

**ENVIRONMENTAL PRODUCT DECLARATION /
PRODUCT ENVIRONMENTAL PROFILE**

Room thermostats with external power supply

RDD.., RDE.., RDF.., RDG.., RDS..,
RDU.. thermostats and RCR.. receivers

Type III according to ISO 14025



Owner of the declaration: Siemens Switzerland Ltd	Program holder and publisher: P.E.P. Association
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.

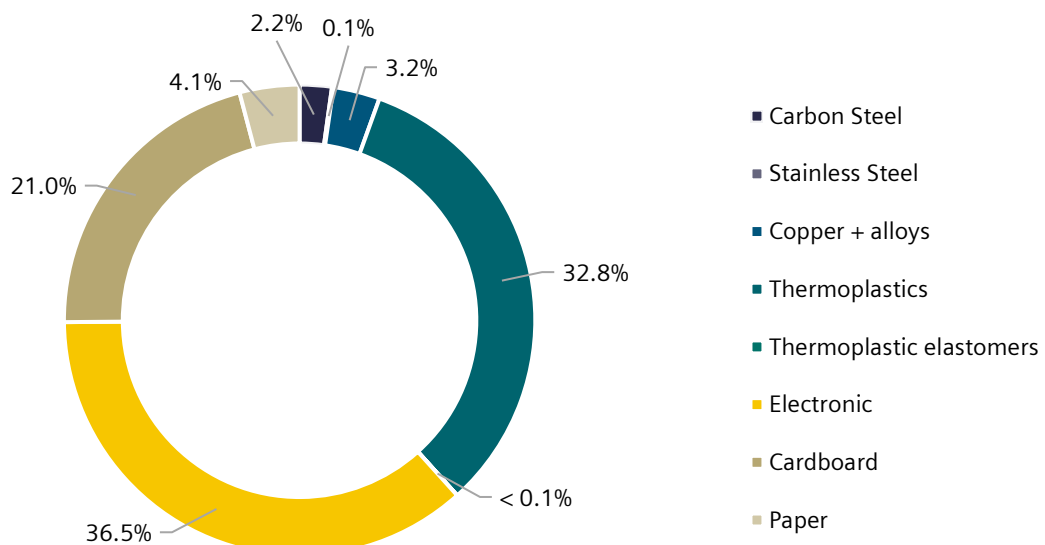
Siemens is dedicated to an environmentally conscious design of its products in line with IEC 62430 and has implemented an integrated management system according to ISO 9001, ISO 14001 and ISO 45001.

Product	All products which can be found in the appendix.
Represented by	S55770-T409 (RDG200KN)
Product Description	Room thermostats to control the room temperature in heating or cooling systems. For fan coil units, heat pump applications, universal applications and compressors in DX-type equipment applications.
Functional Unit	Electronic room 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 (4) 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 0.278 kg adds up with packaging weight of 0.093 kg to a total weight of 0.371 kg. Packaging consists of 20-PAP corrugated fibreboard, PET foil and 22-PAP paper. Plastics 32.8%; Metals 5.5%; Others 61.6%

Product Weight incl. packaging 0.371 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	0	0	0	0	X	0	MND	X	X	X	X

MND – Module not declared as impacts are neglectable.

Temporal & geographical scope & representativeness

Primary data of FY 2022 (10/2021-09/2022);
 Secondary data: OneGaBiModel_Database – 2024.2
 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 10.9.0.20, Database: OneGaBiModel_Database – 2024.2 are used.

Allocation:

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

No cut-off rules were applied. All inputs have been covered and nothing has been excluded intentionally.

Scenarios:

The following information describes 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	Primary data has been used.
Production energy model used	CN: Electricity grid mix
Distribution	This stage covers the product's distribution.
Distribution transport model used	1278 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. All other modules do not apply for this product. Different operating conditions can lead to deviations from the reference scenario.
Energy model used and use scenario	Load rate contact closed: 30% of IL (1.71 W) during 14% of the RLT Load rate contact opened: 86% of standby power (0.86 W) RLT EU-28: Electricity grid mix
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 10.9.0.20, Database: OneGaBiModel_Database - 2024.2.

Environmental performance indicators

Indicators	Unit	Total - (w/o D)	A1-A3	A4	A5	B1-B7	C1-C4	D
			Manufacturing	Distribution	Installation	Use stage	End of life	Benefits & Loads
CC - total	kg CO2 eq	4.23E+01	1.71E+01	3.10E-02	1.33E-01	2.48E+01	2.36E-01	-3.55E-01
CC - fossil	kg CO2 eq	4.21E+01	1.73E+01	3.13E-02	3.65E-03	2.46E+01	2.36E-01	-3.54E-01
CC - biogenic	kg CO2 eq	2.29E-01	-1.21E-01	-7.88E-04	1.29E-01	2.21E-01	6.41E-05	-4.97E-04
CC - luluc	kg CO2 eq	2.11E-02	1.67E-02	5.16E-04	7.39E-06	3.74E-03	1.88E-04	-5.32E-04
ODP	kg CFC11 eq	1.24E-07	1.24E-07	4.52E-15	1.81E-14	5.57E-10	9.11E-13	1.56E-10
AP	molc H+ eq	1.42E-01	9.45E-02	2.14E-04	4.09E-05	4.74E-02	2.37E-04	-1.40E-02
EP- freshwater	kg P eq	1.77E-03	1.67E-03	1.31E-07	7.25E-09	1.02E-04	2.36E-07	-7.48E-07
EP -marine	kg N eq	3.42E-02	2.21E-02	1.06E-04	1.55E-05	1.18E-02	8.80E-05	-5.24E-04
EP - terrestrial	molc N eq	3.05E-01	1.79E-01	1.17E-03	1.91E-04	1.24E-01	1.03E-03	-5.72E-03
POCP	kg NMVOC eq	7.98E-02	4.81E-02	2.08E-04	3.97E-05	3.13E-02	1.91E-04	-2.20E-03
ADP-M&M	kg Sb-Eq	2.24E-03	2.23E-03	2.67E-09	2.28E-10	4.60E-06	8.76E-09	-4.97E-04
ADP-fossil	MJ	7.59E+02	2.43E+02	4.04E-01	4.86E-02	5.14E+02	1.13E+00	-4.70E+00
WDP	m³	1.13E+01	4.52E+00	4.75E-04	1.64E-02	6.69E+00	2.75E-02	-1.96E-01
PM	Disease incidence	1.45E-06	1.05E-06	8.81E-10	2.16E-10	3.96E-07	1.53E-09	-8.99E-08
IRP	kBq U235 eq.	1.46E+01	1.10E+00	1.07E-04	3.24E-04	1.35E+01	2.08E-02	-4.04E-03
ETP-fw	CTUe	3.05E+02	1.55E+02	3.00E-01	2.33E-02	1.49E+02	4.39E-01	-3.21E+00
HTP-c	CTUh	1.50E-08	6.60E-09	6.06E-12	1.17E-12	8.37E-09	1.91E-11	-3.56E-10
HTP-nc	CTUh	5.04E-07	3.75E-07	2.72E-10	2.58E-11	1.28E-07	5.64E-10	-2.69E-08

Indicators	Unit	Total - (w/o D)	A1-A3	A4	A5	B1-B7	C1-C4	D
			Manufacturing	Distribution	Installation	Use stage	End of life	Benefits & Loads
SQP	Dimension-less	2.72E+02	5.34E+01	1.99E-01	1.57E-02	2.18E+02	4.61E-01	-1.75E+00

CC-total: Climate change; **CC-fossil:** Climate change fossil fuels; **CC-biogenic:** Climate change biogenic; **CC-LULUC:** Climate change land use and land use change; **ODP:** Depletion potential of the stratospheric ozone layer; **AP:** Acidification potential, Accumulated Exceedance; **EP-freshwater:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; See “additional Norwegian requirements” for indicator given as PO4 eq. **EP-marine:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **EP-terrestrial:** Eutrophication potential, Accumulated Exceedance; **POCP:** Formation potential of tropospheric ozone; **ADP-M&M:** Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil:** Abiotic depletion potential for fossil resources; **WDP:** Water deprivation potential, deprivation weighted water consumption; **PM:** Particulate matter emissions; **IRP:** Ionizing radiation, human health; **ETP-fw:** Ecotoxicity (freshwater); **ETP-c:** Human toxicity, cancer effects; **HTP-nc:** Human toxicity, non-cancer effects; **SQP:** Land use related impacts / soil quality

Resource use indicators

Indicators	Unit	Total - (w/o D)	A1-A3	A4	A5	B1-B7	C1-C4	D
			Manufacturing	Distribution	Installation	Use stage	End of life	Benefits & Loads
PERE	MJ	4.33E+02	5.86E+01	3.48E-02	1.17E-02	3.72E+02	2.35E+00	-1.61E+00
PERM	MJ	0.00E+00	1.74E+00	0.00E+00	0.00E+00	0.00E+00	-1.74E+00	0.00E+00
PERT	MJ	4.33E+02	6.04E+01	3.48E-02	1.17E-02	3.72E+02	6.14E-01	-1.61E+00
PENRE	MJ	7.59E+02	2.31E+02	4.04E-01	4.86E-02	5.14E+02	1.36E+01	-4.70E+00
PENRM	MJ	0.00E+00	1.25E+01	0.00E+00	0.00E+00	0.00E+00	-1.25E+01	0.00E+00
PENRT	MJ	7.59E+02	2.43E+02	4.04E-01	4.86E-02	5.14E+02	1.13E+00	-4.70E+00
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	1.17E-23	1.17E-23	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	1.38E-22	1.38E-22	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m³	4.32E-01	1.47E-01	3.88E-05	3.87E-04	2.84E-01	8.59E-04	-1.06E-02
Biogenic carbon content of the product	kg of C	0.00E+00						

Indicators	Unit	Total - (w/o D)	A1-A3	A4	A5	B1-B7	C1-C4	D
			Manufacturing	Distribution	Installation	Use stage	End of life	Benefits & Loads

Biogenic
carbon
content of
the
associated
packaging

kg of C 3.21E-02

ERE: Use of renewable primary energy; PERM: Use of renewable primary energy resources used as raw material; PERT: Total use of renewable primary energy resources; PENRE: Use of non-renewable primary energy; PENRM: Use of non-renewable primary energy resources used as raw material; PENRT: Total use of non-renewable primary energy resources; SM: Use of secondary materials; RSF: Use of renewable secondary fuels; NRSF: Use of non-renewable secondary fuels; FW Use of net fresh water

End of life – Waste & output flows

Indicators	Unit	Total - (w/o D)	A1-A3	A4	A5	B1-B7	C1-C4	D
			Manufacturing	Distribution	Installation	Use stage	End of life	Benefits & Loads
HWD	kg	5.48E-06	4.74E-06	1.55E-11	2.32E-11	7.43E-07	1.20E-09	-1.82E-09
NHWD	kg	1.01E+00	4.28E-01	6.60E-05	4.16E-03	4.25E-01	1.51E-01	-2.65E-02
RWD	kg	9.07E-02	8.47E-03	7.36E-07	2.06E-06	8.21E-02	1.28E-04	-1.12E-04
MER	kg	2.10E-01	3.82E-03	0.00E+00	0.00E+00	0.00E+00	2.06E-01	0.00E+00
MFR	kg	3.47E-02	1.02E-03	0.00E+00	0.00E+00	0.00E+00	3.37E-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	1.12E+00	3.26E-02	0.00E+00	0.00E+00	0.00E+00	1.09E+00	0.00E+00
EEE	MJ	4.83E-01	1.41E-02	0.00E+00	0.00E+00	0.00E+00	4.69E-01	0.00E+00

HWD: hazardous waste disposed; NHWD: non-hazardous waste disposed; RWD: radioactive waste disposed; MER: materials for energy recovery; MFR: material for recycling; CRU: components for reuse; ETE: exported thermal energy; EEE: exported electricity energy.

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. The scaling factors listed here are calculated according to this standard.

The extrapolation rules have been defined as follow:

- Manufacturing (A1-A3): $\frac{m_{plastics,i} + m_{metals,i} + 25 \cdot m_{PCBA,i} + m_{others,i}}{m_{plastics,ref} + m_{metals,ref} + 25 \cdot m_{PCBA,ref} + m_{others,ref}}$
- Distribution (A4): $\frac{m_{product,i}}{m_{product,ref}}$
- Installation (A5): $\frac{m_{product,i}}{m_{product,ref}}$
- Use Phase (B1-B7): $\frac{m_{annual\ power\ consumption,i}}{m_{annual\ power\ consumption,ref}}$
- End-of-Life (C1-D): $\frac{m_{plastics,i} - 3 \cdot m_{metals,i} - m_{PCBA,i} - m_{others,i}}{m_{plastics,ref} - 3 \cdot m_{metals,ref} - m_{PCBA,ref} - m_{others,ref}}$

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 from page 4:

Article Type	Manufacturing	Distribution	Installation	Use Phase	End-of-Life
RCR110.2ZB	0.55	0.76	0.76	1.20	-0.07
RCR114.1	0.55	0.76	0.76	2.11	-0.07
RDD100	0.32	0.79	0.79	1.20	-0.43
RDD310/MM	0.63	1.87	1.87	1.20	2.09
RDE100	0.53	1.07	1.07	1.02	0.12
RDF300.02	0.63	1.87	1.87	1.60	2.09
RDF300.02/VB	1.04	0.91	0.91	1.20	1.99
RDF302	0.64	0.76	0.76	1.20	1.13
RDF302.B	0.64	0.76	0.76	1.20	1.13
RDF302/VB	0.68	0.76	0.76	1.20	0.94
RDF310.2/MM	0.63	1.87	1.87	1.20	2.09
RDF340	0.63	1.87	1.87	1.60	2.09
RDF600	0.42	1.63	1.63	0.82	0.31
RDF600KN	0.42	1.63	1.63	0.70	0.31
RDF600KN/S	0.42	1.63	1.63	0.70	0.31
RDF600KN/VB	0.50	0.74	0.74	0.70	0.36
RDF600T	0.42	1.63	1.63	0.82	0.31
RDF660MB	0.51	0.71	0.71	1.80	0.73
RDF660MB/MM	0.51	0.71	0.71	1.80	0.73
RDF660T	0.50	0.74	0.74	1.80	0.70
RDG100	0.88	0.78	0.78	0.73	1.07
RDG100T	0.88	0.78	0.78	0.73	1.07
RDG110	0.88	0.78	0.78	1.20	1.07
RDG110U	0.91	0.76	0.76	0.73	2.05

Article Type	Manufacturing	Distribution	Installation	Use Phase	End-of-Life
RDG160T	0.78	0.70	0.70	0.73	1.41
RDG160TU	0.78	0.70	0.70	0.73	1.41
RDG200KN	1.00	1.00	1.00	1.00	1.00
RDG200KN/BK	1.00	1.00	1.00	1.00	1.00
RDG200T	0.95	0.97	0.97	1.00	0.84
RDG204KN	1.01	1.01	1.01	1.00	1.01
RDG260KN	0.86	0.94	0.94	1.00	0.60
RDG260KN/BK	0.86	0.94	0.94	1.00	0.60
RDG260T	0.83	0.92	0.92	1.00	0.50
RDG264KN	1.01	1.01	1.01	1.00	1.03
RDS110	0.62	1.10	1.10	0.76	6.30
RDS110.R	0.51	1.56	1.56	1.78	3.84
RDS120	0.52	1.11	1.11	0.76	5.30
RDS120.B	0.52	1.11	1.11	0.76	5.30
RDS120-B	0.52	1.11	1.11	0.76	5.30
RDU340	0.62	1.84	1.84	1.60	1.91

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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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"	