

# Opto F+E 3.0

Short-circuit and earth fault indicator



Opto F+E 3.0, plug-in housing



Opto F+E 3.0, surface mount housing

## Product features

- Fibre optic cables for electrical isolation between indicator and current transformers
- High-intensity LED indication
- Single and double flash mode for operation in radial and ring networks
- Remote indication via relay contact
- Current transformer retrofit ready

## Your advantages

- Installation on bare cables and busbars
- New fault detection within reset time

The Opto F+E 3.0 device is a combined short-circuit and earth fault indicator. It is designed to detect, display and remotely indicate short-circuit currents and earth faults in medium voltage distribution networks. The indicator unit can be used in all medium voltage switchgear installations. Fibre optic cables provide electrical isolation between the current transformers, mounted on cable/busbar, and the display unit when transferring signals. Due to its measuring principle, the earth fault indication is suitable for low-impedance or solidly earthed neutral networks as well as for radial or open ring networks.

The current transformers (CT) have an integrated trip threshold detection capability. When the pre-set trip current is reached or exceeded, light pulses will be emitted. A fibre optic cable is used to transmit these light pulses from the CT to the Opto. Phase-selectively operated red LEDs start flashing.

After the first tripping incident (e. g. in radial systems) the LEDs begin a phase-selective flash rhythm of: flash/pause/flash.

A second tripping (e. g. ring operated network with auto-reclosing) is indicated by flashing LEDs of the fault-affected phases in a flash-flash/pause/flash-flash rhythm.

Technical data	Opto F+E 3.0
Short-circuit indicator	■
Earth fault indicator	■
Earth fault detection method	Earth short-circuit
I>> short-circuit trip current	400, 600, 800, 1,000 A <sup>1)</sup> (adjustable at the CT)
tI>> response delay	40, 60, 80, 100, 200, 300, 500 ms (adjustable at the display unit)
I <sub>E</sub> > earth fault trip current	10, 20, 40, 80 A or 40, 80, 120, 160 A (adjustable at the CT)
tI <sub>E</sub> > response delay	60, 100 or 200 ms (adjustable at the display unit)
Accuracy	±15 % (determined by current transformer)
Indication	Phase-selective short-circuit: 3 red LEDs, earth fault: 1 yellow LED, flashing period 2 s, double flash sequence 0.3 s with flashing period 3 s Optional: external signal lamp
Remote signal/communication	2 relay contact
Remote contact	Potential-free permanent or momentary contact Contact capacity: 380 V AC/5 A/1250 VA max.; 220 V DC/5 A/150 W max.
Reset	<ul style="list-style-type: none"> <li>■ By button</li> <li>■ Automatic time reset: 1, 2, 4 or 8 h</li> <li>■ Restoration of auxiliary supply ≥10 s (activated via DIP switch)</li> <li>■ Remote reset</li> </ul>
Power supply	
Internal power supply	Long-life lithium cell, active flashing time >1,000 h, shelf life ≥20 years
External auxiliary supply	12–110 V DC ±10 % or 24–60 V AC (±10 %), 50–60 Hz (optional)
Optional accessories	Transformer with cable for top-hat rail or screw mounting (115–230 V AC/24–48 V AC)
Housing	Polycarbonate, IP40 (plug-in housing), IP65 (surface mount housing)
Temperature range	–30 to +70 °C

1) Further trip currents on request.

Plug-in housing: dimension drawing in catalogue on page 158, M3

Surface mount housing: dimension drawing in catalogue on page 158, M6

Equipment set	Accessories
1 display unit	Cutting tool for fibre optic cables
Opto F+E 3.0, plug-in housing      Order no. 36-0323-001	Transformer for top-hat rail
Opto F+E 3.0, surface mount housing      Order no. 36-0313-001	External signal lamp
3 phase current transformers	Optical testing unit
1 summation current transformer	Disassembly clip
4 fibre optic cables	Spring clip

## For installation on insulated cables

for Alpha M, Alpha E, Sigma plus



Conductor Ø [mm]	Cable length [m]	Order no.
15–52	3.00	49-6011-040
15–52	6.00	49-6011-043

## For installation on medium voltage cables or bright copper bar

for Opto F 3.0, Opto F+E 3.0



Trip currents <sup>1)</sup> [A]	Conductor Ø [mm]	Order no.
400, 600, 800, 1,000	22–42	49-0101-202

1) adjustable



Trip currents <sup>1)</sup> [A]	Conductor Ø [mm]	Order no.
400, 600, 800, 1,000	40–60	49-0101-203

1) adjustable



Trip currents <sup>1)</sup> [A]	Conductor □ [mm]	Order no.
400, 600, 800, 1,000	20 x 4–40 x 10	49-0101-206

1) adjustable

## For installation on insulated cables

for Sigma *plus*



Conductor Ø [mm]	Cable length [m]	Order no.
40–115	3.00	49-6013-016



Conductor [mm]	Cable length [m]	Order no.
280–50, oval	3.00	49-6013-028



Conductor [mm]	Cable length [m]	Order no.
350–50, oval	3.00	49-6013-027

## For installation on medium voltage cables

for Earth Zero, Earth Zero Flag, Earth 4.0



Conductor Ø [mm]	Cable length [m]	Order no.
60–150	3.0	49-6013-029

## For installation on medium voltage cables

for Opto F+E 3.0



Conductor Ø [mm]	Trip currents <sup>1)</sup> [A]	Order no.
up to 115	40, 80, 120 or 160	49-6014-009
up to 115	(10), (20), 40 or 80	49-6014-007



Conductor Ø [mm]	Trip currents <sup>1)</sup> [A]	Order no.
280 x 50, oval	80, 120, 160 or 200	49-6014-022

1) adjustable



Conductor Ø [mm]	Trip currents <sup>1)</sup> [A]	Order no.
350 x 50, oval	80, 120, 160 or 200	49-6014-021

1) adjustable

# Summation current sensors

## Summation current sensor, splittable

for Sigma D<sup>+</sup>, Sigma D<sup>++</sup>, ComPass B series



Conductor Ø [mm]	Cable length [m]	Order no.
220–250	4.00	49-6023-020

# Accessories

For short-circuit and earth fault indicators and integrated voltage detecting systems

## Wall-mounted housings

for the installation of short-circuit and earth fault indicators as well as integrated voltage detecting systems outside the switchgear



W x H x D  
125 x 75 x 125 mm  
Order no.  
49-9001-001 bottom cable entry  
49-9001-002 rear cable entry



W x H x D  
125 x 175 x 125 mm  
Order no.  
V49-9001-004-001  
incl. earthing bar



W x H x D  
125 x 75 x 75 mm  
Order no.  
49-9001-006



W x H x D  
290 x 77 x 200 mm  
Order no.  
V49-9001-007-001  
incl. earthing bar

## External signal lamps

for installation outside the switchgear



3 LEDs	Order no.
5 m connection cable, with battery, for permanent contact	49-0702-005
10 m connection cable, with battery, for permanent contact	49-0702-010
15 m connection cable, with battery, for permanent contact	49-0702-015



Bicolour 3 LEDs red/green	Order no.
3 m connection cable, with battery	49-0706-001



Bicolour 1 LED red/green	Order no.
2 m connection cable, with battery, without fibre optic cable (see page 57)	49-0704-001

## Installation system

for Sigma D series and ComPass series



	Order no.
Tablet for parameter setting during installation or monitoring, incl. cover, pencil, power supply and USB cable	49-6022-010

## Temperature sensor PT100



	Order no.
Temperature range	-50 to +180 °C
Dimension	6 x 50 mm
Cable length	10 m (silicone, 2 ferrules)
Protection degree	IP65

## Fibre optic cables



	Order no.
Fibre optic cable 3 m (standard length for short-circuit CTs)	49-0602-009
Fibre optic cable 4 m (standard length for earth fault CTs)	49-0602-001
Fibre optic cable 1,8 m (standard length for external signal lamp)	49-6007-206

## Accessories for Opto series



	Order no.
Cutting tool for fibre optic cables	49-0109-003



	Order no.
Transformer with cable for top-hat rail mounting (115 V – 230 V AC / 24 V – 48 V AC)	49-0921-002



	Order no.
Optical testing unit to excite the indicator for connection to the fibre optic cable plug	49-0109-002

## Accessories for plug-in housing



	Order no.
Disassembly clip	49-9090-016
Disassembly clip for ComPass B 2.0 / Bs 2.0	49-9090-017



	Order no.
Spring clip suitable for 2 mm front plate thickness (standard)	49-9090-018
Spring clip suitable for 3 mm front plate thickness	49-9090-019