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

	**PKZM0 Motor-protective Circuit Breaker**

Representative product	PKZM0-32 (Y7-278489) 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 turn button 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: 0.16, 0.25, 0.4, 0.63, 1, 1.6, 2.5, 4, 6.3, 10, 12, 16, 20, 25, 32A • GVP2, SOND524, EA, T: Packaging Information
Functional unit	“Protect the installation from overloads and short circuits in a circuit with rated voltage 690V, rated current 32A, with 3 poles, a rated breaking capacity 3kA at 690V AC, 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	3.68E-01 Kg (With packaging)		
Category PEP Material	**Material constituent**	**Mass (kg)**	**% Contribution**
Metals	Steel	1.47E-01	40.0%
Plastics	Polyamide 66 with 25% Glass Fiber	9.06E-02	24.6%
Metals	Copper	3.95E-02	10.7%
Plastics	Polybutylene Terephthalate	3.59E-02	9.8%
Other	Carton	2.18E-02	5.9%
Metals	Ferronickel	1.86E-02	5.0%
Other	Wood	5.00E-03	1.4%
Metals	Silver	2.39E-03	0.6%
Plastics	Unsaturated Polyester Resin	2.13E-03	0.6%
Plastics	Liquid Crystal Polymer	1.83E-03	0.5%
Other	Paper	1.03E-03	0.3%
Other	Label	5.08E-04	0.1%
Plastics	Polyethylene Low Density	5.02E-04	0.1%
Plastics	Polyamide 6	4.15E-04	0.1%
Plastics	Polyetherimide Resin	3.35E-04	<0.1%
Other	Miscellaneous	3.34E-04	<0.1%
Total		3.68E-01	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 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	The recyclability rate of the overall product is 51% 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 v6.2.5 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 9.56 W at full load condition. For Industrial applications considering 50% of the loading rate and 30% of the use time rate, total losses are 125618.40 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.	4.80E+01	3.12E+00	8.77E-02	8.11E-02	4.43E+01	4.43E-01	-1.18E+00
Climate change - fossil fuels (GWP-f)	kg CO_2 eq.	4.79E+01	3.14E+00	8.77E-02	3.65E-02	4.42E+01	4.37E-01	-1.21E+00
Climate change - biogenics (GWP-b)	kg CO_2 eq.	1.12E-01	-2.03E-02	0.00E+00	4.46E-02	8.15E-02	6.57E-03	2.73E-02
Climate change - land use and land use transformation (GWP-lu)	kg CO_2 eq.	6.20E-07	5.39E-07	0.00E+00	0.00E+00	0.00E+00	8.04E-08	-1.13E-07
Ozone depletion (ODP)	kg eq. CFC-11	3.75E-07	1.48E-07	1.35E-10	3.91E-10	2.15E-07	1.17E-08	-1.05E-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.	2.54E-01	2.42E-02	5.56E-04	8.46E-05	2.27E-01	2.29E-03	-1.09E-02
Freshwater eutrophication (Ep-fw)	kg P eq.	3.79E-04	1.07E-04	3.29E-08	3.80E-07	1.17E-04	1.55E-04	-1.27E-05
Marine aquatic eutrophication (Ep-m)	kg of N eq.	3.09E-02	2.68E-03	2.61E-04	4.03E-05	2.76E-02	3.26E-04	-1.07E-03
Terrestrial eutrophication (Ep-t)	mole of N eq.	4.81E-01	3.04E-02	2.86E-03	2.63E-04	4.44E-01	3.75E-03	-1.21E-02
Photochemical ozone formation (POCP)	kg of NMVOC eq.	9.98E-02	1.08E-02	7.21E-04	6.37E-05	8.70E-02	1.21E-03	-4.44E-03
Depletion of abiotic resources - elements (ADP-e)	kg eq. Sb	2.69E-03	2.67E-03	3.46E-09	1.23E-09	1.57E-05	4.93E-06	-4.21E-03
Depletion of abiotic resources - fossil fuels (ADP-f)	MJ	1.23E+03	8.49E+01	1.22E+00	2.69E-01	1.12E+03	2.68E+01	-2.77E+01
Water scarcity (WDP)	m^3 eq. deprivation worldwide	5.55E+00	1.88E+00	3.33E-04	2.22E-03	3.39E+00	2.73E-01	-7.75E-01

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	2.99E+02	2.73E+00	1.63E-03	3.57E-02	2.96E+02	2.73E-01	-1.03E+00
Use of renewable primary energy resources used as raw materials	MJ	8.88E-01	8.88E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-3.98E-01
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	3.00E+02	3.62E+00	1.63E-03	3.57E-02	2.96E+02	2.73E-01	-1.43E+00
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials	MJ	1.23E+03	8.13E+01	1.22E+00	2.69E-01	1.12E+03	2.68E+01	-2.69E+01
Use of non-renewable primary energy resources used as raw materials	MJ	3.57E+00	3.57E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-7.94E-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
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	1.23E+03	8.49E+01	1.22E+00	2.69E-01	1.12E+03	2.68E+01	-2.77E+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	1.30E-01	4.39E-02	7.76E-06	1.72E-04	7.97E-02	6.36E-03	-1.80E-02
Hazardous waste disposed of	kg	1.51E+01	1.29E+01	0.00E+00	1.65E-03	1.94E+00	3.42E-01	-1.25E+01
Non-hazardous waste disposed of	kg	1.05E+01	2.70E+00	3.08E-03	1.36E-02	7.48E+00	3.11E-01	-1.06E+00
Radioactive waste disposed of	kg	2.47E-03	6.36E-04	2.19E-06	1.80E-06	1.72E-03	1.09E-04	-2.98E-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	3.58E-01	1.51E-01	0.00E+00	1.93E-02	0.00E+00	1.87E-01	-3.48E-08
Materials for energy recovery	kg	2.62E-03	0.00E+00	0.00E+00	2.62E-03	0.00E+00	0.00E+00	0.00E+00
Exported energy	MJ by energy vector	3.29E-03	0.00E+00	0.00E+00	2.33E-03	0.00E+00	9.62E-04	0.00E+00
Biogenic carbon content of the product	kg of C.	4.40E-04	4.40E-04	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.	2.06E-02	2.06E-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	2.02E-06	1.77E-07	4.52E-09	4.99E-10	1.83E-06	1.38E-08	-8.48E-08
Ionizing radiation, human health	kBq U^{235} eq.	8.01E+01	1.53E+01	2.14E-04	3.57E-03	6.36E+01	1.08E+00	-6.25E+00
Ecotoxicity, fresh water	CTUe	1.33E+03	1.25E+03	5.75E-02	4.08E-01	8.36E+01	4.97E+00	-2.92E+02
Human toxicity, cancer effects	CTUh	1.21E-07	1.12E-07	1.54E-12	2.82E-09	5.57E-09	1.12E-09	-1.53E-07
Human toxicity, non-cancer effects	CTUh	4.74E-07	3.25E-07	2.98E-11	9.01E-11	1.33E-07	1.55E-08	-1.44E-07
Impacts related to land use/soil quality	-	1.93E+00	2.49E-01	0.00E+00	8.04E-05	1.23E+00	4.58E-01	-3.15E-04

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
Total use of primary energy during the life cycle	MJ	1.53E+03	8.85E+01	1.23E+00	3.05E-01	1.41E+03	2.70E+01	-2.92E+01

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 All Phase Except Use Phase	Extrapolation factor for Use Phase
Y7-278489	PKZM0-32 (Reference)	1.00	1.00
Y7-189894	PKZM0-0,16-EA	1.00	0.56
Y7-72730	PKZM0-0,16	1.00	0.56
Y7-88907	PKZM0-0,16-T	1.00	0.56
Y7-189895	PKZM0-0,25-EA	1.00	0.54
Y7-72731	PKZM0-0,25	1.00	0.54
Y7-88908	PKZM0-0,25-T	1.00	0.54
Y7-202740	PKZM0-0,4-GVP2	1.00	0.55
Y7-189896	PKZM0-0,4-EA	1.00	0.55
Y7-72732	PKZM0-0,4	1.00	0.55
Y7-88909	PKZM0-0,4-T	1.00	0.55
Y7-281002	PKZM0-0,4-SOND524	1.00	0.55
Y7-202741	PKZM0-0,63-GVP2	1.00	0.54
Y7-189897	PKZM0-0,63-EA	1.00	0.54
Y7-72733	PKZM0-0,63	1.00	0.54
Y7-88910	PKZM0-0,63-T	1.00	0.54
Y7-202743	PKZM0-1-GVP2	1.00	0.56
Y7-88911	PKZM0-1-T	1.00	0.56
Y7-189898	PKZM0-1-EA	1.00	0.56
Y7-72734	PKZM0-1	1.00	0.56
Y7-281003	PKZM0-1-SOND524	1.00	0.56
Y7-202742	PKZM0-1,6-GVP2	1.00	0.56
Y7-189899	PKZM0-1,6-EA	1.00	0.56
Y7-72735	PKZM0-1,6	1.00	0.56
Y7-88912	PKZM0-1,6-T	1.00	0.56
Y7-202746	PKZM0-2,5-GVP2	1.00	0.54
Y7-88913	PKZM0-2,5-T	1.00	0.54
Y7-189900	PKZM0-2,5-EA	1.00	0.54
Y7-72736	PKZM0-2,5	1.00	0.54
Y7-202749	PKZM0-4-GVP2	1.00	0.56
Y7-189901	PKZM0-4-EA	1.00	0.56

Part Number	Product Description	Extrapolation Factor for All Phase Except Use Phase	Extrapolation factor for Use Phase
Y7-72737	PKZM0-4	1.00	0.56
Y7-88914	PKZM0-4-T	1.00	0.56
Y7-202750	PKZM0-6,3-GVP2	1.00	0.59
Y7-189902	PKZM0-6,3-EA	1.00	0.59
Y7-72738	PKZM0-6,3	1.00	0.59
Y7-190055	PKZM0-6,3-T-SOND542	1.00	0.59
Y7-88915	PKZM0-6,3-T	1.00	0.59
Y7-202744	PKZM0-10-GVP2	1.00	0.68
Y7-88916	PKZM0-10-T	1.00	0.68
Y7-189903	PKZM0-10-EA	1.00	0.68
Y7-72739	PKZM0-10	1.00	0.68
Y7-278492	PKZM0-12-T	1.00	0.69
Y7-189904	PKZM0-12-EA	1.00	0.69
Y7-278486	PKZM0-12	1.00	0.69
Y7-200524	PKZM0-16-GVP	1.00	0.67
Y7-202745	PKZM0-16-GVP2	1.00	0.67
Y7-189905	PKZM0-16-EA	1.00	0.67
Y7-46938	PKZM0-16	1.00	0.67
Y7-88917	PKZM0-16-T	1.00	0.67
Y7-202747	PKZM0-20-GVP2	1.00	0.61
Y7-88918	PKZM0-20-T	1.00	0.61
Y7-189906	PKZM0-20-EA	1.00	0.61
Y7-46988	PKZM0-20	1.00	0.61
Y7-278493	PKZM0-25-T	1.00	0.74
Y7-189869	PKZM0-25-EA	1.00	0.74
Y7-46989	PKZM0-25	1.00	0.74
Y7-202748	PKZM0-25-GVP2	1.00	0.74
Y7-180802	PKZM0-32-GVP2	1.00	1.00
Y7-125811	PKZM0-32-SOND530	1.00	1.00
Y7-189870	PKZM0-32-EA	1.00	1.00
Y7-178985	WISKA-MCCB-25KA-20A	1.00	0.61
Y7-107936	WISKA-MCCB-10KA	1.00	1.00
Y7-107937	WISKA-MCCB-25KA	1.00	1.00

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Verifier accreditation Number	VH56	Supplemented by	PSR-0005-ed3.1-EN-2023 08 12
Date of issue	05-2025	*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: 2006 « Environmental labels and declarations. Type III environmental declarations »			