

**ENVIRONMENTAL PRODUCT DECLARATION /
PRODUCT ENVIRONMENTAL PROFILE**

Connected Home portfolio family RDZ thermostats series

Type III according to ISO 14025



Owner of the declaration: Siemens Schweiz AG	Program holder and publisher: PEP ecopassport
In compliance with: ISO 14025; EN 50693; PCR-4-ed4-EN-2021 09 06; PSR-0005-ed3.1-EN-2023 12 08	
EPD Type: Representative product with extrapolation rules for homogeneous product family	EPD scope: Cradle-to-Grave

General information

This environmental product declaration (EPD) is based on the international standard ISO 14025. The data in this EPD has been evaluated on a full-scale life cycle assessment (LCA) study according to ISO 14040/44, taking into account the product category rules (PCR) for electronic and electrotechnical products and systems defined in EN 50693 :2019 as well as PCR-4-ed4-EN-2021 09 06 Product Category Rules for Electrical, Electronic and HVAC-R Products and PSR-0005-ed3.1-EN-2023 12 08 – SPECIFIC RULES FOR Electrical switchgear and control gear Solutions.

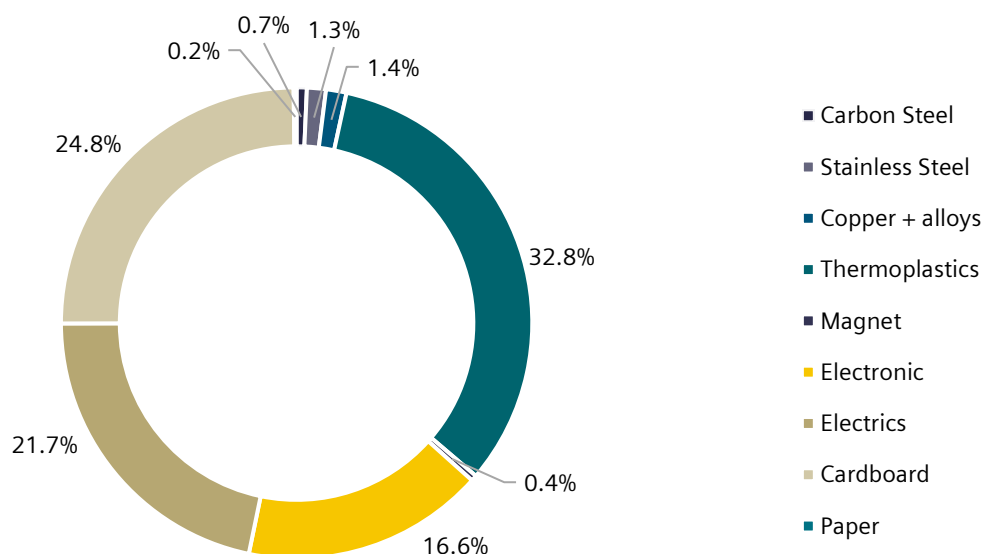
Siemens is dedicated to an environmentally conscious design of its products in line with IEC 62430 and has implemented an integrated management system according to ISO 9001, ISO 14001 and ISO 45001.

Product	All products which can be found in the appendix.
Represented by	S55772-T113 (RDZ100ZB)
Product Description	Connected Home Thermostat with on-of relay, works with Connected Home Hub and Connected Home mobile application. Product targeting residential market and sold in EU region.
Functional Unit	Electronic thermostat with display measures and controls by time programming the ambient temperature(s) set by the user in a range of 5°C and 35°C with a temperature step of 0.5°C, in 1 specific zone according to and characterised by a closed contact current 5 (2) A, according to the appropriate use scenario, and for the reference service life of the product of 10 years.
Production site	Beijing, China

Material composition

The following chart outlines the overall material composition of the calculated reference product including its packaging. Product weight of 0.158 kg adds up with packaging weight of 0.053 kg to a total weight of 0.211 kg. Packaging consists of 20-PAP corrugated fibreboard, 21-PAP Non-corrugated fibreboard and 22-PAP paper. Plastics 32.8%; Metals 3.3%; Others 63.8%

Product Weight 0.211 kg



Substance assessment

At Siemens, we are committed to the development and production of environmentally sound and sustainably produced equipment. This includes avoiding hazardous substances in our products without compromising their benefits for our customers. Please visit the following website to learn more about how we comply with product-related environmental regulations like RoHS, REACH, WEEE and others: [Product Related Environmental Protection](#)

System boundaries & Scenarios

The EPD covers the cradle to grave of the product including the following stages.

Product stage			Distribution	Installation	Use stage							End of life stage				Benefits & loads beyond system boundary
Raw materials	Transport	Manufacturing	Transport	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-Installation	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	0	X	0	0	0	0	0	MND	X	X	X	X

MND – Module not declared as impacts are neglectable.

Temporal & geographical scope & representativeness

Primary data of FY 2023 (10/2022-09/2023);
 Secondary data: GaBi 9.5, Database valid 2025
 The materials and components used in production are globally sourced and have been selected from Sphera data sets according to the global or regional representativeness.
 - Geographical representativeness of some raw material processes is limited due to the use of secondary datasets of other regions however for other processes good as used from regional or global specific data set
 - Technology coverage good, partly very good as secondary data sets built on market average

Data quality

Both primary and secondary data are used. To ensure the high quality and completeness of the LCA results, primary data have been used whenever possible. The main sources for primary data are the bill of materials and the bill of processes. Site-specific data are provided by Siemens reporting system.
 Datasets for resources, such as electrical energy or natural gas, are chosen from the region where the device is produced and assembled. If primary data are not available, datasets reflecting state-of-the-art manufacturing technology are considered. Generic data originating from the LCA tool: GaBi 9.5, Database: GaBi Professional & Extensions, 2020 are used.

Allocation:	Amount of resources used and waste generated in production at Siemens is allocated based on annual production volume. For the end-of-life allocation, the "Polluter Pays" principle is adopted as required by the PCR-ed4-EN-2021 09 06 and PSR-0005-ed3.1-EN-2023 12 08. Waste treatment processes are allocated to the product system that generates the waste until the end-of-waste state is reached. The environmental burdens of recycling and energy recovery processes are therefore allocated to the product system that generates the waste, while the product system that uses the exported energy and recycled materials receives it burden-free. Potential benefits and avoided loads from recovery and recycling processes are considered in separate Benefits & Loads beyond system boundary section.
Cut-off	According to EN 50693, the cut-off criteria can be set to a maximum of 5 % of the overall environmental impacts. In this LCA, stickers, labels, tape, and staples used in the packaging have been excluded as their weights are negligible.

Scenarios:

The following information describe the scenarios in the different modules of the EPD.

Manufacturing	This stage covers the extraction of natural resources, production of raw materials, manufacturing, packaging, and upstream transportation.
Transportation to production site	According to PCR transport scenario
Production energy model used	CN: Electricity grid mix
Distribution	This stage covers the product's distribution.
Distribution transport model used	1232 km distance; GLO: Truck-trailer, Euro IV, 27 t payload, 85% loading rate
Installation	No materials for installation or relevant installation processes required. Packaging waste is considered.
Installation energy model used	Not relevant
Use	This stage covers the operational energy use provided by two AA batteries which will be replaced every year of the RSL. Different operating conditions can lead to deviations from the reference scenario.
Energy model used and use scenario	2 AA batteries each year. Reference service lifetime of 10 years
End of Life (EoL)	This stage covers the disassembly, material recycling in addition to thermal treatment of all recoverable materials and the disposal of all other materials.
EoL: Transport model used	1000 km default distance; GLO: Truck-trailer, Euro IV, 27 t payload, 85% loading rate
EoL: Energy model used	EU-28: Electricity grid mix

Life Cycle Assessment -Results

The following impact categories characterize the product's environmental footprint. They have been calculated with LCIA methodology EN15804+A2; LCA tool: GaBi 9.5, Database: GaBi Professional & Extensions, 2020.

Environmental performance indicators

Indicators	Unit	Total - (w/o D)	A1-A3	A4	A5	B2	C1-C4	D
			Manufacturing	Distribution	Installation	Use stage	End of life	Benefits & Loads
CC - total	kg CO ₂ eq	1.03E+01	4.43E+00	1.65E-02	7.54E-02	5.61E+00	1.37E-01	-1.54E-01
CC - fossil	kg CO ₂ eq	1.03E+01	4.52E+00	1.59E-02	2.06E-03	5.58E+00	1.37E-01	-1.54E-01
CC - biogenic	kg CO ₂ eq	4.80E-03	-8.86E-02	6.83E-04	7.33E-02	1.94E-02	3.25E-05	1.35E-06
CC - luluc	kg CO ₂ eq	1.10E-02	4.53E-03	4.41E-07	3.45E-06	6.32E-03	9.80E-05	-1.16E-04
ODP	kg CFC-11 eq	8.54E-08	8.53E-08	9.66E-16	9.23E-15	1.25E-10	4.58E-13	3.19E-11
AP	Mole de H ⁺ eq	4.39E-02	2.58E-02	1.15E-04	2.30E-05	1.78E-02	1.41E-04	-2.93E-03
EP-freshwater	kg P eq	1.12E-03	1.11E-03	2.06E-09	4.08E-09	1.06E-05	1.31E-07	-1.34E-07
EP - marine	kg N eq	1.29E-02	8.72E-03	5.66E-05	8.69E-06	4.05E-03	5.12E-05	-1.46E-04
EP - terrestrial	Mole de N eq	1.07E-01	5.43E-02	6.21E-04	1.07E-04	5.17E-02	5.97E-04	-1.58E-03
POCP	kg NMVOC eq	2.47E-02	1.37E-02	1.09E-04	2.21E-05	1.08E-02	1.12E-04	-5.66E-04
ADP - M & M	kg Sb eq	4.98E-04	4.70E-04	1.07E-10	1.05E-10	2.84E-05	4.47E-09	-6.56E-05
ADP - fossil	MJ	1.43E+02	6.35E+01	2.30E-01	2.82E-02	7.89E+01	6.76E-01	-1.86E+00
WDP	m ³ eq priv monde	2.14E+00	1.25E+00	7.20E-05	9.31E-03	8.72E-01	1.50E-02	-3.29E-02
PM	Incidence s maladie	4.51E-07	2.67E-07	3.78E-10	1.21E-10	1.82E-07	9.13E-10	-2.18E-08
IRP	kBq U235 eq	5.65E-01	3.08E-01	5.65E-06	2.00E-04	2.45E-01	1.29E-02	-4.65E-03
ETP - fw	CTUe	3.27E+02	7.59E+01	2.75E-01	1.30E-02	2.51E+02	2.53E-01	-5.76E-01
HTP - c	CTUh	6.33E-09	5.91E-09	4.34E-12	6.82E-13	4.09E-10	1.15E-11	-1.65E-10
HTP - nc	CTUh	3.13E-07	1.95E-07	8.32E-11	1.80E-11	1.18E-07	4.17E-10	-3.67E-09
SQP	Sans dimensions (pt)	2.97E+01	1.98E+01	4.79E-04	8.75E-03	9.62E+00	2.62E-01	-2.32E-01

CC-total : changement climatique ; **CC-fossil** : changement climatique, combustibles fossiles ; **CC-biogenic** : changement climatique, biogénique ; **CC-LULUC** : changement climatique, utilisation des terres et changement d'utilisation des terres ; **ODP** : potentiel d'appauvrissement de la couche d'ozone stratosphérique ; **AP** : potentiel d'acidification, dépassement cumulé ; **EP-freshwater** : potentiel d'eutrophisation, fraction des nutriments atteignant le compartiment final d'eau douce ; **EP-marine** : potentiel d'eutrophisation, fraction des nutriments atteignant le compartiment final d'eau de mer ; **EP-terrestrial** : potentiel d'eutrophisation, dépassement cumulé ; **POCP** : potentiel de formation de l'ozone troposphérique ; **ADP-M&M** : potentiel d'épuisement abiotique pour les ressources non fossiles (minéraux et métaux) ; **ADP-fossil** : potentiel d'épuisement abiotique des ressources fossiles ; **WDP** : potentiel de privation d'eau, consommation d'eau pondérée en fonction de la privation ; **PM** : émissions de particules ; **IRP** : rayonnement ionisant, santé humaine ; **ETP-fw** : écotoxicité (eau douce) ; **HTP-c** : toxicité humaine, effets cancérigènes ; **HTP-nc** : toxicité humaine, effets non cancérigènes ; **SQP** : impacts liés à l'utilisation des sols / qualité des sols

Resource use indicators

Indicators	Unit	Total - (w/o D)	A1-A3	A4	A5	B2	C1-C4	D
			Manufacturing	Distribution	Installation	Use stage	End of life	Benefits & Loads
PERE	MJ	3.41E+01	1.29E+01	1.27E-03	6.04E-03	1.99E+01	1.28E+00	-2.34E-01
PERM	MJ	0.00E+00	9.65E-01	0.00E+00	0.00E+00	0.00E+00	-9.65E-01	0.00E+00
PERT	MJ	3.41E+01	1.39E+01	1.27E-03	6.04E-03	1.99E+01	3.15E-01	-2.34E-01
PENRE	MJ	1.43E+02	5.73E+01	2.30E-01	2.82E-02	7.89E+01	7.01E+00	-1.87E+00
PENRM	MJ	0.00E+00	6.33E+00	0.00E+00	0.00E+00	0.00E+00	-6.33E+00	0.00E+00
PENRT	MJ	1.43E+02	6.36E+01	2.30E-01	2.82E-02	7.89E+01	6.76E-01	-1.87E+00
SM	kg	4.30E-03	4.30E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	4.99E-25	4.99E-25	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	5.86E-24	5.86E-24	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m3	7.49E-02	3.69E-02	1.93E-06	2.20E-04	3.73E-02	4.77E-04	-1.58E-03
BIOGCPRODUCT	kg de C	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BIOGCPACKAGING	kg de C	2.16E-02	2.16E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

PERE : utilisation d'énergie primaire renouvelable ; **PERM** : utilisation de ressources d'énergie primaire renouvelable comme matières premières ; **PERT** : utilisation totale de ressources d'énergie primaire renouvelable ; **PENRE** : utilisation d'énergie primaire non renouvelable ; **PENRM** : utilisation de ressources d'énergie primaire non renouvelable comme matières premières ; **PENRT** : utilisation totale de ressources d'énergie primaire non renouvelable ; **SM** : utilisation de matières secondaires ; **RSF** : utilisation de combustibles secondaires renouvelables ; **NRSF** : utilisation de combustibles secondaires non renouvelables ; **FW** : utilisation d'eau douce nette ; **BIOGCPRODUCT** : Teneur en carbone biogénique du produit ; **BIOGCPACKAGING** : Teneur en carbone biogénique de l'emballage

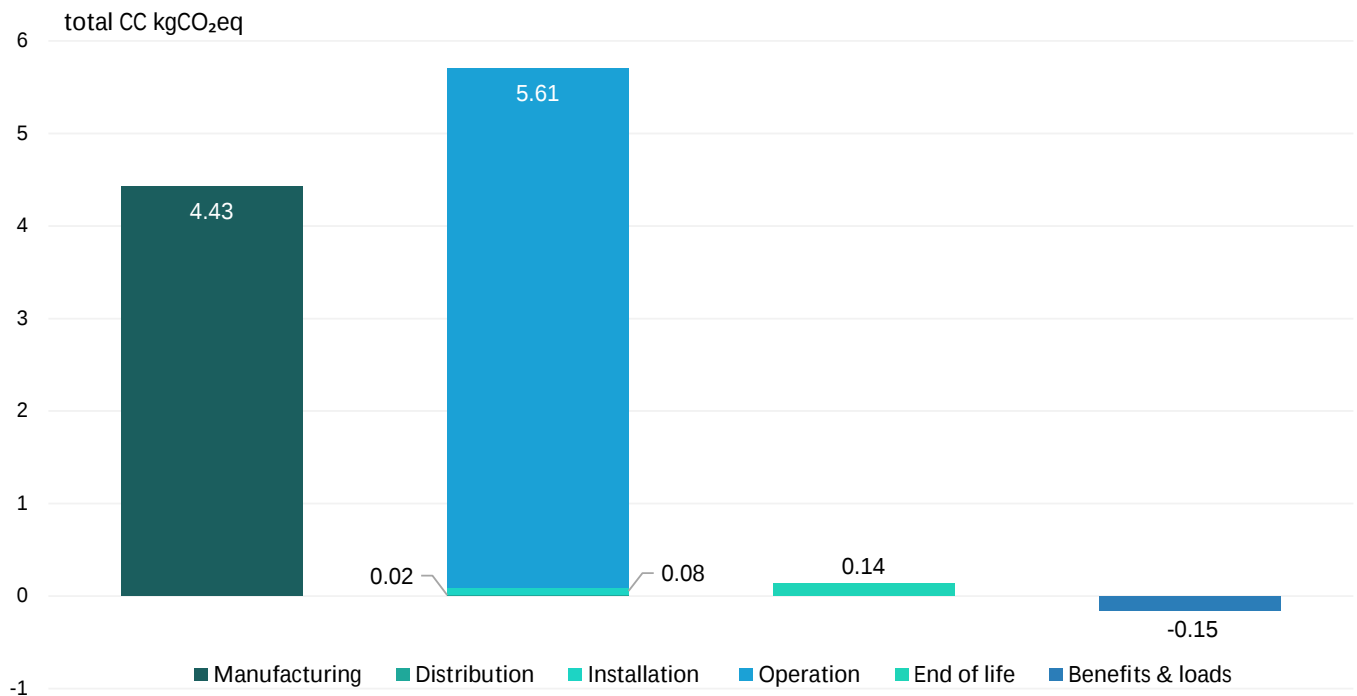
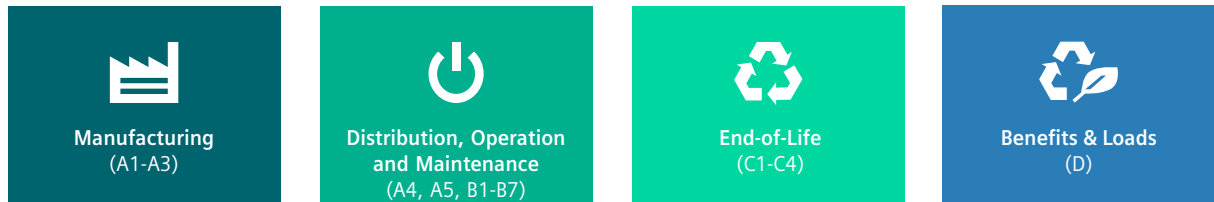
Indicators	Unit	Total - (w/o D)	A1-A3	A4	A5	B2	C1-C4	D
			Manufacturing	Distribution	Installation	Use stage	End of life	Benefits & Loads
HWD	kg	1.80E-06	8.30E-07	5.72E-14	7.66E-13	9.67E-07	7.38E-12	2.79E-10
NHWD	kg	1.44E+00	2.21E-01	8.74E-06	2.36E-03	1.15E+00	6.68E-02	-7.40E-03
RWD	kg	3.86E-03	1.57E-03	8.31E-08	1.26E-06	2.20E-03	7.82E-05	-4.06E-05
MER	kg	1.17E-01	9.32E-03	0.00E+00	0.00E+00	0.00E+00	1.08E-01	0.00E+00
MFR	kg	5.15E-02	3.79E-03	0.00E+00	0.00E+00	0.00E+00	4.77E-02	0.00E+00
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ETE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

HWD : déchets dangereux éliminés ; **NHWD** : déchets non dangereux éliminés ; **RWD** : déchets radioactifs éliminés ; **MER** : matériaux pour la récupération d'énergie ; **MFR** : matériaux pour le recyclage ; **CRU** : composants pour la réutilisation ; **ETE** : énergie thermique exportée ; **EEE** : énergie électrique exportée.

Additional Environmental Information

Climate change

This chart shows the overall impact of the product on climate change – total. The operations phase is the lifecycle phase with the biggest overall impact. Different operating conditions can lead to deviations from the reference scenario.



Appendix

Scaling factors

The results of the LCA of the reference product can be extrapolated to other products of a homogeneous product family according to the standard EN50693:2019. The scaling factors listed here are calculated according to this standard.

The extrapolation rules have been defined as follow:

- Manufacturing (A1-A3):
$$\frac{m_{plastics,i} + m_{metals,i} + 13 \cdot m_{PCBA,i} + m_{others,i}}{m_{plastics,ref} + m_{metals,ref} + 13 \cdot m_{PCBA,ref} + m_{others,ref}}$$
- Distribution (A4):
$$\frac{m_{product,i}}{m_{product,ref}}$$
- Installation (A5):
$$\frac{m_{product,i}}{m_{product,ref}}$$
- Maintenance (B2):
$$\frac{m_{battery\ weight\ over\ lifetime,i}}{m_{battery\ weight\ over\ lifetime,ref}}$$
- End of life (C1-C4):
$$\frac{6 \cdot m_{plastics,i} + 0.01 \cdot m_{metals,i} + 1 \cdot m_{PCBA,i} + 0.04 \cdot m_{others,i}}{6 \cdot m_{plastics,ref} + 0.01 \cdot m_{metals,ref} + 1 \cdot m_{PCBA,ref} + 0.04 \cdot m_{others,ref}}$$
- Benefits & Loads (D):
$$\frac{1 \cdot m_{plastics,i} + 4 \cdot m_{metals,i} + 19 \cdot m_{PCBA,i} + 2 \cdot m_{others,i}}{1 \cdot m_{plastics,ref} + 4 \cdot m_{metals,ref} + 19 \cdot m_{PCBA,ref} + 2 \cdot m_{others,ref}}$$

To extrapolate the impact from the reference product to another product from the range, multiply the following scaling factors to the impact category per life cycle stage:

Article Type	A1-A3	A4	A5	B2	C1-C4	D
RDD100.1	1.72	1.21	1.21	0.50	1.22	1.64
RDD100.1RF	1.74	1.43	1.43	1.00	1.34	1.65
RDD100.1RFS	1.74	1.43	1.43	1.00	1.34	1.65
RDD50.1	1.36	2.63	2.63	0.50	1.09	1.32
RDE100.1	2.32	1.57	1.57	0.50	1.51	2.23
RDE100.1DHW	2.53	1.60	1.60	0.50	1.52	2.43
RDE100.1RF	2.34	1.65	1.65	0.50	1.63	2.24
RDE100.1RFS	2.34	1.65	1.65	0.50	1.63	2.24
RDE50.1	2.17	2.87	2.87	0.50	1.62	2.09
RDE50.1RF/SET	3.85	4.71	4.71	0.50	2.96	3.67
RDH100	2.80	3.99	3.99	1.00	2.32	2.75
RDH100RF/SET	2.79	5.21	5.21	1.00	2.43	2.69
RDH100RF/SET-RO	2.79	5.21	5.21	1.00	2.43	2.69
RDJ100	2.81	4.00	4.00	1.00	2.38	2.75
RDJ100RF/SET	2.80	5.23	5.23	1.00	2.49	2.70
RDK101	0.99	1.21	1.21	0.44	1.01	0.99
RDK101RF.ST	0.88	1.71	1.71	0.44	1.38	0.86
RDL101	1.42	1.47	1.47	0.44	1.35	1.41
RDL101RF.ST	1.28	1.96	1.96	0.44	1.86	1.23

Article Type	A1-A3	A4	A5	B2	C1-C4	D
RDL121	1.63	1.51	1.51	0.44	1.37	1.62
RDL131RF.ST	1.27	2.03	2.03	0.44	1.86	1.23
RDL211	1.67	1.49	1.49	0.44	1.37	1.66
RDL211/H	1.67	1.49	1.49	0.44	1.37	1.66
RDL211RF.ST	1.27	2.03	2.03	0.44	1.86	1.23
RDZ100ZB	1.00	1.00	1.00	1.00	1.00	1.00
RDZ101ZB	0.87	1.07	1.07	1.00	1.35	0.85
RDZ200ZB	1.00	1.00	1.00	1.00	1.00	1.00

References

ISO 14025:2010	Environmental labels and declarations - Type III environmental declarations - Principles and procedures
ISO 14040/44	Life cycle assessment – Principles and framework
EN 50693	Product category rules for life cycle assessments of electronic and electrical products and systems
PCR–ed4-EN-2021 09 06	Product Category Rules for Electrical, Electronic and HVAC-R Products
PSR-0005-ed3.1-EN-2023 12 08	SPECIFIC RULES FOR Electrical switchgear and control gear Solutions



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Verifier accreditation number: VH51	Information and reference documents: www.pep-ecopassport.org
Date of issue: 09-2025	Validity period: 5 years
Independent verification of the declaration and data in compliance with ISO 14025: 2006	
Internal:	External: X
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 or NF E38-500 :2022 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"	