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

	**M22 Complete device without enclosure**

Representative product	M22-PV-K02 (Y7-190929) Product Category: Switches
Description of the product	Eaton Moeller series M22 Complete device without enclosure is designed to establish and cut off the supply of an electrical circuit.
Homogeneous Environmental Families Covered	The PEP concerns following product offerings from Eaton Moeller series M22 Complete device without enclosure as mentioned below: Standard Contacts with 500 V / 6 A: Y7-190929 M22-PV-K02(Reference); Y7-132624 M22-PVT-K01-BVP; Y7-216515 M22-PV/K01; Y7-110938 M22-PV-K01-BVP; Y7-216516 M22-PV/K11; Y7-216514 M22-PVS/K01 Flat rear contacts with 250 V / 4 A: Y7-199732 M22-PV30/FK02; Y7-199750 M22-PVT30/FK02; Y7-199731 M22-PV30/FK12; Y7-199749 M22-PVT30/FK12
Functional unit	'Establish, support and interrupt the rated current 6A AC and rated voltage 500V AC, with rated making capacity of 6A and rated current in continuous operation 10A for an enclosure 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 INDUSTRIES GMB Kompetenzzentrum Baederstrasse, Holzhausen, Germany, 56357 Email: productstewardship-es@eaton.com

Constituent Materials			
Reference product mass	8.71E-02 Kg (With packaging)		
Category PEP Material	**Material constituent**	**Mass (kg)**	**% Contribution**
Plastics	Polyamide 66 GF30	4.67E-02	53.6%
Other	Wood	7.00E-03	8.0%
Metals	Stainless Steel	6.03E-03	6.9%
Other	Cardboard	5.94E-03	6.8%
Plastics	Low density Polyethylene	5.74E-03	6.6%
Other	Paper	5.00E-03	5.7%
Metals	Steel	4.22E-03	4.8%
Metals	Brass	2.99E-03	3.4%
Plastics	Polyamide 6	1.96E-03	2.2%
Metals	Bronze	7.77E-04	0.9%
Plastics	Polyamide 6 GF30	6.57E-04	0.8%
Metals	Silver	1.47E-04	0.2%
Total		8.71E-02	100.0%

Substance Assessment
The representative product is compliant with the EU-RoHS Directive (2011/65/EU) and the product doesn't contain any 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 in Holzhausen, 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 27.5% if it is properly dismantled prior to shredding. The rate is calculated based on "WEEE 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 v6.2.5-3 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 INDUSTRIES GMB Kompetenzzentrum Baederstrasse, Holzhausen, 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 0.11 W at full load condition. For non-continuous operation considering 30% of the loading rate and 30% of the use time rate, total losses are 1.445 kWh over the 20 years. Product do not require any maintenance/replacement during useful life. non-continuous operation is considered as per PSR-0005 section 3.15.2.1. 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 CO2 eq.	1.19E+00	5.59E-01	2.08E-02	4.95E-02	5.09E-01	4.95E-02	-4.70E-02
Climate change - fossil fuels (GWP-f)	kg CO2 eq.	1.18E+00	5.81E-01	2.08E-02	2.12E-02	5.09E-01	4.92E-02	-6.29E-02
Climate change – biogenics (GWP-b)	kg CO2 eq.	7.45E-03	-2.21E-02	0.00E+00	2.83E-02	9.38E-04	3.35E-04	1.59E-02
Climate change - land use and land use transformation (GWP-lu)	kg CO2 eq.	2.17E-08	6.99E-09	0.00E+00	0.00E+00	0.00E+00	1.47E-08	0.00E+00
Ozone depletion (ODP)	kg eq. CFC-11	2.93E-08	2.44E-08	3.19E-11	2.59E-10	2.47E-09	2.10E-09	-1.23E-08
Acidification (AP)	mole of H+ eq.	6.40E-03	3.31E-03	1.32E-04	5.83E-05	2.61E-03	2.97E-04	-5.57E-04
Freshwater eutrophication (EP-fw)	kg P eq.	2.92E-05	1.08E-05	7.80E-09	2.54E-07	1.34E-06	1.68E-05	-5.37E-07
Marine aquatic eutrophication (EP-m)	kg of N eq.	1.18E-03	7.17E-04	6.17E-05	2.10E-05	3.18E-04	6.04E-05	-5.28E-05
Terrestrial eutrophication (EP-t)	mole of N eq.	1.18E-02	5.05E-03	6.77E-04	1.78E-04	5.11E-03	7.44E-04	-5.57E-04
Photochemical ozone formation (POCP)	kg of NMVOC eq.	2.86E-03	1.46E-03	1.71E-04	4.24E-05	1.00E-03	1.92E-04	-2.09E-04
Depletion of abiotic resources – elements (ADPe)	kg eq. Sb	2.00E-04	1.99E-04	8.18E-10	8.30E-10	1.80E-07	5.09E-07	-8.16E-05
Depletion of abiotic resources - fossil fuels (ADP-f)	MJ	2.67E+01	1.12E+01	2.90E-01	1.84E-01	1.29E+01	2.12E+00	-1.29E+00
Water scarcity (WDP)	m3 of eq. deprivation worldwide	6.81E-01	6.22E-01	7.89E-05	1.26E-03	3.90E-02	1.84E-02	-1.70E-01

*Only B6 (Energy Consumption) is taken into account, the other sub-modules of the use phase (B1-B5, B7) are zero.

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	3.78E+00	3.00E-01	3.87E-04	5.47E-02	3.40E+00	2.58E-02	-2.91E-03
Use of renewable primary energy resources used as raw materials	MJ	4.66E-01	4.66E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.94E-01
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	4.25E+00	7.66E-01	3.87E-04	5.47E-02	3.40E+00	2.58E-02	-1.97E-01
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials	MJ	2.53E+01	9.80E+00	2.90E-01	1.84E-01	1.29E+01	2.12E+00	-1.18E+00
Use of non-renewable primary energy resources used as raw materials	MJ	1.44E+00	1.44E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.08E-01
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	2.67E+01	1.12E+01	2.90E-01	1.84E-01	1.29E+01	2.12E+00	-1.29E+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	1.60E-02	1.45E-02	1.84E-06	8.62E-05	9.17E-04	4.37E-04	-3.97E-03
Hazardous waste disposed of	kg	1.37E+00	1.27E+00	0.00E+00	2.29E-03	2.23E-02	7.91E-02	-5.74E-01
Non-hazardous waste disposed of	kg	1.99E-01	8.35E-02	7.30E-04	9.65E-03	8.60E-02	1.93E-02	-1.42E-02
Radioactive waste disposed of	kg	4.38E-05	1.97E-05	5.20E-07	1.22E-06	1.97E-05	2.62E-06	-7.87E-06
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	3.61E-02	1.21E-02	0.00E+00	1.34E-02	0.00E+00	1.06E-02	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	MJ by energy vector	3.30E-03	4.18E-04	0.00E+00	2.88E-03	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.	1.09E-02	1.09E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

*Only B6 (Energy Consumption) is taken into account, the other sub-modules of the use phase (B1-B5, B7) are zero.

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	5.26E-08	2.82E-08	1.07E-09	3.63E-10	2.10E-08	1.96E-09	-8.42E-09
Ionizing radiation, human health	kBq of U235 eq.	1.61E+00	8.70E-01	5.06E-05	3.66E-03	7.32E-01	7.99E-03	-4.21E-01

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
Ecotoxicity, fresh water	CTUe	5.51E+01	5.33E+01	1.36E-02	2.17E-01	9.62E-01	6.33E-01	-5.63E-01
Human toxicity, cancer effects	CTUh	2.34E-05	2.34E-05	3.65E-13	1.31E-09	6.41E-11	2.29E-11	-6.06E-08
Human toxicity, non-cancer effects	CTUh	2.24E-08	1.92E-08	7.07E-12	5.58E-11	1.53E-09	1.58E-09	-7.44E-09
Impacts related to land use/soil quality	-	6.78E-02	1.79E-02	0.00E+00	6.62E-05	1.41E-02	3.56E-02	-1.78E-03
Total use of primary energy during the life cycle	MJ	3.10E+01	1.20E+01	2.90E-01	2.39E-01	1.63E+01	2.15E+00	-1.49E+00

*Only B6 (Energy Consumption) is taken into account, the other sub-modules of the use phase (B1-B5, B7) are zero.

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, and Module-D Phase:

Part Number	Product Description	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.)
Y7-190929 (Reference)	M22-PV-K02 (Reference)	All Phases except Use Phase	1.00												
Y7-199731	M22-PV30/FK12	All Phases except Use Phase	1.00												
Y7-199749	M22-PVT30/FK12	All Phases except Use Phase	1.00												
Y7-216516	M22-PV/K11	All Phases except Use Phase	1.00												
Y7-216514	M22-PVS/K01	All Phases except Use Phase	1.00												
Y7-110938	M22-PV-K01-BVP	Manufacturing	0.92	0.92	0.71	0.00	0.40	0.73	0.23	0.95	0.88	0.84	0.02	0.90	0.43
		Distribution	0.03	0.03	1.00	1.00	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
		Installation	0.72	0.74	0.70	1.00	0.79	0.76	0.65	0.69	0.76	0.76	0.73	0.76	0.63
		End of Life	0.70	0.71	0.16	0.01	0.88	0.67	0.03	0.79	0.80	0.77	0.00	0.66	0.38
		Module D	0.46	0.51	0.64	1.00	0.44	0.27	0.46	0.44	0.45	0.45	0.02	0.59	0.12
Y7-199750	M22-PVT30/FK02	Manufacturing	0.92	0.92	0.71	0.00	0.40	0.73	0.23	0.95	0.88	0.84	0.02	0.90	0.43
		Distribution	0.03	0.03	1.00	1.00	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
		Installation	0.72	0.74	0.70	1.00	0.79	0.76	0.65	0.69	0.76	0.76	0.73	0.76	0.63
		End of Life	0.70	0.71	0.16	0.01	0.88	0.67	0.03	0.79	0.80	0.77	0.00	0.66	0.38
		Module D	0.46	0.51	0.64	1.00	0.44	0.27	0.46	0.44	0.45	0.45	0.02	0.59	0.12
Y7-199732	M22-PV30/FK02	Manufacturing	0.92	0.92	0.71	0.00	0.40	0.73	0.23	0.95	0.88	0.84	0.02	0.90	0.43
		Distribution	0.03	0.03	1.00	1.00	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
		Installation	0.72	0.74	0.70	1.00	0.79	0.76	0.65	0.69	0.76	0.76	0.73	0.76	0.63
		End of Life	0.70	0.71	0.16	0.01	0.88	0.67	0.03	0.79	0.80	0.77	0.00	0.66	0.38
		Module D	0.46	0.51	0.64	1.00	0.44	0.27	0.46	0.44	0.45	0.45	0.02	0.59	0.12
Y7-216515	M22-PV/K01	Manufacturing	0.77	0.77	0.77	0.50	0.55	0.70	0.59	0.78	0.75	0.73	0.48	0.74	0.63
		Distribution	0.72	0.72	1.00	1.00	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
		Installation	0.74	0.72	0.76	1.00	0.74	0.73	0.79	0.83	0.75	0.74	0.77	0.74	0.87
		End of Life	0.68	0.68	0.55	0.50	0.77	0.69	0.51	0.73	0.73	0.71	0.50	0.63	0.58

Part Number	Product Description	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.)
		Module D	0.52	0.62	0.90	1.00	0.53	0.57	0.55	0.68	0.65	0.60	0.50	0.58	0.51
Y7-132624	M22-PVT-K01-BVP	Manufacturing	0.77	0.77	0.77	0.50	0.55	0.70	0.59	0.78	0.75	0.73	0.48	0.74	0.63
		Distribution	0.72	0.72	1.00	1.00	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
		Installation	0.74	0.72	0.76	1.00	0.74	0.73	0.79	0.83	0.75	0.74	0.77	0.74	0.87
		End of Life	0.68	0.68	0.55	0.50	0.77	0.69	0.51	0.73	0.73	0.71	0.50	0.63	0.58
		Module D	0.52	0.62	0.90	1.00	0.53	0.57	0.55	0.68	0.65	0.60	0.50	0.58	0.51

Multiplying Factors for Use Phase for homogenous products:

Part Number	Product Description	Use Phase Extrapolation Factors
Y7-190929 (Reference)	M22-PV-K02 (Reference)	1.00
Y7-132624	M22-PVT-K01-BVP	1.00
Y7-216515	M22-PV/K01	1.00
Y7-199732	M22-PV30/FK02	1.00
Y7-199750	M22-PVT30/FK02	1.00
Y7-110938	M22-PV-K01-BVP	1.00
Y7-199731	M22-PV30/FK12	1.00
Y7-199749	M22-PVT30/FK12	1.00
Y7-216516	M22-PV/K11	1.00

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.

Registration Number	EATO-00304-V01.01-EN	*Drafting rules*	PCR-ed4-EN-2021 09 06
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: 2006 « Environmental labels and declarations. Type III environmental declarations »			