Powering Business Worldwide	**Product Environmental Profile**	PEP ecopassport®

	**PKZM0 Circuit Breaker with Auxiliary Contact**

Representative product	PKZM0-25/NHI11 (Y7-39430) Product Category: Circuit Breakers
Description of the product	Eaton Moeller® series PKZM0 Motor-protective circuit-breaker are designed to provide circuit protection for low-voltage distribution systems. The PKZM0 Motor-protective circuit-breaker comes with pre-assembled standard auxiliary contact as a complete device with assembly-related advantages due to shorter unpacking times and have screw connections.
Homogeneous Environmental Families Covered	The PEP concerns following product offerings from Eaton Moeller series PKZM0 Motor-protective circuit-breaker as mentioned below: • Series: PKZM0 Circuit Breaker • Rated Current: 0.63, 1, 1.6, 2.5, 4, 6.3, 10, 16, 20, 25 A • Types of Auxiliary Contact: NHI11 (Y7-72896) • GVP/SOND: Bulk Packaging information
Functional unit	"Protect the installation from overloads and short circuits in a circuit with rated voltage 690V, rated current 25A, with 3 poles, a rated breaking capacity 3kA at 690V, and IP20 Rating, in the Industrial application area, according to the appropriate use scenario, and during the reference service life of the product of 20 years."
Company information	Eaton Industries GmbH Plant Gladbach, Alteckstraße 48, 56566, Neuwied, Germany Email: productstewardship-es@eaton.com

Constituent Materials			
Reference product mass	3.95E-01 Kg (With packaging)		
Category PEP Material	**Material constituent**	**Mass (kg)**	**% Contribution**
Metals	Steel	1.46E-01	37.0%
Plastics	Polyamide 66 with 25% Glass Fiber	1.13E-01	28.7%
Metals	Copper	3.88E-02	9.8%
Plastics	Polybutylene Terephthalate	3.59E-02	9.1%
Metals	Ferronickel	2.28E-02	5.8%
Other	Carton	1.98E-02	5.0%
Other	Wood	5.83E-03	1.5%
Other	Paper	4.06E-03	1.0%
Plastics	Unsaturated Polyester Resin	2.13E-03	0.5%
Plastics	Liquid Crystal Polymer	1.83E-03	0.5%
Metals	Silver	1.26E-03	0.3%
Metals	Bronze	9.63E-04	0.2%
Other	Labels	5.08E-04	0.1%
Other	Low density polyethylene Film	5.02E-04	0.1%
Plastics	Polyamide 6	4.15E-04	0.1%
Other	Miscellaneous	6.69E-04	0.2%
Total		3.95E-01	100%

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 Gladbach, Germany 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	Recyclability of product is equal to 55**%** based on the method described in IEC/TR 62635, Edition 1.0/2012-10 “Guidelines for end-of-life information provided by manufacturers and recyclers and for recyclability rate calculation of electrical and electronic equipment”.

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 v6.2.5 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 Industries GmbH Plant Gladbach, Alteckstraße 48, 56566, Neuwied, Germany plant. Energy model used: Germany
Distribution Phase	Distribution of the product in its packaging from the Eaton's last logistics platform to the installation place in Europe is considered as per PCR rules.
Installation Phase	Product is installed in Europe. Installation of product and treatment of packaging waste are considered in this phase. There is no energy consumption for reference product. Energy model used: Europe
Use Phase	Reference lifetime: 20 Years Usage profile: The product has power loss of 7.04 W at full load condition. For Industrial applications considering 50% of the loading rate and 30% of the use time rate, total losses are 92505.60 Wh over the 20 years. Product do not require any maintenance/replacement during useful life. Industrial application is considered as per PSR-0005 section 3.2.2. 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 - total (GWP)	kg CO_2 eq.	3.65E+01	3.29E+00	9.41E-02	7.95E-02	3.26E+01	4.59E-01	-1.10E+00
Climate change - fossil fuels (GWP-f)	kg CO_2 eq.	3.64E+01	3.31E+00	9.41E-02	3.53E-02	3.25E+01	4.50E-01	-1.13E+00
Climate change - biogenics (GWP-b)	kg CO_2 eq.	9.13E-02	-2.28E-02	0.00E+00	4.42E-02	6.00E-02	9.93E-03	2.96E-02
Climate change - land use and land use transformation (GWP-lu)	kg CO_2 eq.	6.25E-07	5.43E-07	0.00E+00	0.00E+00	0.00E+00	8.29E-08	-1.13E-07
Ozone depletion (ODP)	kg eq. CFC-11	3.09E-07	1.37E-07	1.45E-10	5.92E-10	1.58E-07	1.34E-08	-4.67E-08

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.	1.95E-01	2.46E-02	5.97E-04	8.64E-05	1.67E-01	2.40E-03	-9.20E-03
Freshwater eutrophication (Ep-fw)	kg P eq.	3.58E-04	1.15E-04	3.54E-08	3.58E-07	8.58E-05	1.57E-04	-3.00E-06
Marine aquatic eutrophication (Ep-m)	kg of N eq.	2.38E-02	2.84E-03	2.80E-04	3.84E-05	2.03E-02	3.41E-04	-1.02E-03
Terrestrial eutrophication (Ep-t)	mole of N eq.	3.66E-01	3.21E-02	3.07E-03	2.57E-04	3.27E-01	3.91E-03	-1.01E-02
Photochemical ozone formation (POCP)	kg of NMVOC eq.	7.74E-02	1.13E-02	7.74E-04	6.33E-05	6.40E-02	1.25E-03	-3.61E-03
Depletion of abiotic resources - elements (ADP-e)	kg eq. Sb	1.85E-03	1.84E-03	3.71E-09	1.51E-09	1.15E-05	4.99E-06	-6.96E-04
Depletion of abiotic resources - fossil fuels (ADP-f)	MJ	9.39E+02	8.72E+01	1.32E+00	2.63E-01	8.23E+02	2.69E+01	-2.64E+01
Water scarcity (WDP)	m^3 eq. deprivation worldwide	5.16E+00	2.38E+00	3.58E-04	3.77E-03	2.50E+00	2.78E-01	-1.03E+00

*Note: The Impacts of phases B1-B5, B7 are Zero (0), Hence not included in the table.

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	2.21E+02	2.76E+00	1.75E-03	5.84E-02	2.18E+02	3.46E-01	-4.99E-01
Use of renewable primary energy resources used as raw materials	MJ	9.16E-01	9.16E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-4.16E-01
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	2.22E+02	3.68E+00	1.75E-03	5.84E-02	2.18E+02	3.46E-01	-9.15E-01
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials	MJ	9.35E+02	8.30E+01	1.32E+00	2.63E-01	8.23E+02	2.69E+01	-2.55E+01

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 non-renewable primary energy resources used as raw materials	MJ	4.13E+00	4.13E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-9.08E-01
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	9.39E+02	8.72E+01	1.32E+00	2.63E-01	8.23E+02	2.69E+01	-2.64E+01
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	m^3	1.21E-01	5.55E-02	8.33E-06	1.97E-04	5.87E-02	6.48E-03	-2.39E-02
Hazardous waste disposed of	kg	1.27E+01	1.09E+01	0.00E+00	1.73E-03	1.43E+00	3.69E-01	-4.55E+00
Non-hazardous waste disposed of	kg	8.91E+00	3.03E+00	3.31E-03	1.36E-02	5.51E+00	3.61E-01	-1.11E+00
Radioactive waste disposed of	kg	2.00E-03	6.10E-04	2.36E-06	1.69E-06	1.26E-03	1.26E-04	-2.34E-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	3.66E-01	1.52E-01	0.00E+00	1.84E-02	0.00E+00	1.96E-01	-3.48E-08
Materials for energy recovery	kg	3.01E-03	0.00E+00	0.00E+00	3.01E-03	0.00E+00	0.00E+00	0.00E+00
Exported energy	MJ by energy vector	3.91E-03	0.00E+00	0.00E+00	2.79E-03	0.00E+00	1.11E-03	0.00E+00
Biogenic carbon content of the product	kg of C.	1.31E-03	1.31E-03	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.	2.05E-02	2.05E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

*Note: The Impacts of phases B1-B5, B7 are Zero (0), Hence not included in the table.

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	1.54E-06	1.77E-07	4.86E-09	5.06E-10	1.34E-06	1.47E-08	-6.60E-08
Ionizing radiation, human health	kBq U^{235} eq.	6.62E+01	1.52E+01	2.30E-04	1.01E+00	4.69E+01	3.14E+00	-7.05E+00
Ecotoxicity, fresh water	CTUe	1.62E+03	1.55E+03	6.17E-02	3.82E-01	6.16E+01	4.98E+00	-6.68E+00
Human toxicity, cancer effects	CTUh	9.22E-08	8.42E-08	1.66E-12	2.57E-09	4.10E-09	1.33E-09	-2.69E-08

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
Human toxicity, non-cancer effects	CTUh	4.67E-07	3.53E-07	3.20E-11	8.57E-11	9.79E-08	1.58E-08	-1.05E-07
Impacts related to land use/soil quality	-	1.62E+00	2.57E-01	0.00E+00	7.80E-05	9.02E-01	4.59E-01	-3.15E-04
Total use of primary energy during the life cycle	MJ	1.16E+03	9.08E+01	1.32E+00	3.21E-01	1.04E+03	2.72E+01	-2.73E+01

*Note: The Impacts of phases B1-B5, B7 are Zero (0), Hence not included in the table.

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

Factors for Manufacturing, Distribution, Installation, Use, End-of-Life, and Module-D Phase:

Part Number	Product Description	Extrapolation Factor for Manufacturing, Distribution, Installation, EoL and Module-D Phase	Extrapolation factor for Use Phase
Y7-39430	PKZM0-25/NHI11 (Reference)	1.00	1.00
Y7-39431	PKZM0-0,63/NHI11	1.00	0.73
Y7-39428	PKZM0-1,6/NHI11	1.00	0.76
Y7-39438	PKZM0-1,6/NHI11-GVP	1.00	0.76
Y7-39429	PKZM0-1/NHI11	1.00	0.76
Y7-39439	PKZM0-1/NHI11-GVP	1.00	0.76
Y7-39424	PKZM0-10/NHI11	1.00	0.92
Y7-39434	PKZM0-10/NHI11-GVP	1.00	0.92
Y7-267394	PKZM0-10/NHI11-SOND519-GVP	1.00	0.92
Y7-39423	PKZM0-16/NHI11	1.00	0.91
Y7-39433	PKZM0-16/NHI11-GVP	1.00	0.91
Y7-39427	PKZM0-2,5/NHI11	1.00	0.73
Y7-39437	PKZM0-2,5/NHI11-GVP	1.00	0.73
Y7-39422	PKZM0-20/NHI11	1.00	0.83
Y7-39432	PKZM0-20/NHI11-GVP	1.00	0.83
Y7-39440	PKZM0-25/NHI11-GVP	1.00	1.00
Y7-39426	PKZM0-4/NHI11	1.00	0.76
Y7-39436	PKZM0-4/NHI11-GVP	1.00	0.76
Y7-267392	PKZM0-4/NHI11-SOND519-GVP	1.00	0.76
Y7-39425	PKZM0-6,3/NHI11	1.00	0.81
Y7-39435	PKZM0-6,3/NHI11-GVP	1.00	0.81
Y7-267393	PKZM0-6,3/NHI11-SOND519-GVP	1.00	0.81

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Verifier accreditation Number	VH56	Supplemented by	PSR-0005-ed3.1-EN-2023 12 08
Date of issue	04-2025	*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: 2010 « Environmental labels and declarations. Type III environmental declarations »			