ENC MINIATURE CIRCUIT BREAKER

PEP ecopassport®

Product Environmental Profile

Registration number:	**ABBG-00732-V01.01-EN**	Drafting rules:	**PCR-ed4-EN-2021 09 06**
Contact information:	**EPD_ELSB@abb.com**	Supplemented by:	**PSR-0005-ed3.1-EN-2023 12 08**
Verifier accreditation number:	**VH51**	Information and reference documents:	**www.pep-ecopassport.org**
Date of issue:	**March-25**	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 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.

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

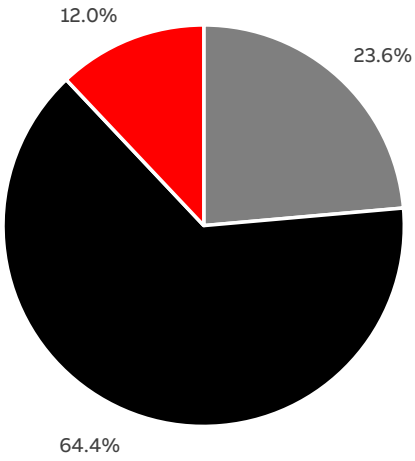
Purpose & Embedding Sustainability

Committed to continually promoting and embedding sustainability accros operations and value chain, aspiring to become a role model for others to follow. Focusing with this Purpose on reducing harmful emissions, preserving natural resources championing ethical and humane behaviour.

General information

Reference product	**ENC62C16 - 2CSS252423R0164**
Description of the product	**ENC62C16 is a Compact Miniature Circuit Breaker acc. IEC/EN 60898-1 with the particularity of having two poles in one module**
Functional unit	**Protect the installation from overloads and short circuits in a circuit with rated voltage (Ue) of 230/240 AC, rated current (In) 16A, with 2 poles (Np), a rated breaking capacity (Icn) of 6kA and the tripping curve (Cd) C in the Household/Commercial application area, according to the appropriate use scenario, and during the reference service life of the product of 20 years**
Other products covered	**ENC MCBs homogeneous family:** **- ENC45 and ENC6** **- 1P+1P, 2P, 3P and 4P** **- B, C curves** **- Ranges from 2 A to 40 A** **- Breaking capacity of 4.5 and 6 kA**
PEP Owner address	**Viale dell'Industria, 18, 20009 Vittuone (MI) - Italy**

Constituent Materials



Total weight of reference product and packaging	**128.7**	**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%
PA	20.3	**Steel**	35.8	**Glass fibre**	8.0
POM	1.6	**Copper**	19.3	**Cardboard**	4.1
PPS	0.9	**Aluminium**	4.9		
PBT	0.8	**Other metals**	3.2		
		Stainless steel	1.1		

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

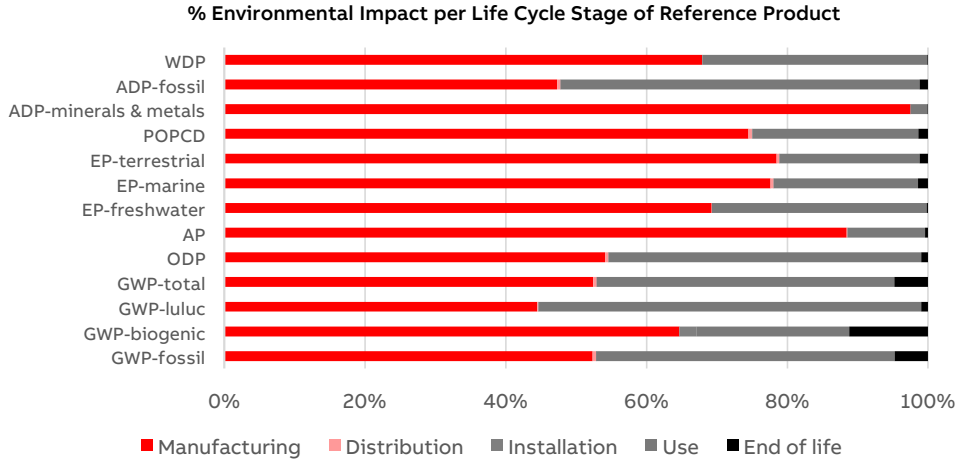
Additional Information

Manufacturing	Includes the environmental impacts associated with extraction and processing of the raw materials used to produce the product and its pacakging, transport to the manufacturing site and assembly. The production occurs at the factory located in Santa Palomba (RM). And the data considered correspond to the year 2024.
Distribution	Includes the transportation in its pacakging from Santa Palomba factory to the Regional Distribution Centres until it reaches the final consumer.
Installation	Installation stage includes the installation of the products made manually and the end-of-life of packaging. No energy is required.
Use	Since the application of this device is primarily household/commercial, a 15 % In load rate and a 30 % use rate for 20 years were considered to calculate de power loss. Regarding the energy mix, the energy mixes of the main sales countries were used. A mix of european countries. And no maintenance is planned for the product.
End of life	Includes its transportation from the installation site to the final end of life treatment site, and end of life 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	Circuit-breakers
Installation elements	No installation materials are required. End-of-life of the packaging components are accounted for during the installation phase
Use scenario	Power loss calculated acc. PSR criteria (15% In)
Geographical representativeness	Europe
Technological representativeness	Materials and processes data are specific for the production of one ENC62C16 MCB
Software and database used	SimaPro 9.6.0.1 & Ecoinvent 3.10
Energy model used	
Manufacturing	A specific green mix of the trading company has been used
Distribution and Installation	Non-applicable
Use	Energy mix of european countries
End of life	Energy from datasets of end-of-life processes for products and packaging in Europe

Common base of mandatory indicators



Environmental impact indicators

Indicator		Unit	Total	Manufacturing	Distribution	Installation	Use	End of life	Benefits
GWP	Total	kg CO2 eq.	3.23E+00	1.69E+00	1.59E-02	1.01E-03	1.37E+00	1.54E-01	-1.32E-01
	Fossil	kg CO2 eq.	3.20E+00	1.67E+00	1.59E-02	3.51E-04	1.36E+00	1.51E-01	-1.32E-01
	Biogenic	kg CO2 eq.	2.76E-02	1.79E-02	2.88E-06	6.56E-04	6.01E-03	3.09E-03	-6.81E-05
	Luluc	kg CO2 eq.	3.62E-03	1.61E-03	5.43E-06	1.06E-07	1.97E-03	3.55E-05	-5.01E-05
ODP		kg CFC-11 eq.	6.16E-08	3.33E-08	3.19E-10	4.83E-12	2.74E-08	5.87E-10	-6.99E-10
AP		H+ eq.	4.94E-02	4.37E-02	5.12E-05	1.55E-06	5.44E-03	2.15E-04	-5.27E-04
EP	Freshwater	kg P eq.	2.74E-04	1.90E-04	1.24E-07	3.79E-09	8.36E-05	5.70E-07	-5.83E-06
	Marine	kg N eq.	3.93E-03	3.05E-03	1.72E-05	1.02E-06	8.06E-04	5.60E-05	-1.07E-04
	Terrestrial	mol N eq.	4.71E-02	3.69E-02	1.89E-04	6.11E-06	9.37E-03	5.66E-04	-1.26E-03
POPCD		kg NMVOC eq.	1.54E-02	1.15E-02	8.35E-05	2.51E-06	3.64E-03	2.17E-04	-4.22E-04
ADP	Minerals & metals	kg SB eq.	7.17E-04	6.99E-04	4.28E-08	1.31E-09	1.76E-05	2.42E-07	-1.07E-06
	Fossil	MJ	4.50E+01	2.13E+01	2.30E-01	3.98E-03	2.29E+01	5.45E-01	-1.36E+00
WDP		m^3 eq. depr.	2.03E+00	1.38E+00	1.10E-03	2.92E-05	6.48E-01	2.64E-03	-2.53E-02

Resource use indicators

Indicator	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life	Benefits
PERE	MJ	1.37E+01	4.45E+00	3.54E-03	1.42E-04	9.27E+00	3.03E-02	-1.34E-01
PERM	MJ	8.38E-02	8.38E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	1.38E+01	4.53E+00	3.54E-03	1.42E-04	9.27E+00	3.03E-02	-1.34E-01
PENRE	MJ	4.42E+01	2.05E+01	2.30E-01	3.98E-03	2.29E+01	5.45E-01	-1.36E+00
PENRM	MJ	7.60E-01	7.60E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	4.50E+01	2.13E+01	2.30E-01	3.98E-03	2.29E+01	5.45E-01	-1.36E+00

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	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	5.55E-02	3.38E-02	3.44E-05	-7.19E-07	2.16E-02	3.96E-05	-7.79E-04

Waste category indicators

Indicator	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life	Benefits
HWD	kg	3.49E-01	1.93E-01	1.97E-02	5.59E-04	1.01E-01	3.42E-02	-6.40E-03
N-HWD	kg	1.06E-04	2.60E-05	6.91E-08	3.01E-09	7.98E-05	3.38E-07	-1.11E-06
RWD	kg	1.38E+01	4.53E+00	3.54E-03	1.42E-04	9.27E+00	3.03E-02	-1.34E-01

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	1.05E-01	4.10E-02	0.00E+00	4.24E-03	0.00E+00	5.97E-02	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	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Other indicators

Indicator		Unit	Total
Biogenic Carbon	Product	kg of C	4.90E-04
	Packaging	kg of C	2.11E-03

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
2CSS242423R0064	0.99	0.99	0.99	0.92	0.99	0.99
2CSS242423R0104	0.99	0.99	0.99	0.71	0.99	0.99
2CSS242423R0164	1.00	1.00	1.00	1.00	1.00	1.00
2CSS242423R0204	1.00	1.00	1.00	1.23	1.00	1.00
2CSS242423R0254	1.01	1.01	1.01	1.28	1.01	1.01
2CSS242423R0324	1.01	1.01	1.01	2.10	1.01	1.01
2CSS242423R0404	1.01	1.01	1.01	2.22	1.01	1.01
2CSS252423R0024	1.02	1.02	1.02	0.67	1.02	1.02
2CSS252423R0044	1.01	1.01	1.01	0.72	1.01	1.01
2CSS252423R0064	0.99	0.99	0.99	0.92	0.99	0.99
2CSS252423R0104	0.99	0.99	0.99	0.71	0.99	0.99
2CSS252423R0134	1.00	1.00	1.00	0.66	1.00	1.00
2CSS252423R0164	1.00	1.00	1.00	1.00	1.00	1.00
2CSS252423R0204	1.00	1.00	1.00	1.23	1.00	1.00
2CSS252423R0254	1.01	1.01	1.01	1.28	1.01	1.01
2CSS252423R0324	1.01	1.01	1.01	2.10	1.01	1.01
2CSS252423R0404	1.01	1.01	1.01	2.22	1.01	1.01
2CSS252423R0065	1.01	1.01	1.01	1.18	1.01	1.01
2CSS252423R0105	0.99	0.99	0.99	0.59	0.99	0.99
2CSS252423R0135	0.99	0.99	0.99	0.94	0.99	0.99
2CSS252423R0165	0.99	0.99	0.99	1.27	0.99	0.99
2CSS252423R0205	1.00	1.00	1.00	1.89	1.00	1.00
2CSS252423R0255	1.01	1.01	1.01	1.93	1.01	1.01
2CSS252423R0325	1.01	1.01	1.01	2.10	1.01	1.01
2CSS252423R0405	1.01	1.01	1.01	2.22	1.01	1.01
2CSS253423R0064	1.70	1.70	1.70	1.38	1.69	1.69
2CSS253423R0104	1.69	1.69	1.69	1.06	1.68	1.68
2CSS253423R0164	1.71	1.71	1.71	1.50	1.70	1.70
2CSS253423R0204	1.71	1.71	1.71	1.85	1.70	1.70
2CSS253423R0254	1.73	1.73	1.73	1.92	1.73	1.73
2CSS253423R0324	1.73	1.73	1.73	3.15	1.73	1.73
2CSS253423R0065	1.73	1.73	1.73	1.77	1.72	1.72
2CSS253423R0105	1.69	1.69	1.69	0.89	1.68	1.68
2CSS253423R0165	1.70	1.70	1.70	1.90	1.68	1.68
2CSS253423R0205	1.71	1.71	1.71	2.84	1.70	1.70
2CSS253423R0255	1.73	1.73	1.73	2.89	1.72	1.72
2CSS253423R0325	1.73	1.73	1.73	3.15	1.73	1.73

Extrapolation Factors

Product name	Manufacturing	Distribution	Installation	Use	End of life	Benefits
2CSS254423R0064	1.99	1.99	1.99	1.84	1.99	1.99
2CSS254423R0104	1.98	1.98	1.98	1.41	1.97	1.97
2CSS254423R0164	2.00	2.00	2.00	2.00	2.00	2.00
2CSS254423R0204	2.00	2.00	2.00	2.47	2.00	2.00
2CSS254423R0254	2.03	2.03	2.03	2.56	2.03	2.03
2CSS254423R0324	2.03	2.03	2.03	4.20	2.03	2.03
2CSS254423R0065	2.02	2.02	2.02	2.36	2.02	2.02
2CSS254423R0105	1.98	1.98	1.98	1.19	1.98	1.98
2CSS254423R0165	1.98	1.98	1.98	2.53	1.98	1.98
2CSS254423R0205	2.00	2.00	2.00	3.78	2.00	2.00
2CSS254423R0255	2.02	2.02	2.02	3.85	2.02	2.02
2CSS254423R0325	2.03	2.03	2.03	4.20	2.03	2.03
2CSS257423R0065	1.01	1.01	1.01	1.18	1.01	1.01
2CSS257423R0105	0.99	0.99	0.99	0.59	0.99	0.99
2CSS257423R0135	0.99	0.99	0.99	0.94	0.99	0.99
2CSS257423R0165	0.99	0.99	0.99	1.27	0.99	0.99
2CSS257423R0205	1.00	1.00	1.00	1.89	1.00	1.00
2CSS257423R0064	0.99	0.99	0.99	0.92	0.99	0.99
2CSS257423R0104	0.99	0.99	0.99	0.71	0.99	0.99
2CSS257423R0134	1.00	1.00	1.00	0.66	1.00	1.00
2CSS257423R0164	1.00	1.00	1.00	1.00	1.00	1.00
2CSS257423R0204	1.00	1.00	1.00	1.23	1.00	1.00

Glossary

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 reachin marine end compartment
EP-terrestrial	Eutrophication potential - Accumulated Exceedance
POPCD	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 indicators	
PENRE	Use of non-renewable primary energy excluding 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
PERE	Use of renewable primary energy excluding non-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)

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	Net use of fresh water

Output flow indicators	
CfRu	Components for re-use
MfR	Materials for recycling
MfER	Materials for energy recovery
EE	Exported Energy

Waste category indicators	
HWD	Hazardous waste disposed
N-HWD	Non-hazardous waste disposed
RWD	Radioactive waste disposed

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 (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 v3.10 (2023). ecoinvent database version 3.10 - (https://ecoinvent.org/)

[7] SimaPro Software version 9.6.0.1 - 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

[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)