Product Environmental Profile

DMV Switch Disconnector Without Rotary Handle and Drive Shaft

Representative product	DMV-250N/4 (Y8-1814410) Product Category: Switch Disconnectors
Description of the product	Eaton's Switch Disconnector are designed to turn off all or part of an electrical installation by disconnecting the installation or part of the installation of all electrical energy, for safety reasons. These switch disconnectors have total 4 poles with Surface mount and with STOP Function Optional.
Homogeneous Environmental Families Covered	The PEP concerns following product offerings from Eaton DMV switch disconnector, as mentioned below: DMV-250N/4 (Y8-1814410) (Reference), DMV-400N/4 (Y8-1814413), DMV-250N/1 (Y8-1814409), DMV-400N/1 (Y8-1814412), DMV-250N/3 (Y8-1814408), DMV-400N/3 (Y8-1814411) *[The product market is spread globally. Different scenarios are studied considering distribution in UK and outside Europe and separate extrapolation factors are given in this PEP considering Europe market as reference]
Functional unit	"Turn off all or part of an installation by separating the installation or part of the installation of all electrical energy or earth, for safety reasons with a rated voltage 690V, and rated current 250A, ensuring isolation characterised by a rated voltage 1000 V AC, and with IP Rating of IP20, according to the appropriate use scenario, and during the reference service life of the product of 20 years."
Company information	Eaton Production International GmbH Claylands Avenue, Dukeries Industrial Estate, Worksop, Nottinghamshire, S81 7DJ, United Kingdom Email: productstewardship-es@eaton.com

Constituent Materials			
Reference product mass	1.73E+00 kg (With packaging)		
Category PEP Material	**Materials**	**Mass (kg)**	**Percentage (%)**
Plastics	Polyester	5.03E-01	29.1%
Metals	Steel	4.95E-01	28.6%
Metals	Copper	2.71E-01	15.6%
Metals	Zinc	1.37E-01	7.9%
Others	Corrugated Cardboard	1.27E-01	7.4%
Plastics	Acrylonitrile Butadiene Styrene	1.16E-01	6.7%
Plastics	Polyamide 6.6 (PA6.6) with 30% glass fibers	5.04E-02	2.9%
Plastics	Polyamide 66	9.40E-03	0.5%
Plastics	Polyethylene Low Density Granulate (PE-LD)	8.40E-03	0.5%
Plastics	Polyamide 6 (PA6) with 30% glass fibers	7.60E-03	0.4%
Others	Paper	5.79E-03	0.3%
Others	Glue	9.89E-05	<0.1
Metals	Silicon	6.18E-05	<0.1
Total		**1.73E+00**	**100.0%**

Substance Assessment
The representative product is compliant with the EU-RoHS Directive (2011/65/EU) with exemption and the product contains lead as Substance-of-Very-High-Concern (SVHC) on the Candidate List of the EU-REACH Regulation (1907/2006/EC).

Additional Environmental Information	
Manufacturing	The reference product is assembled at an Eaton plant in United Kingdom, holding management system certifications according to ISO 14001 standards.
Distribution	Eaton is committed to minimizing weight and volume of product and packaging with focus to optimize transport efficiency.
Installation	The installation process does not require any energy consumption and there is no waste other than the obsolete product packaging generated during this step.
Use	The product requires energy consumption during operation.
End of life	The recyclability rate of the overall product is 63.14% if it is properly dismantled prior to shredding. The rate is calculated based on “ECO’DEEE recyclability and recoverability calculation method” (version V1, 20 Sep. 2008 presented to the French Agency for Environment and Energy Management: ADEME).

Environmental Impacts	
The calculation of the environmental impacts is the result of the Product's Life Cycle Analysis in accordance with ISO 14040/44, covering the entire lifecycle, i.e., "Cradle-to-Grave" including the following life cycle phases: production, distribution, installation, use and end of life. System modelling was carried out using the commercial LCA software EIME v6.2.1 with database version CODDE-2024-04. Indicators Set: PEF EF 3.1 (Compliance: PEP ed.4, EN15804+A2) v2	
Manufacturing Phase	The product is assembled as well as packed at Eaton Production International GmbH, United Kingdom, plant. Energy model used: United Kingdom
Distribution Phase	Distribution of the product in its packaging from the Eaton's last logistics platform to the installation place in Europe.
Installation Phase	Product is installed in Europe. Treatment of packaging waste is considered in this phase as per country specific statistics given in PSR. Energy model used: Europe
Use Phase	Reference lifetime: 20 Years Usage profile: The product has power loss of 15 W at full load condition. For industrial and commercial applications under low voltage scenario considering 50% of the loading rate and 30% use time rate, total losses are 197.1 kWh over the 20 years. Product do not require any maintenance/replacement during useful life. Energy Model Used: Europe
End of life Phase	Product disposed with WEEE guidelines. Energy model used: Europe
Module-D	Module D is calculated according to PCR-ed4-EN-2021 09 06 based on the materials recycled and the modelled end-of-life scenario. It expresses the net benefits and loads beyond the boundaries of the system and are not to be included in the life cycle totals.

Environmental Impact Indicators: Mandatory

Mandatory environmental impact indicators	Units	Sum	A1-A3 - Manufacturing	A4 - Distribution	A5 - Installation	B6- Operational Energy Use	C1-C4 - End of life	D - Benefits and loads beyond the system boundaries
Climate change (GWP)	kg CO_2 eq.	8.28E+01	1.04E+01	4.12E-01	3.85E-01	6.95E+01	2.17E+00	-3.24E+00
Climate change-Fossil (GWP-f)	kg CO_2 eq.	8.25E+01	1.04E+01	4.12E-01	1.67E-01	6.93E+01	2.12E+00	-3.34E+00
Climate change-Biogenic (GWP-b)	kg CO_2 eq.	3.45E-01	-5.16E-02	0.00E+00	2.17E-01	1.28E-01	5.14E-02	9.73E-02
Climate change-Land use and land use change (GWP-lu)	kg CO_2 eq.	2.56E-06	1.59E-06	0.00E+00	0.00E+00	0.00E+00	9.75E-07	0.00E+00
Ozone depletion (ODP)	kg eq. CFC-11	8.09E-07	3.90E-07	6.33E-10	3.19E-09	3.37E-07	7.80E-08	-1.86E-07

Mandatory environmental impact indicators	Units	Sum	A1-A3 - Manufacturing	A4 - Distribution	A5 - Installation	B6- Operational Energy Use	C1-C4 - End of life	D - Benefits and loads beyond the system boundaries
Acidification (AP)	mole of H^+ eq.	4.95E-01	1.22E-01	2.62E-03	5.00E-04	3.56E-01	1.41E-02	-4.92E-02
Eutrophication, freshwater (EP-fw)	kg P eq.	3.69E-03	1.79E-03	1.55E-07	2.01E-06	1.83E-04	1.71E-03	-6.91E-06
Eutrophication, marine (EP-m)	kg of N eq.	5.69E-02	1.04E-02	1.23E-03	2.15E-04	4.34E-02	1.76E-03	-2.57E-03
Eutrophication, terrestrial (EP-t)	mole of N eq.	8.49E-01	1.17E-01	1.35E-02	1.48E-03	6.97E-01	2.13E-02	-2.43E-02
Photochemical ozone formation - human health (POCP)	kg of NMVOC eq.	1.87E-01	4.07E-02	3.39E-03	3.48E-04	1.36E-01	6.36E-03	-1.03E-02
Resource use, minerals and metals (ADP-e)	kg eq. Sb	8.87E-04	8.08E-04	1.63E-08	8.69E-09	2.46E-05	5.49E-05	-4.05E-04
Resource use, fossils (ADP-f)	MJ	2.20E+03	3.30E+02	5.76E+00	1.55E+00	1.75E+03	1.12E+02	-1.25E+02
Water use (WDP)	m^3 of eq. deprivation worldwide	1.39E+01	6.64E+00	1.57E-03	2.02E-02	5.32E+00	1.96E+00	-3.06E+00

Inventory Flow Indicators: Mandatory

Inventory flow indicators	Units	Sum	A1-A3 - Manufacturing	A4 - Distribution	A5 - Installation	B6- Operational Energy Use	C1-C4 - End of life	D - Benefits and loads beyond the system boundaries
Use of renewable primary energy, excluding renewable primary energy resources used as raw materials	MJ	4.79E+02	1.26E+01	7.69E-03	3.24E-01	4.64E+02	1.85E+00	-2.26E+00
Use of renewable primary energy resources used as raw materials	MJ	3.27E+00	3.27E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.95E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	4.82E+02	1.58E+01	7.69E-03	3.24E-01	4.64E+02	1.85E+00	-4.20E+00
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials	MJ	2.18E+03	3.09E+02	5.76E+00	1.55E+00	1.75E+03	1.12E+02	-1.19E+02
Use of non-renewable primary energy resources used as raw materials	MJ	2.15E+01	2.15E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-5.93E+00
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	2.20E+03	3.30E+02	5.76E+00	1.55E+00	1.75E+03	1.12E+02	-1.25E+02
Use of secondary materials	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Inventory flow indicators	Units	Sum	A1-A3 - Manufacturing	A4 - Distribution	A5 - Installation	B6- Operational Energy Use	C1-C4 - End of life	D - Benefits and loads beyond the system boundaries
Net use of fresh water	m3	3.27E-01	1.55E-01	3.65E-05	1.13E-03	1.25E-01	4.57E-02	-7.12E-02
Hazardous waste disposed of	kg	5.89E+01	5.42E+01	0.00E+00	9.28E-03	3.05E+00	1.61E+00	-3.15E+01
Non-hazardous waste disposed of	kg	1.65E+01	3.23E+00	1.45E-02	5.63E-02	1.17E+01	1.52E+00	-8.79E-01
Radioactive waste disposed of	kg	3.70E-03	3.37E-04	1.03E-05	9.58E-06	2.69E-03	6.53E-04	-1.75E-04
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	1.75E+00	6.52E-01	0.00E+00	1.13E-01	0.00E+00	9.80E-01	0.00E+00
Materials for energy recovery	kg	4.22E-02	4.61E-05	0.00E+00	1.51E-02	0.00E+00	2.70E-02	0.00E+00
Exported energy	MJ by energy vector	2.57E-04	0.00E+00	0.00E+00	2.57E-04	0.00E+00	0.00E+00	0.00E+00
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	0.00E+00
Biogenic carbon content of the associated packaging	kg of C.	5.69E-02	5.69E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Environmental Impact Indicators: Optional

Optional Environmental impact indicators	Units	Sum	A1-A3 - Manufacturing	A4 - Distribution	A5 - Installation	B6- Operational Energy Use	C1-C4 - End of life	D - Benefits and loads beyond the system boundaries
Emission of fine particles	incidence of diseases	3.75E-06	7.77E-07	2.13E-08	2.95E-09	2.87E-06	8.74E-08	-3.04E-07
Ionizing radiation, human health	kBq of U^{235} eq.	2.26E+02	1.21E+02	1.01E-03	4.76E+00	9.99E+01	2.61E-01	-7.05E+01
Ecotoxicity, fresh water	CTUe	4.01E+02	2.20E+02	2.71E-01	2.19E+00	1.31E+02	4.69E+01	-2.77E+01
Human toxicity, cancer effects	CTUh	2.89E-04	2.89E-04	7.26E-12	1.54E-08	8.74E-09	8.16E-09	-2.47E-04
Human toxicity, non-cancer effects	CTUh	1.62E-06	1.27E-06	1.40E-10	4.85E-10	2.09E-07	1.45E-07	-6.32E-07
Impacts related to land use/soil quality	-	1.07E+01	3.84E+00	0.00E+00	4.43E-04	1.92E+00	4.96E+00	-2.60E-03
Total use of primary energy during the life cycle	MJ	2.68E+03	3.46E+02	5.77E+00	1.87E+00	2.22E+03	1.14E+02	-1.29E+02

B6-Operational Energy Use is energy requirements during the use stage. Other sub modules in the use stage (B1-B5, B7) are equal to zero. So, it is not listed in the table.

To evaluate the environmental impact of other product covered by this PEP, multiply the impact figures by-

Multiplying Factors for Manufacturing, distribution, installation, End of Life and Module-D Phase for Europe:

Product	Phases	GWP (kg CO_2 eq.)	GWP-f (kg CO_2 eq.)	GWP-b (kg CO_2 eq.)	GWP-lu (kg CO_2 eq.)	ODP (kg CFC-11 eq.)	AP (mol H+ eq.)	EP-fw (kg P eq.)	EP-m (kg N eq.)	EP-t (mol N eq.)	POCP (kg NMVOC eq.)	ADP-e (kg Sb eq.)	ADP-f (MJ)	WDP (m^3 eq.)
Y8-1814410 (Reference)	Manufacturing, Distribution, Installation, EoL, Module D	1.00												
Y8-1814408	Manufacturing, Distribution, Installation, EoL, Module D	1.00												
Y8-1814409	Manufacturing, Distribution, Installation, EoL, Module D	1.00												
Y8-1814411	Manufacturing, Distribution, Installation, EoL, Module D	1.00												
Y8-1814412	Manufacturing	1.07	1.06	0.45	1.22	1.25	1.20	1.21	1.04	1.05	1.07	1.25	1.07	1.21
	Distribution	1.07												
	Installation	1.00												
	End of life	1.12	1.11	1.33	1.29	1.12	1.16	1.31	1.13	1.15	1.13	1.32	1.09	1.25
	Module D	1.10	1.09	0.83	1.00	1.29	1.28	1.04	1.10	1.12	1.17	1.28	1.08	1.23
Y8-1814413	Manufacturing	1.07	1.06	0.45	1.22	1.25	1.20	1.21	1.04	1.05	1.07	1.25	1.07	1.21
	Distribution	1.07												
	Installation	1.00												
	End of life	1.12	1.11	1.33	1.29	1.12	1.16	1.31	1.13	1.15	1.13	1.32	1.09	1.25
	Module D	1.10	1.09	0.83	1.00	1.29	1.28	1.04	1.10	1.12	1.17	1.28	1.08	1.23

Multiplying Factors for Use Phase for Europe:

Part No.	Description	Extrapolation Factor for Use Phase
Y8-1814410 (Reference)	DMV-250N/4	1.00
Y8-1814413	DMV-400N/4	2.40
Y8-1814409	DMV-250N/1	1.00
Y8-1814412	DMV-400N/1	2.40
Y8-1814408	DMV-250N/3	0.75
Y8-1814411	DMV-400N/3	1.80

Factors for Manufacturing, Distribution, Installation, End of Life and Module-D phase for different geographical regions

Product	Geographical regions	Phases	GWP (kg CO_2 eq.)	GWP-f (kg CO_2 eq.)	GWP-b (kg CO_2 eq.)	GWP-lu (kg CO_2 eq.)	ODP (kg CFC-11 eq.)	AP (mol H+ eq.)	EP-fw (kg P eq.)	EP-m (kg N eq.)	EP-t (mol N eq.)	POCP (kg NMVOC eq.)	ADP-e (kg Sb eq.)	ADP-f (MJ)	WDP (m^3 eq.)
Y8-1814410 (Reference)	Europe (Reference)	All Phase	1.00												
	United Kingdom	Manufacturing, EoL, Module D	1.00												
		Distribution	0.29												
		Installation	0.99	0.98	1.00	1.00	1.00	0.96	1.00	0.99	1.01	0.98	0.91	0.95	0.99
	Outside Europe	Manufacturing	1.00												
		Distribution	1.34	1.34	1.00	1.00	1.14	7.00	1.23	3.56	3.55	3.63	1.22	1.22	1.17
		Installation	0.67	0.30	0.96	1.00	0.56	0.62	0.02	0.36	0.68	0.62	0.42	0.59	0.10
		End of life	0.37	0.38	0.04	0.00	0.91	0.42	0.00	0.86	0.91	0.68	0.00	0.13	0.04

Factors for use phase for different geographical regions

Product	Geographical regions	ADP-e (kg SB eq.)	ADP-f(MJ)	AP (mol H+ eq.)	EP-fw (kg P eq.)	EP-m (kg N eq.)	EP-t (mol N eq.)	GWP (kg CO2 eq.)	GWP-b (kg CO2 eq.)	GWP-f (kg CO2 eq.)	GWP-lu (kg CO2 eq.)	ODP (kg CFC-11 eq.)	POCP (kg NMVOC eq.)	WDP (m3 eq.)
Y8-1814410 (Reference)	Europe (Reference)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Germany	1.09	0.86	1.50	0.54	1.34	1.39	1.07	0.73	1.07	1.00	1.43	1.35	1.28
	UK	0.79	0.75	0.67	0.79	0.69	1.17	0.71	1.19	0.71	1.00	0.82	0.61	0.66
	Austria	1.65	0.23	0.43	0.01	0.40	0.63	0.37	0.65	0.37	1.00	0.37	0.36	1.10
	Netherlands	0.79	0.77	0.80	0.18	0.95	0.98	1.14	1.33	1.14	1.00	1.01	0.94	0.92
	India	0.60	2.47	5.87	0.16	5.13	3.64	3.93	0.25	3.94	1.00	4.74	5.44	2.69
	Czech Republic	0.45	1.66	2.35	1.77	2.05	1.77	1.59	0.44	1.59	1.00	2.02	2.12	1.20
	Finland	0.73	0.86	0.91	1.59	0.68	1.42	0.39	0.61	0.39	1.00	0.71	0.56	0.54
	Denmark	0.83	0.35	1.16	0.04	0.98	1.66	0.56	0.90	0.56	1.00	1.30	0.86	0.58

Disclaimer
This Product Environmental Profile and its content is based on information available to us. It refers to the product at the date of issue. We make no express or implied representations or warranties with respect to the information contained herein.

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Verifier accreditation Number	VH53	Supplemented by	PSR-0005-ed3.1-EN-2023 08 12
Date of issue	07-2024	*Information and reference documents*	www.pep-ecopassport.org
		Validity period	5 years
Independent verification of the declaration and data, in compliance with ISO 14025: 2006			
Internal	X	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 *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 »			