



# CableTroll<sup>®</sup> 23X0

(CableTroll 2310, CableTroll 2315, CableTroll 2320 & CableTroll 2330)  
Fault Passage Indicators for underground cables (6-36kv)

CableTroll<sup>®</sup>2300 series fault Indicators indicates phase to phase and/or phase to ground faults in underground cable networks.

CableTroll<sup>®</sup>2300 series fault Indicators can be applied on multi-core and single-core cables.

Features CableTroll<sup>®</sup>2300 series fault Indicators

- Micro-controller based indicator.
- Programmable functions by dipswitches.
- LED fault indication for earth and short circuit faults.
- Out-put for remote signalling and external indication.
- Several power supply alternatives.
- Multi reset function: Manual, automatic, programmable timer, or remote
- Battery monitoring



## Functional Description

CableTroll<sup>®</sup>2300 series fault Indicators is a complete system for indication of phase to ground and phase to phase faults in underground 6-36 kV MV cable networks with multi core cables where sensors can be mounted in a safe area on the cable termination. The earth fault sensor/element (EFE), which is a CT (current transformer), will measure the imbalance in the feeder in the case of an earth fault. Short circuit is detected by two additional phase-mounted sensors. All indicators located between the feeding transformer and the fault location will indicate.

The system consists of :

- Indicator housing with electronics and battery
- Earth Fault Element (EFE),
- Current sensors or short circuit elements (dependent on model)

Trip level for earth fault detection is adjustable in the range from 5-240A. Trip level for short-circuit detection is adjustable in the range from 250-1000 A for product nr 2320 and 350-1200A for product nr 2330.

The programming is done by altering the dipswitches located inside the main indicator housing. Timer reset of indication is programmable to 2, 6, 12 or 24 hours.

Battery lifetime is estimated to 8 years of standby or 1500 hours of indication.

## Technical Specifications



Application: Earth fault and short circuit indication for multi core, single core underground cables.  
 MV- voltage network (6-36kV)  
 Grounding system: Isolated, resistor and solidly grounded  
 Trip levels, see table below:  
 Reset Timer: 2, 6, 12 or 24 hours\*

Prod.nr	Product	I <sub>o</sub>	I>>	Sensor type	Power Supply:
2310	CT 2310	5-240A	-	Earth-Fault Element (EFE)	Lithium battery/ 9-48VDC
2315	CT 2315	5-240A	-	2pcs Earth-Fault Element (EFE)	Lithium battery/ 9-48VDC
232X	CT 2320	5-240A	350-1200A	EFE & 2pcs Fibre-optic current sensors	Lithium battery/ 9-48VDC/230VAC
233X	CT 2330	5-240A	250-1000A	EFE & 2 x Electric current sensors	Lithium battery/ 9-48VDC/230VAC

Indication: Manual: Reset button  
 Automatic: Return of voltage (Cap. outlets or AC-source)  
 1 Red LED for earth-fault fault (I<sub>o</sub>) (2 for CT2315)  
 1 Red LED for short circuit fault (I>>) (product nr 2320 & 2330)  
 "Low battery" warning when < 20% batt.capacity left  
 Flashing freq: 1Hz (ext. powered), duty cycle: 5%  
 0,3Hz if powered by batt./SuperCap, duty cycle: 1,7%

Remote Indication: 2 Output relays NO for (I<sub>o</sub>) and (I>>)  
 For 2310: 1 NO and 1 NC relay

Power supply: External: 1) 9-48VDC, 2) for 2320/2330; 230VAC  
 Alternative back-up for 2320/2330: Lithium batt/Super capacitor  
 Internal: Lithium Cell (A size 3 Ah),  
 Battery life time/change:  
 f battery is main PS: every 1500 ind.hours /up to 8 year  
 If battery is back-up: Up to 10 years

Current consumption: Idle: < 40uA,  
 Indication: 450uA (Int. led + LED-2) / 210uA internal LED only

Temperature range: - 40 to +70°C

Housing: Polycarbonate, UV stablized

Dimension: Main Unit without glands: 121x123x60mm  
 Packaging box: 326x200x66mm

Weight: 2310: 0,97 kg / 2315: 1,45 kg  
 2320: 1,12 kg / 2330: 1,68 kg (including sensors and packaging)

Degree of protection: IP54 (limited by the glands)

## Ordering Information

Product nr: 2310 CT2310 with Lithium battery (inclusive one earth fault element)  
 Product nr: 2315 CT2315 with Lithium battery (inclusive two earth fault elements)  
 Product nr: 2320 CT2320 with Lithium battery (inclusive 2 short circuit elements with fibre optic cable and earth fault element)  
 Product nr: 2330 CT2330 with Lithium battery (inclusive 2 Current sensors and one EFE)  
 Product nr: 2331 CT2330 with ext DC, super.cap (inclusive 2 Current sensors and one EFE)

## About Nortroll AS

Since the foundation in 1977, Nortroll AS has devoted its activities to the development of equipment aiming to reduce electric utilities outage times. We offers a wide range of products for fault detection and remote operation in the MV Distribution Network.

## Your Representative