FAULT INDICATOR TYPE FLA3.1

for overhead lines

Description

The fault indicator type FLA3.1 is used in radial overhead line networks. Faults are indicated:
a) by 6 LEDs
b) by a red flag indicator

Installation of the indicator

The fault indicators type FLA3.1 can be mounted while the overhead line is working.

1.) At first the clamp of the indicator must be opened. The easiest way to open the clamp is to hold the FLA3.1 in two hands as shown in figure 1. The thumbs are placed onto the springs diagonally. Then the forefingers push the lever upwards while the thumbs are pressing downwards.
The clamps will keep their position when they are opened completely.
2.) Secondly, the indicator must be inserted into a mounting adapter as shown in figure 3. For this purpose the indicator has to be put into the four openings of the adapter. Afterwards the adapter must be turned with a light push into the right direction until the indicator is fixed.
3.) At last the indicator can be put onto the cable with the tool. Simply push the indicator against the cable, so that the conductor fits into the open clamp. The clamp closes automatically after a light push.
Now the tool must be carefully turned into the left direction to release the indicator from the tool.

figure 1 - Opening the clamps

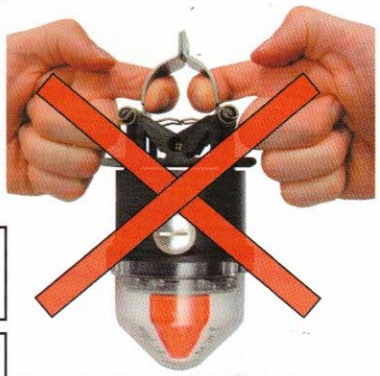

figure 2 - How not to open the clamps

Important: The fault indicators have an identification code (ID), so that each indicator can be programmed individually. Therefore, all installed fault indicators within the range of the remote control must have different IDs. A maximum of 9 different IDs can be set.

Please note: Before the assembly, the fault indicator type FLA3.1 must be activated. For this purpose, the battery box must be opened. The insulator disc on the battery must be removed. Before closing the battery box it should be checked that the minus pole of the battery points to the outside. The battery lid must be screwed tightly again to maintain weatherproofness.
Then the FLA3.1 will perform a start-up sequence:
1.) The LEDs blink in a circular way.
2.) The flag moves into standby position.
Now the FLA3.1 can be mounted.

Advice: The FLA3.1 must not be mounted onto the line while being in radio mode. The installation can disturb the radio mode.

Cable position

In order to ensure the accuracy of the indicator, it must be installed onto the overhead line in the correct position.

Wrong installation
Figure 4 shows a wrong installation. The indicator is hanging loosely on the overhead line cable. From the ground this wrong installation is noticeable due to the fact that the indicator can be moved along the overhead line easily.
Correct installation
Figure 5 shows the correct installation. The indicator is fixed onto the overhead line and is not easily movable. The cable must be fixed inside the springs of the mechanics.

Uninstalling the indicator

To exchange the battery, the indicator must be uninstalled from the line. This can be done with the mounting adaptor as well.

1.) The adapter has to be attached to the indicator by placing the indicator into the four openings of the adapter. The adapter has to be turned into the right direction so that the indicator is fixed.
2.) Pull the tool with the fixed indicator downwards with a strong, sudden draw. The clamps will open and will release the cable.
3.) The indicator can be detached from the tool by turning it into the left direction and pulling it out of the tool.

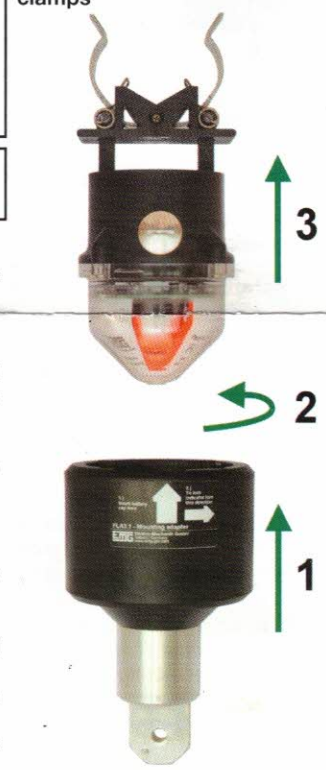

figure 3 - Attaching the reading instrument to the mounting tool

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The signals of the indicator

The fault indicator type FLA3.1 has several LEDs and a flag indication to signal its operation status.
A fault is indicated by 6 LEDs (figure 6: 1) installed in a ring above the flag, so that the indication can be seen from the distance during the nighttime. A fault is also indicated by a big flag indicator (figure 6: 2) at the bottom of the FLA3.1, so that a fault can be seen clearly also during the daytime.
An LED (visible from the bottom of the fault indicator, figure 6: 3) signals the operating status of the fault indicator.

1.) LED does not blink - the fault indicator is ready for service
2.) LED blinks every second - the fault indicator is in radio mode
3.) LED blinks every 3rd second - there is an error

The kind of error can be read out with the remote control type HS. There are two kinds of errors.
- battery status: The FLA3.1 checks the battery status every 12h and indicates when the battery must be exchanged.
- flag error: When the flag could not be moved into parking position, an error is signalled, too.

When the battery voltage is below the necessary voltage to operate the device correctly, the LED (figure 1: 3) signals emergency mode with two flashes every second. The fault detection and radio-mode are disabled in this mode. The battery has to be exchanged.

figure 4 - wrong cable position

Exchanging the battery

If the battery runs low, the indicator will signal this by an LED installed at the bottom of the indicator. First, the indicator must be uninstalled to exchange the battery. (Please refer to „Uninstalling the indicator".)
The battery case is sealed by a waterproof cap. To remove the cap a slotted screwdriver can be used.
The minus pole of the battery must point to the outside.
The fault indicator type FLA3.1 uses lithium batteries type A with 3.6V.

Important: To maintain the weatherproofness of the housing, the cap has to be fixed properly. Otherwise damages and malfunctions can occur!

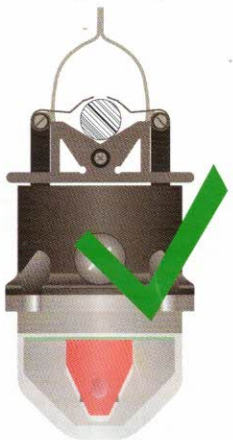

figure 5 - correct cable position

Adjustments

The settings of the fault indicator for trip current, response delay, reset time and reset-mode can be adjusted with the remote control type HS via radio.
The following settings can be programmed:

1) trip current: 20A - 1500A in steps of 20A
or when choosing the option for an automatically adjusted operating value
150% - 500% of the present net current in steps of 50%
2) response delay: 40ms - 300ms in steps of 20ms
3) reset time: 30min - 720min in steps of 30min
4) reset-mode: automatically reset via recovering net voltage on/off

Please refer to the instruction manual for the remote control type HS for detailed information on programming the settings and other features of the remote control.

Please note: The present net current can be read out with the remote control.

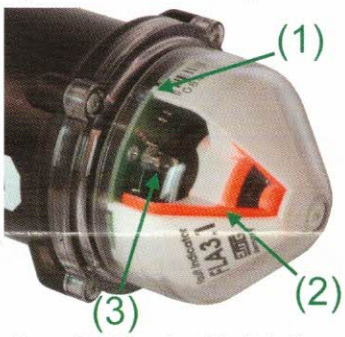

figure 6 - Signals of fault indicator type FLA3.1

The automatic mode of the FLA3.1

When the FLA3.1 is set to adjust its trip current automatically, the FLA3.1 adjusts its trip current on the basis of the measured net current. This adjustment process takes ten seconds. After the adjustment period the automatically adjusted trip current can be read out with the remote control.
(Please refer to the instruction manual for detailed information.)

Autorecloser settings

The FLA3.1 is able to operate with auto-reclosers in the monitored net. To provide an optimized fault detection the autorecloser settings of the FLA3.1 can be used if auto-reclosers are installed.
(Please refer to the instruction manual for detailed information.)

Additional information: If you want to re-power the FLA3.1, please remove the battery. Due to the capacitors inside the FLA3.1 you should wait for 60 seconds, before re-inserting the battery.
A successful re-powering of the device is shown by the start-up sequence as described above.

Careful handling

When moving the adapter down to the ground, please move it downwards vertically. When placing it onto the ground horizontally the connection to the hotstick might break. (Please refer to figure 7.)

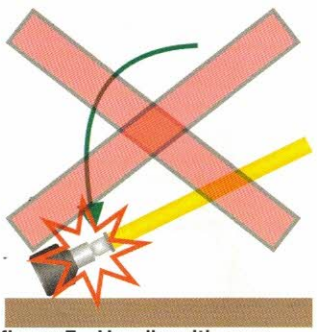

figure 7 - Handle with care

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