



NS2 Molded Case Switch with integrated short-circuit protection with integrated short-circuit protection (UL), with or without Box Terminal and STD Technology

Representative product	NS2-250-NA (Y7-102686) Product Category: Switches
Description of the product	Eaton's moeller series NS2 Molded Case Switch with integrated short-circuit protection with integrated short-circuit protection are designed to Establish and cut off the supply of an electrical circuit. These Molded Case Switch with integrated short-circuit protection switches have total 3 poles with current rating up to 250A.
Homogeneous Environmental Families Covered	The PEP concerns following product offerings from Eaton Moeller series NZM switch disconnecter as mentioned below: • Series: NS2 Molded case switch, with integrated short-circuit protection • Rated Current: 160 A, 200 A, 250 A • No. of Poles: 3 • Region: North America • Terminal Type: with or without Box Terminal
Functional unit	'Establish, support and interrupt the rated current 250 A and rated voltage 690 V AC, with rated short-circuit making capacity of 53 kA at 690 V and IP20 degree of protection for an enclosure / cabinet installation, in the Industrial application areas, according to the appropriate use scenario, and for the reference service life of the product of 20 years'
Company information	Eaton Electro Productie s.r.l, Independentei 8, Sarbi, Romania, 437157 Email: productstewardship-es@eaton.com

Constituent Materials			
Reference product mass	2.69E+00 Kg (With packaging)		
Category PEP Material	Material constituent	Mass (kg)	% Contribution
Plastic	Unsaturated Polyester	4.83E-01	18.0%
Metal	Copper	4.78E-01	17.8%
Metal	Steel	4.72E-01	17.6%
Metal	Polycarbonate	4.47E-01	16.7%
Metal	Stainless Steel	2.45E-01	9.1%
Plastic	Polyamide	1.86E-01	6.9%
Other	Cardboard & label	1.20E-01	4.5%
Plastic	Polyethersulfone	1.19E-01	4.4%
Other	Wood	5.83E-02	2.2%
Plastic	Polybutylene terephthalate	2.58E-02	1.0%
Other	Glass Fiber	1.31E-02	0.5%
Metal	Silver	1.14E-02	0.4%
Plastic	Polyphenylene Sulphide	1.06E-02	0.4%
Metal	Bronze	6.20E-03	0.2%
Other	Paper	4.09E-03	0.2%
Other	Miscellaneous	6.20E-03	0.2%
Total		2.69E+00	100.0%

Substance Assessment
The representative product is compliant with the EU-RoHS Directive (2011/65/EU) with exemption and the product does contain Lead and Perfluoro butane sulfonic acid (PFBS) and its salts as substance listed 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 Sarbi, Romania 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 product is assumed to be disposed with 100% incineration without energy recovery.

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 v6.2.4 with database version CODDE-2024-04 (Updated on 2024-06-04). Indicators Set: PEF EF 3.1 (Compliance: PEP ed.4, EN15804+A2) v2.0

Manufacturing Phase	The product is assembled as well as packed at Eaton facility Eaton Electro Productie s.r.l, Independentei 8, Sarbi, Romania plant. Product is then shipped to distribution centre in Rheinbach. Energy model used: Romania
Distribution Phase	Distribution of the product in its packaging from the Eaton's last logistics platform to the installation place in North America, United States is considered as per PSR rules.
Installation Phase	Product is installed in North America, United States. Installation of product and treatment of packaging waste are considered in this phase. There is no energy consumption for reference product.
Use Phase	Reference lifetime: 20 Years Usage profile: The product has power loss of 59.44 W at full load condition. For Industrial applications considering 50% of the loading rate and 30% of the use time rate, total losses are 781.041 kWh over the 20 years. Product do not require any maintenance/replacement during useful life. Industrial application is considered as per section 3.7.2. PSR-0005-ed3.1-EN-2023 12 08. Energy model used: United States
End of life Phase	Product disposed with WEEE guidelines.
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 – total (GWP)	kg CO2 eq.	3.95E+02	1.85E+01	8.57E-01	3.46E-01	3.74E+02	1.08E+00	0.00E+00
Climate change - fossil fuels (GWP-f)	kg CO2 eq.	3.94E+02	1.85E+01	8.57E-01	6.72E-02	3.74E+02	1.08E+00	0.00E+00
Climate change – biogenics (GWP-b)	kg CO2 eq.	8.12E-01	-4.62E-03	0.00E+00	2.78E-01	5.35E-01	3.32E-03	0.00E+00
Climate change - land use and land use transformation (GWP-lu)	kg CO2 eq.	6.21E-04	6.21E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ozone depletion (ODP)	kg eq. CFC-11	3.66E-06	2.08E-06	1.12E-09	2.27E-09	1.48E-06	9.18E-08	0.00E+00
Acidification (AP)	mole of H+ eq.	1.93E+00	1.95E-01	2.84E-02	3.98E-04	1.70E+00	8.17E-03	0.00E+00
Freshwater eutrophication (EP-fw)	kg P eq.	1.94E-03	1.27E-03	2.96E-07	5.26E-08	6.70E-04	1.19E-06	0.00E+00
Marine aquatic eutrophication (EP-m)	kg of N eq.	2.39E-01	1.44E-02	6.77E-03	9.82E-05	2.16E-01	2.09E-03	0.00E+00
Terrestrial eutrophication (EP-t)	mole of N eq.	2.84E+00	1.67E-01	7.42E-02	1.28E-03	2.57E+00	2.74E-02	0.00E+00
Photochemical ozone formation (POCP)	kg of NMVOC eq.	7.99E-01	6.28E-02	1.91E-02	2.77E-04	7.11E-01	5.88E-03	0.00E+00
Depletion of abiotic resources – elements (ADPe)	kg eq. Sb	1.71E-02	1.70E-02	3.08E-08	4.75E-09	5.00E-05	8.70E-08	0.00E+00
Depletion of abiotic resources - fossil fuels (ADP-f)	MJ	8.82E+03	4.61E+02	1.09E+01	1.24E+00	8.33E+03	1.95E+01	0.00E+00

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
Water scarcity (WDP)	m3 of eq.. deprivation worldwide	3.29E+01	1.53E+01	2.84E-03	2.75E-03	1.75E+01	1.01E-01	0.00E+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	9.24E+02	2.09E+01	1.40E-02	9.24E-02	9.02E+02	1.31E+00	0.00E+00
Use of renewable primary energy resources used as raw materials	MJ	3.47E+00	3.47E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	9.28E+02	2.44E+01	1.40E-02	9.24E-02	9.02E+02	1.31E+00	0.00E+00
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials	MJ	8.78E+03	4.26E+02	1.09E+01	1.24E+00	8.33E+03	1.95E+01	0.00E+00
Use of non-renewable primary energy resources used as raw materials	MJ	3.56E+01	3.56E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	8.82E+03	4.61E+02	1.09E+01	1.24E+00	8.33E+03	1.95E+01	0.00E+00
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
Net use of fresh water	m3	7.69E-01	3.57E-01	6.61E-05	1.07E-04	4.09E-01	2.94E-03	0.00E+00
Hazardous waste disposed of	kg	1.47E+02	1.37E+02	0.00E+00	6.77E-02	8.10E+00	1.55E+00	0.00E+00
Non-hazardous waste disposed of	kg	6.41E+01	8.28E+00	2.64E-02	9.54E-03	5.57E+01	1.64E-01	0.00E+00
Radioactive waste disposed of	kg	1.67E-02	3.32E-03	1.83E-05	3.96E-06	1.33E-02	6.72E-05	0.00E+00
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	6.19E-01	6.19E-01	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
Materials for energy recovery	kg	2.36E-03	2.36E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	MJ by energy vector	3.14E-05	3.14E-05	0.00E+00	0.00E+00	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.	7.41E-02	7.41E-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	1.44E-05	1.75E-06	1.51E-07	2.78E-09	1.24E-05	5.53E-08	0.00E+00
Ionizing radiation, human health	kBq of U235 eq.	5.82E+02	2.16E+02	1.79E-03	2.76E-02	3.66E+02	4.06E-01	0.00E+00
Ecotoxicity, fresh water	CTUe	1.42E+03	8.68E+02	5.14E-01	1.55E+00	5.13E+02	3.69E+01	0.00E+00
Human toxicity, cancer effects	CTUh	3.33E-06	3.28E-06	1.29E-11	1.14E-11	4.40E-08	3.45E-10	0.00E+00
Human toxicity, non-cancer effects	CTUh	3.04E-06	1.89E-06	2.84E-10	4.66E-10	1.14E-06	1.46E-08	0.00E+00
Impacts related to land use/soil quality	-	1.21E+01	5.23E+00	0.00E+00	1.28E-03	6.89E+00	3.19E-02	0.00E+00
Total use of primary energy during the life cycle	MJ	9.75E+03	4.86E+02	1.09E+01	1.33E+00	9.23E+03	2.08E+01	0.00E+00

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

Factors for Manufacturing, Distribution, Installation, End-of-Life Phase:

Part Number	Product Description	Extrapolation Factors for Manufacturing, distribution, installation and End of Life phase
Y7-102686 (Reference)	NS2-250-NA (Reference)	1.00
Y7-107578	NS2-160-BT-NA	1.00
Y7-107579	NS2-200-BT-NA	1.00
Y7-107610	NS2-250-BT-NA	1.00
Y7-102684	NS2-160-NA	1.00
Y7-102685	NS2-200-NA	1.00

Multiplying Factors for Use Phase:

Part Number	Product Description	Use Phase Extrapolation Factors
Y7-102686 (Reference)	NS2-250-NA (Reference)	1.00
Y7-107578	NS2-160-BT-NA	0.41
Y7-107579	NS2-200-BT-NA	0.64
Y7-107610	NS2-250-BT-NA	1.00
Y7-102684	NS2-160-NA	0.41
Y7-102685	NS2-200-NA	0.64

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	VH56	Supplemented by	PSR-0005-ed3.1-EN-2023 12 08
Date of issue	11-2024	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 »			