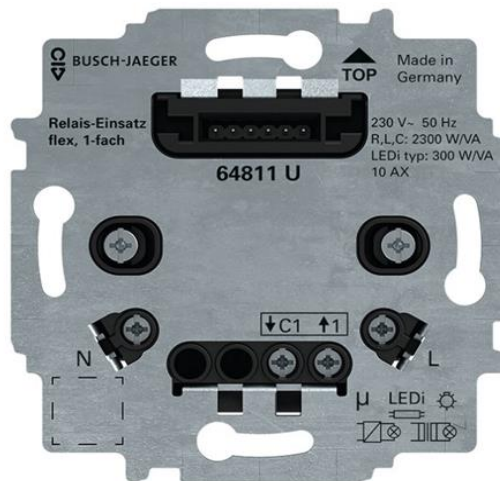


RELAY INSERT FLEX

Product Environmental Profile

Environmental Product Declaration



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

ORGANIZATION		CONTACT INFORMATION				
Busch-Jaeger Elektro GmbH		lide.brito@es.abb.com				
ADDRESS		WEBSITE				
Freisenbergstraße 2, 58513 Lüdenscheid, Germany		https://www.busch-jaeger.de/en/online-catalogue				
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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.

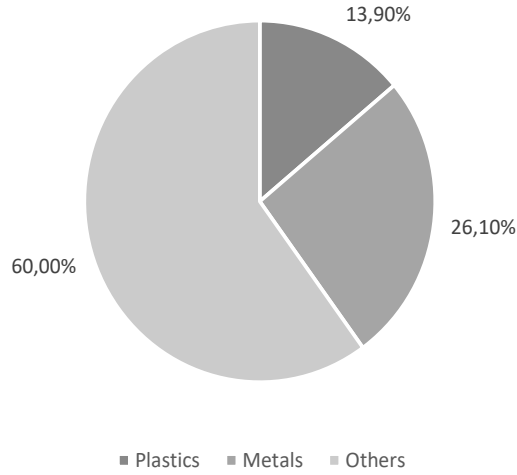


General Information

Reference product	Blind insert flex, 1gang (2CKA006400A0095)
Description of the product	The Relay insert flex is an electronic switch insert for light switching systems, making use of a 3-wire connection, for which a neutral conductor is required. It can be combined with a corresponding centre plate (under a separate order number), and also with motion sensors (PIR) or other functional covers; but those components are not included within the scope of this EPD. The product is designed for indoor applications, such as private homes, hotels, retail and commercial buildings. The Relay insert flex is installed into a flush-mounted wall box, by a professional installer. As the Relay insert flex only has an expected and guaranteed lifetime of 10 years, two Relay insert flex products are manufactured, distributed and treated at the end of life, during the reference life time of 20 years.
Functional unit	Establish, support and interrupt for 20 years rated currents in normal conditions of circuit characterized by the current 10A, including any conditions specified for overload in operation characterized by the current 10A, for the operating voltage 230V and a current for short-circuit 10A.
Other products covered	Blind insert flex, 1gang (2CKA006400A0096) Relay insert flex, 1gang (2CKA006800A3041, 2CKA006800A3042) e-contact insert flex, 1gang (2CKA006800A3047, 2CKA006800A3048) Extension unit insert flex (2CKA006800A3050, 2CKA006800A3051) LED dimmer insert flex, 1gang FM, LED, 3-240 VA (2CKA006500A0012, 2CKA006500A0013) Relay insert flex, 2gang (2CKA006800A3044, 2CKA006800A3045)

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Constituent materials



Total weight of Reference product

140,11 g including the product and its packaging

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-%
30% glass-filled polyamide 6	13,30	Low-alloyed steel (galvanized)	4,00	PCBA	32,10
Polybutylene terephthalate	0,60	Low-alloyed steel	20,40	Cardboard	14,30
–	–	Unalloyed steel	1,70	Printed paper	13,60

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.



Additional Environmental Information

Manufacturing	<p>Plastic components are injection moulded at the Bad Berleburg/Aue manufacturing site, metal components are stamped at the Lüdenscheid manufacturing site, and final assembly of all components into the Relay insert flex happens at Lüdenscheid. No recycled material content is assumed. All components are transported by lorry from the supplier to these manufacturing sites.</p> <p>The electricity mix on both manufacturing sites is largely renewable from Scandinavian hydropower and rooftop solar power on the Lüdenscheid site (together 82% in Bad Berleburg/Aue and 77% in Lüdenscheid). The remaining power and heating demand is met by combustion of natural gas, for which all CO₂ emissions are compensated through ClimatePartner.</p> <p>Production waste is assumed to be transported by lorry (1000 km by default in the PCR) and treated by incineration. Specific one-year data from 2021 on manufacturing site level was collected and allocated to the product by economic partitioning following the requirements of ISO 14044.</p>
Distribution	<p>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 2021.</p>
Installation	<p>Installation is done manually, without using energy or other auxiliary materials. Treatment of packaging waste is included in this stage, assuming an incineration scenario.</p>
Use	<p>The power dissipation is 0,03 W and the product has a reference lifetime of 20 years. The use scenario described in the PSR is followed. At a load rate of 50% of the current and a use time rate of 30%, the power consumption over the lifetime of the product is 7,89 kWh. A regional electricity mix is used to model the fraction of the product to each country it is sold to according to sales data.</p>
End of life	<p>Considering the complexity and the lack of knowledge of the electric and electronic recycling processes, the standard scenario set in the PCR is considered.</p>
Benefits and loads beyond the system boundaries	<p>Not applicable</p>

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Environmental impacts

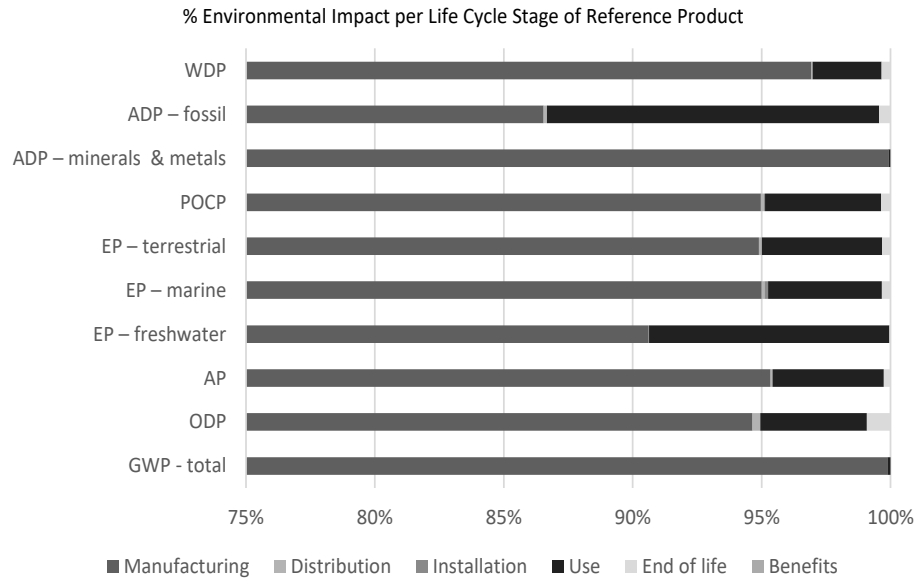
Reference lifetime	20 years
Product category	Switches
Installation elements	Not applicable
Use scenario	Load rate is 50% of In, use time rate is 30% or RLT
Geographical representativeness	Production site data is for Germany, power consumption during the use stage is related to the country it is sold to (European), all other data has a European scope.
Technological representativeness	Materials and process data are specific for the production of Relay insert flex.
Software and database used	SimaPro 9.4.0.2., ecoinvent 3.8

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	Not applicable
Use	Electricity, medium voltage {DE} market for Cut-off, U Electricity, medium voltage {AT} market for Cut-off, U Electricity, medium voltage {NL} market for Cut-off, U
End of life	Not applicable

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Common base of mandatory indicators



Environmental impact indicators

Indicator	Unit	Total	Manu- facturing	Distri- bution	Instal- lation	Use	End of life	Benefi- ts
GWP-total	kg CO ₂ eq.	3,67E+01	3,17E+01	3,80E-02	1,49E-01	4,60E+00	2,45E-01	-
GWP-fossil	kg CO ₂ eq.	3,55E+01	3,10E+01	3,79E-02	2,93E-03	4,26E+00	2,39E-01	-
GWP-biogenic	kg CO ₂ eq.	1,12E+00	6,36E-01	3,44E-05	1,46E-01	3,35E-01	5,71E-03	-
GWP-luluc	kg CO ₂ eq.	5,69E-02	5,14E-02	1,78E-05	1,59E-06	5,36E-03	7,65E-05	-
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.	2,91E-06	2,75E-06	8,52E-09	3,82E-10	1,20E-07	2,67E-08	-
ODP = Depletion potential of the stratospheric ozone layer								
AP	H+ eq.	2,23E-01	2,13E-01	1,51E-04	2,83E-05	9,63E-03	5,91E-04	-
AP = Acidification potential, Accumulated Exceedance								
EP-freshwater	kg P eq.	6,89E-03	6,24E-03	3,08E-07	5,57E-08	6,42E-04	2,96E-06	-
EP-marine	kg N eq.	4,06E-02	3,86E-02	4,33E-05	5,81E-05	1,79E-03	1,39E-04	-
EP-terrestrial	mol N eq.	4,72E-01	4,48E-01	4,79E-04	1,10E-04	2,20E-02	1,54E-03	-
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.	1,22E-01	1,16E-01	1,47E-04	5,00E-05	5,49E-03	4,55E-04	-
POCP = Formation potential of tropo-spheric ozone								
ADP-minerals & metals	kg Sb eq.	1,22E-02	1,22E-02	1,73E-07	8,09E-09	8,71E-06	5,64E-07	-
ADP-fossil	MJ	4,58E+02	3,96E+02	5,66E-01	3,13E-02	5,89E+01	2,06E+00	-
ADP-minerals & metals = Abiotic depletion potential for non-fossil resources ADP-fossil = Abiotic depletion for fossil resources potential								
WDP	m ³ e depr.	7,38E+00	7,15E+00	1,87E-03	1,25E-03	1,97E-01	2,58E-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	Instal- lation	Use	End of life	Benefi- ts
PERE	MJ	5,26E+01	4,24E+01	9,58E-03	1,00E-03	1,01E+01	8,18E-02	-
PERM	MJ	1,25E+00	1,25E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-
PERT	MJ	5,39E+01	4,37E+01	9,58E-03	1,00E-03	1,01E+01	8,18E-02	-
PENRE	MJ	4,55E+02	3,93E+02	5,66E-01	3,13E-02	5,89E+01	2,06E+00	-
PENRM	MJ	3,28E+00	3,28E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-
PENRT	MJ	4,58E+02	3,96E+02	5,66E-01	3,13E-02	5,89E+01	2,06E+00	-

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 re-sources)

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

Indicator	Unit	Total	Manu- facturing	Distri- bution	Instal- lation	Use	End of life	Benefi- ts
SM	kg	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	-
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-
FW	m ³	3,18E-01	2,88E-01	7,15E-05	4,25E-05	2,92E-02	8,54E-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	Instal- lation	Use	End of life	Benefi- ts
Hazardous waste disposed	kg	8,49E-03	8,49E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-
Non- hazardous waste disposed	kg	8,54E-01	5,74E-01	0,00E+00	7,82E-02	0,00E+00	2,02E-01	-
Radioactive waste disposed	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-

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Common base of mandatory indicators

Inventory flows indicator – Output flow indicators

Indicator	Unit	Total	Manu- facturing	Distri- bution	Instal- lation	Use	End of life	Benefi- ts
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-
Materials for recycling	kg	1,04E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,04E-01	-
Materials for energy recovery	kg	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	-

Inventory flow indicator – other indicators

Indicator	Unit	Total	Manu- facturing	Distri- bution	Instal- lation	Use	End of life	Benefi- ts
Biogenic carbon content of the product	kg of C	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	0,00E+00	1,76E-02	0,00E+00	-1,76E-02	0,00E+00	0,00E+00	-

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Optional indicators

Environmental indicators

Indicator	Unit	Total	Manu- facturing	Distri- bution	Instal- lation	Use	End of life	Benefi- ts
Total use of primary energy during the life cycle	MJ	5,12E+02	4,40E+02	5,75E-01	3,23E-02	6,90E+01	2,14E+00	-
Emissions of fine particles	inci- dence of dis- eases	1,52E-06	1,47E-06	2,81E-09	8,79E-10	3,21E-08	1,08E-08	-
Ionizing radiation, human health	kBq U235 eq.	1,74E+00	1,54E+00	2,46E-03	1,07E-04	1,90E-01	9,94E-03	-
Ecotoxicity (fresh water)	CTUe	2,91E+03	2,86E+03	4,62E-01	2,08E+00	3,56E+01	1,35E+01	-
Human toxicity, carcinogenic effects	CTUh	2,90E-08	2,63E-08	1,69E-11	2,24E-11	8,53E-10	1,81E-09	-
Human toxicity, non-carcinogenic effects	CTUh	1,25E-06	1,22E-06	4,67E-10	3,81E-10	3,11E-08	2,89E-09	-
Impact related to land use/soil quality	Pt	1,55E+02	1,45E+02	3,34E-01	3,15E-02	8,46E+00	7,56E-01	-


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For other products than the Reference product covered by this PEP, the environmental impacts for each phase of the lifecycle are obtained by multiplying the values of the Reference product by the following coefficients:

* if the coefficient is "1", the impacts of the phase of the life cycle are assimilated to the Reference product, meaning that the impacts are unchanged in comparison to the Reference product

Product name	Manufacturing	Distribution	Installation	Use	End of life	Benefits
Relay insert flex, 1gang	0,639	0,755	0,77	1	0,75	-
e-contact insert flex, 1gang	0,44	0,818	0,998	1	0,748	-
Extension unit insert flex	0,303	0,778	1	1	0,693	-
LED dimmer insert flex, 1gang, FM, LED, 3-240 VA	0,522	0,821	1	1	0,752	-
Relay insert flex, 2gang	0,977	0,992	0,972	1	1	-
Blind insert flex, 1gang	1	1	1	1	1	-

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Registration number:	Drafting Rules:	PCR-ed4-EN-2021 09 06
PEP ecopassport@: ABBG-00127-V01.01-EN	Supplemented by:	PSR-0005-ed2-EN-2016 03 29
Verifier accreditation number: VH32	Information and reference documents: www.pep-ecopassport.org	
Date of issue: 01/2023	Validity period:	5 years
Independent verification of the declaration and data, in compliance with ISO 14025:2006		
Internal <input type="radio"/>	External <input checked="" type="radio"/>	
<p>The PCR review was conducted by a panel of experts chaired by Julie Orgelet (DDemain)</p> <p>PEPs are compliant with XP C08-100-1:2016 or EN 50693:2019 The components of the present PEP may not be compared with components from any other program.</p> <p>Document in compliance with ISO 14025:2006 "Environmental labels and declarations. Type III environmental declarations"</p>		

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Environmental Impact Indicator Glossary

Impact indicators

Indicator	Description	Unit
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.	m ³ e depr.

Resource use indicators

Indicator	Description	Unit
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 resources (primary energy and primary energy resources used as raw materials)	MJ (lower heating value)

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