The SIL-A is an overcurrent and earth fault protection relay for primary and secondary distribution with auxiliary power supply 24-220 Vdc/ 48-230 Vac. The current measurement is obtained either by standard current transformers /1 or /5, or by special Low Power Current Transformers (LPCT).

Many protection functions: 50_1, 50N/G_1a, 50/51, 50/51N/Gm, 52, 46, 79, 74TCS, CLP (Cold Load Pickup), 86, 49T, 68 (Zone Selection Interlocking) and optionally 50_2, 50N/G_2, 50BF, 48, 74CT, 37, 46BC, TB (Trip Block) and SHB.

Metallic box with high electromagnetic compatibility level (EMC) and wide range of operating temperature.

Direct signalling/control both of the circuit breaker (52 function), both of the recloser (79 function).

Zone selection interlocking (ZSI) function is available through configurable inputs and outputs thanks to the programmable logic.

To allow the communication, relays have a communication port on the front of the equipment and remote communication with different options (ports and protocols) on the back:
- RS485 PORT: IEC60870-5-103, Modbus RTU or DNP3.0 Serial, selectable by model/settings.
- RJ45 PORT: IEC 61850, Modbus TCP/IP, DNP3.0 TCP/IP or IEC 60870-5-104, selectable by model/settings).

The SIL-A has configurable and dedicated inputs and outputs, depending on adaptation:

SIL-A 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)

(1) Note:
- LPCT model: neutral current is calculated so overcurrent protection functions are 50N(2) and 50/51N.
- Standard /1 or /5 models: neutral current is measured so overcurrent protection functions are 50N/G(2) and 50/51N/G.
• 5 Oscillographic records, 20 fault reports and 200 events saved in non-volatile RAM memory with date/time, even without power supply, thanks to its internal RTC (Real Time Clock).

Additional information to fault reports

Technical specifications SIL-A

Functions diagram SIL-A

- RTC (1 ms)
- DFR
- Setting groups
- LDP
- Test
- Out configurable
- Input configurable
- Leds configurable

- Modbus TCP/IP*
- DNP3.0 TCP/IP*
- Modbus RTU*
- IEC 61870-5-103*
- RS485
- Modbus RTU
- Modbus RTU. Tx, Rx
- Modbus RTU. DNP3.0 Serial

(1) Note:
- LPCT model: neutral current is calculated so overcurrent protection functions are 50(2) and 50/51N.
- Standard /1 or /5 models: neutral current is measured so overcurrent protection functions are 50N/G(2) and 50/51N/G.
## Technical specifications

### Technical parameters SIL-A

<table>
<thead>
<tr>
<th>Function enable:</th>
<th>• Adaptation “B”: Yes/No</th>
<th>• Adaptation “C”: Yes/No/SHB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Tap:</td>
<td>0.10 to 30 xIn (step 0.01)</td>
<td></td>
</tr>
</tbody>
</table>

| Time Delay:      | • Adaptation “B”: 0.02 to 300 s (step 0.01 s) | • Adaptation “C”: 0.00 to 300 s (step 0.01 s) |
| Activation level | 100%                                             |
| Deactivation level | 95%                                               |
| Instantaneous deactivation |                            |
| Timing accuracy (greater of both): | If Time Delay 0.00 to 0.02 s, ±50 ms or ±0.5% | If Time Delay 0.02 to 300 s, ±30 ms or ±0.5% |

### Technical parameters SIL-B

<table>
<thead>
<tr>
<th>Function enable:</th>
<th>• Adaptation “B”: Yes/No</th>
<th>• Adaptation “C”: Yes/No/SHB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Tap:</td>
<td>0.10 to 7 xIn (step 0.01)</td>
<td></td>
</tr>
</tbody>
</table>

| Time Delay:      | • Adaptation “B”: 0.02 to 300 s (step 0.01 s) | • Adaptation “C”: 0.00 to 300 s (step 0.01 s) |
| Activation level | 100%                                             |
| Deactivation level | 95%                                               |
| Instantaneous deactivation |                            |
| Timing accuracy (greater of both): | If Time Delay 0.00 to 0.02 s, ±50 ms or ±0.5% | If Time Delay 0.02 to 300 s, ±30 ms or ±0.5% |

### Technical parameters SIL-C

<table>
<thead>
<tr>
<th>Function enable:</th>
<th>• Adaptation “B”: Yes/No</th>
<th>• Adaptation “C”: Yes/No/SHB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Tap:</td>
<td>0.10 to 7 xIn (step 0.01)</td>
<td></td>
</tr>
</tbody>
</table>

| Time Delay:      | • Adaptation “B”: 0.02 to 300 s (step 0.01 s) | • Adaptation “C”: 0.00 to 300 s (step 0.01 s) |
| Activation level | 100%                                             |
| Deactivation level | 95%                                               |
| Instantaneous deactivation |                            |
| Timing accuracy (greater of both): | If Time Delay 0.00 to 0.02 s, ±50 ms or ±0.5% | If Time Delay 0.02 to 300 s, ±30 ms or ±0.5% |

### Circuit Breaker Monitoring

| Maximum number of openings: | 1 to 10.000 (step 1) |
| Maximum accumulated amps:   | 0 to 100.000 (Ma) (step 1) |
| Opening time:              | 0.02 to 30 s (step 0.01 s) |
| Closing time:              | 0.02 to 30 s (step 0.01 s) |
| Excessive repeated openings: | 1 to 10.000 (step 1) |
| Repetitive openings/time: | 1 to 300 min (step 1 min) |
| Open circuit breaker activation threshold: | 8% In |
| Open circuit breaker reset threshold: | 10% In |
| Configurable function pickup: |                       |

### Inputs

<table>
<thead>
<tr>
<th>Function enable:</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hold enable:</td>
<td>Yes/No/No time</td>
</tr>
<tr>
<td>Number of reclosings:</td>
<td>1 to 5</td>
</tr>
<tr>
<td>Reclosing time:</td>
<td>0.02 to 300 s (step 0.01 s)</td>
</tr>
<tr>
<td>Hold:</td>
<td>0.02 to 300 s (step 0.01 s)</td>
</tr>
<tr>
<td>Reset:</td>
<td>0.02 to 300 s (step 0.01 s)</td>
</tr>
<tr>
<td>Safe:</td>
<td>0.02 to 300 s (step 0.01 s)</td>
</tr>
<tr>
<td>Locking possibilities:</td>
<td>pulse inputs, level inputs, commands,</td>
</tr>
</tbody>
</table>

### 74TCS

<table>
<thead>
<tr>
<th>Function enable:</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time delay:</td>
<td>0.02 to 300 s (step 0.01 s)</td>
</tr>
<tr>
<td>Continuity in circuits A and B:</td>
<td></td>
</tr>
<tr>
<td>Inputs:</td>
<td>• Adaptation “B”: Configurable Digital Inputs</td>
</tr>
<tr>
<td></td>
<td>• Adaptation “C”: Dedicated Digital Inputs</td>
</tr>
</tbody>
</table>

### CLP

<table>
<thead>
<tr>
<th>Function enable:</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Settings groups:</td>
<td>1 to 4 (step 1)</td>
</tr>
<tr>
<td>No load Time:</td>
<td>0.02 to 300 s (step 0.01 s)</td>
</tr>
<tr>
<td>Cold load Time:</td>
<td>0.02 to 300 s (step 0.01 s)</td>
</tr>
<tr>
<td>CLP activation threshold:</td>
<td>8% In</td>
</tr>
<tr>
<td>CLP reset threshold:</td>
<td>10% In</td>
</tr>
</tbody>
</table>

(1) Note:  
- LPCT model: neutral current is calculated as overcurrent protection functions are 50N(2) and 50/51N.
- Standard 1 or 5 models: neutral current is measured as overcurrent protection functions are 50N(2) and 50/51N.

(*) Note:  
- Optional depending on model.
### Technical parameters SIL-A

#### Load Data Profiling (LDP)

- **Demand of current with the following characteristics:**
  - Number of records: 168
  - Recording mode circular
  - Sampling rate (interval): configurable through communications (1 – 60 min)
  - Record format: Date/Time
  - IMAX (in interval)
  - IMAX (actual)
  - IA
  - IB
  - IC
  - IN

- **inputs**
  - Same voltage as the auxiliary power supply
  - Adaptation “B”: 6 configurable DI
  - Adaptation “C”: 4 configurable DI + 2 dedicated DI

- **Outputs**
  - 250 Vac – 8 A
  - 30 Vdc – 5 A
  - 4 configurable outputs
  - Output 1 and output 2: NC + NO
  - Output 2 and output 4: NO

- **Frequency**
  - 50/60 Hz selectable by general settings

- **Current measurement**
  - Adaptation “B”:
    - Phase current (IA, IB, IC), neutral (IN), positive sequence (I1), negative sequence(I2), maximum current (Imax) and thermal image (TI)
  - Adaptation “C”:
    - ±2% Accuracy over a band of ±20% over the nominal current and 4% over the rest of the range

- **Fundamental values (DFT)**
  - Sampling: 16 samples/cycle
  - Adaptation “B”:
    - ±2% Accuracy over a band of ±20% over the nominal current and 4% over the rest of the range
  - Adaptation “C”:
    - ±2% Accuracy over a band of ±20% over the nominal current and 4% or ±5 mA (greater of both) over the rest of the range

- **Communications**
  - LOCAL COMMUNICATION
    - 1 Local port RS232: ModBus RTU
  - REMOTE COMMUNICATION (*)
    - 1 remote port with the following options :
      - 1 Remote port RS485: ModBus RTU, IEC 60870-5-103 or DNP3.0 Serial (by model/settings)
      - 1 Remote port RJ45: IEC 61850, DNP3.0 TCP/IP, Modbus TCP/IP or IEC 60870-5-104 (by model/ settings)

- **Auxiliary power**
  - 24-230 Vac/dc (-20% / +10%)

- **Environmental conditions**
  - Operating temperature: -10 to 70ºC
  - Storage temperature: -20 to 80ºC
  - Relative humidity: 95%

- **Transformers**
  - Measurement 3 or 4 CT /1 or /5
  - Measurement 3 LPCT (current transformers with voltage output)

- **Mechanical Characteristics**
  - Metallic box
  - Panel mounted.
  - Height x Width: 177 x 107 mm
  - Depth: 122.1 mm
  - IP-54 on panel
  - Weight: 1.5 kg.

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<table>
<thead>
<tr>
<th>PGC</th>
<th>OR4, OR4_LATCH, OR4_PULSES, OR4_TIMERUP, OR4_PULSE, N5OR4, N5OR4_LATCH, N5OR4_TIMERUP, N5OR4_PULSE, AND4, AND4_PULSES, AND4_TIMERUP, AND4_PULSE, NAND4, NAND4_TIMERUP, NAND4_PULSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>86</td>
<td>Allows to latch (lock out) the contact trip due to programmable logic (PGC: LATCH).</td>
</tr>
<tr>
<td>49T</td>
<td>Available through configurable inputs thanks to the programmable logic.</td>
</tr>
</tbody>
</table>
| 74CT(*) | Function enable: Yes/No  
Current Tap: 0.10 to 30 x In (step 0.01)  
Time delay: 0.02 to 300 s (step 0.01 s)  
Timing accuracy: ±30 ms or ±0.5% (greater of both) |
| 37(*) | Function enable: Yes/No  
Current Tap: 15 to 100% (step 1%)  
Time delay: 0.00 to 300 s (step 0.01 s)  
Timing accuracy: ±30 ms or ±0.5% (greater of both) |
| 46BC(*) | Function enable: Yes/No  
Current Tap: 1.5 to 20 x In (step 0.01)  
Time delay: 0.02 to 300 s (step 0.01 s)  
Timing accuracy: ±30 ms or ±0.5% (greater of both) |
| SHB(*) | Function enable: Yes/No  
Current Tap: 5 to 50% (step 1%)  
Reset time: 0.00 to 300 s (step 0.01 s)  
Block threshold: 0.1 to 30 x In (step 0.01) |
| TB(*) | Function enable: Yes/No  
Current Tap: 1.5 to 20 x In (step 0.01) |

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(1) Note:
- *LPCT model: neutral current is calculated as overcurrent protection functions are 50N/G(2) and 50/51N.
- Standard /1 or /5 models: neutral current is measured as overcurrent protection functions are 50N/G(2) and 50/51N/G.

(*) Note:
- Optional depending on model.
• 3 LPCT Transformers

• 3 Standard Current Transformers

• 4 Standard Current Transformers
SIL-A Overcurrent & Earth Fault Protection Relay for Primary & Secondary

**PROTECTION FUNCTIONS**
- 50_1 + 50_2 + 50/51 + 50N/G_1 + 50N/G_2 + 50/51N/G + 52 + 50BF
- + 46 + 79 + 74TCS + CLP + 86 + 49T

**PHASE MEASUREMENT**
- LPCT (Primary = 50 – 800 A)
- Standard: 1 A or 5 A
- Sensitive: 0.5 A or 2.5 A

**NEUTRAL MEASUREMENT**
- LPCT (Neutral internally calculated)
- Standard: 1 A (0.1-30 A) or 5 A (0.5-150 A)
- Sensitive: 0.1 A (0.01-3 A) or 0.5 A (0.05-15 A)

**NET FREQUENCY**
- Defined by General Setting

**POWER SUPPLY**
- 24-230 Vac/dc

**ADDITIONAL FUNCTIONS**
- + 49 + 74CT + 37 + 46BC + Trip Block
- + 49 + 46BC + SHB (available only for Adaptation “C”)

**REAR COMMUNICATIONS**
- RS232 (Modbus RTU) + RS485 (Modbus RTU or IEC 60870-5-103)
- RS232 (Modbus RTU) + RJ45 (IEC 61850)
- RS232 (Modbus RTU) + RJ45 (IEC 60870-5-104)
- RS232 (Modbus RTU) + RS485 (Modbus RTU or DNP3.0 serial)
- RS232 (Modbus RTU) + RJ45 (Modbus TCP/IP or DNP3.0 TCP/IP)

**INPUTS-OUTPUTS**
- 6 Inputs + 4 Outputs

**MECHANICS**
- Vertical assembly

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

**ADAPTATION**
- Without 50_2, 50N/G_2 and 50BF (74TCS with dedicated DI)

Example of ordering code:
```
SIL A 0 0 0 C 2 A 1 2 B B
```

SILA 000 C 2 A 1 2 B B