

PRODUCTS FAMILY DECLARATION FOR RCBO CIRCUIT BREAKER OF ABB

PRODUCT ENVIRONMENTAL PROFILE

Environmental Product Declaration



Document in compliance with ISO 14025: 2010 "Environmental labels and declarations. Type III environmental declarations"

ORGANIZATION ABB LV Installation Materials Co., Ltd. Beijing	WEBSITE https://new.abb.com/cn
ADDRESS No.17 Kangding Street, Beijing Economic-Technological Development Area, Beijing, China	CONTACT INFORMATION Ms. Gao, changqiu.gao@cn.abb.com , Ms.Bian, bianca-ka.bian@cn.abb.com

STATUS	SECURITY LEVEL	REGISTRATION NUMBER	REV.	LANG.	PAGE
Approved	Public	ABBG-00139-V01.01-EN	A	en	1/8



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.



General Information

<p>Reference product</p>	<p>The reference product is one unit of the circuit breaker produced by ABB, the representative product is RCBO GSJ201 AC-C20/0.03.</p> <p>The products covered by this PEP are:</p> <ul style="list-style-type: none"> ✓ 1P+N RCBO: GSH201, GSJ201, GSE201, GSE201L, GS201, GS201M, FGH201. ✓ 2P 3P 4P RCBO serious: GSH202, GSH203, GSH204, GSJ202, GSJ203, GSJ204, GSE202, GSE203, GSE204, GSE202L, GSE203L, GSE204L.
<p>Description of the product</p>	<p>The function of the products is to protect during 20 years the installation against overloads and short-circuits and people and premises at risk of fire or explosion against insulation defects in circuit with assigned voltage 230V/240V/400V AC and rated current from 6A,10A,13A,16A,20A,32A,40A,50A,63A.</p> <p>This protection is ensured in accordance with the following parameters for the products family covered by this LCA study:</p> <ul style="list-style-type: none"> - Number of poles Np, 1PN, 2, 3, 4 - Rated breaking capacity Icn: 4.5 kA, 6 kA, 10 kA - Tripping curve Cd: B,C,D - Sensitivity S: 10mA,30mA,100mA,300mA - Type of differential protection Tp: AC, A, A APR, F, AC S, A S <p>The representative product is only used in China. For all the products covered by this PEP, 97% were sold and used in China and 3% were exported to South Africa, Australia, Vietnam, and Korea in year 2021.</p>
<p>Functional unit of the representative product</p>	<p>Protect during 20 years the installation against overloads and short-circuits and people and premises at risk of fire or explosion against insulation defects in circuit with assigned voltage 230V AC and rated current 20A.</p> <p>This protection is ensured in accordance with the following parameters for the products family covered by this LCA study:</p> <ul style="list-style-type: none"> - Number of poles Np, 1PN - Rated breaking capacity Icn: 6 kA - Tripping curve Cd: C - Sensitivity S: 30 mA - Type of differential protection Tp: AC
<p>Products concerned</p>	<p>The products covered by this PEP are:</p> <p>1P+N RCBO: GHS 201, GSJ 201, GSE 201, GSE 201L, GS 201, GS 201M, FGH201.</p> <p>2P 3P 4P RCBO serious: GSH202, GSH203, GSH204, GSJ202, GSJ203, GSJ204, GSE202, GSE203, GSE204, GSE202L, GSE203L, GSE204L.</p>

STATUS	SECURITY LEVEL	DOCUMENT ID.	REV.	LANG.	PAGE
Approved	Public	ABBG-00139-V01.01-EN	A	en	2/8



Constituent materials

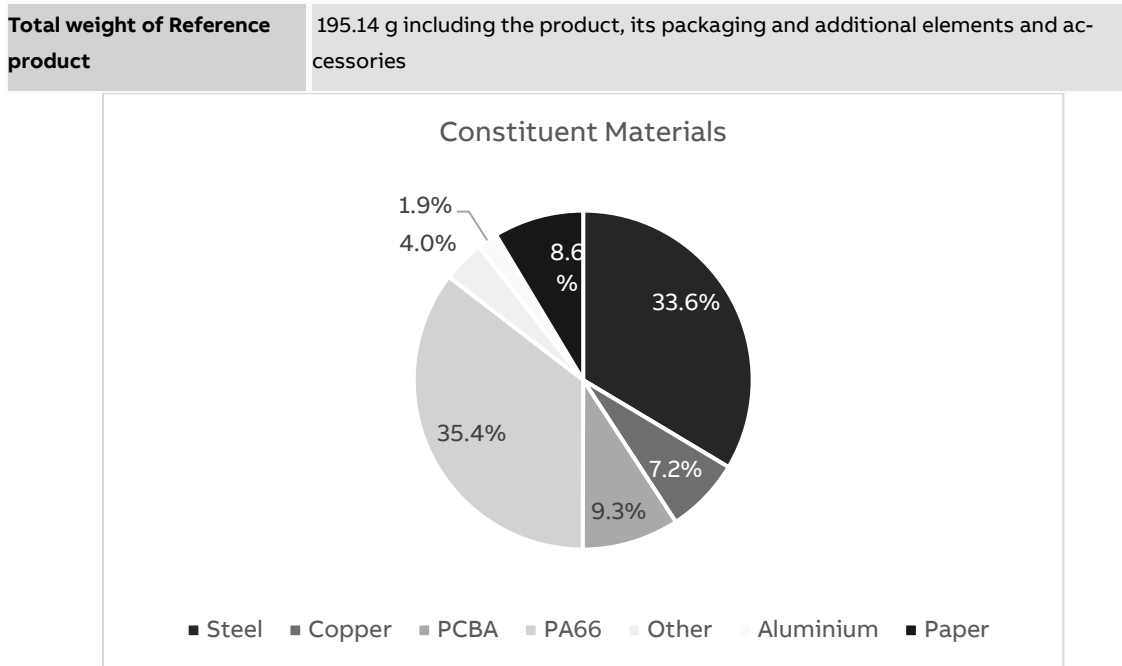


Figure 1 Constituent materials of the reference product

Table 1 Materials distribution of the reference product

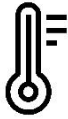
Plastics as % of weight		Metals as % of weight		Other as % of weight	
Name and CAS number	Weight-%	Name and CAS number	Weight-%	Name and CAS number	Weight-%
PA66	35.4%	Steel	33.6%	Paper	8.6%
		Copper	7.2%	Other	4.0%
		Aluminum	1.9%	PCBA	9.3%



Additional Environmental Information

Manufacturing	Manufacturing takes place in ABB plant in Beijing. The plant has the ISO 14001, ISO9001 certification
Distribution	Packaging and logistic flows are continuously improved in order to reduce their impact.
Installation	For the installation of the product, only standard tools (electric screw) are needed.
Use	This product requires no servicing, no maintenance or additional products. Greener electricity (e.g., electricity from PV) can reduce the environmental impact in use stage.

End of life	The reference product is assumed to be landfilled.
Software and database used	Simapro version 9.4.04 & database ecoinvent 3.8
Standards	All the products apply to standards as below: GB/T 16917.1/IEC61009.2/ IEC 61009-1



Environmental impacts

Modules	Life cycle stage
A1-A3 Manufacturing Stage	Production of the materials and components making up the reference product and assembly. The refining and production process of raw materials and basic materials for major components Production (extraction, treatment, transformation, etc.) of packaging raw materials and transportation of the packaging from its manufacturing site to the product packaging site. Industrial processes used to assemble the reference product and packaging components.
A4 Distribution Stage	Transportation of the product in its packaging from the manufacturer's last logistics platform to the distributor and from the distributor to the installation place.
A5 Installation Stage	Packaging waste management. Installation processes.
B1-B7 Use stage	Energy consumption of the product during its use over RSL.
C1-C4 End-of-life stage	Processes required for the deinstallation, Transportation required to collect the end-of-life product and transport it from the installation site to the final treatment site, Disposal (landfill).

Reference lifetime	20 years.			
Product category	Circuit breaker, PSR-0005-ed2-EN-2016 03 29			
Installation elements	Electric screw is used for installation, not other material is needed.			
Use scenario	The representative product is only used in China. The calculation is based on the use scenario in China. Operation for 20 years at 50% of rated load, during 30% of the time.			
Geographical representativeness	China.			
Technological representativeness	As per the functional unit.			
Energy model used	Manufacturing	Installation	Use	End of life
	Average electricity mix in China	Average electricity mix in China	Average electricity mix in China	Average electricity mix in global

Compulsory Indicators							
Impact indicators	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life
Climate change	kg CO2 eq	4.26E+01	1.64E+00	4.45E-02	5.43E-02	4.08E+01	5.88E-02
Climate change - Fossil	kg CO2 eq	4.23E+01	1.64E+00	4.45E-02	2.60E-04	4.06E+01	5.87E-02
Climate change - Biogenic	kg CO2 eq	2.51E-01	-5.93E-04	2.60E-05	5.41E-02	1.98E-01	2.99E-05
Climate change - Land use and LU change	kg CO2 eq	7.46E-03	2.29E-03	1.81E-05	6.37E-08	5.14E-03	2.08E-05
Ozone depletion	kg CFC11 eq	2.99E-07	6.75E-08	9.80E-09	2.56E-11	2.13E-07	8.86E-09
Acidification	mol H+ eq	2.41E-01	2.68E-02	1.84E-04	8.32E-06	2.14E-01	1.77E-04
Eutrophication, freshwater	kg P eq	9.04E-03	1.46E-03	3.34E-06	2.39E-08	7.57E-03	3.67E-06
Eutrophication, marine	kg N eq	4.79E-02	2.48E-03	5.43E-05	1.30E-05	4.51E-02	2.44E-04
Eutrophication, terrestrial	mol N eq	5.09E-01	2.64E-02	5.92E-04	3.24E-05	4.81E-01	5.55E-04
Photochemical ozone formation	kg NMVOC eq	1.33E-01	8.09E-03	1.80E-04	2.27E-05	1.25E-01	1.73E-04
Resource use, minerals and metals	kg Sb eq	5.44E-04	4.22E-04	1.52E-07	5.44E-10	1.22E-04	1.80E-07
Resource use, fossils	MJ	3.80E+02	2.09E+01	6.56E-01	2.25E-03	3.58E+02	6.08E-01
Water use	m3 depriv.	5.07E+00	8.08E-01	2.27E-03	8.73E-05	4.25E+00	2.92E-03

Resource use indicators	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life
Use of renewable primary energy, excluding renewable primary energy resources used as raw materials	MJ	3.91E+01	2.36E+00	7.55E-03	7.96E-05	3.68E+01	8.60E-03
Use of renewable primary energy resources used as raw materials	MJ	2.04E-01	2.04E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources	MJ	3.93E+01	2.56E+00	7.55E-03	7.96E-05	3.68E+01	8.60E-03
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials	MJ	3.78E+02	1.87E+01	6.56E-01	2.25E-03	3.58E+02	6.08E-01
Use of non-renewable primary energy resources used as raw materials	MJ	2.18E+00	2.18E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources	MJ	3.80E+02	2.09E+01	6.56E-01	2.25E-03	3.58E+02	6.08E-01

Use of secondary materials and energy resources	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life
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
Net use of fresh water	M3	1.24E-01	2.14E-02	7.31E-05	2.88E-06	1.02E-01	8.91E-05

Waste category indicators	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life
Hazardous waste disposed of	kg	7.54E-04	6.84E-04	1.71E-06	4.67E-09	6.74E-05	1.59E-06
Non-hazardous waste disposed of	kg	3.67E+00	2.14E-01	3.33E-02	9.92E-05	3.31E+00	1.08E-01
Radioactive waste disposed of	kg	2.52E-04	3.75E-05	4.25E-06	1.02E-08	2.06E-04	3.85E-06

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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Biogenic Carbon of product and packaging

	Unit	Total
Biogenic carbon content of the product	kg of C	0.00E+00
Biogenic carbon content of the associated packaging	kg of C	7.08E-03

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:

- ✓ Manufacturing, Distribution, Installation End of life phases are proportional to the mass of the product. So the environmental impact for those phases of a product covered by the PEP other than the representative product should be calculated by multiple the coefficients in Table 2 by the environmental impact for those phases of the representative product.

Table 2 Extrapolation rules for Manufacturing, Distribution, Installation, and End of life phases.

In/A	1P+N GSH201/GSJ201/ GSE201/GSE201L	1P+N GS201/GS201M	2P	3P	4P
06	1.03	1.17	1.84	2.43	2.96
08	1.01	1.16	1.85	2.45	2.98
10	1.01	1.15	1.86	2.46	3.00
13	1.01	1.16	1.86	2.46	2.99
16	1.00	1.13	1.85	2.45	2.98
20	1.00	1.14	1.86	2.46	2.99
25	1.02	1.15	1.87	2.48	3.02


32	1.10	1.21	2.08	2.63	3.23
40	1.09	1.22	2.10	2.67	3.28
50	1.13	1.24	2.19	3.33	4.03
63	1.12	1.23	2.18	3.31	4.00

- ✓ Use phase is proportional to the rated power. So the environmental impact for use phase of a product covered by the PEP other than the representative product should be calculated by multiple the coefficients in Table 3 by the environmental impact for use phase of the representative product.

Table 3 Extrapolation rules for Use phase

Number of poles	In/A	Factor
1P+N	06	0.68
	08	0.53
	10	0.69
	13	0.88
	16	0.86
	20	1.00
	25	1.30
	32	1.65
	40	2.26
	50	2.18
2P	63	3.33
	06	1.93
	08	1.25
	10	1.50
	13	2.11
	16	1.81
	20	2.28
	25	2.70
	32	3.08
	40	3.83
3P	50	2.95
	63	4.07
	06	2.60
	08	1.57
	10	1.94
	13	2.87
	16	2.41
	20	3.12
	25	3.75
	32	4.32
4P	40	5.44
	50	4.13
	63	5.80
	06	3.26
	08	1.89
	10	2.39
	13	3.62

	16	3.01
	20	3.96
	25	4.80
	32	5.55
	40	7.05
	50	5.30
	63	7.53

Registration number: ABBG-00139-V01.01-EN	Drafting Rules <i>PCR-ed4-EN-2021 09 06</i> Supplemented by <i>PSR-0005-ed2-EN-2016 03 29</i>	
Verifier accreditation number: VH42	Information and reference documents: www.pep-ecopassport.org	
Date of issue: <i>December-2022</i>	Validity period: 5 years	
Independent verification of the declaration and data, in compliance with ISO 14025: 2010		
Internal: <input type="checkbox"/>	External: <input checked="" type="checkbox"/>	
The PCR review was conducted by a panel of experts chaired by Julie Orgelet (DDemain)		
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 in compliance with ISO 14025: 2010: "Environmental labels and declarations. Type III environmental declarations"		

STATUS	SECURITY LEVEL	DOCUMENT ID.	REV.	LANG.	PAGE
Approved	Public	ABBG-00139-V01.01-EN	A	en	8/8