The SIA-C is a overcurrent protection relay with self powered and dual powered (self + auxiliary) models. The relay is self powered using the operating current through three /5 (<5VA) or /1 (<2.5VA) standard current transformers fitted on the lines. These transformers are also used to obtain current measurements. Besides, SIA-C relay can be used with auxiliary power supply (24 Vdc, 230 Vac, 48 Vdc or 100-230 Vdc/ac). The relay can also be occasionally supplied by an external battery portable kit (KITCOM).

Internal commissioning battery as optional. Lithium battery: 20 years lifetime.

Front port connection (ModBus RTU protocol) for local communication. Remote communication through rear RS485 (ModBus RTU or IEC 60870-5-103 selectable by general setting).

Specific test menu is provided and configurable inputs and outputs.

High electromagnetic compatibility (EMC).

The installation and subsequent maintenance of batteries is eliminated. The operating costs of the centre are reduced.

In self powered mode, the start-up of the relay from low energy levels, 0.1 times of the nominal current in three phases, ensures capacity to trip.

The line opening mechanism is activated either by means of a striker PRT, operated by the energy supplied by the relay itself, or by a coil using the TCM trip adapter in case it is necessary.

There are bistable magnetic indicators which indicate the trip cause, maintaining their position even though the relay loses the supply (flags).

Self diagnosis of the status (Watchdog) through leds and physical outputs.

The SIA-C 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 1024 events and 20 fault report and, depending on model, disturbance fault recording (10 oscillographic records in COMTRADE format), maintaining date & time, thanks to its internal RTC (Real time clock) even without power supply.
**Functions diagram SIA-C**

### Technical parameters SIA-C

<table>
<thead>
<tr>
<th>Function 50/1</th>
<th>Function 50G_1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function Enable: yes/no/SHB</td>
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</tr>
<tr>
<td>Current tap: 0.10 to 30 x In (step 0.01 x In)</td>
<td>Current tap: 0.10 to 7 x In (step 0.01 x In)</td>
</tr>
<tr>
<td>Time delay: 0.02 to 300 s (step 0.01 s)</td>
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</tr>
<tr>
<td>Activation level 100%</td>
<td>Activation level 100%</td>
</tr>
<tr>
<td>Deactivation level 95%</td>
<td>Deactivation level 95%</td>
</tr>
<tr>
<td>Instantaneous deactivation</td>
<td>Instantaneous deactivation</td>
</tr>
<tr>
<td>Timing accuracy:</td>
<td>Timing accuracy:</td>
</tr>
<tr>
<td>- Without SHB permitted: ± 20 ms or ± 0.5% (greater of both).</td>
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</tr>
<tr>
<td>- With SHB permitted: ± 50 ms or ± 0.5% (greater of both).</td>
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<table>
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<tr>
<th>Function 50_1</th>
<th>Function 50G_2 (*)</th>
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</tbody>
</table>

(*) Optional depending on model
Trip supervision through the control of the trip voltage level.

Charging time 10 s. It is activated by short-circuiting the 50/60 Hz.

Available through configurable inputs and outputs thanks to 3.5 Kg.

Function 46 (*)

Function Enable: yes/no
Current tap: 15 to 100 % (step 1%)
Time delay: 0.02 to 300 s (step 0.01 s)
Timing accuracy: ±30 ms or ±0.5% (greater of both)

Function 46BC (*)

Function Enable: yes/no
Current tap: 0.1 to 2.4 x In (step 0.01)
Time delay: 0.00 to 30 s (step 0.01 s)
Block threshold: 0.1 to 30 x In (step 0.1 x In)

Function 50BF (*)

Function Enable: yes/no
Current tap: 10 to 50% (step 1%)
Reset time: 0.00 to 300 s (step 0.02 s)
Block threshold: 0.1 to 30 x In (step 0.01 x In)

Function 49 (*)

Function Enable: yes/no
Current tap: 0.1 to 2.4 x In (step 0.01)
Cooling: 1 to 6 s; heating: 1 to 600 min (step 1 min)
Alarm: 20 to 99 % (step 1%)
Trip level: 100%
Trip reset: 95% of alarm level
Timing accuracy: ±5% over the theoretical value
Trip time curves are valid under 20 times the adjusted tap. With currents higher than 20 times the adjusted tap, trip time and thermal image are truncated to 20 times the adjusted tap.

Function SHB (*)

Function Enable: yes/no
Current tap: 10 to 50% (step 1%)
Reset time: 0.00 to 300 s (step 0.02 s)
Block threshold: 0.1 to 30 x In (step 0.01 x In)

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: 8% In
CLP reset threshold: 10% In

Function 74CT (*)

Function Enable: yes/no
Time delay: 0.02 to 300 s (step 0.01 s)
Timing accuracy: ±30 ms or ±0.5% (greater of both)

Function 74TCS
Trip supervision through the control of the trip voltage level.

Function 49T (*)

Charging time 10 s. It is activated by short-circuiting the terminals without external supply.

Function 68 (*)

Available through configurable inputs and outputs thanks to programmable logic

Maximum number of openings: 1 to 10,000 (step 1)
Maximum accumulated amps: 0 to 100,000 (MAA) (step 1)
Maximum open time: 0.02 to 30 s (step 0.01 s)
Maximum close time: 0.02 to 30 s (step 0.01 s)
Repetitive open number: 1 to 10000 (step 1)
Repetitive open time: 1 to 300 min (step 1 min)

Function 72 (*)

Function Enable: yes/no
Hold enable: yes/no/no time
Reclose number: 1 to 5
Reclose time: 1, 2, 3, 4, 5, 0.02 to 300 s (step 0.01 s)
Hold time: 0.02 to 300 s (step 0.01 s)
Reset time: 0.02 to 300 s (step 0.01 s)
Safe time: 0.02 to 300 s (step 0.01 s)

Function 79 (*)

Function Enable: yes/no
Hold enable: yes/no/no time
Reclose number: 1 to 5
Reclose time: 1, 2, 3, 4, 5, 0.02 to 300 s (step 0.01 s)
Hold time: 0.02 to 300 s (step 0.01 s)
Reset time: 0.02 to 300 s (step 0.01 s)
Safe time: 0.02 to 300 s (step 0.01 s)

Locking possibilities: pulse inputs, level inputs, commands.

Programmable logic control (PGC)

OR4, OR4_LATCH, OR4_PULSES, OR4_TIMERUP, OR4_PULSE, NOR4, AND4_LATCH, NOR4 TIMERUP, NOR4_PULSE, AND4, AND4_PULSES, AND4_TIMERUP, AND4_PULSE, NAND4, NAND4_TIMERUP, NAND4_PULSE, NOR4_PULSES

Settings groups (*)

Adaptation A and C:
- 3 settings groups
- Activated by inputs or by general settings.
Adaptation B:
- 4 settings groups
- Activated by inputs or by general settings

Disturbance Fault Recording (DFR)

20 fault reports, 16 events in each

10 COMTRADE records of 50 cycles: 3 prefault and 47 postfault cycles (*)

Trip output

For Striker: 25 Vdc–135 mJ
For coil (optionally with TCM adapter):
- 250 Vac – A
- 30 Vdc – 8A
- Resistive load (cos φ = 1)

Signaling outputs (*)
Up to 3 configurable outputs (output 2, output 3 and output 4):
- 220 Vdc – 1 A (30 W max)
- 250 Vac – 1 A (62.5 VA max)

Signaling inputs (*)
2 configurable inputs:
They are activated by short-circuiting the terminals without external supply

Frequency
50/60 Hz

Current measurement
RMS
Accuracy of ±2% on a band of ±20% over the nominal current and ±4% over the rest of the range.

Communication
RS232 port: Modbus RTU
RS485 port: Modbus RTU (*)
RS485 port: Modbus RTU or IEC 60870-5-103 (*)

Auxiliary power supply (*)
230 Vac ±20 %
24 Vdc ±10 %
48 Vdc ±10 %
100-230 Vdc/Vac ±15 %

Battery supply
Externally, with adapter (Kitcom) DB9 port
Internal commissioning battery (*)

Self-powering from current
Self powered with /5 or /1 standard CT:
- I > 0.1Ix for three phases
- I > 0.2Ix single phase

Environment
Operating temperature: –40 to 70ºC
Storage temperature: –40 to 80 ºC
Humidity: 95%

Transformers
Power supply and measurement CT /5 or /1

Metallic box
Panel Mounting

Mechanical features
Height x width:
- Compact Vertical model: 177 x 155 (mm)
- Standard Vertical model: 177 x 189 (mm)
- Horizontal model: 177.8 x 290.3 (mm)

Depth:
- Compact Vertical model: 132.8 mm / 135 mm for the withdrawable model
- Standard Vertical model: 145.8 (mm)
- Horizontal model: 100,75 mm

Weight
3.5 Kg.
Connections diagram SIA-C

- 3 Phases CTs
- 2 Inputs + 2 Outputs
- Striker
- RS485
- External trip

(*) Example of connections diagram
Dimensions and cutout SIA-C

Vertical assembly
Mechanical assembly: D

Withwadrable
Vertical assembly
Compact size
Mechanical assembly: F

Vertical assembly
Compact size
Mechanical assembly: E, G

Horizontal assembly
Mechanical assembly: B, C
**Selection & Ordering data SIA-C**

<table>
<thead>
<tr>
<th>SIA-C</th>
<th>Overcurrent &amp; Earth Fault Protection Relay - Dual &amp; Self Powered</th>
<th>PROTECTION FUNCTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>50_1 + 50/51 + 50G_1 + 50/51G + 74TCS + PGC</td>
</tr>
<tr>
<td>1 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 5 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PHASE MEASUREMENT**
- In = 1 A; (0,10 – 30,00 A)
- In = 5 A; (0,50 – 150,00 A)

**NEUTRAL MEASUREMENT**
- In = 1 A; (0,10 – 30,00 A)
- In = 5 A; (0,50 – 150,00 A)
- In = 0,1 A; (0,01 – 3,00 A)
- In = 0,2 A; (0,02 – 6,00 A)

**NET FREQUENCY**
- 50 Hz
- 60 Hz

**POWER SUPPLY**
- Self powered
- Self powered + 230 Vac (Dual)
- Self powered + 24 Vdc (Dual)
- Self powered + 48 Vdc (Dual)
- Self powered + 100-230 Vac-dc (Dual)
- Self powered + Commissioning battery
- Self powered + 230 Vac (Dual) + Commissioning battery
- Self powered + 24 Vdc (Dual) + Commissioning battery
- Self powered + 48 Vdc (Dual) + Commissioning battery
- Self powered +100-230 Vac-dc (Dual) + Commissioning battery

**ADDITIONAL FUNCTIONS**
- Striker
- Striker and with external trip (49T)
- Coil
- Coil and with external trip (49T)
- Striker and 230 Vac adapted external trip

**COMMUNICATIONS**
- RS232 (Modbus RTU)
- RS232 (Modbus RTU) + RS485 (Modbus RTU)
- RS232 (Modbus RTU) + RS485 (Modbus RTU or IEC60870-5-103)

**INPUTS-OUTPUTS**
- Trip
- Trip + 2 outputs
- Trip + 2 outputs + 2 inputs
- Trip + 3 outputs

**MEMORY**
- Non-volatile RAM memory
- Non-volatile RAM memory + Fast start-up

**LANGUAGE**
- English, Spanish and German
- English, Spanish and Turkish
- English, Spanish and French
- English, Spanish and Russian

**MECHANICS**
- Horizontal assembly with 1 magnetic Flag
- Horizontal assembly with 3 magnetic Flags
- Double rear terminals, Vertical assembly with 1 magnetic Flag
- Vertical, Compact Size with 3 magnetic Flags
- Vertical, Compact Size with 3 Flags, Backlight LCD, Withdrawable
- Vertical Assembly, compact size with 1 magnetic indicator, Backlight LCD
- Double rear terminals, Vertical assembly with 1 magnetic Flag with anticorrosive treatment
- Vertical, Compact Size with 3 magnetic Flags with anticorrosive treatment

**ADAPTATION**
- -
- + 50_2 + 50G_2 + 3 Settings group
- + CLP + 4 Settings groups
- + 50_2 + 50G_2 + 46 + 50BF + 49 + 79 + 52 + 74CT + 46BC + SHB + 3 settings groups

Example of ordering code:

```
SIA C 1 1 5 0 0 3 2 A F A
```

**Example:**

```
SIA C 1 1 5 0 0 0 3 2 A F A
```