Product Environmental Profile

Arc fault detection circuit breaker
General information

Representative product
 Arc fault detection circuit breaker - A9FDB616

Description of the product
 The main purpose of the ARCs products is to reduce the risk of electrical fires. It combines the following functions:
- Protection against fire hazards by detection of abnormal electric arcs;
- Protection against load fire hazards due to slow overvoltages;
- Circuit opening and positive break indication (green strip);
- Fire hazard tripping indication via the front panel indicator;
- Device self-diagnostics via the test button.

Functional unit
 Protect during 20 years the installation against overloads and short-circuits in circuit with assigned voltage 230V and rated current In 16A. This protection is ensured in accordance with the following parameters:
- Number of poles 1P + N

Constituent materials

Reference product mass
 220 g including the product, its packaging and additional elements and accessories

Material distribution:
- Steel: 29.8%
- Copper: 7.3%
- Ferrous alloys: 1.2%
- Stainless steel: 1.1%
- Zamak: 0.7%
- Miscellaneous: 0.4%
- Various: 0.6%
- Paper: 3.8%
- Electronic components: 4.2%
- Cardboard: 8.7%
- PBT Polybutylene Terephthalate: 3.3%
- PC Polycarbonate: 3.7%
- PA Polyamide: 32.9%
- PET Polyethylene Terephthalate: 1%
- PES Polyethersulfone: 0.7%
- PPS Polyphenylene Sulphur: 0.7%
- PA Polyamide: 32.9%

Plastics: 42.3%
Metals: 40.0%
Others: 17.7%

Substance assessment

Products of this range are designed in conformity with the requirements of the RoHS directive (European Directive 2011/65/EU of 8 June 2011) and do not contain, or only contain in the authorised proportions, lead, mercury, cadmium, hexavalent chromium or flame retardants (polybrominated biphenyls - PBB, polybrominated diphenyl ethers - PBDE) as mentioned in the Directive.

Details of ROHS and REACH substances information are available on the Schneider-Electric Green Premium website:
The Arc fault detection circuit breaker presents the following relevant environmental aspects

**Manufacturing**
- Manufactured at a Schneider Electric production site ISO14001 certified

**Distribution**
- Weight and volume of the packaging optimized, based on the European Union's packaging directive
- Packaging weight is 30 g, consisting of cardboard (66.1%), Paper (33.9%)

**Installation**
- Ref A9FDB616 does not require any installation operations.

**Use**
- The product does not require special maintenance operations.

**End of life**
- End of life optimized to decrease the amount of waste and allow recovery of the product components and materials
- This product contains electronic card (8g) that should be separated from the stream of waste so as to optimize end-of-life treatment.

The location of these components and other recommendations are given in the End of Life Instruction document which is available on the Schneider-Electric Green Premium website http://www2.schneider-electric.com/sites/corporate/en/products-services/green-premium/green-premium.page

Recyclability potential: 44%
- Based on "ECO'DEEE recyclability and recoverability calculation method" (version V1, 20 Sep. 2008 presented to the French Agency for Environment and Energy Management: ADEME).

### Environmental impacts

**Reference life time**
- 20 years

**Product category**
- Circuit-breakers

**Installation elements**
- No special components needed

**Use scenario**
- Load rate: 50% of In
- Use time rate: 30% of RLT

**Geographical representativeness**
- Germany

**Technological representativeness**
- The main purpose of the ARCs products is to reduce the risk of electrical fires.
- It combines the following functions:
  - Protection against fire hazards by detection of abnormal electric arcs;
  - Protection against load fire hazards due to slow overvoltages;
  - Circuit opening and positive break indication (green strip);
  - Fire hazard tripping indication via the front panel indicator;
  - Device self-diagnostics via the test button.

**Energy model used**

<table>
<thead>
<tr>
<th>Energy model used: Germany</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manufacturing</strong></td>
</tr>
<tr>
<td>Electricity grid mix; AC; consumption mix, at consumer; &lt; 1kV; EU-27</td>
</tr>
<tr>
<td><strong>Installation</strong></td>
</tr>
<tr>
<td>Electricity grid mix; AC; consumption mix, at consumer; &lt; 1kV; EU-27</td>
</tr>
<tr>
<td><strong>Use</strong></td>
</tr>
<tr>
<td>Electricity grid mix; AC; consumption mix, at consumer; &lt; 1kV; EU-27</td>
</tr>
<tr>
<td><strong>End of life</strong></td>
</tr>
<tr>
<td>Electricity grid mix; AC; consumption mix, at consumer; &lt; 1kV; EU-27</td>
</tr>
</tbody>
</table>

### Compulsory indicators

<table>
<thead>
<tr>
<th>Impact indicators</th>
<th>Arc fault detection circuit breaker - A9FDB616</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unit</td>
</tr>
<tr>
<td>Contribution to mineral resources depletion</td>
<td>kg Sb eq</td>
</tr>
<tr>
<td>Contribution to the soil and water acidification</td>
<td>kg SO₂ eq</td>
</tr>
<tr>
<td>Contribution to water eutrophication</td>
<td>kg PO₄eq</td>
</tr>
<tr>
<td>Contribution to global warming</td>
<td>kg CO₂ eq</td>
</tr>
<tr>
<td>Contribution to ozone layer depletion</td>
<td>kg CFC11 eq</td>
</tr>
<tr>
<td>Contribution to photochemical oxidation</td>
<td>kg C₂H₄ eq</td>
</tr>
<tr>
<td>Resources use</td>
<td>Unit</td>
</tr>
<tr>
<td>Net use of freshwater</td>
<td>m3</td>
</tr>
<tr>
<td>Total Primary Energy</td>
<td>MJ</td>
</tr>
</tbody>
</table>

**Environmental impacts**

- **Total Primary Energy**
- **Net use of freshwater**
- **Recyclability potential**
- **Contribution to ozone layer depletion**
- **Contribution to water eutrophication**
- **Contribution to mineral resources depletion**
- **Contribution to global warming**
- **Contribution to the soil and water acidification**
- **Contribution to photochemical oxidation**

**Additional environmental information**

- Based on "ECO'DEEE recyclability and recoverability calculation method" (version V1, 20 Sep. 2008 presented to the French Agency for Environment and Energy Management: ADEME).

**Environmental model used**

- Energy model used: Germany

**Impact indicators**

- **Compulsory indicators**
- **Arc fault detection circuit breaker - A9FDB616**

**Technological representativeness**

- The main purpose of the ARCs products is to reduce the risk of electrical fires.
- It combines the following functions:
  - Protection against fire hazards by detection of abnormal electric arcs;
  - Protection against load fire hazards due to slow overvoltages;
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  - Device self-diagnostics via the test button.

**Environmental models**

- Germany
- EU-27

**Manufacturing**

- The main purpose of the ARCs products is to reduce the risk of electrical fires.
- It combines the following functions:
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  - Circuit opening and positive break indication (green strip);
  - Fire hazard tripping indication via the front panel indicator;
  - Device self-diagnostics via the test button.

**Installation**

- The Arc fault detection circuit breaker presents the following relevant environmental aspects

**Use**

- The Arc fault detection circuit breaker presents the following relevant environmental aspects

**End of life**

- The Arc fault detection circuit breaker presents the following relevant environmental aspects

**Additional environmental information**

- Based on "ECO'DEEE recyclability and recoverability calculation method" (version V1, 20 Sep. 2008 presented to the French Agency for Environment and Energy Management: ADEME).
**Arc fault detection circuit breaker - A9FDB616**

### Impact indicators

<table>
<thead>
<tr>
<th>Impact indicators</th>
<th>Unit</th>
<th>Total</th>
<th>Manufacturing</th>
<th>Distribution</th>
<th>Installation</th>
<th>Use</th>
<th>End of Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contribution to fossil resources depletion</td>
<td>MJ</td>
<td>7.00E+01</td>
<td>1.82E+01</td>
<td>3.99E-01</td>
<td>2.11E-02</td>
<td>5.12E+01</td>
<td>2.44E-01</td>
</tr>
<tr>
<td>Contribution to air pollution</td>
<td>m³</td>
<td>5.14E+02</td>
<td>3.17E+02</td>
<td>1.21E+00</td>
<td>6.46E-02</td>
<td>1.94E+02</td>
<td>2.20E+00</td>
</tr>
<tr>
<td>Contribution to water pollution</td>
<td>m³</td>
<td>6.82E+02</td>
<td>4.88E+02</td>
<td>4.67E+00</td>
<td>2.46E-01</td>
<td>1.86E+02</td>
<td>2.95E+00</td>
</tr>
</tbody>
</table>

### Resources use

<table>
<thead>
<tr>
<th>Resources use</th>
<th>Unit</th>
<th>Total</th>
<th>Manufacturing</th>
<th>Distribution</th>
<th>Installation</th>
<th>Use</th>
<th>End of Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of secondary material</td>
<td>kg</td>
<td>2.38E-02</td>
<td>2.38E-02</td>
<td>0*</td>
<td>0*</td>
<td>0*</td>
<td>0*</td>
</tr>
<tr>
<td>Total use of renewable primary energy resources</td>
<td>MJ</td>
<td>1.24E+01</td>
<td>9.95E-01</td>
<td>0*</td>
<td>0*</td>
<td>1.14E+01</td>
<td>0*</td>
</tr>
<tr>
<td>Total use of non-renewable primary energy resources</td>
<td>MJ</td>
<td>1.08E+02</td>
<td>2.88E+01</td>
<td>4.01E-01</td>
<td>2.12E-02</td>
<td>7.86E+01</td>
<td>3.02E-01</td>
</tr>
<tr>
<td>Use of renewable primary energy excluding renewable primary energy used as raw material</td>
<td>MJ</td>
<td>1.20E+01</td>
<td>6.01E-01</td>
<td>0*</td>
<td>0*</td>
<td>1.14E+01</td>
<td>0*</td>
</tr>
<tr>
<td>Use of renewable primary energy resources used as raw material</td>
<td>MJ</td>
<td>3.94E-01</td>
<td>3.94E-01</td>
<td>0*</td>
<td>0*</td>
<td>0*</td>
<td>0*</td>
</tr>
<tr>
<td>Use of non renewable primary energy excluding non renewable energy used as raw material</td>
<td>MJ</td>
<td>1.05E+02</td>
<td>2.62E+01</td>
<td>4.01E-01</td>
<td>2.12E-02</td>
<td>7.86E+01</td>
<td>3.02E-01</td>
</tr>
<tr>
<td>Use of non renewable primary energy resources used as raw material</td>
<td>MJ</td>
<td>2.58E+00</td>
<td>2.58E+00</td>
<td>0*</td>
<td>0*</td>
<td>0*</td>
<td>0*</td>
</tr>
<tr>
<td>Use of non renewable secondary fuels</td>
<td>MJ</td>
<td>0.00E+00</td>
<td>0*</td>
<td>0*</td>
<td>0*</td>
<td>0*</td>
<td>0*</td>
</tr>
<tr>
<td>Use of renewable secondary fuels</td>
<td>MJ</td>
<td>0.00E+00</td>
<td>0*</td>
<td>0*</td>
<td>0*</td>
<td>0*</td>
<td>0*</td>
</tr>
</tbody>
</table>

### Waste categories

<table>
<thead>
<tr>
<th>Waste categories</th>
<th>Unit</th>
<th>Total</th>
<th>Manufacturing</th>
<th>Distribution</th>
<th>Installation</th>
<th>Use</th>
<th>End of Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazardous waste disposed</td>
<td>kg</td>
<td>8.09E+00</td>
<td>7.77E+00</td>
<td>0*</td>
<td>0*</td>
<td>2.35E-03</td>
<td>3.18E-01</td>
</tr>
<tr>
<td>Non hazardous waste disposed</td>
<td>kg</td>
<td>1.82E+01</td>
<td>1.39E+00</td>
<td>0*</td>
<td>0*</td>
<td>1.68E+01</td>
<td>0*</td>
</tr>
<tr>
<td>Radioactive waste disposed</td>
<td>kg</td>
<td>1.18E-02</td>
<td>5.64E-04</td>
<td>0*</td>
<td>0*</td>
<td>1.12E-02</td>
<td>1.54E-06</td>
</tr>
</tbody>
</table>

### Other environmental information

<table>
<thead>
<tr>
<th>Other environmental information</th>
<th>Unit</th>
<th>Total</th>
<th>Manufacturing</th>
<th>Distribution</th>
<th>Installation</th>
<th>Use</th>
<th>End of Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials for recycling</td>
<td>kg</td>
<td>1.36E-01</td>
<td>2.16E-02</td>
<td>0*</td>
<td>2.83E-02</td>
<td>6*</td>
<td>8.61E-02</td>
</tr>
<tr>
<td>Components for reuse</td>
<td>kg</td>
<td>0.00E+00</td>
<td>0*</td>
<td>0*</td>
<td>0*</td>
<td>0*</td>
<td>0*</td>
</tr>
<tr>
<td>Materials for energy recovery</td>
<td>kg</td>
<td>8.24E-03</td>
<td>0*</td>
<td>0*</td>
<td>0*</td>
<td>0*</td>
<td>8.24E-03</td>
</tr>
<tr>
<td>Exported Energy</td>
<td>MJ</td>
<td>8.98E-05</td>
<td>8.44E-06</td>
<td>0*</td>
<td>8.14E-05</td>
<td>0*</td>
<td>0*</td>
</tr>
</tbody>
</table>

* represents less than 0.01% of the total life cycle of the reference flow

The use phase is the life cycle phase which has the greatest impact on the majority of environmental indicators (based on compulsory indicators).

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Life cycle assessment performed with EIME version EIME v5.8.1, database version 2016-11 in compliance with ISO14044.

The use phase is the life cycle phase which has the greatest impact on the majority of environmental indicators (based on compulsory indicators).
Please note that the values given above are only valid within the context specified and cannot be used directly to draw up the environmental assessment of an installation.

<table>
<thead>
<tr>
<th>Registration number</th>
<th>SCHN-00516-V01.01-EN</th>
<th>Drafting rules</th>
<th>PCR-ed3-EN-2015 04 02</th>
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<tr>
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<td>VH33</td>
<td>Supplemented by</td>
<td>PSR-0005-ed2-EN-2016 03 29</td>
</tr>
<tr>
<td>Date of issue</td>
<td>12/2019</td>
<td>Information and reference documents</td>
<td><a href="http://www.pep-ecopassport.org">www.pep-ecopassport.org</a></td>
</tr>
<tr>
<td>Internal</td>
<td>External</td>
<td>Validity period</td>
<td>5 years</td>
</tr>
</tbody>
</table>

Independent verification of the declaration and data, in compliance with ISO 14025 : 2010

Internal External X

The PCR review was conducted by a panel of experts chaired by Philippe Osset (SOLINNEN)

PEP are compliant with XP C08-100-1 :2016

The elements of the present PEP cannot be compared with elements from another program.

Document in compliance with ISO 14025 : 2010 « Environmental labels and declarations. Type III environmental declarations »

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