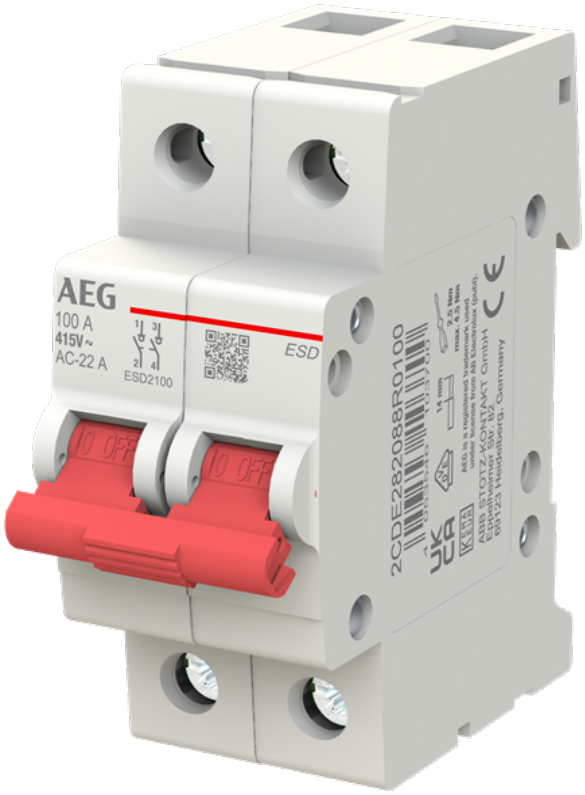
ESD SERIES

PEP ecopassport®

Environmental Product Declaration



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

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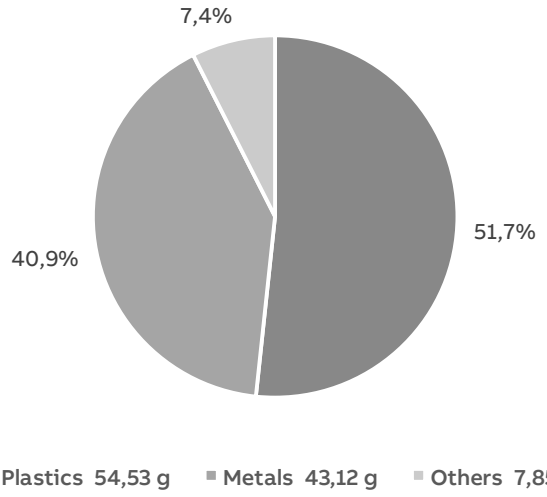
Purpose & Embedding Sustainability

AEG 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 AEG Purpose, AEG is focusing on reducing harmful emissions, preserving natural resources and championing ethical and humane behavior.

General Information

Reference product	Reference product identification: ESD10100, 2CDE281088R0100 PSR product category: Disconnectors
Description of the product	The DSSD (Dual Single Switch Disconnector) is a disconnector to switch and safely disconnect resistive loads
Functional unit	Turn off all or part of an installation by separating the installation or part of the in-stallation of all electrical energy, for safety reasons with a rated voltage U of 240V and rated current of 100A and 1 pole ensuring insulation characterised by a rated insulation voltage of 25kA during the reference service life of the product of 20 years at a use rate of 30% and a load rate of 50%.
Other products covered	The ESD10100 (100 A, 1 pole) DSSD is the reference product for the ESD product family. Other products of the series cover rated currents from 80 A to 125 A and between 1 and 4 poles. They differ regarding weight of the devices and power consumption. The extrapolation factors for manufacturing, distribution, installation and end of life stage are calculated by dividing the weight of the desired product by the weight of the ESD10100. The extrapolation factor for the use stage is calculated by dividing the power loss of

Constituent Materials



Total weight of Reference product	105,5	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%
Other plastic	50,0	**Steel**	20,9	**Cardboard**	6,5
GFRP	1,7	**Copper**	17,5	**Paper**	1,0
–	x	**Aluminium**	1,2	–	x
–	x	**Other metals**	1,2	–	x

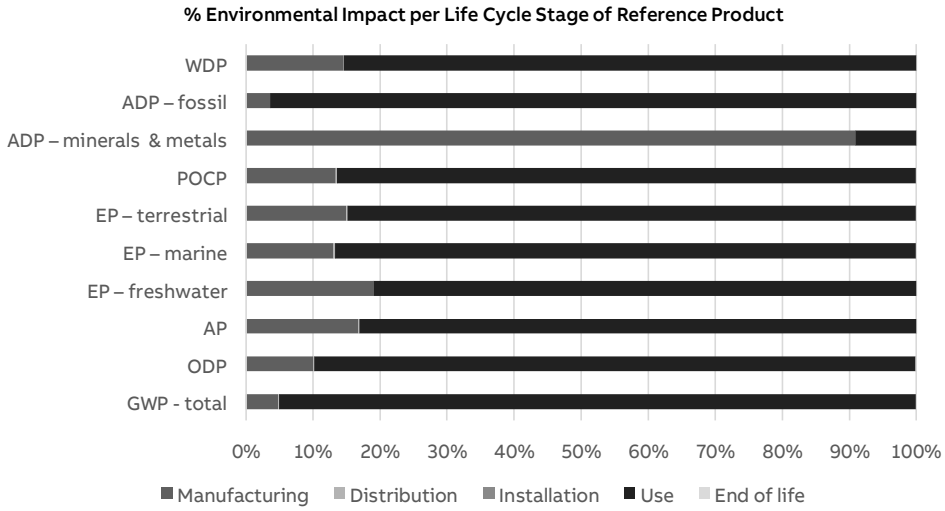
Additional Environmental Information

Manufacturing	The product is manually assembled in Bulgaria. The production site of the products is certified according to ISO 14001.
Distribution	Specific transport distances based on sales data are applied to model the distribution.
Installation	As installation is performed manually, no environmental burdens are associated to this phase besides the disposal of product packaging.
Use	The device is sold and then used worldwide.
End of life	Due to the lack of knowledge of the disposal pathway, landfilling as proposed standard scenario in the PCR is considered.
Benefits and loads beyond the system boundaries	Not considered

Environmental Impacts

Reference lifetime	20 years
Product category	Electrical switchgear and control gear solutions
Installation elements	Does not require any special installation elements.
Use scenario	The scenario is modelled with a use rate of 30% and a load rate of 50%
Geographical representativeness	Global
Technological representativeness	Represents the device series ESD DSSD
Software and database used	SimaPro 9.& with ecoinvent 3.10, cut-off and industry data 2.0
Energy model used	
Manufacturing	Electricity, medium voltage {BG}| market for electricity, medium voltage | Cut-off, S
Installation	{RoW}
Use	No use-stage modelled. See "Additional environmental information - Use."
End of life	{RoW}

Common base of mandatory indicators



Environmental impact indicators

Indicator	Unit	Total	Manu-facturing	Distri-bution	Installation	Use	End of life
GWP-total	**kg CO_2 eq.**	2,49E+01	1,20E+00	2,09E-02	1,18E-02	2,37E+01	1,84E-02
GWP-fossil	**kg CO_2 eq.**	2,49E+01	1,21E+00	2,08E-02	3,19E-04	2,36E+01	1,72E-02
GWP-biogenic	**kg CO_2 eq.**	2,86E-02	-4,68E-03	4,74E-06	1,14E-02	2,06E-02	1,28E-03
GWP-luluc	**kg CO_2 eq.**	3,27E-02	1,47E-03	7,89E-06	8,51E-08	3,13E-02	4,21E-06
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.**	1,78E-07	1,78E-08	3,84E-10	4,62E-12	1,59E-07	2,40E-10
ODP = Depletion potential of the stratospheric ozone layer							
AP	**H+ eq.**	1,43E-01	2,40E-02	1,96E-04	2,20E-06	1,19E-01	5,01E-05
AP = Acidification potential, Accumulated Exceedance							
EP-freshwater	**kg P eq.**	1,40E-03	2,67E-04	1,41E-07	3,19E-09	1,13E-03	1,01E-07
EP-marine	**kg N eq.**	2,37E-02	3,09E-03	5,65E-05	9,40E-07	2,05E-02	2,41E-05
EP-terrestrial	**mol N eq.**	2,71E-01	4,05E-02	6,25E-04	9,81E-06	2,29E-01	2,01E-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.**	7,91E-02	1,06E-02	1,99E-04	2,65E-06	6,83E-02	7,78E-05
POCP = Formation potential of tropospheric ozone							
ADP-minerals & metals	**kg Sb eq.**	1,41E-03	1,28E-03	4,71E-08	6,32E-10	1,28E-04	3,06E-08
ADP-fossil	**MJ**	2,10E+02	7,52E+00	2,14E-02	4,96E-04	2,02E+02	1,46E-02
ADP-minerals & metals = Abiotic depletion potential for non-fossil resources ADP-fossil = Abiotic depletion for fossil resources potential							
WDP	**m^3 eq. depr.**	3,67E+00	5,32E-01	1,03E-03	5,03E-04	3,13E+00	7,01E-04
WDP = Water Deprivation potential							

Common base of mandatory indicators

Inventory flows indicator – Resource use indicators

Indicator	Unit	Total	Manu-facturing	Distri-bution	Installation	Use	End of life
PERE	**MJ**	4,32E+01	2,04E+00	3,93E-03	7,95E-05	4,12E+01	2,72E-03
PERM	**MJ**	1,02E-01	1,02E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	**MJ**	4,33E+01	2,14E+00	3,93E-03	7,95E-05	4,12E+01	2,72E-03
PENRE	**MJ**	3,15E+02	1,67E+01	2,85E-01	2,72E-03	2,98E+02	1,76E-01
PENRM	**MJ**	4,20E-02	4,20E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	**MJ**	3,15E+02	1,67E+01	2,85E-01	2,72E-03	2,98E+02	1,76E-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
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	N/A	N/A	N/A	N/A	N/A
NRSF	**MJ**	0,00E+00	N/A	N/A	N/A	N/A	N/A
FW	**m^3**	1,34E-01	1,49E-02	3,03E-05	1,18E-05	1,19E-01	2,07E-05

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
Hazardous waste disposed	**kg**	2,91E-03	2,91E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non- hazardous waste disposed	**kg**	2,00E-04	2,00E-04	0,00E+00	0,00E+00	0,00E+00	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

Common base of mandatory indicators

Inventory flows indicator – Output flow indicators

Indicator	Unit	Total	Manu-facturing	Distri-bution	Installation	Use	End of life
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	1,12E-02	1,12E-02	0,00E+00	6,94E-18	0,00E+00	0,00E+00
Materials for energy recovery	kg	2,73E-03	2,73E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	3,16E-02	3,16E-02	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
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	3,12E-03	3,12E-03	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
Emissions of fine particles	incidence of diseases	1,10E-06	9,97E-08	1,73E-09	2,35E-11	9,98E-07	1,22E-09
Ionizing radiation, human health	kBq U235 eq.	1,25E+00	5,08E-02	1,11E-04	1,68E-06	1,20E+00	7,72E-05
Ecotoxicity (fresh water)	CTUe	1,96E+02	4,80E+01	8,18E-02	1,35E-02	1,48E+02	3,58E-01
Human toxicity, car-cinogenic effects	CTUh	4,20E-08	1,40E-08	1,17E-10	2,95E-12	2,78E-08	7,13E-11
Human toxicity, non-carcinogenic effects	CTUh	4,18E-07	1,90E-07	2,07E-10	2,65E-11	2,25E-07	2,14E-09
Impact related to land use/soil quality	kBq U235 eq.	6,84E+01	1,52E+01	2,35E-01	1,58E-03	5,28E+01	2,05E-01

Other indicators

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

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	Manu-facturing	Distri-bution	Installation	Use	End of life	Benefits
ESD1080	1,00	1,00	1,00	0,66	1,00	
ESD10125	1,00	1,00	1,00	1,54	1,00	
	2,00	2,00	2,00	1,32	2,00	
ESD20100	2,00	2,00	2,00	2,00	2,00	
ESD20125	2,00	2,00	2,00	3,09	2,00	
ESD3080	3,00	3,00	3,00	1,97	3,00	
ESD30100	3,00	3,00	3,00	3,00	3,00	
ESD30125	3,00	3,00	3,00	4,63	3,00	
ESD4080	4,00	4,00	4,00	2,63	4,00	
ESD40100	4,00	4,00	4,00	4,00	4,00	
ESD40125	4,00	4,00	4,00	6,18	4,00	

Environmental Impact Indicator Glossary

Impact indicators

Indicator	Description	Distribution
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 eq. depr.

Resource use indicators

Indicator	Description	Distribution
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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Verifier accreditation number: **VH50**	Information and reference documents: **www.pep-ecopassport.org**
Date of issue: **05-2024**	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)	
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.	
Document complies with ISO 14025:2006 “Environmental labels and declarations. Type III environmental declarations”	