ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

Owner of the Declaration ASSA ABLOY

Programme holder Institut Bauen und Umwelt e.V. (IBU)

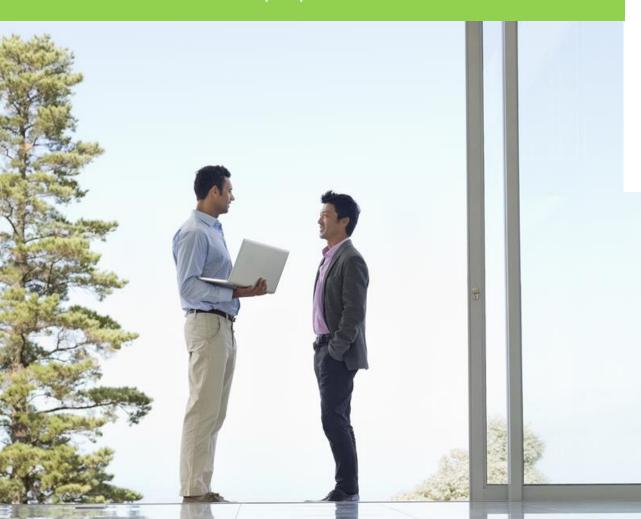
Publisher Institut Bauen und Umwelt e.V. (IBU)

Declaration number EPD-ASA-20150273-IAB1-EN

Issue date 29.09.2015 Valid to 28.09.2020

Access control systems – LCU9016III for the ARX system ASSA AB











1. General Information

ASSA AB

Programme holder

IBU - Institut Bauen und Umwelt e.V. Panoramastr. 1

10178 Berlin Germany

Declaration number

EPD-ASA-20150273-IAB1-EN

This Declaration is based on the Product Category Rules:

Electronic Access Control Systems, 11-2013 (PCR tested and approved by the independent expert committee (SVR))

Issue date

29.09.2015

Valid to

28.09.2020

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

Value 111

ARX LCU 9016III

Owner of the Declaration

ASSA AB

Förmansvägen 11

117 43 Stockholm

Sweden

Declared product / Declared unit

This Declaration represents controller unit LCU9016III S5590163164 that is a main system component in the ARX security system:

Scope:

The Life Cycle Assessment is based on data collected from the production facility. The LCU is assembled at the production facilities in Sweden and Malaysia. The primary manufacturing processes are made by external suppliers in Malaysia and the final manufacturing processes and assembly occur at the manufacturing factory in Pajala in Sweden. 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

x externally



2. Product

2.1 Product description

LCU9016III is a central unit for the ARX system that can be connected directly to existing TCP / IP network. The central unit can handle up to 16 door environments with up to 32 card readers, and also 16 up to 32 SIO units, depending on number of doors being used LCU9016III uses dynamic IP address: it communicates with the protocol SSL / TLS and switches automatically to the customer's unique encryption keys associated with the installation. LCU9016III has an enclosure that can be easily fitted with ARX alarm components, such as master and slave cards, which creates conditions for building an alarm system in the ARX. LCU9016III with attached master card 9016III MIO, can directly manage six alarm zones and control sounders. When 9016III MIO is supplemented with alarm interface (LIF01) can alarms be sent to alarm transmitters.

To increase the number of alarm zones and alarm areas more alarm units and add-on cards can be connected to the alarm system on the unique AES 128-bit encrypted bus (ASSA-SIO bus).

LCU can handle over 100,000 cards and practically unlimited number of schedules, calendars, day types etc. More than 30,000 log events can be saved locally before they need to be transferred to the ARX server. LCU9016III also has a separate event log file for alarm related events.

The LCU works autonomously, that is, it works even if the network is down or the server is not running. The software is stored in flash memory and can be updated from the server ARX.

2.2 Application

LCU 9016III is a controller that can be used for both access control and intrusion alarm. In principle the controller handles access control and with the 9016MIO add-on card the controller also work as an alarm central unit. The product is suitable for all kind of customers/segments and gives the possibility to build a security system with both access control and intrusion, with the same hardware and software in conjunction.



2.3 Technical Data

The product has the following technical properties:

Technical data

Name	Value	Unit
Power supply	17-40 VDC	V
Current Requirements	50	mA
Operating Temperature	+5 to 65	°C
Operating Humidity	20% to 70%	%
Weight	3	kg
Memory size program	16	MB
Memory size data	16	MB

2.4 Placing on the market / Application rules

The LCU9016III is suitable as a part of ARX security system on almost all segments on the market and for both small/medium-sized systems and for larger advanced global system.

The LCU9016III is a central unit and fulfills the environmental class II, defined in standard EN 50131-1, which means that installation demands for this product is in-house with temperature above + 5 Celsius. LCU9016III is certified for security grade 4 (for intrusion) and meets the requirements in the standard for access control system IEC 60839-11-1.

For the placing on the market of the products in the EU/EFTA (with the exception of Switzerland) the following harmonization legislation of the European Union applies:

- Directive 2004/108/EC of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC (EMC directive)
- Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS directive).

The products are subject to CE marking according to the relevant harmonization legislation.

- a) EMC directive: Affixing the CE marking to the products means the compliance of products with the EMC directive.
- b) RoHS directive: Affixing the CE marking to the products means the compliance of the products with the RoHS directive.

The following standards apply:

EMC:

- EN 61000-6-3:2006+A1:2010: Electromagnetic compatibility (EMC) - Part 6-3: Generic standards -Emission standard for residential, commercial and light-industrial environments (IEC 61000-6-3:2006 + A1:2010)
- EN 61000-6-2:2005: Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments (IEC 61000-6-2:2005)

RoHS:

 EN 50581:2012: Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

2.5 Delivery status

Each LCU unit is individually packaged and delivered with mounting hardware. Packaged LCU dimensions: 8.5cm x 50cm x 21.5cm.

2.6 Base materials / Ancillary materials

The composition of the LCU in percentages (%) of total mass per unit is as follows:

Component	Percentage in mass (%)
Brass	0.09
Plastics	73.1
Steel	0.04
Electronic	25.87
Electro-mechanics	0.9
Total	100.0

Packaging components incurred during installation are directed to energy recovery systems:

EWC 15 01 01 Paper and cardboard packaging.

2.7 Manufacture

The LCU is assembled at the production facility in Pajala in Sweden. The parts are purchased from external suppliers in Malaysia. The final assembly take place in Pajala in Sweden. During assembly the individual parts are put together. The assembled LCU is then pack for shipment.

2.8 Environment and health during manufacturing

ASSA AB is committed to producing and distributing door opening solutions, where health & safety and environment are 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 the effectiveness of the environmental management program is evaluated.
- Code of Conduct covers human rights, labor practices and decent work. The management of ASSA AB is aware of their roles and responsibilities, providing appropriate training, supporting accountability and recognizing outstanding performance.
- The factory of Mikromakarna AB has certification of Environmental Management to ISO 14001:2004 standard.

2.9 Product processing/Installation

The Controller units LCU9016III with additional add-on cards 9016MIO, LIF01, 9016SLIO, loopcard 4014LC are installed by trained product installers / integrators. Installation instructions are included with each LCU and add-on card units.

2.10 Packaging

The LCU is packed in a cardboard box. Also included in the packaging are paper installation instructions



Packaging materials shall be collected separately for recycling.

Material	Percentage in mass (%)
Cardboard/paper	100.0
Total	100.0

2.11 Condition of use

No auxiliary or consumable materials are incurred for maintenance and usage of the LCU. Repairs or replacement are not usually necessary. No cleaning efforts need to be taken into consideration.

2.12 Environment and health during use

There are no interactions between products, the environment and health.

2.13 Reference service life

The service life of the LCU is estimated to be 15 years.

2.14 Extraordinary effects

Water

No substances are used which have a negative impact on ecological water quality on contact by the device with water.

Mechanical destruction

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

2.15 Re-use stage

The following possibilities arise with reference to the material composition of the LCU.

Re-use

During the reference service life the LCU can be disconnected and dismounted then remounted and attached elsewhere.

Material Recycling

All materials are directed to recycling / energy recovery system:

- EWC 16 02 14 Discarded equipment other than those mentioned in 16 02 09 to 16 02 13
- EWC 16 02 16 Components removed from discarded equipment other than those mentioned in 16 02 15.

EU Recycling: ASSA distributors act as the importer of the equipment into their member state. Thus the distributor has the legal responsibility to:

- Register as the WEEE producer in their member state.
- Finance arrangements for collection and recycling of WEEE arising from ASSA products that the distributor sells in their member state.
- In this instance, please contact your distributor for recycling information.

2.16 Disposal

No disposal is foreseen for the product nor for the corresponding packaging.

2.17 Further information

More information on ASSA AB the LCU9016 is available by:

ASSA AB Förmansvägen 11 117 43 Stockholm Sweden

Internet: www.assa.se

3. LCA: Calculation rules

3.1 Declared Unit

The declaration refers to the functional unit of 1 piece of control unit LCU9016III as specified in Part B requirements on the EPD for Electronic Access Control Systems /IBU Product Category Rules (PCR) Part B/.

Declared unit

Name	Value	Unit
Declared unit	1	piece of LCU9016
Conversion factor to 1 kg	0.512	-

3.2 System boundary

Type of the EPD: cradle to gate - with options The following life cycle stages were considered:

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 lock operation)

End-of-life stage:

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

These information modules include provision and transport of all materials, products, as well as energy and water provisions, waste processing up to the end-of-waste state or disposal of final residues.

Module D:

 Declaration of all benefits or recycling potential from EoL and A5

3.3 Estimates and assumptions

Use stage:

For the use stage, it is assumed that the lock is used in the European Union, thus an European electricity grid mix is considered within this stage.



EoL:

In the End-of-Life stage, 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 6 Software System for Life Cycle Engineering, developed by thinkstep AG, is used /GaBi 6 2013/. The GaBi-database contains consistent and documented datasets which are documented in the online

GaBi-documentation /GaBi 6 2013D/.

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 AG 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 6 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 2012/13 (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. Following specific life cycle inventories for the WIP are considered:

- Waste incineration of plastic
- Waste incineration of paper
- Thermal treatment of plastic parts
- Waste incineration of electronic scraps (PWB)

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

The following technical information is a basis for the declared modules or can be used for developing specific scenarios in the context of a building assessment if modules are not declared (MND).

Installation into the building (A5)

Name	Value	Unit
Output substances following waste treatment on site: paper packaging	0.026	kg

Reference service life

Name	Value	Unit			
Reference service life	15	а			

Operational energy use (B6)

operational energy acc (Bc)		
Name	Value	Unit
Electricity consumption	1024.92	kWh
Years of use	15	а
Days per year in use	365	d
Hours per day in on mode	24	h
Hours per day in stand-by mode	-	h
Power consumption on mode	0.0078	kW

Power consumption stand-by mode	-	kW

End of life (C2-C4)

Name	Value	Unit
Collected separately Aluminum, Plastic Parts, Stainless Steel, Steel, Zinc, Electronic and Electro Mechanic Parts	1.9517	kg
Collected as mixed construction waste construction waste for landfilling	0.00	kg
Recycling Aluminum	0.00	kg
Incineration of plastic parts	1.4217	kg
Recycling stainless steel	0.0074	kg
Recycling steel	0.00078	kg
Recycling brass	0.0018	kg
Recycling metals from electronic	0.503	kg
Recycling metals from electro mechanic	0.017	kg
Construction waste for landfill	0.00	kg



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

Colorant Coomano milorination		
Name	Value	Unit
Collected separately waste Card reader (including packaging)	1.97	kg
Recycling brass	0.09	%
Reuse plastic parts	72.16	%
Recycling Steel	0.04	%
Recycling/Reuse Electronic	25.53	%
Recycling/Reuse Electro mechanics	0.86	%
Reuse Paper packaging (from module A5)	1.32	%



5. LCA: Results

Results shown below were calculated using CML 2000 – Apr. 2013 Methodology.

DESC	RIP	RIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT										TO	DECL/	ARED)						
			CONST	RUCTI											BENE L					
PROD	UCT	STAGE	ON PR	OCESS AGE		USE STAGE													LOADS YOND THE SYSTEM UNDARYS	
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance		Repair	Replacement ¹⁾	Refurbishment ¹⁾	Operational energy	Operational water	use De-construction	demolition	Transport	Waste processing		Disposal Reuse-	Recovery- Recycling- potential	
A1	A2	А3	A4	A5	B1	B2	I	В3	B4	B5	В6	В	7 (C1	C2	С3	С	:4	D	
Х	Χ	Х	Х	Х	MND	MNE	M	IND N	MND	MND	Х	MN	ID M	ND	Χ	Х	>	X	X	
RESU	LTS	OF TH	IE LCA	4 - EN\	/IRON	IMEN	TAI	L IMP	ACT:	One	piec	e of C	Contro	ol ur	nit LC	U901	6III			
Paramet	ter	Pa	rameter	•	U	Init	Α	\1 - A3	Α	4	A5		B6	(C2	C3		C4	D	
GWP		Global wa	• • •		[kg C	O ₂ -Eq.]	7.7	72E+01	6.691	E-01 :	3.68E-0	02 4.8	37E+02	3.62	2E-01	3.44E-0	02 3	.63E+00	-1.45E+01	
ODP		Depletion stratospho			[kg CF	C11-Ec	J.] 9.3	38E-09	2.42	-12	1.68E-	13 3.3	3E-07	1.34	‡E-12	2.35E-	11 1	.09E-11	-9.95E-10	
AP	P	Acidification ar	n potentia nd water	al of land	[kg S	O ₂ -Eq.]	4.6	66E-01	1.911	E-02	8.40E-(06 2.3	0E+00	9.76	SE-03	1.62E-0	04 9	9.43E-04	-1.49E-01	
EP		Eutrophic			[kg (PC	O₄) ³ - Ec	ı.] 3.7	73E-02	1.96	E-03	1.47E-(06 1.2	29E-01	1.01	IE-03	9.12E-0	06 7	7.76E-05	-8.85E-03	
POCP		mation pot zone photo			kg Eth	nen Eq.] 3.′	15E-02	1.05	-03	5.96E-0	07 1.3	36E-01	4.96	SE-04	9.63E-0	06 4	1.68E-05	-7.85E-03	
ADPE	. A	biotic depl	letion pot ssil resou		[kg S	Sb Eq.]	7.5	55E-03	1.77	E-08	6.65E-′	10 6.7	74E-05	9.82	2E-09	4.76E-0	09 2	2.59E-07	-1.01E-02	
ADPF	. A	biotic dep	letion pot	ential for	[N	VJ]	9.9	98E+02	8.27	+00	1.03E-0	02 5.5	3E+03	E+03 4.50		3.90E-0	01 1	.57E+00	-1.56E+02	
RESU	LTS			resources			OURCE USE: One piece of Control unit L						41.01	1004	CIII					
		01 111	Parameter			CE U	SE:	One	ріес	e of C	contro	ol uni	t LUL	1901	бШ					
Paramet					OUK	CE U		Init One	A1 - A		A4	A5		36	C2	(C3	C4	D	
Paramet PERE	ter	Renewabl	Para e primar	meter			U	Jnit		3			E			(C3 -	C4 -	D -	
	ter F	Renewable	Para e primar cai primary	meter y energy rrier energy r	as enei	rgy	U [N	Jnit MJ]	A1 - A	01			E	36		(C3 -	C4 -	D .	
PERE	ter	Renewable	Para e primar car primary material of renewa	meter y energy rrier energy re utilization able prim	as enei esource	rgy es as	U [/\ /I]	Unit MJ] MJ]	A1 - A 5.75E+ 0.00E+	01 00	A4 - -	A5 -	E	36 - -	C2 -		-	-	D	
PERE	ter Re	Renewabl enewable I	Para e primar cal primary material of renewa reso able prim	y energy rrier energy rutilization able primurces ary energ	as ener esource n ary ene	rgy es as ergy	U [N] [N]	Unit MJ] MJ] MJ]	A1 - A 5.75E+ 0.00E+	01 00 01 3.9	A4 - -	A5 -	E	36 - -	C2 -		-	-	-	
PERE PERM PERT	ter Re No	Renewable enewable fotal use of the renewa	Para e primar cal primary material of renews reso able prim cal ewable p	meter y energy rrier energy re utilization able prim urces	as eneresource ary energy as en	rgy es as ergy energy	(N) (N) (N)	Jnit MJ] MJ] MJ] MJ]	A1 - A 5.75E+ 0.00E+ 5.75E+	3 01 00 01 3.9	A4 - -	A5 -	E	36 - -	C2 -		-	-	-	
PERM PERT PENRE	ter Re No	Renewable I fotal use of the renewable on renewable on renewable on renewable on renewable of the renewable	Para e primary car primary material of renews reso ble prim car ewable p material e of non i	y energy rrier energy r utilization able prim urces ary energ rrier orimary e utilization renewabl	as ener esource a ary energy as en nergy as neergy as	rgy es as ergy nergy	(N)	Unit Au] Au] Au] Au] Au] Au]	A1 - A 5.75E+ 0.00E+ 5.75E+ 1.12E+ 0.00E+	3 01 00 01 3.9 03	- - 4E-02	- - 9.62E-0	04 1.58	36 - - E+03 -	- - 3.26E- -	-02 1.12	- - 2E-01 -	- 1.19E-01 -	-	
PERE PERE PENRE PENRE	ter Re No	Renewable I ortal use of the control	Para e primary car primary material of renew reso ble prim car ewable p material e of non renergy r	y energy rrier energy re utilization able prim urces ary energerier orimary e utilization	as energy as ene	rgy es as ergy nergy	U [N] [N] [N]	Unit AU] AU] AUJ AUJ AUJ AUJ AUJ AUJ	A1 - A 5.75E+ 0.00E+ 5.75E+ 1.12E+ 0.00E+ 1.12E+	3 01 00 01 3.9 03 00 03 8.30	A4	- - 9.62E-0 - -	04 1.58 02 8.66	E+03	3.26E- - - 4.52E-	-02 1.12	- - 2E-01 - -	- 1.19E-01 - - 1.75E+00	- - 1 -7.38E+00 -	
PERE PERM PENRE PENRE	ter Re No	Renewable Infotal use of the second renewable Non renewa Non renewa Total use	Paral e primary car primary material of renews reso able prim car ewable primaterial e of non interprimaterial e of secon	y energy rrier energy r utilization able prim urces ary energ rrier orimary e utilization renewable	as eneres as energy as ene	es as ergy nergy s	(N)	Unit Unit	A1 - A 5.75E+ 0.00E+ 5.75E+ 1.12E+ 0.00E+ 1.12E+ 9.35E-	3 01 00 01 3.9 03 00 03 8.30 0.00	A4	A5 - 9.62E-0 1.21E-0	04 1.58 02 8.66 00 0.00	E+03 E+03 E+03	3.26E- - - 4.52E+ 0.00E+	-02 1.12 -00 6.11 -00 6.00	- - 2E-01 - - E-01	1.19E-01 1.75E+0(0.00E+0(- - 1-7.38E+00 - - 0-1.67E+02	
PERE PENRE PENRE PENRE SM	ter Re No	Renewable Infotal use of the second renewable Non renewa Non renewa Total use	Para e primar cal primary material of renews reso ible prim cal ewable p material of of non renergy r of secor	y energy rrier energy rutilization able prim urces ary energy rrier orimary e utilization renewabl esources adary ma	as eneressource of a series of as energy as energy as energy as energy as the eprima of a series of a	rgy es as ergy nergy s ry	(N)	Unit Unit	A1 - A 5.75E+ 0.00E+ 5.75E+ 1.12E+ 0.00E+ 1.12E+ 9.35E- 0.00E+	3 01 00 01 3.9 03 00 00 00 0.00 00 0.00	A4 4E-02: 0E+00 0E+00	A5 - 9.62E-0 1.21E-0 0.00E+0	04 1.58 02 8.66 00 0.00	E+03 - E+03 - E+00 E+00	3.26E- - - 4.52E+ 0.00E-	+00 6.11 +00 0.00 +00 0.00	- - 2E-01 - - E-01 9E+00	- 1.19E-01 - - 1.75E+00 0.00E+00		
PERE PERM PENT PENRM PENRM PENRM RSF	ter Re No	Renewable Incomplete the control of	Para e primary cal primary material of renews reso able prim cal ewable p material e of non r energy r of secor enewable	y energy rrier energy rutilization able prim urces ary energy rrier orimary e utilization renewabl esources adary ma	as energy as energy as energy as energy as terial ary fuels	rgy es as ergy nergy s ry	UU IMMI MMI MMI MMI MMI MMI MMI MMI MMI	Unit UI UI UI UI UI UI UI UI UI U	A1 - A 5.75E+ 0.00E+ 5.75E+ 1.12E+ 0.00E+ 1.12E+ 9.35E- 0.00E+	3 01 00 01 3.9 03 8.30 0.00 0.00 0.00 0.00 0.00 0.00 0	A4	A5 9.62E-0 1.21E-0 0.00E+0	04 1.58 02 8.66 00 0.00 00 0.00	E+03 E+03 E+00 E+00 E+00	3.26E- - - 4.52E- 0.00E- 0.00E-	-02 1.12 -00 6.11 -00 0.00 -00 0.00 -00 0.00	E-01 E+00 E+00 E+00	1.19E-01 - 1.75E+00 0.00E+00 0.00E+00	- 1-7.38E+00 - - 0-1.67E+02 0.00E+00	
PERE PERM PENRE PENRE PENRE SM RSF NRSF FW	ter F F F F F F F F F F F F F F F F F F F	Renewable Provide the control of the	Para e primar car primary material of renewa reso able prim car ewable p material e of non r energy r of secor enewable n renewa	y energy rrier energy re utilization renewabl esources adary ma e second fresh wa	as energy as energy as energy as terial ary fuels ary fuels	rrgy ss as rrgy sergy sergy sry ss		Unit VU] VU] VU] VU] VU] VU] VU] VU	A1 - A 5.75E+ 0.00E+ 5.75E+ 1.12E+ 0.00E+ 1.12E+ 9.35E- 0.00E+ 0.00E+ 3.74E-	3 01 00 01 3.9 03 8.30 00 00 0.00 0.00 0.00 0.00 0.00	A4	A5 9.62E-C 1.21E-C 0.00E+(0.00E+(1.07E-C	04 1.58 02 8.66 00 0.00 00 0.00 00 0.00 04 3.91	E+03 E+03 E+00 E+00 E+00 E+00	- 3.26E- - - 4.52E- 0.00E- 0.00E- 4.15E-	+00 6.11 +00 0.00 +00 0.00 +00 0.00		1.19E-01 - 1.75E+0(0.00E+0(0.00E+0(0.00E+0(9.09E-03		
PERE PERM PENRE PENRE PENRE SM RSF NRSF		Renewable Provide the control of the	Para e primary cal primary material of renews reso able prim cal ewable p material e of non n energy r of secor enewable n renewa se of net	y energy rrier energy re utilization renewabl esources adary ma e second fresh wa	as energy as energy as energy as terial ary fuels ary fuels	s as		Unit UI UI UI UI UI UI UI UI UI U	A1-A-A-A-A-A-A-A-A-A-A-A-A-A-A-A-A-A-A-	3 01 00 01 3.9 03 8.30 00 00 0.00 0.00 0.00 0.00 0.00	A4		04 1.58 02 8.66 00 0.00 00 0.00 00 0.00 04 3.91	E+03 E+03 E+00 E+00 E+00 E+00	- 3.26E- - - 4.52E- 0.00E- 0.00E- 4.15E-	+00 6.11 +00 0.00 +00 0.00 +00 0.00	- - - - - - E-01 E+00 E+00 E+00	1.19E-01 - 1.75E+0(0.00E+0(0.00E+0(0.00E+0(9.09E-03		
PERE PERM PENRE PENRE PENRE PENRE SM RSF NRSF FW RESU LCU9		Renewable enewable liotal use of on renewa Non rene I Total use Use Use of re Use of non Use OF TH	Para e primary cat primary material f renews reso soluble primary material e wable p material e of non n energy r of secor enewable n renewa se of net	y energy rrier energy rutilization able primurces ary energy rrier orimary e utilization renewabl esources adary ma e second bble seco fresh wa	as energy as energy as energy as terial ary fuels and ary fuels TPUT	es as sas as a	U [N	Unit UI UI UI UI UI UI UI UI UI U	A1 - A 5.75E+ 0.00E+ 5.75E+ 1.12E+ 0.00E+ 11.12E+ 9.35E- 0.00E+ 3.74E- WAS	3 01 00 00 00 3.9 00 00 00 0.00 00 0.00 0.00	A4	A5 9.62E-0 1.21E-0 0.00E+0 0.00E+0 1.07E-0	04 1.58 02 8.66 00 0.00 00 0.00 00 0.00 04 3.91 ES: C	E+03 E+03 E+00 E+00 E+00 E+00 E+00	3.26E- - - 4.52E- 0.00E- 0.00E- 4.15E- Diece	+00 6.11 +00 0.00 +00 0.00 -00 2.76 of Co		- 1.19E-01 - 1.75E+00 0.00E+00 0.00E+00 0.00E+00 9.09E-03		
PERE PERM PENRE PENRE PENRE PENRE SM RSF NRSF FW RESU LCU9	T No	Renewable Interpretation of the control of the cont	Para e primar cal primary material of renews reso able prim cal e wable p material e of non n energy r of secon enewable renewable to from n energy r of secon	y energy renergy renergy renergy rutilization able primurces arry energy ririer orimary e utilization renewable esources adary ma e second ble second fresh wa ameter	as energy as energy as energy as energy as terial ary fuels ary fuels truther	s as	IN I		A1 - A A1 - A	3	A4	A5 9.62E-C - 1.21E-C 0.00E+C 0.00E+C 0.00E+C 0.00E+C 0.00E+C 1.07E-C	04 1.58 02 8.66 00 0.00 00 0.00 00 0.00 04 3.91 ES: C	E+03 E+03 E+00 E+00 E+00 E+00 E+00 E+00	3.26E 3.26E 4.52E- 0.00E- 0.00E- 4.15E- Diece	-02 1.12 -00 6.11 -00 0.00 -00 0.00 -00 2.76 of Co		1.19E-01 - 1.75E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00		
PERE PERM PENRE PENRE PENRE PENRE SM RSF NRSF FW RESU LCU9 Parame HWI	T NC	Renewable Protal use of the second renewal lenewable Non renewal lenewable Use Use of reluction lenewable Use of non Use Use of non Use Non h	Para e primary cal primary material of renews reso able primary material e of non renergy r of secon energy r of secon enewable a renewa se of net IE LCA Para eardous a gardous	y energy rier energy rutilization able prim urces ary energy rier enewable esources adary ma e second able second fresh waste dis	as energy as energy as energy as energy as terial ary fuels are fu	rrgy s as rrgy nergy s s rry FLO	IN I	Init	A1 - A A1	3	A4	A5 9.62E-0 1.21E-0 0.00E+0 0.00E+0 1.07E-0 GORII	04 1.58 02 8.66 00 0.00 00 0.00 04 3.91 ES: C	E+03 E+03 E+03 E+00 E+00 E+00 E+00 5.88	3.26E- - - 4.52E- 0.00E- 0.00E- 4.15E- Diece	-02 1.12 -00 6.11 -00 0.00 -00 0.00 -00 0.00 -05 2.76 C3 8.47E-		1.19E-01 - 1.75E+00 0.00E+00 0.00E+00 0.00E+00 9.09E-03 Dl unit C4 1.30E-04		
PERE PERM PENRE PENRE PENRE SM RSF NRSF FW RESU LCU9 Parame HWE NHW	R	Renewable enewable I ortal use of on renewa Non rene I Total use Use Use of re Use of non Use I Haz Non h	Para e primary cat primary material of renews reso able primary material e wable p material e of non r energy r of secor enewable n renewa se of net le LCA Para cardous v azardous ioactive	y energy rier energy rutilization able primurces ary energy rier or rier or imary e utilization renewable esources adary ma e second ble second fresh wa ameter waste dis s waste o	as energy as energy as energy as terial ary fuels ary fuels ary fuels ter ary fuels are fuel ary fuels are fuel	ss as ss as sregy energy energ	IN I	Mu]	A1 - A A1	3	A4	A5 9.62E-0 1.21E-0 0.00E+0 0.00E+0 1.07E-0 GORII 507 104 207 1.	04 1.58 02 8.66 00 0.00 00 0.00 00 0.00 04 3.91 ES: 0 B6 .20E+0	E+03 E+03 E+03 E+00 E+00 E+00 E+00 5.6 5.6		-02 1.12 -02 1.12 -00 6.11 -00 0.00 -00 0.00 -00 2.76 C3 8.47E- 1.97E- 8.81E-	E-01 E-01 E+00 E+00 E+00 E-04 C-05 C-04 C-05 C-06 C-07 C-07 C-07 C-07 C-07 C-07 C-07 C-07	1.19E-01 - 1.75E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 1.30E-04 1.30E-04 3.48E-01 7.15E-05		
PERE PERM PENRE PENRE PENRE PENRE SM RSF NRSF FW RESU LCU9 Parame HWI NHWI RWI	T Note that I have the second of the second	Renewable Interpretation of the control of the cont	Para e primar cal primary material of renews reso able prim cal e wable p material e of non n energy r of secon enewable renewable a renewa se of net lE LCA Para cardous v azardous ioactive omponei	y energy rier energy rutilization able primurces arry energy rier orimary e utilization renewable esources adary ma e second bble second resh wa ameter waste dis s waste dis waste dis	as energy as energy as energy as energy as terial ary fuels ary fuels posed disposed sposed -use	s as	IN I	MJ M	A1-A 5.75E+ 0.00E+ 5.75E+ 1.12E+ 0.00E+ 1.12E+ 0.00E+ 3.74E- WAS 3 1 1.000 1.1	3	A4	A5 9.62E-C - 1.21E-C 0.00E+C 0.00E+C 1.07E-C GORII 507 104 207 1.	04 1.58 02 8.66 00 0.00 00 0.00 04 3.91 ES: C B6 .20E+0 .80E+0 .25E+0	E+03 E+03 E+00 E+00 E+00 E+00 5.8 0 5.8 0 9.5	3.26E- 3.26E- 4.52E- 0.00E- 0.00E- 4.15E- 0.00E- 33E-06 69E-05 60E-06	-02 1.12 -00 6.11 -00 0.00 -00 0.00 -00 0.00 -00 2.76 C3 8.47E- 1.97E- 8.81E- 0.00E-	E-01 E-01 E+00 E+00 E-04 05 0-04 05 005 005 005 005 005 005 005 005 00	1.19E-01 1.75E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+01 1.30E-04 3.48E-01 7.15E-05 0.00E+00		
PERE PERM PENRE PENRE PENRE PENRE SM RSF NRSF FW RESU LCU9 Parame HWE NHWE RWE MFF	R	Renewable enewable I otal use of on renewa Non rene I Total use Use Use of ro Use S OF TH II Haz Non h Rad Co M Mate	Para e primary cat primary material of renews reso able primary material e of non renergy r of secor enewable n renewa se of net le LCA Para cardous v azardou dioactive omponee Materials of rone	y energy renergy river energy rutilization able primurces arriver orimary e utilization renewable esources adary ma e second ble second fresh was a waste dis s waste of waste dis not for recyclenergy renergy renerg	as energy as energy as energy as terial ary fuels ary fuels posed disposed sposed sposed ecovery	es as sas as a	IN I	MJ M	A1 - A A1	3 01 00 01 3.9 03 0.0 00 0.0 0	A4	A5 9.62E-C 1.21E-C 0.00E+C 0.00E+C 1.07E-C GORII 504 204 207 104 207 002 002 0.	D2 8.66 00 0.00 00 0.00 00 0.00 04 3.91 ES: 0 80E+0 .25E+0 .00E+0 .00E+0	E+03 E+03 E+03 E+00 E+00 E+00 E+00 5.8 0 0.0 0 0.0 0 0.0	C2 3.26E- 3.26E- 4.52E+ 0.00E+ 0.00E+ 0.00E+ 4.15E- 0.0E- 0.0E-00	-02 1.12 -02 1.12 -00 6.11 -00 0.00 -00 0.00 -00 0.00 -01 2.76 C3 8.47E- 1.97E- 8.81E- 0.00E- 9.99E- 0.00E-	E-01 E-01 E-00 E+00 E+00 E-04 C-05 C-04 C-05 C-03 C-06 C-03 C-06 C-07 C-07 C-08 C-09 C-09 C-09 C-09 C-09 C-09 C-09 C-09	- 1.19E-01 - 1.75E+0(0.00E+0(
PERE PERM PENRE PENRE PENRE PENRE SM RSF NRSF FW RESU LCU9 Parame HWI NHW RWI CRU	Record R	Renewable enewable en	Para e primary cal primary material of renews reso soluble primary material e wable p material e of non renewable n renewable renergy r of secor enewable rardous v mazardou ioactive ompone Materials orited el	y energy rrier energy rutilization able primurces ary energy rrier primary e utilization renewable esources adary ma e second ble second fresh waste dis s waste dis s waste dis nts for referency of the recycle.	as energy	s as	IN I	MJ M	A1 - A A1	3 01 00 00 00 00 00 00 00 00 00 00 00 00	A4	A5	04 1.58 02 8.66 00 0.00 00 0.00 00 0.00 04 3.91 ES: C B6 .20E+0 .25E+0 .00E+0	E+03 E+03 E+03 E+00 E+00 E+00 C+00 C+00	C2 3.26E 4.52E- 0.00E- 0.00E- 0.00E- 4.15E- 0.0E- 0	-02 1.12 -00 6.11 -00 0.00 -00	E+00 E+00 E+00 E+00 E+00 E+00 E+00 E+00	- 1.19E-01 - 1.75E+00 0.00E+00 0.00E+00 0.00E+01 9.09E-03 01 unit C4 1.30E-04 3.48E-01 7.15E-05 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00		



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).

The production phase (modules A1-A3) contributes between 2% and 22% to the overall results for all the environmental impact assessment categories hereby considered, except for the abiotic depletion potential (ADPE), for which the contribution from the production phase accounts for app. 99% - this impact category describes the reduction of the global amount of non-renewable raw materials, therefore, as expected, it is mainly related with the extraction of raw materials (A1).

Within the production phase, the main contribution for all the impact categories is the production of plastic and electronic parts mainly due to the energy consumption on this process. Plastic accounts with app. 73% and electronics with app. 26% to the overall mass of the product. Plastic production contributes between 0.2% (Abiotic depletion potential for non-fossil

resources) and 13.7% (Abiotic depletion potential for fossil resources) to the impact categories. Electronic parts contribute between 68 % (POCP) and 94 % (ODP). 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 it has a major contribution for all the impact assessment categories considered - between 75% and 99%, with the exception of ADPE (0.8%). This is a result of 24 hours of operation in on mode per day and per 365 days in a year.

In the end-of-life phase, there are loads and benefits (module D, negative values) considered. 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), 2013-04 www.bau-umwelt.de

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 2013 www.bau-umwelt.de

PCR Part B

IBU PCR Part B: PCR Guidance-Texts for Building-Related Products and Services. From the range of Environmental Product Declarations of Institute Construction and Environment e.V. (IBU). Part B: Requirements on the EPD for Electronic Access Control Systems. www.bau-umwelt.com

IEC 60839-11-1

Meets the requirements in the Access control system standard IEC 60839-11-1.

ISO 9001:1994

Quality systems – Model for quality assurance in design, development, production, installation and servicing

ISO 14001:1999

Environmental Management System Certificate

ISO 14025

DIN EN ISO 14025:2011-10: 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

GaBi 6 2013

GaBi 6 2013: Software-System and Database for Life Cycle Engineering. Copyright, TM. Stuttgart, thinkstep AG, Leinfelden-Echterdingen, 1992-2013.

GaBi 6 2013D

GaBi 6 2013D: Documentation of GaBi 6: Software-System and Database for Life Cycle Engineering. Copyright, TM. Stuttgart, thinkstep AG, Leinfelden-Echterdingen, 1992-2013. http://documentation.gabi-software.com/

EMC directive

EMC directive (2004/108/EC) immunity to, and emission of electromagnetic disturbance.

EN 50131-3

EN 50131-3:2009, central unit, Intrusion system, security grade 4, environmental class II



EN 50130

EN 50130-5:2011: Environmental resistance fire, intruder, hold up, CCTV, access control and social alarm systems

EN 50130-4

EN 50130-4:2011+ A1:2014: Alarm systems - Part 4: Electromagnetic compatibility - Product family standard: Immunity requirements for components of fire, intruder, hold up, CCTV, access control and social alarm systems

EN61000-6-2

EN61000-6-2:2005: Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments (IEC 61000-6-2:2005

EN 61000-6-3

EN 61000-6-3:2007, A1:2011: Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments

EN 55022

EN 55022: Electromagnetic compatibility, Class B

IEC 60839-11-1

IEC 60839-11-1: Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware

EN 50581

EN 50581:2012: Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

RoHS directive

Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment Text with EEA relevance



9. Annex

Results shown below were calculated using TRACI Methodology.

DESC	RIP	TION O	F THE	SYST	ГЕМ ВС	DUNI	DARY	(X =	INCL	UD	ED II	N LC	CA: I	MND	= MO	DU	LE N	ОΤ	DECL	ARED)				
PROE	DUCT	STAGE	CONST ON PRO	RUCTI		USE STAGE							END OF LIFE STAGE					BEN BE	EFITS AND LOADS YOND THE SYSTEM UNDARYS					
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair		Replacement ¹⁾		Replacement ¹⁾		Replacement ¹⁾		Operational energy	Operational water	Operational water	De-construction	Transport		Waste processing	Disposal	Reuse-	Recovery- Recycling- potential
A1	A2	А3	A4	A5	B1	B2	В3	В	4 E	35	В6	ı	B7	C1	C2		C3	C4	4	D				
Х	Χ	Х	Х	Χ	MND	MND	MND	MN	ID M	ND	Х	M	IND	MNE) X		Χ	Х		Χ				
RESU	ILTS	OF TH	IE LCA	4 - EN	VIRON	MEN	TAL II	/IPA	CT: C	ne	piec	e of	Cor	ntrol	unit L	CU	9016	Ш						
Paran	neter	Pa	aramete	r	Unit		A1-3		A4		A5		В6		C2		C3	C	C4	D				
GV	/P		arming p		[kg CO ₂ -		7.72E+0	1 6.6	9E-01	3.6	8E-02	4.87	7E+02	2 3.6	2E-01	3.44	1E-02	3.63	8E+00	-1.45E+01				
OE	P	stratosph	n potentia neric ozor	ne layer	[kg CFC Eq.]	11- ,	1.02E-08	2.5	7E-12	1.7	9E-13	3.5	4E-07	7 1.4	2E-12	2.50)E-11	1.16	SE-11	-1.39E-09				
Al	Р		ation pote d and wat		[kg SO ₂ -	Eq.]	1.68E-0	2.0	1E-02	1.0	2E-05	2.17	7E+0	0 1.0	3E-02	1.53	3E-04	1.11	IE-03	-1.43E-01				
El	Р		ication po		[kg N-e	q.] (3.15E-02	6.7	3E-04	5.8	6E-07	9.2	5E-02	2 3.5	0E-04	6.53	3E-06	3.64	1E-05	-3.80E-03				
Sm	og		nd-level si ation pote		[kg O ₃ -6	eq.] 6	3.20E+0	3.6	9E-01	2.3	7E-04	1.97	7E+0	1 1.9	0E-01	1.39	9E-03	9.90	DE-03	-1.63E+00				
Resou	urces	re	urces – fo esources		[MJ]		3.90E+0		9E+00		1E-03	3.94E+0				2.78	3E-02	1.61	IE-01	-8.24E+00				
RESU	ILTS	OF TH	IE LCA	- RE	SOURC	E U	SE: O	ne pi	ece c	of C	ontro	ol ur	nit L	CU9	016III									
Parame	eter		Para	meter			Unit	Δ	1 - A3	A4		A5	A5		(C2 C		C3		D				
PERI	E	Renewab		ry energ	y as ene	gy	[MJ]	5.7	'5E+01		-		-					-		-	-		-	-
PERI	VI		primary material	energy utilization	on		[MJ] 0.		0.00E+00		-			-		-	-	-		-				
PER.	Т	Total use		able pri ources	mary ene	rgy	[MJ]	5.7	'5E+01	3.94	3.94E-02 9		E-04 1	.58E+	03 3.26	E-02	2 1.12E	-01	1.19E-0	1 -7.38E+00				
PENR	Œ	Non rer		primary y carrier	energy a	3	[MJ]	1.1	1.12E+03				-		-				-	-				
PENR	M			primary	energy a	3	[MJ]	0.0	0.00E+00		-			-				-		-				
PENF	RT.	Total use	e of non energy i		ble prima es	У	[MJ]		1.12E+038.3		8.30E+00 1		1.21E-02 8		03 4.52	E+0	0 6.11E	E-01	1.75E+0	0-1.67E+02				
SM		Use	of seco				[kg]	9.35E-03 0.00E+000.00			0.00E	+00	00 0.00E+00 0.0			00.00E	+00	0.00E+0	0.00E+00					
RSF	:	Use of r	enewabl	le secor	dary fuel			0.0	0.00E+00		E+00	0.00E	+00).00E+	-00 0.00	E+0	00.00E	+00	0.00E+0	0.00E+00				
NRS	F	Use of no	n renewa	able sec	ondary fu	els	[MJ]			-					_		_	+		0.00E+00				
FW			se of net				[m ³]			<u> </u>										3 -8.60E-02				
RESU LCU9		OF TH	IE LCA	\	TPUT	FLO	AN SW	ID W	AST	E C	ATE	GOR	RIES	: On	e piec	e o	f Cor	ntro	l unit					
Param	eter		Para	meter		Ur	nit A1	- A3	A 4	l	A.	5	В	6	C2		СЗ		C4	D				
HW	D	Haza	ardous w	aste dis	posed	[k	g] 5.19	E-02	1.01E	-05	8.31E	-07	1.20E	E+00	5.83E-0	6 8	3.47E-0	5 1	.30E-04	-2.93E-03				
NHM					disposed	[k	-		1.10E		9.25E		2.80E		9.59E-0	-	1.97E-0	+	3.48E-01	-1.34E-01				
RW			pactive w		·	[k	-	E-02			7.07E		1.25E		5.60E-0	-	3.81E-0		.15E-05					
CRI			mponent			[kṛ	-		0.00E			-	0.00		0.00E+0	-).00E+(_		0.00E+00 0.00E+00				
MFI			aterials for o			[kṛ	-		0.00E			-	0.00		0.00E+0	-	9.99E-0		.00E+00					
MEI			ials for e orted ele			[kṛ	-		0.00E				0.00		0.00E+0	_	0.00E+0		.00E+00	0.00E+00 0.00E+00				
EE						[M			0.00E			-	0.00		0.00E+0	_			.79E+00	-				
	•	Exported thermal energy					0.00	00	0.00E	. 00	1.02	. 01	0.000	- 100	J.UUL∓(,0 0	,.∪∪LT(JU 1.	.556	0.00L700				





Publisher

| Institut Bauen und Umwelt e.V. | Tel | +49 (0)30 3087748- 0 | Panoramastr. 1 | Fax | +49 (0)30 3087748- 29 | 10178 Berlin | Mail | info@bau-umwelt.com | Germany | Web | www.bau-umwelt.com



Programme holder



Author of the Life Cycle Assessment

 thinkstep AG
 Tel
 +49 711 34 18 17 22

 Hauptstraße 111
 Fax
 +49 711 34 18 17 25

 70771 Leinfelden-Echterdingen
 Mail
 info@pe-ithinkstep.com

 Germany
 Web
 www.thinkstep.com

ASSA ABLOY

Owner of the Declaration

ASSA AB Förmansvägen 11 117 43 Stockholm Sweden

Tel +46 8 775 16 00 Fax +46 8 775 16 20 Web **www.assa.se**