

AEG DCC, EX41NR and EX61NR Miniature Circuit Breaker

PEP ecopassport®

Product Environmental Profile



Registration number:	ABBG-00609-V01.02-EN	Drafting rules:	PCR-ed4-EN-2021 09 06
Contact information:	EPD_ELSB@abb.com	Supplemented by:	PSR-0005-ed3-EN-2023 06 06
Verifier accreditation number:	VH50	Information and reference documents:	www.pep-ecopassport.org
Date of issue:	May-24	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 (Ddomain)			
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.

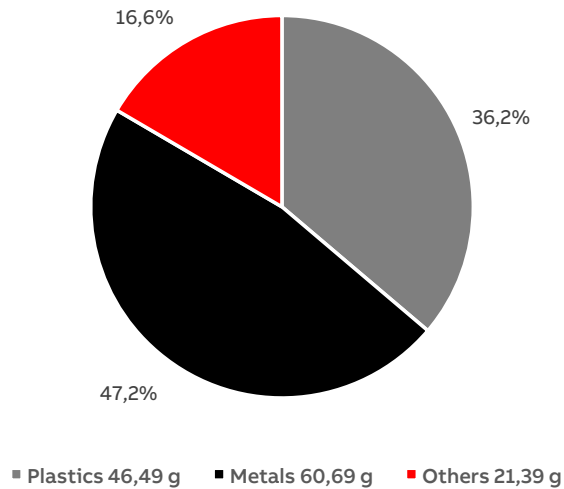


General information

Reference product	2CSS245145R0164 - DCC+ 41 N C16 AEG
Description of the product	The DCC+ 41 N C16 AEG products are universal Miniature circuit breakers, designed for the protection of circuits against overload and short circuit
Functional unit	Protect the installation from overloads and short circuits in a circuit with rated voltage 230V, rated current 16A, with 1P+N poles, a rated breaking capacity 6kA, and the tripping curve C
Other products covered	AEG DCC environmental homogeneous family: Family: DCC, EX41NR, EX61NR Sizes: 1P+N Rated Current [A]: 2, 4, 6, 10, 13, 16, 20, 25, 32, 40 Tripping Curve [Cd]: C, B Rated breaking capacity [KA] 4.5, 6
Manufacturing address	Viale dell'Industria, 18 20009 Vittuone (MI) - Italy www.aeg-low-voltage.com



Constituent Materials



Total weight of reference product and packaging

128,6

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	24,5	STEEL	37,7	CARDBOARD	15,2
PE + PTFE + GF	7,9	COPPER	8,6	Wood	0,5
POM	1,6	OTHER METALS	0,7	Paper	0,6
PC	1,2	Zinc	0,2	Miscellaneous	0,2
PPS	0,9				

Total weight of the reference product 107,8 g plus packaging 20,8 g



Additional Information

Manufacturing	The manufacturing stage includes the production and transportation to the manufacturer's last logistic platform of DCC+ 41 N, EX61NR and EX41NR and its packaging. The production occurs at the factory located in Santa Palomba (RM).
Distribution	The transport from the factory to the Regional Distribution Centre in Vignate (Italy) was taken into account. For the distribution of the product from Vignate to the final customer, the intracontinental transport scenario provided by PCR-ed4-EN-2021 09 06 standard was adopted, considering the European macro-area.
Installation	The installation phase only implies manual activities and no energy is consumed. This phase also includes the disposal of the packaging of the product. Statistical average data from Eurostat databases were considered for the disposal of the product and its packaging.
Use	During the use phase, the product dissipate some electricity due to power losses. The average power loss of the switch has been calculated following the assumption indicated in the PSR-0005-ed3-EN-2023 06 06: • Nominal current load rate @15% (Household/Commercial scenario) • RSL of 20 years. • Functioning time of 30% of the RSL (α). No maintenance is planned for the product.
End of life	The default end of life scenario provided by the IEC/TR 62635 document has been adopted, considering the product transport by lorry over 1000 km and its disposal.
Benefits and loads beyond the system boundaries	The potential benefits derives from the impacts prevented by recycling and waste to energy recovery of the packaging in the installation phase



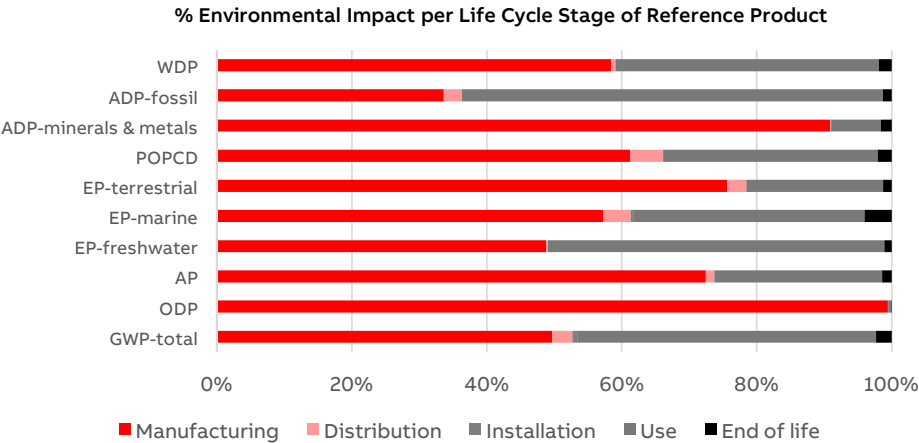
Environmental Impacts

Reference lifetime	20 years
Product category	Miniature circuit-breakers
Installation elements	No installation materials are required in the life cycle of the product.
Use scenario	The calculation of the use stage electricity consumption from the average power consider the following assumptions: - Nominal current load rate as 15% (Household / Commercial); - RSL of 20 years; - Functioning time of 30% of the RSL. No maintenance is planned for the product
Geographical representativeness	Europe
Technological representativeness	Technological representativeness refers to the specific production process for primary data.
Software and database used	SimaPro 9.5 and ecoinvent 3.9.1

Energy model used

Manufacturing	ABB GO energy mix 2022. The energy-related processes used for the remaining inputs are those included in the ecoinvent v3.9.1 datasets.
Installation	No energy consumption occur during the installation stage.
Use	Electricity, low voltage {RER} market group for electricity, low voltage Cut-off, S
End of life	The energy-related processes used for the inputs of the end-of-life stage are those included in the ecoinvent datasets selected for the analysis.

Common base of mandatory indicators



Environmental impact indicators

Indicator		Unit	Total	Manufacturin g	Distribu tion	Installation	Use	End of life	Benefits
GWP	Total	kg CO2 eq.	3,52E+00	1,75E+00	1,04E-01	2,58E-02	1,56E+00	8,09E-02	-2,38E-01
	Fossil	kg CO2 eq.	3,27E+00	1,59E+00	1,04E-01	1,82E-03	1,51E+00	6,15E-02	-2,47E-01
	Biogenic	kg CO2 eq.	2,49E-01	1,53E-01	9,46E-05	2,39E-02	5,26E-02	1,93E-02	8,33E-03
	Luluc	kg CO2 eq.	5,86E-03	2,00E-03	5,08E-05	6,51E-07	3,76E-03	5,03E-05	-1,40E-04
ODP		kg CFC-11 eq.	5,77E-06	5,74E-06	2,28E-09	3,18E-11	2,87E-08	9,07E-10	-1,70E-09
AP		H+ eq.	3,48E-02	2,52E-02	4,30E-04	7,90E-06	8,64E-03	4,99E-04	-5,11E-03
EP	Freshwater	kg P eq.	2,86E-03	1,40E-03	7,32E-06	1,81E-07	1,43E-03	3,08E-05	-4,07E-04
	Marine	kg N eq.	4,09E-03	2,34E-03	1,64E-04	1,45E-05	1,40E-03	1,65E-04	-3,94E-04
	Terrestrial	mol N eq.	6,22E-02	4,70E-02	1,75E-03	2,98E-05	1,26E-02	7,80E-04	-4,88E-03
POPCD		kg NMVOC eq.	1,28E-02	7,84E-03	6,30E-04	1,38E-05	4,06E-03	2,66E-04	-1,63E-03
ADP	Minerals & metals	kg SB eq.	2,49E-04	2,26E-04	3,36E-07	5,73E-09	1,83E-05	3,99E-06	-5,67E-05
	Fossil	MJ	5,50E+01	1,85E+01	1,48E+00	1,79E-02	3,43E+01	7,40E-01	-2,80E+00
WDP		m³ eq. depr.	9,84E-01	5,75E-01	6,02E-03	1,23E-04	3,84E-01	1,88E-02	-8,74E-02

Resource use indicators

Indicator	Unit	Total	Manufacturin g	Distribution	Installation	Use	End of life	Benefits
PERE	MJ	1,47E+01	6,92E+00	2,30E-02	8,84E-04	7,68E+00	7,38E-02	-2,19E-01
PERM	MJ	8,16E-01	8,16E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,55E+01	7,73E+00	2,30E-02	8,84E-04	7,68E+00	7,38E-02	-2,19E-01
PENRE	MJ	5,32E+01	1,67E+01	1,48E+00	1,79E-02	3,43E+01	7,40E-01	-2,80E+00
PENRM	MJ	1,78E+00	1,78E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	5,50E+01	1,85E+01	1,48E+00	1,79E-02	3,43E+01	7,40E-01	-2,80E+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	1,54E-02	1,54E-02	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	5,22E-02	2,36E-02	2,11E-04	7,82E-06	2,77E-02	6,25E-04	-2,22E-03

Waste category indicators

Indicator	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life	Benefits
HWD	kg	3,25E-04	2,51E-04	9,44E-06	1,04E-07	6,02E-05	3,68E-06	-9,07E-06
N-HWD	kg	5,92E-01	2,89E-01	7,24E-02	7,30E-03	1,38E-01	8,52E-02	-3,97E-02
RWD	kg	2,80E-04	2,99E-05	4,82E-07	1,88E-08	2,47E-04	2,14E-06	-2,13E-07

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	2,20E-01	1,52E-01	0,00E+00	1,19E-02	0,00E+00	5,69E-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	4,02E-02	0,00E+00	0,00E+00	1,23E-02	0,00E+00	2,79E-02	0,00E+00

Other indicators

Indicator		Unit	Total
Biogenic Carbon	Product	kg of C	1,79E-04
	Packaging	kg of C	2,58E-02

Optional indicators

Indicator	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life	Benefits
Tot PE	MJ	7,05E+01	2,62E+01	1,51E+00	1,88E-02	4,19E+01	8,14E-01	-3,02E+00
Efp	Dise inc	1,96E-07	1,51E-07	8,51E-09	1,35E-10	3,17E-08	4,94E-09	-2,12E-08
IrHH	kBq U-235 eq	1,09E+00	1,18E-01	1,98E-03	7,65E-05	9,66E-01	8,38E-03	-8,44E-04
ETX FW	CTUe	3,11E+01	2,39E+01	7,31E-01	4,07E-02	5,76E+00	6,77E-01	-5,66E+00
HTX CE	CTUh	7,88E-09	5,76E-09	4,75E-11	1,66E-12	7,08E-10	1,36E-09	-2,54E-10
HTX N-CE	CTUh	2,48E-07	2,11E-07	1,04E-09	3,53E-11	2,82E-08	8,32E-09	-5,59E-08
IrLS	Pt	3,47E+01	2,67E+01	8,83E-01	1,11E-02	6,68E+00	4,48E-01	-1,48E+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 a linear correlation with respect to weight for the production, distribution, and end-of-life phase and with respect to average power loss for the use phase. Each environmental indicator value shall be calculated using the following formulas:

For the manufacturing stage, distribution stage and end-of-life stage: $y = ax_1 + b$ where x_1 is the weight of the product

For the use stage: $y = ax_2 + b$ where x_2 is the average power loss of the product

* 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

Impact Category	Manufacturing		Distribution		Installation		Use		End of Life	
	a1	b1	a2	b2	a2	b2	a4	b4	a5	b5
GWP-total	1.48E-02	2.28E-01	8.03E-04	2.13E-02	0.00E+00	2.58E-02	4.34E-01	5.32E-05	7.85E-04	-2.81E-05
GWP-fossil	1.39E-02	1.62E-01	8.02E-04	2.13E-02	0.00E+00	1.82E-03	4.18E-01	5.12E-05	5.97E-04	-2.13E-05
GWP-biogenic	8.46E-04	6.59E-02	7.30E-07	1.94E-05	0.00E+00	2.39E-02	1.46E-02	1.79E-06	1.88E-04	-6.71E-06
GWP-luluc	1.37E-05	5.87E-04	3.92E-07	1.04E-05	0.00E+00	6.51E-07	1.04E-03	1.28E-07	4.88E-07	-1.75E-08
ODP	5.57E-08	4.08E-09	1.76E-11	4.66E-10	0.00E+00	3.18E-11	7.98E-09	9.77E-13	8.81E-12	-3.15E-13
AP	2.24E-04	2.19E-03	3.32E-06	8.82E-05	0.00E+00	7.90E-06	2.40E-03	2.94E-07	4.84E-06	-1.73E-07
EP-freshwater	1.25E-05	1.10E-04	5.65E-08	1.50E-06	0.00E+00	1.81E-07	3.96E-04	4.85E-08	2.99E-07	-1.07E-08
EP-marine	1.91E-05	3.74E-04	1.27E-06	3.36E-05	0.00E+00	1.45E-05	3.88E-04	4.75E-08	1.60E-06	-5.72E-08
EP-terrestrial	4.19E-04	3.85E-03	1.35E-05	3.59E-04	0.00E+00	2.98E-05	3.51E-03	4.30E-07	7.57E-06	-2.71E-07
POCP	6.52E-05	1.12E-03	4.86E-06	1.29E-04	0.00E+00	1.38E-05	1.13E-03	1.38E-07	2.58E-06	-9.22E-08
ADPE	2.02E-06	1.80E-05	2.59E-09	6.88E-08	0.00E+00	5.73E-09	5.07E-06	6.21E-10	3.88E-08	-1.38E-09
ADPF	1.58E-01	2.26E+00	1.14E-02	3.04E-01	0.00E+00	1.79E-02	9.52E+00	1.17E-03	7.19E-03	-2.57E-04
WDP	4.73E-03	8.77E-02	4.64E-05	1.23E-03	0.00E+00	1.23E-04	1.07E-01	1.31E-05	1.82E-04	-6.52E-06
CRU	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	9.58E-04	5.29E-02	0.00E+00	0.00E+00	0.00E+00	1.19E-02	0.00E+00	0.00E+00	5.53E-04	-1.97E-05
MER	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.23E-02	0.00E+00	0.00E+00	2.71E-04	-9.67E-06
PM	1.33E-09	1.43E-08	6.57E-11	1.75E-09	0.00E+00	1.35E-10	8.80E-09	1.08E-12	4.80E-11	-1.71E-12
IRP	1.00E-03	1.52E-02	1.53E-05	4.07E-04	0.00E+00	7.65E-05	2.68E-01	3.29E-05	8.14E-05	-2.91E-06
PENRE	1.41E-01	2.16E+00	1.14E-02	3.04E-01	0.00E+00	1.79E-02	9.52E+00	1.17E-03	7.19E-03	-2.57E-04
PENRM	1.63E-02	1.01E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	1.58E-01	2.26E+00	1.14E-02	3.04E-01	0.00E+00	1.79E-02	9.52E+00	1.17E-03	7.19E-03	-2.57E-04
PERE	4.07E-02	2.73E+00	1.78E-04	4.72E-03	0.00E+00	8.84E-04	2.13E+00	2.61E-04	7.16E-04	-2.56E-05
PERM	2.73E-03	5.35E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	4.34E-02	3.26E+00	1.78E-04	4.72E-03	0.00E+00	8.84E-04	2.13E+00	2.61E-04	7.16E-04	-2.56E-05
PE	2.01E-01	5.52E+00	1.16E-02	3.09E-01	0.00E+00	1.88E-02	0.00E+00	0.00E+00	7.91E-03	-2.82E-04
SM	0.00E+00	1.54E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.53E-04	-1.97E-05	0.00E+00	0.00E+00
RSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.71E-04	-9.67E-06	0.00E+00	0.00E+00
FW	1.69E-04	6.18E-03	1.63E-06	4.33E-05	0.00E+00	7.82E-06	7.71E-03	9.44E-07	6.07E-06	-2.17E-07
HWD	2.24E-06	2.02E-05	7.28E-08	1.93E-06	0.00E+00	1.04E-07	1.67E-05	2.05E-09	3.57E-08	-1.28E-09
NHWD	2.41E-03	4.08E-02	5.59E-04	1.48E-02	0.00E+00	7.30E-03	3.83E-02	4.69E-06	8.28E-04	-2.96E-05
RWD	2.53E-07	3.87E-06	3.72E-09	9.87E-08	0.00E+00	1.88E-08	6.87E-05	8.41E-09	2.08E-08	-7.44E-10
ETP-fw	2.14E-01	1.82E+00	5.65E-03	1.50E-01	0.00E+00	4.07E-02	1.60E+00	1.96E-04	6.57E-03	-2.35E-04
HTP-c	4.95E-11	6.64E-10	3.66E-13	9.73E-12	0.00E+00	1.66E-12	1.97E-10	2.41E-14	1.32E-11	-4.73E-13
HTP-nc	1.82E-09	2.33E-08	8.06E-12	2.14E-10	0.00E+00	3.53E-11	7.84E-09	9.60E-13	8.08E-11	-2.89E-12
SQP	1.57E-01	1.05E+01	6.81E-03	1.81E-01	0.00E+00	1.11E-02	1.86E+00	2.27E-04	4.35E-03	-1.56E-04
BCProd	1.74E-06	-6.22E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BCPack	8.30E-05	1.72E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Extrapolation Factors

[illegible]

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		
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		Waste category indicators	
SM	Use of secondary materials	HWD	Hazardous waste disposed
RSF	Use of renewable secondary fuels	N-HWD	Non-hazardous waste disposed
NRSF	Use of non-renewable secondary fuels	RWD	Radioactive waste disposed
FW	Net use of fresh water		
Output flow indicators		Optional indicators	
CfRu	Components for re-use	Tot PE	Total use of primary energy during the life cycle
MfR	Materials for recycling		
MfER	Materials for energy recovery	Efp	Emissions of Fine particles
EE	Exported Energy	IrHH	Ionizing radiation, human health
		ETX FW	Ecotoxicity, freshwater
		HTX CE	Human toxicity, carcinogenic effects
		HTX N-CE	Human toxicity, non-carcinogenic
		IrLS	Impact related to Land use / soil quality

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