

## FAULT INDICATOR

### TYPE **FLA3.1**

for overhead lines

#### General description

The fault indicator type FLA3.1 is used in overhead lines of a network. The indicator can be mounted under live conditions with the help of an adapter and a hot stick. The FLA3.1 is completely self-sustained by the monitored network from a current flow of 20A upwards. The indication is done by six flashing LEDs for a clear nighttime visibility and three red display areas for a clear daytime visibility.

The FLA3.1 can communicate to a remote control via a bidirectional wireless connection. In this way all settings of the indicator can be adjusted at any time without removing the indicator from the powered line. The FLA3.1 stands out for the great flexibility of the adjustments that can be done. Beside the basic settings of the indicator like trip current, response delay, reset time, etc., the FLA3.1 can be adapted to auto-reclosers in the network. This provides for an optimized fault indication and also allows the indication of different fault types. Permanent and temporary faults can be distinguished and indicated separately.

The bidirectional connection between the remote control and the fault indicator allows to read out the present current of the monitored network with the remote control at any time.

The fault indicator type FLA3.1 can be integrated into a SCADA system with the help of the remote indication interface type RIS. This allows an easy-to-install remote indication solution for the overhead line indicators. Please refer to the datasheets of the remote indication interface type RIS for detailed information how to integrate the type FLA3.1 into a SCADA system and which information can be collected from the FLA3.1s.

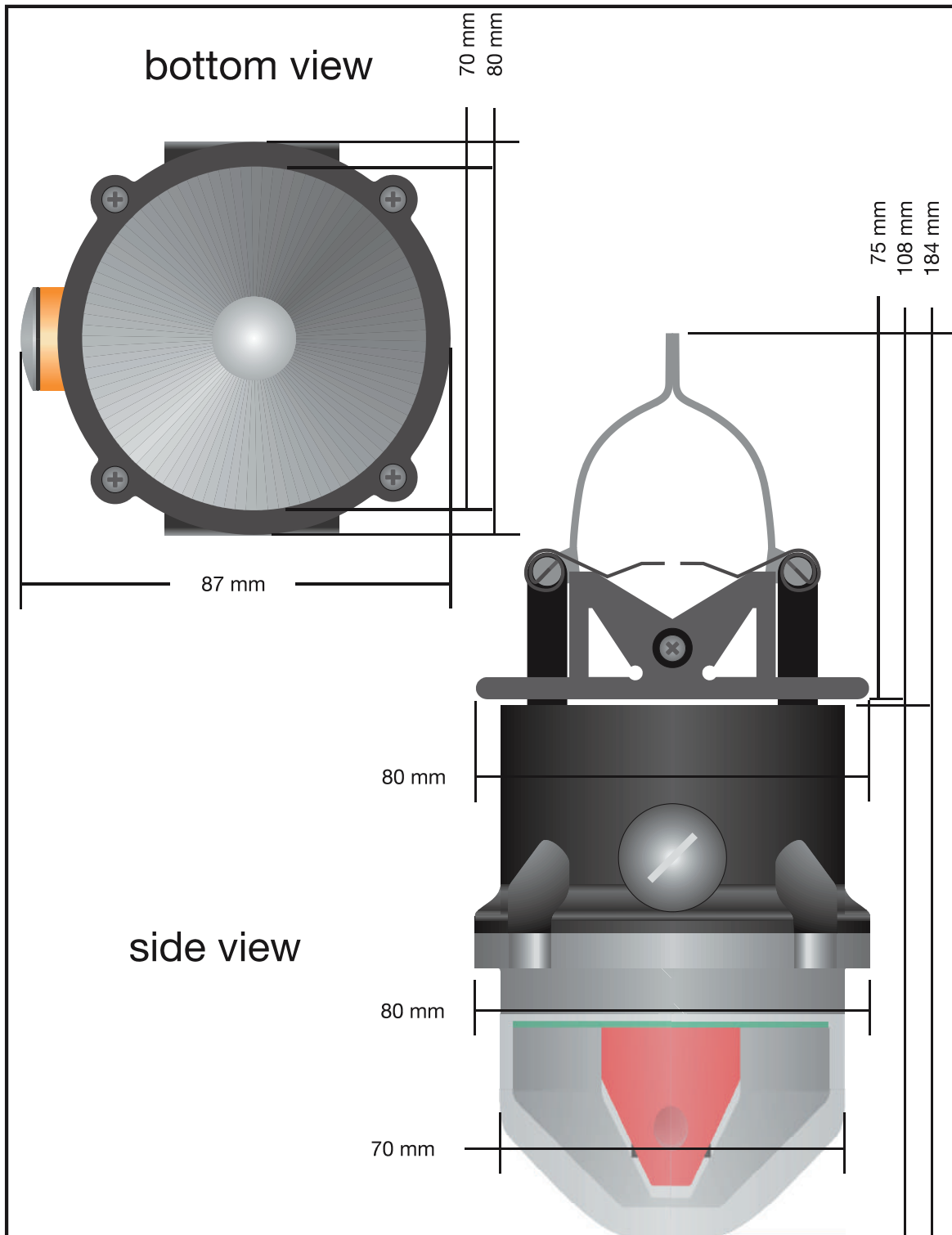
#### Advanced fault detection


The fault indicator type FLA3.1 provides a **short-circuit detection**. The short-circuit has a fixed or automatically calculated absolute current threshold as trip value. The short-circuit detection can also be switched off completely.

Additionally the fault indicator type FLA3.1 provides an **earth-fault detection by di/dt algorithm**. This works with a di/dt measurement method that analyses the load change within a certain time. The height of the load change can be adjusted. An additional criterion for an earth-fault is a subsequent voltage loss. Also the earth-fault detection can be switched off completely.




Subject	Value
trip current short-circuit	a) Standard mode: fixed trip value 20A to 1500A (in steps of 20A) b) Automatic mode: automatically adjusted 150% to 500% (in steps of 50%) of service current
trip current di/dt (can be switched off completely)	a) di/dt measurement and subsequent voltage loss: di: 4A to 110A (in steps of 5A) dt: 20ms at 50Hz / 16ms at 60Hz
response delay	selectable between 40 and 300 ms (in steps of 20 ms)
voltage detection	selectable between 20% to 90% of $U_n$ (in steps of 10%)
indication unit	suitable for surface installation
indication	6x LED indication, 360° visibility, >3000 mcd each Flag indication, 360° visibility, red signal color
inrush current restraint	duration up to 3 secs
reset of the indicator	a) by remote control b) by time: selectable from 30 min to 960 min (in steps of 30 min) c) by recovering net current: optional on/off d) by recovering after 1 second continuous net voltage: optional on/off
on-site function test	by remote control
dimensions	diameter: 80mm height: 184mm
protection class	IP67
housing material	ABS HI100-NP, Carbotex K20 UVR
weight	0.610kg
type tests	according to IEEE 495-2007, EN 60068-2-11 2000-02, ASTM G44-99 (2005)
operation temperature range	-25°C to +75°C
accuracy	+/- 10%
cable diameter ranges	a) 6 mm - 15 mm b) 10 mm - 28 mm c) 25 mm - 42 mm
power supply	lithium battery (LiSOCl <sub>2</sub> ) type A / 3.6V / 3600 mAh self-sustained from 20A net current upwards
total fault indication hours	800 hours
flashing frequency	60 per minute
maximum operating voltage	<= 46kV
current withstand	25 kA / 170ms Sym. RMS peak withstand current: 65kA
communication	433MHz bidirectional radio interface to remote control type HS and remote indication interface type RIS
remote indication	faults and the reset of the indicator



<b>Maßstab/scale:</b> <span style="font-size: 2em; font-weight: bold;">1:1</span>	<b>Name:</b> Fault indicator type FLA3.1	<b>Erstellt am/von:</b> D. Kusserow/ <b>created on/by:</b> 09.04.2013
 Elektro-Mechnik GmbH 42553 Velbert Germany	<b>Status:</b> <input type="checkbox"/> ungültig/invalid Ersetzt durch/replaced by: <u>XX.XXXX.XX</u>	<b>Zeichnungsnummer/                  drawing number:</b> <span style="font-size: 1.5em; font-weight: bold;">401531_02</span>



<b>Maßstab/scale:</b> <span style="font-size: 2em;">1:1</span>	<b>Name:</b> Remote control type HS	<b>Erstellt am/von:</b> D. Kusserow/ <b>created on/by:</b> 10.06.2013
 Elektro-Mechnik GmbH 42553 Velbert Germany	<b>Status:</b> <input type="checkbox"/> ungültig/invalid Ersetzt durch/replaced by: <u>XX.XXXX.XX</u>	<b>Zeichnungsnummer/                  drawing number:</b> <span style="font-size: 1.5em;">401708.01</span>