STANDARD RANGE (SA/S8.X.2.2)

PEP ecopassport®
Product Environmental Profile

Document in compliance with ISO 14025: 2006 "Environmental labels and declarations. Type III environmental declarations"

ORGANIZATION			CONTACT INFORMATION		
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ABB Purpose & Embedding Sustainability

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

Reference product	SA/S8.16.2.2 Schaltaktor, 8fach, 16 A (2CDG110263R0011)
Description of the product	The switch actuator uses potential free contacts to switch 8 independent electrical loads via the ABB i-bus®. The rated current is 6A, 10A or 16A. Manual operation and display of the switching state of the contacts.
Functional unit	For switching 8 independent electrical loads with rated current 6A, 10A or 16A and rated voltage 230V, using mutually independent switching relays and potential free contacts, to switch electric consumers individually. The device has a degree of protection IP20. The reference for service life of the product is 10 years.
Other products covered	SA/S8.10.2.2 Schaltaktor, 8fach, 10 A (2CDG110259R0011), SA/S8.6.2.2 Schaltaktor, 8fach, 6 A (2CDG110255R0011), SA-M-8.16.2.2 Schaltaktor, 8fach, 16 A (2CDG510026R0011), SA-M-8.16.2.12 Schaltaktor, 8fach, 16 A (2CDG510026R0021)

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Constituent Materials
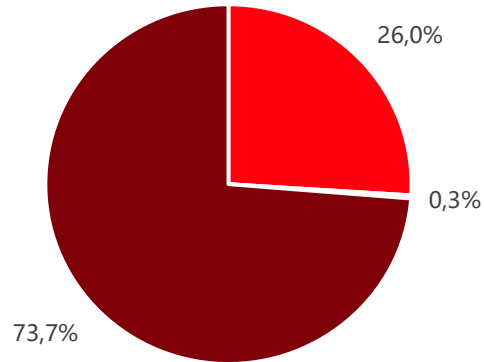
■ Plastics 127,53 g ■ Metals 1,47 g ■ Others 361,50 g

Total weight of Reference product	490,5	g

Plastics as % of weight		Metals as % of weight		Others as % of weight	
Name and CAS number	Weight%	Name and CAS number	Weight%	Name and CAS number	Weight%
Polycarbonate	26,0	Stainless steel	0,3	Cardboard - packaging	12,8
–	x	–	x	Active electronic component	0,3
–	x	–	x	PCBA	57,3
–	x	–	x	Paper	3,3

The product is in conformity with the provisions of RoHS directive 2011/65/EU, covering 2015/863(EU), REACH regulation No 1907/2006 and national legislation. The product contains the SVHC lead (CAS 7439-92-1).

✎ Additional Environmental Information

Manufacturing	The PCBA is manufactured at the Hornberg production site, while final assembly of all components into the Switch/shutter actuator happens at Lüdenscheid. No recycled material content is assumed. All components are transported by lorry from the supplier to these manufacturing sites. The electricity mix on the both manufacturing sites are largely renewable from Scandinavian hydropower and rooftop solar power (80% on Ludenscheid and 100% on Hornberg). Instead of hydropower, a German electricity market mix was modelled to avoid double counting of renewable energy. The remaining power and heating demand is met by combustion of natural gas, for which all CO_2 emissions are compensated through ClimatePartner. Nevertheless, this compensation is not accounted for in the model of this EPD. Production waste is assumed to be transported by lorry (100 km by default in the PCR) and treated by recycling. Specific one-year data from 2022 on manufacturing site level was collected and allocated to the product by economic partitioning following the requirements of ISO 14044.
Distribution	The transport scenario is estimated based on the distance to the capital city of the countries it is sold to, according to the sales data for 2022.
Installation	Installation is done manually, without using energy or other auxiliary materials. For treatment of packaging waste, the scenario set by the PSR is followed.
Use	The reference product is on stand-by during 95% of the time with and energy consumption of 0,15W, and is in active mode with a maximum energy consumption of 0,25 W for the remaining 5% of the time. With a reference lifetime of 10 years and 8760 hours per year, this results in a power consumption of 13,58 kWh over the lifetime.
End of life	The standard scenario set in the PCR is considered.
Benefits and loads beyond the system boundaries	Steel has a recovery rate of 80% according to the PCR. The Module D formula from the PCR was used to calculate the benefits of steel. Other materials were not included here, due to a material recovery rate of 0 or lack of recycling in real life scenarios.

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🌡 Environmental Impacts
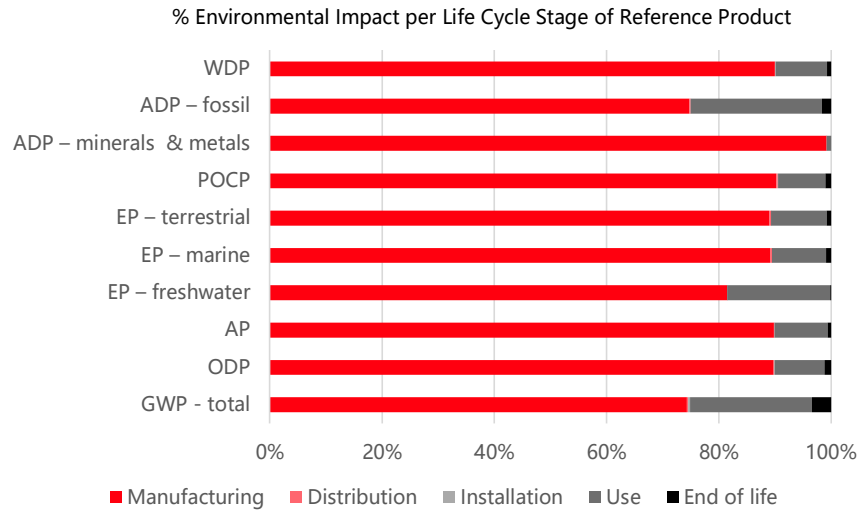
Reference lifetime	10 years
Product category	Other equipment
Installation elements	Not applicable
Use scenario	Active product
Geographical representativeness	DACH+ (Germany, Austria, Switzerland), Europe, MEA (Middle East and Africa) and Asia
Technological representativeness	Materials and process data are specific for the production of the Switch actuator
Software and database used	SimaPro version 9.5.0.1, Ecoinvent 3.9.1, PEF 3.1

Energy model used

Manufacturing	Electricity, high voltage {DE}| market for	Cut-off, U Electricity, low voltage {DE}| electricity production, photovoltaic, 3kWp slanted-roof installation, single-Si, panel, mounted	Cut-off, U Natural gas, high pressure {DE}| market for	Cut-off, S
Installation	A market for electricity from all European countries is included in the dataset used to model the recycling of cardboard ("Electricity, medium voltage {DE}| market group for electricity, medium voltage | Cut-off, S")
Use	Electricity, low voltage {DE}| market for electricity, low voltage	Cut-off, S Electricity, low voltage {Europe without Switzerland}| market group for electricity, low voltage	Cut-off, S Electricity, low voltage {RME}| market group for electricity, low voltage	Cut-off, S Electricity, low voltage {RAS}| market group for electricity, low voltage	Cut-off, S
End of life	Not applicable

Common base of mandatory indicators

% Environmental Impact per Life Cycle Stage of Reference Product

Legend: ■ Manufacturing ■ Distribution ■ Installation ■ Use ■ End of life

Environmental impact indicators

Indicator	Unit	Total	Manu-facturing	Distri-bution	Installation	Use	End of life	Bene-fits
GWP-total	kg CO₂ eq	3,22E+01	2,39E+01	7,30E-02	1,02E-01	7,00E+00	1,08E+00	-4,44E-02
GWP-fossil	kg CO₂ eq	3,12E+01	2,36E+01	7,30E-02	3,99E-03	6,49E+00	1,01E+00	-5,66E-02
GWP-biogenic	kg CO₂ eq	8,97E-01	2,40E-01	1,85E-05	9,84E-02	4,98E-01	6,12E-02	1,36E-02
GWP-luluc	kg CO₂ eq.	5,50E-02	4,53E-02	1,89E-05	2,19E-06	9,52E-03	1,02E-04	-8,84E-04

GWP-fossil = Global Warming Potential fossil fuels
GWP-biogenic = Global Warming Potential biogenic
GWP-luluc = Global Warming Potential land use and land use change

ODP	kg CFC-11 eq.	9,03E-07	8,11E-07	1,12E-09	1,29E-10	8,06E-08	1,05E-08	-1,66E-09

ODP = Depletion potential of the stratospheric ozone layer

AP	H+ eq.	2,31E-01	2,08E-01	3,44E-04	2,40E-05	2,18E-02	1,38E-03	-2,87E-04

AP = Acidification potential, Accumulated Exceedance

EP-freshwater	kg P eq.	4,28E-03	3,49E-03	3,42E-07	7,73E-08	7,86E-04	5,36E-06	-3,89E-06
EP-marine	kg N eq.	3,54E-02	3,15E-02	1,23E-04	9,74E-06	3,39E-03	3,13E-04	-1,50E-04
EP-terrestrial	mol N eq.	4,14E-01	3,68E-01	1,32E-03	1,01E-04	4,10E-02	3,15E-03	-8,75E-04

EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment
EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment
EP-terrestrial = Eutrophication potential, Accumulated Exceedance

POCP	kg NMVOC eq.	1,50E-01	1,36E-01	4,38E-04	2,81E-05	1,27E-02	1,44E-03	-2,53E-04

POCP = Formation potential of tropospheric ozone

ADP-minerals & metals	kg Sb eq.	8,54E-03	8,48E-03	8,71E-08	9,87E-09	6,41E-05	7,15E-07	-3,51E-07
ADP-fossil	MJ	4,18E+02	3,13E+02	9,83E-01	4,07E-02	9,78E+01	6,65E+00	-7,50E-01

ADP-minerals & metals = Abiotic depletion potential for non-fossil resources
ADP-fossil = Abiotic depletion for fossil resources potential

WDP	m³ eq. depr.	6,35E+00	5,72E+00	3,14E-03	2,61E-03	5,83E-01	4,58E-02	-2,81E-02

WDP = Water Deprivation potential

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Common base of mandatory indicators

Inventory flows indicator – Resource use indicators

Indicator	Unit	Total	Manu-facturing	Distri-bution	Installation	Use	End of life	Bene-fits
PERE	MJ	6,01E+01	3,65E+01	7,04E-03	5,06E-03	2,35E+01	5,96E-02	-5,37E-02
PERM	MJ	8,93E-01	8,93E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-4,22E-01
PERT	MJ	6,10E+01	3,74E+01	7,04E-03	5,06E-03	2,35E+01	5,96E-02	-4,76E-01
PENRE	MJ	4,18E+02	3,13E+02	9,83E-01	4,07E-02	9,78E+01	6,65E+00	-7,49E-01
PENRM	MJ	6,70E-05	6,70E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	4,18E+02	3,13E+02	9,83E-01	4,07E-02	9,78E+01	6,65E+00	-7,49E-01

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials
PERM = Use of renewable primary energy resources used as raw materials
PERT = Total Use of renewable primary energy resources
PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials
PENRM = Use of non-renewable primary energy resources used as raw materials
PENRT = Total Use of non-renewable primary energy resources

Inventory flows indicator – Indicators describing the use of secondary materials, water, and energy resources

Indicator	Unit	Total	Manu-facturing	Distri-bution	Installation	Use	End of life	Bene-fits
SM	kg	0,00E+00	0,00E+00	0,00E+00	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	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m³	2,47E-01	1,98E-01	9,99E-05	8,30E-05	4,68E-02	1,34E-03	-8,58E-04

SM = Use of secondary material
RSF = Use of renewable secondary fuels
NRSF = Use of non-renewable secondary fuels
FW = Use of net fresh water

Inventory flows indicator – Waste category indicators

Indicator	Unit	Total	Manu-facturing	Distri-bution	Installation	Use	End of life	Bene-fits
Hazardous waste disposed	kg	2,87E-01	4,69E-03	0,00E+00	0,00E+00	0,00E+00	2,82E-01	0,00E+00
Non-hazardous waste disposed	kg	2,65E-01	1,09E-01	0,00E+00	1,13E-02	0,00E+00	1,45E-01	0,00E+00
Radioactive waste disposed	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Common base of mandatory indicators

Inventory flows indicator – Output flow indicators

Indicator	Unit	Total	Manu-facturing	Distri-bution	Installation	Use	End of life	Bene-fits
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
Materials for recycling	kg	7,33E-01	6,80E-01	0,00E+00	5,15E-02	0,00E+00	1,34E-03	0,00E+00
Materials for energy recovery	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Inventory flow indicator – other indicators

Indicator	Unit	Total	Manu-facturing	Distri-bution	Installation	Use	End of life	Bene-fits
Biogenic carbon content of the product	kg of C	6,15E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Biogenic carbon content of the associated packaging	kg of C	2,85E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Optional indicators

Environmental indicators

Indicator	Unit	Total	Manu-facturing	Distri-bution	Installation	Use	End of life	Bene-fits
Total use of primary energy during the life cycle	MJ	4,79E+02	3,50E+02	9,90E-01	4,57E-02	1,21E+02	6,71E+00	-1,22E+00
Emissions of fine particles	incidence of diseases	1,47E-06	1,34E-06	3,33E-09	2,58E-10	1,13E-07	1,57E-08	-3,86E-09
Ionizing radiation, human health	kBq U235 eq.	1,36E+00	9,89E-01	2,37E-04	6,00E-05	3,73E-01	1,73E-03	-1,93E-03
Ecotoxicity (fresh water)	CTUe	6,01E+02	5,54E+02	5,36E-01	1,24E-01	1,35E+01	3,31E+01	-5,32E-01
Human toxicity, car-cinogenic effects	CTUh	4,56E-08	4,20E-08	1,76E-11	6,25E-12	2,30E-09	1,27E-09	-7,52E-11
Human toxicity, non-carcinogenic effects	incidence of diseases	1,23E-06	1,11E-06	9,09E-10	2,62E-10	1,04E-07	1,00E-08	-7,94E-10
Impact related to land use/soil quality		1,78E+02	1,55E+02	4,59E-01	3,10E-02	2,08E+01	9,34E-01	-2,20E+00

Other indicators

Indicator	Unit	Total	Manu-facturing	Distri-bution	Installation	Use	End of life	Bene-fits
No Other indicators used								

Environmental Impact Indicator Glossary

Impact indicators

Indicator	Description	Distri-bution
Global warming potential (GWP) - total	Indicator of potential global warming caused by emissions to air contributing to the greenhouse effect. The total global warming potential (GWP-total) is the sum of three sub-categories of climate change. GWP-total = GWP-fossil + GWP-biogenic + GWP- land use and land use change	kg CO_2 eq.
Ozone depletion (ODP)	Emissions to air that contribute to the destruction of the stratospheric ozone layer	kg CFC-11 eq.
Acidification of soil and water (A)	Acidification of soils and water caused by the release of certain gases to the atmosphere, such as nitrogen oxides and sulphur oxides	H+ eq.
Eutrophication (E)	Indicator of the contribution to eutrophication of water by the enrichment of the aquatic ecosystem with nutritional elements, e.g. industrial or domestic effluents, agriculture, etc. This indicator is divided to three: freshwater, marine and terrestrial.	kg P eq., kg N eq., mole N eq.
Photochemical ozone creation (POCP)	Indicator of emissions of gases that affect the creation of photochemical ozone in the lower atmosphere (smog) because of the rays of the sun.	kg NMVOC eq.
Depletion of abiotic resources – elements (ADPe)	Indicator of the depletion of natural non-fossil resources	kg Sb eq.
Depletion of abiotic resources – fossil fuels (ADPf)	The use of non-renewable fossil resources in an unsustainable way (e.g. from material to waste)	MJ (lower heating value)
Water Deprivation potential (WDP)	Deprivation-weighted water consumption. Assesses the potential of water deprivation, to either humans or ecosystems, building on the assumption that the less water remaining available per area, the more likely another user will be deprived.	m³ eq. depr.

Resource use indicators

Indicator	Description	Distri-bution
Total use of primary energy	Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) + Total use of renewable primary energy re-sources (primary energy and primary energy resources used as raw materials)	MJ (lower heating value)

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		Supplemented by:	*PSR-0005-ed3-EN-2023 06 06*
Verifier accreditation number:	*VH32*	Information and reference documents:	**www.pep-ecopassport.org**
Date of issue:	*07/03/2024*	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)

PEP are compliant with XP C08-100-1:2016 and EN 50693:2019 or NF E38-500 :2022
The elements of the present PEP cannot be compared with elements from any other program.

Document in compliance with ISO 14025: 2006 "Environmental labels and declarations. Type III environmental declarations"

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