FANOX


# SIA-B

## with Standard CTs /1

**Overcurrent & Earth Fault Protection / Dual & Self Powered**

**Secondary Distribution Protection Relay**

KEMA Laboratories
DNV·GL

5
Five year guarantee

fanox.com

# SIA-B

## Overcurrent & Earth Fault Protection Relay for Secondary Distribution

**Dual & Self Powered / Standard CTs**


| PROTECTIONS | |
|---|---|
| 50 | Instantaneous phase overcurrent |
| 50/51 | Inverse time phase overcurrent |
| 50G | Instantaneous Neutral overcurrent |
| 50/51G | Inverse time neutral overcurrent |
| 46 | Negative Sequence instant. overcurrent |
| 49 | Thermal image |
| CLP | Cold Load Pick-up |
| SHB | Second Harmonic Blocking |
| 50BF | Circuit Breaker opening failure |
| 52 | Circuit Breaker monitoring |
| 49T | External trip |
| TB | Trip Block protection |

## Main characteristics

- The SIA-B is an overcurrent protection relay with self powered and dual powered (Self-powering + Auxiliary power) options.
- The relay is self powered using the operating current through three /1 (<2VA) standard current transformers fitted on the lines. These transformers are also used to obtain current measurements. Besides, SIA-B relay can be used with auxiliary power supply (24-230 Vac/dc). The relay can be also supplied by a USB cable connected to the laptop, with the USB KITCOM adapter or an standard power bank.

*Multiple options for powering and communication*

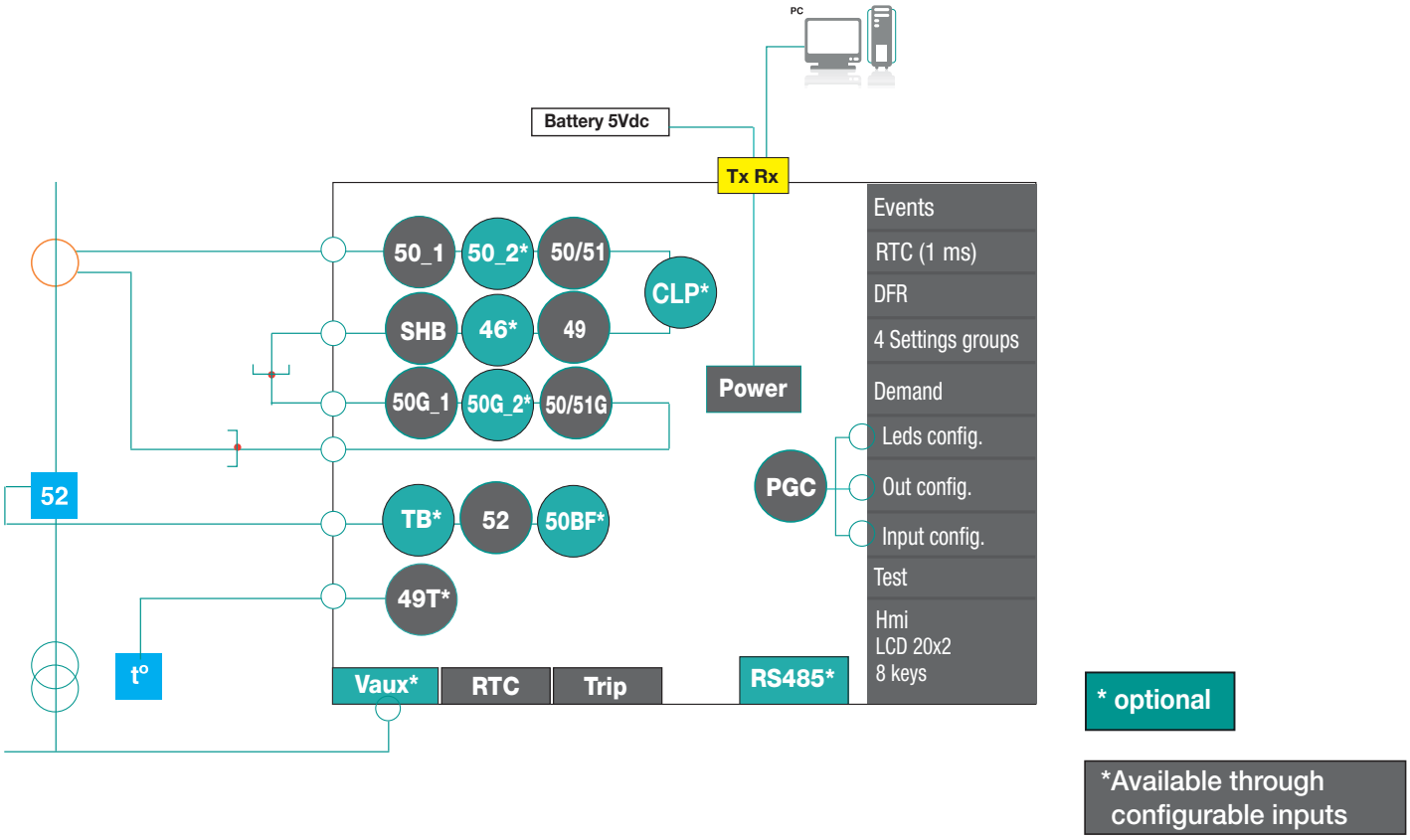
- Internal commissioning battery included. (Lithium battery: 20 years lifetime).
- 50_1, 50/51, 50G_1, 50/51G, 49, SHB, PGC protection functions.
- Micro USB front port connection (Modbus RTU protocol) for local communication. Remote communication through rear **RS485 port (Modbus RTU or DNP 3.0** selectable by general setting) as optional.
- 49T function available through configurable inputs.
- 52 function to control the state of the circuit breaker.
- 50_2, 50G_2, CLP, 46, 50BF and trip block for switch disconnector as optional.
- Specific test menu is provided.
- High electromagnetic compatibility.
- **The installation and subsequent maintenance of external batteries is eliminated. The operating costs of the centre are reduced**.
- Really low start-up levels: 75 mA in three phase system /160 mA in single phase system.
- The line opening mechanism is activated by means of a striker PRT, operated by the energy supplied by the relay.
- There are 4 configurable LEDs. When the relay is switched off, their previous states can be checked by powering the relay up (by self-powering the relay, through USB cable, auxiliary voltage or pressing commissioning battery).

- The SIA-B is fitted with the demand of current (load data profiling) with the following characteristics:

  Number of records: 168
  Recording mode circular
  Sampling rate (interval): configurable through communications: 1 – 60 min.

- Non-volatile RAM memory in order to store up to 1.024 events, disturbance fault recording (DFR- 20 fault reports and 10 oscillographic records in COMTRADE format), maintaining date & time thanks to its internal RTC (Real Time Clock) even without power supply.

## Functions diagram SIA-B



# Technical parameters SIA-B

| | |
|---|---|
| **Function 50_1**<br>**Function 50_2 (*)** | Function Enable: Yes/No/SHB |
| | Current Tap: 0.07 to 20 x In (step 0.01 x In) |
| | Time Delay: 0.02 to 300 s (step 0.01 s) |
| | Activation level 100% |
| | Deactivation level 95% |
| | Instantaneous deactivation |
| | Timing accuracy:<br>Without SHB permitted: ± 30 ms or ± 0.5% (greater of both).<br>With SHB permitted: ± 50 ms or ± 0.5% (greater of both). |
| **Function 50G_1**<br>**Function 50G_2 (*)** | Function Enable: Yes/No/SHB |
| | Current Tap: 0.05 to 10 x In (step 0.01 x In) |
| | Time Delay: 0.02 to 300 s (step 0.01 s) |
| | Activation level 100% |
| | Deactivation level 95% |
| | Instantaneous deactivation |
| | Timing accuracy:<br>Without SHB permitted: ± 30 ms or ± 0.5% (greater of both).<br>With SHB permitted: ± 50 ms or ± 0.5% (greater of both). |
| **Function 50/51** | Function Enable: Yes/No/SHB |
| | Current Tap: 0.07 to 7 x In (step 0.01 x In) |
| | Curves: IEC 60255-151 and IEEE |
| | Time Delay: IEC Inverse curve, IEC very inverse curve, IEC extremely inverse curve, IEC long time inverse, IEEE Inverse curve, IEEE very inverse curve, IEEE extremely inverse curve. Defined time: 0.02 to 300 s (step 0.01 s) |
| | Dial (TMS): 0.01 to 1.5 (step 0.01) |
| | Curve, activation level 110% |
| | Curve, deactivation level 100% |
| | Defined time, activation level 100% |
| | Defined time, deactivation level 95% |
| | Instantaneous deactivation |
| | Timing accuracy:<br>Without SHB permitted: ± 30 ms or ± 5% (greater of both).<br>With SHB permitted: ± 50 ms or ± 5% (greater of both). |
| **Function 50/51G** | Function Enable: Yes/No/SHB |
| | Current Tap: 0.05 to 7 x In (step 0.01 x In) |
| | Curves: IEC 60255-151 and IEEE |
| | Time Delay: IEC Inverse curve, IEC very inverse curve, IEC extremely inverse curve, IEC long time inverse, IEEE Inverse curve, IEEE very inverse curve, IEEE extremely inverse curve. Defined time: 0.02 to 300 s (step 0.01 s) |
| | Dial (TMS): 0.01 to 1.5 (step 0.01) |
| | Curve, activation level 110% |
| | Curve, deactivation level 100% |
| | Defined time, activation level 100% |
| | Defined time, deactivation level 95% |
| | Instantaneous deactivation |
| | Timing accuracy:<br>Without SHB permitted: ± 30 ms or ± 5% (greater of both).<br>With SHB permitted: ± 50 ms or ± 5% (greater of both). |

| | |
|---|---|
| **Function 49** | Function Enable: yes/no |
| | Tap: 0.10 to 2.40 xIn (step 0.01) |
| | ζ heating: 3 to 600 minutes (step 1 min) |
| | ζ cooling: 1 to 6 x ζ heating (step 1) |
| | Alarm level: 20 to 99% (step 1 %) |
| | Trip level: 100% |
| | Trip reset: 95% of alarm level |
| | Timing accuracy: ± 5% regarding theoretical value |
| **Function SHB** | Function Enable: Yes/No |
| | Current Tap: 5% to 50% (step 1%) |
| | Reset Time: 0.00 to 300 s (step 0.01 s) |
| **Function 52** | Maximum number of openings: 1 to 10000 (step 1) |
| | Maximum accumulated amps: 0 to 100000 ($M(A^2)$) (step 1) |
| | Maximum opening time 0.02 to 30 s (step 0.01 s) |
| | Maximum closing time 0.02 to 30 s (step 0.01 s) |
| | Excessive repeated openings: 1 to 10000 (step 1) |
| | Repetitive openings/time: 1 to 300 min (step 1 min) |
| **Function CLP (*)** | Function Enable: Yes/No |
| | Settings group: 1 to 4 (step 1) |
| | No load time: 0.02 to 300 s (step 0.01 s) |
| | Cold Load Time: 0.02 to 300 s (step 0.01 s) |
| | CLP activation threshold: 60 mA |
| | CLP reset threshold: 80 mA |
| **Function 46 (*)** | Function Enable: Yes/No/SHB |
| | Current Tap: 0.10 to 7.00 xIn (step 0.01) |
| | Curves IEC 60255-151 and IEEE |
| | Time Delay:: IEC Inverse curve, IEC very inverse curve, IEC extremely inverse curve IEC long time inverse, IEEE Inverse curve, IEEE very inverse curve, IEEE extremely inverse curve. Defined time : 0.02 to 300 s (step 0.01 s) |
| | Dial (TMS): 0.01 to 1.5 (step 0.01) |
| | Curve, activation level 110% |
| | Curve, deactivation level 100% |
| | Defined time, activation level 100% |
| | Defined time, deactivation level 95% |
| | Instantaneous deactivation |
| **Function 49T** | Available through configurable inputs |
| **Function TRIP BLOCK (*)** | Blocking: Yes/No |
| | Blocking limit: 1.5 to 20 x In (step 0.1) |
| **Function 50BF (*)** | Function Enable: yes/no |
| | Opening fault time: 0.02 to 1.00 s (step 0.01 s) |
| | Open circuit breaker activation threshold: 60 mA |
| **Programmable logic control (PGC)** | OR4, OR4_LATCH, OR4_PULSES, OR4_TIMERUP, OR4_PULSE, NOR4, NOR4_TIMERUP, NOR4_PULSE, NOR4_PULSES, AND4, AND4_LATCH, AND4_PULSES, AND4_TIMERUP, AND4_PULSE, NAND4, NAND4_ TIMERUP, NAND4_PULSE. |
| **Settings groups** | 4 Settings groups: Activated by inputs or by general settings |
| **Events** | 1024 events |
| **Disturbance Fault Recording (DFR)** | 20 fault reports, 16 events in each<br>10 Oscillographic records (50 cycles each) |

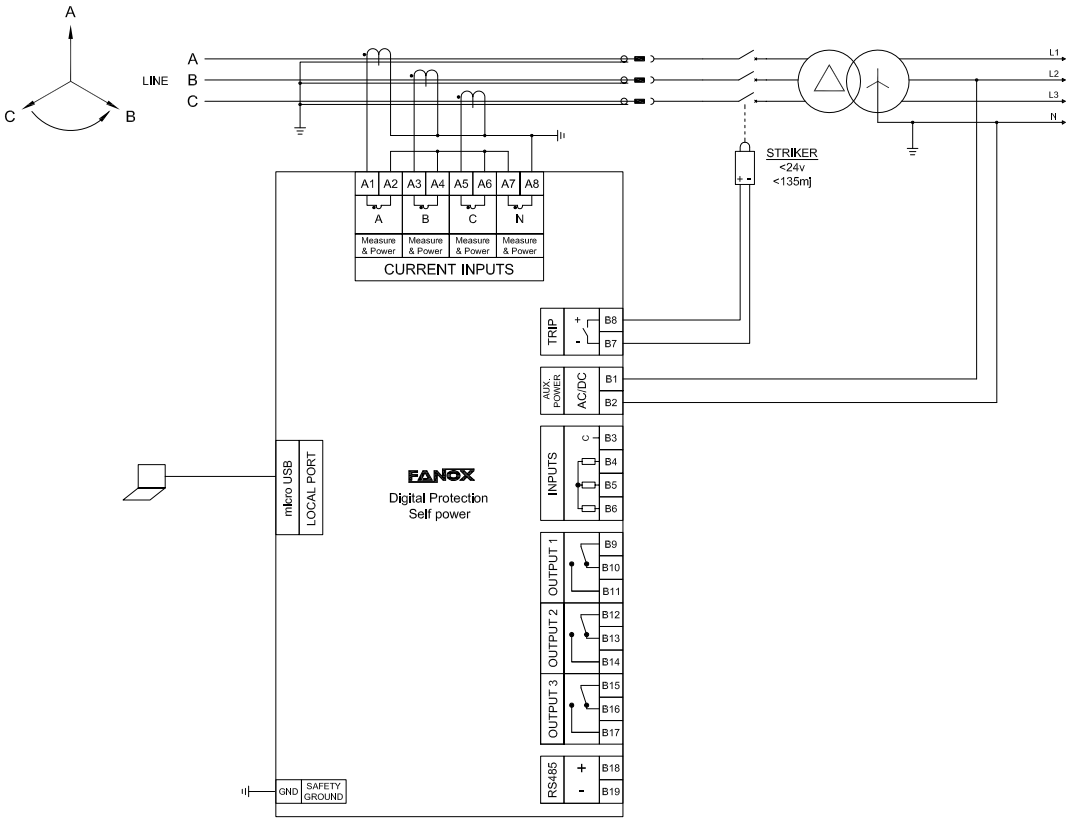
## Technical parameters SIA-B

| | |
|---|---|
| **Load Data Profiling (Current Demand)** | Demand of current with the following characteristics:<br>• Number of records: 168<br>• Recording mode circular<br>• Sampling rate (interval): configurable through communications: 1 – 60 min<br>• Record format:<br>Date/Time<br>IMAX (in interval)<br>IMAX (actual)<br>IA<br>IB<br>IC<br>IN |
| **Trip output** | For Striker: 24 Vdc-135 mJ |
| **Signaling outputs** | 3 changeover outputs (output 1, output 2 and output 3):<br>250 Vac – 8 A<br>220 Vdc – 8 A |
| **Signaling inputs** | 3 inputs: They are activated by short-circuiting the terminals without external supply |
| **Frequency** | Selectable by general settings |

| | |
|---|---|
| **Current measurement** | Fundamental values (DFT) |
| | Sampling: 16 samples/cycle |
| | Accuracy of ±2% on a band of ±20% over the nominal current and ±4% or ± 5mA (greater of both) over the rest of the range. |
| **Communication** | Micro USB front port: Modbus RTU |
| | RS485 port: Modbus RTU or DNP3.0 Serial (*) |
| **Power supply** | 24-230 Vac/dc -20% + 10% |
| **Battery supply** | With USB KITCOM adapter or standard power bank |
| | Internal commissioning battery |
| **Self-power from current** | Three phase self-power level:<br>I > 75mA |
| **Environment** | Operating temperature: -40 to 70ºC |
| | Storage temperature: -40 to 80 ºC |
| | Humidity: 95% |
| **Transformers** | Power supply and measurement CT /1 |
| **Mechanical features** | Metallic box |
| | Panel Mounting |
| | Height x Width: 90 x 245 (mm) |
| | Depth: 139.4 (mm) |
| | IP-54 |
| **Weight** | 3 Kg. |

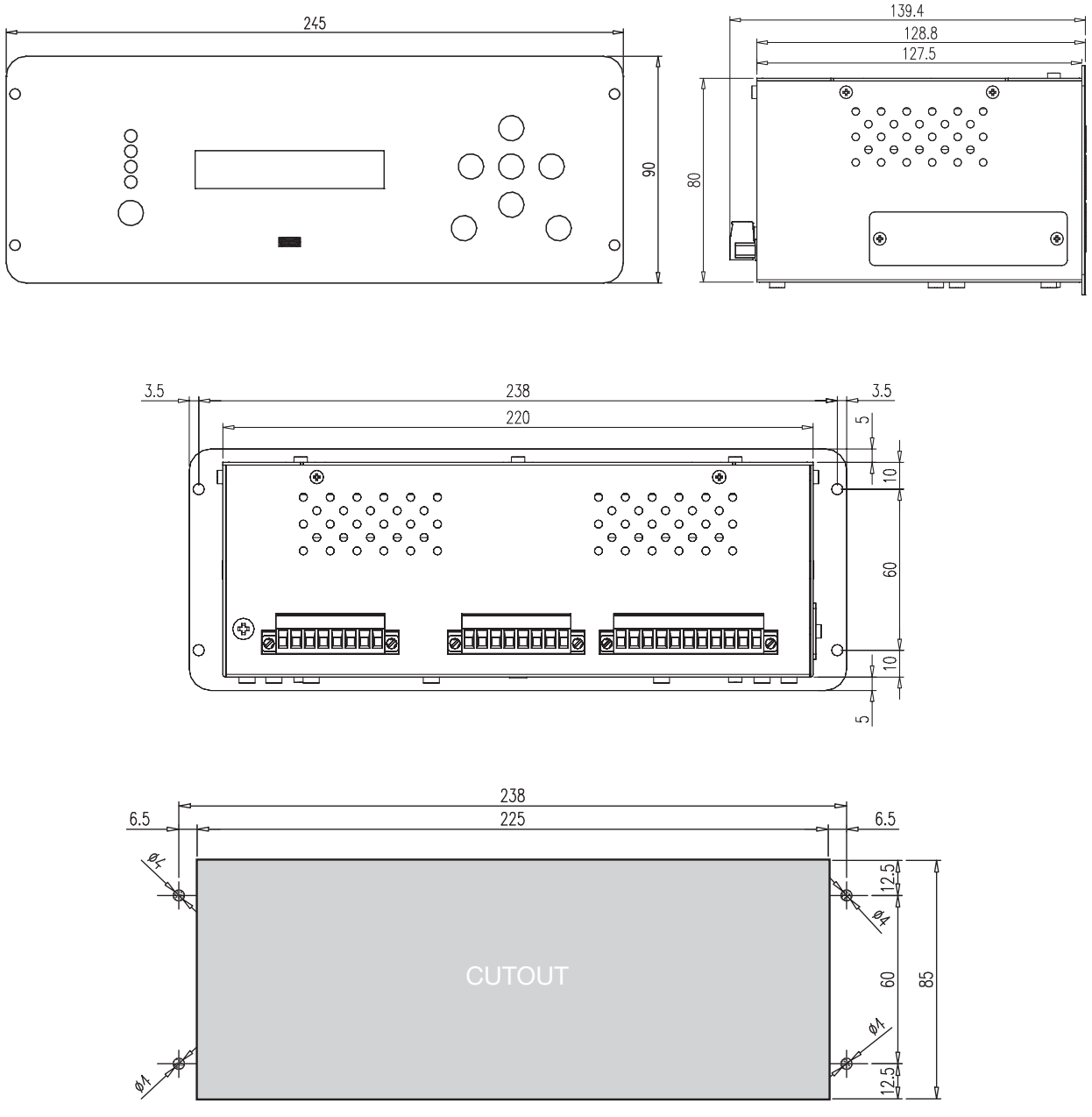
## Connections diagram SIA-B

- 3 CT power supply-measurement
- Rigid neutral




(*) Example of connections diagram

## Dimensions and cutout SIA-B



# Selection & Ordering data SIA-B

| SIA-B | Overcurrent & Earth Fault Protection Relay - Dual & Self Powered | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | | | | | | | | | | **PHASE MEASUREMENT**<br>In= 1 A: (0.10 - 30.00 A) |
| | | 1 | | | | | | | | | **NEUTRAL MEASUREMENT**<br>In= 1 A: (0.05 - 16.00 A) |
| | | | 0 | | | | | | | | **NET FREQUENCY**<br>Defined by General Settings |
| | | | | A | | | | | | | **POWER SUPPLY**<br>Self-powered + Commissioning battery |
| | | | | F | | | | | | | Self-powered + 24-230 Vac/dc (Dual) + Commissioning battery |
| | | | | | C | | | | | | **ADDITIONAL FUNCTIONS**<br>+ 49 + SHB + 4 Settings groups + LDP + DFR + 52 |
| | | | | | D | | | | | | + 49 + SHB + 4 Settings groups + LDP + DFR + 52 + 46 + Trip Block for switch disconnector + 50_2 + 50G_2 + CLP + 50BF |
| | | | | | | 0 | | | | | **COMMUNICATIONS**<br>USB (Modbus RTU) |
| | | | | | | 2 | | | | | USB (Modbus RTU) + RS485 (Modbus RTU or DNP3.0 Serial) |
| | | | | | | | 3 | | | | **INPUTS AND OUTPUTS**<br>4 LEDs + Trip (Striker) + 3 Outputs + 3 Inputs |
| | | | | | | | | 2 | | | **MECHANICAL ASSEMBLY**<br>Extended Horizontal Assembly |
| | | | | | | | | | A | | **LANGUAGE**<br>English, Spanish and German |
| | | | | | | | | | B | | English, Spanish and Turkish |
| | | | | | | | | | C | | English , Spanish and French |
| | | | | | | | | | D | | English , Spanish and Russian |
| | | | | | | | | | | C | **ADAPTATION**<br>Standard CTs /1 |

Example of ordering code:

| SIA B | 1 | 1 | 0 | F | C | 0 | 3 | 2 | A | C | *SIA B 1 1 0 F C 0 3 2 A C* |
|---|---|---|---|---|---|---|---|---|---|---|---|

*"Our innovative spirit, the direct care of market requirements and our extensive experience in the manufacture of protection relays, have made our Self Powered Relays a reference worldwide."*

## More than 40.000 Self Powered relays on site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