EPD

Environmental Product Declaration

Indoor Current Sensor KECA 250 B1

Production site: Brno, Czech Republic

DOCUMENT KIND Environmental Product Declaration	IN COMPLIANCE WITH ISO 14025 and EN 50693			
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EPD Owner	ABB Switzerland Ltd, Group Technology Management
Organization No.	CHE-101.538.426
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Program operator	The Norwegian EPD Foundation Post Box 5250 Majorstuen, 0303 Oslo, Norway phone: +47 23 08 80 00, email: post@epd-norge.no
Declared product	Indoor current sensor KECA 250 B1
Product description	The KECA 250 B1 is indoor low-power passive current sensor cast in PUR resin and designed with nominal current 250 A and rated primary current of application up to 4 000 A.
Functional unit	To measure and protect an energy distribution system with the rated primary current of application 4 000 A, during a service life of 20 years in Europe with a use rate of 100%.
Reference flow	Indoor current sensor KECA 250 B1, including related accessories and packaging.
Independent verification	Independent verification of the declaration and data, according to ISO 14025:2010 ☐ INTERNAL ☒ EXTERNAL Independent verifier approved by EPD-Norge: Elisabet Amat Signature: 
Approved by	Håkon Hauan, CEO EPD-Norge Signature: 
Reference PCR	EN 50693:2019 – Product Category Rules for Life Cycle Assessments of Electronic and Electrical Products and Systems. EPDItaly007 – Electronic and Electrical Products and Systems, Rev. 3.0, 2023/01/13. EPDItaly015 – Electronic and Electrical Products and Systems – Switchboards, Rev. 1.5, 2022/02/23.
Program instructions	The Norwegian EPD Foundation/EPD-Norge, General Programme Instructions 2019, Version 3.0, 2019/04/24.
LCA study	This EPD is based on the LCA study described in the LCA report 1VLG101211.
EPD type	Specific product by a specific manufacturer
EPD scope	Cradle-to-grave
Product RSL	20 years, this is a theoretical period selected for calculation purposes only and it is not representative for the minimum, average, nor actual service life of the product
Geographical representativeness	Manufacturing (suppliers): Global Manufacturing (ABB): Czech Republic Downstream: Europe
Reference year	2023
LCA software	SimaPro 9.5 (2023)
LCI database	Ecoinvent v3.9.1 (2022)
Comparability	EPDs published within the same product category, though originating from different programs, may not be comparable. Full conformance with a PCR allows EPD comparability only when all stages of a life cycle have been considered. However, variations and deviations are possible.
Liability	The owner of the declaration shall be liable for the underlying information and evidence. EPD-Norge shall not be liable with respect to manufacturer, life cycle assessment data, and evidence.

Contents

Sustainability at ABB

ABB is a leading global technology company that energizes the transformation of society and industry to achieve a more productive, sustainable future. By connecting software to its electrification, robotics, automation, and motion portfolio, ABB pushes the boundaries of technology to drive performance to new levels.

At ABB, we actively contribute to a more sustainable world, leading by example in our own operations and partnering with customers and suppliers to enable a low-carbon society, preserve resources, and promote social progress.

Learn more on our website global.abb/group/en/sustainability or scan the QR code.

General Information

The product declared in this Environmental Product Declaration is the indoor current sensor KECA 250 B1, including related accessories and packaging.

The KECA 250 B1 is an indoor current sensor with construction done without the use of ferromagnetic core. Current measurement in KECA 250 B1 is based on the Rogowski coil principle. A Rogowski coil is a toroidal, without an iron core, placed around the primary conductor in the same way as the secondary winding a current transformer.

As there is no iron core, no necessity for high burden values and thus a possibility for low current losses and only one secondary winding needed, KECA 250 B1 sensors exhibit extremely low energy consumption that is just a fraction of that transferred to heat in conventional CTs. This fact contributes to huge energy savings during its entire operating life, supporting the world-wide effort to reduce energy consumption.

The current sensor type KECA 250 B1 is intended for use in current measurement in low voltage or medium voltage switchgear. In case of medium voltage switchgear, the current sensor should be installed over a bushing insulator, insulated cable or any other type of insulated conductor.

General technical specifications of the product are presented below.

Technical information		
	Unit	**Value**
Outer height/width/length	mm	147/37.5/176
Insulation level	kV	0.72
Rated primary	A	250 (up to 4 000)
Accuracy class	-	0.5 / 5P340
Transformation ratio	-	250 A/150 mV at 50 Hz 250 A/180 mV at 60 Hz
Frequency	Hz	50 / 60

The production of the instrument sensors, from which medium indoor current sensor KECA 250 B1 is part of, is located in the ABB Brno Videnska factory. The instrument sensors are produced and assembled directly in the ABB factory combined with components produced by ABB's suppliers.

ABB Brno ELDS adopts and implements for its own activities an integrated Quality/Environmental/Health Management System in compliance with the following standards:

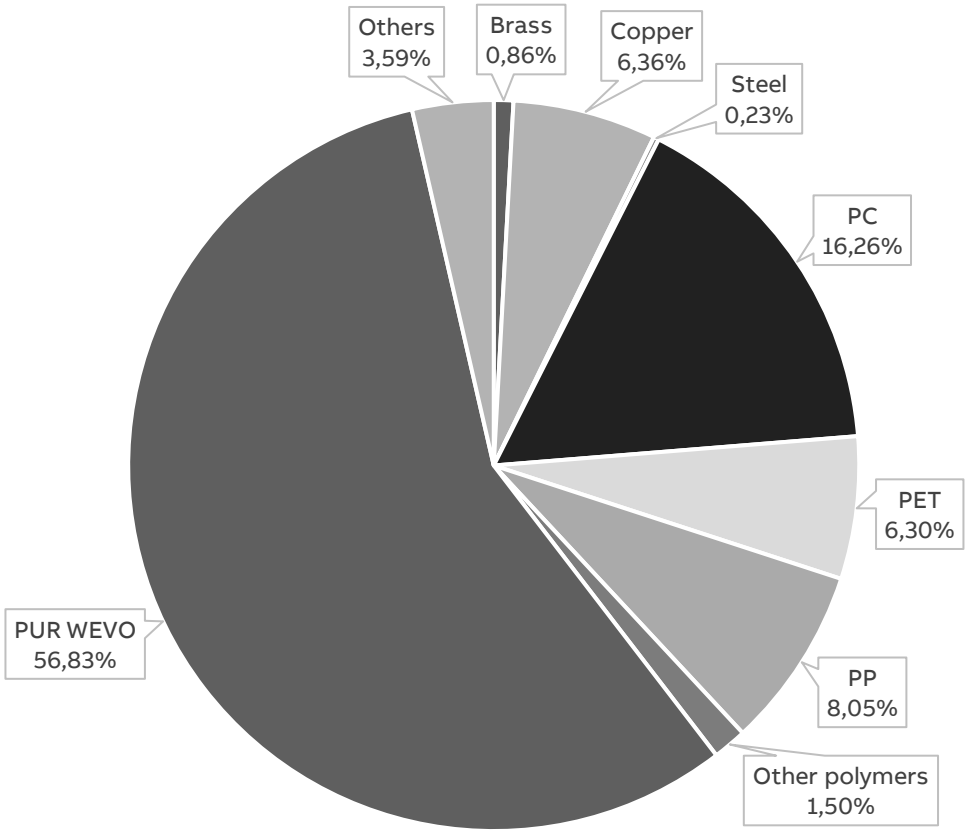
- UNI EN ISO 9001:2015 - Quality Management Systems- Requirements
- UNI EN ISO 14001:2015 - Environmental Management Systems
- UNI EN ISO 45001:2018 - Occupational Health and Safety Management system

Constituent Materials

The constituent materials of KECA 250 B1 are presented below.

Type	Material	Weight [kg]	Weight [%]
	Brass	0.010	0.86
	Copper	0.070	6.36
	Steel	0.003	0.23
Plastics	PC	0.180	16.26
	PET	0.070	6.30
	PP	0.089	8.05
	Other polymers	0.017	1.50
Others	PUR WEVO	0.630	56.83
	Others	0.040	3.59
Total		**1.108**	**100**

KECA 250 B1



The packaging materials and accessories weigh 0.229 kg, and the constituent materials are presented below.

Description	Material	Weight [kg]	Weight [%]
Metals	Aluminum	0.00025	0.11
	Steel	0.0104	4.56
Plastics and Rubbers	Polymers	0.0052	2.29
	Rubber	0.00029	0.13
Wooden base materials	Wood (pallet + case)	0.2058	89.91
Unit test report	Paper	0.005	2.18
Others	Cardboard	0.0019	0.82
Total		**0.2289**	**100**

LCA Background Information

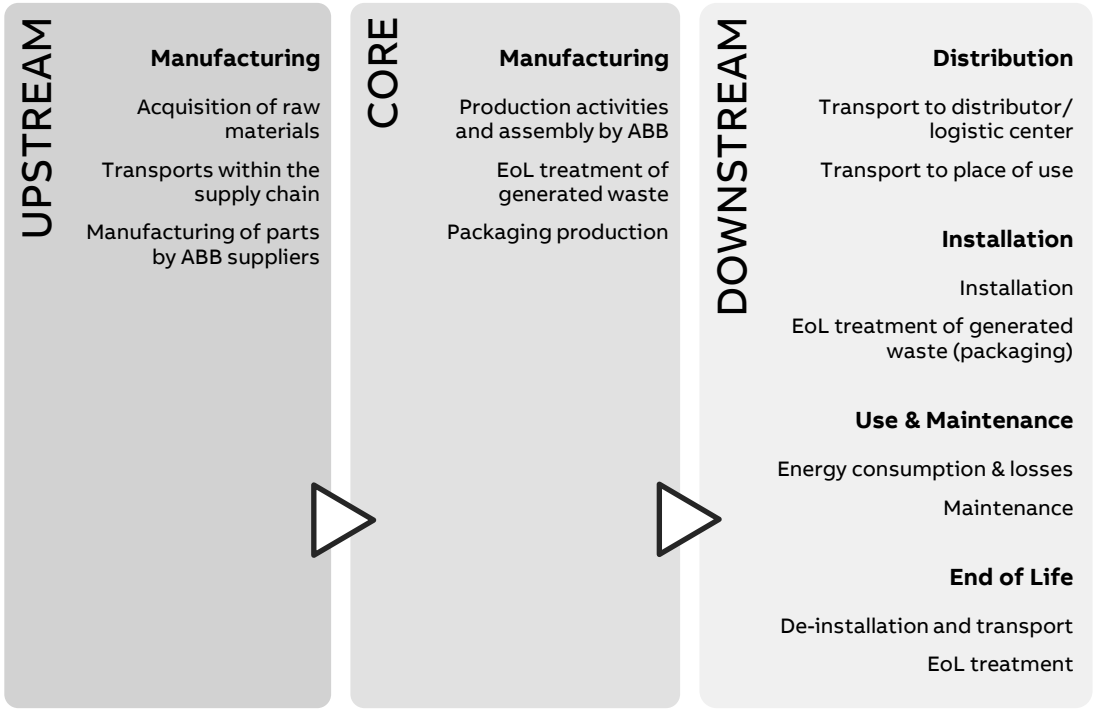
Functional Unit

The functional unit of this study is to measure and protect an energy distribution system (up to 4 000 A) during a service life of 20 years and with a use rate of 100 %. The reference flow is an indoor current sensor KECA 250 B1 cast in polyurethane and its related accessories and packaging.

Note, the reference service life (RSL) of 20 years is a theoretical period selected for calculation purposes only – this is not representative for the minimum, average, nor actual service life of the product.

System Boundaries

The life cycle assessment of the KECA 250 B1, an EEPS (Electronic and Electrical Products and Systems), is a “cradle-to-grave” analysis. The figure below shows the product life cycle stages and the information considered in the LCA.



Data quality

Both primary and secondary data are used. The main sources for primary data are the bill of materials and technical drawings, while site specific foreground data are provided by ABB. Furthermore, information and data obtained from other LCA studies are also used.

For all processes for which primary data are not available, generic data originating from the ecoinvent v3.9.1 database, “allocation, cut-off by classification”, are used. The LCA software used for the calculations is SimaPro 9.5.

Allocation rules

The utility consumption and waste generation by ABB, in the core manufacturing stage, is allocated to the production of one reference product according to applicable rules. For the end-of-life allocation, the “Polluter Pays” principle is adopted according to what is defined in the CEN/TR 16970 standard. However, the potential benefits and avoided loads from recovery and recycling processes are not considered because it is not required by the PCR.

Cut-off criteria

The materials that were excluded are glue, and adhesive, as their mass represents less than 2% of that of the whole product, as stated in the paragraph of cut-off criteria of EPDItaly015: “Materials making up the sensor itself whose total mass does not exceed 2% of the total weight of the device”.

The same applies for tape and labels used in packaging, which are even a smaller fraction of the total mass.

Sandblasting of capacitors and phosphating were also excluded due to the model complexity and unavailability of reference data.

Inventory Analysis

Manufacturing Stage (upstream)

The life cycle inventory in the upstream manufacturing stage is based on the primary data available from ABB. Datasets are applied accordingly, to the best of our knowledge, to represent each material, manufacturing process, and surface treatment. Modelling decisions and assumptions that are highly relevant to the results are as following:

- All steel components (hot rolled steel, spring steel, stainless steel) are modelled with the same kind of steel: "*Steel, low-alloyed {GLO}| market for | Cut-off, S*", as it is representative for the large majority of the steel parts. Stainless steel is only used for a small number of screws and due to lack of data they are modelled using one type of steel.
- PUR is modelled on a chemical level, i.e., each chemical used is considered and mapped with the most representative dataset available.
- To account for the production activities of metal and plastic parts, Metal working, average and Injection molding are the most frequently used processes. Surface treatments are also included, and the most common surface treatments are *ABB_Nickel plating (GLO), S (mm2)* and *ABB_Tin plating, pieces (GLO)_SMP_V1*.

Additionally, supply chain transports are added as far as data is available between ABB, the suppliers, and sub-suppliers. Only primary suppliers are considered. The rest of the transports are assumed to already be included in ecoinvent's "market for"-processes. The selected ecoinvent processes are *Transport, freight, lorry 16-32 metric ton, EURO4 {RER}* for lorry and *transport, freight, sea, container ship {GLO}* for sea transport.

Manufacturing Stage (core)

In the core manufacturing stage, utility consumption and waste generation at the ABB manufacturing site are accounted for. The packaging materials and accessories associated with the product are also considered. The energy mix used for the production is representative for ABB Videnska factory based on the guarantee of origin (GO) energy certificate. This dataset includes electricity inputs produced in this country and from imports and transformed to medium voltage, the transmission voltage, direct emissions to air and electricity losses during transmission.

Distribution

The transport distance from ABB's plant to the site of installation is assumed to be 300 km over land, as suggested by the PCR EPDItaly015, as the actual distance is unknown. The selected ecoinvent process is *Transport, freight, lorry 16-32 metric ton, euro4 {RER}| market for transport, freight, lorry 16-32 metric ton, EURO4 | Cut-off, S*, and the scenario is representative for Europe.

Installation

The installation phase only implies manual activities, and no energy is consumed. Therefore, this phase only considers the end-of-life of the packaging materials used.

	Scenario	Transport	Representation
Packaging End-of-Life	*Packaging waste by waste management operations* (Eurostat, 2021)*	100 km by lorry (assumption)	Europe

*Due to lack of data from Eurostat, 100% landfill is assumed for ceramics (e.g., bentonite)

Use

The use stage considers the reference power consumption and power losses over the reference service life of 20 years as defined in the functional unit. This is calculated using the following formula, according to the PCR EPDItaly015 "Electronic and electrical products and systems - Switchboards" which defines specific rules for major product family the functional unit is used in.

Calculation of losses for KECA 250 B1 applied in UniGear 550 Digital with nominal current 1 250 A:

$$\Delta P_{use} = \frac{U^2}{R} = I^2 * R = 0.00156^2 * 480 = 0.00117\ W$$

$$E_{use}[kWh] = \frac{\Delta P_{use} * 8760 * RSL}{1000} = \frac{0.00117 * 8760 * 20}{1000} = 0.205\ kWh$$

Where:

- E_{use} = Total energy use over the reference service life
- I = Secondary current in A
- ΔP_{use} = Reference power consumption in watts
- R =Total resistance in Ω
- *RSL* = Reference Service Life in years
- 8760 is the number of hours in a year
- 1000 is the conversion factor from W to kW

Because this product is sold globally and is not limited to any specific country, the latest energy mix of the European Union is adopted as suggested by the standard EN 50693. The emission factor of the energy mix is presented below.

Energy mix	Source	Amount	Unit
Electricity, medium voltage {RER}| market group for | Cut-off, S	Ecoinvent v3.9.1	0.361	kg CO_2-eq/kWh

Since no maintenance happens during the use phase, the environmental impacts linked to this procedure are omitted from the analysis.

End of life

Decommissioning of the product only implies manual activities, and no energy is consumed. Therefore, this phase only considers the end-of-life of the product.

	Scenario	Transport	Representation
Product End-of-Life	IEC/TR 62635 (Annex D.3)*	100 km by lorry (assumption)	Europe

*A conservative approach is adopted by considering all parts as either: requiring selective treatment, difficult to process, or going through a separation process; no individual part is considered as a single recyclable material. Also, due to the sensor containing parts difficult to process through separation, these are all modelled as 100 % waste to landfill to represent the typical waste streams within Europe.

Environmental Indicators

In accordance with the PCR EPDItaly007, the environmental impact indicators are determined by using the characterization factors and impact assessment methods specified in EN 15804:2012+A2:2019.

KECA 250 B1

			Cradle-to-gate		Cradle-to-grave			
Impact category	Unit	Total	UPSTREAM	CORE	DOWNSTREAM			
			Manufacturing		Distribution	Installation	Use and maintenance	End-of-life
GWP – total	kg CO_2 eq.	6.82E+00	6.02E+00	3.35E-01	7.51E-02	1.12E-01	7.43E-02	1.96E-01
GWP – fossil	kg CO_2 eq.	7.02E+00	6.01E+00	6.67E-01	7.50E-02	1.32E-02	7.14E-02	1.76E-01
GWP – biogenic	kg CO_2 eq.	-2.09E-01	3.38E-03	-3.33E-01	6.83E-05	9.91E-02	2.64E-03	1.91E-02
GWP – luluc	kg CO_2 eq.	1.05E-02	8.50E-03	1.65E-03	3.67E-05	3.84E-06	1.79E-04	1.41E-04
ODP	kg CFC-11 eq.	1.33E-06	1.28E-06	4.40E-08	1.64E-09	1.46E-10	1.28E-09	1.18E-09
AP	mol H+ eq.	8.69E-02	8.09E-02	4.70E-03	3.11E-04	3.90E-05	3.59E-04	5.16E-04
EP – freshwater	kg P eq.	6.20E-03	5.89E-03	2.07E-04	5.29E-06	1.11E-06	6.52E-05	3.20E-05
EP – marine	kg N eq.	2.48E-02	9.17E-03	1.46E-03	1.18E-04	4.73E-05	6.38E-05	1.40E-02
EP – terrestrial	mol N eq.	1.14E-01	9.20E-02	1.84E-02	1.26E-03	1.66E-04	5.62E-04	1.41E-03
POCP	kg NMVOC eq.	3.68E-02	3.12E-02	4.50E-03	4.55E-04	5.53E-05	1.81E-04	4.67E-04
ADP – minerals and metals	kg Sb eq.	9.31E-04	9.25E-04	5.26E-06	2.43E-07	2.41E-08	1.42E-07	6.49E-07
ADP – fossil	MJ, net calorific value	1.32E+02	1.19E+02	8.70E+00	1.07E+00	1.01E-01	1.64E+00	1.33E+00
WDP	m^3 eq.	5.57E+00	5.29E+00	2.39E-01	4.35E-03	5.46E-04	1.68E-02	2.27E-02

GWP-fossil: Global Warming Potential fossil; GWP-biogenic: Global Warming Potential biogenic; GWP-luluc: Global Warming Potential land use and land use change; ODP: Depletion potential of the stratospheric ozone layer; AP: Acidification potential; EP-freshwater: Eutrophication potential-freshwater compartment; EP-marine: Eutrophication potential-marine compartment; EP-terrestrial: Eutrophication potential-accumulated exceedance; POCP: Formation potential of tropospheric ozone; ADP-minerals & metals: Abiotic Depletion for non-fossil resources potential; ADP-fossil: Abiotic Depletion for fossil resources potential; WDP: Water deprivation potential.

Resource use parameters	Unit	Total	Cradle-to-gate		Cradle-to-grave			
			UPSTREAM	CORE	DOWNSTREAM			
			Manufacturing		Distribution	Installation	Use and maintenance	End-of-life
PENRE	MJ, low cal. value	1.09E+02	9.60E+01	8.47E+00	1.07E+00	1.01E-01	1.64E+00	1.33E+00
PERE	MJ, low cal. value	3.55E+01	9.17E+00	2.59E+01	1.66E-02	2.22E-03	3.16E-01	1.12E-01
PENRM	MJ, low cal. value	2.35E+01	2.33E+01	2.28E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERM	MJ, low cal. value	3.92E+00	7.20E-01	3.20E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ, low cal. value	1.32E+02	1.19E+02	8.70E+00	1.07E+00	1.01E-01	1.64E+00	1.33E+00
PERT	MJ, low cal. value	3.94E+01	9.89E+00	2.91E+01	1.66E-02	2.22E-03	3.16E-01	1.12E-01
FW	m^3	1.47E-01	1.37E-01	7.61E-03	1.53E-04	2.16E-05	1.29E-03	7.31E-04
MS	kg	3.16E-02	2.57E-02	5.95E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

PENRE: Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw material; PERE: Use of renewable primary energy excluding renewable primary energy resources used as raw material; PENRM: Use of non-renewable primary energy resources used as raw material; PERM: Use of renewable primary energy resources used as raw material; PENRT: Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials); PERT: Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials); FW: Net use of fresh water; MS: Use of secondary materials; RFS: Use of renewable secondary fuels; NRSF: Use of non-renewable secondary fuels.

System output indicators	Unit	Total	Cradle-to-gate		Cradle-to-grave			
			UPSTREAM	CORE	DOWNSTREAM			
			Manufacturing		Distribution	Installation	Use and maintenance	End-of-life
HWD	kg	1.41E-03	1.33E-03	7.04E-05	6.82E-06	5.84E-07	2.08E-06	4.76E-06
NHWD	kg	2.11E+00	7.13E-01	1.80E-01	5.23E-02	8.67E-02	4.51E-03	1.07E+00
RWD	kg	1.20E-04	9.06E-05	1.47E-05	3.48E-07	4.30E-08	1.20E-05	2.18E-06
MER	kg	7.17E-02	0.00E+00	7.07E-03	0.00E+00	6.46E-02	0.00E+00	0.00E+00
MFR	kg	2.15E-01	1.25E-02	6.02E-02	0.00E+00	8.21E-02	0.00E+00	6.02E-02
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	2.93E-01	0.00E+00	2.01E-02	0.00E+00	2.73E-01	0.00E+00	0.00E+00
EEE	MJ	1.62E-01	0.00E+00	9.82E-03	0.00E+00	1.52E-01	0.00E+00	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.

Sensitivity analysis

This chapter presents the results of a sensitivity analysis, to understand how the impact category “GWP – total” varies in different scenarios. A theoretical waste scenario has been evaluated, where is assumed that all the components of the sensor are recycled according to the single material recyclability of IEC/TR 62635 (Annex D.3), a recyclability potential of up to 13.76 % can be achieved.

			Cradle-to-gate		Cradle-to-grave			
Impact category	**Unit**	**Total**	**UPSTREAM**	**CORE**	**DOWNSTREAM**			
			Manufacturing		**Distribution**	**Installation**	**Use and maintenance**	**End-of-life**
GWP – total	kg CO_2 eq.	6.93E+00	6.02E+00	3.35E-01	7.51E-02	1.12E-01	7.43E-02	3.09E-01
MFR	kg	3.07E-01	1.25E-02	6.02E-02	0.00E+00	8.21E-02	0.00E+00	1.53E-01

Sensitivity analysis is added to understand how a different nominal current affects environmental impact during use stage. Calculation of losses for KECA 250 B1 with nominal current 4 000 A is added, because in some cases the nominal current can rise to this value.

Calculation of losses for KECA 250 B1 with nominal current 4 000 A:

$$\Delta P_{use} = \frac{U^2}{R} = I^2 * R = 0.005^2 * 480 = 0.012\ W$$

$$E_{use}[kWh] = \frac{\Delta P_{use} * 8760 * RSL}{1000} = \frac{0.012 * 8760 * 20}{1000} = 2.103\ kWh$$

KECA 250 B1 with nominal current 4 000 A

Impact category	Unit	Total	Cradle-to-gate		Cradle-to-grave			
			UPSTREAM	CORE	DOWNSTREAM			
			Manufacturing		Distribution	Installation	Use and maintenance	End-of-life
GWP – total	kg CO_2 eq.	7.50E+00	6.02E+00	3.35E-01	7.51E-02	1.12E-01	7.60E-01	1.96E-01
GWP – fossil	kg CO_2 eq.	7.68E+00	6.01E+00	6.67E-01	7.50E-02	1.32E-02	7.32E-01	1.76E-01
GWP – biogenic	kg CO_2 eq.	-1.85E-01	3.38E-03	-3.33E-01	6.83E-05	9.91E-02	2.70E-02	1.91E-02
GWP – luluc	kg CO_2 eq.	1.22E-02	8.50E-03	1.65E-03	3.67E-05	3.84E-06	1.83E-03	1.41E-04
ODP	kg CFC-11 eq.	1.34E-06	1.28E-06	4.40E-08	1.64E-09	1.46E-10	1.31E-08	1.18E-09
AP	mol H+ eq.	9.02E-02	8.09E-02	4.70E-03	3.11E-04	3.90E-05	3.67E-03	5.16E-04
EP – freshwater	kg P eq.	6.81E-03	5.89E-03	2.07E-04	5.29E-06	1.11E-06	6.68E-04	3.20E-05
EP – marine	kg N eq.	2.54E-02	9.17E-03	1.46E-03	1.18E-04	4.73E-05	6.53E-04	1.40E-02
EP – terrestrial	mol N eq.	1.19E-01	9.20E-02	1.84E-02	1.26E-03	1.66E-04	5.76E-03	1.41E-03
POCP	kg NMVOC eq.	3.85E-02	3.12E-02	4.50E-03	4.55E-04	5.53E-05	1.86E-03	4.67E-04
ADP – minerals and metals	kg Sb eq.	9.32E-04	9.25E-04	5.26E-06	2.43E-07	2.41E-08	1.46E-06	6.49E-07
ADP – fossil	MJ, net calorific value	1.47E+02	1.19E+02	8.70E+00	1.07E+00	1.01E-01	1.68E+01	1.33E+00
WDP	m^3 eq.	5.73E+00	5.29E+00	2.39E-01	4.35E-03	5.46E-04	1.72E-01	2.27E-02

GWP-fossil: Global Warming Potential fossil; GWP-biogenic: Global Warming Potential biogenic; GWP-luluc: Global Warming Potential land use and land use change; ODP: Depletion potential of the stratospheric ozone layer; AP: Acidification potential; EP-freshwater: Eutrophication potential-freshwater compartment; EP-marine: Eutrophication potential-marine compartment; EP-terrestrial: Eutrophication potential-accumulated exceedance; POCP: Formation potential of tropospheric ozone; ADP-minerals & metals: Abiotic Depletion for non-fossil resources potential; ADP-fossil: Abiotic Depletion for fossil resources potential; WDP: Water deprivation potential.

Resource use parameters	Unit	Total	Cradle-to-gate		Cradle-to-grave			
			UPSTREAM	CORE	DOWNSTREAM			
			Manufacturing		Distribution	Installation	Use and maintenance	End-of-life
PENRE	MJ, low cal. value	1.24E+02	9.60E+01	8.47E+00	1.07E+00	1.01E-01	1.68E+01	1.33E+00
PERE	MJ, low cal. value	3.84E+01	9.17E+00	2.59E+01	1.66E-02	2.22E-03	3.23E+00	1.12E-01
PENRM	MJ, low cal. value	2.35E+01	2.33E+01	2.28E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERM	MJ, low cal. value	3.92E+00	7.20E-01	3.20E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ, low cal. value	1.47E+02	1.19E+02	8.70E+00	1.07E+00	1.01E-01	1.68E+01	1.33E+00
PERT	MJ, low cal. value	4.23E+01	9.89E+00	2.91E+01	1.66E-02	2.22E-03	3.23E+00	1.12E-01
FW	m^3	1.59E-01	1.37E-01	7.61E-03	1.53E-04	2.16E-05	1.32E-02	7.31E-04
MS	kg	3.16E-02	2.57E-02	5.95E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

PENRE: Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw material; PERE: Use of renewable primary energy excluding renewable primary energy resources used as raw material; PENRM: Use of non-renewable primary energy resources used as raw material; PERM: Use of renewable primary energy resources used as raw material; PENRT: Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials); PERT: Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials); FW: Net use of fresh water; MS: Use of secondary materials; RFS: Use of renewable secondary fuels; NRSF: Use of non-renewable secondary fuels.

System output indicators	Unit	Total	Cradle-to-gate		Cradle-to-grave			
			UPSTREAM	CORE	DOWNSTREAM			
			Manufacturing		Distribution	Installation	Use and maintenance	End-of-life
HWD	kg	1.43E-03	1.33E-03	7.04E-05	6.82E-06	5.84E-07	2.13E-05	4.76E-06
NHWD	kg	2.15E+00	7.13E-01	1.80E-01	5.23E-02	8.67E-02	4.62E-02	1.07E+00
RWD	kg	2.31E-04	9.06E-05	1.47E-05	3.48E-07	4.30E-08	1.23E-04	2.18E-06
MER	kg	7.17E-02	0.00E+00	7.07E-03	0.00E+00	6.46E-02	0.00E+00	0.00E+00
MFR	kg	2.15E-01	1.25E-02	6.02E-02	0.00E+00	8.21E-02	0.00E+00	6.02E-02
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	2.93E-01	0.00E+00	2.01E-02	0.00E+00	2.73E-01	0.00E+00	0.00E+00
EEE	MJ	1.62E-01	0.00E+00	9.82E-03	0.00E+00	1.52E-01	0.00E+00	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

Circularity Values

The recyclability potential of the product (excluding packaging) is calculated by dividing “MFR: material for recycling” in the end-of-life stage by the total weight of the product. As a result, the recyclability potential of the product 5.43 %. The result is representative for Europe according to IEC/TR 62635.

	Recyclability potential
KECA 250 B1	5.43 %

However, according to the theoretical end-of-life scenario shown in the Sensitivity Analysis chapter, where is assumed that all the components of the sensor are recycled according to single material recyclability of IEC/TR 62635 (Annex D.3), a recyclability potential of up to 13.76 % can be achieved.

Greenhouse gas emissions from the use of electricity in the manufacturing phase

Production mix from import, medium voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process.

Energy mix	Source	Amount	Unit
ABB_Electricity mix CZ factory {CZ}_biomass49%_PV30%_Wind21%_2023| S_SMP_V1	Ecoinvent v3.9.1	0.068	kg CO_2-eq/kWh

Dangerous substances

The product complies with REACH and RoHS directive requirements and does not contain any of the listed materials in excess of the authorized proportions.
For further information about REACH and RoHS, please visit the ABB webpage: https://new.abb.com/contact/form

Indoor environment

The product meets the requirements for low emissions.

Carbon footprint

Carbon footprint has not been worked out for the product.

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