

ELECTRONSYSTEM MD TECHNICAL SHEET

Revision B of 18.10.2019

APPLICATIONS

- Detect earth faults in medium voltage net

Highlights

- Earth fault passage indicator combined
- Automatic and manual reset
- Front push button for test and reset
- Selectable earth fault trip currents
- Long lasting li-ion battery for stand-alone service during fault condition (up to 50 hours)
- High efficiency high resolution display for fault indication
- Remote indication by change-over contact for fault condition
- External reset with dry contact or external AUX restoring
- System to prevent false indication due to inrush current after 230Vca restoring
- Selectable rise time before fault remoting
- Output suitable for blinking lamp indicator



All specs are subject to change without notice

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APPLICATION

Fault circuit indicators are used to detect earth faults in medium voltage net: a change-over contact is used to remote the over-current tripping while a local LCD display indication is used to select the faulted area of the net.

The high sensitivity of earth fault indicators allow to use them in the most typical application.

Connection between tripping device and earth current sensor is made by electrical cables suitable to be used in tropical environments.

Device is normally energized by 100÷240Vca/Vdc aux while the energy to trip the remote indication relay and manual reset is stored by internal li-ion battery (15 years is the estimated life time).

A diagnostic test can be performed locally by pressing a push-button. Reset can be performed locally by a second push button or by a remote command.

The device keeps the remote fault indication during the whole timing before reset. The local LCD indication always lasts the whole timing before reset.

The operating points for earth fault are adjusted with a threshold level electronic. When the current exceeds the pre-adjusted threshold level, a signal is sent to the reading instrument for evaluation. The respective LCD indication is activated and starts to blink.

Automatic reset is possible either after elapsing of internal timer or after AUX restoring; a system to prevent false indication due to inrush current (after AUX restoring), disable sensing circuit for some seconds.

FUNCTIONS

Minimum impulse adjustment: the reading instrument is equipped with a setting for minimum impulse duration. The impulse picked up from the sensor is evaluated for its duration. If the impulse length is shorter than the adjusted value for the minimum impulse duration, no fault will be indicated. If the impulse duration is longer than the pre-adjusted duration, an earth fault circuit will be indicated.

Test: a push button on front panel allows to verify all the functions are ready to run. Pressing "test" also the remote relay will change state. Test can be done only if start-up "smile" indication appears on display

Reset: the reset of the earth fault or short circuit can be done over:

- A) automatic reset: a time element controls the indication and resets it after a pre-adjusted time (4h or 6h)
- B) manual reset by a push-button on front
- C) external reset by connecting together pins 1-2
- D) external reset with AUX restoring pins L - N and delayed filter

Fault indication:

earth fault: must be detected connecting a three-phase current transformer on input phase L2. If the current is above threshold a lamp & earth symbol will appear on LCD display.

Start-up: a dip switch allows to activate this function that enables power on through li-ion battery. A "smile" will appear on display indicating the device is ready to run and test or reset can be achieved. If AUX is present li-ion battery will be disabled. An auto-diagnostic cycle supervise the circuitry and only if everything is OK the "smile" will appear.

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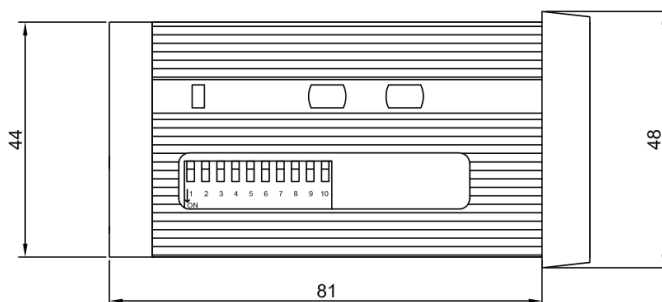
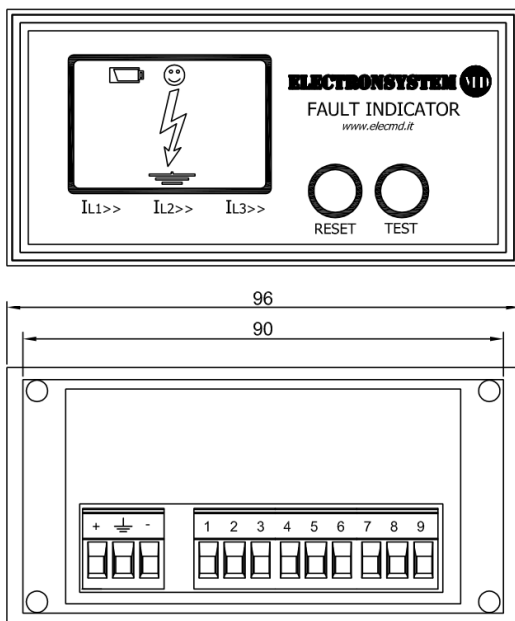
Material and dimensions	Technical Data
Box :..... polycarbonate Mounting:.....panel mounted according to DIN 43700 Dimensions :.....wxhxd=96x48x81mm Panel cut:wxh=92x44mm	Inputs :..... earth current transformer AUX power:..... powered by 100÷240Vca/Vdcinternal li-ion battery (replaceable) Power consumption:.....<20uA (stand-by mode) Trip indication:.....LCD graphic display Outputs - earth fault: 1 change over contact, - source for external blinking lamp Current transformer sensors: - earth fault: 3 phases laminated - transformer plates with coil, electrical cable Threshold fault current: - earth fault:..... 40, 100, 150, 240A user selectable** Accuracy:.....+/- 10% Test:.....manual test on front panel Reset :manual, automatic (4, 6hours**)
Relè datadry contact external resetAUX restoring reset Temperature range :..... -30°C + 60°C Protection class - control unit.....IP54 - current transformers sensors:.....IP67
Filtering	(**)Other values can be chosen by special request
RELAY features Contacts Material :.....Ag-Gold plated Nominal Value :.....0.5A 125VAC (cosφ=1.0) :.....1A 30VDC Max changeover current :.....1 A Max changeover voltage :.....125 VCA, 110VDC Electric live :.....1A/30 VDC cosφ1 2 x 10 ⁵ cycles Mechanical live :.....1 x 10 ⁶ cycles Dielectric strength (open contacts) :.....300VAC 1min (coil-contacts) :.....1000VAC 1min Surge strength :.....min 1500V/1.2X50us	
Pick up times (dip switch) :.....40, 60, 80, 160ms Inrush current time:.....<15s Reset after 230Vca restoring:.....20s	

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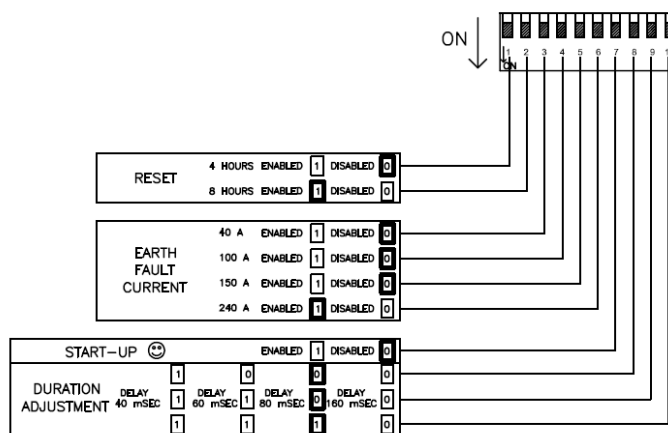
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Dimension EFI/P

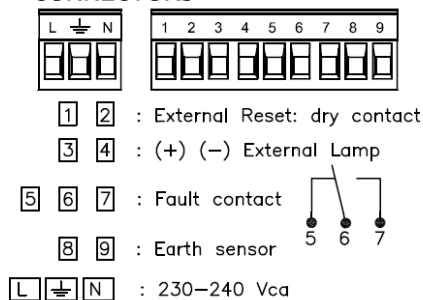
Drawing:
43911034



DIP-SWITCH SELECTION DP1:



CONNECTORS



ORDERING CODE:

Code : EFI/P

NOTE:

- Default dip-switch configuration is marked by bold square

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Drawing:
 43911034

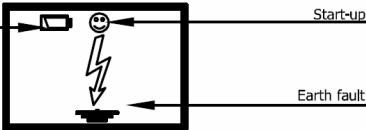
TECHNICAL DATA

- Inputs: electrical earth sensor
 remote dry contact for reset
- Aux Power: 100÷240 Vdc/Vac
 internal li-Ion battery 3,6V 2,5Ah (replaceable)
- LCD Indication:

Battery Low

Start-up

Earth fault


- Outputs: 1 change over contact for earth fault detection
 power source for blinking lamp
- Current transformer sensors: for earth fault, laminated plates coils with electrical cable
- Trip current: 40, 100, 150, 240A selectable for earth fault**
- Accuracy: +/- 10%
- Pick up times (impulse duration): 40, 60, 80, 160 msec
- Reset: manual, automatic (4, 8hours)
 dry contact external reset
 AUX restoring reset
- Temperature range: -30°C ÷ 60°C
- Humidity range: 30% ÷ 95%
- Protection class: din rail mounted instrument IP54

RELAY FEATURE

- Contacts Material: Ag-Gold plated
- Nominal Value: 0.5A 125Vac (cosΦ=1.0)
 1A 30Vdc
- Max changeover current: 1A
- Max changeover voltage: 125 Vac, 110Vdc
- Electric live: 1A/30Vdc cosΦ 1 2 x 10⁵ cycles
- Mechanical live: 1 x 10⁶ cycles
- Dielectric strength (open contacts): 300Vac 1min
 (coil-contacts) : 1000Vac 1min
- Surge strength: min 1500V/1.2X50us

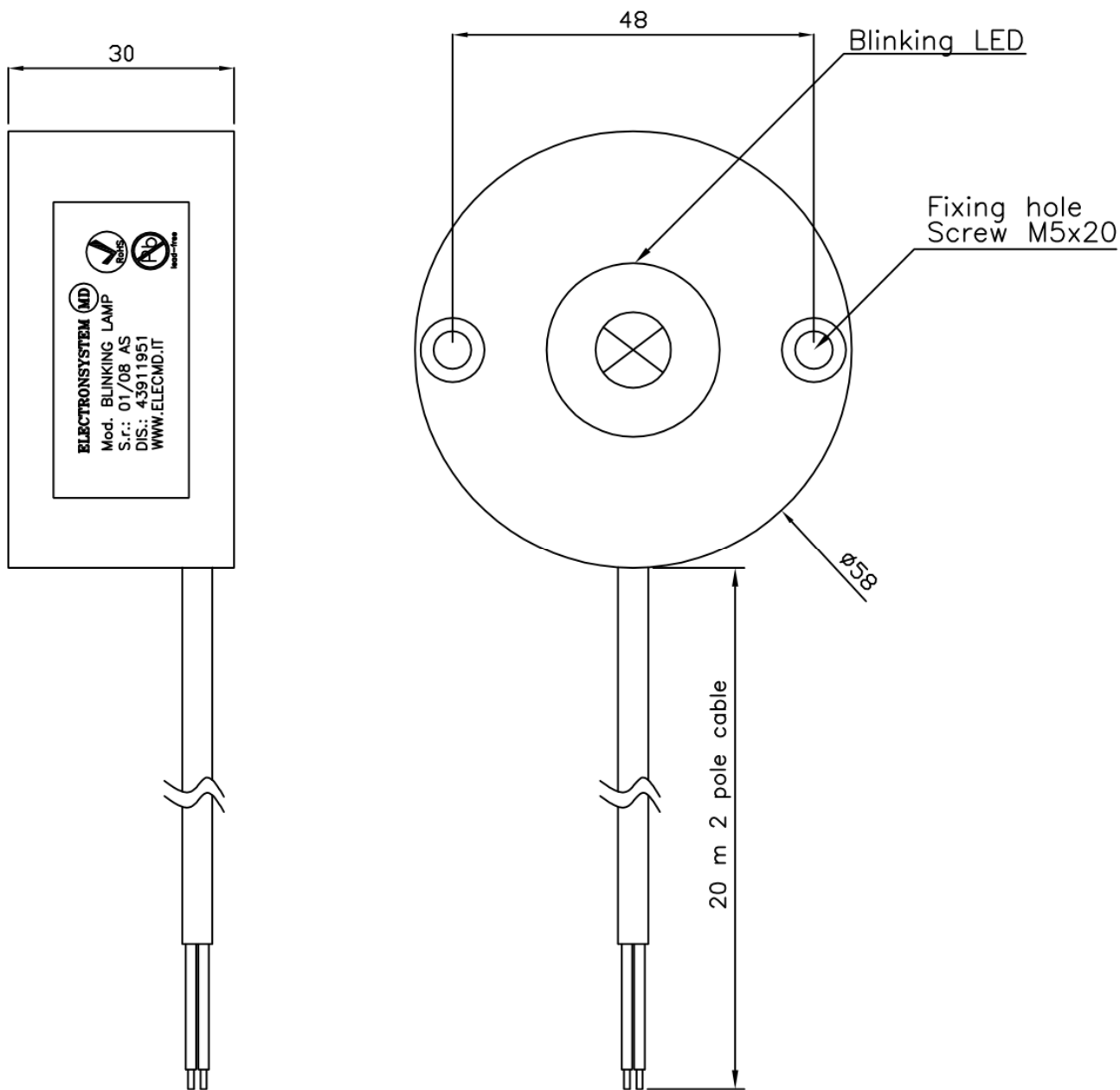
(**) Other values can be chosen by special request

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Accessories *Blinking lamp*

Drawing:
43911951



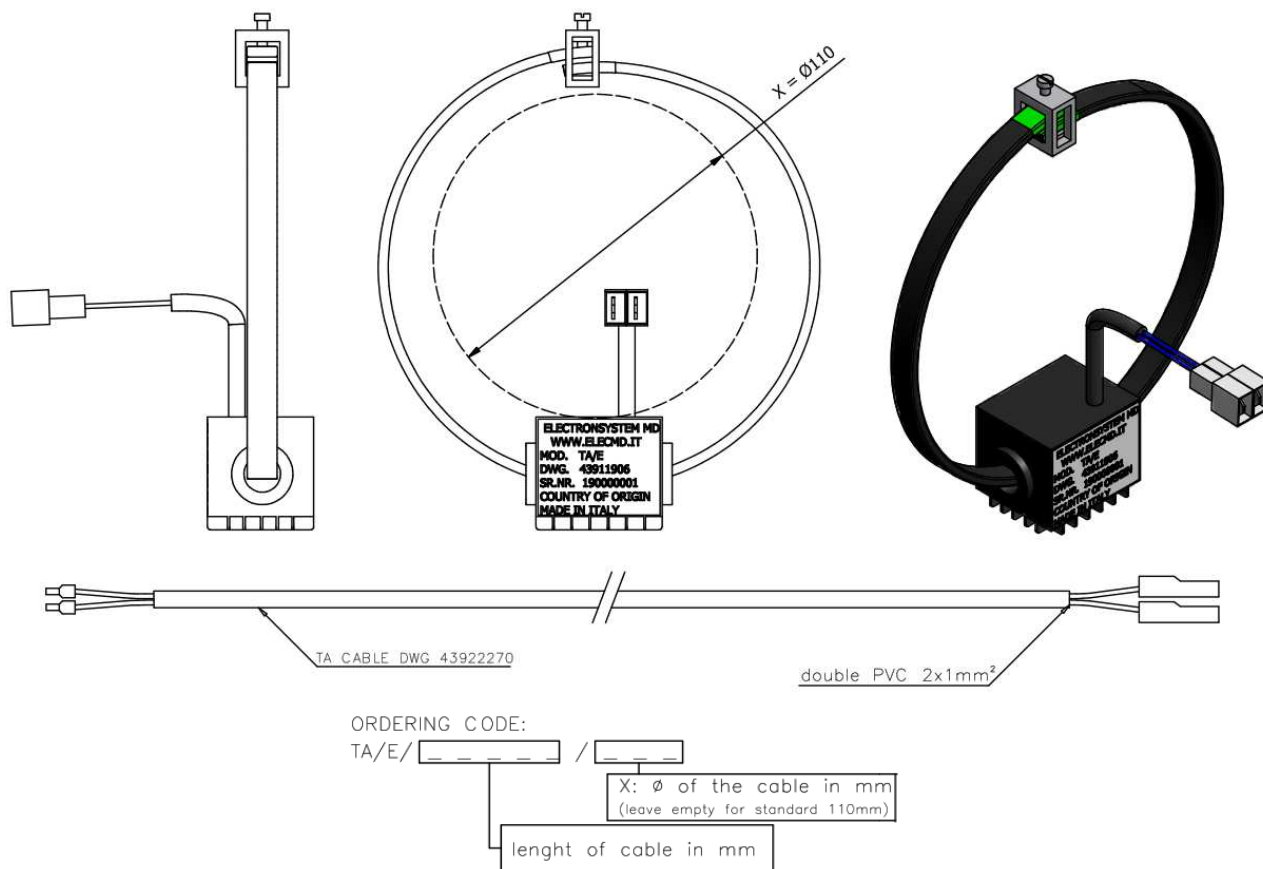
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Accessories TA/E

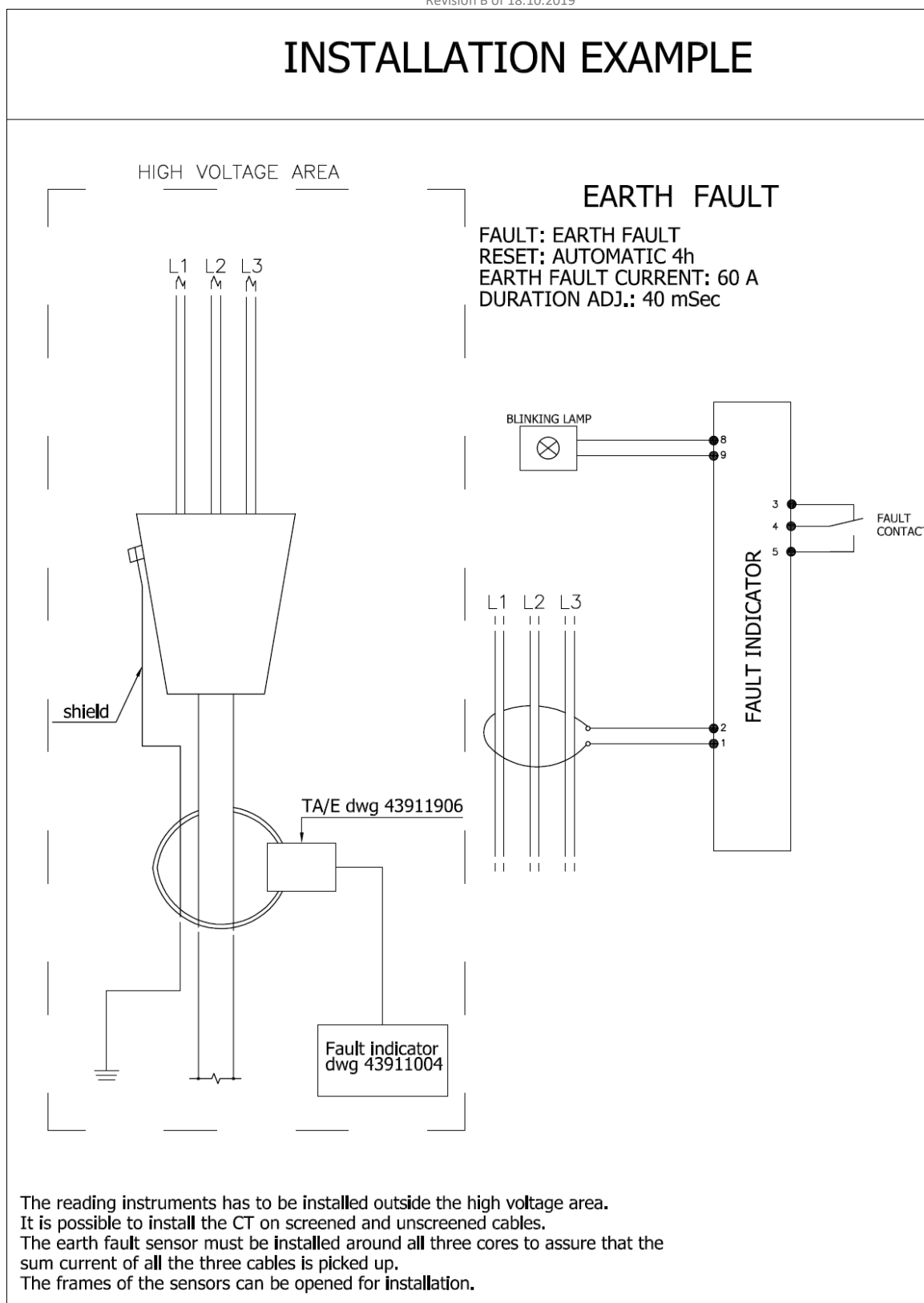
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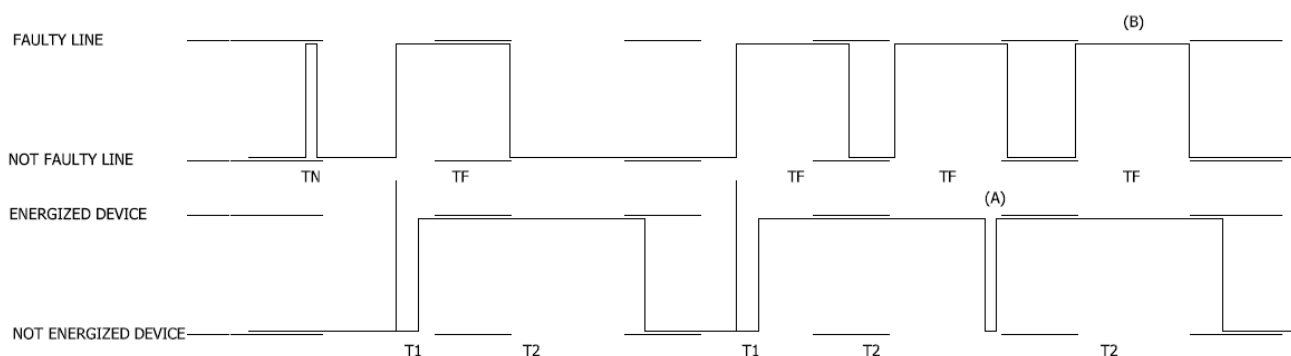
INSTALLATION EXAMPLE

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OPERATING DIAGRAMS WITH FAULTY LINE

**COMMENTS:**

TN: NOISE DURATION < T1

TF: FAULT DURATION

T1: FILTER DURATION SET BY DIP-SWITCH

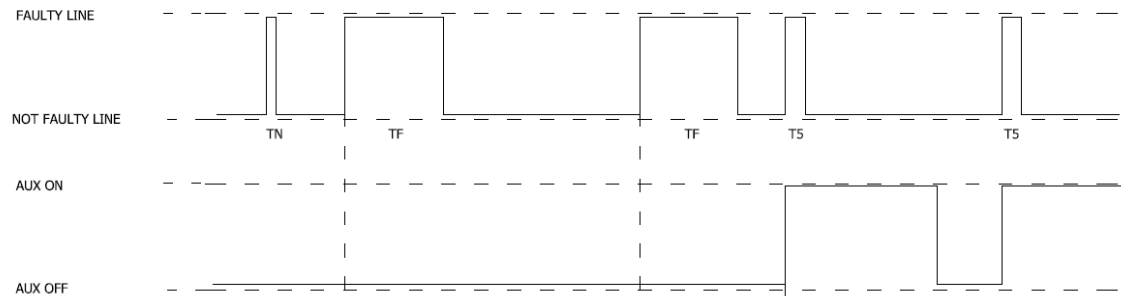
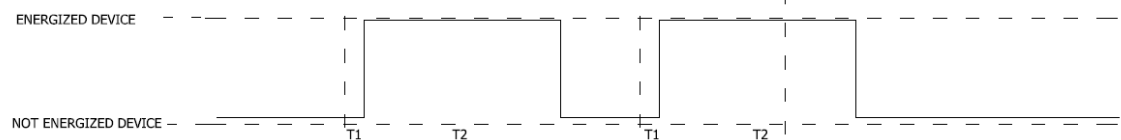
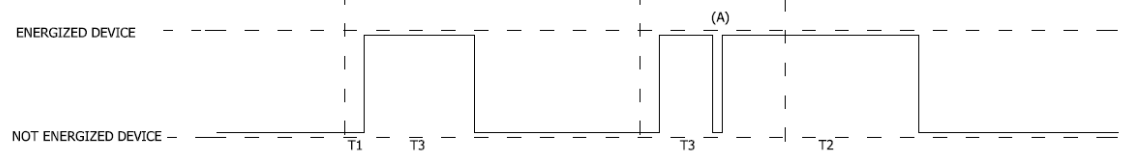
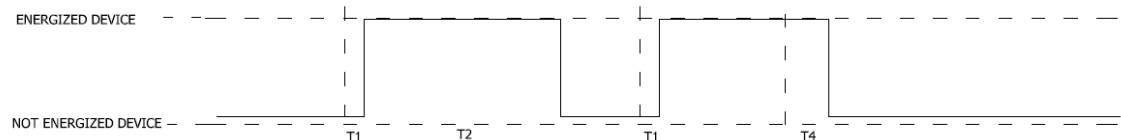
T2: AUTOMATIC RESET DURATION SET BY DIP-SWITCH

(A) IN CASE OF RESET WITH STILL FAULTY LINE THE DEVICE ENERGIZES AGAIN

(B) IN CASE OF NEW FAULT WITH ALREADY ENERGIZED DEVICE NOTHING HAPPENS

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OPERATING RESET DIAGRAMS**(1) AUTOMATIC RESET****(2) MANUAL/EXTERNAL RESET****(3) AUX RESTORING****COMMENTS:**

TN: NOISE DURATION < T1

TF: FAULT DURATION

T1: FILTER DURATION SET BY DIP-SWITCH

T2: AUTOMATIC RESET DURATION SET BY DIP-SWITCH

T3: RANDOM DURATION OF MANUAL OR EXTERNAL RESET

T4: DELAY OF RESET AFTER AUX RESTORING: ABOUT 5s

T5: INRUSH CURRENT AFTER AUX RESTORING < T4

(A) IN CASE OF RESET WITH STILL FAULTY LINE THE DEVICE ENERGIZES AGAIN

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MAINTENANCE SPECIFICATIONS

KIT ASSEMBLIES

N°1 EFI/P DWG. 43911034

N°1 TA/E DWG. 43911906

N°1 BLINKING LAMP DWG. 43911951

STORAGE

If the complex must be storage before use, please keep dry and repaired from cold and hot climates, respecting the original position of case. Move and take care to prevent injuries.

OPERATING TEMPERATURE RANGE: $-30^{\circ}\text{C} \div +70^{\circ}\text{C}$

STORAGE TEMPERATURE: $-40^{\circ}\text{C} \div +85^{\circ}\text{C}$

RELATIVE HUMIDITY: 95% @ $+40^{\circ}\text{C}$

BATTERY SPECIFICATIONS

TYPE: Lithium thionyl chloride battery

NOMINAL CAPACITY: 2500mAh

NOMINAL VOLTAGE: 3,6 Vdc

STANDARD DISCHARGE CURRENT: 2mA

MAXIMUM CONTINUOUS CURRENT: 100mA

MAXIMUM PULSE CURRENT: 200mA

OPERATING TEMPERATURE RANGE: $-30^{\circ}\text{C} \div +85^{\circ}\text{C}$

STORAGE TEMPERATURE: $+30^{\circ}\text{C}$ Max (recommended)

Electronsystem MD work in partnership with its customers in designing customized executions in order to meet specific requirements, please contact us.