



ENVIRONMENTAL PRODUCT DECLARATION

# SENTRON MCCB

3VA2[0,1,2]..-..[3,4]..-..AA.

3VA6[1,2]..-..[3,4]..-..AA.

Type II according to ISO 14021 including life cycle impact assessment (LCIA)



# SIEMENS

# General information

This environmental product declaration (EPD) is based on the international standard ISO 14021 (“Environmental labels and declarations – Self declared environmental claims – Type II environmental labelling”). 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, as well as product specific rules (PSR) for low-voltage switchgear and control gear equipment in IEC TS 63058 ED1.0

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.

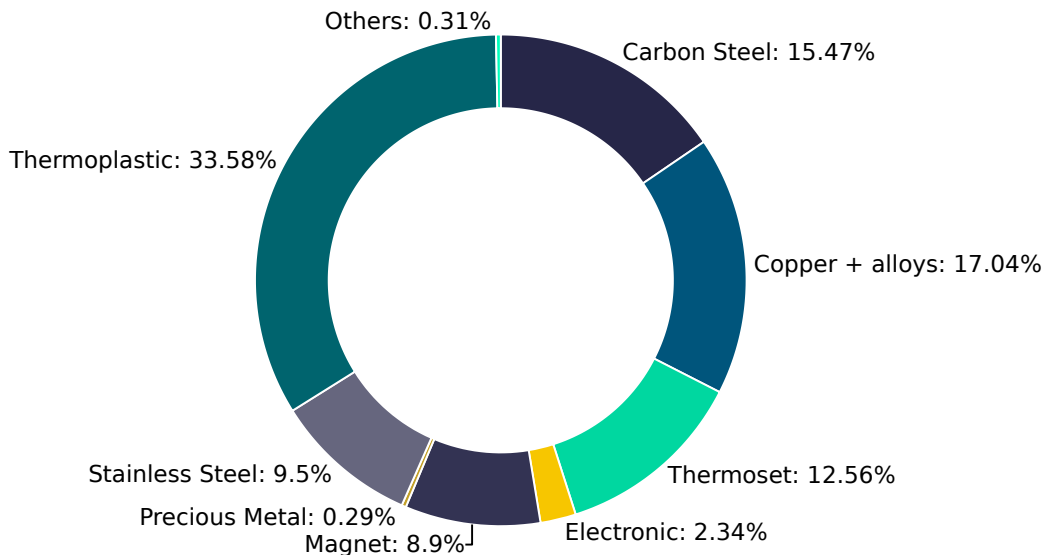
<b>Products</b>	<b>All variants in the range of 3VA2[0,1,2]...[3,4]-.AA. and 3VA6[1,2]...[3,4]-.AA.</b>
<b>Represented by the reference product</b>	3VA6140-5LL32-0AA0
<b>Product Description</b>	Circuit breaker 3VA6 plus UL Frame 150 breaking capacity class M 35 kA @ 480 V 3-pole, line protection ETU420, LI, In=40 A overload protection Ir=16 A ...40 A short-circuit protection Ii=1.5...12x In without connection
<b>Functional Unit</b>	To carry its rated current on 3 or 4 poles, as defined in IEC 60947-2, without interruption for a period of 20 years. To make and break its rated current for a defined number (M) times. To interrupt an overload current at a specific multiple (N) of the rated current for a defined number (M) times, where M and N are given in IEC 60947-2. To break and make a short-circuit up to its ultimate short-circuit capacity (Icu) and its service short-circuit breaking capacity (Ics), in accordance with IEC 60947-2. <sup>1</sup>

<sup>1</sup> The lifetime value used for calculation is a reference value and does not equate with the minimum, average or real life time.

# Material composition

The following chart outlines the overall material composition of the calculated reference product without packaging. Product weight of 2.18 kg adds up with packaging weight of 0.12 kg to a total weight of 2.3 kg. Packaging consists of: Corrugated box (average composition) (EoL), Graphic paper (EoL), PE film (EoL).

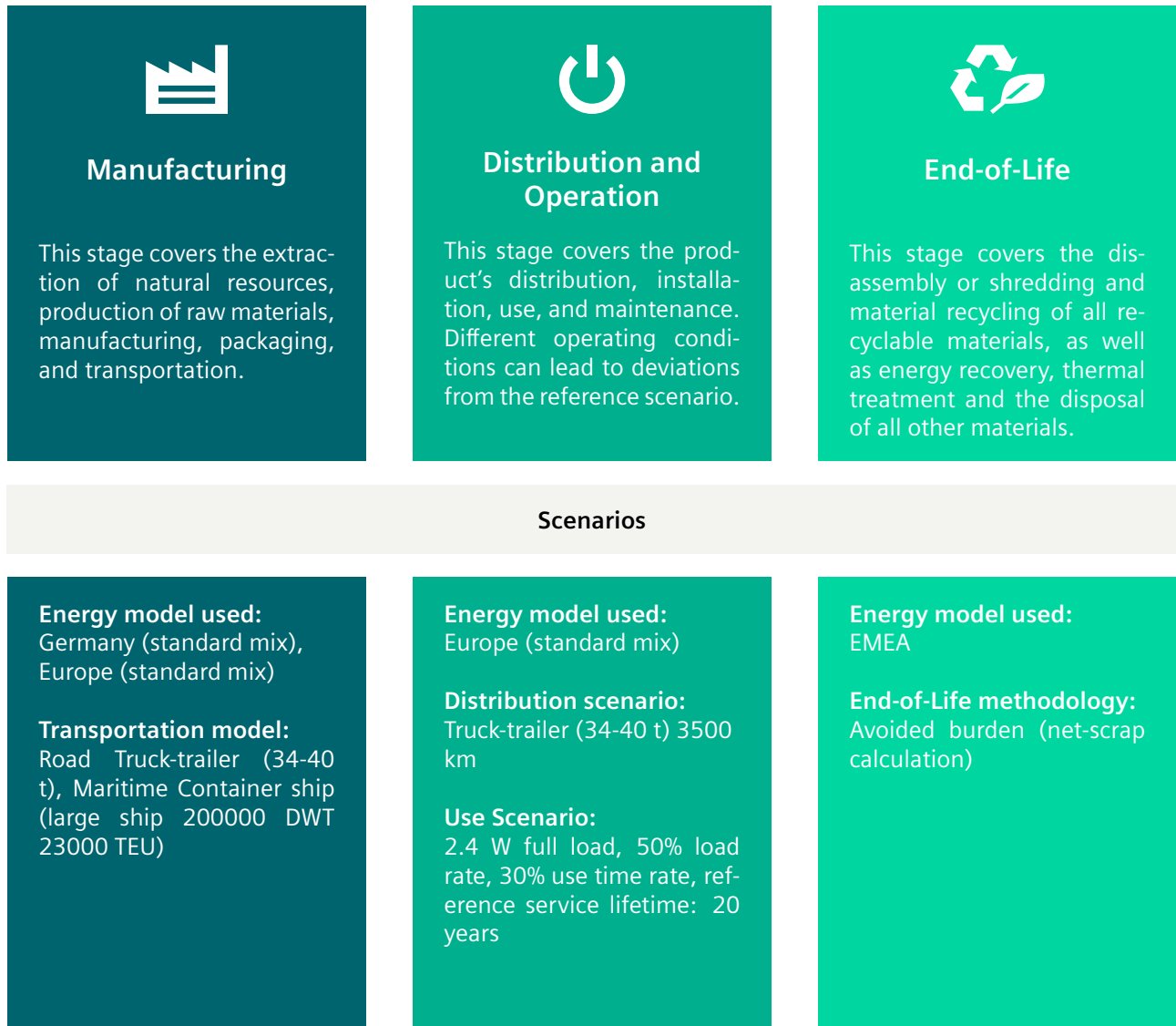
## Product Weight 2.18 kg



# 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](#)

## Life cycle stages and reference scenarios



# Key environmental performance indicators

The following impact categories characterize the product's environmental footprint. They have been calculated with LCIA methodology 01 EN15804+A2 (EF 3.1); LCA tool: Green Digital Twin (GDT), Database: One Siemens LCA Database (based on MLC CUP 2024.1, formerly GaBi).

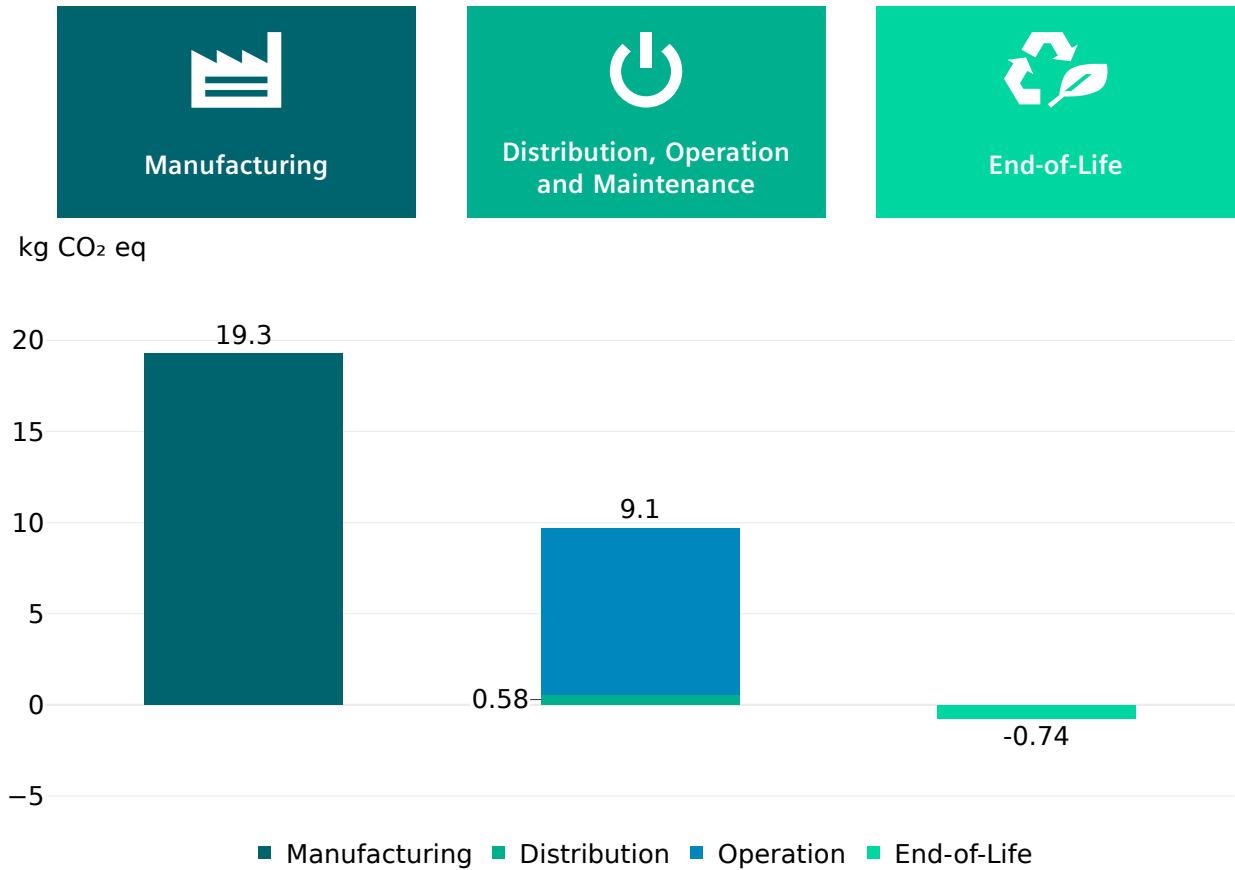
To ensure the high quality and completeness of the LCA results, primary data have been used whenever possible. Datasets for resources, such as electrical energy or natural gas, are chosen from the region where the device is produced and assembled. If primary data are not available, datasets reflecting state-of-the-art manufacturing technology are considered.

For products belonging to the same homogeneous product family range the extrapolation rules in the appendix can be used to derive their corresponding environmental impacts (i) according to the standard EN50693.

Impact Category	Unit	Total	Manufacturing	Distribution	Operation	End of life
Acidification	Mole of H+ eq	1.55E-1	2.15E-1	7.81E-4	1.74E-2	-7.74E-2
Climate change – total	kg CO <sub>2</sub> eq	2.82E+1	1.93E+1	5.81E-1	9.12E+0	-7.44E-1
Climate change – fossil	kg CO <sub>2</sub> eq	2.80E+1	1.91E+1	5.69E-1	9.03E+0	-7.22E-1
Climate change – biogenic	kg CO <sub>2</sub> eq	2.46E-1	1.55E-1	1.36E-3	8.40E-2	5.70E-3
Climate Change, land use and land use change	kg CO <sub>2</sub> eq	5.50E-2	5.37E-2	9.57E-3	1.37E-3	7.26E-5
Ecotoxicity, freshwater – total	CTUe	3.05E+2	2.58E+2	5.57E+0	5.48E+1	-1.30E+1
Eutrophication, freshwater	kg P eq	1.75E-4	1.42E-4	2.43E-6	3.77E-5	-6.68E-6
Eutrophication, marine	kg N eq	2.05E-2	1.90E-2	2.83E-4	4.35E-3	-3.13E-3
Eutrophication, terrestrial	Mole of N eq	2.18E-1	2.02E-1	3.37E-3	4.56E-2	-3.31E-2
Human toxicity, cancer – total	CTUh	4.18E-7	4.18E-7	1.12E-10	3.08E-9	-2.53E-9
Human toxicity, non-cancer – total	CTUh	4.29E-7	5.10E-7	5.05E-9	4.72E-8	-1.33E-7
Ionising radiation, human health	kBq U235 eq	6.79E+0	1.85E+0	1.98E-3	4.97E+0	-3.08E-2
Land Use	dimensionless (pt)	1.73E+2	9.56E+1	3.69E+0	8.01E+1	-6.76E+0
Ozone depletion	kg CFC-11 eq	1.89E-9	1.70E-9	0.00E+0	2.05E-10	-8.50E-12
Particulate matter	Disease incidences	1.37E-6	1.77E-6	7.81E-9	1.46E-7	-5.54E-7
Photochemical ozone formation, human health	kg NMVOC eq	6.29E-2	6.36E-2	7.77E-4	1.15E-2	-1.29E-2
Resource use, fossils	MJ	4.48E+2	2.80E+2	0.00E+0	1.89E+2	-2.83E+1
Resource use, mineral and metals	kg Sb eq	1.21E-3	2.69E-3	4.96E-8	1.69E-6	-1.48E-3
Water use	m <sup>3</sup> world eq deprived water	1.67E+1	1.56E+1	8.82E-3	2.46E+0	-1.37E+0

# Climate change

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



## End-of-Life results

The end-of-life stage was modelled by shredding of the device, followed by sorting and material separation process.



It leads to:

- **product recyclability of up to 40%** mainly due to metal content
- **energy recoverability of up to 43%** from plastic materials
- **minimum disposal rate of 17%**

The exact final values depend on the used recycling process and add up to 100%.

**Note:** The device should not be disposed of as unsorted municipal waste. Special treatment for specific components may be mandated by law or recommended for environmental reasons. Observe all local and applicable laws.

# Appendix – Extrapolation Rules

To extrapolate the impact from the reference product to another product from the range, apply the following extrapolation rules to each key environmental impact (i) per life cycle stage from page 4:

MANUFACTURING (i) = Mass of (product) / Mass of (reference product) \* manufacturing impact value (i) of the reference product

DISTRIBUTION (i) = Mass of (product) / Mass of (reference product) \* distribution impact value (i) of the reference product

OPERATION (i) = Power loss in Watts (product) / Power loss in Watts (reference product) \* operation impact value (i) of the reference product

END-OF-LIFE (i) = Mass of (product) / Mass of (reference product) \* end-of-life impact value (i) of the reference product

TOTAL (i) =  $\Sigma$  Life Cycle Stages (i)

## Data Sources:

Mass of product in the product catalog

Product specific electrical data in the technical data sheets

# Legal Disclaimer

This Environmental Product Declaration (EPD) is for information purposes only. It is based upon the standards mentioned above. This EPD does not warrant or guarantee the composition of a product or that the product will retain a particular composition for a particular period. Therefore, all warranties, representations, conditions, and all other terms of any kind whatsoever implied by statute or common law are – to the fullest extent permitted by applicable law – excluded.

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Please be aware that the data of this EPD cannot be compared with data calculated based upon product category rules (PCRs) other than the standards mentioned above. The values given are only valid within the context specified and cannot be used directly to draw up the environmental assessment of an installation.

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