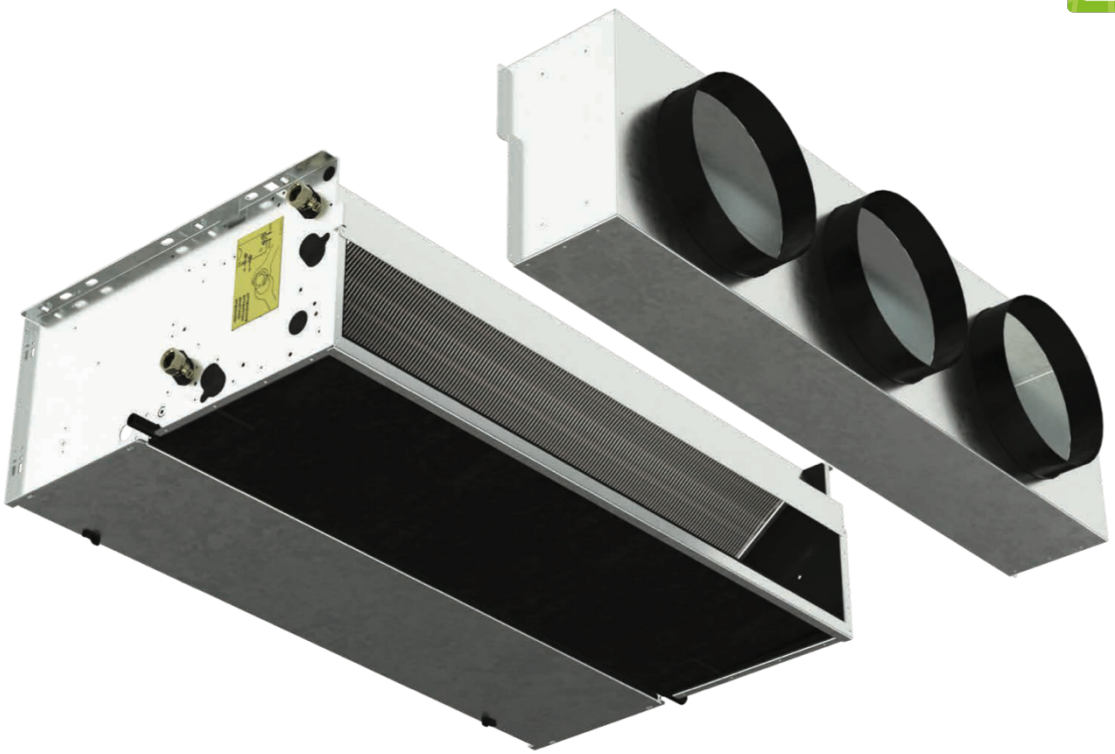
THE INTERNATIONAL EPD® SYSTEM



Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Fan Coils – Carisma CRSL-ECM

From **Sabiana S.p.A.**

EPD of multiple products, based on a representative product.
Included products:

- 2 pipe: CRSL-ECM 03, 13, 23, 43, 73, 83, 04, 14, 24, 44, 74, 84
- 4 pipe: CRSL-ECM 03+1,13+1, 23+1, 43+1, 73+1, 83+1, 04+1, 14+1, 24+1, 44+1, 74+1, 84+1, 03+2, 13+2, 23+2, 43+2

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P- 12659
Publication date:	2024-02-26
Valid until:	2029-02-25

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

Accountabilities for PCR and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): Construction Products, 2019:14, version 1.3.2 and c-PCR-027 Fan coils (c-PCR to PCR 2019:14)
PCR review was conducted by: Technical Committee of the International EPD® System. The review panel may be contacted via info@environdec.com c-PCR review was conducted by: Gorka Benito Alonso
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by individual verifier Third-party verifier: Guido Croce Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

About Sabiana S.p.A

Sabiana is an Italian manufacturer of heating and air conditioning products, leader for hydronic terminal fan coil unit.

Founded in 1929 in Milan, from 2014 is part of the Arbonia Group, a group listed on the SIX Swiss Exchange, global force in the building components sector, operating actively in over 70 countries and maintains major manufacturing facilities in Italy, Switzerland, Germany, the Czech Republic, Poland, Serbia and Belgium.

Sabiana headquarter is located in Corbetta (MI) and production facilities are all located nearby: two sites in Corbetta (MI) and two sites in Magenta (MI).

Sabiana's continuous innovation and quality enhancement strategy is pursued by the continuous R&D investments, with the adoption of advanced 3D design and simulations and modern laboratories for product testing and inspection, by continuous investments on advanced production equipment and new technologies and by the implementation of IoT across the organization.

Strong commitment to quality and sustainability is witnessed by the long-held ISO 9001 certification of the company and the ISO 14001 certification of the main production sites.
Sustainability and Circular Economy became pillars of the company strategy, with the main results[1] of:

- 96.6% of production material sourced from the European Union (of which 83.6% from Italian suppliers, most of them located in a short distance)
- Self-production of 60% of the overall electrical energy consumption, with the target of 80% in few years
- Continuous increase of % of reusable and recyclable materials in production

The Plants

Name and location of production site(s):
Sabiana plants involved in the production process of fan coils are:
Sabiana 1: via Piave 53, 20011 Corbetta (MI), Italy
Sabiana 2 and 3: via Virgilio 2, 20013 Magenta (MI), Italy

Aerial view of Sabiana headquarter

[1] Referred to 2022

Product information

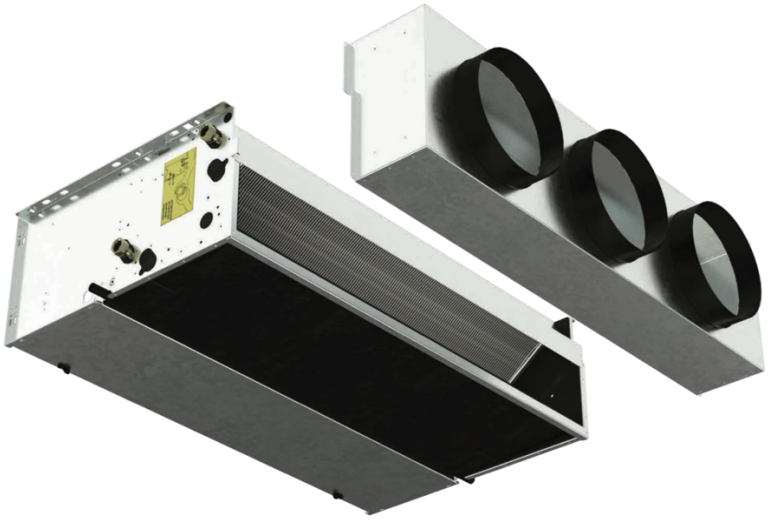
Product name: Fan Coils Carisma CRSL-ECM

Product identification: Hydronic Fan Coil Unit (FCU) is defined as a factory-made single assembly, which provides one or more of the functions of forced circulation of air, heating, cooling, dehumidification and filtering of air, but which does not include the source of heating or cooling. This device includes at least a liquid-to-air heat exchanger and a fan and may be designed for free or ducted intake air and/or for free or ducted delivery of supply air. (BS EN 1397:2021).

Geographical scope: A1-A2 Global, A3 Italian, A4-A5, B, C European

UN CPC code: UN CPC Code: 43912 and HS 2007 8415.83

Product description: CRSL-ECM Range is a high static pressure ducted fan coil range equipped with 3 or 4 row coil and with the possibility to add a 1 or 2 row coil for 4 pipe systems.
CRSL-ECM has the ability to continuously vary the air flow providing a great regulation and control flexibility, ensuring at the same time excellent comfort conditions and extremely low electrical consumption.
The innovative synchronous electronic motor with permanent magnets, is controlled by an inverter board designed and developed in Italy.
The air flow rate can be varied continuously by means of a 1-10 V signal generated by Sabiana controls or by independent control systems.
The continuous air flow control improves the acoustic comfort and allows a quicker response to the variation of the thermal loads and a greater stability of the requested ambient temperature.
The fan motor high efficiency, also at low speed, makes it possible to greatly reduce electrical consumption under normal operating conditions.
The full compliance with the Electromagnetic Compatibility Directive and with the other severe Standards in force is certified by an independent institute.
The inverter board that controls the motor operation is powered by 230 Volt, single-phase and, with a switching system, it generates a three-phase frequency modulated, wave form power supply.
The electric power supply required for the machine is therefore single-phase with voltage of 230 V and frequency of 50 - 60 Hz.



In line with innovative trends and modern industrial design, the Carisma CRSL-ECM fan coil range meets today's demanding requirements of performance, size, acoustics, low energy, ease of installation and maintenance.
The fan coil unit has been designed around a platform of models, versions and accessories,

all of which have been independently tested and certified by Eurovent.
All fan coils with centrifugal fans are equipped with electric motors which reduce electrical consumption.

The present EPD covers the 28 models of Fan Coils CRSL-ECM shown in the following table.

N°	Model	TYPE	TUBE SYSTEM
1	CRSL-ECM 03	Ducted Fan Coil	2-pipe
2	CRSL-ECM 13	Ducted Fan Coil	2-pipe
3	**CRSL-ECM 23**	**Ducted Fan Coil**	**2-pipe**
4	CRSL-ECM 43	Ducted Fan Coil	2-pipe
5	CRSL-ECM 73	Ducted Fan Coil	2-pipe
6	CRSL-ECM 83	Ducted Fan Coil	2-pipe
7	CRSL-ECM 04	Ducted Fan Coil	2-pipe
8	CRSL-ECM 14	Ducted Fan Coil	2-pipe
9	CRSL-ECM 24	Ducted Fan Coil	2-pipe
10	CRSL-ECM 44	Ducted Fan Coil	2-pipe
11	CRSL-ECM 74	Ducted Fan Coil	2-pipe
12	CRSL-ECM 84	Ducted Fan Coil	2-pipe
13	CRSL-ECM 03+1	Ducted Fan Coil	2-pipe
14	CRSL-ECM 13+1	Ducted Fan Coil	2-pipe
15	CRSL-ECM 23+1	Ducted Fan Coil	2-pipe
16	CRSL-ECM 43+1	Ducted Fan Coil	2-pipe
17	CRSL-ECM 73+1	Ducted Fan Coil	2-pipe
18	CRSL-ECM 83+1	Ducted Fan Coil	2-pipe
19	CRSL-ECM 04+1	Ducted Fan Coil	2-pipe
20	CRSL-ECM 14+1	Ducted Fan Coil	2-pipe
21	CRSL-ECM 24+1	Ducted Fan Coil	2-pipe
22	CRSL-ECM 44+1	Ducted Fan Coil	2-pipe
23	CRSL-ECM 74+1	Ducted Fan Coil	2-pipe
24	CRSL-ECM 84+1	Ducted Fan Coil	2-pipe
25	CRSL-ECM 03+2	Ducted Fan Coil	2-pipe
26	CRSL-ECM 13+2	Ducted Fan Coil	2-pipe
27	CRSL-ECM 23+2	Ducted Fan Coil	2-pipe
28	CRSL-ECM 43+2	Ducted Fan Coil	2-pipe

According to the General Programme Instruction (GPI) v. 4.0 and the PCR 2019:14 "Construction products" v.1.3.2, the results for each category of impact are represented for the product CRSL-ECM 23, identified as representative. This product is the model of the CRSL-ECM range with the highest sales volumes.

Technical data

Sabiana Fan Coils are certified Eurovent (Certificate n-96.01.182), European organization which tests and certifies that performance and technical characteristics of air conditioning products are fully compliant with manufacturer's claims.

2-pipe units:

COOLING (summer mode)

Entering air temperature: +27°C d.b. +19°C w.b.
Water temperature: + 7°C E.W.T. +12°C L.W.T.

HEATING (winter mode)

Entering air temperature: +20°C
Water temperature: +45 °C E.W.T. +40 °C L.W.T.

MODEL		CRSL-ECM 03			CRSL-ECM 13			CRSL-ECM 23		
Speed		1,5 MIN	5,5 MED	8 MAX	4 MIN	6,3 MED	8 MAX	4 MIN	6,5 MED	8,5 MAX
Air flow (E)	m³/h	110	225	290	240	305	360	430	540	630
Available pressure (E)	Pa	10	50	75	32	50	68	34	50	70
Cooling total capacity (E)	kW	0,75	1,39	1,65	1,64	1,97	2,23	2,72	3,21	3,55
Cooling sensible capacity (E)	kW	0,55	1,00	1,30	1,17	1,42	1,63	1,99	2,38	2,68
Heating capacity (E)	kW	0,80	1,50	1,90	1,65	2,05	2,37	2,88	3,51	4,00
Fan Power input (E)	W	7	21	37	18	29	39	26	43	64

(E) = Eurovent certified performance

MODEL		CRSL-ECM 43			CRSL-ECM 73			CRSL-ECM 83		
Speed		3,5 MIN	7 MED	9 MAX	2,5 MIN	5 MED	8 MAX	5,5 MIN	7,5 MED	9 MAX
Air flow (E)	m³/h	595	835	960	900	1175	1410	1238	1638	1923
Available pressure (E)	Pa	24	50	66	30	50	72	28	50	70
Cooling total capacity (E)	kW	3,84	4,94	5,43	5,66	6,81	7,67	6,75	8,60	10,00
Cooling sensible capacity (E)	kW	2,83	3,77	4,21	4,15	5,11	5,86	5,05	6,50	7,80
Heating capacity (E)	kW	4,07	5,56	6,27	5,69	7,09	8,24	7,00	9,25	10,70
Fan Power input (E)	W	30	67	98	52	100	155	84	160	246

(E) = Eurovent certified performance

MODEL		CRSL-ECM 04			CRSL-ECM 14			CRSL-ECM 24		
Speed		1,5 MIN	5,5 MED	8 MAX	4 MIN	6,3 MED	8 MAX	4 MIN	6,5 MED	8,5 MAX
Air flow (E)	m³/h	110	225	290	240	305	360	430	540	630
Available pressure (E)	Pa	10	50	75	32	50	68	34	50	70
Cooling total capacity (E)	kW	0,80	1,55	1,95	1,77	2,17	2,48	3,14	3,79	4,25
Cooling sensible capacity (E)	kW	0,60	1,15	1,45	1,25	1,54	1,78	2,20	2,68	3,04
Heating capacity (E)	kW	0,80	1,65	2,00	1,73	2,17	2,52	3,08	3,80	4,37
Fan Power input (E)	W	7	21	37	18	29	39	26	43	64

(E) = Eurovent certified performance

MODEL		CRSL-ECM 44			CRSL-ECM 74			CRSL-ECM 84		
Speed		3,5 MIN	7 MED	9 MAX	2,5 MIN	5 MED	8 MAX	5,5 MIN	7,5 MED	9 MAX
Air flow (E)	m³/h	595	835	960	900	1175	1410	1238	1638	1923
Available pressure (E)	Pa	24	50	66	30	50	72	28	50	70
Cooling total capacity (E)	kW	4,09	5,34	5,91	6,12	7,46	8,47	7,20	9,25	10,60
Cooling sensible capacity (E)	kW	2,95	3,97	4,45	4,40	5,48	6,33	5,50	7,10	8,20
Heating capacity (E)	kW	4,19	5,77	6,55	6,26	7,96	9,35	8,00	10,00	11,50
Fan Power input (E)	W	30	67	98	52	100	155	84	160	246

(E) = Eurovent certified performance

4-pipe units:

COOLING (summer mode)

Entering air temperature: +27°C d.b. +19°C w.b.
Water temperature: + 7°C E.W.T. +12°C L.W.T.

HEATING (winter mode)

Entering air temperature: +20°C
Water temperature: +65°C E.W.T. +55°C L.W.T.

MODEL		CRSL-ECM 03+1			CRSL-ECM 13+1			CRSL-ECM 23+1		
Speed		1,5 MIN	5,5 MED	8 MAX	4 MIN	6,3 MED	8 MAX	4 MIN	6,5 MED	8,5 MAX
Air flow (E)	m³/h	110	225	290	240	305	360	430	540	630
Available pressure (E)	Pa	10	50	75	32	50	68	34	50	70
Cooling total capacity (E)	kW	0,75	1,39	1,65	1,64	1,97	2,23	2,72	3,21	3,55
Cooling sensible capacity (E)	kW	0,55	1,00	1,30	1,17	1,42	1,63	1,98	2,38	2,67
Heating capacity (E)	kW	0,55	1,07	1,29	1,46	1,72	1,92	2,36	2,74	3,03
Fan Power input (E)	W	7	21	37	18	29	39	26	43	64

(E) = Eurovent certified performance

MODEL		CRSL-ECM 43+1			CRSL-ECM 73+1			CRSL-ECM 83+1		
Speed		1,5 MIN	5,5 MED	8 MAX	2,5 MIN	5 MED	8 MAX	5,5 MIN	7,5 MED	9 MAX
Air flow (E)	m³/h	595	835	960	900	1175	1410	1238	1638	1923
Available pressure (E)	Pa	24	50	66	30	50	72	28	50	70
Cooling total capacity (E)	kW	3,84	4,88	5,35	5,66	6,81	7,67	6,75	8,60	10,00
Cooling sensible capacity (E)	kW	2,83	3,71	4,13	4,15	5,11	5,86	5,05	6,50	7,80
Heating capacity (E)	kW	3,09	3,87	4,22	4,70	5,60	6,31	6,00	7,00	7,80
Fan Power input (E)	W	30	67	98	52	100	155	84	160	246

(E) = Eurovent certified performance

MODEL		CRSL-ECM 04+1			CRSL-ECM 14+1			CRSL-ECM 24+1		
Speed		1,5 MIN	5,5 MED	8 MAX	4 MIN	6,3 MED	8 MAX	4 MIN	6,5 MED	8,5 MAX
Air flow	m³/h	110	225	290	240	305	360	430	540	630
Available pressure	Pa	10	50	75	32	50	68	34	50	70
Cooling total capacity	kW	0,80	1,55	1,95	1,77	2,17	2,48	3,14	3,79	4,25
Cooling sensible capacity	kW	0,60	1,15	1,45	1,25	1,54	1,78	2,20	2,68	3,04
Heating capacity	kW	0,55	1,07	1,29	1,46	1,72	1,92	2,36	2,74	3,03
Fan Power input	W	7	21	37	18	29	39	26	43	64

MODEL		CRSL-ECM 44+1			CRSL-ECM 74+1			CRSL-ECM 84+1		
Speed		3,5 MIN	7 MED	9 MAX	2,5 MIN	5 MED	8 MAX	5,5 MIN	7,5 MED	9 MAX
Air flow	m³/h	595	835	960	900	1175	1410	1238	1638	1923
Available pressure	Pa	24	50	66	30	50	72	28	50	70
Cooling total capacity	kW	4,09	5,34	5,91	6,12	7,46	8,47	7,20	9,25	10,60
Cooling sensible capacity	kW	2,95	3,97	4,45	4,40	5,48	6,33	5,50	7,10	8,20
Heating capacity	kW	3,09	3,87	4,22	4,70	5,60	6,31	6,00	7,00	7,80
Fan Power input	W	30	67	98	52	100	155	84	160	246

MODEL		CRSL-ECM 03+2			CRSL-ECM 13+2			CRSL-ECM 23+2			CRSL-ECM 43+2		
Speed		1,5 MIN	5,5 MED	8 MAX	4 MIN	6,3 MED	8 MAX	4 MIN	6,5 MED	8,5 MAX	3,5 MIN	7 MED	9 MAX
Air flow	m³/h	110	225	290	240	305	360	430	540	630	595	835	960
Available pressure	Pa	10	50	75	32	50	68	34	50	70	24	50	66
Cooling total capacity	kW	0,75	1,39	1,65	1,64	1,97	2,23	2,72	3,21	3,55	3,84	4,88	5,35
Cooling sensible capacity	kW	0,55	1,00	1,30	1,17	1,42	1,63	1,98	2,38	2,67	2,83	3,71	4,13
Heating capacity	kW	1,2	2,1	2,53	2,48	2,98	3,03	3,93	5,03	5,45	5,99	7,5	8,29
Fan Power input	W	7	21	37	18	29	39	26	43	64	30	67	98

Fan Coils are sold in cardboard boxes placed on wood pallets and wrapped in plastic film. The following table shows the conversion factors to determine the weight of the of the various fan coil models compared to the representative model CRSL-ECM 23.

MODEL	DIMENSIONS	UNPACKED UNIT	PACKED UNIT	UNPACKED UNIT	PACKED UNIT
	mm	WEIGHT (kg)		CONVERSION FACTORS	
CRSL-ECM 03	511x248x454	13,8	16,40	0,61	0,63
CRSL-ECM 13	511x248x669	16,9	19,50	0,75	0,75
CRSL-ECM 23	**511x248x884**	**22,6**	**25,90**	**1,00**	**1,00**
CRSL-ECM 43	511x248x1099	26,4	30,04	1,17	1,16
CRSL-ECM 73	511x248x1529	44,5	51,42	1,97	1,99
CRSL-ECM 83	511x248x1744	51,1	60,58	2,26	2,34
CRSL-ECM 04	511x248x454	14,3	16,90	0,63	0,65
CRSL-ECM 14	511x248x669	17,9	20,50	0,79	0,79
CRSL-ECM 24	511x248x884	23,6	26,60	1,04	1,03
CRSL-ECM 44	511x248x1099	27,5	31,14	1,22	1,20
CRSL-ECM 74	511x248x1529	46,6	53,52	2,06	2,07
CRSL-ECM 84	511x248x1744	52,8	62,28	2,34	2,40
CRSL-ECM 03+1	511x248x454	14,5	17,10	0,64	0,66
CRSL-ECM 13+1	511x248x669	18,1	20,70	0,80	0,80
CRSL-ECM 23+1	511x248x884	24	27,00	1,06	1,04
CRSL-ECM 43+1	511x248x1099	28,1	31,84	1,24	1,23
CRSL-ECM 73+1	511x248x1529	46,7	53,62	2,07	2,07
CRSL-ECM 83+1	511x248x1744	53,5	62,98	2,37	2,43
CRSL-ECM 04+1	511x248x454	15	17,60	0,66	0,68
CRSL-ECM 14+1	511x248x669	19,1	21,70	0,85	0,84
CRSL-ECM 24+1	511x248x884	26	28,00	1,15	1,08
CRSL-ECM 44+1	511x248x1099	29,3	32,94	1,30	1,27
CRSL-ECM 74+1	511x248x1529	48,9	55,82	2,16	2,16
CRSL-ECM 84+1	511x248x1744	55,3	64,78	2,45	2,50
CRSL-ECM 03+2	511x248x454	15	17,60	0,66	0,68
CRSL-ECM 13+2	511x248x669	18,8	21,40	0,83	0,83
CRSL-ECM 23+2	511x248x884	25,4	28,00	1,12	1,08
CRSL-ECM 43+2	511x248x1099	29,3	32,94	1,30	1,27

Content information

The ranges of products from Sabiana Spa comply with the requirements of the "RoHS" Directive (EU) 2015/863 of 31 March 2015 and 2011/65/EU of 8 June 2011.
Sabiana S.p.A fulfils the requirements of “Regulation (EC) No 1907/2006 - Registration, Evaluation, Authorisation and Restriction Chemicals (REACH)”. Detailed declaration of the SVHC substances that may be present above a concentration of 0.1% (w/w) in the individual articles is available.

Product components (unit)	Weight, kg	Post-consumer recycled material, weight-%	Pre-consumer recycled material, weight-%	Total recycled material, weight-%	Biogenic material, weight-% and kg C/kg
Sheet metal	12,1898	0	0	0	0 resp. 0
Aluminium	3,0248	14,97	4,65	19,62	0 resp. 0
Copper	2,2908	12,95	0	12,95	0 resp. 0
Steel	1,1932	0	0	0	0 resp. 0
ABS	1,4430	0	0	0	0 resp. 0
PP	0,0400	0	0	0	0 resp. 0
PE	0,0920	0	0	0	0 resp. 0
Fiberglass	0,0051	0	0	0	0 resp. 0
Electronic	0,1000	0	0	0	0 resp. 0
Brass	0,1215	0	0	0	0 resp. 0
Rubber	0,0320	0	0	0	0 resp. 0
Nylon	0,0498	0	0	0	0 resp. 0
Iron	1,6716	0	0	0	0 resp. 0
PVC	0,0568	0	0	0	0 resp. 0
Bronze	0,0280	0	0	0	0 resp. 0
Ferrite	0,2690	0	0	0	0 resp. 0
PBT	0,0192	0	0	0	0 resp. 0
Polyurethane	0,0040	0	0	0	0 resp. 0
Paper	0,0030	0	0	0	0 resp. 0
Mylar	0,0075	0	0	0	0 resp. 0
TOTAL	**22,6219**	**3,31**	**0,62**	**3,93**	**0 resp. 0**

Packaging materials	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C/kg
Wood (pallet)	0,5714	2,53	0 resp. 0
Cardboard	2,0100	8,89	0 resp. 0
LDPE	0,0286	0,13	0 resp. 0
Paper	0,0680	0,30	0 resp. 0
TOTAL	**2,6780**	**11,84**	**0 resp. 0**

Data referred to a single unit of the representative product Carisma CRSL-ECM 23. Note: The share of biobased/recycled material is unknown so, in accordance with PCR 2019:14 v.1.3.2, this part of the content declaration is declared as 0% (a conservative estimate).

LCA information

Methodology: The quantification of the environmental performance was carried out in accordance with the Life Cycle Assessment (LCA - Life Cycle Assessment) methodology regulated by the ISO 14040, ISO 14044 and ISO 14025 standards and following the specific product requirements PCR 2019: 14 Construction Products Version 1.3.2 and c-PCR 027 Fan coils.
The LCA methodology allows you to determine the environmental impacts of a product or service in terms of resource consumption and emissions into the environment, as well as waste production, from a life cycle perspective.
Functional unit: The functional unit is 1 kWh of thermal energy exchanged with the air of the room in cooling and/or heating mode by a heating/cooling equipment using small scale HVAC as defined in CPC 43912 and HS 8415.83 and, specifically, using an Hydronic Fan Coil Unit as defined into EN1397. The environmental impacts are given per functional unit.

Reference service life: The lifetime for fan coil is considered to be 20 years.

Time representativeness: The LCA study is conducted in 2023 with data relating to 2022 (with the exception of the distribution for which the 2023 data were used).

Database and LCA software: The Ecoinvent database v.3.9.1 (www.ecoinvent.org) provides the life cycle inventory data for the raw and process materials obtained from the background system. LCA software used is SimaPro 9.5.

Cut-off rules: 1% cut-off is applied. According to PCR 2019:14 v.1.3.2, data for elementary flows to and from the product system contributing to a minimum of 99% of the declared environmental impacts have been included.

Quality data: Specific data are used for raw materials, electricity, fuel data, emissions, waste data, average distances and means of transport in modules A2 and A4.
Selected generic data derived from the Ecoinvent v.3.9.1 database are used for the following phases: production of raw materials, fuels and electricity.
Proxy data do not contribute to the potential environmental impacts by more than 10% for each impact category.

Allocation rules: No allocation was made in the A1-A2 modules. The materials and weights were extracted from the BoM. For each material, the type of packaging with which it arrives at the Sabiana plant has been identified and the amount of packaging allocated to the individual material has been calculated. Raw material transports were calculated based on manufacturer/supplier distances. For module A4 an allocation was made based on the number of pieces to determine the specific consumes of a fan coil. In particular, in the Sabiana 1 plant, where the production of the batteries takes place (fan coil component), where possible, we tried to avoid allocation otherwise the total consumption of the battery department was allocated by number of batteries produced. In the Sabiana 2 and Sabiana 3 plants, all consumption and outputs were allocated on the basis of the parts produced and the pieces handled respectively.

Environmental impact method: EN 15804 + A2 based on EF 3.1 characterisation factors (JRC Website)

Description of the system boundaries: Cradle to grave and module D (A + B + C + D).

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Construction process stage			Use stage							End of life stage			Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	X	X	ND	X	X	X	ND	X	ND	X	X	X	X	X
Geography	GLO	GLO	IT	EU	EU	-	EU	EU	EU	-	EU	-	EU	EU	EU	EU	EU
Specific data used	>90%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	-31/+241%																
Variation – sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

X=Declared module, ND= Non declared, EU=European, GLO=Global, IT=Italy. For module B. only B2 and B6 are applicable for fan coils usage (according to c-PCR-027 Fan coils.

The following table shows the range of variability for each module and for each category of impact. These values are required by PCR 2019:14 v.1.3.2 for EPD of multiple products with variances greater than 10%.

Module	A1-A3	A4	A5	B2	B3	B4	B6	C1	C2	C3	C4	D
GWP-GWP	-31/+241%	-34/+232%	-32/+239%	0%	0%	0%	-64/+153%	0%	-34/+232%	-34/+232%	-34/+232%	-34/+232%
GWP-total	-31/+241%	-34/+232%	-32/+239%	0%	0%	0%	-64/+153%	0%	-34/+232%	-34/+232%	-34/+232%	-34/+232%
ODP	-32/+240%	-34/+232%	-32/+238%	0%	0%	0%	-64/+153%	0%	-34/+232%	-34/+232%	-34/+232%	-34/+232%
AP	-33/+233%	-34/+232%	-32/+238%	0%	0%	0%	-64/+153%	0%	-34/+232%	-34/+232%	-34/+232%	-34/+232%
EP-freshwater	-33/+234%	-34/+232%	-36/+211%	0%	0%	0%	-64/+153%	0%	-34/+232%	-34/+232%	-34/+232%	-34/+232%
EP-marine	-33/+235%	-34/+232%	-32/+239%	0%	0%	0%	-64/+153%	0%	-34/+232%	-34/+232%	-34/+232%	-34/+232%
EP-terrestrial	-33/+234%	-34/+232%	-32/+239%	0%	0%	0%	-64/+153%	0%	-34/+232%	-34/+232%	-34/+232%	-34/+232%
POCP	-33/+235%	-34/+232%	-32/+239%	0%	0%	0%	-64/+153%	0%	-34/+232%	-34/+232%	-34/+232%	-34/+232%
ADP-minerals&metals	-34/+232%	-34/+232%	-37/+203%	0%	0%	0%	-64/+153%	0%	-34/+232%	-34/+232%	-34/+232%	-34/+232%
ADP-fossil	-31/+241%	-34/+232%	-32/+238%	0%	0%	0%	-64/+153%	0%	-34/+232%	-34/+232%	-34/+232%	-34/+232%
WDP	-32/+237%	-34/+232%	-43/+160%	0%	0%	0%	-64/+153%	0%	-34/+232%	-34/+232%	-34/+232%	-34/+232%

Life Cycle Stages

A1, raw material supply. This includes the extraction and processing of all raw materials and energy which occur upstream from the manufacturing process. The electrical mix used to model the electrical consumption at medium voltage is based on the Italian Residual Mix 2022 (Source: AIB, “European Residual Mixes - Results of the calculation of Residual Mixes for the calendar year 2022”, 593 g CO_2eq/ kWh).

A2, transport to the manufacturer. The raw materials are transported to the manufacturing site. The modelling includes road and boat transportations of each raw material. For each component/material, the distance from the production country to the Sabiana plant has been calculated. For non-European materials, the transportation from the production plants to the port of origin has been deemed irrelevant compared to the distance that the product needs to travel by ship. For the components/materials coming from countries outside Europe but unknown, a distance on ship of 10000 km and a distance of 165 km on road (from the port of Genoa to Sabiana) have been assumed.

A3, manufacturing. This module includes the manufacture/assembling of product at the Sabiana’ plants and the manufacture of packaging. The production of packaging material is taken into account at this stage. The processing of any waste arising from this stage is also included. The 28,6% of the electricity used for the production of the Carisma CRSL-ECM 23 fan coil at Sabiana plants is self-produced by photovoltaic panels. The end-of-life scenario for raw material packaging was modelled according to CONAI 2022 data (Italian Packaging Consortium).

A4, transport to the building site. This module includes transport from the production gate to the installation site. The average distribution distance is calculated based on the sales of the entire CRSL-ECM range in the year 2023 (latest distribution available). Specifically, the following distribution is considered: 48% of the product is sold in Italy and 52% in other European countries (it was considered the specific distance for each state). Shipments to Italy and Europe took place by truck, with some distances also covered by train (for the United

Kingdom and Ireland) or by ferry (Sicily and Ireland).

A5, installation into the building. This module includes all material and energy inputs and outputs required for the installation of the fan coil. The installation starts manually without the use of energy. Specifically, this module includes the end of life of the product packaging and the consumption of water for battery recharge. The end-of-life scenario for packaging was modelled for an European scenario according to the PCR Part A for Building-Related Products and Services v.4 of UL Environment framework.

B1, use. This module includes the use of the installed product in terms of any emissions released into the environment during its lifetime (not covered by B2-B7). According to the PCR, this module is not declared as it is not relevant for the product.

B2, maintenance, B3, repair, B4, replacement. As indicated by the manufacturer, no maintenance, repair, replacement action is required during the lifetime of 20 years. Any exceptional events are not considered in this study.

B5, refurbishment. According to the PCR, this module is not declared as it is not relevant for the product.

B6, operational energy use. This module includes the energy consumption from the operation of the fan coil unit. The total electrical energy consumption along FCU lifetime is been calculated according to the Technical Certification Rules Of The Eurovent Certified Performance Mark with the following hypotheses:

- 1100 hours in summer 65% (LS) 30% (MS) 5% (HS)
- 1500 hours in winter 70% (LS) 25% (MS) 5% (HS)

where:

LS=Low Speed

MS=Medium Speed

HS=High Speed

An average European electric mix (*Electricity, low voltage {RER}| market group for electricity, low voltage | Cut-off, U,* 333 g CO_2eq/ kWh), was considered in the modelling as the product is mainly sold in Europe and the sales distribution from country to country varies significantly from year to year. In the "Additional environmental information" section, the B6 module is reported for different scenarios, based on the country where the fan coil is used.

C1 - de-construction. This stage includes the impacts during the dismantling of the CRSL ECM fan coil from the building. It is assumed that no energy and additional material are needed for the dismantling of the product. This module has a contribution of 0 to all environmental indicators.

C2, waste transport. This stage includes the transportation of discarded products to the waste processing/disposal area. 50 km distance by trucks is assumed.

C4, waste disposal. Waste disposal including physical pre-treatment and management of the disposal site. According to PCR Part A for Building-Related Products and Services v.4 of UL Environment framework, for Europe it is assumes the following scenario: a 37% in landfill and 13% in incineration. No energy recovery is considered.

C3, waste processing. This module includes the collection of waste fractions from the deconstruction and waste processing of material flows intended for reuse, recycling and energy recovery. For Europe, it is assumed a material recycling rate of 50% according to PCR Part A for Building-Related Products and Services v.4 of UL Environment framework.

D, reuse, recycling and energy recovery potentials. Meterials that are recycled are assumed to substitute the use of virgin metals. Benefits of heat recovery from the incineration are excluded.

A1 Raw materials production

Production of electricity and fuel extraction

A2 Transport of raw materials

A3 Production/ assembling at Sabiana plant

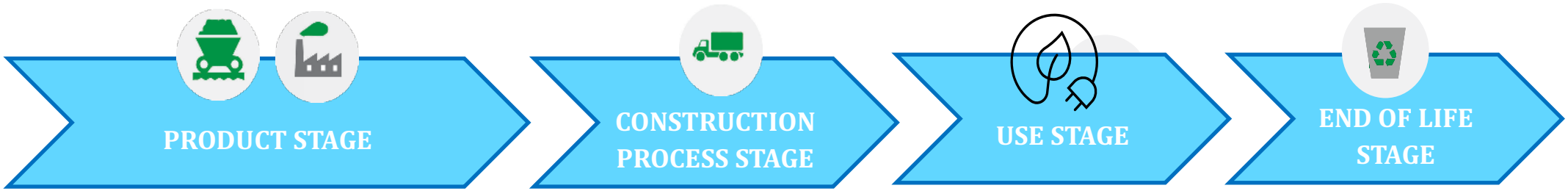
Packaging production

A4 + A5 Products distribution

Product installation

B6 Energy consumption during use phase

C2 Waste transport
C3 Reuse, recycling and/or
C4 disposal



Results of the environmental performance indicators

Mandatory impact category indicators according to EN 15804

Results referred to 1 kWh of thermal energy exchanged with the air of the room in cooling and/or heating mode (CRSL-ECM 23, representative model)													
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B2**	**B3**	**B4**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO_2 eq.	6,91E-04	1,99E-05	3,20E-07	0	0	0	3,56E-03	0	1,40E-06	3,34E-07	4,60E-06	-2,92E-04
GWP-biogenic	kg CO_2 eq.	-2,39E-05	-1,26E-08	1,78E-05	0	0	0	-3,40E-04	0	-8,60E-10	-1,25E-10	2,14E-05	5,04E-05
GWP-luluc	kg CO_2 eq.	3,79E-06	3,91E-10	1,21E-11	0	0	0	9,01E-06	0	2,72E-11	1,17E-11	1,59E-10	-1,37E-06
GWP-total	kg CO_2 eq.	6,70E-04	1,99E-05	1,81E-05	0	0	0	3,23E-03	0	1,40E-06	3,34E-07	6,74E-06	-2,56E-04
ODP	kg CFC 11 eq.	1,54E-11	4,29E-13	4,69E-15	0	0	0	5,82E-11	0	3,00E-14	4,61E-16	3,02E-14	-5,80E-12
AP	mol H^+ eq.	1,13E-05	5,38E-08	9,47E-10	0	0	0	1,75E-05	0	3,51E-09	1,12E-10	7,18E-09	-4,67E-06
EP-freshwater	kg P eq.	6,59E-08	1,56E-11	5,05E-13	0	0	0	3,53E-07	0	1,09E-12	3,04E-13	5,13E-12	-2,74E-08
EP-marine	kg N eq.	9,24E-07	2,07E-08	4,19E-09	0	0	0	2,32E-06	0	1,36E-09	5,02E-11	3,77E-09	-3,83E-07
EP-terrestrial	mol N eq.	1,15E-05	2,20E-07	3,19E-09	0	0	0	2,66E-05	0	1,44E-08	5,08E-10	3,71E-08	-4,78E-06
POCP	kg NMVOC eq.	4,08E-06	8,49E-08	2,43E-09	0	0	0	8,54E-06	0	5,69E-09	1,29E-10	1,05E-08	-1,72E-06
ADP-minerals&metals*	kg Sb eq.	1,36E-07	6,82E-13	1,36E-14	0	0	0	2,22E-10	0	4,78E-14	4,09E-15	4,73E-14	-5,37E-08
ADP-fossil*	MJ	9,40E-03	2,64E-04	2,66E-06	0	0	0	8,38E-02	0	1,85E-05	1,27E-07	7,57E-06	-3,88E-03
WDP*	m^3 eq	3,25E-04	2,42E-07	4,33E-07	0	0	0	8,36E-04	0	1,69E-08	1,80E-08	-4,16E-08	-1,18E-04
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; 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, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption												

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

Additional mandatory and voluntary impact category indicators

Results referred to 1 kWh of thermal energy exchanged with the air of the room in cooling and/or heating mode (CRSL-ECM 23, representative model)													
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B2**	**B3**	**B4**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[2]	kg CO_2 eq.	6,97E-04	1,99E-05	4,27E-06	0	0	0	3,59E-03	0	1,40E-06	3,35E-07	4,61E-06	-2,94E-04

[2] This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.

Resource use indicators

Results referred to 1 kWh of thermal energy exchanged with the air of the room in cooling and/or heating mode (CRSL-ECM 23, representative model)													
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B2**	**B3**	**B4**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
PERE**	MJ	1,41E-03	6,26E-07	1,26E-07	0	0	0	1,66E-02	0	4,20E-08	8,14E-09	1,48E-06	-5,88E-04
PERM**	MJ	1,38E-03	9,53E-08	9,18E-05	0	0	0	2,37E-03	0	6,54E-09	1,10E-07	5,63E-07	-6,95E-04
PERT**	MJ	2,78E-03	7,22E-07	9,19E-05	0	0	0	1,90E-02	0	4,86E-08	1,18E-07	2,04E-06	-1,28E-03
PENRE	MJ	7,88E-03	2,64E-04	2,66E-06	0	0	0	8,37E-02	0	1,85E-05	1,27E-07	7,55E-06	-3,14E-03
PENRM	MJ	1,51E-03	3,61E-08	1,19E-09	0	0	0	4,73E-06	0	2,52E-09	9,56E-11	1,44E-08	-7,41E-04
PENRT	MJ	9,40E-03	2,64E-04	2,66E-06	0	0	0	8,37E-02	0	1,85E-05	1,27E-07	7,57E-06	-3,88E-03
SM	kg	1,30E-05	0	0	0	0	0	0	0	0	0	0	1,30E-05
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0
FW	m^3	1,17E-05	1,11E-08	1,06E-08	0	0	0	6,57E-05	0	7,72E-10	6,85E-10	9,74E-09	-4,35E-06
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water												

*** The indicators PERE, PERM and PERT were calculated according to method B of the Annex 3 (PCR 2019:14 v.1.3.2)*

Waste indicators

Results referred to 1 kWh of thermal energy exchanged with the air of the room in cooling and/or heating mode (CRSL-ECM 23, representative model)													
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B2**	**B3**	**B4**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	1,49E-06	1,89E-09	1,05E-09	0	0	0	2,27E-06	0	1,32E-10	6,76E-09	1,18E-05	-1,19E-07
Non-hazardous waste disposed	kg	1,55E-04	1,30E-08	4,93E-06	0	0	0	9,71E-05	0	9,01E-10	1,53E-07	5,38E-05	-1,03E-04
Radioactive waste disposed	kg	1,61E-08	2,80E-11	2,15E-12	0	0	0	6,22E-07	0	1,58E-12	2,00E-13	2,21E-11	-6,03E-09

Output flow indicators

Results referred to 1 kWh of thermal energy exchanged with the air of the room in cooling and/or heating mode (CRSL-ECM 23, representative model)													
Indicator	Unit	A1-A3	A4	A5	B2	B3	B4	B6	C1	C2	C3	C4	D
Components for re-use	kg	0	0	0	0	0	0	0	0	0	0	0	0
Material for recycling	kg	5,07E-05	0	1,21E-05	0	0	0	0	0	0	7,21E-05	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0	0	0	0	0	0	0	0	0

Additional Environmental Information

Different scenarios for module B6

The following tables show different scenarios for module B6. Specifically, the results are reported for the B6 module depending on the European country in which the CRSL-ECM 23 is used for all its lifetime.

Module B6: Results referred to 1 kWh of thermal energy exchanged with the air of the room in cooling and/or heating mode (CRSL-ECM 23, representative model)														
Indicator	Unit	Albania	Austria	Belgium	Bulgaria	Croatia	Estonia	Finland	France	Germany	Greece	Ireland	Italy	Sweden
GWP - total	kg CO_2 eq.	4,20E-03	7,13E-03	9,65E-03	1,78E-03	2,97E-03	3,61E-03	1,02E-03	4,98E-04	3,10E-03	6,91E-03	3,58E-03	2,63E-03	2,45E-04
GWP-GWP	kg CO_2 eq.	4,42E-03	7,41E-03	9,69E-03	4,67E-03	3,49E-03	5,32E-03	1,78E-03	5,89E-04	3,37E-03	6,96E-03	3,88E-03	2,91E-03	2,47E-04
ODP	kg CFC 11 eq.	3,38E-11	4,44E-11	5,07E-11	9,32E-12	5,30E-11	1,62E-10	2,29E-11	2,50E-11	2,99E-11	1,47E-10	2,49E-10	7,04E-11	3,40E-12
AP	mol H^+ eq.	8,57E-06	4,07E-05	4,43E-05	8,75E-07	4,80E-05	4,75E-05	7,64E-06	2,55E-06	7,83E-06	3,99E-05	8,57E-06	1,18E-05	1,21E-06
EP-freshwater	kg P eq.	6,78E-07	2,06E-06	1,73E-06	1,77E-08	7,04E-07	2,02E-07	1,10E-07	1,34E-08	8,05E-07	1,38E-06	1,77E-08	7,60E-08	1,65E-08
EP-marine	kg N eq.	1,62E-06	6,18E-06	7,17E-06	8,82E-07	3,31E-06	7,20E-06	1,27E-06	5,61E-07	1,40E-06	3,18E-06	1,67E-06	1,73E-06	3,19E-07
EP-terrestrial	mol N eq.	2,05E-05	6,90E-05	7,99E-05	1,04E-05	3,74E-05	7,91E-05	1,57E-05	5,66E-06	1,78E-05	3,44E-05	1,92E-05	2,11E-05	4,21E-06
POCP	kg NMVOC eq.	5,64E-06	1,53E-05	2,21E-05	3,16E-06	1,00E-05	2,70E-05	3,90E-06	1,59E-06	3,86E-06	1,44E-05	5,81E-06	7,43E-06	7,05E-07
ADP-minerals&metals	kg Sb eq.	2,60E-10	1,13E-10	7,32E-11	2,42E-10	2,22E-10	2,21E-10	3,00E-10	5,72E-10	3,96E-10	1,07E-10	2,89E-11	8,75E-11	3,00E-10
ADP-fossil	MJ	6,53E-02	1,01E-01	1,01E-01	9,47E-02	7,17E-02	1,16E-01	8,43E-02	1,27E-01	6,63E-02	9,63E-02	5,95E-02	6,02E-02	6,39E-02
WDP	m^3 eq	1,25E-04	3,37E-04	5,94E-04	8,19E-04	8,18E-04	4,27E-04	5,27E-04	1,40E-04	6,95E-05	2,23E-03	4,51E-04	1,37E-03	4,27E-04

Module B6: Results referred to 1 kWh of thermal energy exchanged with the air of the room in cooling and/or heating mode (CRSL-ECM 23, representative model)													
Indicator	Unit	Lithuania	Netherlands	Poland	Portugal	United Kingdom	Czech Republic	Russia	Serbia	Spain	Switzerland	Hungary	Norway
GWP - total	kg CO_2 eq.	2,85E-03	3,41E-03	7,24E-03	5,31E-03	3,00E-03	5,24E-03	5,93E-03	8,19E-03	2,05E-03	3,23E-04	3,14E-03	1,62E-04
GWP-GWP	kg CO_2 eq.	3,58E-03	3,84E-03	7,90E-03	6,20E-03	3,02E-03	5,38E-03	6,14E-03	8,47E-03	2,11E-03	1,96E-04	3,22E-03	1,64E-04
ODP	kg CFC 11 eq.	7,52E-11	1,31E-10	3,33E-11	1,16E-10	1,48E-10	3,30E-11	4,50E-11	1,09E-11	4,97E-11	5,07E-12	7,48E-11	2,48E-12
AP	mol H^+ eq.	1,44E-05	6,95E-06	6,76E-05	6,70E-05	6,82E-06	2,59E-05	3,16E-05	1,50E-04	1,25E-05	8,99E-07	1,62E-05	3,67E-07
EP-freshwater	kg P eq.	1,99E-07	2,30E-07	1,62E-06	8,21E-07	3,18E-08	1,37E-06	6,01E-07	3,44E-06	6,91E-08	1,14E-08	5,98E-07	1,02E-08
EP-marine	kg N eq.	2,43E-06	1,79E-06	6,78E-06	5,75E-06	1,88E-06	3,67E-06	3,99E-06	6,52E-06	2,09E-06	1,63E-07	2,22E-06	8,03E-08
EP-terrestrial	mol N eq.	2,73E-05	2,11E-05	7,67E-05	6,52E-05	2,32E-05	4,08E-05	4,39E-05	7,12E-05	2,32E-05	2,62E-06	2,54E-05	1,05E-06
POCP	kg NMVOC eq.	9,37E-06	5,05E-06	1,78E-05	1,78E-05	6,58E-06	9,49E-06	1,49E-05	2,02E-05	6,53E-06	4,48E-07	7,08E-06	2,09E-07
ADP-minerals&metals	kg Sb eq.	1,65E-10	1,27E-10	3,18E-10	2,93E-10	1,71E-10	1,55E-09	2,10E-10	2,23E-10	2,43E-10	1,58E-10	6,44E-10	2,20E-11
ADP-fossil	MJ	8,86E-02	7,36E-02	1,16E-01	1,24E-01	5,36E-02	1,15E-01	1,36E-01	1,18E-01	7,81E-02	3,48E-02	1,16E-01	5,47E-03
WDP	m^3 eq	4,73E-04	3,20E-04	7,74E-04	1,73E-03	8,03E-04	6,24E-04	1,06E-03	8,70E-04	1,05E-03	1,28E-04	6,02E-04	1,41E-04

GWP-GHG results of the “Best-Case Product”

The following table shows the GWP-GHG indicator for the CRSL-ECM 04 +1 model, the best-case product.

Results referred to 1 kWh of thermal energy exchanged with the air of the room in cooling and/or heating mode (CRSL-ECM 04 +1, best-case product)													
Indicator	Unit	A1-A3	A4	A5	B2	B3	B4	B6	C1	C2	C3	C4	D
GWP-GHG	kg CO_2 eq.	4,81E-04	1,31E-05	2,90E-06	0	0	0	1,36E-03	0	9,25E-07	2,21E-07	3,04E-06	-1,94E-04

GWP-GHG results of the “Worst-Case Product”

The following table shows the GWP-GHG indicator for the CRSL-ECM 03 +1 model, the worst-case product.

Results referred to 1 kWh of thermal energy exchanged with the air of the room in cooling and/or heating mode (CRSL-ECM 03 +1, worst-case product)													
Indicator	Unit	A1-A3	A4	A5	B2	B3	B4	B6	C1	C2	C3	C4	D
GWP-GHG	kg CO_2 eq.	1,68E-03	4,61E-05	1,02E-05	0	0	0	4,92E-03	0	3,25E-06	7,76E-07	1,07E-05	-6,82E-04

Conversion factors

Conversion coefficients are given for the environmental impact of the functional unit, **1 kWh of thermal energy exchanged with the air of the room in cooling and/or heating mode**. For each module of the life cycle, the environmental impacts of the product concerned are calculated by multiplying the impacts of the declaration corresponding to the reference product by the conversion coefficient. The "Total" column should be calculated by adding the environmental impacts of each stage of the life cycle.

Indicator	CRSL-ECM 03				CRSL-ECM 13				CRSL-ECM 43				CRSL-ECM 73			
	A1-A3	A5	B6	A4/C2/C3/C4/D	A1-A3	A5	B6	A4/C2/C3/C4/D	A1-A3	A5	B6	A4/C2/C3/C4/D	A1-A3	A5	B6	A4/C2/C3/C4/D
GWP-GWP	1,89	1,82	1,13	1,82	1,30	0,95	1,15	1,27	0,79	0,80	0,91	0,80	0,94	0,97	1,06	0,97
ODP	1,89	1,81	1,13	1,82	1,30	0,95	1,15	1,27	0,79	0,80	0,91	0,80	0,94	0,97	1,06	0,97
AP	1,83	1,81	1,13	1,82	1,27	0,95	1,15	1,27	0,80	0,80	0,91	0,80	0,96	0,97	1,06	0,97
EP-freshwater	1,83	1,51	1,13	1,82	1,28	0,87	1,15	1,27	0,80	0,80	0,91	0,80	0,96	0,97	1,06	0,97
EP-marine	1,84	1,82	1,13	1,82	1,28	0,95	1,15	1,27	0,80	0,80	0,91	0,80	0,96	0,97	1,06	0,97
EP-terrestrial	1,84	1,81	1,13	1,82	1,28	0,95	1,15	1,27	0,80	0,80	0,91	0,80	0,96	0,97	1,06	0,97
POCP	1,85	1,82	1,13	1,82	1,28	0,95	1,15	1,27	0,80	0,80	0,91	0,80	0,96	0,97	1,06	0,97
ADP-minerals&metals	1,82	1,42	1,13	1,82	1,27	0,85	1,15	1,27	0,80	0,80	0,91	0,80	0,97	0,97	1,06	0,97
ADP-fossil	1,89	1,80	1,13	1,82	1,30	0,95	1,15	1,27	0,79	0,80	0,91	0,80	0,94	0,97	1,06	0,97
WDP	1,86	0,94	1,13	1,82	1,29	0,72	1,15	1,27	0,79	0,81	0,91	0,80	0,95	0,98	1,06	0,97

Indicator	CRSL-ECM 83				CRSL-ECM 04				CRSL-ECM 14				CRSL-ECM 24			
	A1-A3	A5	B6	A4/C2/C3/C4/D	A1-A3	A5	B6	A4/C2/C3/C4/D	A1-A3	A5	B6	A4/C2/C3/C4/D	A1-A3	A5	B6	A4/C2/C3/C4/D
GWP-GWP	0,86	0,89	1,37	0,89	1,83	1,76	1,06	1,76	1,28	1,25	1,08	1,25	0,93	0,97	0,90	0,94
ODP	0,86	0,89	1,37	0,89	1,83	1,76	1,06	1,76	1,27	1,25	1,08	1,25	0,93	0,98	0,90	0,94
AP	0,89	0,89	1,37	0,89	1,77	1,76	1,06	1,76	1,26	1,25	1,08	1,25	0,94	0,98	0,90	0,94
EP-freshwater	0,89	0,91	1,37	0,89	1,78	1,58	1,06	1,76	1,26	1,27	1,08	1,25	0,93	1,08	0,90	0,94
EP-marine	0,88	0,89	1,37	0,89	1,78	1,76	1,06	1,76	1,26	1,25	1,08	1,25	0,93	0,97	0,90	0,94
EP-terrestrial	0,89	0,89	1,37	0,89	1,78	1,76	1,06	1,76	1,26	1,25	1,08	1,25	0,93	0,97	0,90	0,94
POCP	0,88	0,89	1,37	0,89	1,79	1,76	1,06	1,76	1,26	1,25	1,08	1,25	0,93	0,97	0,90	0,94
ADP-minerals&metals	0,89	0,92	1,37	0,89	1,77	1,52	1,06	1,76	1,25	1,27	1,08	1,25	0,94	1,11	0,90	0,94
ADP-fossil	0,86	0,89	1,37	0,89	1,83	1,76	1,06	1,76	1,28	1,25	1,08	1,25	0,93	0,98	0,90	0,94
WDP	0,88	0,95	1,37	0,89	1,80	1,23	1,06	1,76	1,27	1,29	1,08	1,25	0,93	1,28	0,90	0,94

Indicator	CRSL-ECM 44				CRSL-ECM 74				CRSL-ECM 84			
	A1-A3	A5	B6	A4/C2/C3/C4/D	A1-A3	A5	B6	A4/C2/C3/C4/D	A1-A3	A5	B6	A4/C2/C3/C4/D
GWP-GWP	0,78	0,79	0,87	0,79	0,89	0,92	0,96	0,92	0,81	0,84	1,25	0,84
ODP	0,78	0,80	0,87	0,79	0,89	0,92	0,96	0,92	0,81	0,85	1,25	0,84
AP	0,79	0,80	0,87	0,79	0,92	0,92	0,96	0,92	0,84	0,85	1,25	0,84
EP-freshwater	0,79	0,91	0,87	0,79	0,91	1,01	0,96	0,92	0,84	0,94	1,25	0,84
EP-marine	0,79	0,79	0,87	0,79	0,91	0,92	0,96	0,92	0,83	0,84	1,25	0,84
EP-terrestrial	0,79	0,79	0,87	0,79	0,91	0,92	0,96	0,92	0,83	0,84	1,25	0,84
POCP	0,79	0,79	0,87	0,79	0,91	0,92	0,96	0,92	0,83	0,84	1,25	0,84
ADP-minerals&metals	0,79	0,95	0,87	0,79	0,92	1,03	0,96	0,92	0,84	0,97	1,25	0,84
ADP-fossil	0,78	0,80	0,87	0,79	0,89	0,92	0,96	0,92	0,81	0,85	1,25	0,84
WDP	0,79	1,13	0,87	0,79	0,90	1,17	0,96	0,92	0,82	1,13	1,25	0,84

Indicator	CRSL-ECM 03 +1				CRSL-ECM 13 +1				CRSL-ECM 23 +1				CRSL-ECM 43 +1			
	A1-A3	A5	B6	A4/C2/C3/C4/D	A1-A3	A5	B6	A4/C2/C3/C4/D	A1-A3	A5	B6	A4/C2/C3/C4/D	A1-A3	A5	B6	A4/C2/C3/C4/D
GWP-GWP	2,41	2,39	1,37	2,32	1,49	1,47	1,25	1,47	1,19	1,18	1,13	1,20	0,99	1,00	1,08	1,01
ODP	2,40	2,38	1,37	2,32	1,49	1,47	1,25	1,47	1,19	1,18	1,13	1,20	0,99	1,00	1,08	1,01
AP	2,33	2,38	1,37	2,32	1,47	1,47	1,25	1,47	1,20	1,18	1,13	1,20	1,00	1,00	1,08	1,01
EP-freshwater	2,34	2,11	1,37	2,32	1,47	1,44	1,25	1,47	1,20	1,28	1,13	1,20	1,00	1,09	1,08	1,01
EP-marine	2,35	2,39	1,37	2,32	1,48	1,47	1,25	1,47	1,20	1,18	1,13	1,20	1,00	1,00	1,08	1,01
EP-terrestrial	2,34	2,39	1,37	2,32	1,48	1,47	1,25	1,47	1,20	1,18	1,13	1,20	1,00	1,00	1,08	1,01
POCP	2,35	2,39	1,37	2,32	1,48	1,47	1,25	1,47	1,20	1,18	1,13	1,20	1,00	1,00	1,08	1,01
ADP-minerals&metals	2,32	2,03	1,37	2,32	1,47	1,43	1,25	1,47	1,20	1,31	1,13	1,20	1,01	1,12	1,08	1,01
ADP-fossil	2,41	2,38	1,37	2,32	1,49	1,47	1,25	1,47	1,19	1,18	1,13	1,20	0,99	1,00	1,08	1,01
WDP	2,37	1,60	1,37	2,32	1,48	1,38	1,25	1,47	1,20	1,48	1,13	1,20	1,00	1,26	1,08	1,01

Indicator	CRSL-ECM 73 +1				CRSL-ECM 83 +1				CRSL-ECM 04 +1				CRSL-ECM 14 +1			
	A1-A3	A5	B6	A4/C2/C3/C4/D	A1-A3	A5	B6	A4/C2/C3/C4/D	A1-A3	A5	B6	A4/C2/C3/C4/D	A1-A3	A5	B6	A4/C2/C3/C4/D
GWP-GWP	1,10	1,14	1,19	1,14	1,01	1,07	1,53	1,05	0,69	0,68	0,38	0,66	1,52	1,48	1,20	1,50
ODP	1,11	1,14	1,19	1,14	1,01	1,08	1,53	1,05	0,68	0,68	0,38	0,66	1,52	1,49	1,20	1,50
AP	1,14	1,14	1,19	1,14	1,04	1,08	1,53	1,05	0,67	0,68	0,38	0,66	1,50	1,49	1,20	1,50
EP-freshwater	1,13	1,23	1,19	1,14	1,04	1,17	1,53	1,05	0,67	0,64	0,38	0,66	1,50	1,58	1,20	1,50
EP-marine	1,13	1,14	1,19	1,14	1,04	1,07	1,53	1,05	0,67	0,68	0,38	0,66	1,51	1,48	1,20	1,50
EP-terrestrial	1,13	1,14	1,19	1,14	1,04	1,08	1,53	1,05	0,67	0,68	0,38	0,66	1,50	1,48	1,20	1,50
POCP	1,13	1,14	1,19	1,14	1,03	1,08	1,53	1,05	0,67	0,68	0,38	0,66	1,51	1,48	1,20	1,50
ADP-minerals&metals	1,14	1,26	1,19	1,14	1,05	1,20	1,53	1,05	0,66	0,63	0,38	0,66	1,50	1,61	1,20	1,50
ADP-fossil	1,10	1,15	1,19	1,14	1,01	1,08	1,53	1,05	0,69	0,68	0,38	0,66	1,52	1,49	1,20	1,50
WDP	1,12	1,41	1,19	1,14	1,03	1,36	1,53	1,05	0,68	0,57	0,38	0,66	1,51	1,76	1,20	1,50

Indicator	CRSL-ECM 24 +1				CRSL-ECM 44 +1				CRSL-ECM 74 +1				CRSL-ECM 84 +1			
	A1-A3	A5	B6	A4/C2/C3/C4/D	A1-A3	A5	B6	A4/C2/C3/C4/D	A1-A3	A5	B6	A4/C2/C3/C4/D	A1-A3	A5	B6	A4/C2/C3/C4/D
GWP-GWP	1,20	1,13	1,05	1,21	1,00	0,99	1,04	1,02	1,10	1,14	1,14	1,14	1,01	1,07	1,49	1,05
ODP	1,20	1,14	1,05	1,21	1,00	1,00	1,04	1,02	1,11	1,15	1,14	1,14	1,01	1,08	1,49	1,05
AP	1,21	1,14	1,05	1,21	1,01	1,00	1,04	1,02	1,14	1,15	1,14	1,14	1,05	1,08	1,49	1,05
EP-freshwater	1,21	1,36	1,05	1,21	1,01	1,23	1,04	1,02	1,14	1,33	1,14	1,14	1,04	1,27	1,49	1,05
EP-marine	1,20	1,13	1,05	1,21	1,01	0,99	1,04	1,02	1,13	1,14	1,14	1,14	1,04	1,07	1,49	1,05
EP-terrestrial	1,20	1,14	1,05	1,21	1,01	1,00	1,04	1,02	1,13	1,15	1,14	1,14	1,04	1,07	1,49	1,05
POCP	1,20	1,14	1,05	1,21	1,01	0,99	1,04	1,02	1,13	1,14	1,14	1,14	1,03	1,07	1,49	1,05
ADP-minerals&metals	1,21	1,42	1,05	1,21	1,02	1,29	1,04	1,02	1,14	1,39	1,14	1,14	1,05	1,33	1,49	1,05
ADP-fossil	1,20	1,14	1,05	1,21	1,00	1,00	1,04	1,02	1,10	1,15	1,14	1,14	1,01	1,08	1,49	1,05
WDP	1,20	1,77	1,05	1,21	1,01	1,66	1,04	1,02	1,12	1,68	1,14	1,14	1,03	1,63	1,49	1,05

Indicator	CRSL-ECM 03 +2				CRSL-ECM 13 +2				CRSL-ECM 23 +2				CRSL-ECM 43 +2			
	A1-A3	A5	B6	A4/C2/C3/C4/D	A1-A3	A5	B6	A4/C2/C3/C4/D	A1-A3	A5	B6	A4/C2/C3/C4/D	A1-A3	A5	B6	A4/C2/C3/C4/D
GWP-GWP	1,61	1,60	0,89	1,56	1,12	1,10	0,90	1,10	0,91	0,88	0,81	0,91	0,70	0,69	0,73	0,71
ODP	1,61	1,60	0,89	1,56	1,12	1,11	0,90	1,10	0,91	0,89	0,81	0,91	0,70	0,70	0,73	0,71
AP	1,56	1,60	0,89	1,56	1,11	1,11	0,90	1,10	0,91	0,89	0,81	0,91	0,71	0,70	0,73	0,71
EP-freshwater	1,57	1,51	0,89	1,56	1,11	1,15	0,90	1,10	0,91	1,03	0,81	0,91	0,71	0,82	0,73	0,71
EP-marine	1,57	1,60	0,89	1,56	1,11	1,10	0,90	1,10	0,91	0,88	0,81	0,91	0,71	0,69	0,73	0,71
EP-terrestrial	1,57	1,60	0,89	1,56	1,11	1,10	0,90	1,10	0,91	0,88	0,81	0,91	0,71	0,69	0,73	0,71
POCP	1,58	1,60	0,89	1,56	1,11	1,10	0,90	1,10	0,91	0,88	0,81	0,91	0,70	0,69	0,73	0,71
ADP-minerals&metals	1,56	1,48	0,89	1,56	1,10	1,17	0,90	1,10	0,91	1,08	0,81	0,91	0,71	0,86	0,73	0,71
ADP-fossil	1,61	1,60	0,89	1,56	1,12	1,11	0,90	1,10	0,91	0,89	0,81	0,91	0,70	0,70	0,73	0,71
WDP	1,59	1,33	0,89	1,56	1,11	1,25	0,90	1,10	0,91	1,32	0,81	0,91	0,70	1,05	0,73	0,71

Additional Information

Thermal/Electrical Energy Calculation

The total thermal energy provided/to subtracted from the air of the room and the total electrical energy consumption along fan coil lifetime is been calculated by the following formula (based on *Technical Certification Rules Of The Eurovent Certified Performance Mark – Fan Coil Unit – Rev 00 2021):*

$$\textit{Total Thermal Energy } (kWh) = \textit{Cooling Energy} + \textit{Heating Energy}$$

where:

$$\textit{Cooling Energy} = (5\%\ P\ (c)_{high} + 30\%\ P\ (c)_{med} + 65\%\ P\ (c)_{low}) * h_{cooling} * \textit{Lifetime}$$
$$\textit{Heating Energy} = (5\%\ P\ (h)_{high} + 25\%\ P\ (h)_{med} + 70\%\ P\ (h)_{low}) * h_{heating} * \textit{Lifetime}$$

$$\textit{Total Electrical Consumption } (kWh) = \textit{Cooling Electrical Consumption} + \textit{Heating Electrical Consumption}$$

where:

$$\textit{Cooling Consumption} = (5\%\ Pe\ (c)_{high} + 30\%\ Pe\ (c)_{med} + 65\%\ Pe\ (c)_{low}) * h_{cooling} * \textit{Lifetime}$$
$$\textit{Heating Consumption} = (5\%\ Pe\ (h)_{high} + 25\%\ Pe\ (h)_{med} + 70\%\ Pe\ (h)_{low}) * h_{heating} * \textit{Lifetime}$$

- $P\ (c)_{high}$ / $P\ (c)_{med}$ / $P\ (c)_{low}$ = Total Cooling Capacity (kW) at high/med/low speed in cooling mode at standard rating conditions, according to EN1397
- $Pe\ (c)_{high}$ / $Pe\ (c)_{med}$ / $Pe\ (c)_{low}$ = Total Electrical Power Input (kW) at high/med/low speed in cooling mode according to EN1397
- $P\ (h)_{high}$ / $P\ (h)_{med}$ / $P\ (h)_{low}$ = Heating Capacity (kW) at high/med/low speed in cooling mode at standard rating conditions, according to EN1397
- $Pe\ (h)_{high}$ / $Pe\ (h)_{med}$ / $Pe\ (h)_{low}$ = Total Electrical Power Input (kW) at high/med/low speed in heating mode according to EN1397
- Medium speed is the standard fan speed as defined in EN 1397 (having 0Pa at inlet of the unit and 50 Pa at outlet of the unit), low/high speed are the other two speeds measured according to EN 1397
- *hcooling* and *hheating* are the yearly operational hours in cooling (1100hrs) and average heating (1500hrs) mode
- Lifetime= 20 years

Model	Total Thermal Energy (kWh)	Total Electrical Consumption (kWh)
CRSL-ECM 03	52.614,00	639,40
CRSL-ECM 13	92.487,00	1145,70
CRSL-ECM 23	**156.792,00**	**1690,50**
CRSL-ECM 43	229.580,00	2258,50
CRSL-ECM 73	319.346,00	3648,60
CRSL-ECM 83	396.710,00	5860,80
CRSL-ECM 04	55.990,00	639,40
CRSL-ECM 14	98.746,00	1145,70
CRSL-ECM 24	174.326,00	1690,50
CRSL-ECM 44	241.322,00	2258,50
CRSL-ECM 74	351.254,00	3648,60
CRSL-ECM 84	435.920,00	5860,80
CRSL-ECM 03+1	43.224,00	639,40
CRSL-ECM 13+1	85.347,00	1145,70
CRSL-ECM 23+1	138.642,00	1690,50
CRSL-ECM 43+1	193.250,00	2258,50
CRSL-ECM 73+1	284.486,00	3648,60
CRSL-ECM 83+1	354.485,00	5860,80
CRSL-ECM 04+1	155.831,00	639,40
CRSL-ECM 14+1	88.801,00	1145,70
CRSL-ECM 24+1	149.246,00	1690,50
CRSL-ECM 44+1	200.477,00	2258,50
CRSL-ECM 74+1	296.234,00	3648,60
CRSL-ECM 84+1	365.870,00	5860,80
CRSL-ECM 03+2	66.459,00	639,40
CRSL-ECM 13+2	117.882,00	1145,70
CRSL-ECM 23+2	192.417,00	1690,50
CRSL-ECM 43+2	287.480,00	2258,50

References

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