# Product Environmental Profile

## ACB HW1 55kA 1250A 3P Drawout sentinel TU (with terminals HWY048H)



## Company information

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## References covered

HW1M312DB; HW1M316DB; HW1E308DB; HW1E310DB; HW1E312DB; HW1E306DB; HW1E316DB; HW1N306DB; HW1N308DB; HW1N310DB; HW1M306DB; HW1M308DB; HW1M310DB; HW1N312DB; HW1N316DB; HW1M310DE; HW1N312DE; HW1N316DE; HW1E316DE; HW1M312DE; HW1M316DE; HW1M304DE; HW1M306DE; HW1M308DE; HW1E308DE; HW1E310DE; HW1E312DE; HW1E304DE; HW1E306DE; HW1N304DE; HW1N306DE; HW1N308DE; HW1N310DE; HW1E304DB; HW1M304DB; HW1N304DB (with terminals HWY048H)

## Methodology

PEP has been performed according to the PCR version PEP-PCR-ed4-2021 09 06 and PSR version PSR-0005-ed3-2023 06 06 issued by the PEP ecopassport program.
For further information, please see the website of the program www.pep-ecopassport.org

## Reference product

**Reference product identification**
HW1M312DB

**Use scenario based on :**
**PSR product Category : PSR-0005-ed3-2023 06 06**
3.1. Circuit-breakers

## Functional unit

Protect during 20 years the installation against overloads and short-circuits in circuit with assigned voltage 440-690V and rated current 400A-1600A. This protection is ensured in accordance with the following parameters:
- Number of poles 3P, Rated breaking capacity 42kA/55kA/66kA at 440V, Rated breaking capacity 42kA at 690V,sentinel trip unit LI / LSI / LSIG, sentinel Energy trip unit LSI/LSIG

The functional unit is based on the use scenario recommended by the PCR for the category of the reference product.

## Materials and substances

All useful measures have been adopted to ensure that the materials used in the composition of the product do not contain any substances banned by the legislation in force at the time of marketing.

| Plastics | | | Metals | | | Others | | |
|---|---|---|---|---|---|---|---|---|
| | g | % | | g | % | | g | % |
| PA66 | 1703.49 | 2.6% | Copper | 13232.67 | 20.2% | Wood | 17155.35 | 26.2% |
| PET | 945.48 | 1.4% | Steel | 10687.89 | 16.4% | Cardboard | 11651.16 | 17.8% |
| PC | 897.84 | 1.4% | Stainless steel | 871.70 | 1.3% | Calcium Carbonate | 2370.43 | 3.6% |
| PE-LD | 454.75 | 0.7% | Aluminium | 389.37 | 0.6% | Glass | 2007.43 | 3.1% |
| Silicon rubber | 359.49 | 0.5% | Zinc | 344.76 | 0.5% | Melamine cyanurate | 499.16 | 0.8% |
| Other | 259.86 | 0.4% | Other | 987.73 | 1.5% | Other | 545.18 | 0.8% |
| **Total mass of reference product with raw material packaging :** | | | **65363.73 g** | | | | | |

| | |
|---|---|
| **Total mass of reference product (Product + packaging)** | **62213.845 g** |

## System Boudaries

The environmental information included in the PEP covers all the stages of the life cycle, from "cradle to grave".

| Manufacturing | | | Distribution | Installation | Use | | | | | | | End of life | | | | Module D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Raw material extraction and processing | Transport to the manufacturer | Manufacturing | Distribution to the place of operation | Installation on the place of operation | Use or application of the product installed | Maintenance | Repair | Replacement | Restoration | Energy requirements during the use stage | Water requirements during the use stage | Deinstallation | Transport to the waste treatment site | Treatment of waste in view of its reuse, recovery and/or recycling | Disposal | Benefits and loads beyond the system boundaries |
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| Life cycle stages | | | | | | | | | | | | | | | | |

## Manufacturing

These products are manufactured by a site that has received an environmental certification ISO 14001.

This phase takes into account raw materials, manufacturing processes, production offcuts and their end-of-life treatment, upstream transport of materials and sub-assemblies to the manufacturing site, and transport from the manufacturing site to the final logistics platform.

## Distribution

The packaging has been designed in accordance with current regulations. In particular, the European directive 94/62/CE relative to packaging and packaging waste.

The used packaging is 100% recyclable or recoverable.
Packaging and logistic flows are continuously improved in order to reduce their impact.

This phase taken into account the transport of the finished product, including packaging, to its place of use.

## Installation

**Installation processes**

The processes to install the product are not considered in this study because of their weak impact compared to the other life cycles steps.

This phase only take into account the impact of the the packaging waste treatment is taken into account.

**Installation elements (non delivered with the product)**

Elements non delivered with the product and needed to install the product are not considered.

## Use

For the considered scenario, the product has an average power of 59.30000 W in active mode during 30% of the time. This corresponds to a total energy consumption of 3116.808 kWh for the use span of 20 years.

**Energy model of the use phase :**
Europe

**Consumables and maintenance :**
None

## End of life

Considering the complexity of the recycling channels for electric and electronic equipment impacts, we rely mainely on ESR modules (datasets for WEEE product end of life).

The recycling potential of the product is: 48%. The calculation of this rate is based on the method of the IEC/TR 62635.

## Environmental impacts

Evaluation of the environmental impact covers the following life cycle stages: raw materials + manufacturing (RMM), distribution (D), installation (I), use (U) and end of life (EoL).

All calculations are done with EIME software version 6.0.0 with the database versionVersion  CODDE® 2023-02 .

Indicators set : Indicators for PEF EF 3.0 (Compliance: PEP ed.4, EN15804+A2) v2.0

PEP representative of the covered products marketed in: Europe

Energy models considered for each phase

| Manufacturing A1-A3 | Distribution A4 | Installation A5 | Use B1-B7 | End Of Life C1-C4 |
|---|---|---|---|---|
| Europe | - | Europe | Europe | Europe |

**Environmental impact indicators**

| Indicators | Unit | Manufacturing A1-A3 | Distribution A4 | Installation A5 | Use B1-B7 | End Of Life C1-C4 | GLOBAL | Module D |
|---|---|---|---|---|---|---|---|---|
| Acidification (PEF-AP) | mole H+ eq | 4.30E+00 | 9.43E-02 | 3.85E-02 | 7.57E+00 | 5.60E-01 | 1.26E+01 | -5.67E+00 |
| Climate change - Total (PEF-GWP) | kg CO2 eq. | 2.41E+02 | 1.11E+01 | 2.39E+01 | 1.33E+03 | 4.08E+01 | 1.64E+03 | -5.52E+01 |
| Climate change-Biogenic (PEF-GWPb) | kg CO2 eq. | 1.05E+01 | 0.00E+00 | 5.43E-01 | 1.77E+00 | 1.10E+01 | 2.38E+01 | -1.30E+00 |
| Climate change-Fossil (PEF-GWPf) | kg CO2 eq. | 2.31E+02 | 1.11E+01 | 2.33E+01 | 1.32E+03 | 2.98E+01 | 1.62E+03 | -5.39E+01 |
| Climate change-Land use and land use change (PEF-GWPlu) | kg CO2 eq. | 1.63E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.63E-03 | 0.00E+00 |
| Ecotoxicity, freshwater (PEF-CTUe) | CTUe | 2.21E+04 | 7.43E+00 | 1.80E+02 | 1.43E+04 | 1.34E+04 | 5.00E+04 | -4.08E+04 |
| EF-particulate Matter (PEF-PM) | Incidence of diseases | 2.70E-05 | 6.83E-07 | 2.21E-07 | 5.87E-05 | 1.52E-06 | 8.81E-05 | -1.14E-05 |
| Eutrophication, freshwater (PEF-Epf) | kg P eq. | 2.16E-02 | 4.14E-06 | 2.05E-04 | 3.63E-03 | 5.04E-04 | 2.59E-02 | -5.63E-01 |
| Eutrophication marine (PEF-Epm) | kg N eq. | 3.18E-01 | 3.74E-02 | 2.24E-02 | 8.60E-01 | 3.81E-01 | 1.62E+00 | -2.57E-01 |
| Eutrophication, terrestrial (PEF-Ept) | mole of N eq. | 3.43E+00 | 4.10E-01 | 1.23E-01 | 1.29E+01 | 2.97E-01 | 1.72E+01 | -3.27E+00 |
| Human toxicity, cancer (PEF-CTUh-c) | CTUh | 3.25E-04 | 1.93E-10 | 1.30E-06 | 1.55E-07 | 6.52E-08 | 3.26E-04 | -7.87E-07 |
| Human toxicity, non-cancer (PEF-CTUh-nc) | CTUh | 4.83E-05 | 2.21E-08 | 7.57E-08 | 6.14E-06 | 4.17E-06 | 5.87E-05 | -6.57E-05 |
| Ionising radiation, human health (PEF-IR) | kg Bq U235 eq. | 4.90E+03 | 2.67E-02 | 1.75E+00 | 1.97E+03 | 1.41E+00 | 6.87E+03 | -1.82E+00 |
| Land use (PEF-LU) | No dimension | 6.92E+01 | 0.00E+00 | 7.31E-01 | 2.64E+01 | 1.01E+02 | 1.97E+02 | -6.36E+02 |
| Ozone depletion (PEF-ODP) | kg CFC-11 eq. | 7.94E-05 | 1.68E-08 | 1.73E-07 | 5.67E-06 | 2.55E-06 | 8.78E-05 | -2.89E-06 |
| Photochemical ozone formation - human health (PEF-POCP) | kg of NMVOC eq. | 1.17E+00 | 1.04E-01 | 3.18E-02 | 2.76E+00 | 1.02E-01 | 4.17E+00 | -9.51E-01 |
| Resource use, fossils (PEF-ADPf) | MJ | 5.61E+03 | 1.54E+02 | 1.19E+02 | 3.38E+04 | 3.26E+02 | 4.00E+04 | -5.63E+02 |
| Resource use, minerals and metals (PEF-ADPe) | kg Sb eq | 1.16E-01 | 4.34E-07 | 2.18E-07 | 9.61E-05 | -1.01E-04 | 1.16E-01 | -1.63E-02 |
| Water use (PEF-WU) | m3 eq. | 1.59E+02 | 4.18E-02 | 2.85E+00 | 4.69E+01 | 9.00E+03 | 9.21E+03 | -4.86E+04 |

**Resource use indicators**

| Indicators | Unit | Manufacturing A1-A3 | Distribution A4 | Installation A5 | Use B1-B7 | End Of Life C1-C4 | GLOBAL | Module D |
|---|---|---|---|---|---|---|---|---|
| Net use of fresh water | $m^3$ | 3.72E+00 | 9.72E-04 | 1.02E-01 | 1.09E+00 | 2.42E+02 | 2.47E+02 | -1.14E+03 |
| Total use of primary energy | MJ | 6.26E+03 | 1.54E+02 | 2.03E+02 | 4.03E+04 | 3.67E+02 | 4.73E+04 | -7.00E+02 |
| Total use of non renewable primary energy resources | MJ | 5.61E+03 | 1.54E+02 | 1.19E+02 | 3.38E+04 | 3.26E+02 | 4.00E+04 | -5.63E+02 |
| Total use of renewable primary energy resources | MJ | 6.50E+02 | 2.05E-01 | 8.44E+01 | 6.49E+03 | 4.11E+01 | 7.26E+03 | -1.37E+02 |
| Use of non-renewable primary energy, excluding non renewable primary energy resources used as raw materials | MJ | 5.42E+03 | 1.54E+02 | 1.19E+02 | 3.38E+04 | 3.26E+02 | 3.98E+04 | -5.63E+02 |
| Use of non-renewable primary energy resources as raw materials | MJ | 1.90E+02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.90E+02 | 0.00E+00 |
| Use of non-renewable secondary fuels | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of renewable primary energy, excluding renewable primary energy resources used as raw materials | kg | 1.13E+02 | 2.05E-01 | 8.44E+01 | 6.49E+03 | 4.11E+01 | 6.73E+03 | -1.37E+02 |
| Use of renewable primary energy resources as raw materials | MJ | 5.36E+02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.36E+02 | 0.00E+00 |
| Use of renewable secondary fuels | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of secondary materials | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

**Waste category indicators**

| Indicators | Unit | Manufacturing A1-A3 | Distribution A4 | Installation A5 | Use B1-B7 | End Of Life C1-C4 | GLOBAL | Module D |
|---|---|---|---|---|---|---|---|---|
| Hazardous waste disposed | kg | 2.37E+03 | 0.00E+00 | 2.82E-01 | 2.48E+01 | -1.17E+00 | 2.39E+03 | -1.66E-16 |
| Non-hazardous waste disposed | kg | 9.12E+01 | 3.86E-01 | 1.63E+01 | 1.91E+02 | 1.56E+01 | 3.14E+02 | -3.32E-16 |
| Radioactive waste disposed | kg | 4.92E-02 | 2.75E-04 | 7.99E-04 | 3.99E-02 | 3.82E-04 | 9.06E-02 | 0.00E+00 |

**Output flow indicators**

| Indicators | Unit | Manufacturing A1-A3 | Distribution A4 | Installation A5 | Use B1-B7 | End Of Life C1-C4 | GLOBAL | Module D |
|---|---|---|---|---|---|---|---|---|
| Components for re-use | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Exported energy | MJ | 5.24E-01 | 0.00E+00 | 5.26E+00 | 0.00E+00 | 0.00E+00 | 5.78E+00 | 0.00E+00 |
| Materials for energy recovery | kg | 7.09E-01 | 0.00E+00 | 5.83E+00 | 0.00E+00 | 1.75E-04 | 6.54E+00 | 0.00E+00 |
| Materials for recycling | kg | 4.93E+00 | 0.00E+00 | 4.89E+00 | 0.00E+00 | 0.00E+00 | 9.82E+00 | 0.00E+00 |

**Biogenic carbon content**

| Packaging | Unit | Cardboard | Paper | Wood | Sum |
|---|---|---|---|---|---|
| Biogenic carbon content (ratio) | % | 2.80E+01 | 3.78E+01 | 3.95E+01 | |
| Mass | kg | 1.17E+01 | 5.96E-02 | 1.72E+01 | 2.89E+01 |
| Biogenic carbon content (declared unit) | kg of C | 3.26E+00 | 2.25E-02 | 6.78E+00 | 1.01E+01 |
| Biogenic carbon content (functional unit) | kg of C | 3.26E+00 | 2.25E-02 | 6.78E+00 | 1.01E+01 |
| Source | | ADEME | APESA/RECORD | EN 16485 | |

| Product | Unit | Cardboard | Paper | Wood | Sum |
|---|---|---|---|---|---|
| Mass | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Biogenic carbon content (declared unit) | kg of C | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Biogenic carbon content (functional unit) | kg of C | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

## Extrapolation rules

This extrapolation rule is given for use phase only :

| Caliber (A) | 400 | 630 | 800 | 1000 | 1250 | 1600 |
|---|---|---|---|---|---|---|
| Coef | 0.10 | 0.22 | 0.36 | 0.60 | 1.00 | 1.86 |

This given PEP is done on ACB HW1 3P Drawout range with terminal connections HWY048H and the Body sensor HWX057 mounted on it.

## Verification

| | | |
|---|---|---|
| Registration N°: HAGE-00691-V02.01-EN | Drafting Rules | PEP-PCR-ed4-2021 09 06 |
| | Supplemented by | PSR-0005-ed3-2023 06 06 |
| Verifier accreditation N°: VH36 | Information and reference documents: www.pep-ecopassport.org | |
| Date of issue: 5-2024 | Validity period: | 5 years |
| Independent verification of the declaration and data, in compliance with ISO 14025 : 2006 | | |
| Internal ● External ○ | | |
| The PCR review was conducted by a panel of experts chaired by Julie Orgelet (DDemain) | | |
| PEPs are compliant with XP C08-100-1:2016 or EN 50693:2019<br>The elements of the present PEP cannot be compared with elements from another program. | | |
| Document in compliance with ISO 14025 : 2006 « Environmental labels and declarations. Type III environmental declarations » | | |

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