

ABB S802PV-M-H & S800PV-SD Switch Disconnectors - Global Market

PEP ecopassport[®] Product Environmental Profile



Registration number:	ABBG-00662-\	/01.01-EN	Drafting rules:	PCF	PCR-ed4-EN-2021 09 06		
Contact information:	EPD_ELSB@ab	b.com	Supplemented by:		PSR-0005-ed3-EN-2023 06 06		
Verifier accreditation	number:	VH45	Information and ref	erence	documents:	wv	vw.pep-ecopassport.org
Date of issue:	September-24		Validity period:	5 y	ears		
Independent verifica	Independent verification of the declaration and data in compliance with ISO 14025: 2006						
Internal:	Ext	ernal: X					
The PCR review was	conducted by a panel	og experts chaired by Julie Orgelet (Dder	nain)				
PEPs are compliant with XP C08-100-1:2016 and EN 50693:2019 or NF E38-500 :2022 The components of the present PEP may not be compared with components from any other program.						PEP eco PASS	
Document complies	Type III environmental de	eclarati	ons"				
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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.

The contect of this PEP cannot be compared with the content based on another program/database.

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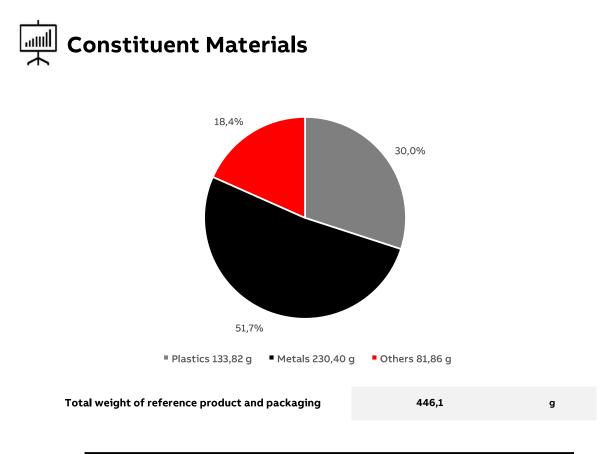


General information

Reference product	S802PV-M32-H - 2CCP247204R0001
Description of the product	The S802PV-M32-H is a 2-pole polarized switch disconnector for photovoltaics systems. It can be used for currents up to 32A and has a rated operational voltage of 1000V DC by only 54mm width. The rated short-term withstand current Icw is 1.5Ka.
Functional unit	Turn off all or part of a low voltage photovoltaic installation by separating it of all electrical energy, for safety reasons with a rated voltage (U) of 1000 DC, and a rat-ed current of 32A ensuring isolation characterised by a rated insulation voltage (Ui) of 1500 DC and with 2 poles, during the reference service life of 20 years.
Other products covered	S800 Switch Disconnectors homogeneous family: S802PV-M-H & S800PV-SD Series. 2, 3 & 4 poles. Ranges from 32 A to 125 A.
Manufacturing address	ABB Schweiz AG – ELSB (Fulachstrasse 150, 8200 Schaffhausen, Switzerland)

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Plastics as %	Plastics as % of weight		of weight	Others as % of weight		
Name and CAS number	Weight%	Name and CAS number	Weight%	Name and CAS number	Weight%	
РА	29,1	Stainless steel	6,0	Glass fiber	12,1	
РС	0,5	Steel	22,3	Adhesive polyester	< 0,1	
Polyester	0,3	Brass	2,2	CARDBOARD	5,1	
PTFE	< 0,1	Copper	20,9	PAPER	1,1	
PPE	0,1	Silver alloys	0,3			

RoHS and REACH compatability and other information about the products materials (i.e. halogen free, recyclability)

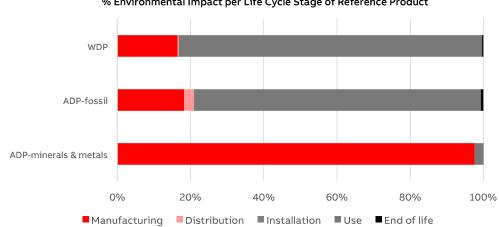
എ ചെ Additional Information

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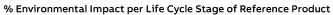
Manufacturing	Includes the environmental impacts associated with extraction and processing of the raw materials used to produce the product and its packaging, transport to the manufacturing site and assembly.
Distribution	Includes the transportation of the packaged product from the manufacturer's last logistic platform to the distributor.
Installation	Includes the manual installation of the products and the end-of- life of packaging.
Use	The energy mix of the main sales countries has been considered.
End of life	Includes the transportation of the product to the final end-of-life treatment site and treatment processes. A value of 100 km transport by lorry is used for the transportation.
Benefits and loads beyond the system boundaries	Prevented impacts of recycling materials.

Environmental Impacts

Reference lifetime	20 years
Product category	Disconnectors
Installation elements	End-of-life of the packaging components
Use scenario	Power losses calculated PSR criteria (50% In)
Geographical representativeness	Global
Technological representativeness	Materials and processes data are specific for the production of one High Performance Circuit Breaker
Software and database used	Simapro 9.3 and Ecoinvent 3.9
Energy model used	
Manufacturing	Energy mix obtained from IEA data
Installation	Non-applicable
Use	Global



Common base of mandatory indicators



Environmental impact indicators

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Indicat	or	Unit	Total	Manufacturin g	Distribut ion	Installation	Use	End of life	Benefits
	Total	kg CO2 eq.	2,22E+01	4,12E+00	6,57E-01	5,94E-04	1,71E+01	3,68E-01	-2,10E+00
GWP	Fossil	kg CO2 eq.	2,21E+01	4,10E+00	6,57E-01	5,93E-04	1,70E+01	3,68E-01	-2,09E+00
GWP	Biogenic	kg CO2 eq.	7,66E-02	1,47E-02	6,98E-05	7,25E-07	6,17E-02	1,27E-04	-7,08E-03
	Luluc	kg CO2 eq.	1,04E-02	3,17E-03	6,28E-05	3,09E-07	6,94E-03	1,99E-04	-3,31E-03
ODP		kg CFC-11 eq.	1,08E-06	7,64E-07	1,05E-08	2,64E-11	3,04E-07	2,56E-09	-1,03E-07
AP		H+ eq.	1,75E-01	7,62E-02	2,84E-03	2,83E-06	9,48E-02	8,64E-04	-9,26E-02
	Freshwater	kg P eq.	1,14E-03	5,25E-04	1,29E-06	6,03E-09	6,07E-04	2,92E-06	-4,18E-04
EP	Marine	kg N eq.	2,23E-02	8,01E-03	1,14E-03	1,07E-06	1,29E-02	2,12E-04	-4,92E-03
	Terrestrial	mol N eq.	2,59E-01	9,81E-02	1,23E-02	1,16E-05	1,47E-01	2,28E-03	-6,87E-02
POPCD)	kg NMVOC eq.	8,49E-02	2,69E-02	3,88E-03	4,03E-06	5,32E-02	8,65E-04	-2,10E-02
ADP	Minerals & metals	kg SB eq.	5,63E-03	5,50E-03	2,13E-07	1,96E-09	1,32E-04	9,84E-07	-1,14E-03
	Fossil	МЈ	3,27E+02	5,97E+01	8,74E+00	8,32E-03	2,56E+02	2,34E+00	-3,49E+01
WDP		m³ eq. depr.	4,92E+00	8,09E-01	1,56E-02	6,02E-05	4,07E+00	1,83E-02	-1,80E+00

Resource use indicators

Indicator	Unit	Total	Manufacturin g	Distribution	Installation	Use	End of life	Benefits
PERE	MJ	4,79E+01	1,12E+01	3,30E-02	1,72E-04	3,65E+01	1,27E-01	-4,87E+00
PERM	MJ	4,46E-01	4,46E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	4,83E+01	1,17E+01	3,30E-02	1,72E-04	3,65E+01	1,27E-01	-4,87E+00
PENRE	MJ	3,23E+02	5,59E+01	8,74E+00	8,32E-03	2,56E+02	2,34E+00	-3,49E+01
PENRM	MJ	3,87E+00	3,87E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	3,27E+02	5,97E+01	8,74E+00	8,32E-03	2,56E+02	2,34E+00	-3,49E+01

Common base of mandatory indicators

Use of secondary materials, water, and energy resources

Indicator	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life	Benefits
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	MЭ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m³	1,98E-01	7,03E-02	5,56E-04	3,26E-06	1,27E-01	6,96E-04	-4,58E-02

Waste category indicators

Indicator	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life	Benefits
HWD	kg	2,50E+00	9,27E-01	2,38E-02	2,90E-03	1,11E+00	4,39E-01	-5,63E-01
N-HWD	kg	7,13E-04	1,41E-04	7,00E-07	3,47E-09	5,69E-04	1,66E-06	-5,33E-05
RWD	kg	4,83E+01	1,17E+01	3,30E-02	1,72E-04	3,65E+01	1,27E-01	-4,87E+00

Output flow indicators

Indicator	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life	Benefits
CfRu	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MfR	kg	3,78E-01	3,97E-03	0,00E+00	2,27E-02	0,00E+00	3,51E-01	0,00E+00
MfER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	L	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Other indicators

India	cator	Unit	Total
Biogenic	Product	kg of C	0,00E+00
Carbon	Packaging	kg of C	1,39E-02
Environm	ental Cost	€	0,00E+00

Extrapolation Factors

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
2CCF019635R0001	1,00	1,00	1,00	1,00	1,00	1,00
2CCF019634R0001	1,00	1,00	1,00	3,10	1,00	1,00
2CCF019636R0001	1,00	1,00	1,00	9,73	1,00	1,00
2CCF019637R0001	1,50	1,50	1,50	1,50	1,50	1,50
2CCF019638R0001	1,50	1,50	1,50	4,65	1,50	1,50
2CCF019639R0001	1,50	1,50	1,50	14,59	1,50	1,50
2CCF019640R0001	2,00	2,00	2,00	2,00	2,00	2,00
2CCF019641R0001	2,00	2,00	2,00	6,20	2,00	2,00
2CCF019642R0001	2,00	2,00	2,00	19,46	2,00	2,00
2CCP247204R0001	1,00	1,00	1,00	1,00	1,00	1,00
2CCP247205R0001	1,00	1,00	1,00	3,10	1,00	1,00
2CCP247212R0001	1,00	1,00	1,00	6,70	1,00	1,00

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Glossary

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 - freshwater compartment EP-freshwater Eutrophication potential - fraction of nutrients reachin marine end compartment EP-terrestrial Eutrophication potential - fraction of nutrients reachin marine end compartment EP-terrestrial Eutrophication potential - fraction of nutrients reachin marine end compartment EP-terrestrial Eutrophication potential - fraction of nutrients reachin marine end compartment EP-terrestrial Eutrophication potential - fropospheric ozone ADP-m&m Abiotic Depletion for non-fossil resources potential ADP-fossil Abiotic Depletion potential WDP Water deprivation potential WDP Water deprivation potential Veso of non-renewable primary energy resources used as raw material PENRE Use of non-renewable primary energy resources (primary energy resources used as raw material PERM Use of renewable primary energy resources (primary energy resources used as raw material PERM Use of renewable primary energy resources (primary energy resources used as raw material PERM Use of renewable primary energy resources (primary energy resour	GWP-1	total	Global Warming Potential total (Clir	nate hange)		
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References

[1] PCR "PEP-PCR-ed4-EN-2022_09_06" - Product Category Rules for Electrical, Electronic and HVAC-R Products (published: 6th September 2022)

[2] PSR "PSR-0005-ed2-EN-2016 03 29" - SPECIFIC RULES FOR Electrical switchgear and control gear Solutions (Circuit breakers)

[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 v3.8 (2022). ecoinvent database version 3.8 - (https://ecoinvent.org/)[7] SimaPro Software version 9.3.0.3 - 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

[10] https://www.ecosystemspa.com/

[11] LB-DT 17-21D - RoHS II (MCCBs and ACBs)

[12] LB-DT 18-21D - REACH (MCCBs and ACBs)

[13] 1SDL000571R0 Ver 01 - RoHS Exemptions (MCCBs and ACBs)

[14] 1SDL000572R0 Ver 01 - SVHC present in excess of 0.1% (MCCBs and ACBs)