

# VAMP 125

## Arc Flash Protection Unit

Publication version: V125/en M/B002

## User manual





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# 1 General

## 1.1 Legal notice

### Copyright

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### Disclaimer

No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this document. This document is not intended as an instruction manual for untrained persons. This document gives instructions on device installation, commissioning and operation. However, the manual cannot cover all conceivable circumstances or include detailed information on all topics. In the event of questions or specific problems, do not take any action without proper authorization. Contact Schneider Electric and request the necessary information.

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## 1.2 Safety information

### Important Information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service or maintain it. The following special messages may appear throughout this bulletin or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

**⚠ DANGER**

**DANGER** indicates an imminently hazardous situation which, if not avoided, **will result in** death or serious injury.

**⚠ WARNING**

**WARNING** indicates a potentially hazardous situation which, if not avoided, **can result in** death or serious injury.

**⚠ CAUTION**

**CAUTION** indicates a potentially hazardous situation which, if not avoided, **can result in** minor or moderate injury.

**NOTICE**

**NOTICE** is used to address practices not related to physical injury.

**User qualification**

Electrical equipment should be installed, operated, serviced, and maintained only by trained and qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material. A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

**Password protection**

Use the IED's password protection feature to protect untrained persons from interacting with this device.

**Settings protection**

The IED's settings protection is intended for detecting accidental settings change. It automatically alarms, if the system is not installed after the DIP switch changes.

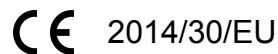
**⚠ WARNING****WORKING ON ENERGIZED EQUIPMENT**

Do not choose lower Personal Protection Equipment while working on energized equipment.

**Failure to follow these instructions can result in death or serious injury.**

## 1.3 EU directive compliance

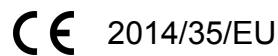
### EMC compliance



Compliance with the European Commission's EMC Directive. Product Specific Standards were used to establish conformity:

- EN 60255-26: 2013

### Product safety



Compliance with the European Commission's Low Voltage Directive. Compliance is demonstrated by reference to generic safety standards:

- EN60255-27:2014

## 1.4 Periodical testing

The protection IED, cabling and arc sensors must periodically be tested according to the end-user's safety instructions, national safety instructions or law. The manufacturer recommends that functional testing is carried out at the minimum every five (5) years.

It is proposed that the periodic testing is conducted with a secondary injection principle for those protection stages which are used in the IED and its related units where current measurement is used.

## 1.5 Purpose

**NOTE:** For applications in the US, Canada and Mexico, use specific documents reviewed in line with the requirements of the relevant regulatory authorities. Please contact our local Schneider Electric office for assistance.

This document contains instructions on the installation, commissioning and operation of VAMP 125. This guide also contains an application example of configuring an arc flash protection system.

This document is intended for persons who are experts on electrical power engineering, and it covers the device models as described by the ordering code in Chapter 10 Order information.

### Related documents

| Document                               | Identification*) |
|--|------------------|
| VAMP 125 Setup and Wiring Instructions | V125/EN AB/xxxx  |

\*) xxxx = *revision number*

Download the latest manual at  
[www.schneider-electric.com/vamp-protection](http://www.schneider-electric.com/vamp-protection) or [m.vamp.fi](http://m.vamp.fi).



## 1.6 Abbreviations

|          |  |
|----------|--|
| ac       | Alternating current  |
| ANSI     | American National Standards Institute. A standardization organisation. |
| AWG      | American wire gauge  |
| CB       | Circuit breaker  |
| CT       | Current transformer  |
| dc       | Direct current   |
| DI       | Digital input  |
| DO       | Digital output, output relay   |
| FPGA     | Field-programmable gate array  |
| HSO      | High speed output  |
| HMI      | Human-machine interface  |
| IED      | Intelligent electronic device, refers to VAMP 125 in this document     |
| LED      | Light-emitting diode   |
| MT       | Master trip  |
| SF       | IED status inoperative   |
| SPST     | Single pole single throw   |
| VAMP 221 | Central unit for VAMP 221 arc flash protection                         |
| VAMP 321 | Central unit for VAMP 321 arc flash protection                         |
| VAM 4C   | Current I/O unit for VAMP 221 and VAMP 321 arc flash protection        |

## 2 Introduction

### 2.1 VAMP 125



Figure 2.1: Arc protection unit VAMP 125

The VAMP 125 arc flash protection unit is a versatile and independently operating device for bay based protection.

VAMP 125 has a fixed one type design, and it is optimized for use in arc protection as a stand-alone device or as part of a system. It can be used in various arc protection applications in low or medium voltage power distribution systems.

- External input for overcurrent measurement via the  $I > I_N$  input
- Event memory, LED indication memory in case of mains loss
- Operation on simultaneous current and light or on light only mode ( $I >$  &  $L >$ , or  $L >$ )
- Typically a 7 ms operation time with a mechanical output relay: with HSO the operation time is typically 1 ms in the light only mode
- Two programmable operation zones
- Full system self-supervision
- Up to two normally-open trip contacts for fast arc flash detection: T1 (HSO) and T2 (SPST)
- One change-over signal contact: SF
- LED indications of status, fault and trip indications
- Binary input/output (BI/O) bus for light and overcurrent information and master trip

## 2.2 Unit features

VAMP 125 is a state of the art arc protection unit for electrical power distribution systems. By using VAMP 125 in switchgears, considerable safety improvements are obtained in the form of minimized injury and damage in case of an arc fault. VAMP 125 is a stand alone device, which provides a compact solution when the application does not require overcurrent measurement or when the overcurrent information is available from the incomer protection relay or any other arc protection unit (VAMP 221, 321 / VAM 4C). It is possible to connect four arc sensors of the VA1DA or VA1EH type to the VAMP 125 unit.

## 2.3 DIP switch settings on unit

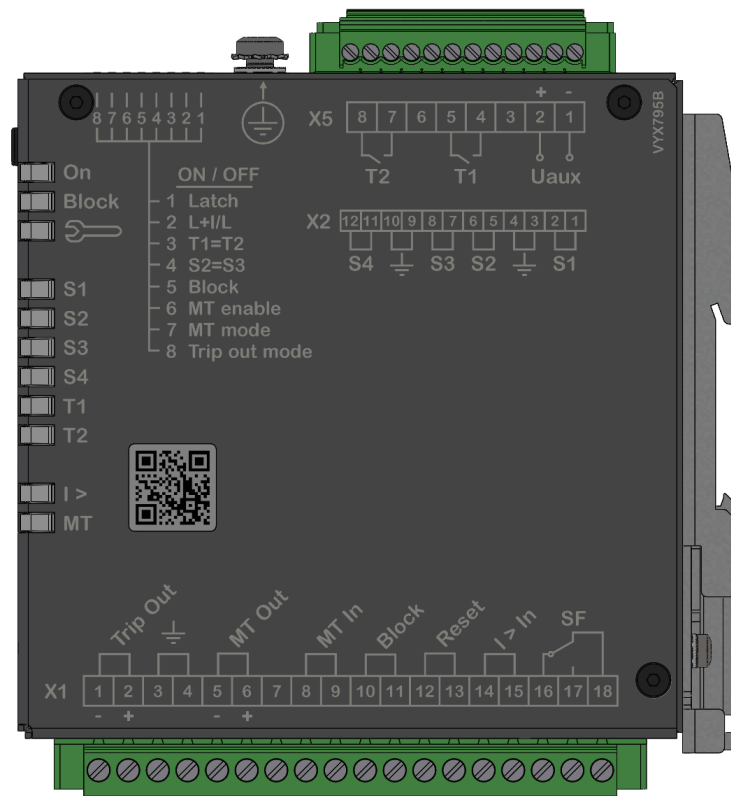


Figure 2.2: VAMP 125 dipswitch operations and sensor connection

The unit is configured using dipswitches which are located on top of the device.

**NOTE:** If any settings are changed, the device indicates it via the service output and the “ $\Rightarrow$ ” LED is lit.

**Dipswitches 1 – 8:**

| <b>ON / OFF</b><br>1 Latch<br>2 L+I/L<br>3 T1=T2<br>4 S2=S3<br>5 Block<br>6 MT enable<br>7 MT mode<br>8 Trip out mode | <b>SW No.</b>      | <b>Description</b>   |
|---|--------------------|--|
|   | 1 Latch            | The Latch switch enables latching of the trip relays. If set to the 'ON' position, the latching function is activated. If set to the 'OFF' position, the output relays will follow the state of the sensors and minimally 20 ms output control pulse is generated.   |
|   | 2 L+I/L            | The L+I/L switch selects the operation mode. If set to the 'ON' position, the unit operates in the L+I mode (requires both I> input activation and light + external I> I <sub>N</sub> signal). If set to the 'OFF' position, the unit operates in the L> mode (light only mode).                                   |
|   | 3 T1=T2            | The T1=T2 mode is for setting the system selectivity. If set to the 'OFF' position, sensors nr. 1 and 2 will trip relay T1. Accordingly, sensors nr. 3 and 4 will trip relay T2. If set to the 'ON' position, all four sensor channels will activate both trip outputs.  |
|   | 4 S2=S3            | If the configuration switch for sensor inputs 2 and 3 is in the 'ON' position, the activation of sensor 2 or 3 results in a common trip of both T1 and T2. If the switch is in the 'OFF' position, sensor 2 is linked to T1, sensor 3 is linked to T2 and both will individually trip their dedicated trip relays. |
|   | 5 Block            | The Block switch enables blocking function to unit outputs.  |
|   | 6 MT enable        | The MT enable switch enables the master trip function.   |
|   | 7 MT mode          | If the configuration switch is set to the 'OFF' position, the MT output follows T1. If the configuration switch is set to the 'ON' position, the MT output follows T1 and T2.<br><br>Note! Operation applies also to the L+I/L function.   |
|   | 8 Trip output mode | If the configuration switch is set to the 'OFF' position, the Trip out follows the state of T1. If the switch is set to the 'ON' position, the Trip out follows the state of T2.   |

## 2.4 Connecting the supply voltage

**NOTE:** Do not connect the supply voltage before the device connections and configuration are done. If the settings of the unit need to be changed, disconnect the supply voltage before configuring the device(s).

- Ensure the device connections, protective grounding and unit configurations are in order.
- Connect the auxiliary supply voltage to the IED's terminal block.

### **⚠ DANGER**

#### **HAZARD OF ELECTRICAL SHOCK**

Always connect the protective grounding before connecting the power supply.

**Failure to follow these instructions will result in death or serious injury.**

## 2.5 Disconnecting the supply voltage

The auxiliary supply power must be disconnected from the IED if the following service actions are required:

- Replacement, add-on or removal of unit, cabling or sensors
- Changing of unit settings

## 3 Functions

### 3.1 Arc flash protection, general principle

The arc flash protection contains two protection zones, which may be used to trip for example the incomer and outgoing circuit breakers. Arc protection zones are activated with external overcurrent status and light signals (or light signal alone). The allocation of different light signals to arc zones is defined in the sensor channel mapping of the unit.

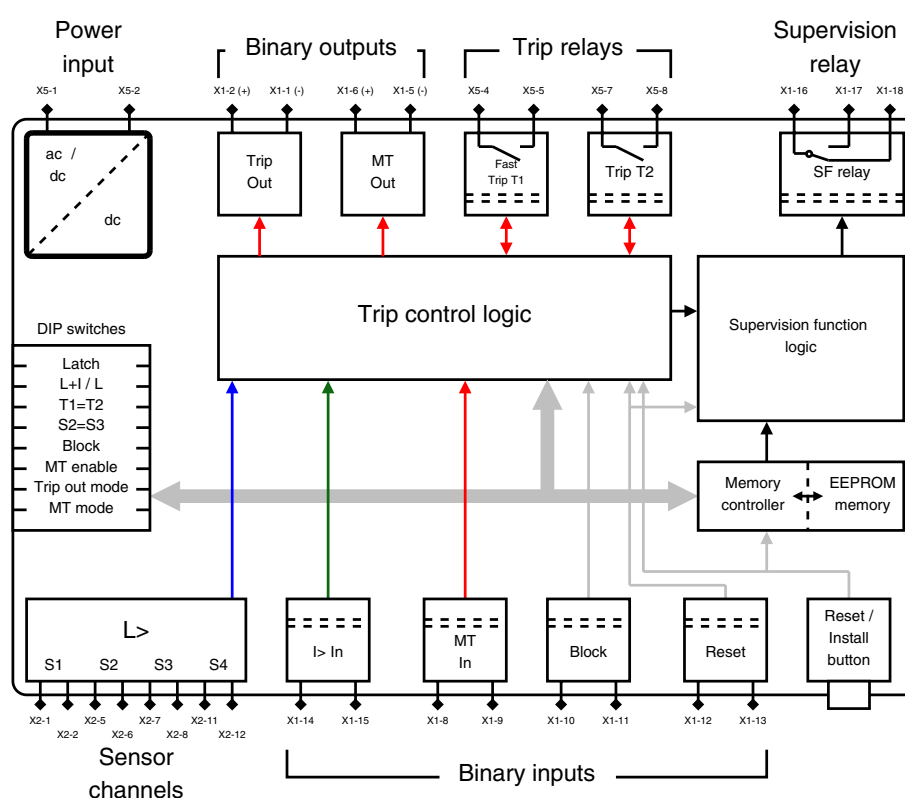


Figure 3.1: VAMP 125 block diagram

### 3.2 Self-supervision

The electronics and operation of the VAMP 125 unit are supervised by means of a separate self-supervision logic. The arc flash sensors are also self-supervised. In case the self-supervision detects a permanent fault within the VAMP 125 unit or the arc sensors connected, the self-supervision output and system status indication LED are activated.

## 3.3 Binary inputs and outputs

Information from the arc protection function can be transmitted and/or received through binary inputs (BI) and outputs (BO). The rated voltage of these signals is 24 V dc when active. The input signal voltage range is 18 – 250 V dc.

### Binary inputs

The binary inputs 'BI' (MT In, Block, Reset or  $I > I_N$ ) can be used to receive the master trip, Blocking, Reset or Current indication from another IED to build selective arc protection scheme(s). BI is a dry type input for a 18 – 250 V dc signal. The function of BI signals is configured with the DIP switch.

### Binary output

The binary outputs 'BO' (Trip Out or MT Out) can be used to send the trip indication/information signal to another IED's binary input to build selective arc protection systems. BO is an internally driven (wetted) 24 Vdc signal. The function of BO signals is configured with the DIP switch.

## 3.4 Output relays

The output relays are also called digital outputs. Trip contacts can be controlled only by the corresponding arc flash sensors. The activated contact is indicated by the T1 and T2 LEDs.

An output relay can be configured as latched or non-latched using DIP switch 1. Latched relay contacts can be set free by pressing the IED's "Reset / Install" key.

The difference between the trip contacts and signal contacts is the DC breaking capacity. The contacts are single pole single throw (SPST) normal open type (NO), except for the signal relay SF which has a change-over contact single pole double throw (SPDT).

## 3.5 HMI functions and indications

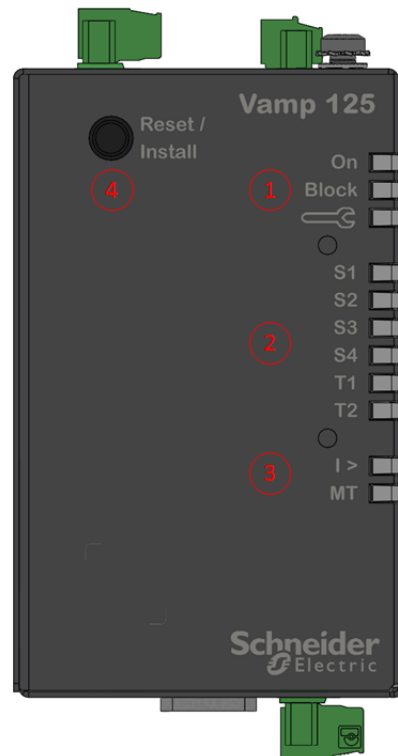


Figure 3.2: VAMP 125 dipswitch operations and sensor connection

### 1. Operating status indication lights

- On: Green, steady when the device is powered
- Block: Yellow, lit when the block is active, either from DIP or Block input
- Tool: Red, steady when the device is in the error state or blocked

### 2. Sensor and trip output indications

- S1: Yellow, steady when sensor 1 is activated, flashing in the unhealthy state
- S2: Yellow, steady when sensor 2 is activated, flashing in the unhealthy state
- S3: Yellow, steady when sensor 3 is activated, flashing in the unhealthy state
- S4: Yellow, steady when sensor 4 is activated, flashing in the unhealthy state
- T1: Red, steady when trip 1 is activated, flashing in the unhealthy state
- T2: Red, steady when trip 2 is activated, flashing in the unhealthy state



**3. Binary input indications**

- I>: Red, steady when I> input is energized
- MT: Red, steady when external master trip is received from MT In

**4. Reset / Install**

- Push button on the front: "Reset / Install"
  - 0.5 s press to, reset and clear indications / latch
  - 5 s to press to, install sensors
- While pressing "Install", the device will flash all LEDs at the end of the installation routine to perform the LED function test.

# 4 Application

Every switchgear or assembly compartment is equipped with an arc flash point sensor. Up to four sensors can be connected to the unit. The trip relays are electromechanical and hybrid type of outputs. Relays can be connected directly to control the circuit breakers.

VAMP 125 is an arc flash protection relay for small MV and LV power distribution applications used in power generation, industry and utilities where the light only operation mode with full selectivity is required.

If overcurrent criteria are required simultaneously with light activation, a binary current signal has to be connected to X1-14/15. This  $I > I_N$  signal can for example be taken from the VAM 4C or VAMP 221, 321 units.

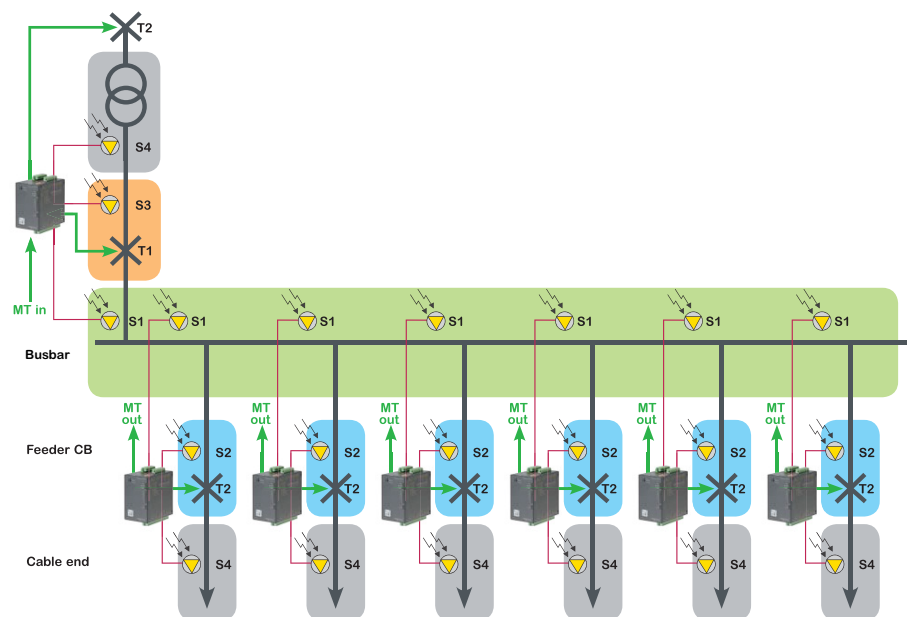


Figure 4.1: One main application on MV switchgear

## Fault in cable end

- S4 sensor activates trip contact "T2". Busbar remains operational.

## Fault in busbar and feeder CB

- S1 sensor in busbar or S2 sensor in feeder CB activates the master trip.
- MT Out is connected to the incomer VAMP 125 unit.
- When the VAMP 125 unit located in the incomer receives MT to input, the incomer unit activates the trip contact "T1".

### Fault in incomer CB or cable end

- Sensors S3 and S4 activate contact "T2".

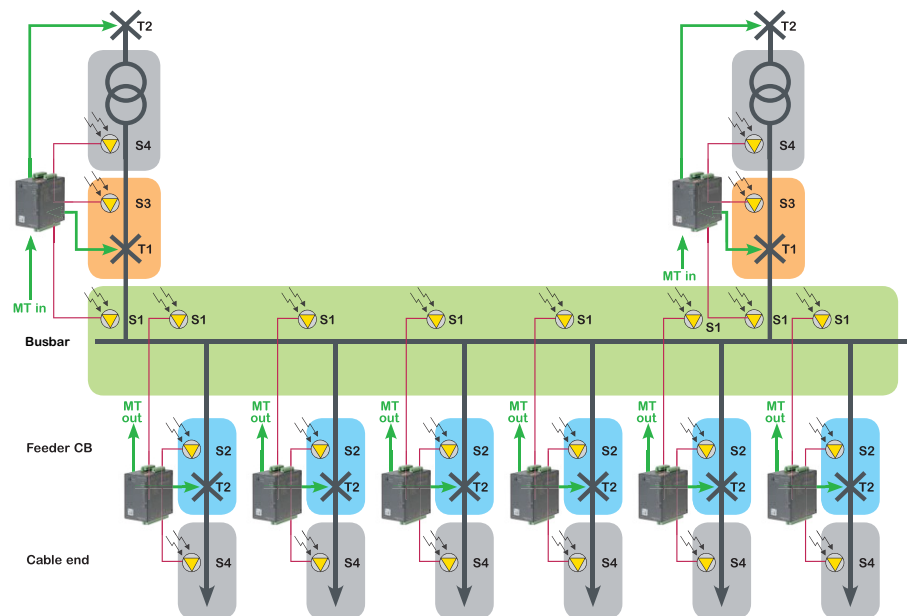


Figure 4.2: Two main application on MV switchgear

DIP switch settings for One main and Two main applications. These settings are identical for the incomer and feeder VAMP 125 IED.

|               | ON | OFF |
|---------------|----|-----|
| Latch         | X  |     |
| L+I/L         |    | X   |
| T1=T2         |    | X   |
| S2=S3         |    | X   |
| Block         |    | X   |
| MT enable     | X  |     |
| MT mode       |    | X   |
| Trip out mode |    | X   |

Please see "VAMP 125, Setup and Wiring Instructions" for more application examples.

# 5 Connections

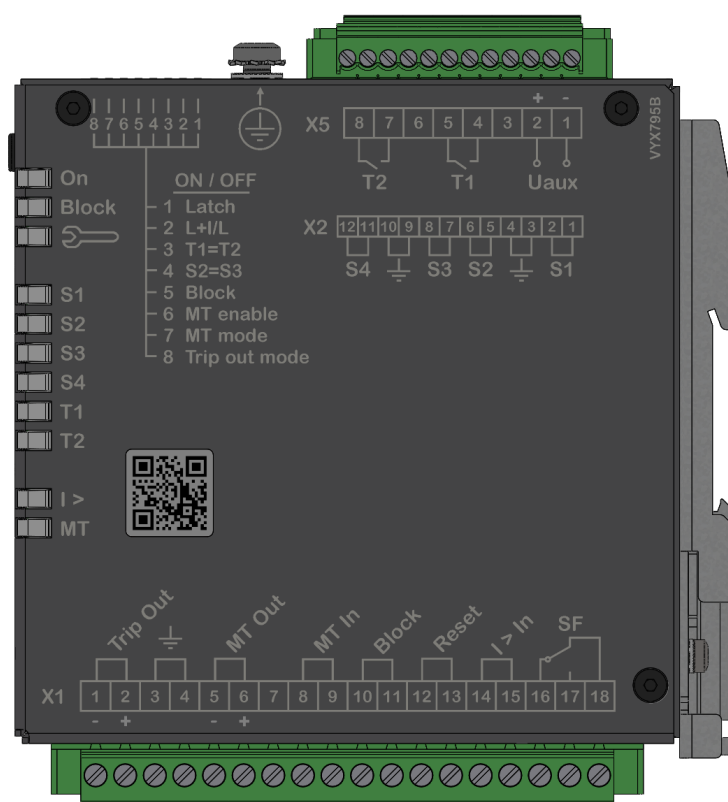


Figure 5.1: VAMP 125 connections

The VAMP 125 unit comprises two independent arc protection zones. Both zones have their own trip relay, trip 1 and trip 2. Trip 1 is controlled by sensor inputs 1 and 2. Trip 2 is controlled by sensors 3 and 4.

Trip Out is activated if either or both the trip relays trip.

- If the Trip out mode switch is in the "OFF" position, the output follows the state of T1.
- If the Trip out mode switch is in the "ON" position, the output follows the state of T2.

If the "T1=T2" dip switch is in the "ON" position, both trip outputs will work in parallel for any sensor activation.

If the "S2=S3" dip switch is in the "ON" position, activation of sensor 2 or 3 will cause both T1 and T2 to trip. This is for example used for CB compartment supervision where two zones overlap each other.

If the overcurrent criteria are required simultaneously with light activation, a binary current signal has to be connected to X1-14/15. This I> signal can e.g. be taken from VAM 4C or VAMP 221 or 321

units. External reset is possible by energizing the Reset input in X1-12/13 by auxiliary voltage.

The auxiliary voltage is connected to X5-1 and X5-2. VAMP 125 has a wide power supply range.

## ⚠ DANGER

### HAZARD OF ELECTRICAL SHOCK

Always connect the protective grounding before connecting the power supply.

**Failure to follow these instructions will result in death or serious injury.**

## 5.1 X1 connector

**Table 5.1: Type: Phoenix contact MSTB 2.5 – 5.06**

| Pin No. | Symbol    | Description                           |
|---------|-----------|---------------------------------------|
| 1       | Trip Out  | Trip Out, negative terminal           |
| 2       | Trip Out  | Trip Out, positive terminal, +24 V dc |
| 3       | GND       | Binary output GND                     |
| 4       | GND       | Binary output GND                     |
| 5       | MT Out    | MT Out, negative terminal             |
| 6       | MT Out    | MT Out, positive terminal, +24 V dc   |
| 7       | NC        | No connection                         |
| 8       | MT In     | External master trip input            |
| 9       | MT In     | External master trip input            |
| 10      | Block     | External block input                  |
| 11      | Block     | External block input                  |
| 12      | Reset     | External reset input                  |
| 13      | Reset     | External reset input                  |
| 14      | I> In     | External current input                |
| 15      | I> In     | External current input                |
| 16      | SF COMMON | Service status output, common         |
| 17      | SF NO     | Service status output, normal open    |
| 18      | SF NC     | Service status output, normal close   |

**NOTE:** Binary inputs are polarity free which means that the user can freely choose "-" and "+" terminals for each binary input.

## 5.2 X2 connector

**Table 5.2: Type: Phoenix contact MC 1.5 – 3.5**

| Pin No. | Symbol | Description                             |
|---------|--------|---|
| 1       | S1     | Arc sensor channel 1, positive terminal |
| 2       | S1     | Arc sensor channel 1, negative terminal |
| 3       | GND    | Arc sensor channel 1 Ground             |
| 4       | GND    | Arc sensor channel 2 Ground             |
| 5       | S2     | Arc sensor channel 2, positive terminal |
| 6       | S2     | Arc sensor channel 2, negative terminal |
| 7       | S3     | Arc sensor channel 3, positive terminal |
| 8       | S3     | Arc sensor channel 3, negative terminal |
| 9       | GND    | Arc sensor channel 3 Ground             |
| 10      | GND    | Arc sensor channel 4 Ground             |
| 11      | S4     | Arc sensor channel 4, positive terminal |
| 12      | S4     | Arc sensor channel 4, negative terminal |

## 5.3 X5 connector

**Table 5.3: Type: Phoenix contact MSTB 2.5 – 5.06**

| Pin No. | Symbol    | Description                          |
|---------|-----------|--------------------------------------|
| 1       | L / - / ~ | Supply voltage, positive terminal    |
| 2       | N / + / ~ | Supply voltage, negative terminal    |
| 3       | NC        | No connection                        |
| 4       | T1        | Trip relay 1, HSO type               |
| 5       | T1        | Trip relay 1, HSO type               |
| 6       | NC        | No connection                        |
| 7       | T2        | Trip relay 2, electromechanical type |
| 8       | T2        | Trip relay 2, electromechanical type |

## 6 Arc flash sensor

VA 1 xx is a point type arc flash sensor. Arc flash light is transformed to a current signal in the sensor.

- Standard 8000 – 10000 lux visible light sensitivity
- Wide area arc flash detection
- Typically <1 ms detection time
- Standard cable length of 6 m or 20 m (cut to length on site)
- Easy to install (2-wired non-polarity sensitive connection)
- Can be mounted on switchgear surface, in customer drilled holes in switchgear or on VYX001 Z shape or VYX002 L shape mounting plates available from VAMP, or locally fabricated from supplied drawings

The sensor is used by an arc flash protection device (IED) or system to detect the light coming from the arc flash incident.

### 6.1 VA 1 DA

The arc sensor VA 1 DA is activated by strong light. The sensor transforms the light information into the current signal, which is used by the IED to detect arc flash light.

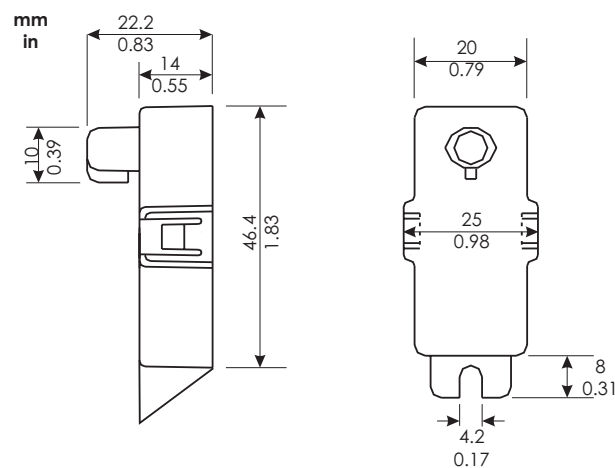


Figure 6.1: VA 1 DA dimensions

You can install the arc sensor onto the switchgear wall from the outside. Press the active part of the sensor through the 10 mm hole in the wall and fix it using a 4 mm screw.

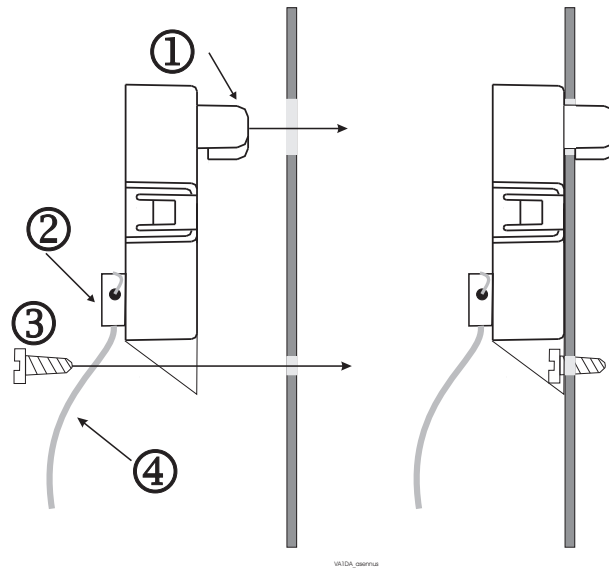


Figure 6.2: VA 1 DA mounting

- |   |                           |   |              |
|---|---------------------------|---|--------------|
| 1 | Active part of the sensor | 2 | Cable clamp  |
| 3 | Fastening screw 4 x 15 mm | 4 | Sensor cable |

## 6.2 Connecting the IED

The sensors are delivered with 6 or 20 m cables. After mounting the sensors, connect them to the IED as follows:

- Draw the wire to the nearest IED using the shortest route possible and cut it to a suitable length.
- Connect the arc sensors to the screw terminals. The polarity of the arc sensor cables is not critical.
- Connect the cable shield to the corresponding connector on X2 terminal when using shielded cable on sensor(s).

**NOTE:** Do not splice or extend pre-made/supplied cables with any type of wires or cables.



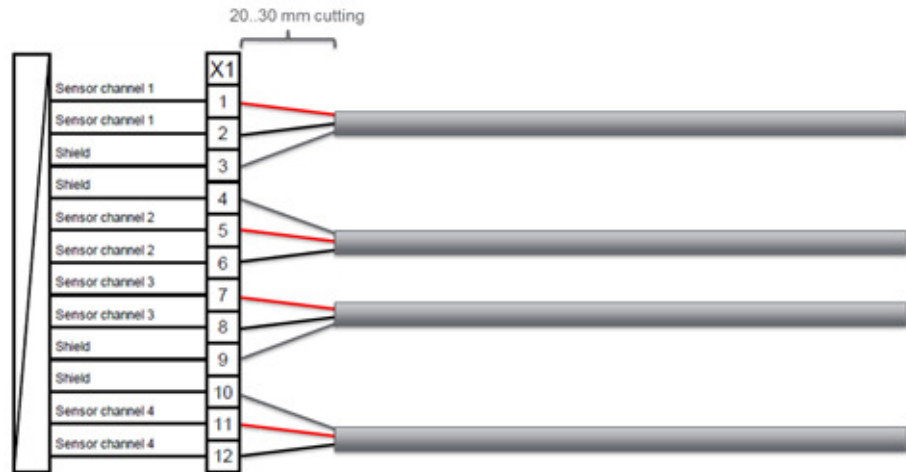


Figure 6.3: Cable landing to VAMP 125 X1 connector

## 6.3 Sensitivity

**NOTE:** The sensor must not be exposed to direct sunlight or other strong light sources. Do not mount the sensor directly under a light source.

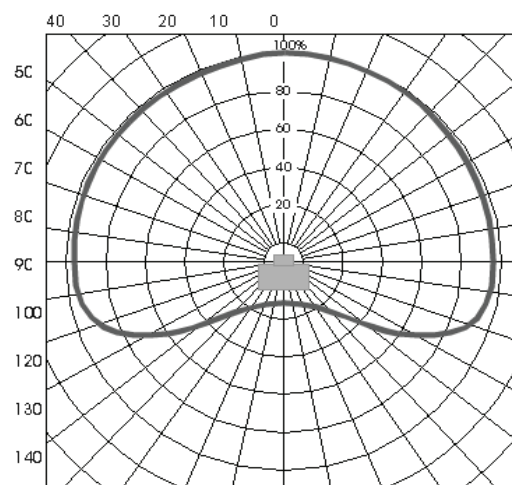


Figure 6.4: Sensitivity of the arc sensor VA 1 DA

# 7

## Preventive maintenance

The IED requires maintenance to ensure that it works according to the specification. Keep record of the maintenance actions performed for the system. The maintenance can include, but is not limited to, the following actions.

### 7.1

### Maintenance

The VAMP arc products, sensors and cabling shall be visually checked when the switchgear is de-energized. During such inspection pay attention to:

- Possible dirty arc sensors
- Loose wire connections
- Damaged wiring
- Indicator lights (unit start-up)
- Other mechanical connections.

Visual inspection shall be carried out at the minimum once every three (3) years.

#### **⚠ CAUTION**

##### **EQUIPMENT OPERATION HAZARD**

Carry out periodical system testing as per manufacturer's recommendation or in case the protection system scheme has been changed.

**Failure to follow these instructions can result in injury or equipment damage.**

## 7.2 Cleaning of hardware

Special attention must be paid to ensure that the IED, its extension units and sensors do not become dirty. In case cleaning is required, wipe out dirt from the units.

Use a dry cleaning cloth or equivalent together with mild soapy water to clean any residues from the sensor.

### **⚠ CAUTION**

#### **EQUIPMENT OPERATION HAZARD**

Do not use any type of solvents or gasoline to clean the IED, sensors or cables.

**Failure to follow these instructions can result in injury or equipment damage.**

## 7.3 Sensor condition and positioning check

After commissioning, sensor replacement, modification procedure, cleaning and periodical testing always check that the sensor positioning remains as it was originally designed.

## 7.4 System status messages

In case the IED's self-checking detects any unintended system status, it provides an alarm by activating the Service LED (☞) and indication status notification on the SF output. Should this happen, contact your local office for further guidance.

## 7.5 Spare parts

Use the entire unit as a spare for the device to be replaced.

# 8 Technical data

## 8.1 VAMP 125

**Table 8.1: Auxiliary power supply**

|                   |                              |
|-------------------|------------------------------|
| U <sub>AUX</sub>  | 24 – 240 (-20% +10%) V ac/dc |
| Power consumption | 8 W                          |

**Table 8.2: Hybrid output, T1**

|                                     |   |
|-------------------------------------|---|
| Number of contacts                  | 1, NO   |
| Rated voltage                       | 24 – 240 V ac/dc  |
| Continuous carry                    | 5 A   |
| Minimum making current              | -   |
| Typical operation time (light only) | ≤1 ms   |
| Make and carry, 0.5 s               | 30 A  |
| Make and carry, 3 s                 | 15 A  |
| Breaking capacity, ac               | 2 000 VA  |
| Breaking capacity, dc (L/R = 40ms)  |   |
| at 48 V dc:                         | 5 A   |
| at 110 V dc:                        | 3 A   |
| at 220 V dc:                        | 1 A   |
| Contact material                    | AgNi 90/10  |
| Terminal block:<br>- MSTB2.5 - 5.08 | Wire dimension:<br>Maximum 2.5 mm <sup>2</sup> (13 – 14 AWG)<br>Minimum 1.5 mm <sup>2</sup> (15 – 16 AWG) |

**Table 8.3: Trip contact, T2**

|                                     |   |
|-------------------------------------|---|
| Number of contacts                  | 1, NO   |
| Rated voltage                       | 250 V ac/dc   |
| Continuous carry                    | 5 A   |
| Minimum making current              | 100 mA at 24 Vdc  |
| Typical operate time (light only)   | ≤8 ms   |
| Make and carry, 0.5 s               | 30 A  |
| Make and carry, 3 s                 | 15 A  |
| Breaking capacity, ac               | 2 000 VA  |
| Breaking capacity, dc (L/R = 40ms)  |   |
| at 48 V dc:                         | 1.15 A  |
| at 110 V dc:                        | 0.5 A   |
| at 220 V dc:                        | 0.25 A  |
| Contact material                    | AgNi 90/10  |
| Terminal block:<br>- MSTB2.5 - 5.08 | Wire dimension:<br>Maximum 2.5 mm <sup>2</sup> (13 – 14 AWG)<br>Minimum 1.5 mm <sup>2</sup> (15 – 16 AWG) |

**Table 8.4: Self-supervision contact; SF**

|                                    |  |
|------------------------------------|--|
| Number of contacts:                | 2, NC/NO   |
| Rated voltage                      | 250 V ac/dc  |
| Continuous carry                   | 5 A  |
| Minimum making current             | 100 mA at 24 V ac/dc   |
| Make and carry, 0.5 s              | 30 A   |
| Make and carry, 3 s                | 15 A   |
| Breaking capacity, ac              | 2 000 VA   |
| Breaking capacity, dc (L/R = 40ms) |  |
| at 48 V dc:                        | 1.15 A   |
| at 110 V dc:                       | 0.5 A  |
| at 220 V dc:                       | 0.25 A   |
| Contact material                   | AgNi 90 / 10   |
| Terminal block<br>- MSTB2.5 - 5.08 | Wire dimension<br>Maximum 2.5 mm <sup>2</sup> (13 – 14 AWG)<br>Minimum 1.5 mm <sup>2</sup> (15 – 16 AWG) |

**Table 8.5: Binary outputs; Trip Out, MT Out**

|                                     |   |
|-------------------------------------|---|
| Number of outputs                   | 2   |
| Rated output voltage                | +24 V dc (max +32 V dc unloaded)  |
| Rated output current                | 20 mA   |
| Terminal block:<br>- MSTB2.5 - 5.08 | Wire dimension:<br><br>Maximum 2.5 mm <sup>2</sup> (13 – 14 AWG)<br><br>Minimum 1.5 mm <sup>2</sup> (15 – 16 AWG) |
| Connection cable                    | Twisted pair, with shield. Shield shall be grounded to the appropriate connector.                                 |

**Table 8.6: Binary inputs; MT In, Block, Reset, I<sub>N</sub>**

|                                     |   |
|-------------------------------------|---|
| Number of inputs                    | 4   |
| Voltage withstand                   | 250 V ac/dc   |
| Nominal operation voltage           | 24 – 240 V ac/dc (max. 250 V ac/dc)   |
| Typical switching threshold         | 12 V dc ±5 %  |
| Current drain                       | approx. 3 mA  |
| Terminal block:<br>- MSTB2.5 - 5.08 | Wire dimension:<br><br>Maximum 2.5 mm <sup>2</sup> (13 – 14 AWG)<br><br>Minimum 1.5 mm <sup>2</sup> (15 – 16 AWG) |
|                                     | Twisted pair, with shield. Shield shall be grounded to the appropriate connector.                                 |

**Table 8.7: Arc sensor inputs; S1 – S4**

|                                   |  |
|-----------------------------------|--|
| Number of inputs                  | 4  |
| Supply to sensors                 | 8 V dc   |
| Grounding                         | 4 pcs ground termination on connector  |
| Terminal block:<br>- MC 1.5 - 3.5 | Wire dimension:<br><br>Maximum 1.5 mm <sup>2</sup> (15 – 16 AWG)<br><br>Minimum 0.14 mm <sup>2</sup> (25 – 26 AWG) |
| Connection cable                  | Twisted pair, with shield. Shield shall be grounded to the appropriate connector.                                  |

**Table 8.8: Disturbance tests**

| Test                              | Standard & Test class / level   | Test value   |
|-----------------------------------|---|--|
| <b>Emission</b>                   | IEC/EN 60255-26 (ed3)   |  |
| - Conducted                       | EN 55022, Class A & CISPR 22  | 0.15 – 80 MHz  |
| - Emitted                         | EN 55011, Class A / IEC 60255-25 / CISPR 11<br>EN 55011, Class A & CISPR 11 | 30 – 1000 MHz  |
| <b>Immunity</b>                   | IEC/EN 60255-26 (ed3) Zone A  |  |
| - 1 Mhz damped oscillatory wave   | IEC/EN 61000-4-18   | ±2.5 kVp CM, ±2.5 kVp DM   |
| - Static discharge (ESD)          | IEC/EN 61000-4-2 Level 4  | ±8 kV contact, ±15 kV air  |
| - Emitted HF field                | IEC/EN 61000-4-3 Level 3  | 80 – 2700 MHz, 10 V/m  |
| - Fast transients (EFT)           | IEC/EN 61000-4-4 Level 4  | ±4 kV, 5/50 ns, 5 kHz  |
| - Surge                           | IEC/EN 61000-4-5 Level 3  | ±4 kV, 1.2/50 µs, CM<br>±2 kV, 1.2/50 µs, DM   |
| - Conducted HF field              | IEC/EN 61000-4-6 Level 3  | 0.15 – 80 MHz, 10 Vrms   |
| - Power-frequency magnetic field  | IEC/EN 61000-4-8  | 300 A/m (continuous), 1000 A/m 1 – 3 s   |
| - Pulse magnetic field            | IEC/EN 61000-4-9 Level 5  | 1000 A/m, 1.2/50 µs  |
| - ac and dc voltage dips          | IEC/EN 61000-4-29, IEC/EN 61000-4-11  | 0% of rated voltage <ul style="list-style-type: none"> <li>ac: 5 cycles</li> <li>dc: 100 ms</li> </ul> 40% of rated voltage <ul style="list-style-type: none"> <li>ac: 10 cycles</li> <li>dc: 200 ms</li> </ul> 70% of rated voltage <ul style="list-style-type: none"> <li>ac: 25 cycles</li> <li>dc: 500 ms</li> </ul> |
| - ac and dc voltage interruptions | IEC/EN 61000-4-29, IEC/EN 61000-4-11  | 100% interruption <ul style="list-style-type: none"> <li>ac: 250 cycles</li> <li>dc: 5 s</li> </ul>  |
| - Voltage alternative component   | IEC/EN 61000-4-17   | 15% of operating voltage (dc) / 10 min   |

**Table 8.9: Electrical safety tests**

| Test                            | Standard & Test class / level | Test value             |
|---------------------------------|-------------------------------|------------------------|
| - Impulse voltage withstand     | IEC/EN 60255-27               | 5 kV, 1.2/50 µs, 0.5 J |
| - Dielectric test               | IEC/EN 60255-27               | 2 kV, 50 Hz            |
| - Insulation resistance         | IEC/EN 60255-27               |                        |
| - Protective bonding resistance | IEC/EN 60255-27               |                        |
| - Power supply burden           | IEC 60255-1                   |                        |

**Table 8.10: Mechanical tests**

| Test                       | Standard & Test class / level                                     | Test value                             |
|----------------------------|---|--|
| <b>Device in operation</b> |   |  |
| - Vibrations               | IEC 60255-21-1, Class II / IEC 60068-2-6, Fc                      | 1 Gn, 10 – 150 HZ                      |
| - Shocks                   | IEC 60255-21-2, Class II / IEC 60068-2-27, Ea                     | 10 Gn / 11 ms                          |
| - Seismic                  | IEC 60255-21-3 Method A, Class II                                 | 2G horizontal / 1G vertical, 1 – 35 Hz |
| <b>Device de-energized</b> |   |  |
| - Vibrations               | IEC 60255-21-1, Class II / IEC 60068-2-6, Fc                      | 2 Gn, 10 – 150 HZ                      |
| - Shocks                   | IEC 60255-21-2, Class II / IEC 60068-2-27, Ea<br>Panel mounting   | 30 Gn / 11 ms                          |
|                            | IEC 60255-21-2, Class I / IEC 60068-2-27, Ea<br>DIN rail mounting | 15 Gn / 11 ms                          |
| - Bump                     | IEC 60255-21-2, Class II / IEC 60068-2-27, Ea<br>Panel mounting   | 20 Gn / 16 ms                          |
|                            | IEC 60255-21-2, Class I / IEC 60068-2-27, Ea<br>DIN rail mounting | 10 Gn / 16 ms                          |

**Table 8.11: Environmental tests**

| Test                       | Standard & Test class / level | Test value  |
|----------------------------|-------------------------------|---|
| <b>Device in operation</b> |                               |   |
| - Dry heat                 | EN / IEC 60068-2-2, Bd        | 70°C (158°F)  |
| - Cold                     | EN / IEC 60068-2-1, Ad        | -40°C (-40°F)   |
| - Damp heat, cyclic        | EN / IEC 60068-2-30, Db       | <ul style="list-style-type: none"> <li>From 25°C (77°F) to 55°C (131°F)</li> <li>From 93% RH to 98% RH</li> <li>Testing duration: 6 days</li> </ul> |
| - Damp heat, static        | EN / IEC 60068-2-78, Cab      | <ul style="list-style-type: none"> <li>40°C (104°F)</li> <li>93% RH</li> <li>Testing duration: 10 days</li> </ul>                                   |
| Change of temperature      | IEC / EN 60068-2-14, Nb       | <ul style="list-style-type: none"> <li>Lower Temp -40°C</li> <li>Upper Temp 70°C</li> <li>5 Cycles</li> </ul>                                       |
| <b>Device in storage</b>   |                               |   |
| - Dry heat                 | EN / IEC 60068-2-2, Bb        | 80°C (176°F)  |
| - Cold                     | EN / IEC 60068-2-1, Ab        | -40°C (-40°F)   |

**Table 8.12: Environmental conditions**

|                                 |                          |
|---------------------------------|--------------------------|
| Ambient temperature, in-service | -40 – 65°C (-40 – 149°F) |
| Ambient temperature, storage    | -40 – 80°C (-40 – 176°F) |
| Relative air humidity           | <95%                     |
| Maximum operating altitude      | 2000 m (6561.68 ft)      |



**Table 8.13: Casing**

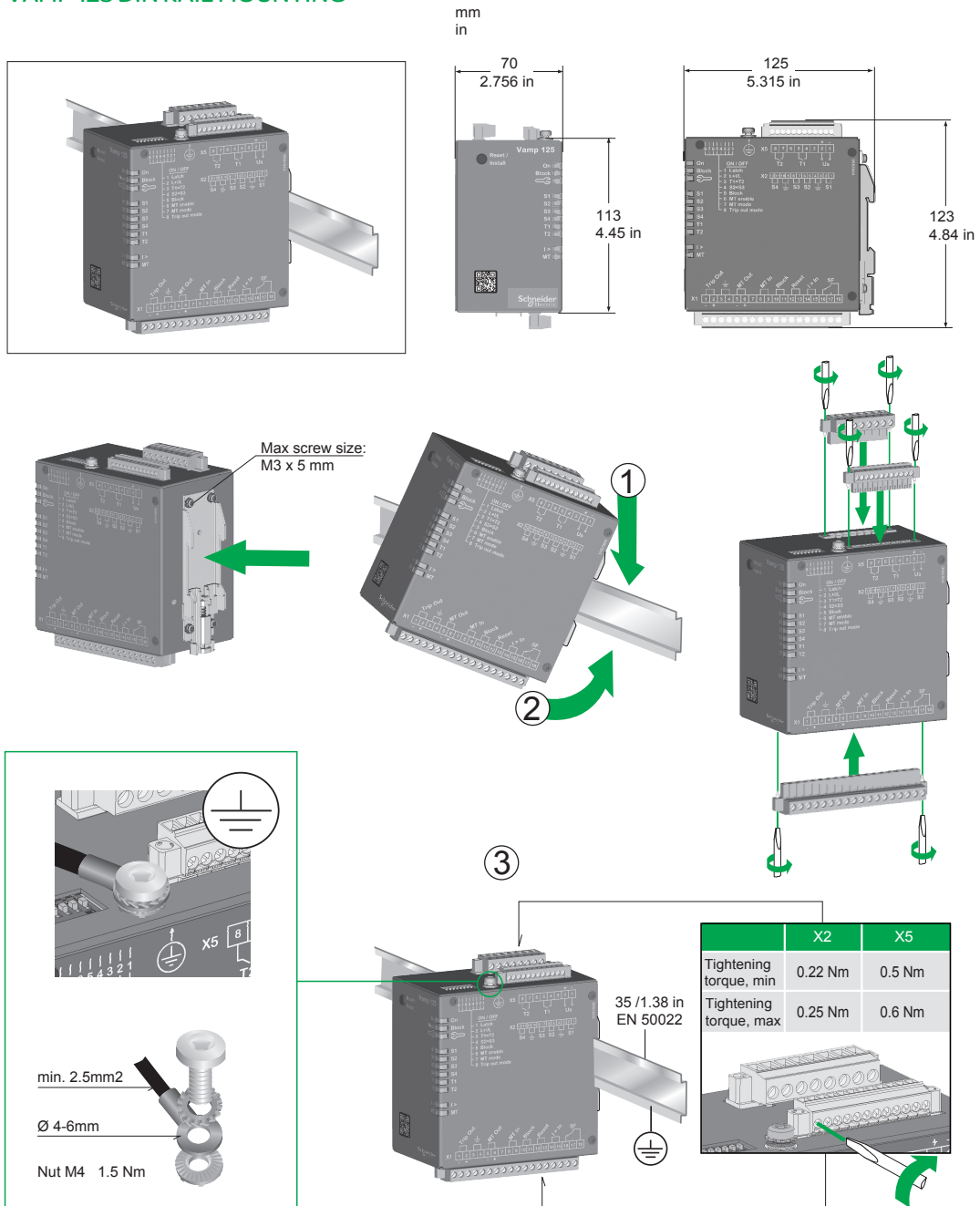
|                                  |   |
|----------------------------------|---|
| Degree of protection (IEC 60529) | IP20                                      |
| Dimensions (W x H x D)           | 70 x 135 x 123 mm / 2.76 x 5.31 x 4.84 in |
| Weight                           | 0.9 kg (1.987 lb)                         |

## 8.2 Arc flash sensor

|                                     |   |
|-------------------------------------|---|
| U <sub>AUX</sub>                    | 8, 12 or 15 V dc (from the IED)                       |
| Current consumption                 | <2 – 4 mA (in normal mode)<br><18 – 29 mA (activated) |
| Housing class (IEC 60529)           | IP20  |
| Dimensions (W x H x D)              | 25 x 55 x 14 mm / 0.98 x 2.17 x 0.55 in               |
| Material                            | Plastic   |
| Weight (with 6 m / 236.22 in cable) | 0.3 kg (0.662 lb)                                     |
| Cable length                        | 6 m (236.22 in) or 20 m (787.40 in)                   |
| Environment                         | Pollution Degree 2                                    |
| Operation temperature               | -40 – 85°C (-40 – 185°F)                              |
| Light spectrum sensitivity area     | 400 – 1100 nm   |

# 9 Mounting

## VAMP 125 DIN RAIL MOUNTING



*Figure 9.1: DIN rail mounting*

# VAMP 125 PANEL MOUNTING

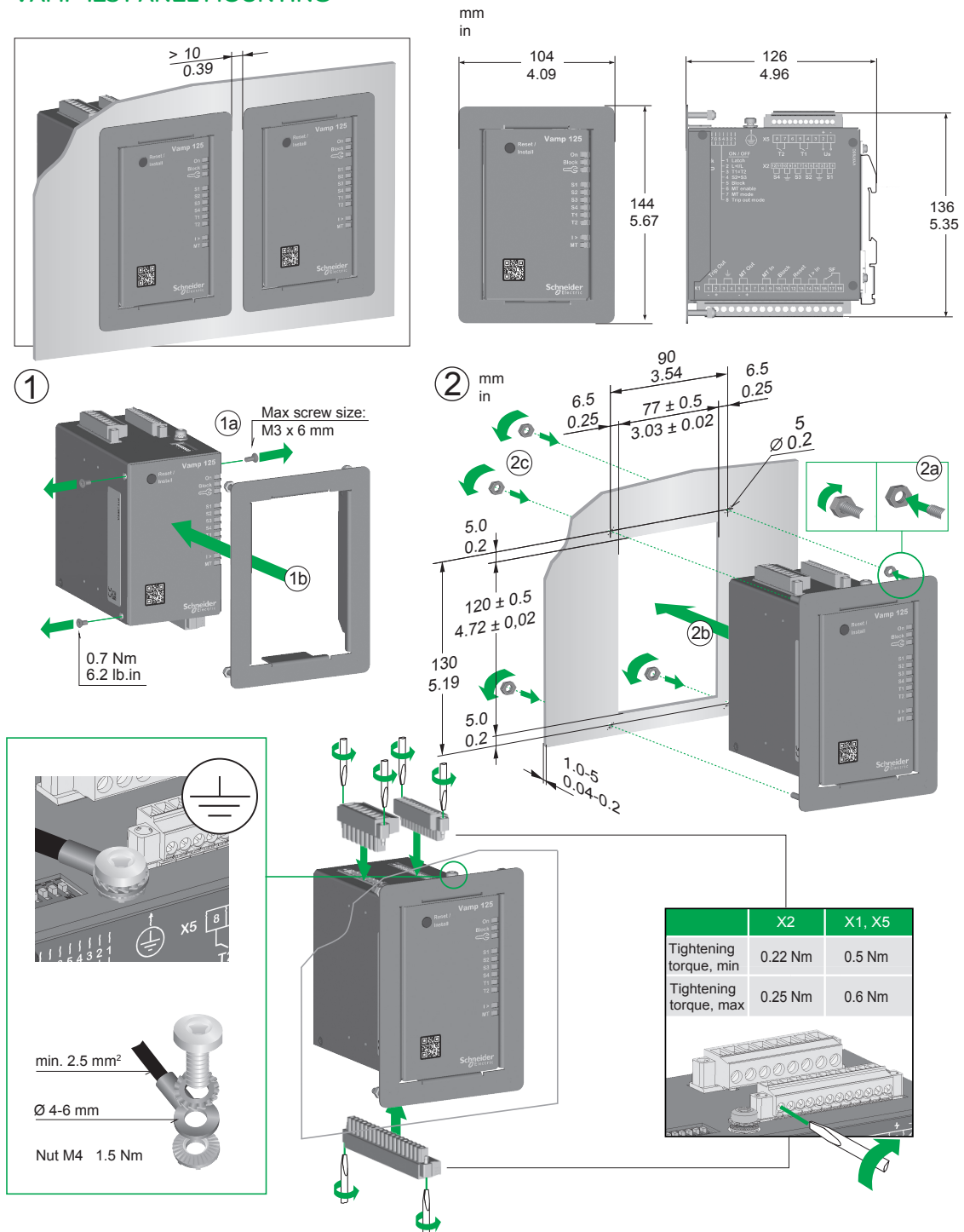


Figure 9.2: Panel mounting

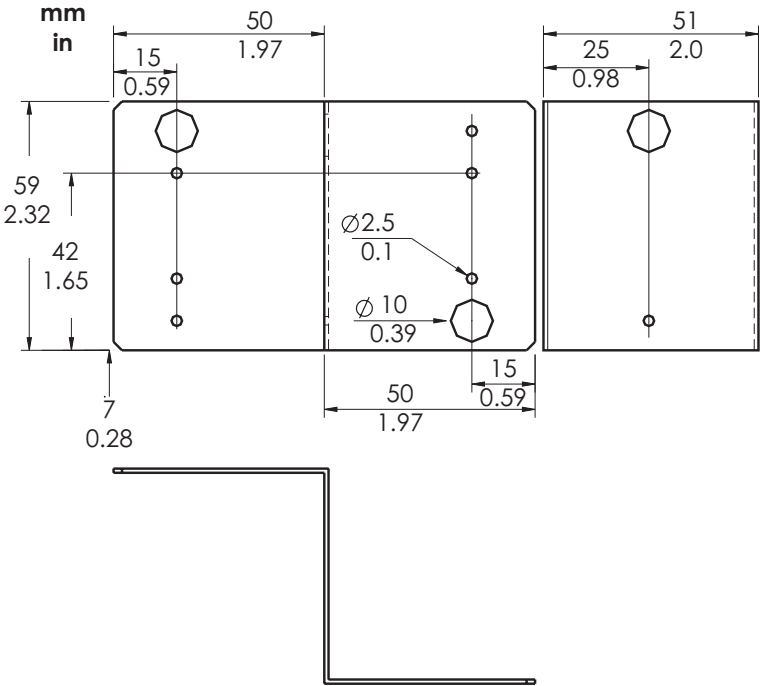


Figure 9.3: VYX 001 mounting plate for sensors

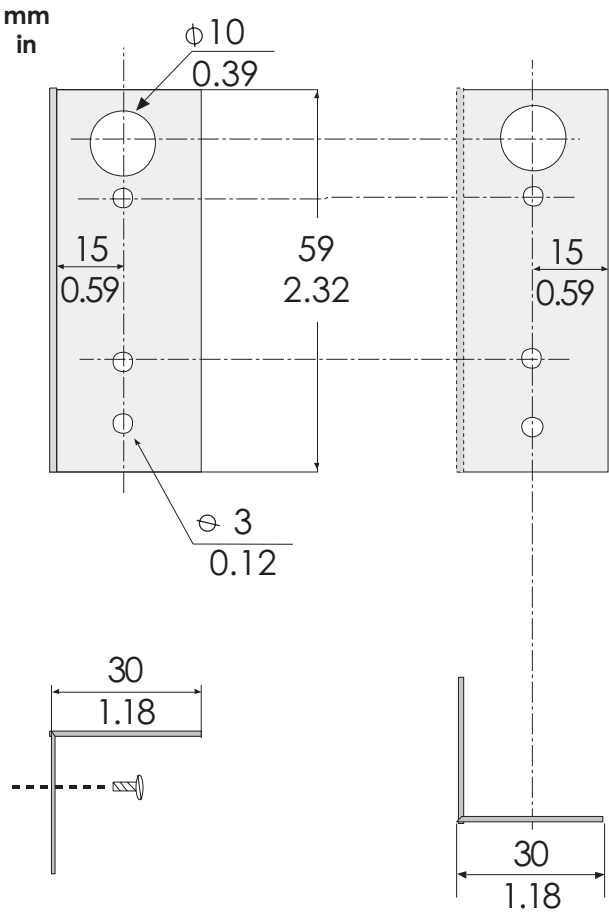


Figure 9.4: VYX 002 mounting plate for sensors

# 10 Order information

When ordering, please state:

- Type designation: V125
- Quantity:
- Accessories (see respective ordering code):

## Accessories

| Order code    | Description                               | Note   |
|---------------|---|--|
| VA 1 DA-6     | Arc sensor                                | Cable length 6 m (19.69 ft)                              |
| VA 1 DA-20    | Arc sensor                                | Cable length 20 m (65.62 ft)                             |
| VA 1 DA-6s    | Arc Sensor, shielded                      | Cable length 6 m (19.69 ft)                              |
| VA 1 DA-20s   | Arc Sensor, shielded                      | Cable length 20 m (65.62 ft)                             |
| VA 1 DA-6-HF  | Arc Sensor, halogen free                  | Cable length 6 m (19.69 ft)                              |
| VA 1 DA-20-HF | Arc Sensor, halogen free                  | Cable length 20 m (65.62 ft)                             |
| VA 1 EH-6     | Arc Sensor (Pipe type)                    | Cable length 6 m (19.69 ft)                              |
| VA 1 EH-20    | Arc Sensor (Pipe type)                    | Cable length 20 m (65.62 ft)                             |
| VA 1 GIS-1,5  | Arc Sensor, shielded with GIS adapter     | Cable length 1.5 m (4.93 ft)                             |
| VA 1 GIS-3    | Arc Sensor, shielded with GIS adapter     | Cable length 3 m (9.85 ft)<br>Cable length 9.85 ft (3 m) |
| VA 1 GIS-5    | Arc Sensor, shielded with GIS adapter     | Cable length 5 m (16.41 ft)                              |
| VA 1 GIS-10   | Arc Sensor, shielded with GIS adapter     | Cable length 10 m (32.81 ft)                             |
| VYX 001       | Surface Mounting Plate for Sensors        | Z-shaped   |
| VYX 002       | Surface Mounting Plate for Sensors        | L-shaped   |
| VYX 328       | Surface Mounting Plate for VA 1 DV Sensor | U-shaped   |
| REL52901      | Door mount bracket                        | Fot Vamp 125, IP 20                                      |





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