

 <i>Powering Business Worldwide</i>	Product Environmental Profile	
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	Single phase Uninterruptible Power Supply (UPS) with energy storage system (UPS 9PX 3kVA with 1EBM)
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Eaton UPS product	9PX 3kVA with 1 EBM
Representative product catalog number	9PX3000IRT2U for UPS and 9PXEbm72RT2U for EBM
Description of the product	The Eaton 9 series of UPS are more powerful solution in a compact footprint for users who have relatively continuous power requirements in clinics & hospitals, financial institutions, businesses, and other sites in need of an emergency power supply system. Eaton 9 series UPS is offered for both rack and stand-alone installations. Both 9PX series UPS have power ratings of 3kVA and 2.2 kVA with low and high voltage options and up to four optional external battery modules.
Homogeneous Environmental Families Covered	The PEP covers 3 KVA & 2.2 KVA 9PX offerings in single phase UPS excluding and including external battery modules (EBMs) (up to 4 EBMs) i.e. (3KVA UPS+1EBM, 3KVA UPS+2EBM, 3KVA UPS+3EBM, 3KVA UPS+4EBM, 3KVA UPS without EBM, 2.2KVA UPS+1EBM, 2.2KVA UPS+2EBM, 2.2KVA UPS+3EBM, 2.2KVA UPS+4EBM, 2.2KVA UPS without EBM)
Functional unit	To protect the load of 3000 Watts against input power failure for 8 years and provide a backup time of 20 minutes in case of a power outage
Company information	Eaton Electrical Ltd. No.4 Liu Fang Rd., Block 67 Baoan, Shenzhen, China Email: productstewardship-es@eaton.com

Constituent Materials			
Reference product mass	8.33E+01 kg (with unit packaging)		
Category PEP Material	Materials	Masse (kg)	Percentage (%)
Metals	Lead	3.51E+01	42.06%
Metals	Steel	1.71E+01	20.50%
Other	Sulfuric Acid	5.80E+00	6.96%
Plastics	Acrylonitrile Butadiene Styrene (ABS)	5.09E+00	6.10%
Other	Corrugated Cardboard	4.98E+00	5.98%
Other	Wood Pellet	3.64E+00	4.36%
Metals	Copper	1.81E+00	2.18%
Plastics	Polyethylene Low Density (PELD)	1.18E+00	1.41%
Metals	Aluminium	1.07E+00	1.29%
Plastics	Polyvinylchloride (PVC)	1.07E+00	1.29%
Plastics	Rigid Polyurethane (PU) Foam	7.38E-01	0.88%
Plastics	Polystyrene Expandable Granulate (EPS);	6.56E-01	0.79%
Plastics	Epoxy Resin	6.42E-01	0.77%
Metals	Ferrites	5.45E-01	0.65%
Other	Miscellaneous	3.98E+00	4.78%
Total		8.33E+01	100.00%

Substance Assessment

The representative product is compliant with the EU-RoHS Directive (2011/65/EU) by application of exemptions and the product contains lead (Pb) which is 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 Eaton plant holding management system certifications according to ISO9001 & 14001 standards.
Distribution	Eaton is committed to minimizing weight and volume of product and packaging with focus to optimize transport efficiency. Transport from last logistics platform (Shenzhen, China) to the distributor (Rheinbach, Germany) and from the distributor to the installation place (end user) should be considered in Distribution phase
Installation	Product needs standard tools which do not require any additional energy source. Waste generated due to packaging (primary + secondary) is handled in this step.

Use	The reference product comprises of the UPS and an external battery module (EBM) for extended run time. The batteries used in EBM and UPS needs to be replaced as per PSR rules. Following operations and materials are considered as a part of the impact assessment - Replacement of parts – manufacturing and delivery to the site of use of PSDR PCBs, battery of EBM, and fans - Waste collection and treatment of replaced components.
End of life	The reference product End-of-life is modelled based on the scenario recommended by the Eco'DEEE method. This product was designed to comply with the following recycling directives/standards: Directive 2012/19/EU (WEEE directive), Directive 2004/12/EC (Packaging directive) Directive 2013/56/EU (Batteries directive) Recyclability of product is equal to 67.66% 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 environmental impacts is the result of a Product Life Cycle Analysis in accordance with ISO 14040/44, covering the entire product lifecycle, i.e. "from 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 v5.9.3 with database version CODDE-2022-01.														
Manufacturing Phase	The product is manufactured at Eaton Shenzhen, China plant. Energy model used: China													
Distribution Phase	Distribution of the product in its packaging from the manufacturer's last logistics platform to the installation place is considered as per PCR rules.													
Installation Phase	Product installed in Europe. Packaging waste treatment is considered in this phase. <u>Energy model used</u> Europe													
Use Phase	<u>Reference lifetime:</u> 08 Years													
	<u>Energy model used</u> : Europe													
	<u>Usage profile</u> : The product has an average energy efficiency of 92.8%. The methodology for the calculation of the electricity consumption is based on Uninterruptible Power Supplies (UPSs) PSR.													
	<table><tr><td>Operating loads</td><td>25%</td><td>50%</td><td>75%</td><td>100%</td></tr><tr><td>Proportion of Time spent at</td><td>0</td><td>0.3</td><td>0.4</td><td>0.3</td></tr></table>					Operating loads	25%	50%	75%	100%	Proportion of Time spent at	0	0.3	0.4
Operating loads	25%	50%	75%	100%										
Proportion of Time spent at	0	0.3	0.4	0.3										
End of life Phase	Total energy losses are 10883 kWh over the 08 years.													
	Maintenance is required for Battery (both in UPS & EBM), AC/DC capacitors, Fans & PCB													
	Battery: Waste treatment by Pyrometallurgical process Product disposed with WEEE guidelines <u>Energy model used</u> Europe													

Environmental Impact Indicators: Mandatory

Impact Indicators	Unit	Total	Manufacturing	Distribution	Installation	Use* (B2 – Maintenance)	Use* (B6 - Energy requirements during the use stage)	End of life
Global warming (GWP100)	kg CO ₂ eq.	5.19E+03	4.60E+02	3.23E+01	1.95E+00	3.21E+02	4.30E+03	6.91E+01
Ozone layer depletion	kg CFC-11 eq.	1.52E-04	6.06E-05	5.66E-08	3.63E-08	6.26E-05	1.70E-05	1.18E-05
Acidification potential	kg SO ₂ eq.	9.65E+00	7.75E-01	8.14E-01	7.81E-03	4.68E-01	7.52E+00	6.07E-02
Eutrophication	kg PO ₄ ³⁻ eq.	1.82E+00	1.75E-01	8.27E-02	6.56E-03	1.39E-01	1.39E+00	2.72E-02
Photochemical oxidation	kg ethylene eq.	7.82E-01	7.86E-02	4.08E-02	5.92E-04	5.13E-02	5.92E-01	1.92E-02
Abiotic depletion (elements)	kg antimony eq.	4.36E-01	2.26E-01	1.18E-06	1.12E-07	2.09E-01	4.43E-04	1.18E-06
Abiotic depletion (fossil fuels)	MJ	7.69E+04	5.28E+03	4.16E+02	2.14E+01	3.56E+03	6.70E+04	6.32E+02
Water Pollution	m ³	3.93E+05	9.89E+04	4.87E+03	2.50E+02	1.11E+05	1.52E+05	2.59E+04
Air pollution	m ³	6.42E+05	1.79E+05	4.02E+03	1.87E+02	1.53E+05	2.97E+05	7.37E+03

*Other sub modules in the use stage (B1,B3-B5, B7) are equal to 0, that's why they are not listed in the table

Environmental Impact Indicators: Optional

Impact Indicators	Unit	Total	Manufacturing	Distribution	Installation	Use (B2 – Maintenance)	Use (B6 - Energy requirements during the use stage)	End of life
Use of renewable primary energy, excluding renewable primary energy resources used as raw materials	MJ	2.23E+04	2.73E+02	5.38E-01	3.88E-01	1.64E+02	2.18E+04	8.23E-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	0.00E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	2.24E+04	3.65E+02	5.38E-01	3.88E-01	1.64E+02	2.18E+04	8.23E-01
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials	MJ	1.29E+05	9.68E+03	4.18E+02	2.27E+01	4.53E+03	1.14E+05	9.81E+02
Use of non-renewable primary energy resources used as raw materials	MJ	6.62E+02	4.24E+02	0.00E+00	0.00E+00	2.38E+02	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	1.30E+05	1.01E+04	4.18E+02	2.27E+01	4.77E+03	1.14E+05	9.81E+02
Use of secondary materials	kg	1.83E+01	1.49E+01	0.00E+00	0.00E+00	3.45E+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	2.13E+02	1.63E+01	2.55E-03	1.26E-03	3.14E+00	1.93E+02	1.63E-01
Hazardous waste disposed of	kg	8.97E+02	4.22E+02	0.00E+00	6.10E-03	2.33E+02	8.33E+01	1.59E+02
Non-hazardous waste disposed of	kg	8.38E+02	1.18E+02	1.01E+00	1.28E+01	6.09E+01	6.42E+02	3.29E+00

Radioactive waste disposed of	kg	2.21E-01	4.66E-02	7.07E-04	4.54E-04	3.10E-02	1.34E-01	8.12E-03
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	8.27E+01	0.00E+00	0.00E+00	0.00E+00	3.41E+01	0.00E+00	4.86E+01
Materials for energy recovery	kg	1.39E-07	1.06E-07	0.00E+00	0.00E+00	3.30E-08	0.00E+00	0.00E+00
Exported energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of primary energy during the life cycle	MJ	1.52E+05	1.05E+04	4.18E+02	2.31E+01	4.93E+03	1.35E+05	9.81E+02

*Other sub modules in the use stage (B1,B3-B5, B7) are equal to 0, that's why they are not listed in the table

Other 9PX offerings in single phase (2.2 kVA) UPS excluding or including external battery modules (EBMs) up to 4 which meet the requirements of homogeneous product family. Major parameters variation for the change of environmental impact for these offerings are mainly due to number of EBM (up to 4 numbers), weight of the UPS and rated power output of UPS.

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

Product family	Impact indicator	Global warming (GWP100)	Ozone layer depletion	Acidification potential	Eutrophication	Photochemical oxidation	Abiotic depletion (elements)	Abiotic depletion (fossil fuels)	Water Pollution	Air pollution
	Unit	kg CO ₂ eq.	kg CFC-11 eq.	kg SO ₂ eq.	kg PO ₄ ³⁻ eq.	kg ethylene eq.	kg antimony eq.	MJ	m ³	m ³
Baseline Product (9PX 3KVA with 1 EBM)	All Phases	1	1	1	1	1	1	1	1	1
9PX 3KVA without EBM	Manufacturing	0.66	0.62	0.57	0.61	0.66	0.41	0.65	0.48	0.44
	Distribution	0.45								
	Installation	0.51								
	Use (B2)	1.41	1.46	1.47	1.47	1.42	1.63	1.42	1.58	1.61
	Use (B6)	1.00								
	End of life	0.34	0.35	0.37	0.35	0.35	0.36	0.35	0.35	0.35
9PX 3KVA with 2 EBM	Manufacturing	1.34	1.38	1.43	1.39	1.34	1.59	1.35	1.52	1.56
	Distribution	1.55								
	Installation	1.49								
	Use (B2)	1.41	1.46	1.47	1.47	1.42	1.63	1.42	1.58	1.61
	Use (B6)	1.00								
	End of life	1.66	1.65	1.63	1.65	1.65	1.64	1.65	1.65	1.65
9PX 3KVA with 3 EBM	Manufacturing	1.68	1.76	1.85	1.79	1.69	2.19	1.70	2.05	2.12
	Distribution	2.11								
	Installation	1.98								
	Use (B2)	1.82	1.93	1.95	1.94	1.84	2.26	1.84	2.16	2.21

	Use (B6)	1.00								
	End of life	2.33	2.30	2.26	2.30	2.31	2.29	2.30	2.29	2.31
9PX 3KVA with 4 EBM	Manufacturing	2.03	2.13	2.28	2.18	2.03	2.78	2.05	2.57	2.68
	Distribution	2.66								
	Installation	2.48								
	Use (B2)	2.23	2.39	2.42	2.41	2.26	2.90	2.26	2.74	2.82
	Use (B6)	1.00								
	End of life	2.99	2.95	2.89	2.95	2.96	2.93	2.95	2.94	2.96
9PX 2.2KVA without EBM	Manufacturing	0.64	0.60	0.56	0.59	0.65	0.37	0.64	0.44	0.41
	Distribution	0.41								
	Installation	0.51								
	Use (B2)	0.57	0.50	0.52	0.50	0.57	0.35	0.56	0.38	0.36
	Use (B6)	0.73								
	End of life	0.30	0.31	0.33	0.31	0.31	0.32	0.31	0.31	0.30
9PX 2.2KVA with 1 EBM	Manufacturing	0.99	0.98	0.99	0.98	0.99	0.96	0.99	0.96	0.97
	Distribution	0.96								
	Installation	1.00								
	Use (B2)	0.98	0.97	0.99	0.97	0.98	0.98	0.98	0.96	0.96
	Use (B6)	0.73								
	End of life	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
9PX 2.2KVA with 2 EBM	Manufacturing	1.33	1.35	1.41	1.38	1.34	1.56	1.34	1.49	1.53
	Distribution	1.52								
	Installation	1.49								
	Use (B2)	1.39	1.43	1.46	1.44	1.40	1.61	1.40	1.54	1.57
	Use (B6)	0.73								
	End of life	1.63	1.61	1.59	1.61	1.61	1.61	1.61	1.61	1.61
9PX 2.2KVA with 3 EBM	Manufacturing	1.67	1.73	1.84	1.77	1.68	2.15	1.69	2.01	2.09
	Distribution	2.07								
	Installation	1.98								
	Use (B2)	1.80	1.90	1.94	1.91	1.82	2.25	1.82	2.12	2.18
	Use (B6)	0.73								
	End of life	2.29	2.26	2.22	2.27	2.27	2.25	2.26	2.25	2.27
9PX 2.2KVA with 4 EBM	Manufacturing	2.01	2.11	2.27	2.17	2.03	2.74	2.03	2.53	2.65
	Distribution	2.62								
	Installation	2.48								
	Use (B2)	2.21	2.36	2.41	2.38	2.24	2.88	2.24	2.70	2.78
	Use (B6)	0.73								
	End of life	2.95	2.91	2.85	2.92	2.92	2.90	2.91	2.90	2.92

Disclaimer

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Registration N°	EATO-00030-V01.01-EN	Drafting rules	PCR-ed3-EN-2015 04 02
Verifier accreditation N°	VH32	Supplemented by	PSR-0010-ed1.1-EN-2015 10 16
Date of issue	04-2022	Information and reference documents	www.pep-ecopassport.org
		Validity period	5 years
Independent verification of the declaration and data, in compliance with ISO 14025: 2010			
Internal		External	X
The PCR review was conducted by a panel of experts chaired by Philippe Osset (SOLINNEN)			
The elements of the present PEP cannot be compared with elements from another program.			
Document in compliance with ISO 14025: 2010 « Environmental labels and declarations. Type III environmental declarations »			