PRODUCTS FAMILY DECLARATION FOR FLUSH-MOUNTED BOX OF ABB

PRODUCT ENVIRONMENTAL PROFILE

Environmental Product Declaration

ORGANIZATION	WEBSITE
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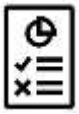
ABB Purpose & Embedding Sustainability

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 Flush-mounted box produced by ABB; the representative product is 41383F-B-03 (2TMA130160B0053).
Description of the product	The product is a mounting accessory for outdoor station, named mounted box. Through the mounted box, different size OS frames can be fixed and be protected from water and finally support indirectly to the communication between the visitors outside the building and the residents in the buildings.
Functional unit of the representative product	Protect people from direct contact with live active parts and ensure the grouping of control, command and protection devices in a single unequipped cabinet having the following dimensions 0.052 m x 0.275 m x 0.133 m while protecting them against mechanical impacts (IK07) and the penetration of solid objects and liquids (IP54), according to the appropriate use scenario, and for the reference service life of the product of 20 years.
Products concerned	The products covered by this PEP are: 41381F-B (2TMA130160B0001), 41381F-H (2TMA130160H0001) 41381F-B-03 (2TMA130160B0051), 41381F-H-03 (2TMA130160H0033) 41382F-B (2TMA130160B0002), 41382F-H (2TMA130160H0002) 41382F-B-03 (2TMA130160B0052), 41382F-H-03 (2TMA130160H0034) 41383F-B (2TMA130160B0003), 41383F-H (2TMA130160H0003) 41383F-B-03 (2TMA130160B0053), 41383F-H-03 (2TMA130160H0035) 41384F-B (2TMA130160B0004), 41384F-H (2TMA130160H0004) 41384F-B-03 (2TMA130160B0054), 41384F-H-03 (2TMA130160H0036) 41385F-B (2TMA130160B0005), 41385F-H (2TMA130160H0005) 41385F-B-03 (2TMA130160B0055), 41385F-H-03 (2TMA130160H0037) 41386F-B (2TMA130160B0006), 41386F-H (2TMA130160H0006) 41386F-B-03 (2TMA130160B0056), 41386F-H-03 (2TMA130160H0038) 41381S-B (2TMA130160B0009), 41381S-H (2TMA130160H0009) 41381S-B-03 (2TMA130160B0059), 41381S-H-03 (2TMA130160H0041) 41382S-H (2TMA130160B0010), 41382S-H (2TMA130160H0010) 41382S-B-03 (2TMA130160B0060), 41382S-H-03 (2TMA130160H0042) 41383S-B (2TMA130160B0011), 41383S-H (2TMA130160H0011) 41383S-B-03 (2TMA130160B0061), 41383S-H-03 (2TMA130160H0043) 41384S-B (2TMA130160B0012), 41384S-H (2TMA130160H0012) 41384S-B-03 (2TMA130160B0062), 41384S-H-03 (2TMA130160H0044) 41385S-B (2TMA130160B0013), 41385S-H (2TMA130160H0013) 41385S-B-03 (2TMA130160B0063), 41385S-H-03 (2TMA130160H0045) 41386S-B (2TMA130160B0014), 41386S-H (2TMA130160H0014) 41386S-B-03 (2TMA130160B0064), 41386S-H-03 (2TMA130160H0046) 41381PB (2TMA130160B0017), 41381PB-03 (2TMA130160B0067) 41382PB (2TMA130160B0018), 41382PB-03 (2TMA130160B0068) 41383PB (2TMA130160B0019), 41383PB-03 (2TMA130160B0069) 41384PB (2TMA130160B0020), 41384PB-03 (2TMA130160B0070)

	41385PB (2TMA130160B0021), 41385PB-03 (2TMA130160B0071) 41386PB (2TMA130160B0022), 41386PB-03 (2TMA130160B0072)

Constituent materials

Total weight of Reference product	Net weight of the product is 414.4 g. The total weight of packaged product is 641.5 g (including product packaging and transportation packaging).

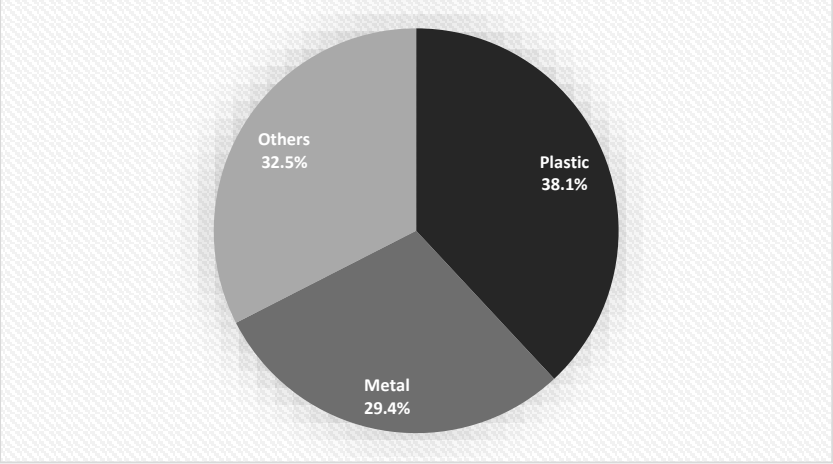


Figure 1 Constituent materials of the reference product (2TMA130160B0053)

Table 1 Information on mass of reference product and its packaging

Components	2TMA130160B0053	Product weight, incl. product pack (g)	Product weight, incl. product pack and transportation pack (g)
Product (g)	414.4	636.2	641.5
Product packaging (g)	221.8		
Transportation packaging (g)	5.3		

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-%
ASA	35.2%	Low carbon steel	28.3%	Paper	32.4%	Others	<0.1%
PE	2.4%	Magnet	1.1%				
Silicon rubber	0.3%	Stainless steel 304	<0.1%				
PA66	0.2%						

Environmental impacts

Reference lifetime		20 years

Product category		Flush-mounted box. According to the Specific rules for electrical switchgear and control gear Solutions (PSR-0005-ed3-EN-2023 06 06), the product is covered by Unequipped enclosures and Cabinets-cabinet.
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		No energy consumption in the RSL of reference product
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. For the production of 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 & EF3.0
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	Global	Non-applicable	Non-applicable	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	1.13E+01	4.49E+00	5.81E+00	3.73E-01	0.00E+00	6.52E-01
Climate change – Fossil	kg CO2 eq	1.10E+01	4.53E+00	5.81E+00	4.69E-02	0.00E+00	6.52E-01
Climate change – Biogenic	kg CO2 eq	2.81E-01	-4.73E-02	1.86E-03	3.26E-01	0.00E+00	2.23E-04
Climate change – Land use and LU change	kg CO2 eq	5.41E-03	4.98E-03	3.49E-04	4.21E-06	0.00E+00	7.13E-05
Ozone depletion	kg CFC11 eq	1.57E-06	2.26E-07	1.32E-06	1.50E-09	0.00E+00	1.88E-08
Acidification	mol H+ eq	5.38E-02	2.27E-02	3.03E-02	8.19E-05	0.00E+00	7.25E-04
Eutrophication, freshwater	kg P eq	1.47E-03	1.35E-03	7.35E-05	1.21E-06	0.00E+00	4.42E-05
Eutrophication, marine	kg N eq	1.68E-02	5.32E-03	1.12E-02	3.88E-05	0.00E+00	2.82E-04
Eutrophication, terrestrial	mol N eq	1.72E-01	4.66E-02	1.22E-01	3.48E-04	0.00E+00	2.91E-03
Photochemical ozone formation	kg NMVOC eq	4.67E-02	1.44E-02	3.15E-02	8.87E-05	0.00E+00	7.91E-04
Resource use, minerals and metals	kg Sb eq	5.04E-05	4.84E-05	1.62E-06	3.41E-08	0.00E+00	3.39E-07
Resource use, fossils	MJ	1.46E+02	6.33E+01	8.14E+01	1.11E-01	0.00E+00	1.46E+00

Water use	m3 depriv.	2.09E+00	1.96E+00	5.38E-02	9.58E-03	0.00E+00	7.25E-02

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	Distribu-tion	Installa-tion	Use	End of life
Use of renewable primary energy, excluding renewable primary energy resources used as raw materials	MJ	9.36E+00	9.06E+00	2.44E-01	2.79E-03	0.00E+00	4.69E-02
Use of renewable primary energy resources as raw materials	MJ	2.95E+00	2.95E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources	MJ	1.23E+01	1.20E+01	2.44E-01	2.79E-03	0.00E+00	4.69E-02
Use of non-renewable primary energy, excluding renewable primary energy resources used as raw materials	MJ	1.39E+02	5.64E+01	8.14E+01	1.11E-01	0.00E+00	1.46E+00
Use of non-renewable primary energy resources as raw materials	MJ	6.75E+00	6.75E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources	MJ	1.46E+02	6.32E+01	8.14E+01	1.11E-01	0.00E+00	1.46E+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	5.54E-02	5.08E-02	2.33E-03	3.17E-04	0.00E+00	1.98E-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	1.46E-03	1.24E-03	2.17E-04	2.72E-07	0.00E+00	3.28E-06
Non-hazardous waste disposed	kg	2.60E+00	1.96E+00	1.31E-01	2.30E-01	0.00E+00	2.82E-01
Radioactive waste disposed	kg	6.84E-04	9.81E-05	5.78E-04	4.96E-07	0.00E+00	8.33E-06

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	1.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.50E-01
Materials for energy recovery	kg	1.14E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.14E-01
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	9.44E-02	9.44E-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 8 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

For the stages of use: as no input of energy and material and output of waste as well as emissions to water and air, no environmental impact in this stage. Thus, the factor (namely factor_4) is 1.

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 family products

SAP Number	Article Number	Factor_1	Factor_2	Factor_3
2TMA130160B0017	41381PB	0.34	0.42	0.57
2TMA130160B0067	41381PB-03	0.34	0.42	0.57
2TMA130160B0018	41382PB	0.45	0.48	0.53
2TMA130160B0068	41382PB-03	0.45	0.48	0.53
2TMA130160B0019	41383PB	0.58	0.85	1.36
2TMA130160B0020	41384PB	0.68	0.90	1.32
2TMA130160B0069	41383PB-03	0.58	0.85	1.36
2TMA130160B0009	41381S-B	0.66	0.70	0.77
2TMA130160B0059	41381S-B-03	0.66	0.70	0.77
2TMA130160H0009	41381S-H	0.66	0.70	0.77
2TMA130160H0041	41381S-H-03	0.66	0.70	0.77
2TMA130160B0070	41384PB-03	0.68	0.90	1.32
2TMA130160B0051	41381F-B-03	0.76	0.77	0.78
2TMA130160H0033	41381F-H-03	0.76	0.77	0.78
2TMA130160B0001	41381F-B	0.76	0.77	0.78

2TMA130160H0001	41381F-H	0.76	0.77	0.78
2TMA130160B0010	41382S-B	0.78	0.65	0.40
2TMA130160B0060	41382S-B-03	0.78	0.65	0.40
2TMA130160H0010	41382S-H	0.78	0.65	0.40
2TMA130160H0042	41382S-H-03	0.78	0.65	0.40
2TMA130160B0021	41385PB	0.84	1.19	1.86
2TMA130160B0071	41385PB-03	0.84	1.19	1.86
2TMA130160B0022	41386PB	0.87	1.32	2.17
2TMA130160B0072	41386PB-03	0.87	1.32	2.17
2TMA130160B0052	41382F-B-03	0.88	0.77	0.58
2TMA130160H0034	41382F-H-03	0.88	0.77	0.58
2TMA130160B0002	41382F-B	0.88	0.77	0.58
2TMA130160H0002	41382F-H	0.88	0.77	0.58
2TMA130160B0011	41383S-B	0.91	0.75	0.45
2TMA130160B0061	41383S-B-03	0.91	0.75	0.45
2TMA130160H0011	41383S-H	0.91	0.75	0.45
2TMA130160H0043	41383S-H-03	0.91	0.75	0.45
2TMA130160B0053	41383F-B-03	1.00	1.00	1.00
2TMA130160B0003	41383F-B	1.02	1.00	0.98
2TMA130160H0003	41383F-H	1.02	1.00	0.98
2TMA130160B0012	41384S-B	1.03	0.86	0.55
2TMA130160B0062	41384S-B-03	1.03	0.86	0.55
2TMA130160H0012	41384S-H	1.03	0.86	0.55
2TMA130160H0044	41384S-H-03	1.03	0.86	0.55
2TMA130160H0035	41383F-H-03	1.04	1.01	0.98
2TMA130160B0004	41384F-B	1.14	1.05	0.88
2TMA130160H0004	41384F-H	1.14	1.05	0.88
2TMA130160B0054	41384F-B-03	1.15	1.05	0.88
2TMA130160H0036	41384F-H-03	1.15	1.05	0.88
2TMA130160B0013	41385S-B	1.15	1.06	0.88
2TMA130160B0063	41385S-B-03	1.15	1.06	0.88
2TMA130160H0013	41385S-H	1.15	1.06	0.88
2TMA130160H0045	41385S-H-03	1.15	1.06	0.88
2TMA130160B0005	41385F-B	1.32	1.18	0.93
2TMA130160H0005	41385F-H	1.32	1.18	0.93
2TMA130160B0055	41385F-B-03	1.33	1.19	0.93
2TMA130160H0037	41385F-H-03	1.33	1.19	0.93
2TMA130160B0014	41386S-B	1.57	1.29	0.76
2TMA130160B0064	41386S-B-03	1.57	1.29	0.76
2TMA130160H0014	41386S-H	1.57	1.29	0.76
2TMA130160H0046	41386S-H-03	1.57	1.29	0.76
2TMA130160B0006	41386F-B	1.87	1.80	1.66
2TMA130160H0006	41386F-H	1.87	1.80	1.66
2TMA130160B0056	41386F-B-03	1.88	1.80	1.66
2TMA130160H0038	41386F-H-03	1.88	1.80	1.66

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Independent verification of the declaration and data in compliance with ISO 14025: 2006	
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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”	