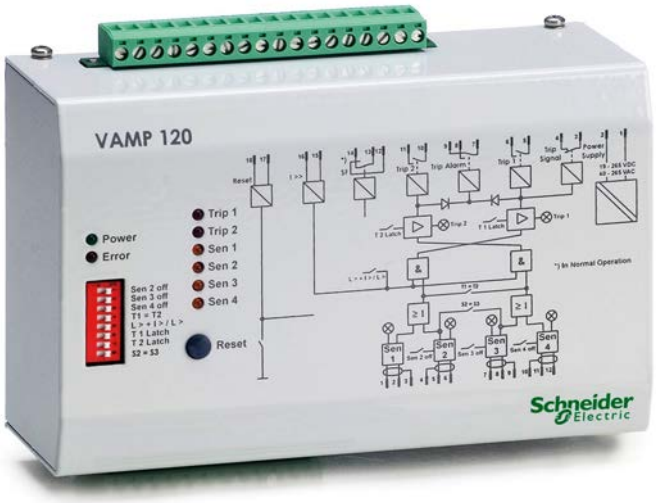
VAMP 120

Arc flash protection unit

Publication version: V120/EN M/B003

User manual



Schneider Electric

Table of Contents

1. General

This manual describes the general functions of the arc protection unit, it also includes mounting and configuration instructions.

1.1. Arc protection unit VAMP 120

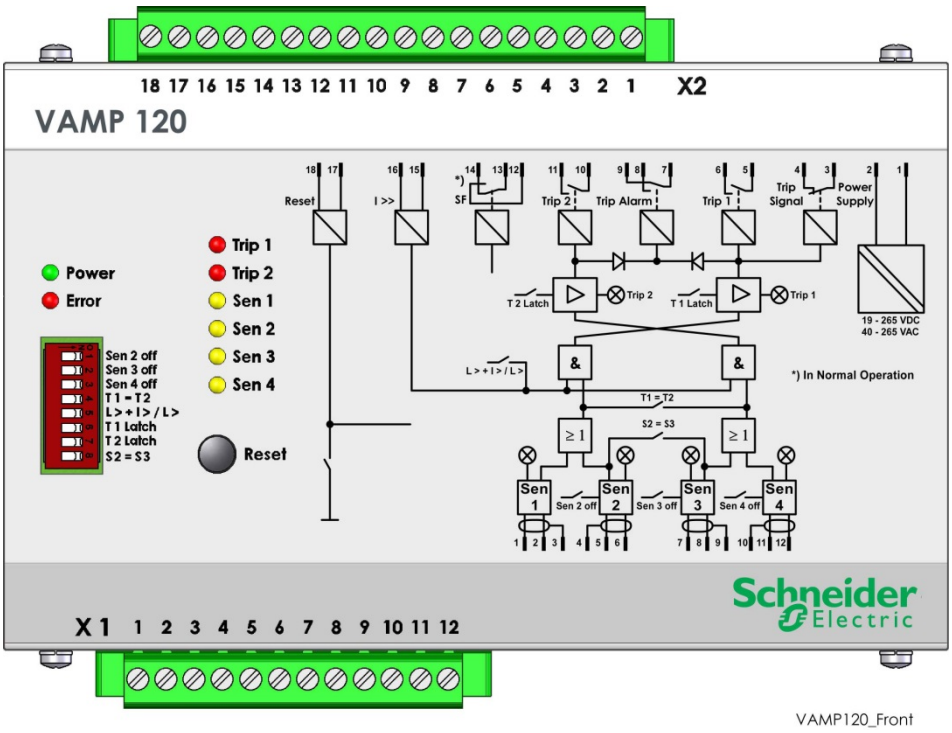


Figure 1.1-1. Arc protection unit VAMP 120

1.2. Unit features

VAMP 120 is a state of the art arc protection unit for electrical power distribution systems.

By using VAMP 120 in switchgears considerable safety improvements are obtained in the form of minimized injury and damage in case of an arc fault.

VAMP 120 is a “stand alone” system, which gives a compact solution when the application doesn’t require overcurrent measurement or when the overcurrent information is available from the incomer protection relay or any other arc protection unit (VAMP 221 / VAM 4C). It is possible to connect 4 arc sensors, of the type VA 1 DA or VA 1 EH, to the VAMP 120 unit.

2. Unit configuration

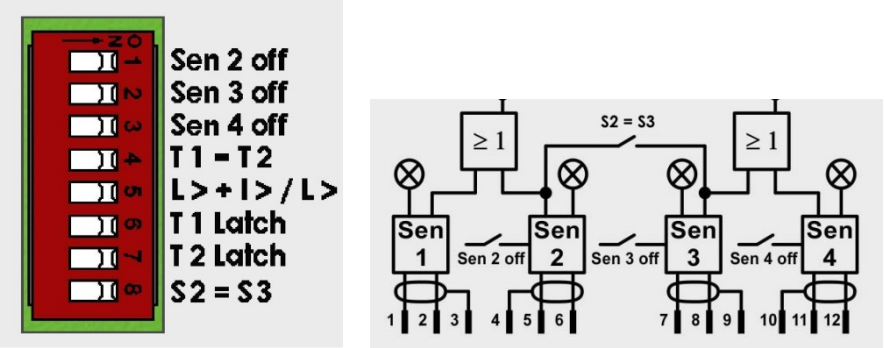


Figure 2-1. VAMP 120 dipswitch operations and sensor connection

The unit is configured using the dipswitches:

Dipswitches 1-5 (see Figure 2-1):

If only one arc sensor in use, SENSOR 1 input should be used.

- SW nr. 1 : if sensor input 2 is also required, SEN 1 should be set to the left position.
- SW nr. 2 and 3 : if sensor input 3 and 4 are used, SW nr. 2 and 3 should respectively be set to left position.
- SW nr. 4 : is setting the system selectivity. If set to the left position, sensor nr. 1 and 2 will trip relay T1. Accordingly sensor nr. 3 and 4 will trip relay T2. The NC trip signal out put will always work in parallel with T1. If SW nr. 4 is to the right, all four sensor channels will activate both trip groups.
- SW nr. 5 : is the selection of tripping criteria. If set to the right, the unit will trip for light only. If set to the left, the unit needs both light and current information for tripping.
- SW nr. 6 and 7 : the Latch switches enables latching of the trip relays. When it is in ON position the latching function is activated.
- SW nr. 8 : is the configuration switch for sensor inputs 2 and 3. If it is in “ON” position, sensor 2 or 3 activation will make a common trip of both T1 and T2. If it is in “OFF” position, sensor 2 is linked to T1 and sensor 3 to T2.

3. Sensors

3.1. Arc sensor VA 1 DA

The arc sensor is a light sensitive element, which is activated by strong light. Arc sensors should be mounted in the switch-gear cubicles, in such a way that the light sensitive part (see Figure 3.1-2) covers the protected area as completely as possible.

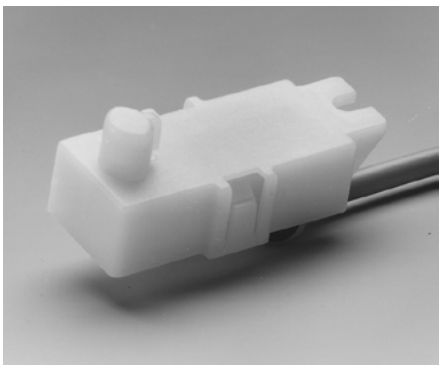


Figure 3.1-1. Arc sensor VA 1 DA

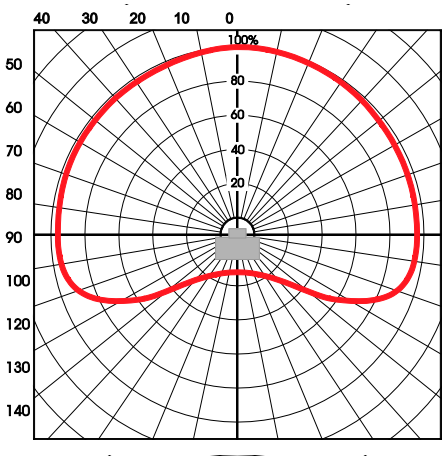


Figure 3.1-2. The sensitivity of the VA1DA arc sensor to light from different directions.

In open spaces, such as the bus bar section, arc sensors should be mounted max. four meters apart.

The light sensitivity of the arc sensor is 8000 LUX

The arc sensor can be mounted from the outside on partition wall of the switchgear. The active part of the sensor is mounted in a 10 mm hole, to the area in the switchgear that should be protected, and fastened with a 4 mm self-tapping screw (see Figure 3.1-3).

The arc sensor can alternatively be mounted completely in the protected area with the help of a mounting plate VYX 01 (Z-shaped) or VYX 02 (L-shaped). (See Figure 8.4-1)

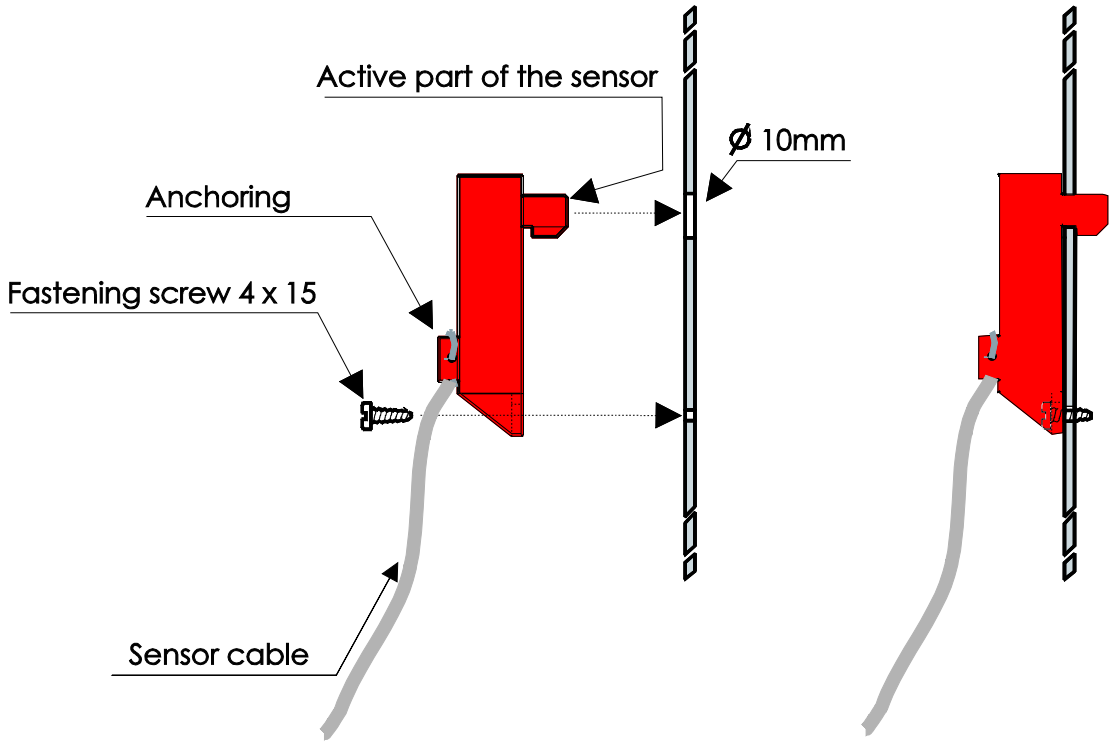


Figure 3.1-3. Arc sensor mounting picture.

4. Functions

VAMP 120 includes an extensive self-supervision. The self-supervision includes internal functions as well as all arc sensors.

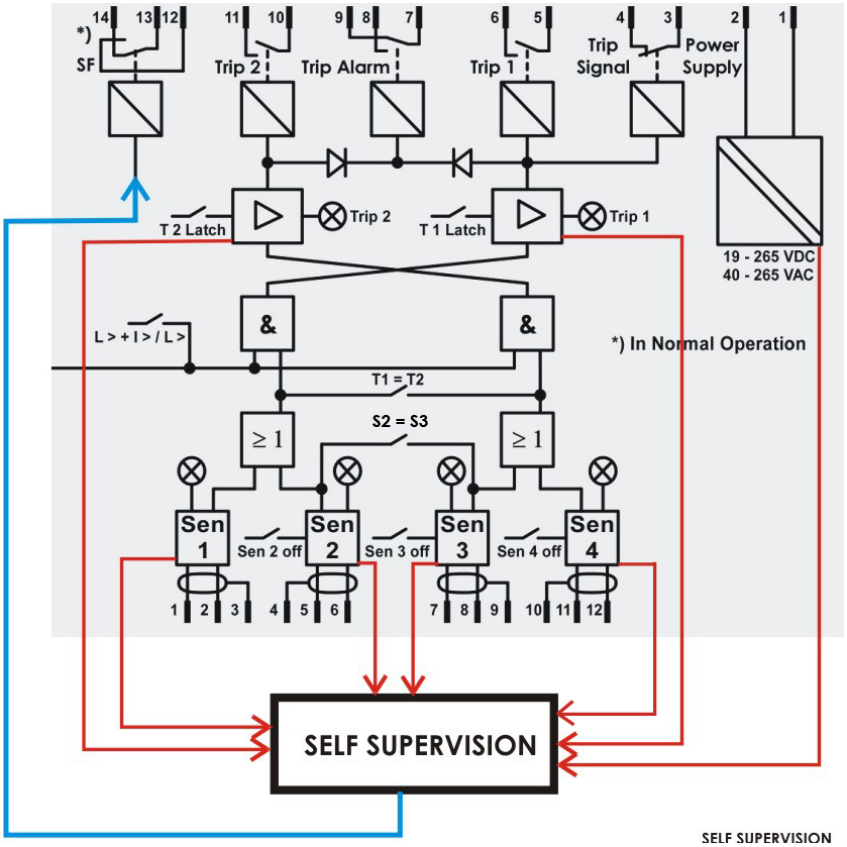


Figure 4-1 Self-supervision block diagram

If an internal fault occurs the self-supervision relay is activated and the ERROR-led is lit.

5. Applications

Every compartment is equipped with an arc sensor. Up to four sensors can be connected to the VAMP 120 unit. The trip relays are electromechanical and can be connected directly to control the circuit-breakers (see chapter Technical data).

The VAMP 120 is suitable for small power generation plants where light is the only criteria for tripping and full selectivity is required.

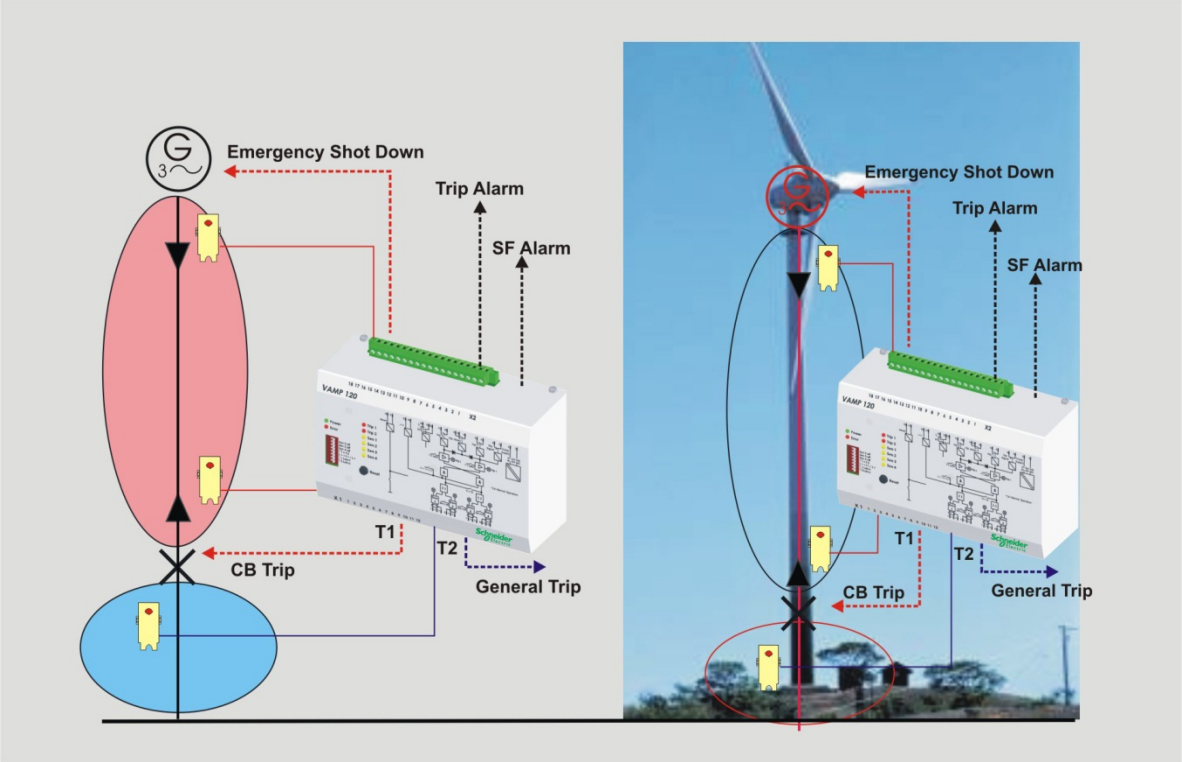


Figure 5-1 Wind power application

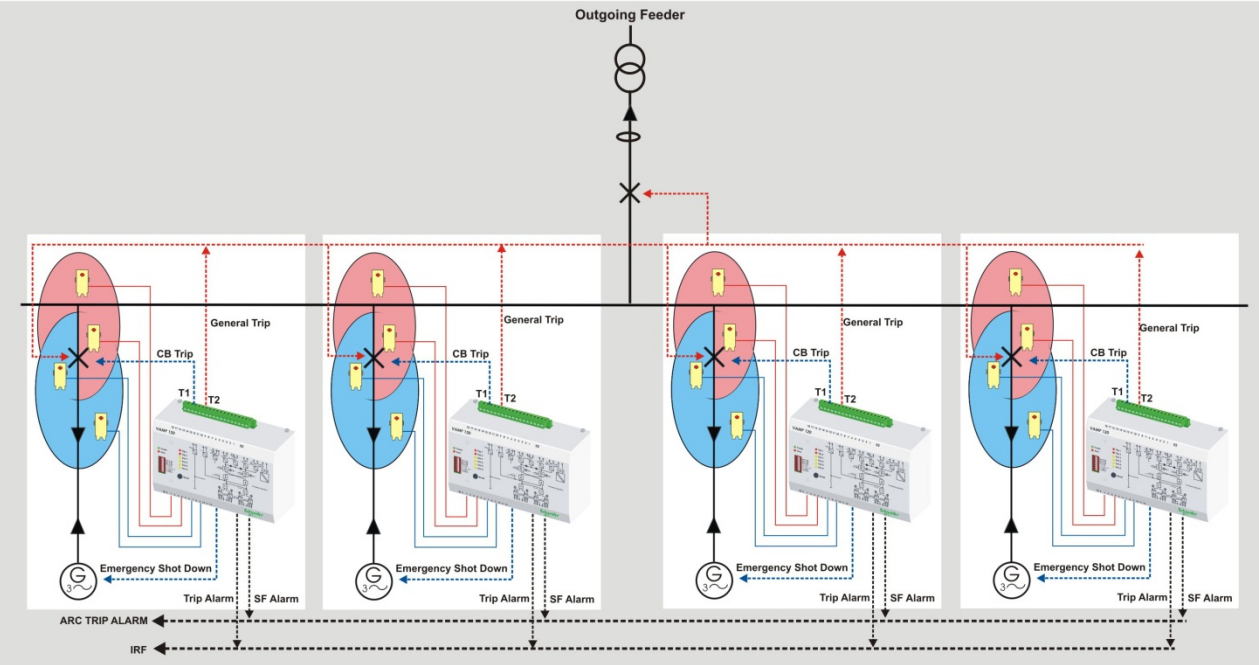
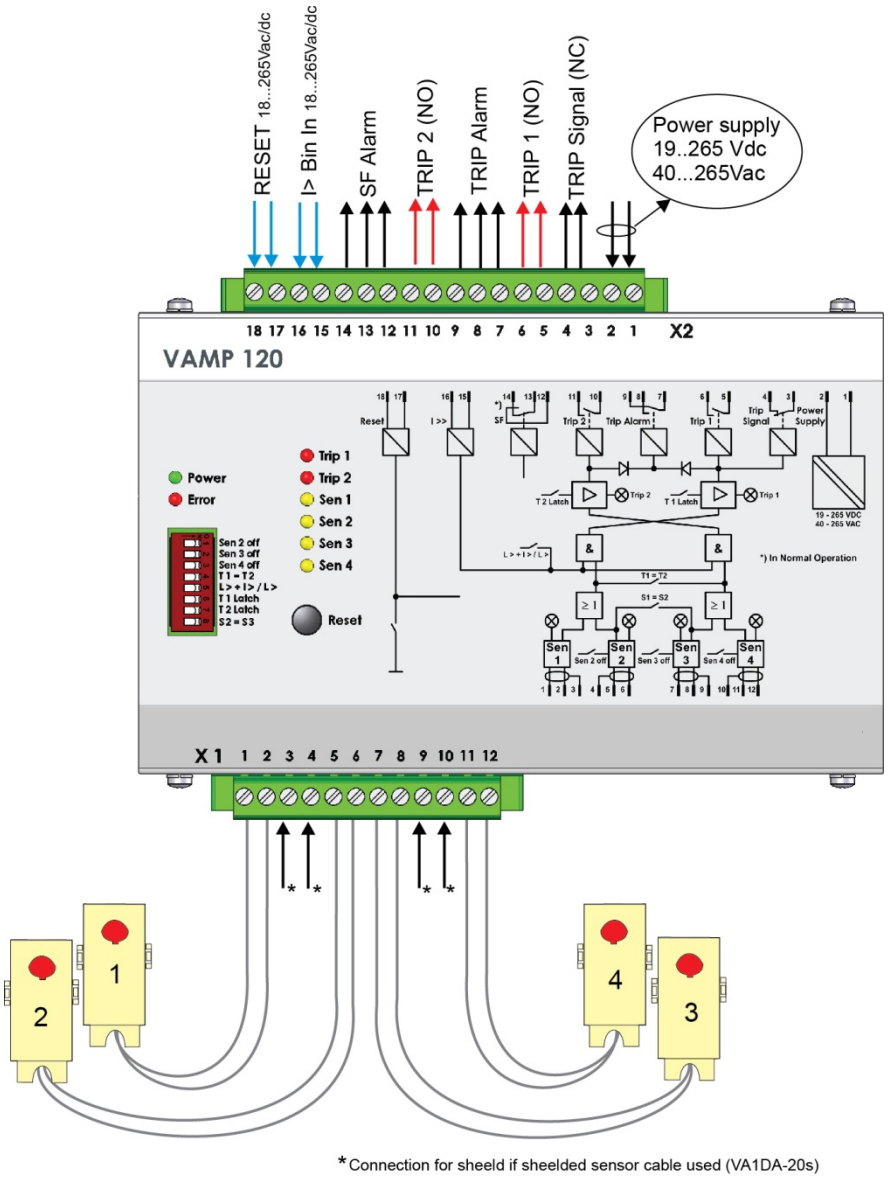


Figure 5-2 Diesel power plant application

6. Connections



***Connection for shield if shield sensor cable used (VA1DA-20s)**

Figure 6-1. VAMP 120 connections

The VAMP 120 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 is controlled by sensors 3 and 4.

Trip alarm is activated if either or both are tripping. If “T1=T2” dip switch is at “on” position, both trip outputs will work in parallel for any sensor activation.

If “S2=S3” dip switch is at “on” position, sensors 2 and 3 activation will cause both T1 and T2 to trip. This is e.g. used for CB compartment supervision where two zones are overlapping each other.

If overcurrent criteria is required simultaneously with light activation, a binary current signal has to be connected to X2-15/16. This I> signal can e.g. be taken from a VAM 4C or VAMP 221 unit. The external reset is possible by correcting an auxiliary voltage to X2-17/18.

The auxiliary voltage is connected to X2-1 and X2-2. VAMP has a wide range power supply from 19 to 265 Vdc or 40 to 265 Vac in the same hardware.

7. Technical data

Auxiliary voltage

Us	19 – 265 V dc / 40 – 265 V ac
In (stby)	30mA
IsensAct	20mA
Iarc	120mA + (IsensAct x n); n = number of active sensors

Trip contacts

Number of contacts	2
Rated voltage	250V ac/dc
Continuous carry	5A
Minimum making current	100 mA @ 24 Vdc
Typical operation time	7 ms ±15%
Make and carry for 0.5s	30A
Make and carry for 3s	15A
Breaking capacity DC (L/R=40ms) at 48 Vdc: at 110 Vdc: at 220 Vdc:	 1.15 A 0.5 A 0.25 A
Contact material	AgNi 90/10
Terminal block: -Phoenix MVSTBW or equivalent	Maximum wire dimension: 2.5 mm^2 (13-14 AWG)

Signal contacts

Number of contacts	1
Rated voltage	250V ac/dc
Continuous carry	3A
Minimum making current	100 mA @ 24 Vdc
Breaking capacity DC (L/R=40ms) at 48 Vdc: at 110 Vdc: at 220 Vdc:	 1.15 A 0.5 A 0.25 A
Contact material	AgNi 0.15 gold plated
Terminal block: -Phoenix MVSTBW or equivalent	Maximum wire dimension: 2.5 mm^2 (13-14 AWG)

I>> Input & Reset input

Rated voltage	18 – 265 Vac/dc
Rated current / input	5 mA
Number of inputs	2

Disturbance tests

Test	Standard & Test class / level	Test value
Emission	EN 61000-6-4 / IEC 60255-26	
- Conducted	EN 55011, Class A / IEC 60255-25	0.15 – 30 MHz
- Emitted	EN 55011, Class A / IEC 60255-25	30 – 1 000 MHz
Immunity	EN 61000-6-2 / IEC 60255-26	
- 1Mhz damped oscillatory wave	IEC 60255-22-1	±2.5kVp CM, ±2.5kVp DM
- Static discharge (ESD)	EN 61000-4-2 Level 4 / IEC 60255-22-2 Class 4	±8 kV contact, ±16 kV air
- Emitted HF field	EN 61000-4-3 Level 3 / IEC 60255-22-3	80 - 2700 MHz, 10 V/m
- Fast transients (EFT)	EN 61000-4-4 Level 4 / IEC 60255-22-4 Class A	±4 kV 5/50 ns, 5 kHz
- Surge	EN 61000-4-5 Level 4 / IEC 60255-22-5	±4 kV, 1.2/50 μs, CM ±2 kV, 1.2/50 μs, DM
- Conducted HF field	EN 61000-4-6 Level 3 / IEC 60255-22-6	0.15 - 80 MHz, 10 Vemf
- Power-frequency magnetic field	EN 61000-4-8	300A/m (continuous), 1000A/m 1-3s
- Pulse magnetic field	EN 61000-4-9 Level 5	1000A/m, 1.2/50 μs
- Voltage interruptions	EN 61000-4-29 / IEC 60255-11	30%/1s, 60%/0.1s, 100%/0.05s
- Voltage alternative component	EN 61000-4-17 / IEC 60255-11	15% of operating voltage (DC) / 10min
- Voltage dips and short interruptions	EN 61000-4-11	30%/10ms, 100%/10ms, 60%/100ms >95%/5000ms

Electrical safety tests

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

Mechanical tests

Test	Standard & Test class / level	Test value
Device in operation		
- Vibrations	IEC 60255-21-1, Class II / IEC 60068-2-6, Fc	1Gn, 10Hz – 150 HZ
- Shocks	IEC 60255-21-2, Class I / IEC 60068-2-27, Ea	5Gn/11ms
Device de-energized		
- Vibrations	IEC 60255-21-1, Class II / IEC 60068-2-6, Fc	2Gn, 10Hz – 150 HZ
- Shocks	IEC 60255-21-2, Class I / IEC 60068-2-27, Ea	15Gn/11ms
- Bump	IEC 60255-21-2, Class I / IEC 60068-2-27, Ea	10Gn/16ms

Environmental tests

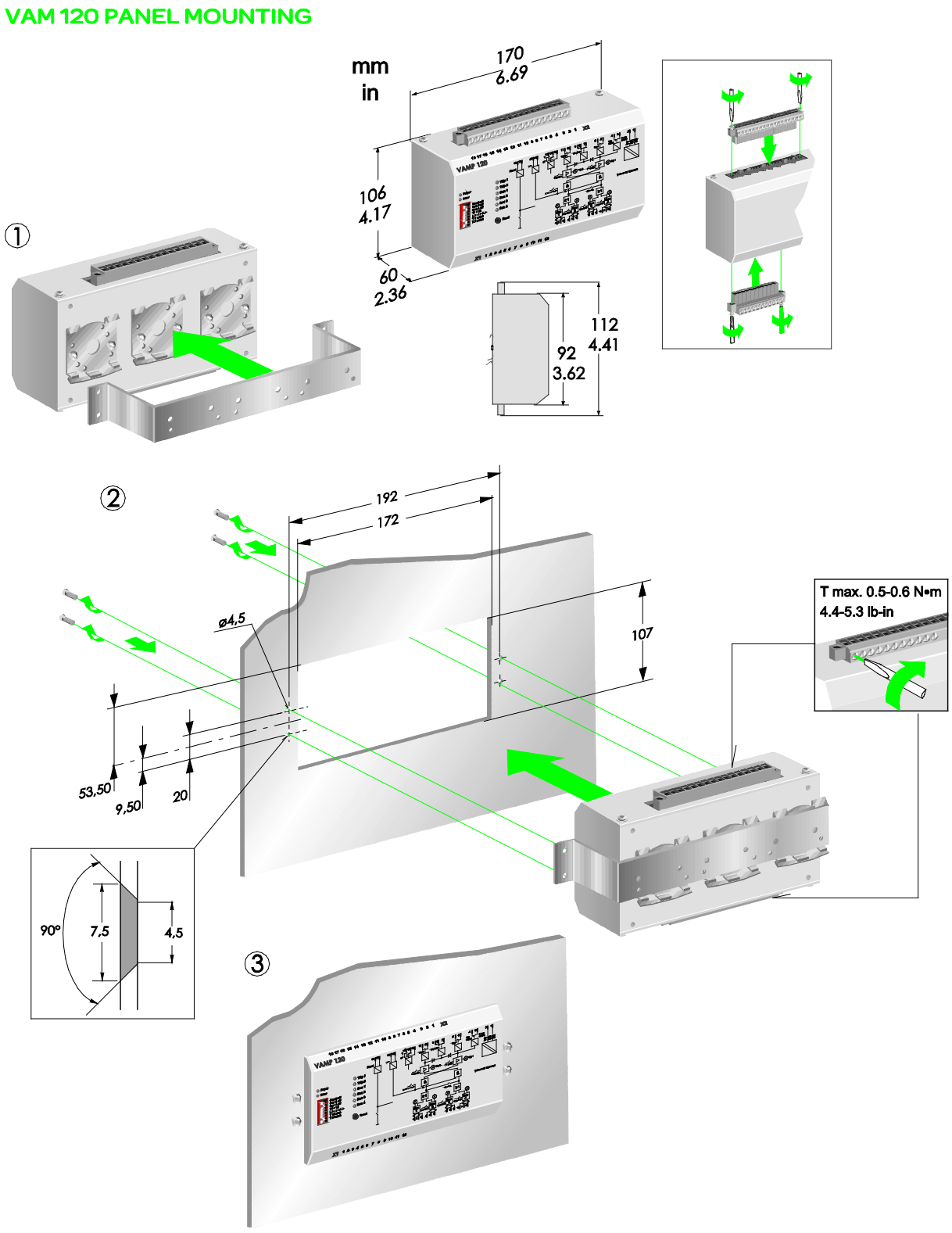
Test	Standard & Test class / level	Test value
Device in operation		
- Dry heat	EN / IEC 60068-2-2, Bd	+60°C
- Cold	EN / IEC 60068-2-1, Ad	-40°C
- Damp heat, cyclic	EN / IEC 60068-2-30, Db	From +25°C to +55°C, From 93% RH to 98% RH, 6 days
- Damp heat, static	EN / IEC 60068-2-78, Cab	+40°C, 93% RH, 10 days
Device in storage		
- Dry heat	EN / IEC 60068-2-2, Bb	+70°C
- Cold	EN / IEC 60068-2-1, Ab	-40°C

Environmental conditions

Ambient temperature, in-service	-35 – +60°C
Ambient temperature, storage	-40 – +70 °C
Relative humidity	< 95%, no condensation allowed
Maximum operating altitude	2000 m
Degree of protection (IEC 60529)	IP20

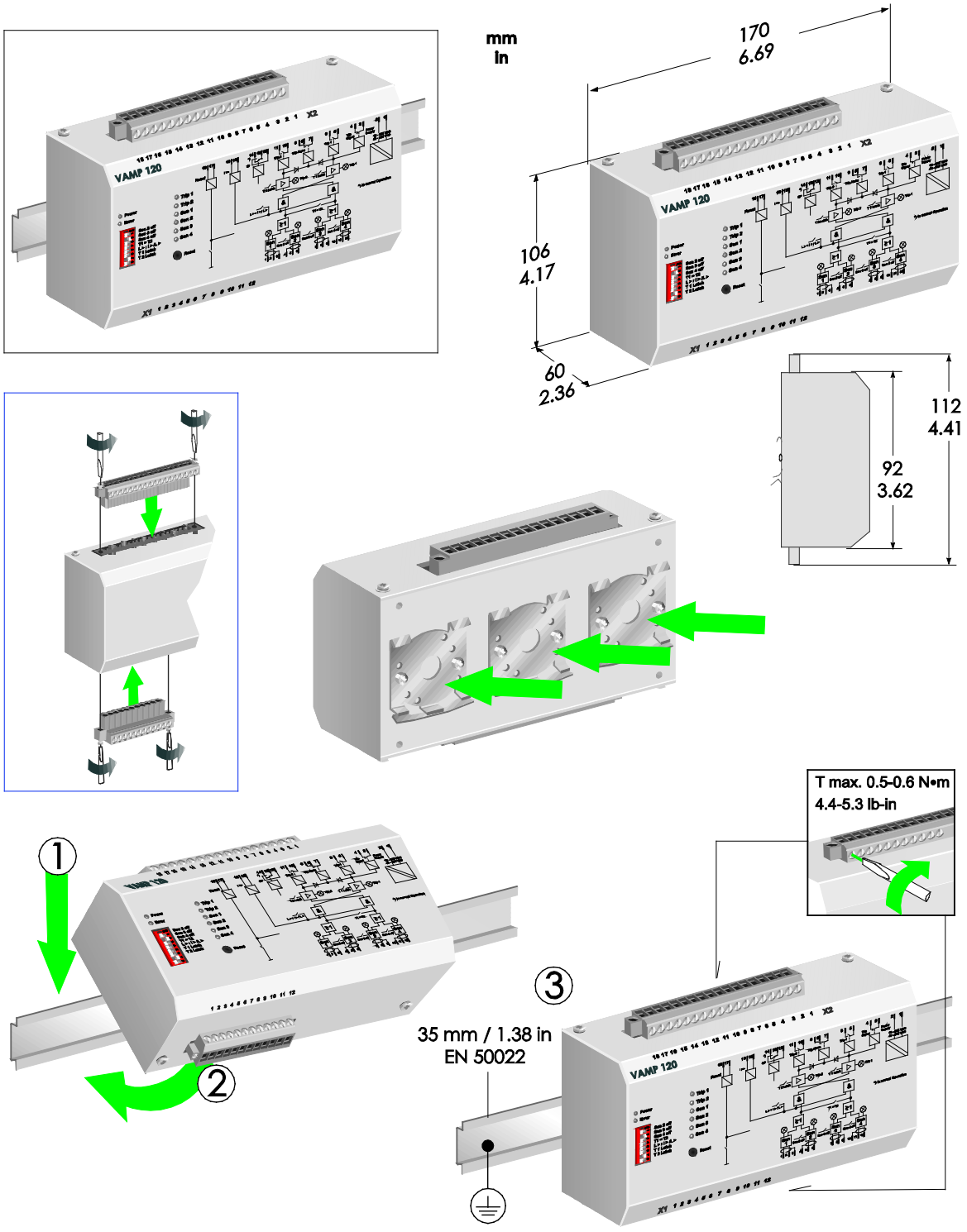
8. Dimensions

8.1. VAMP 120 panel mounting



8.2. VAMP din rail mounting

VAM 120 DIN RAIL MOUNTING



8.3. VA 1 DA arc sensor

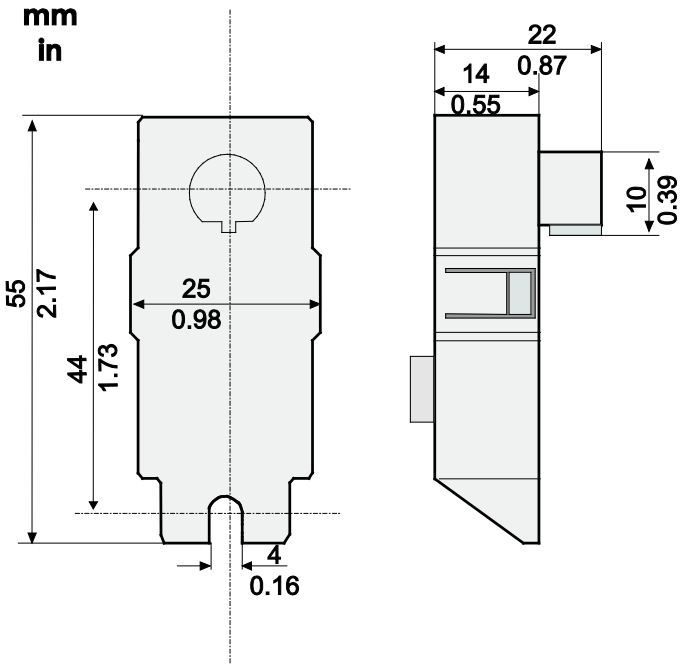


Figure 8.3-1. VA 1 DA arc sensor dimensions

8.4. Mounting plates for VA 1 DA

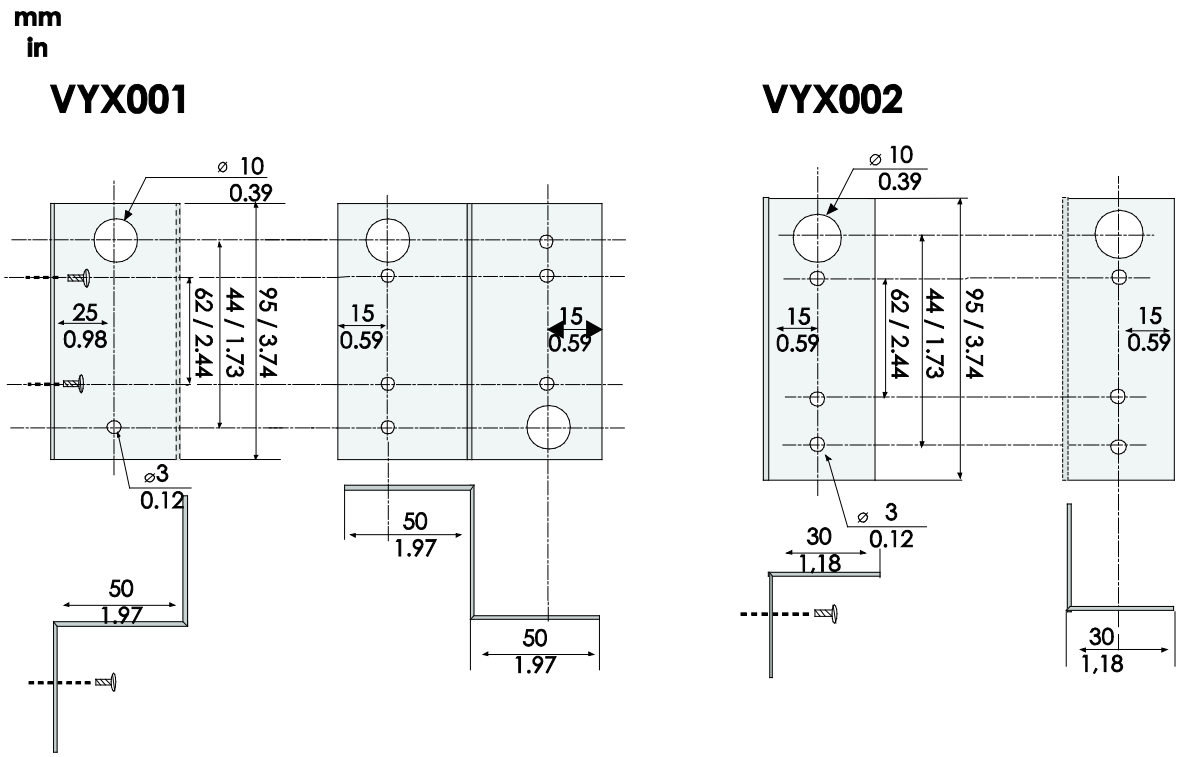


Figure 8.4-1. Mounting plate dimensions.

9. Order information

Unit	Ordering code
VAMP 120 unit	V120
Installation kit for flush mounting	V120-F-KIT
Arc sensor, 6 m cable	VA 1 DA-6
Arc sensor, 6 m cable	VA 1 EH-6 (IP65)
Arc sensor, 20 m cable	VA 1 DA-20

Customers Care Center

http://www.schneider-electric.com/ccc

Schneider Electric

35 rue Joseph Monier
92506 Rueil-Malmaison
FRANCE
Phone: +33 (0) 1 41 29 70 00
Fax: +33 (0) 1 41 29 71 00

www.schneider-electric.com

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