ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

Owner of the Declaration	**Entrematic**
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-ASA-20190063-IBA1-EN
Issue date	08.04.2019
Valid to	07.04.2024

EM PSW250 swing door operator

Entrematic

Institut Bauen und Umwelt e.V.

www.bau-umwelt.com / https://epd-online.com

ENTREMATIC

1. General Information

Entrematic Group AB

Programme holder

IBU - Institut Bauen und Umwelt e.V.
Panoramastr. 1
10178 Berlin
Germany

Declaration number

EPD-ASA-20190063-IBA1-EN

This Declaration is based on the Product Category Rules:

PCR Automatic doors, automatic gates, and revolving door systems (door systems) 11.2017
(PCR tested and approved by the independent expert committee (SVA))

Issue date

08.04.2019

Valid to

07.04.2024

Prof. Dr.-Ing. Horst J. Bossenmayer
(President of Institut Bauen und Umwelt e.V.)

Dr. Alexander Röder
(Managing Director IBU)

EM PSW250 swing door operator

Owner of the Declaration

Entrematic Group AB
Lodjursgatan 10
SE-261 44 Landskrona
Sweden

Declared product / Declared unit

The declaration represents 1 automatic EM PSW250 swing door operator

Scope:

This declaration and its LCA study is relevant to the EM PSW250 swing door operator. The final assembly and production stage occurs in Ostrov u Stribra, Czech Republic at D5 Logistic Park 34901 Ostrov u Stribra, Czech Republic. Components are sourced from international Tier one suppliers. The EM PSW250 swing door operator cover length vary according to project requirements; an operator with cover standard length 840 mm and push arm system is used in this declaration. The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Verification

The CEN Standard EN 15804 serves as the core PCR
Independent verification of the declaration and data according to ISO 14025
☐ internally ☒ externally

Dr. Wolfram Trinius
(Independent verifier appointed by SVA)

2. Product

2.1 Product description

Product name: EM PSW250 swing door operator
Product characteristics: Automatic, slim, electro-mechanical swing door operator.
The operator works electro-mechanically. It opens with motor and closes with motor and spring. The opening and closing speeds can be varied individually.
The motor and gear box are combined into a compact unit mounted alongside the control unit within the cover. The operator is connected to the door leaf with a range of different arm systems.
The 70 mm slim EM PSW250 swing door operator requires a minimum of space while providing maximum performance. Furthermore, the door system operates very silent despite its capability to handle heavy doors up to 250 kg.
The EM PSW250 swing door operator is fire approved, making it ideal for creating and maintaining security, smoke and fire zones.
Automatic swing door operators are generally made of metal and plastic.
The EM PSW250 swing door operator has been designed to meet all operational and safety requirements in the European Directives and the standards issued by the European Standardization Committee (CEN).

2.2 Application

The EM PSW250 swing door operator is suitable for both external and internal swing doors and can be retrofitted with existing doors.
The EM PSW250 swing door operator facilitates entry and exit in buildings, and this widely-used operator can be found on applications ranging from hospital corridors to high-traffic retail operations.
The operator is truly reliable during all weather conditions as it is not affected by stack pressure and wind load when opening and/or closing. For added convenience, the EM PSW250 swing door operator can easily be manually opened, despite extended closing torque, due to sensor detection ensuring lowest manual opening force.

2.3 Technical Data

The product has the following technical properties:

Features

Length (standard cover)	840 mm, optional lenghts available
Height	70 mm
Depth	148 mm
Inertia	Max 140 kg/ m²
Profile finish	anodized aluminum, RAL colors available on request

Performance

Mains power supply	100-240 V AC +10/-15%, 50/60 Hz, mains fuse max 10A (building installation)
Power consumption	Max. 300W
Auxiliary voltage	24 V DC, max. 700 mA
Opening time (0° - 80°)	variable between 2.5 - 12 seconds
Closing time (90° - 10°)	variable between 4 - 12 seconds
HOLD open time	1.5-30 seconds
Ambient temperature	-20°C to +45°C

2.4 Placing on the market / Application rules

For the placing on the market in the EEA, Switzerland and Turkey the following European directives apply to the EM PSW250 swing door operator:
2004/108/EC Electromagnetic Compatibility Directive (EMCD)
2006/42/EC Machinery Directive (MD)
These directives provides for CE marking of the product and issuing a Declaration of Conformity.

Harmonized European standards, which have been applied:
EN 60335-1 Household and similar electrical appliances -Safety -Part 1: General requirements
EN 61000-6-2 Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
EN 61000-6-3 Electromagnetic compatibility (EMC) — Part 6-3: Generic standards — Emission standard for residential, commercial and light-industrial environments
EN ISO 13849-1 Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design
EN 16005 Power operated pedestrian doorsets - Safety in use -Requirements and test methods.

Other standards or technical specifications, which have been applied:
DIN 18650-1 Powered pedestrian doors - Part 1: Product requirements and test methods
DIN 18650-2 Powered pedestrian doors - Part 2: Safety at powered pedestrian doors
EN 60335-2-103 Household and similar electrical appliances -Safety -Part 2: Particular requirements for drives for gates, doors and windows
IEC 600335-1 Household and similar electrical appliances -Safety -Part 1: General requirements
IEC 60335-2-103 Household and similar electrical appliances Safety Part 2-103: Particular requirements for drives for gates, doors and windows.
Disposal of the product is subject to the WEEE Directive within Europe, Directive 2012/19/EU

For the application and use the respective national provisions apply.

2.5 Delivery status

The EM PSW250 is delivered ready for installation.

2.6 Base materials / Ancillary materials

The average composition of EM PSW250 is as follows:

Component	Percentage in mass (%)
Aluminium	37,74
Brass	0.0012
Plastics	1,00
StainlessSteel	2.11
Steel	36.15
Electronic	4.81
Electro_mechanics	17.08
others	1.1
Total	**100.0**

2.7 Manufacture

The primary manufacturing processes are made by tier one suppliers and the final manufacturing processes for operator units occur in factory in Ostrov, Czech Republic. The profiles are machined and surface treated; either anodized (externally) or powder coated (internally). Other parts as electronics etc. arrive from tier one suppliers or the factory in China and a final assembly is done in Ostrov. The operators are packed in cardboard boxes and forwarded to on-site installation. The certified quality management system, EN ISO 9001:2015, ensures high standards.
Offcuts and scraps during the manufacturing process are directed to a recycling unit. Wastewater is cleared on-site and waste is sent for disposal.
Waste codes according to European Waste Catalogue and Hazardous Waste List - Valid from 1 January 2002
EWC 12 01 01 Ferrous metal filings and turnings
EWC 12 01 03 Non-ferrous metal filings and turnings
EWC 08 02 01 Waste coating powders
EWC 12 01 05 Plastics

2.8 Environment and health during manufacturing

Entrematic is committed to producing and distributing door opening solutions with minimal environmental impact, where health & safety is the primary focus for all employees and associates.

- Environmental operations, GHG, energy, water, waste, VOC, surface treatment and H&S are being routinely monitored. Inspections, audits, and reviews are conducted periodically to ensure that applicable standards are met and environment management program effectiveness is evaluated.
- Code of Conduct covers human rights, labor practices and decent work. The management of Entrematic is aware of their roles and responsibilities, providing appropriate training, supporting accountability and recognizing outstanding performance.
- Preparation and manufacturing conditions (including the process of powder coating) in the factory of Ostrov do not require special health and safety measures. Standard health and safety measures (work gloves, hearing protection, safety shoes, dust mask when sanding and milling, dust extraction, etc.) are observed where appropriate.
- Water and soil contamination does not occur and all production related waste is processed internally in the appropriate manner.

2.9 Product processing/Installation

The EM PSW250 swing door operator is supplied ready for installation. The installation is performed by certified installation technicians.

2.10 Packaging

The EM PSW250 swing door operator is packed in cardboard packaging. The cardboard is recyclable.

Material	Value (%)
Cardboard/paper	99.62
Plastics	0.38
Total	**100.0**

All materials incurred during installation are directed to a recycling unit.
Waste codes according to European Waste Catalogue and Hazardous Waste List - Valid from 1 January 2002
EWC 15 01 01 paper and cardboard packaging
EWC 15 01 02 plastic packaging

2.11 Condition of use

Regular inspections shall be made according to national regulations and product documentation by an Entrematic' trained and qualified technician. The number of service occasions should be in accordance with national requirements and product documentation. Service is recommended according to "Service Log Book".
Regular inspections and cleaning should be performed by the owner of the product, according to "Users Manual"
The best way to remove dust and dirt from the EM PSW250 swing door operator is to use water and a soft cloth or a sponge. A gentle detergent may be used. To maintain the quality of the enamel layer, the surfaces should be cleaned three times/year (once/four month's period). The cleaning should be documented.

- Do not expose profiles to alkalis. Aluminum is sensitive to alkalis.
- Do not clean with high pressure water. Operator, programme selector and sensor may be damaged and water may enter the profiles.
- Do not use polishing detergent.
- Do not scrub with materials like Scotch-brite, as this will cause mechanical damage.

2.12 Environment and health during use

There is no harmful emissive potential. Minimal risk for personal injury if correctly configured and maintenance recommendations apply.

2.13 Reference service life

The product has a reference service life of more than 1,000,000 cycles and 10 years of standard daily use (with the recommended maintenance and service program). For this EPD lifetime of 10 years was considered.

2.14 Extraordinary effects

Fire
The EM PSW250 swing door operator is tested for usage in fire and smoke protection doors according to EN1634-1.

Water
Contains no substances that have any impact on water in case of flood. Product operation can be influenced.

Mechanical destruction
No danger to the environment can be anticipated during mechanical destruction.

2.15 Re-use phase

The product is possible to re-use during the reference service life and be moved from one door to another. The majority, by weight, of components is aluminium alloy and steel which can be recycled. The plastic components can be used for energy recovery within a waste incineration process.
All materials are directed to a recycling unit. The components made of aluminum alloy, steel, and stainless steel can be recycled. The plastic components can be used for energy recovery within a waste incineration process.
Waste codes according to European Waste Catalogue and Hazardous Waste List - Valid from 1 January 2002
EWC 16 02 13* discarded equipment containing hazardous components other than those mentioned in 16 02 09 to 16 02 12
EWC 17 02 03 plastic
EWC 17 04 01 copper, bronze, brass
EWC 17 04 02 aluminium
EWC 17 04 05 iron and steel
EWC 17 04 11 Cables with the exception of those outlined in 17 04 10
Disposal of the product is subject to the WEEE Directive within Europe, Directive 2012/19/EU.

2.16 Disposal

The requirements on waste disposal and recycling listed in the European Waste Catalogue (EWC) should be followed. The requirements on waste disposal and recycling listed in the European Waste Catalogue (EWC) should be followed. As the product contains no substances harmful to the environment or human health, the entire system can be safely placed in a landfill site in cases where no waste recycling technologies are available.
In this EPD, small parts of product were treated as a waste for landfill:
17 09 04 mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03

2.17 Further information

Entrematic Group AB
Lodjursgatan 10
SE-261 44 Landskrona
Sweden
www.entrematic.com

3. LCA: Calculation rules

3.1 Declared Unit

The declaration refers to the functional unit of 1 piece of the EM PSW250 swing door operator as specified in Part B requirements on the EPD for Doors, windows, shutters, and related products/IBU PCR Part B/. PCR Automatic doors, automatic gates, and revolving door systems (door systems).

Declared unit

Name	Value	Unit
Declared unit	1	piece of operator
Mass of product (without packaging)	13.38	kg
Mass of packaging	1.33	kg
Conversion factor to 1 kg	0.074	-

3.2 System boundary

Type of the EPD: cradle to gate - with Options
The following life cycle phases were considered for Door Closer:

Production stage:

- A1 – Raw material extraction and processing
- A2 – Transport to the manufacturer and
- A3 – Manufacturing

Construction stage:

- A4 - Transport from the gate to the site
- A5 – Packaging waste processing

Use stage related to the operation of the building includes:

- B6 – Operational energy use (Energy consumption for operation)

End-of-life stage:

- C2 – Transport to waste processing
- C3 – Waste processing for recycling and
- C4 – Disposal (landfill)

This includes provision of all materials, products and energy, packaging processing and its transport, as well as waste processing up to the end-of waste state or disposal of final residues.

- D - Declaration of all benefits or recycling potential from EOL and A5

3.3 Estimates and assumptions

Use phase:
For the use phase, it is assumed that the swing door operator is used in Europe, thus an EU electricity grid mix is considered within this stage.

EoL:
In the End-of-Life phase, for all the materials which can be recycled, a recycling scenario with 100% collection rate was assumed.

3.4 Cut-off criteria

In the assessment, all available data from the production process are considered, i.e. all raw materials used, auxiliary materials (e.g. lubricants), thermal energy consumption and electric power consumption - including material and energy flows contributing less than 1% of mass or energy (if available). In case a specific flow contributing less than 1% in mass or energy is not available, worst case assumption proxies are selected to represent the respective environmental impacts.
Impacts relating to the production of machines and facilities required during production are out of the scope of this assessment.

3.5 Background data

For life cycle modeling of the considered products, the GaBi 8 Software System for Life Cycle Engineering, developed by thinkstep AG, is used /GaBi 8 2018/. The GaBi-database contains consistent and documented datasets which are documented in the online GaBi-documentation /GaBi database SP25: 2016/.
To ensure comparability of results in the LCA, the basic data of GaBi database were used for energy transportation and auxiliary materials.

3.6 Data quality

The requirements for data quality and background data correspond to the specifications of the /IBU PCR PART A/.
thinkstep performed a variety of tests and checks during the entire project to ensure high quality of the completed project. This obviously includes an extensive review of project-specific LCA models as well as the background data used.
The technological background of the collected data reflects the physical reality of the declared products. The datasets are complete and conform to the system boundaries and the criteria for the exclusion of inputs and outputs.
All relevant background datasets are taken from the GaBi 8 software database. The last revision of the used background data has taken place not longer than 10 years ago.

3.7 Period under review

The period under review is 2013/14 (12 month average).

3.8 Allocation

Regarding incineration, the software model for the waste incineration plant (WIP) is adapted according to the material composition and heating value of the combusted material. In this EPD the following specific life cycle inventories for the WIP are considered:
• Waste incineration of plastic
• Waste incineration of paper
• Waste incineration of electronic scrap
Regarding the recycling material of metals, the metal parts in the EoL are declared as end-of-waste status. Thus, these materials are considered in module D.
Specific information on allocation within the background data is given in the GaBi dataset documentation.

3.9 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to /EN 15804/ and the building context, respectively the product-specific characteristics of performance, are taken into account.

4. LCA: Scenarios and additional technical information

Installation into the building (A5)

Name	Value	Unit
Output substances following waste treatment on site Packaging (paper)	1.321	kg
Output substances following waste treatment on site Packaging (plastic)	0.005	kg

Reference service life

Name	Value	Unit
Reference service life	10	a

Operational energy use (B6)

Name	Value	Unit
Electricity consumption	1971	kWh
Days per year in use	365	days
Hours per day in on mode	10	h
Hours per day in stand-by mode	6	h
Hours per day in idle mode	8	h
Power consumption in on mode in W	40	W
Power consumption in idle mode in W	10	W
Power consumption in off mode in W	10	W

End of life (C1-C4)

Name	Value	Unit
Collected separately Aluminium, brass, stainless steel, steel, electronic, electro mechanics, plastics	13.24	kg
Collected as mixed construction waste construction waste for landfilling	0.14	kg
Reuse plastic parts	0.13	kg
Recycling Steel, stainless steel, aluminium, brass, electronics, electro mechanics	13.11	kg
Landfilling construction waste for landfilling	0.14	kg

Reuse, recovery and/or recycling potentials (D), relevant scenario information

Name	Value	Unit
Collected separately waste type EM PSW250 swing door operator (including packaging)	14.71	kg
Recycling Aluminium	34,34	%
Recycling Brass	0.01	%
Recycling Steel	32,89	%
Recycling Stainless steel	1.92	%
Recycling Electronic and electro-mechanics	19,92	%
Reuse Plastic parts	0.92	%
Reuse Paper packaging (from A5)	8.97	%
Reuse Plastic packaging (from A5)	0.03	%
Loss Construction waste for landfilling (no recycling potential)	0.97	%

5. LCA: Results

Results shown below were calculated using CML 2001 – Apr. 2013 methodology.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARYS
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement[1)]	Refurbishment[1)]	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	MND	MND	MND	MND	X	MND	MND	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: One piece of EM PSW250

Parameter	Unit	A1-3	A4	A5	B6	C2	C3	C4	D
GWP	[kg CO_2-eq.]	1,58E+02	1.13E-01	1.88E+00	9.36E+02	1.39E-02	4.33E-01	7.46E-01	-5.61E+01
ODP	[kg CFC11-eq.]	1,57E-07	5.41E-13	8.58E-12	6.41E-07	6.67E-14	2.97E-10	2.42E-12	2.10E-08
AP	[kg SO_2-eq.]	9,56E-01	5.17E-04	4.28E-04	4.41E+00	6.38E-05	2.04E-03	4.30E-04	-3.43E-01
EP	[kg PO_4^{3-}-eq.]	6,48E-02	1.18E-04	7.46E-05	2.49E-01	1.46E-05	1.15E-04	7.23E-05	-1.67E-02
POCP	[kg ethene-eq.]	6,40E-02	-1.67E-04	3.03E-05	2.62E-01	-2.06E-05	1.21E-04	3.31E-05	-2.05E-02
ADPE	[kg Sb-eq.]	7,71E-03	4.26E-09	3.43E-08	1.30E-04	5.25E-10	6.00E-08	1.50E-07	-4.28E-03
ADPF	[MJ]	1,74E+03	1.56E+00	5.27E-01	1.06E+04	1.92E-01	4.92E+00	7.81E-01	-5.42E+02
Caption	GWP = Global warming potential; ODP = Ozone depletion potential; AP = Acidification potential; EP = Eutrophication potential; POCP = Photochemical ozone creation potential; ADPE = Abiotic depletion potential for non fossil resources; ADPF = Abiotic depletion potential for fossil resources								

RESULTS OF THE LCA - RESOURCE USE: One piece of EM PSW250

Parameter	Unit	A1-3	A4	A5	B6	C2	C3	C4	D
PERE	[MJ]	3,98E+02	-	-	-	-	-	-	-
PERM	[MJ]	0.00E+00	-	-	-	-	-	-	-
PERT	[MJ]	3,98E+02	6.15E-02	4.91E-02	3.04E+03	7.58E-03	1.41E+00	8.01E-02	-1.94E+02
PENRE	[MJ]	2,12E+03	-	-	-	-	-	-	-
PENRM	[MJ]	0.00E+00	-	-	-	-	-	-	-
PENRT	[MJ]	2,12E+03	2,12E+03	6.18E-01	1.67E+04	1.93E-01	7.71E+00	8.72E-01	-6.61E+02
SM	[kg]	4.36E+00	0.00E+00	0.00E+00	0.00E+00	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	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	0.00E+00
FW	[m^3]	1.23E+00	4.34E-05	5.46E-03	7.51E+00	5.35E-06	3.48E-03	1.75E-03	-5.43E-01
Caption	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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Use of net fresh water								

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: One piece of EM PSW250

Parameter	Unit	A1-3	A4	A5	B6	C2	C3	C4	D
HWD	[kg]	1,11E-01	3.57E-06	4.25E-05	2.31E+00	4.40E-07	1.07E-03	9.03E-05	-3.02E-03
NHWD	[kg]	1,99E+01	1.97E-04	4.77E-02	5.38E+00	2.43E-05	2.49E-03	1.99E+00	-8.10E+00
RWD	[kg]	1,54E-01	2.05E-06	3.60E-05	2.40E+00	2.53E-07	1.11E-03	3.64E-05	-4.71E-02
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-
MFR	[kg]	0.00E+00	0.00E+00	8.24E-01	0.00E+00	0.00E+00	1.04E+01	0.00E+00	-

MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-
EEE	[MJ]	0.00E+00	0.00E+00	2.38E+00	0.00E+00	0.00E+00	0.00E+00	6.55E-01	-
EET	[MJ]	0.00E+00	0.00E+00	6.72E+00	0.00E+00	0.00E+00	0.00E+00	1.80E+00	-
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy								

6. LCA: Interpretation

This chapter contains an interpretation of the Life Cycle Impact Assessment categories. Stated percentages in the whole interpretation are related to the overall life cycle, excluding credits (module D). Production phase (module A1-A3) contributes between 14 % and 20 % to total impact assessment, with exception for ADPE (98 %). Upstream emissions associated with steel- and aluminum making processes as well as from electronic and electro mechanic parts dominate this stage. The environmental impacts for the transport (A2) have a negligible impact within this stage.

To reflect the use phase (module B6), the energy consumption was included and, with exception of ADPE (2 %), it contributes between 79 % and 86 % for all the other impact categories considered.

In the end-of-life phase, there are loads and benefits (module D, negative values) considered (only ODP positive). The benefits are considered beyond the system boundaries and are declared for the recycling potential of the metals and for the credits from the incineration process (energy substitution).

7. Requisite evidence

Not applicable in this EPD.

8. References

Institut Bauen und Umwelt
Institut Bauen und Umwelt e.V., Berlin (pub.): Generation of Environmental Product Declarations (EPDs);

General principles
for the EPD range of Institut Bauen und Umwelt e.V. (IBU), 2018
www.bau-umwelt.de

IBU PCR Part A
IBU PCR Part A: Institut Bauen und Umwelt e.V., Berlin (pub.): Product Category Rules for Construction Products from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Background Report. April 2018
www.bau-umwelt.de

IBU PCR Part B
IBU PCR Part B: PCR Automatic doors, automatic gates, and revolving door systems (door systems) (PCR tested and approved by the independent expert committee)

2004/108/EC Electromagnetic Compatibility Directive (EMCD)
Relating to electromagnetic compatibility and repealing Directive 89/336/EEC

2006/42/EC Machinery Directive (MD)
Directive 2006/42/EC on machinery

DIN 18650-1
DIN 18650-1: 2005: Powered pedestrian doors - Part 1: Product requirements and test methods.

ISO 14025
EN ISO 14025:2011: Environmental labels and declarations - Type III environmental declarations - Principles and procedures

EN 15804
EN 15804:2012+A1:2014: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products

EN 16005
EN 16005:2012: Power operated pedestrian doorsets - Safety in use - Requirements and test methods.

EN 60335-1
EN 60335-1: 2012: Household and similar electrical appliances -Safety -Part 1: General requirements

EN 60335-2-103
EN 60335-2-103: 2003 Household and similar electrical appliances Safety Part 2-103: Particular requirements for drives for gates, doors and windows

EN 61000-6-2
EN 61000-6-2: 2005: Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments

EN 61000-6-3
EN 61000-6-3 : 2001 : Quality management systems - Requirements (EN ISO 9001:2015)

EN ISO 13849-1
EN ISO 13849-1:2008: Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design

GaBi 8 2018
GaBi 8 2018: Software-System and Database for Life Cycle Engineering. Copyright, TM. Stuttgart, thinkstep AG, Leinfelden-Echterdingen, 1992-2018.

GaBi database SP25:2016
GaBi 8 2018D: Documentation of GaBi 8: Software-System and Database for Life Cycle Engineering. Copyright, TM. Stuttgart, thinkstep AG, Leinfelden-Echterdingen, 1992-2018. http://documentation.gabi-software.com/

WEEE
Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE)

EWC
European Waste Catalog

9. Annex

Results shown below were calculated using TRACI Methodology.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARYS
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement[1)]	Refurbishment[1)]	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse- Recovery- Recycling- potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	MND	MND	MND	MND	X	MND	MND	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: One piece of EM PSW250 swing door operator

Parameter	Unit	A1-3	A4	A5	B6	C2	C3	C4	D
GWP	[kg CO_2-eq.]	1,58E+02	1.13E-01	1.88E+00	9.36E+02	1.39E-02	4.33E-01	7.46E-01	-5.61E+01
ODP	[kg CFC11-eq.]	1,67E-07	5.76E-13	9.12E-12	6.81E-07	7.10E-14	3.16E-10	2.57E-12	2.22E-08
AP	[kg SO_2-eq.]	9,37E-01	6.76E-04	5.19E-04	4.18E+00	8.34E-05	1.93E-03	5.12E-04	-3.22E-01
EP	[kg N-eq.]	4,43E-02	4.78E-05	2.98E-05	1.78E-01	5.89E-06	8.24E-05	3.77E-05	-8.46E-03
Smog	[kg O_3-eq.]	1,09E+01	1.39E-02	1.21E-02	3.78E+01	1.72E-03	1.75E-02	1.18E-02	-2.96E+00
Resources	[MJ]	1,37E+02	2.24E-01	6.18E-02	7.57E+02	2.77E-02	3.51E-01	8.64E-02	-4.04E+01
Caption	GWP = Global warming potential; ODP = Ozone depletion potential; AP = Acidification potential; EP = Eutrophication potential; Smog = Smog, air; Resources = Resources, fossil fuels								

RESULTS OF THE LCA - RESOURCE USE: One piece of EM PSW250 swing door operator

Parameter	Unit	A1-3	A4	A5	B6	C2	C3	C4	D
PERE	[MJ]	3,98E+02	-	-	-	-	-	-	-
PERM	[MJ]	0.00E+00	-	-	-	-	-	-	-
PERT	[MJ]	3,98E+02	6.15E-02	4.91E-02	3.04E+03	7.58E-03	1.41E+00	8.01E-02	-1.94E+02
PENRE	[MJ]	2,12E+03	-	-	-	-	-	-	-
PENRM	[MJ]	0.00E+00	-	-	-	-	-	-	-
PENRT	[MJ]	2,12E+03	1.57E+00	6.18E-01	1.67E+04	1.93E-01	7.71E+00	8.72E-01	-6.61E+02
SM	[kg]	4.36E+00	0.00E+00	0.00E+00	0.00E+00	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	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	0.00E+00
FW	[m^3]	1.23E+00	4.34E-05	5.46E-03	7.51E+00	5.35E-06	3.48E-03	1.75E-03	-5.43E-01
Caption	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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Use of net fresh water								

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: One piece of EM PSW250 swing door operator

Parameter	Unit	A1-3	A4	A5	B6	C2	C3	C4	D
HWD	[kg]	1,11E-01	3.57E-06	4.25E-05	2.31E+00	4.40E-07	1.07E-03	9.03E-05	-3.02E-03
NHWD	[kg]	1,99E+01	1.97E-04	4.77E-02	5.38E+00	2.43E-05	2.49E-03	1.99E+00	-8.10E+00
RWD	[kg]	1,54E-01	2.05E-06	3.60E-05	2.40E+00	2.53E-07	1.11E-03	3.64E-05	-4.71E-02
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-
MFR	[kg]	0.00E+00	0.00E+00	8.24E-01	0.00E+00	0.00E+00	1.04E+01	0.00E+00	-

MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-
EEE	[MJ]	0.00E+00	0.00E+00	2.38E+00	0.00E+00	0.00E+00	0.00E+00	6.55E-01	-
EET	[MJ]	0.00E+00	0.00E+00	6.72E+00	0.00E+00	0.00E+00	0.00E+00	1.80E+00	-
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy								

Publisher
Institut Bauen und Umwelt e.V.
Panoramastr. 1
10178 Berlin
Germany

Tel +49 (0)30 3087748- 0
Fax +49 (0)30 3087748- 29
Mail info@bau-umwelt.com
Web **www.bau-umwelt.com**

Programme holder
Institut Bauen und Umwelt e.V.
Panoramastr 1
10178 Berlin
Germany

Tel +49 (0)30 - 3087748- 0
Fax +49 (0)30 – 3087748 - 29
Mail info@bau-umwelt.com
Web **www.bau-umwelt.com**

Author of the Life Cycle Assessment
thinkstep AG
Hauptstraße 111-113
70771 Leinfelden-Echterdingen
Germany

Tel +49 711 34 18 17 0
Fax +49 711 34 18 17 25
Mail info@thinkstep.com
Web **www.thinkstep.com**

Owner of the Declaration
Entrematic Group AB
Lodjursgatan 10
SE-261 44 Landskrona
Sweden

Tel +46 10 47 47 000
Fax +46 418 284 12
Mail info.@entrematic.com
Web **www.entrematic.com**