

USB interface	Mini-USB
Slave test	✓
Digital Inputs	1
Digital IOs configurable	--
Switching functions feeder control unit	--
Remote signalling	4 potential-free contacts • adjustable as wiping contact • adjustable as permanent contact when auxiliary power is available.

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Interfaces and communication

Remote test	Function test including switching of the remote signalling contacts possible by connecting a potential-free normally open contact to the slave input.
Switching capacity relay	Umax 110 V AC/DC, Imax 100 mA
Relay outputs	4
Connection of passive blinkers	Three passive blinkers with LEDs can be connected.
Voltage inputs	1

Measurement values and functions

Voltage measurement	-
Measuring range voltage	Capacitive
Measuring range voltage	1..52 kV (depending on the LRM module used)
Precision voltage measurement	--
Cross calibration	-
Current measurement	✓
Measuring range current	5..2.000 A (short-term), max. continuous current 800 A
Rotary field detection	✓
Logic functions programmable	--

Power supply

Auxiliary power supply	24 … 230 V AC/DC (jeweils 15 %)
Power consumption	2 W
Insulation voltage	2 kV; 1 min
Battery type	Lithium
CT-supplied	✓
Notes on transformer supply	• IKI-LUG-1500: from 5 A three-phase, from 15 A single-phase • IKI-LUM: from 6 A three-phase, from 18 A single-phase

Compatible current transformers

Article number	Product designation
2512106_H001	IKI-LUM_d92 Split-Core Transducer with cable tie (set) | Ø 92mm
2512106_H003	IKI-LUM_d92 Split-Core Transducer for C-Cone-Bushings (set) | Ø 92mm
2512106_H004	IKI-LUM_d92 Split-Core Transducer for SIEMENS-Bushings (set) | Ø 92mm

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Article number	Product designation
2512105_H001	IKI-LUG_1500 Split-Core Transducer with cable tie (set) | Ø 92mm
2512105_H003	IKI-LUG_1500 Split-Core Transducer for C-Cone-Bushings (set) | Ø 92mm
2512105_H004	IKI-LUG_1500 Split-Core Transducer for SIEMENS-Bushings (set) | Ø 92mm

Connecting cables CTs

Article number	Product designation
3503118_S	Connecting cable set | pluggable | Length = 3,0m
3503135_S	Connecting cable set | pluggable | Length = 5,0m
3503135_S999	Connecting cable set | pluggable | Lengths on request

Accessories

Article number	Product designation
2500484	Y-cable IKI to CAPDIS | 0.4 m | 2 x system plug
2500486_H002	Y-Cable IKI to CAPDIS | 0.4 m | Sx blade plug to system plug, decoupled
2500487	Y-cable IKI to CAPDIS | 0.4 m | 2 x Sx blade plug to system plug
2500486_H004	Y-cable| IKI-23 U1 to capacitive tap | 0,4 m
2500484_S999	Y-cable CAPDIS to IKI; Lengths and connector combinations on request

Comparison of products

	IKI-23 **2502293**	**IKI-23 with Modbus** **2502208**
Level of digitalisation	1	1
Short circuit detection I>>	✓	✓
Directional short-circuit detection I>>	✓	✓
Earth short-circuit detection Ie>>	✓	✓
Directional earth short-circuit detection Ie>>	✓	✓
Earth fault transient detection	✓	✓
Pulsation detection	✓	✓

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	IKI-23 **2502293**	**IKI-23 with Modbus** **2502208**
Directional static earth fault detection Ie>;	✓	✓
Slave test	✓	✓
Relay outputs	4	4
Modbus-RTU	-	✓
Modbus-RTU Slave		✓
CT-supplied	✓	✓
Auxiliary power supply	24 … 230 V AC/DC (jeweils 15 %)	24 … 230 V AC/DC (jeweils 15 %)
Buffer of power supply	Battery	Battery
USB interface	Mini-USB	Mini-USB
Digital Inputs	1	1
Digital IOs configurable	--	--
Switching functions feeder control unit	--	--
Voltage inputs	1	1
Voltage measurement	-	-
Precision voltage measurement	--	--
Measuring range voltage	Capacitive	Capacitive
Cross calibration	-	-
Current measurement	-	✓
Logic functions programmable	--	--
Balanced core CT optional	✓	✓
Compatible CTs	IKI-LUM_d92 Split-Core Transducer with cable tie (set) | Ø 92mm (2512106_H001) IKI-LUM_d92 Split-Core Transducer for C-Cone-Bushings (set) | Ø 92mm (2512106_H003) IKI-LUM_d92 Split-Core Transducer for SIEMENS-Bushings (set) | Ø 92mm (2512106_H004) IKI-LUG_1500 Split-Core Transducer with cable tie (set) | Ø 92mm (2512105_H001) IKI-LUG_1500 Split-Core Transducer for C-Cone-Bushings (set) | Ø 92mm (2512105_H003) IKI-LUG_1500 Split-Core Transducer for SIEMENS-Bushings (set) | Ø 92mm (2512105_H004)	IKI-LUM_d92 Split-Core Transducer with cable tie (set) | Ø 92mm (2512106_H001) IKI-LUM_d92 Split-Core Transducer for C-Cone-Bushings (set) | Ø 92mm (2512106_H003) IKI-LUM_d92 Split-Core Transducer for SIEMENS-Bushings (set) | Ø 92mm (2512106_H004) IKI-LUG_1500 Split-Core Transducer with cable tie (set) | Ø 92mm (2512105_H001) IKI-LUG_1500 Split-Core Transducer for C-Cone-Bushings (set) | Ø 92mm (2512105_H003) IKI-LUG_1500 Split-Core Transducer for SIEMENS-Bushings (set) | Ø 92mm (2512105_H004)

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