# PRODUCT ENVIRONMENTAL PROFILE

## Environmental Product Declaration

### ABB Fuse Switch Disconnector SLK160

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VERIFIED

DATE: 2024-09-16

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|---|---|
| REGISTRATION NUMBER<br>ABBG-00362-V01.01-EN | IN COMPLIANCE WITH PCR-ED4-EN-2021 09 06<br>SUPPLEMENTED BY PSR-0005-ED3.1-EN-2023 12 08 |
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| DATE OF ISSUE<br>07-2024 | VALIDITY PERIOD<br>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) | |
| PEP ARE COMPLIANT WITH XP C08-100-1 :2016 AND EN 50693:2019<br>THE COMPONENTS OF THE PRESENT PEP MAY NOT BE COMPARED WITH COMPONENTS FROM ANY OTHER PROGRAM. | |
| DOCUMENT IN COMPLIANCE WITH ISO 14025: 2006 « ENVIRONMENTAL LABELS AND DECLARATIONS. TYPE III ENVIRONMENTAL DECLARATIONS » | |

| | |
|---|---|
| **EPD Owner** | ABB Electrification Sweden AB, Kabeldon<br>BOX 531, SE-441 15 Alingsas, Sweden<br>www.abb.com |
| **Manufacturer name and address** | ABB Electrification Sweden AB, Kabeldon<br>BOX 531, SE-441 15 Alingsas, Sweden |
| **Company contacts** | EPD_ELSP@in.abb.com |
| **Reference product** | ABB Fuse Switch Disconnector SLK160 |
| **Description of the product** | SLK160 range of fuse switch-disconnectors ensures high protection and reliable operation in critical power applications, distribution boards, switchboards, capacitor banks. A wide range of cable terminals and Snap-On accessories make the installation easy and fast. SLK160 can be fitted into different distribution systems by means of busbar adapters |
| **Functional unit** | The functional unit is to establish, support and interrupt the rated current I and rated voltage U, for enclosure / cabinet installation, in the Industrial application areas, according to the appropriate use scenario, and for the reference service life of the product of 20 years.<br>U = Rated voltage (V) = 500<br>I = Rated current in continuous operation (A) = 160 |
| **Other products covered** | ABB Fuse Switch Disconnector SLK160 |
| **Reference lifetime** | 20 years |
| **Product category** | Electrical, Electronic and HVAC-R Products (Switches) |
| **Use Scenario** | The use phase has been modeled based on the sales mix data (2023), and the corresponding low voltage electricity countries mix. |
| **Geographical representativeness** | Raw materials & Manufacturing: [Europe / Global]<br>Assembly: [Romania]<br>Distribution / Use: [Global] country specific sales mix<br>EoL: [Global] |
| **Technological representativeness** | Materials and processes data are specific to the production of SLK160 Fuse Switch Disconnector & Secondary data is based on Ecoinvent v3.9 |
| **LCA Study** | This study is based on the LCA study described in the LCA report 2CGC0160 |
| **EPD type** | Product family declaration |
| **EPD scope** | “Cradle to grave” |
| **Year of reported primary data** | 2023 |
| **LCA software** | SimaPro 9.5.0.1 (2023) |
| **LCI database** | Ecoinvent v3.9 (2023) |
| **LCIA methodology** | EN 15804:2012+A2:2019 |

# Contents

# ABB Purpose & Embedding Sustainability

ABB is a leading global technology company that energizes the transformation of society and industry to achieve a more productive, sustainable future. By connecting software to its electrification, robotics, automation and motion portfolio, ABB pushes the boundaries of technology to drive performance to new levels. With a history of excellence stretching back more than 130 years, ABB's success is driven by about 105 thousand talented employees in over 100 countries.
ABB's Electrification business offers a wide-ranging portfolio of products, digital solutions and services, from substation to socket, enabling safe, smart and sustainable electrification. Offerings encompass digital and connected innovations for low voltage and medium voltage, including EV infrastructure, solar inverters, modular substations, distribution automation, power protection, wiring accessories, switchgear, enclosures, cabling, sensing and control.
ABB is committed to continually promoting and embedding sustainability across its operations and value chain, aspiring to become a role model for others to follow. With its ABB Purpose, ABB is focusing on reducing harmful emissions, preserving natural resources and championing ethical and humane behavior.

# General Information

ABB Switches and fusegears operates in Alingsas in Sweden. ABB Provides a complete low voltage distribution system consisting of cabinets, busbars, switching devices, connectors and wide range of accessories that support a great variety of customer applications.

- ABB products comply with following EC directive: "Low-Voltage Directives" (LVD) no. 2014/35/EU
- ISO 9001 for quality management
- ISO 14001 for environmental management
- OHSAS 18001 for the management of the health and safety of employees in the workplace
- ISO 150001 for energy management

Different products produced in ABB Switches an Fusegears are

- SLD, SLE and SLK Fuse Switch Disconnectors
- CDC Cabinets
- CMS Cabinets
- Connectors
- Switches and Moulded Case Circuit breakers

Each brand are specific systems which is developed according to standards for different country distribution systems. The primary scope is to deliver a system with high level of safety, simplicity and reliability. Every installer and surrounding environments should be safe during the 40 years of the products lifetime. The products are critical parts of public infrastructure, and continuous operation needs to be secured.

# ABB Fuse switch disconnector SLK160 product cluster

SLK160 range of fuse switch-disconnectors ensures high protection and reliable operation in critical power applications, distribution boards, switchboards, capacitor banks. A wide range of cable terminals and Snap-On accessories make the installation easy and fast. fuse switch disconnectors can be fitted into different distribution systems by means of busbar adapters. The degree of protection is IP20 in open position. fuse switch disconnectors can be pad-locked in closed and open positions.

- **SLK160 Fuse Switch Disconnector product rating**

| Fuse Switch Disconnector | SLK160 |
|---|---|
| U = Rated operating voltage (V) | 500 |
| I = Rated operating current (A) | 160 |

Table 1: Technical characteristics of Fuse Switch Disconnectors
(Refer Technical catalogue for complete details).

# Constituent Materials

## SLK160 Fuse Switch Disconnector

SLK160 Fuse switch Disconnectors weighs 2.37kg including its installed accessories, paper documentation and packaging.

| SLK160 | | | | |
|---|---|---|---|---|
| **Materials** | **Name** | **IEC 62474 MC** | **[g]** | **%** |
| **Metals** | Cu and Cu Alloys | M-121 | 614.0 | 25.8% |
| | Aluminium | M-120 | 165.0 | 6.9% |
| | Steel | M-119 | 49.2 | 2.1% |
| | Stainless Steel | M-100 | 16.9 | 0.7% |
| **Plastics** | Polyamide | M-258 | 840.5 | 35.4% |
| | Unsaturated Polyester | M-301 | 505.0 | 21.2% |
| | Polycarbonate | M-254 | 46.9 | 2.0% |
| | Elastomer | M-320 | 4.4 | 0.2% |
| | Polyethylene | M-251 | 2.6 | 0.1% |
| **Other** | Paper/Cardboard | M-341 | 133.0 | 5.6% |
| **Total** | | | **2377.5** | **100.0%** |

Table 2: Weight of materials SLK160 Fuse Switch Disconnector

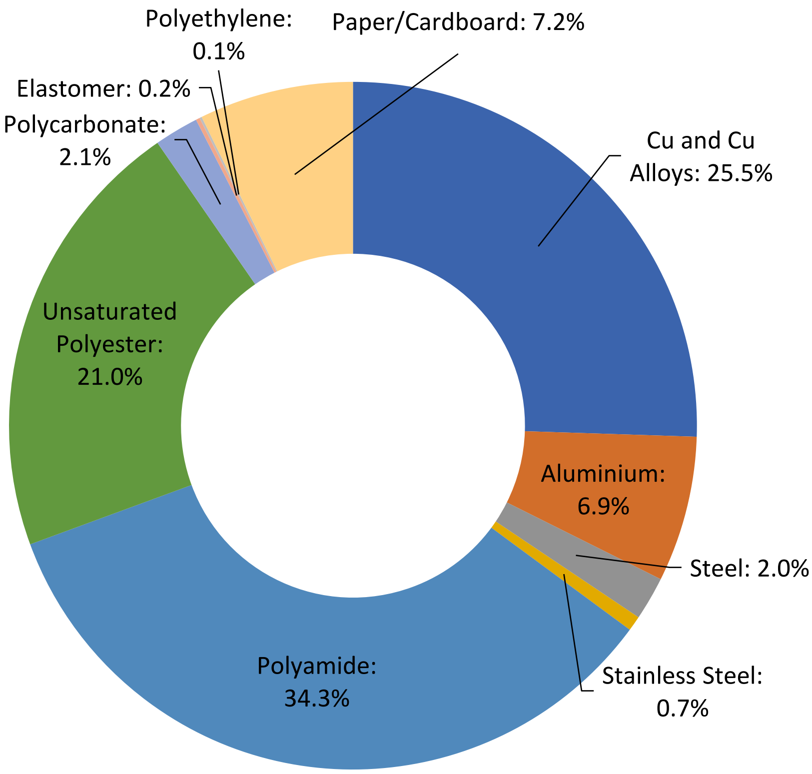


Figure 1: Composition of SLK160 Fuse Switch Disconnector

Packaging for reference product SLK160 weighs 177g, with the following substance composition:

| Material | Unit | Total | % |
|---|---|---|---|
| Corrugated Cardboard | g | 133.0 | 5.6% |
| Polyethylene | g | 2.6 | 0.1% |
| **Total** | | **135.6** | **5.7%** |

Table 3: Weight of packaging materials SLK160 Fuse Switch Disconnector

No cut-off criteria have been applied to the analysis of the product and its packaging. Additional packaging for semifinished products along the supply chain have been considered.

# LCA background information

## Functional unit and Reference Flow

The functional unit is the reference unit used to quantify the performance of the service delivered by a product to the user. The main purpose of the functional unit is to provide a reference to which inputs and outputs are related in the LCA.

The functional unit is to establish, support and interrupt the rated current I and rated voltage U, for enclosure / cabinet installation, in the Industrial application areas, according to the appropriate use scenario, and for the reference service life of the product of 20 years.

| Fuse Switch Disconnector | SLK160 |
|---|---|
| U = Rated operating voltage (V) | 500 |
| I = Rated operating current (A) | 160 |

Table 4: Functional unit

The Reference Flow of the study is a single Fuse Switch Disconnector (including its packaging and accessories) with mass described in chapter 1.3, table 2 & 3.

# System boundaries and life cycle stages

The life cycle of the Fuse Switch Disconnector, an EEPS (Electronic and Electrical Products and Systems), is a “from cradle to grave” analysis and covers the following main life cycle stages: manufacturing, including the relevant acquisition of raw material, preparation of semi-finished goods, etc. and processing steps; distribution; installation, including the relevant steps for the preparation of the product for use; use including the required maintenance steps within the RSL (reference service life of the product) associated to the reference product; end-of-life stage, including the necessary steps until final disposal or recovery of the product system.

The following table shows the stages of the product life cycle and the information stages according to EN 50693:2019 [3] for the evaluation of electronic and electrical products and systems.

| Manufacturing | Distribution | Installation | Use | End-of-Life (EoL) |
|---|---|---|---|---|
| Acquisition of raw materials<br>Transport to manufacturing site<br>Components/parts manufacturing<br>Assembly<br>Packaging<br>EoL treatment of generated waste | Transport to distributor/ logistic center<br>Transport to place of use | Installation<br>EoL treatment of generated waste (packaging) | Usage<br>Maintenance | Deinstallation<br>Collection and transport<br>EoL treatment |

Table 5: Phases for the evaluation of construction products according to EN50693:2019 [3].

# Temporal and geographical boundaries

The ABB component suppliers are sourced all over the world. All primary data collected are from 2023, which is a representative production year. Secondary data are also representative for this year, as provided by ecoinvent [6].

The selected ecoinvent [6] processes in the LCA model have a global representativeness, due to the unclear origin of each component. In this way, a conservative approach has been adopted.

# Boundaries in the life cycle

As indicated in the PCR capital goods such as buildings, machinery, tools and infrastructure, the packaging for internal transport which cannot be allocated directly to the production of the reference product, may be excluded from the system boundary.

Infrastructures, when present, such as processes deriving from the ecoinvent [6] database have not been excluded.

# Data quality

In this LCA, both primary and secondary data are used. Site specific foreground data have been provided by ABB. Main data sources are the bill of materials & drawings which are available on the ERP (SAP) & Windchill. For all processes for which primary are not available, generic data originating from the ecoinvent database [6], allocation cut-off by classification, are used. The ecoinvent database available in the SimaPro software [7] is used for the calculations.

The data quality characterized by quantitative and qualitative aspects, is presented in Appendix 1. Each data quality parameter has been rated according to DQR tables from Chapter 7.19.2.2 of the Product Environmental Footprint Guide v.6.3 to give an indication of geography, technology and temporal representativeness.

# Environmental impact indicators

The information obtained from the inventory analysis is aggregated according to the effects related to the various environmental issues. According to “PCR-ed4-EN-2021 09 06” and EN 50693 [3] the environmental impact indicators must be determined using the characterization factors and impact assessment methods specified in EN 15804:2012+A2:2019 [8].

PCR-ed4-EN-2021 09 06 and the EN 50693:2019 [3] standard establish four indicators for climate change: Climate change (total) which includes all greenhouse gases; Climate change (fossil fuels); Climate change (biogenic) which includes the emissions and absorption of biogenic carbon dioxide and biogenic carbon stored in the product; Climate change (land use) - land use and land use transformation. Other indicators as per the PCR [1].

# Allocation rules

Allocation coefficients are based on the SLK line's occupancy area for electricity and the total amount of waste generated by the production line.

The total number of operators was considered for water consumption. All these flows have been allocated and divided by the total number of SLK160 Fuse Switch Disconnector produced in 2023.

# Limitations and simplifications

Raw materials life cycle stage includes the extraction of raw materials as well as the transport distances to the manufacturing suppliers. These distances are assumed to be 1000 km as per the PCR. This distance has been added to the one already included in the market processes used for the model, as a result of a conservative choice made by the LCA operators.

Application of grease lubricant on the Fuse Switch Disconnector operating mechanism has been excluded since it is negligible. Surface treatments like galvanizing, silver plating as well as their related transport processes (back and forth from the finishing suppliers) have been considered in the LCA model. Scraps for metal working and plastic processes are included when already defined in ecoinvent [6].

# Energy Models

| LCA Stage | EN 15804:2012 +A2:2019 module | Energy model | Notes |
|---|---|---|---|
| Raw material extraction and processing | A1-A2 | Electricity, {RER}\| market group for \| Cut-off<br>Electricity, {GLO}\| market group for \| Cut-off | Based on materials and supplier's locations |
| Manufacturing | A3 | Electricity, low voltage {RO}\| market for electricity, low voltage \| Cut-off | Standard Energy model for Romania manufacturing plant |
| Installation (Packaging EoL) | A5 | Electricity, {GLO}\| market group for \| Cut-off | |
| Use Stage | B1 | Electricity, [country]x \| market for \| Cut-off, S ** | Low voltage, based on 2023 country sales mix |
| EoL | C1-C4 | Electricity, {GLO}\| market group for \| Cut-off | |

Table 6: Energy models used in each LCA stage

** Please refer the use phase for further description

# Inventory analysis

In this LCA, both primary and secondary data are used. Site specific foreground data have been provided by ABB. For data collection, Bills of Material (BOM) extracted from ABB's internal SAP and Windchill ERP were used. They are a list of all the components and assemblies that constitute the finished product, organized by hierarchy level. Each item is matched with its code, quantity, weight and supplier. The BOMs were then processed, adding material, surface area, volume and weight data, taken from technical drawings/datasheets. Finally, the manufacturing process and surface treatment were assigned, according to information provided by R&D personnel. Road distances between the suppliers and ABB were calculated using Google Maps, and marine distances using Distances & Time (Searates).

All primary data collected from ABB are from 2023, which was a representative production year. The ecoinvent cut-off by classification system processes [6] are used to represent the LCA model.

To improve both the inventory and modelling phase of the product, a specific modular dataset framework has been adopted. Raw materials and Manufacturing processes datasets from Ecoinvent database [6] have been clustered and listed inside two distinct mater data tables ABB Raw Materials and ABB Materials & Processes. Data used in the analysis is not older than 10 years.

## Manufacturing stage

The Fuse Switch Disconnectors are composed of a multitude of components, all of which are made from of numerous materials. Most of the inputs to the products' manufacturing stage are already produced component parts.
All the fuse switch disconnector's components have been modelled according to their specific raw materials and manufacturing processes.

The paper documentation is included in the analysis in the manufacturing stage. ABB receives semifinished products, does the surface treatment, assembly, testing, packaging and delivers to the customer according to the orders.

The entire supplier's network has been modelled with the calculation of each transportation stage, from the first manufacturing supplier to the next.

All the distances from the last subassembly suppliers' factories to the ABB facility have been calculated.
The energy mix used for the production phase is representative for production.

## Distribution

The transport distances from ABB manufacturing plant to the distribution centers (regional distribution centers / local sales organizations) have been calculated considering the specific 2023 sales mix data for SLK product cluster (SAP ERP sales data as a source). The Distribution mix is representative of entire product cluster including reference product and products listed in the extrapolation tables.

The other parameter affecting the environmental impact for this LCA stage is total mass of the product (including its packaging). Different mass values for each specific configuration covered by this study have been considered in the model.

As per PSR, additional distance 1000km is considered to account for the last mile delivery distance.

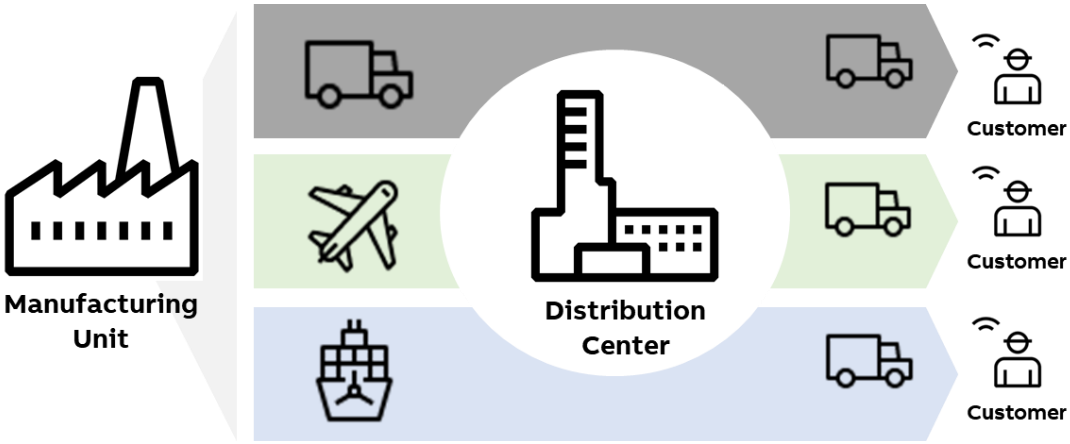


Figure 2: Distribution methodology.

## Installation

The installation phase only implies manual activities, and no energy is consumed. This phase also includes the disposal of the packaging of the Fuse switch Disconnector.

For the disposal of the packaging after installation of the product at the end of its life, a transport distance of 100 km (according to PSR [2]) was assumed.

The actual disposal site is unknown and is managed by the customer. The disposal scenario of the packaging was calculated based on the latest Eurostat data (EU-27) available.

## Use

Use and maintenance are modelled according to the PCR [1].

During the use phase, SLK Fuse Switch Disconnectors dissipate some electricity due to power losses. They are calculated according to the data provided in the catalogue of the fuse switch disconnector and following the PCR [1] & PSR [2] rules:

| Parameters | | |
|---|---|---|
| $I_n$ | [A] | 160 |
| $I_n$ | [%] | 50 |
| h/year | [h] | 8760 |
| RSL | [years] | 20 |
| Time operating coefficient | [%] | 30 |

Table 7: Use phase parameters

The formula for the calculation of the electricity consumed is shown below and it is described as follows, where $P_{use}$ is the power consumed by the switch at a given value of current:

$$E_{use}\,[kWh] = \frac{P_{use} * 8760 * RSL * \alpha}{1000}$$

The above calculations have been performed according to the number of poles (3) on which relevant current flows during use phase.

The Energy model used for this phase was built based on the 2023 actual sales mix data for the entire SLK product range (SAP ERP sales data as a source). This approach has been taken since this list of countries will be the most representative also for the other products listed in the extrapolation tables.

From Ecoinvent [6] database, the low voltage electricity country mix for each country(x) has been selected with its respective percentage on the total sales mix (Electricity, low voltage [country]x | market for | Cut-off, S).

Since no maintenance happens during the use phase, the environmental impacts linked to this procedure have been considered as null in the analysis.

## End of life

The end-of-life stage is modelled according to IEC/TR 62635 [9]. The percentages for end-of-life treatments of materials are taken from IEC/TR 62635 [9].

Since no specific data is available, the transport distances from the place of use to the place of disposal are assumed to be 1000 km (local/domestic transport by lorry, according to PCR [1]).

# Environmental impacts

The following table show the environmental impact indicators of the life cycle of a single SLK160 Fuse Switch Disconnector, as indicated by PCR [1] and EN 50693:2019 [3]. The indicators are divided into the contribution of the processes to the different stages (manufacturing, distribution, installation, use and end-of-life).

| Impact category | Unit | Total | Manufacturing | Distribution | Installation | Use | End of Life |
|---|---|---|---|---|---|---|---|
| GWP-total | kg CO2 eq | 3.84E+01 | 2.25E+01 | 7.29E-01 | 5.03E-02 | 1.44E+01 | 6.79E-01 |
| GWP-fossil | kg CO2 eq | 3.72E+01 | 2.24E+01 | 7.28E-01 | 5.05E-03 | 1.34E+01 | 6.72E-01 |
| GWP-biogenic | kg CO2 eq | 7.97E-01 | -4.01E-02 | 6.18E-04 | 4.53E-02 | 7.84E-01 | 6.80E-03 |
| GWP-luluc | kg CO2 eq | 3.76E-01 | 2.11E-01 | 3.39E-04 | 1.11E-06 | 1.65E-01 | 4.87E-04 |
| ODP | kg CFC11-eq | 7.67E-07 | 4.34E-07 | 1.56E-08 | 5.23E-11 | 3.11E-07 | 6.60E-09 |
| AP | mol H+ eq | 5.71E-01 | 4.60E-01 | 2.95E-03 | 1.24E-05 | 1.06E-01 | 2.91E-03 |
| EP-freshwater | kg P eq | 5.03E-02 | 3.55E-02 | 5.08E-05 | 2.19E-07 | 1.46E-02 | 1.26E-04 |
| EP-marine | kg N eq | 5.66E-02 | 3.97E-02 | 1.12E-03 | 2.43E-05 | 1.40E-02 | 1.79E-03 |
| EP-terrestrial | mol N eq | 5.72E-01 | 4.07E-01 | 1.19E-02 | 4.71E-05 | 1.46E-01 | 7.13E-03 |
| POCP | kg NMVOC eq | 1.87E-01 | 1.39E-01 | 4.48E-03 | 2.11E-05 | 4.18E-02 | 2.44E-03 |
| ADP-m&m | kg Sb eq | 6.07E-03 | 5.08E-03 | 1.93E-06 | 5.43E-09 | 9.88E-04 | 7.30E-07 |
| ADP-fossil | MJ | 7.50E+02 | 3.30E+02 | 1.04E+01 | 2.79E-02 | 4.02E+02 | 6.64E+00 |
| WDP | m3 of equiv. depriv. | 2.67E+01 | 1.71E+01 | 4.98E-02 | 6.79E-04 | 9.55E+00 | 5.73E-02 |
| PENRE | MJ | 7.18E+02 | 2.99E+02 | 1.04E+01 | 2.79E-02 | 4.02E+02 | 6.64E+00 |
| PENRM | MJ | 3.16E+01 | 3.16E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PENRT | MJ | 7.50E+02 | 3.31E+02 | 1.04E+01 | 2.79E-02 | 4.02E+02 | 6.64E+00 |
| PERE | MJ | 1.01E+03 | 4.02E+01 | 1.53E-01 | 6.55E-04 | 9.73E+02 | 4.78E-01 |
| PERM | MJ | 1.57E+00 | 1.57E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PERT | MJ | 1.02E+03 | 4.18E+01 | 1.53E-01 | 6.55E-04 | 9.73E+02 | 4.78E-01 |
| SM | kg | 4.64E-01 | 4.64E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RSF | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NRSF | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PET | MJ | 1.76E+03 | 3.72E+02 | 1.06E+01 | 2.85E-02 | 1.37E+03 | 7.11E+00 |
| FW | m3 | 6.78E+00 | 4.52E-01 | 1.64E-03 | 2.22E-05 | 6.32E+00 | 2.10E-03 |
| HWD | kg | 1.92E-03 | 1.30E-03 | 6.49E-05 | 1.62E-07 | 5.23E-04 | 2.60E-05 |
| N-HWD | kg | 1.29E+01 | 3.84E+00 | 9.16E-01 | 1.35E-02 | 7.25E+00 | 8.85E-01 |
| RWD | kg | 5.29E-03 | 7.22E-04 | 3.19E-06 | 1.23E-08 | 4.56E-03 | 6.84E-06 |
| CfR | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| MfR | kg | 2.52E+00 | 7.73E-01 | 0.00E+00 | 1.11E-01 | 0.00E+00 | 1.64E+00 |
| MfER | kg | 1.07E-01 | 5.93E-02 | 0.00E+00 | 1.36E-02 | 0.00E+00 | 3.43E-02 |
| EN | MJ by energy vector | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PM | disease inc. | 2.53E-06 | 1.68E-06 | 7.33E-08 | 2.02E-10 | 7.28E-07 | 5.22E-08 |
| IRP | kBq U-235 eq | 2.34E+01 | 2.59E+00 | 1.32E-02 | 5.02E-05 | 2.08E+01 | 2.78E-02 |
| ETP-fw | CTUe | 5.07E+02 | 3.89E+02 | 5.47E+00 | 8.15E-02 | 1.10E+02 | 2.72E+00 |
| HTP-c | CTUh | 9.36E-08 | 6.86E-08 | 3.09E-10 | 2.02E-12 | 2.37E-08 | 8.98E-10 |
| HTP-nc | CTUh | 6.56E-06 | 5.38E-06 | 9.73E-09 | 1.11E-10 | 1.11E-06 | 5.52E-08 |
| SQP | Pt | 3.37E+02 | 1.87E+02 | 1.06E+01 | 2.87E-02 | 1.33E+02 | 5.11E+00 |

Table 8: Impact indicators for SLK160 Fuse Switch Disconnectors

| Impact category | Unit | SLK160 |
|---|---|---|
| Biogenic Carbon content of the product | kg | 0.00E+00 |
| Biogenic Carbon content of the associated packaging | kg | 2.91E-02 |

Table 9: Inventory flow other indicators

**Environmental impact indicators**

| | |
|---|---|
| GWP-total | Global Warming Potential total (Climate change) |
| GWP-fossil | Global Warming Potential fossil |
| GWP-biogenic | Global Warming Potential biogenic |
| GWP-luluc | Global Warming Potential land use and land use change |
| ODP | Depletion potential of the stratospheric ozone layer |
| AP | Acidification potential |
| EP-freshwater | Eutrophication potential - freshwater compartment |
| EP-marine | Eutrophication potential - fraction of nutrients reaching marine end compartment |
| EP-terrestrial | Eutrophication potential -Accumulated Exceedance |
| POCP | Formation potential of tropospheric ozone |
| ADP-m&m | Abiotic Depletion for non-fossil resources potential |
| ADP-fossil | Abiotic Depletion for fossil resources potential, WDP |
| WDP | Water deprivation potential. |

**Resource use indicators**

| | |
|---|---|
| PERE | Use of renewable primary energy excluding renewable primary energy resources used as raw material |
| PERM | Use of renewable primary energy resources used as raw material |
| PERT | Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) |
| PENRE | Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw material |
| PENRM | Use of non-renewable primary energy resources used as raw material |
| PENRT | Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) |
| PET | Total use of primary energy in the lifecycle |

**Secondary materials, water and energy resources**

| | |
|---|---|
| SM | Use of secondary materials |
| RSF | Use of renewable secondary fuels |
| NRSF | Use of non-renewable secondary fuels |
| FW | FW: Net use of fresh water |

**Waste category indicators**

| | |
|---|---|
| HWD | Hazardous waste disposed |
| N-HWD | Non-hazardous waste disposed |
| RWD | Radioactive waste disposed |

**Output flow indicators**

| | |
|---|---|
| MfR | Materials for recycling |
| MfER | Materials for energy recovery |
| CfR | Component for reuse |
| EN | Exported energy |

**Others indicators**

| | |
|---|---|
| PM | Emissions of Fine particles |
| IRP | Ionizing radiation, human health |
| ETP-fw | Ecotoxicity, freshwater |
| HTP-c | Human toxicity, carcinogenic effects |
| HTP-nc | Human toxicity, non-carcinogenic effects |
| SQP | Impact related to Land use / soil quality |

# Additional environmental information

According to the waste treatment scenario calculation in Simapro [7], based on the recycling rate in the technical report IEC/TR 62635 Edition 1.0 [9] Table D.6, the following recyclability potentials were calculated. The recyclability potential is calculated based on the product weight (excluding packaging).

| Recyclability potential | SLK160 |
|---|---|
| | 73.0% |

Table 10: Recyclability potential of SLK160

# References


[1] PCR "PEP-PCR-ed4-EN-2021_09_06" - Product Category Rules for Electrical, Electronic and HVAC-R Products (published: 6th September 2021)

[2] PSR "PSR-0005-ed3.1-EN-2023 12 08" - SPECIFIC RULES FOR Electrical switchgear and control gear Solutions

[3] EN 50693:2019 - Product category rules for life cycle assessments of electronic and electrical products and systems

[4] ISO 14040:2006 - Environmental management -Life cycle assessment - Principles and framework

[5] ISO 14044:2006 - Environmental management - Life cycle assessment - Requirements and guidelines

[6] ecoinvent v3.9 (2023). ecoinvent database version 3.9 - (https://ecoinvent.org/)

[7] SimaPro Software version 9.5.0.1 - PRé Sustainability

[8] UNI EN 15804:2012+A2:2019: Sustainability of constructions - Environmental product declarations (September 2019).

[9] IEC/TR 62635 - Guidelines for end-of-life information provided by manufacturers and recyclers and for recyclability rate calculation of electrical and electronic equipment - Edition 1.0 2012-10