VAMP 120 & 121
Arc flash detection units

VAMP 120 and 121(D) are extremely fast arc flash detection units for LV and MV switchgear and controlgear.

The units are especially designed to increase the safety and to minimize material damage caused by arc faults.

Customer benefits

• **Reduces loss of production**
  The shorter the operate time of the arc flash detection unit the smaller the damage caused by the arc fault will be and the shorter the possible outage of the power supply.

• **Prolonged switchgear life cycle**
  A modern arc protection unit increases the life-cycle expectancy of switchgear installations, investment decisions in new switchgear installations can be postponed and money can be saved by re-Vamping existing switchgear systems.

• **Reduced insurance costs**
  The faster and better the protection system of a power installation is, the more generous the insurance terms and costs will be.

• **Low investment costs and fast installation**
  A comprehensive arc protection is characterized by low investment costs and a fast installation and commissioning time. One successful operation of the arc flash detection units provides immediate investment pay off.

• **Reliable operation**
  Function is based on appearance of light or alternatively on the appearance of light and current from an external equipment. Immune to nuisance trippings!

• **Vast experience**
  Schneider Electric is the pioneer in the field of arc flash protection with more than 15,000 VAMP arc flash protection systems and units with over 300,000 arc detection sensors in service world-wide.
VAMP 120 & 121
Arc flash protection overview and the application

Secure your assets
VAMP arc flash protection is an extremely fast protection system for LV and MV switchgear and controlgear. Vamp arc flash protection increases the safety and minimizes the material damage of the installation in the most hazardous power system fault situations. The arc protection unit detects an arc flash in an installation and trips the feeding breaker.
On detection of a fault the arc flash detection unit immediately trips the concerned circuit breaker(s) to isolate the fault.
An arc flash protection system operates much faster than conventional protection relays and thus damage caused by an arc short circuit can be kept to a minimum level.

Why arc flash protection?
When the traditional time-grading or blocking based protection coordination principle is used, the traditional protection systems may not provide fast enough protection of substation faults. Further, high-impedance type of earth-faults may cause prolonged operation times of earth-fault relays leading to the significant release of the arcing energy. These facts pose a considerable risk to operators and economical assets.

VAMP 121(D) applied for the switchgear application
Every compartment is equipped with an arc sensor. Up to ten sensors can be connected to the VAMP 121(D) unit. The trip relay is electromechanical and can be connected directly to control the circuit-breaker.

Modern society heavily depends on an uninterrupted supply of electric power. Prolonged power outages cause loss of business to the power supplier and loss of production to the power consumer. Regardless how safe a power system is, faults do occur. This being the case the damage caused by power system faults must be kept to a minimum level.
The ultimate solution is to selectively isolate the fault as fast as possible, while maintaining the operation of the healthy network parts.
VAMP 120 & 121

Typical applications

VAMP 120 applied for wind power applications

VAMP 120 provides the most simple, straightforward and economical solution designed for wind power applications.

VAMP 120 applied for arc flash detection at medium size power generation plant

Possible arc flash in busbar or circuit breaker compartment trips the grid and all generator units. Should the arc flash fault happen in cable area, an emergency shut down for the concerned generator unit is activated.
VAMP 120 & 121

Product characteristics and highlights

Common features

- Operation on light only
- Supports point or smoke sensors
- Straight-forward installation
- Cost-efficient solution
- Self-supervision

VAMP 120 arc flash detection unit

- Up to 4 sensors
- Selective trip for 2 zones and possibility for generator set emergency trip (separate contact)
- Operation time typically 7 ms (including the output relay)
- Non-volatile trip status
- Input for current criteria for I> & L> operation
- NO & NC trip outputs (Zone 1)
- Integrated 19–265 V ac/dc aux. supply
- Optimized for wind power and other small applications

VAMP 121 ans 121D arc flash detection units

- Up to 10 sensors
- Single trip contact
- Operation time typically 9 ms (including the output relay)
- Binary input for blocking or resetting (programmable) the unit
- Possibility for double arc channel activation trip criteria
- BIO light transfer to other Vamp device

Additional feature to VAMP 121D
Door mounted, text pocket for sensor specific labels

Connection diagrams

VAMP 120

VAMP 121(D)
Accessories

**Point sensors**
- Easy installation and replacement
- Enables fault location indication
- Surface mounting
- Tube mounting
- Continuous self-supervision

- **Point sensor VA1EH-x** (pipe)
- **Point sensor VA1DA-x** (surface)

**Sensor mounting plates**
- Z- or L-shaped
- Wall mounting to VA1DA-x sensors (no extra holes in the switchgear)

- **VYX001, Z-shaped**
- **VYX002, L-shaped**

**V120 Flush mount KIT**

**Line amplifier 3P001**
- Flare, solid state relay with 6.2 mm overall width
- Output, transistor module, spring clamp terminal, jumper at negative pole at the control side

**Power supply unit 3P004**
- Primary-switched MINI POWER power supply for DIN rail mounting
- Input: 1-phase, output: 24 V DC/1.3 A

**Portable sensor VA1DP**
- Provides extra personal safety while working on live switchgear
- Quick connection with snap-in socket

**Portable sensor VA1DP-5**
- Snap-in socket connection to sensor I/O unit

**Portable sensor VA1DP-5D**
- Snap-in socket connection to sensor I/O unit via VX031-5 cable

**Extension cable VX031-5**
- Extension cable and door socket for VA1DP-5D
- Diplexer for two portable sensors

**V120 Flush mount KIT**

**Alarm relay 3P007**
- Relay terminal block, with soldered-in miniature power relay
- Contacts (AgSnO): medium to large loads,
- 1 PDT, input voltage 24 V DC
- For assembly on NS 35/7.5
- Terminal width 6.2 mm

**Trip multiplier relay VAMP 4R**
- 4 + 4 trip outputs (4 x NO and 4 x NC)
- Two separate tripping groups
- Enables a 7 ms total operation time to a large number of CBs (controlled by binary output (BO) of VAMP 121 unit)
- External auxiliary power supply
# VAMP 120 & 121

## Order codes

**VAMP 120**

<table>
<thead>
<tr>
<th>Order code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>V120</td>
<td>Arc flash detection unit, DIN rail mounted</td>
</tr>
</tbody>
</table>

**Accessories for VAMP 120**

<table>
<thead>
<tr>
<th>Order code</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>VA 1 DA-6</td>
<td>Arc Sensor</td>
<td>Cable length 6 m</td>
</tr>
<tr>
<td>VA 1 DA-20</td>
<td>Arc Sensor</td>
<td>Cable length 20 m</td>
</tr>
<tr>
<td>VA 1 EH-6</td>
<td>Arc Sensor (Pipe type)</td>
<td>Cable length 6 m</td>
</tr>
<tr>
<td>VA 1 EH-20</td>
<td>Arc Sensor (Pipe type)</td>
<td>Cable length 20 m</td>
</tr>
<tr>
<td>VA 1 EH-6S-IP</td>
<td>Arc Sensor, shielded (Pipe type, IP65)</td>
<td>Cable length 6 m</td>
</tr>
<tr>
<td>VA 1 EH-20S-IP</td>
<td>Arc Sensor, shielded (Pipe type, IP65)</td>
<td>Cable length 20 m</td>
</tr>
<tr>
<td>VA 1 EH-20-IP</td>
<td>Arc Sensor (Pipe type, IP65)</td>
<td>Cable length 20 m</td>
</tr>
<tr>
<td>VX031-5</td>
<td>Extension cable for VA1DP-5D</td>
<td>Cable length 5 m</td>
</tr>
<tr>
<td>VYX001</td>
<td>Surface Mounting Plate for Sensors</td>
<td>Z-shaped</td>
</tr>
<tr>
<td>VYX002</td>
<td>Surface Mounting Plate for Sensors</td>
<td>L-shaped</td>
</tr>
<tr>
<td>V120-F-KIT</td>
<td>V120 Flush mount KIT</td>
<td>For panel mounting</td>
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</tbody>
</table>

**VAMP 121**

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<tbody>
<tr>
<td>V121</td>
<td>Arc flash detection unit, DIN rail mounted</td>
</tr>
<tr>
<td>V121D</td>
<td>Arc flash detection unit, door mounted</td>
</tr>
</tbody>
</table>

**Accessories for VAMP 121**

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<td>Cable length 6 m</td>
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<tr>
<td>VA 1 DA-20</td>
<td>Arc Sensor</td>
<td>Cable length 20 m</td>
</tr>
<tr>
<td>VA 1 EH-6</td>
<td>Arc Sensor (Pipe type)</td>
<td>Cable length 6 m</td>
</tr>
<tr>
<td>VA 1 EH-20</td>
<td>Arc Sensor (Pipe type)</td>
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<tr>
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<td>Arc Sensor, shielded (Pipe type, IP65)</td>
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<td>Arc Sensor, shielded (Pipe type, IP65)</td>
<td>Cable length 20 m</td>
</tr>
<tr>
<td>VA 1 EH-20-IP</td>
<td>Arc Sensor (Pipe type, IP65)</td>
<td>Cable length 20 m</td>
</tr>
<tr>
<td>VA 1 DP-5</td>
<td>Portable Arc Sensor</td>
<td>Cable length 5 m</td>
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<tr>
<td>VA 1 DP-5D</td>
<td>Portable Arc Sensor</td>
<td>Cable length 5 m</td>
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<td>VX031-5</td>
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<td>VYX002</td>
<td>Surface Mounting Plate for Sensors</td>
<td>L-shaped</td>
</tr>
<tr>
<td>3P001</td>
<td>Line amplifier for arc protection BI/O channels</td>
<td>DIN rail mount</td>
</tr>
<tr>
<td>3P004</td>
<td>Supply unit, 100-240AC/24DC/1.3A</td>
<td></td>
</tr>
<tr>
<td>3P007</td>
<td>Alarm relay, Phoenix DEK-REL-G24/21</td>
<td></td>
</tr>
</tbody>
</table>
VAMP 120 & 121

Technical characteristics

### VAMP 120 unit

**Power Supply**
- **Us**: 19 – 265 V dc / 40 – 265 V ac
- **Pmax**: 4 W

**TRIP Contacts**
- **2 pcs**

**Rated voltage**
- 250 V ac/dc

**Continuous carry**
- 5 A

**Make and carry for 0.5 s**
- 30 A

**Make and carry for 3 s**
- 15 A

**t>**
- 7 ms

**Digital Inputs**
- **Rated voltage**: 18 – 265 V ac/dc
- **Number of inputs**: 2

### VAMP 121 / 121D units

**Power Supply**
- **Us**: 24 V dc

**In (stand-by)**
- 30 mA

**I sensAct**
- 20 mA

**Iarc**
- 120 mA (I sensAct x n) *

**Tripping Contacts**
- **1 pc NO**

**Rated voltage**
- 250 V ac/dc

**Continuous carry**
- 5 A

**Make and carry for 0.5 s**
- 30 A

**Make and carry for 3 s**
- 15 A

**Breaking capacity DC, when time constant L/R=40 ms**
- 50 W

**Contact material**
- AgNi

**t>**
- 9 ms

**BIO Inputs/Outputs**
- **Rated voltage**: +24 V

**Rated current / output**
- 20 mA (max)

**Rated current / input**
- 5 mA

**Number of inputs**
- 1

**Number of outputs**
- 1

### 3P001 line amplifier

**Wieland type**
- flare 24VDC/48VDC-2A

**Coil circuit**
- **Operating voltage**: 24 V dc
- **Minimum input voltage**: 0 - 5 V dc
- **Maximum input voltage**: 10 - 53 V dc
- **Nominal input current**: 4 - 7 mA
- **Status display**: LED yellow

**Switching characteristics**
- **Nominal switching voltage**: 4.4 - 53 V dc
- **Maximum switching voltage**: 53 V dc
- **Maximum switching current DC1 30 / 110 / 220 V DC**: 2 A
- **Min. switching voltage**: 4.4 V dc
- **Min. switching current**: 1 mA
- **Max. switching frequency**: 5 Hz
- **Pick-up delay**: 1 ms
- **Release delay**: 5 ms

### 3P004 power supply unit

**Phoenix type**
- MINI-PS-100-240AC/24DC/1.3

**Input Data**
- **Nominal input voltage**: 100 V ac – 240 V ac
- **Nominal output voltage**: 24 V dc ±1%
- **AC input voltage range**: 85 V ac – 264 V ac
- **DC input voltage range**: 90 V ac – 350 V dc
- **AC frequency range**: 45 Hz – 65 Hz
- **DC frequency range**: 0 Hz

**Output Data**
- **Nominal output voltage**: 24 V DC ±1%
- **Output current**: 1.3 A (-25 °C – 60 °C)

### 3P007 alarm relay

**Phoenix type**
- DEK-REL-G24/21

**Coil side**
- **Nominal input voltage Un**: 24 V dc
- **Contact type**: Single contact, 1-PDT

**Input voltage range**
- in reference to Un: 0.8 – 1.1

**Limiting continuous current**
- 6 A

**Nominal input current at Un**
- 9 mA

**Contact material**
- AgSnO

**Typical response time**
- 8 ms

**Maximum switching voltage**
- 250 V ac/dc

**Minimum switching voltage**
- 12 V 68 ac/dc

**Maximum inrush current**
- 6 A

**Min. switching current**
- 10 mA

**Limiting continuous current**
- 6 A
## Disturbance tests

### Emission

<table>
<thead>
<tr>
<th>VAMP 120</th>
<th>VAMP 121 / VAMP 121D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard &amp; Test class / level</td>
<td>Standard &amp; Test class / level</td>
</tr>
<tr>
<td>Test value</td>
<td>Test value</td>
</tr>
<tr>
<td>Conducted</td>
<td>EN 55011, Class A / IEC 60255-25</td>
</tr>
<tr>
<td>0.01 - 30 MHz</td>
<td>0.01 - 30 MHz</td>
</tr>
<tr>
<td>Emitted</td>
<td>EN 55011, Class A / IEC 60255-25</td>
</tr>
<tr>
<td>30 - 1 000 MHz</td>
<td>30 - 1 000 MHz</td>
</tr>
</tbody>
</table>

### Immunity

| Standard & Test class / level | Standard & Test class / level |
| Test value | Test value |
| 1MHz damped oscillatory wave | ±2.5kVp CM, ±2.5kVp DM |
| Static discharge (ESD) | ±8 kV contact, ±16 kV air |
| Emitted HF field | EN 55011, Class A / IEC 60255-25 |
| 80 - 2700 MHz, 10 V/m | 80 - 2700 MHz, 10 V/m |
| Fast transients (EFT) | ±4 kV 5/50 μs, ±5 kV 5 kHz |
| Surge | EN 55011, Class A / IEC 60255-25 |
| ±4 kV, 1.2/50 μs, CM |
| ±2 kV, 1.2/50 μs, DM |
| Conducted HF field | EN 55011, Class A / IEC 60255-25 |
| 0.15 - 80 MHz, 10 Vemf |
| Power-frequency magnetic field | ±2 kV, 1.2/50 μs, CM |
| ±1 kV, 1.2/50 μs, DM |

### Electrical safety tests

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

### Mechanical tests

#### Device in operation

| Standard & Test class / level | Test value |
| VIBRATIONS | 1Gn, 10Hz – 150 Hz |
| SHOCKS | 5Gns/11ms |

#### Device de-energized

| Standard & Test class / level | Test value |
| VIBRATIONS | 2Gn, 10Hz – 150 Hz |
| SHOCKS | 15Gns/11ms |
| BUMP | 10Gns/16ms |

### Environmental conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature, in-service</td>
<td>-35°C to +60°C</td>
</tr>
<tr>
<td>Ambient temperature, storage</td>
<td>-40°C to +70°C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>&lt; 95%, no condensation allowed</td>
</tr>
<tr>
<td>Maximum operating altitude</td>
<td>2000 m</td>
</tr>
<tr>
<td>Degree of protection (IEC 60529)</td>
<td>IP20</td>
</tr>
</tbody>
</table>