PRODUCTS FAMILY DECLARATION FOR POWER SUPPLY OF ABB

PRODUCT ENVIRONMENTAL PROFILE

Environmental Product Declaration

ORGANIZATION	WEBSITE
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ABB Purpose & Embedding Sustainability

ABB is demonstrating their commitment to sustainability by making themselves sustainable. Across their own operations and value chain, aspiring to become a role model for others to follow. With **ABB Purpose** ABB is focusing on reducing harmful emissions, preserving natural resources, and championing ethical and humane behavior to achieve this. Detail info see the website: Sustainability strategy 2030 — ABB Group (global.abb)

General Information

Reference product	The reference product is one unit of power supply produced by ABB; the representative product is 83301 (2TMA020080H0001).
Description of the product	The product is power supply and system controller. It supplies power and controls the operation of the door entry system.
Functional unit of the representative product	To provide power and control the operation of the door entry system over a reference lifetime of 10 years.
Products concerned	The homogeneous family products covered in this PEP are power supply. Their composition, functions and use scenarios are almost the same. The main differences among them are: 1) Product colors 2) Product names and article numbers The products concerned: 83301 (2TMA020080H0001), 83301-500 (2TMA020080H0002), 83301-500 (2TMA020080H0003), M2300-02 (2TMA210160H0001), M2300 (2TMA070080W0011), M2300-101 (2TMA210161W0001), 83310-500-02 (2TMA020080W0002), 83310-500 (2TMA020080N0004), 83310-500 (2TMA020080N0006), 83310 (2TMA020080N0002), M2301-02 (2TMA210160H0002), M2301 (2TMA070080W0012), M2301-101 (2TMA210161W0002), YSM01-PS (2TMA130160H0085)

Constituent materials

Total weight of Reference product	Net weight of the product is 344.3 g. The total weight of packaged product is 744.9 g (including product packaging and transportation packaging).

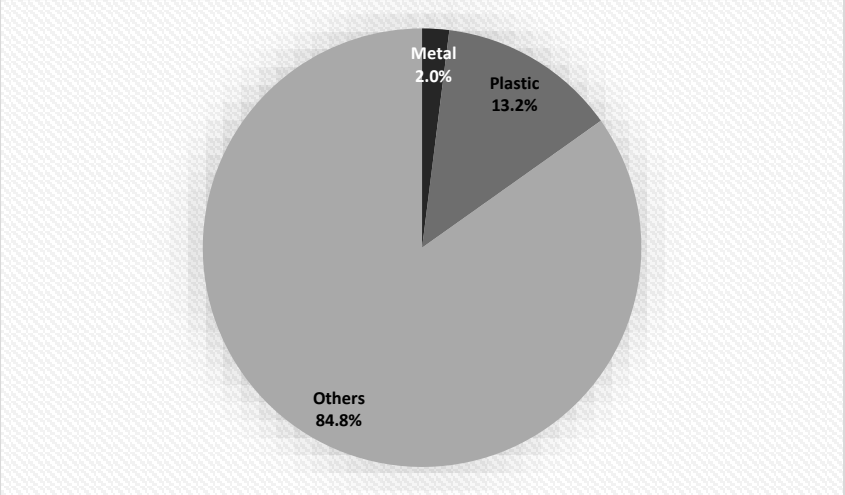

Figure 1 Constituent materials of the reference product (2TMA020080H0001)

Table 1 Information on mass of reference product and its packaging

Components	2TMA020080H0001	Product weight, incl. product pack (g)	Product weight, incl. product pack and transportation pack (g)
Product (g)	344.3	740.6	744.9
Product packaging (g)	396.3		
Transportation packaging (g)	4.3		

Detailed constituent materials of the reference product were shown in Figure 1 and then listed in Table 2.

Table 2 Materials distribution of the reference product

Plastics as % of weight		Metals as % of weight		Paper as % of weight		Other as % of weight	
Name and CAS number	Weight-%	Name and CAS number	Weight-%	Name and CAS number	Weight-%	Name and CAS number	Weight-%
PA 66	12.5%	Al alloy	1.7%	Printed paper	32.7%	Electronic parts	31.8%
PE	0.5%	Steel	0.3%	Folding boxboard carton	14.2%	Others	< 0.1%
PC	0.2%			Corrugated board box	6.0%		

Environmental impacts

Reference lifetime		10 years
Product category		Power supply and system controller. According to the Specific rules for electrical switchgear and control gear Solutions (PSR-0005-ed3-EN-2023 06 06), the product is covered by other equipment - Category 2: active products.

Installation elements		The product is installed manually. There is no input of materials / accessories and energy during the installation. The main environmental impact was caused by the waste generated in this stage.
Use scenario		The reference product is used in Germany using low voltage electricity.
Geographical representativeness		The studied product is produced in China but used in Germany.
Technological representativeness		In the manufacturing stage, specific data was collected to calculate the environmental impact caused by the manufacturing process. To produce raw materials and parts, datasets from Ecoinvent 3.8 were used. During the dataset selection, the technological representation was considered carefully. Datasets with the same production processes were preferred. If not available, datasets with similar production processes were chosen.
Software and databases used		Simapro version 9.4.04 & databases Ecoinvent 3.8 and EF 3.0
Standards applied in ABB		ABB had used many recycling materials, e.g., plastic and metal. The products' standards applied include: EN 62368-1:2014/A11:2017 EN IEC 61000-6-1:2019 EN 61000-6-3:2007/A1:2011

Energy model used	**Manufacturing**	**Distribution**	**Installation**	**Use**	**End of life**
	Average electricity mix in China	Non-applicable	Non-applicable	Germany	Global

Table 3 Environmental impact indicators of life cycle Impact assessment

Compulsory Indicators

Impact indicators	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life
Climate change	**kg CO2 eq**	2.10E+02	1.24E+01	6.75E+00	6.49E-01	1.89E+02	5.73E-01
Climate change - Fossil	**kg CO2 eq**	1.94E+02	1.28E+01	6.74E+00	2.84E-02	1.74E+02	5.71E-01
Climate change - Biogenic	**kg CO2 eq**	1.50E+01	-3.62E-01	2.15E-03	6.20E-01	1.47E+01	2.14E-03
Climate change - Land use and LU change	**kg CO2 eq**	2.60E-01	2.05E-02	4.05E-04	7.31E-06	2.39E-01	1.35E-04
Ozone depletion	**kg CFC11 eq**	6.94E-06	5.89E-07	1.54E-06	2.62E-09	4.77E-06	3.89E-08
Acidification	**mol H+ eq**	6.27E-01	1.35E-01	3.52E-02	1.40E-04	4.47E-01	9.15E-03
Eutrophication, freshwater	**kg P eq**	2.81E-01	1.95E-02	8.54E-05	2.09E-06	2.61E-01	1.85E-05
Eutrophication, marine	**kg N eq**	1.70E-01	2.13E-02	1.30E-02	6.55E-05	1.30E-01	6.45E-03
Eutrophication, terrestrial	**mol N eq**	1.31E+00	2.29E-01	1.42E-01	5.89E-04	9.37E-01	4.01E-03
Photochemical ozone formation	**kg NMVOC eq**	3.39E-01	6.25E-02	3.66E-02	1.51E-04	2.38E-01	1.50E-03
Resource use, minerals and metals	**kg Sb eq**	7.78E-03	6.23E-03	1.88E-06	5.91E-08	1.54E-03	1.99E-06
Resource use, fossils	**MJ**	2.66E+03	1.61E+02	9.45E+01	1.92E-01	2.40E+03	4.13E+00
Water use	**m3 depriv.**	1.67E+01	5.33E+00	6.24E-02	1.53E-02	1.11E+01	1.32E-01

Note: the recycled content and the scrape rates of raw materials of the products and products' packaging are adjusted to 0% and 30% respectively according to the PSR.

Table 4 Resource use indicators of life cycle Impact assessment

Compulsory Indicators

Resource use indicators	Unit	Total	Manufac-turing	Distri-bution	Instal-lation	Use	End of life
Use of renewable primary energy, excluding renewable primary energy resources used as raw materials	MJ	5.88E+02	2.49E+01	2.84E-01	4.79E-03	5.62E+02	5.30E-01
Use of renewable primary energy resources as raw materials	MJ	5.25E+00	5.25E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources	MJ	5.93E+02	3.02E+01	2.84E-01	4.79E-03	5.62E+02	5.30E-01
Use of non-renewable primary energy, excluding renewable primary energy resources used as raw materials	MJ	2.66E+03	1.58E+02	9.45E+01	1.92E-01	2.40E+03	4.13E+00
Use of non-renewable primary energy resources as raw materials	MJ	3.16E+00	3.16E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources	MJ	2.66E+03	1.61E+02	9.45E+01	1.92E-01	2.40E+03	4.13E+00
Use of secondary materials	kg	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
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
Freshwater	m^3	1.34E+00	1.55E-01	2.70E-03	5.12E-04	1.17E+00	3.96E-03

Table 5 Waste category indicators of life cycle Impact assessment

Compulsory Indicators

Waste category indicators	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life
Hazardous waste disposed	kg	6.74E-03	2.57E-03	2.52E-04	4.64E-07	3.84E-03	8.12E-05
Non-hazardous waste disposed	kg	1.58E+01	1.84E+00	1.50E-01	4.11E-01	1.14E+01	2.07E+00
Radioactive waste disposed	kg	1.11E-02	3.93E-04	6.71E-04	8.74E-07	9.98E-03	2.30E-05

Table 6 Output flow indicators

Compulsory Indicators

Output flow indicators	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life
Components for reuse	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.06E-02
Materials for energy recovery	kg	4.71E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.71E-02
Exported energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Note: The recovery of materials for materials and energy was calculated according to Annex D of the PCR.

Biogenic Carbon of product and packaging

As no biogenic carbon in the product, thus, only the biogenic carbon in the packaging was calculated. Of the product packaging and packaging for transportation, the materials containing biogenic carbon are wood pallet and paper board.

Table 7 Amount of biogenic carbon of product and packaging

Item	Unit (kg of C)	Total
Biogenic carbon content of the product	0.00E+00	0.00E+00
Biogenic carbon content of the associated packaging	6.87E-02	6.87E-02

Extrapolation to a homogeneous environmental family

To determine the environmental impact of a product covered by the PEP other than the representative product, the following rules apply:

1) Manufacturing stage

The impact for this phase of a product covered by the PEP other than the representative product is proportional to weight of the product, thus, the impacts should be calculated by multiple the coefficients factor_1 in Table 8 by the environmental impact for this phase of the representative product.

2) Distribution

The impact for this phase of a product covered by the PEP other than the representative product is proportional to the packaged product weight, thus, the impacts should be calculated by multiple the coefficients factor_2 in Table 8Table 8 Extrapolation rules for by the environmental impact for those phases of the representative product.

3) Installation

The impact for this phase of a product covered by the PEP other than the representative product is proportional to weight of the product packaging, thus, the impacts should be calculated by multiple the coefficients factor_3 in Table 8 by the environmental impact for those phases of the representative product.

4) Use

The environmental impact for B1-B6 stage of a product covered by the PEP other than the representative product should be calculated by multiple the factor_4 in Table 8 by the environmental impact for this phase of the representative product. Factor_4 is proportional to the amount of energy consumption.

5) End of life phases

The impacts of the representing product from the end-of-life are less than 2% of the total impact. However, the impact for this phase of a product covered by the PEP other than the representative product is calculated by multiple the coefficients factor_1 in Table 8 by the environmental impact for this phase of the representative product.

Table 8 Extrapolation rules for homogeneous environmental family products

SAP Number	Article Number	Factor_1	Factor_2	Factor_3	Factor_4
2TMA020080H0001	83301	1.00	1.00	1.00	1.00
2TMA020080H0002	83301-500	1.00	1.09	1.18	1.00
2TMA020080H0003	83301-500	1.00	1.09	1.18	1.00
2TMA210160H0001	M2300-02	1.09	0.73	0.42	1.45
2TMA070080W0011	M2300	1.09	0.73	0.42	1.45
2TMA210161W0001	M2300-101	1.09	0.73	0.42	1.45
2TMA020080W0002	83310-500-02	1.36	0.86	0.42	1.11
2TMA020080N0004	83310-500	1.36	0.86	0.42	1.11
2TMA020080N0006	83310-500	1.36	0.86	0.42	1.11
2TMA020080N0002	83310	1.36	0.86	0.42	1.11
2TMA210160H0002	M2301-02	0.47	0.31	0.17	0.98
2TMA070080W0012	M2301	0.47	0.31	0.17	0.98
2TMA210161W0002	M2301-101	0.47	0.31	0.17	0.98
2TMA130160H0085	YSM01-PS	1.51	0.94	0.43	1.59

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Verifier accreditation number: VH50	Information and reference documents: www.pep-ecopassport.org
Date of issue: 09-2023	Validity period: 5 years
Independent verification of the declaration and data in compliance with ISO 14025: 2006	
Internal: ☐	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 or 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"	