

ENVIRONMENTAL-PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2

Owner of the Declaration	dormakaba
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-DOR-20220340-CBA1-EN
Issue date	15.03.2023
Valid to	14.03.2028

SU5000 Optical Turnstile with Motorized Barriers dormakaba

www.ibu-epd.com | <https://epd-online.com>



General Information

dormakaba

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number

EPD-DOR-20220340-CBA1-EN

This declaration is based on the product category rules:

Electronic and physical Access Control Systems, 01.01.0001
(PCR checked and approved by the SVR)

Issue date

15.03.2023

Valid to

14.03.2028



Dipl.-Ing Hans Peters
(chairman of Institut Bauen und Umwelt e.V.)



Dipl. Ing. Hans Peters
(Managing Director Institut Bauen und Umwelt e.V.)

SU5000 Optical Turnstile with Motorized Barriers

Owner of the declaration

dormakaba International Holding GmbH
DORMA Platz 1
58256 Ennepetal
Germany

Declared product / declared unit

1 SU5000 Optical Turnstile with Motorized Barriers (1piece), consisting of the following items:

- housing
- steering
- drive unit (motor, gearbox, lock)
- panels (1 secondary cabinet, 1 main cabinet)
- sensors
- power adapter
- product packaging
- fastening material

Scope:

This declaration is a specific product declaration for the SU5000 Optical Turnstile with Motorized Barriers.

The underlying life cycle assessment is based on the entire life cycle of this specific turnstile manufactured by Alvarado.

The production site is located in Chino, USA.

The year of data collection is 2022.

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.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804 bezeichnet*.

Verification

The standard EN 15804 serves as the core PCR	
Independent verification of the declaration and data according to ISO 14025:2011	
<input type="checkbox"/>	internally
<input checked="" type="checkbox"/>	externally



Dr.-Ing. Wolfram Trinius,
(Independent verifier)

Product

Product description/Product definition

Information about the enterprise

dormakaba stands for a broad offering of products, solutions and services for smart and secure access to buildings and rooms from a single source.

dormakaba was created by merging the two well-established brands Dorma and Kaba. Alongside the dormakaba brand, the Group's portfolio contains a number of other brands. They provide a wide range of security and access related products and thereby complete the offer of dormakaba.

Product description/ Product definition

The SU5000 provides bi-directional access control and other operational and passage modes. In controlled passage mode, barriers are securely locked deterring unauthorized entry. Upon receipt of a valid card signal from an access control system, the motorized barriers of the turnstile open away from the user, and integrated sensors allow a single user to pass through the turnstile in the requested direction. If an unauthorized user attempts to tailgate on the entry, the unit will recognize the illegal passage, a violation alarm will sound and red notification lights will flash. The SU5000 utilizes tandem motorized barriers, distributed processing and integrated optical sensors to control access. The optical sensors detect patrons, determine the direction of patron movement and (in conjunction with the facility access system) detect unauthorized users. In addition to detecting "tailgating" on allowed entries, the SU5000's sensors prevent barriers from closing on users.

For placing the SU5000 sensor barriers on the market following legal provisions apply:

- *UL2593*
- *Restriction of Hazardous Substances (RoHS)*

The CE-marking considers the proof of conformity with the respective harmonized standards based on the legal provisions above. For the application and use the respective national provisions apply. Please select one of the following options and delete the header of the selected [alternative]:

[Alternative 1a: Product according to the CPR based on a hEN]:

For the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) Regulation (EU) No. 305/2011 (CPR) applies. The product needs a declaration of performance taking

into consideration EN xyz:date, title and the CE-marking.

For the application and use the respective national provisions apply.

[Alternative 1b: Products according to the CPR based on an ETA]:

For the placing of the product on the market in the European Union/European Free Trade Association /EU/EFTA) (with the exception of Switzerland) the Regulation (EU) No. 305/2011 (CPR) applies. The product needs a declaration of performance taking into consideration ETA no. xyz:date, title and the CE-marking.

For the application and use the respective national provisions apply.

[Alternative 2a: Product not harmonised in accordance with the CPR but in accordance with other provisions for harmonisation of the EU]:

For the placing on the market in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) the following legal provisions apply:

- *Directive no. xyz: date, title*
- *Regulation no. xyz: date, title*
- and the harmonised standards based on these provisions:
- *EN xyz: date, title*

The CE-marking takes into account the proof of conformity with the respective harmonized standards based on the legal provisions above.

For the application and use the respective national provisions apply.

[Alternative 2b: Product harmonized as well in accordance with the CPR as with other provisions for harmonisation of the EU]:

For the placing of the product on the market in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) the Regulation (EU) No. 305/2011/ (CPR) and the following other provisions for harmonisation apply:

- *Directive (EU) xyz: date, title*
- *Regulation (EU) no. xyz: date, title*

The product needs a declaration of performance in accordance with the CPR taking into consideration /EN xyz: date/, title or /ETA no. xyz/:date, title respectively and the CE-marking.

The CE-marking for the product takes into account the Declaration of Performance in accordance with the CPR and the proof of conformity with the following harmonised standards or based on the other provisions for harmonisation:

- *EN xyz: date, title*
- *Source, date, title*

For the application and use the respective national provisions apply.

[Alternative 3: Product for which no legal provisions for harmonisation of the EU exist]:

For the use and application of the product the respective national provisions at the place of use apply, in Germany for example the building codes of the federal states and the corresponding national specifications.

Application

SU5000 is ideal for secured entry control applications for main lobby access, employee entrances, elevator bank access and visitor management applications. Areas of application are:

- Corporate security
- Industrial facilities
- Government security
- Higher education
- Health and fitness

Technical Data

Following technical specification applies for mid-height barriers (standard variante):

- Length: 1321 mm
- Height: 1038 mm
- Width: 993 mm with 711 mm passageway

Please provide a general indication of the area of use of the device (indoor or outdoor).

The SU5000 Optical Turnstile is independently tested by a Nationally Recognized Testing Laboratory (NRTL). The SU5000 is ETL listed, conforming to both UL and

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

Base materials/Ancillary materials

The product composition of the SU5000 Optical Turnstile with Motorized Barriers is the following:

Material	Value	Unit
Steel	45,84	%
Aluminium	6,05	%
Zinc	1,82	%
Plexi Glass	16,99	%
Plastic	24,45	%
Electronics	4,16	%
Paper	0,69	%

LCA: Calculation rules

Declared Unit

The declared unit is 1 piece of the product: SU5000 Optical Turnstile with Motorized Barriers.

Declared unit

Name	Value	Unit
Declared unit	1	pce.
Mass (total system)	166.47	kg

For IBU core EPDs (where clause 3.6 is part of the EPD): for average EPDs, an estimate of the robustness of the LCA values must be made, e.g. concerning variability of the production process, geographical representativeness and the influence of background data and preliminary products compared to the environmental impacts caused by actual production.

The product contains partial articles which contain substances listed in the Candidate List of REACH

Regulation
1907/2006/EC (date: 17.01.2023)

exceeding 0.1
percentage by mass: no
The Candidate
List can be found on the ECHA website

address: <https://echa.europa.eu/de/home>.

Environment and health during use

Reference service life

The product is certified according to *UL 2593*. Under normal conditions and depending on cycle frequency, it means an approximate duration of 20 years.

System boundary

The type of EPD is: cradle to gate with options, modules C1–C4, and module D (A1–A3 + C + D and additional modules: A4 + A5 + B6)

Production - Module A1-A3

The product stage includes:

- A1, raw material extraction, processing and mechanical treatments, processing of secondary material input (e.g. recycling processes),
- A2, transport to the manufacturer,
- A3, manufacturing and assembly including provision of all materials, products and energy, as well as waste processing up to the end-of waste state.

Construction stage - Modules A4-A5

The construction process stage includes:

— A4, transport to the building site;
 — A5, installation into the building;
 including provision of all materials, products and energy, as well as waste processing up to the end-of-waste state or disposal of final residues during the construction process stage.

Maintenance

– Module B2

This module includes the production and the end of life of the batteries. The potential use of batteries is declared in module B2.

Use stage - Module B6

The use stage related to the operation of the building includes:
 — B6, operational energy use
 The potential use of electricity from the grid is declared in module B6.

End-of-life stage– Modules C1-C4 and D

The end-of-life stage includes:
 — C1, de-construction, demolition;
 — C2, transport to waste processing;

— C3, waste processing for reuse, recovery and/or recycling;
 — C4, disposal;
 including provision and all transport, provision of all materials, products and related energy and water use.

Module D (Benefits and loads beyond the system boundary) includes:

— D, recycling potentials, expressed as net impacts and benefits.

Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product’s lifespan: United States

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.

LCA: Scenarios and additional technical information

**Characteristic product properties
 Information on biogenic carbon**

The biogenic carbon content quantifies the amount of biogenic carbon in a construction product leaving the factory gate, and it shall be separately declared for the product and for any accompanying packaging.
 If the total mass of biogenic carbon containing materials is less than 5 % of the total mass of the product and accompanying packaging, the declaration of biogenic carbon content may be omitted. The mass of packaging containing biogenic carbon shall always be declared.

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO₂.

Information on describing the biogenic Carbon Content at factory gate

Name	Value	Unit
Biogenic carbon content in product	-	kg C
Biogenic carbon content in accompanying packaging	0,425	kg C

The following technical scenario information is required for the declared modules:

Transport to the building site (A4)

Name	Value	Unit
Litres of fuel	0.00276	l/100km
Capacity utilisation (including empty runs) via medium truck	55	%
Transport distance via medium truck	100	km

The product is transported via truck. The main distribution region is North America.

Installation into the building (A5)

Name	Value	Unit
Paper packaging	1,1531	kg
Plastic packaging	0,393	kg

In case a **reference service life** according to applicable ISO standards is declared then the assumptions and in-use conditions underlying the determined RSL shall be declared. In addition, it shall be stated that the RSL applies for the reference conditions only.

The same holds for a service life declared by the manufacturer. Corresponding information related to in-use conditions needs not be provided if a service life taken from the list on service life by BNB is declared.

Reference service life

Name	Value	Unit
Life Span according to the manufacturer	20	a

Operational energy use (B6)

The use stage is declared for 7 years.

Name	Value	Unit
Electricity consumption for 1 year	183.23	kW
Days per year in use	365	days
On mode per day	1,1	h
Idle mode per day	22,9	h
On mode power	40	W
Idle mode power	20	W

End of life (C1-C4)

C1: The product expansion depends on the building. The product share is so low that no environmental burden is assumed.

Name	Value	Unit
Collected separately	164.97	kg
Recycling	91.1	kg
Energy recovery	68.6	kg
Landfilling	5.27	kg
Transport to waste management	50	km

The product is disassembled in a recycling process. Material recycling is then assumed for the metals, electronic and electromechanics. The plastic

components are assumed to be incinerated with energy recovery. Minor proportions of residues arising from the recycling process are landfilled.
Region for the End of Life is: Global.

Reuse, recovery and/or recycling potentials (D), relevant scenario information
Collection rate is 100 %.

LCA: Results

B2 declares the environmental impact for the use stage under the assumption that batteries are used.

B6 declares the environmental impact for the use stage under the assumption that electricity from the grid (B6/1: region EU, B6/2: region mainly US) is used.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	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	MNR	MNR	MNR	X	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 piece SU5000 Optical Turnstile with Motorized Barriers

Parameter	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
GWP-total	kg CO ₂ -Äq.	8.21E+02	1.46E+00	2.63E+00	2.06E+03	0	7.15E-01	1.74E+02	8E-02	-4.36E+02
GWP-fossil	kg CO ₂ -Äq.	8.2E+02	1.39E+00	1.04E+00	2.06E+03	0	6.83E-01	1.74E+02	8E-02	-4.36E+02
GWP-biogenic	kg CO ₂ -Äq.	-4.19E-01	6.4E-02	1.59E+00	4.45E-01	0	3.2E-02	9E-03	2.73E-04	8.94E-01
GWP-luluc	kg CO ₂ -Äq.	8.94E-01	3.31E-05	8.34E-05	6.21E-01	0	1.63E-05	1E-02	2.3E-04	-5.87E-01
ODP	kg CFC11-Äq.	1.92E-09	1.47E-16	7.98E-16	7.25E-12	0	7.21E-17	8.79E-14	2.96E-16	-4.98E-10
AP_a2	mol H ⁺ -Äq.	3.81E+00	1E-03	6.36E-04	3.33E+00	0	6.84E-04	3.1E-02	5.73E-04	-1.72E+00
EP-freshwater	kg PO ₄ -Äq.	1.07E-03	2.98E-07	1.38E-07	1E-03	0	1.46E-07	1.4E-05	1.37E-07	-3.92E-04
EP-marine	kg N-Äq.	5.38E-01	4.43E-04	2.05E-04	7.13E-01	0	2.18E-04	7E-03	1.48E-04	-2.69E-01
EP-terrestrial	mol N-Äq.	5.86E+00	5E-03	3E-03	7.65E+00	0	2E-03	1.41E-01	2E-03	-2.92E+00
POCP_a2	kg NMVOC-Äq.	2.59E+00	1E-03	5.49E-04	2.04E+00	0	6.15E-04	1.9E-02	4.47E-04	-8.11E-01
ADPE	kg Sb-Äq.	4.35E-02	4.17E-08	1.16E-08	4.09E-04	0	2.05E-08	1.21E-06	7.18E-09	-1.9E-02
ADPF	MJ	1.35E+04	1.97E+01	9.79E-01	3.33E+04	0	9.69E+00	8.08E+01	1.05E+00	-5.8E+03
WDP	m ³ world-Äq. deprived	1.71E+02	3E-03	3.05E-01	3.98E+02	0	1E-03	1.78E+01	8E-03	-1.22E+02

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 piece SU5000 Optical Turnstile with Motorized Barriers

Parameter	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
PERE	MJ	2.1E+03	6.2E-02	1.41E+01	5.27E+03	0	3.1E-02	2.1E+01	1.37E-01	-1.4E+03
PERM	MJ	1.39E+01	0	-1.38E+01	0	0	0	-3E-02	0	0
PERT	MJ	2.11E+03	6.2E-02	2.14E-01	5.27E+03	0	3.1E-02	2.1E+01	1.37E-01	-1.4E+03
PENRE	MJ	1.12E+04	1.98E+01	1.79E+01	3.33E+04	0	9.7E+00	2.37E+03	1.05E+00	-5.8E+03
PENRM	MJ	2.31E+03	0	-1.69E+01	0	0	0	-2.29E+03	0	0
PENRT	MJ	1.35E+04	1.98E+01	9.79E-01	3.33E+04	0	9.7E+00	8.08E+01	1.05E+00	-5.8E+03
SM	kg	3.82E+01	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0
FW	m ³	7.51E+00	1.12E-04	7E-03	1.22E+01	0	5.48E-05	4.26E-01	2.64E-04	-5.39E+00

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 – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2:
1 piece SU5000 Optical Turnstile with Motorized Barriers

Parameter	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
HWD	kg	4.32E-05	1.92E-09	2.53E-09	1.28E-05	0	9.41E-10	3.08E-07	1.6E-08	-1.89E-05
NHWD	kg	7.67E+01	2E-03	1.55E-01	1.03E+01	0	9.92E-04	1.81E+01	5.27E+00	-4.15E+01
RWD	kg	2.59E-01	2.12E-05	4.43E-05	2.97E+00	0	1.04E-05	3E-03	1.19E-05	-2.18E-01
CRU	kg	0	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	8.96E+01	0	0
MER	kg	0	0	0	0	0	0	0	0	0
EEE	MJ	9.74E-01	0	4.32E+00	0	0	0	0	0	0
EET	MJ	1.77E+00	0	8.73E+00	0	0	0	0	0	0

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

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:
1 piece SU5000 Optical Turnstile with Motorized Barriers

Parameter	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
PM	Disease incidence	5.35E-05	7.32E-09	4.81E-09	2.98E-05	0	3.59E-09	3.96E-07	7.1E-09	-3.04E-05
IR	kBq U235-Äq.	3.35E+01	3E-03	6E-03	2.45E+02	0	1E-03	2.7E-01	1E-03	-3.83E+01
ETP-fw	CTUe	6.11E+03	1.4E+01	4.19E-01	9.93E+03	0	6.87E+00	3.03E+01	5.99E-01	-2.37E+03
HTP-c	CTUh	9.15E-05	2.63E-10	2.8E-11	2.14E-07	0	1.29E-10	2.62E-09	8.88E-11	-5.36E-07
HTP-nc	CTUh	2.47E-05	1.13E-08	2.09E-09	8.08E-06	0	5.52E-09	2.66E-07	9.78E-09	2.14E-06
SQP	SQP	2.23E+03	5.1E-02	2.76E-01	3.05E+03	0	2.5E-02	2.42E+01	2.19E-01	-7.01E+02

PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

Disclaimer 1 – for the indicator IRP

This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators ADPE, ADPF, WDP, ETP-fw, HTP-c, HTP-nc, SQP

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

References
DIN EN ISO 14025:

DIN EN ISO 14025:2011-10,
Environmental labels and declarations — Type III
environmental declarations - Principles and procedures.

equipment (RoHS), Directive (EU) No 2011/65.

European Chemicals Agency (ECHA)

<https://echa.europa.eu/de/>

EN 15804:2019+A2

EN 15804:2019+A2 (in press), Sustainability of
construction works — Environmental Product
Declarations — Core rules for the product category of
construction products.

Further References
IBU 2021
UL 2593

UL 2593: 2011-26, Underwriters Laboratories,

General

Instructions for the EPD programme of Institut Bauen und
Umwelt e.V. Version
2.0, Berlin: Institut Bauen und Umwelt e.V., 2021. www.ibu-epd.com

UL LLC Outline of Investigation for Motor Driven Turnstile
Operators and Systems

**Registration, Evaluation, Authorisation and
Restriction of Chemicals (REACH)**

Regulation (EC) No 1907/2006 of the European
Parliament and of the Council on the Registration,
Evaluation, Authorisation and Restriction of Chemicals
(REACH).

GaBi ts software

Sphera Solutions GmbH
Gabi Software System and Database for Life Cycle
Engineering 1992-2020
Version 10.0.0.71
University of Stuttgart
Leinfelden-Echterdingen

Restriction of Hazardous Substances (RoHS)

Directive on the restriction of the use of certain
hazardous substances in electrical and electronic

GaBi ts documentation

GaBi life cycle inventory data documentation
(<https://www.gabi-software.com/support/gabi/gabidatabase-2020-lci-documentation/>).

LCA-tool dormakaba

LCA tool ESC, tool no.: IBU-DOR-202109-LT1-EN.
Developed by Sphera Solutions GmbH.

PCR Part A

PCR – Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report according to EN 15804+A2:2019, Version 1.0, Institut Bauen und Umwelt e.V., www.ibu-epd.com.

PCR Part B

PCR – Part B: Requirements on the EPD for Building Hardware product, version 1.2, Institut Bauen und Umwelt e.V., www.ibu-epd.com, 2019.

The literature referred to in the Environmental Product Declaration must be listed in full. Standards already fully quoted in the EPD do not need to be listed here again.

The current version of PCR Part A and PCR Part B of the PCR document on which they are based must be referenced.



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