

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2

Owner of the Declaration	dormakaba International Holding GmbH
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-DOR-20220259-CBA1-EN
Issue date	29.11.2022
Valid to	28.11.2027

AL 401 Series Sliding Door Operator dormakaba

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General Information

<p>dormakaba</p> <hr/> <p>Programme holder IBU – Institut Bauen und Umwelt e.V. Hegelplatz 1 10117 Berlin Germany</p> <hr/> <p>Declaration number EPD-DOR-20220259-CBA1-EN</p> <hr/> <p>This declaration is based on the product category rules: Drive systems for automatic doors and gates, 11.2017 (PCR checked and approved by the SVR)</p> <hr/> <p>Issue date 29.11.2022</p> <hr/> <p>Valid to 28.11.2027</p> <hr/> <p> Dipl. Ing. Hans Peters (chairman of Institut Bauen und Umwelt e.V.)</p> <hr/> <p> Dr. Alexander Röder (Managing Director Institut Bauen und Umwelt e.V.)</p>	<p>AL 401 Series - Sliding Door Operator</p> <hr/> <p>Owner of the declaration dormakaba International Holding GmbH DORMA Platz 1 58256 Ennepetal Germany</p> <hr/> <p>Declared product / declared unit 1 piece of the product: AL 401 Series - sliding door operator, consisting of the following items: - AL 401 profiles - AL 401 drive components, consisting of motor, controller, power supply - AL 401 belt drive components - AL 401 accessories battery pack and lock - AL 401 carrier components - additional mechanical components - packaging</p> <hr/> <p>Scope: The EPD refers to a specific automatic sliding door operator AL 401 produced by dormakaba. The product site is located in Hallam, Australia.</p> <p>The year of data collection is 2022.</p> <p>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 <i>EN 15804+A2</i>. In the following, the standard will be simplified as <i>EN 15804</i>.</p> <hr/> <p>Verification</p> <table border="1"> <tr> <td colspan="2">The standard <i>EN 15804</i> serves as the core PCR</td> </tr> <tr> <td colspan="2">Independent verification of the declaration and data according to <i>ISO 14025:2011</i></td> </tr> <tr> <td><input type="checkbox"/> internally</td> <td><input checked="" type="checkbox"/> externally</td> </tr> </table> <hr/> <p> Dr.-Ing. Wolfram Trinius (Independent verifier)</p>	The standard <i>EN 15804</i> serves as the core PCR		Independent verification of the declaration and data according to <i>ISO 14025:2011</i>		<input type="checkbox"/> internally	<input checked="" type="checkbox"/> externally
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<input type="checkbox"/> internally	<input checked="" type="checkbox"/> externally						

Product

Product description/Product definition

The AL 401 is a heavy duty automatic door operator. Its unique rubber-mounted stainless steel tracking system and heavy-duty cowl provide the product longevity, a load capacity of 400 kg maximum and installation alternatives.

The AL 401 is designed to control and operate bi-parting and single sliding doors including aluminium framed and frameless glass doors up to 19 mm thick.

Features

- High Security Locking
- Heavy Duty & Robust
- Purpose Designed Motor
- Fully Integrated UPS system
- State-of-the-Art Electronics

For the placing on the market following legal provisions apply:

- *Australian Standard AS 5007*

- Endurance testing clause 4.4.1.1. and 4.4.2 by NATA accredited facility
- 2011/65/EU ROHS3 Directive

Application

The dormakaba AL 401 automatic door operator is a proven performer in airports, shopping centres, supermarkets, hotels, hospitals, financial institutions, sports stadiums and many other commercial sites.

The following parameters are applicable for single and double-leaf doors:

Single-panel sliding door

- Maximum door width: 3000 mm
- Maximum door weight: 400 kg

Double leaf sliding door

- Maximum door width: 2000 mm
- Maximum door weight: 200 kg

Technical Data

The technical data of the AL 401 series are as follows:

Name	Value	Unit
Height	240	mm
Installation depth	152	mm
Opening speed maximum	50	cm/s
Closing speed maximum	40	cm/s
Hold open time maximum	60	s
Supply voltage, frequency maximum	60	Hz
Power consumption	175	W
Class of protection	20	IP

Product not harmonised in accordance with the CPR but in accordance with:

- Australian Standard AS5007

Delivery status:

The declared AL 401 series sliding door operator includes the profiles, drive, belt drive, carrier, battery

pack and lock, mechanical components and packaging with a weight of 123,20 kg.

Components	Absolute	Percentage
Average AL 401 Operator	121,78 kg	98,85%
Average Packaging	1,42 kg	1,15%
Total	123,20 kg	100%

Base materials/Ancillary materials

The AL 401 automatic sliding door operator comprises the following components including packaging:

Components	Percentage
Aluminium elements	52,76%
Steel elements	31,00%
Zinc elements	0,18%
Brass elements	0,63%
Plastic elements	2,95%
Electronic elements incl. Motor	7,83%
Paper	1,15%
Lead battery	3,50%
Total	100,00%

The product contains partial articles which contain substances listed in the Candidate List of REACH Regulation 1907/2006/EC (date: 10.06.2022) exceeding 0.1 percentage by mass: yes

- Lead (Pb): 7439-92-1 (CAS-No) is used in the brass alloy. The concentration of lead in the alloy does not exceed 4 % (by mass).
- The drive system is battery-powered (lead accumulator).

Reference service life

The life cycle of the AL 401 series is about 10 years, depending on the application and frequency of use. Regular maintenance is advised to ensure the life expectancy of 10 years. For repairs or renewals, suitable spare parts are available. The AL 401 is tested and certified to 1,000,000 cycles according to AS 5007 NATA accredited.

LCA: Calculation rules

Declared Unit

The declared unit is 1 piece of the product: AL 401 Series Sliding Door Operator

Declared unit

Name	Value	Unit
Declared unit	1	pce.
Mass (total system) (excl. packaging)	123,20	kg

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.

Use stage - Module B6

The use stage related to the operation of the building includes:

— B6, operational energy use

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.

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.

Background database: *GaBi, SP40*.

LCA: Scenarios and additional technical information

Characteristic product properties

Information on biogenic Carbon

Information on describing the Biogenic Carbon Content at factory gate

Name	Value	Unit
Biogenic Carbon Content in product	0.11	kg C
Biogenic Carbon Content in accompanying packaging	0.52	kg C

The following technical scenario information is required for the declared modules

Transport from the gate to the site (A4)

Name	Value	Unit
Litres of fuel (per 1 kg)	0.00276	l/100km
Capacity utilisation (including empty runs)	55	%
Transport distance via medium truck	100	km

Transport distance is declared for a distance of 100 km by truck in order to allow scaling to a specific point of installation.

Installation into the building (A5)

Name	Value	Unit
Waste packaging (paper and plastic)	1.42	kg

Reference service life

Name	Value	Unit
Life Span according to the manufacturer	10	a

Operational energy use (B6)

The use stage is declared for 10 years

Name	Value	Unit
Electricity consumption for 1 year	93.84	kWh
Days per year in use	365	days
On mode per day	1	h
Idle mode per day	7	h
Off mode per day	16	h

On mode power	67,2	W
Idle mode power	7,7	W
Off mode power	8,5	W

End of life (C1-C4)

Name	Value	Unit
Recycling	103	kg
Energy recovery	3.4	kg
Landfilling	15.2	kg
Transport to waste management	50	km

The product is disassembled in a recycling process. Material recycling is then assumed for the metals, electronics 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

The collection rate is 100 %.

LCA: Results

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	ND	ND	MNR	MNR	MNR	X	ND	X	X	X	X	X	

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 piece AL 401 sliding door operator

Core Indicator	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ -Eq.]	7.97E+2	1.08E+0	2.02E+0	9.42E+2	0.00E+0	5.29E-1	9.40E+0	1.32E-1	-4.76E+2
GWP-fossil	[kg CO ₂ -Eq.]	7.99E+2	1.03E+0	6.30E-2	9.41E+2	0.00E+0	5.06E-1	8.66E+0	1.31E-1	-4.75E+2
GWP-biogenic	[kg CO ₂ -Eq.]	-2.67E+0	4.80E-2	1.96E+0	8.46E-1	0.00E+0	2.30E-2	7.42E-1	4.49E-4	-1.09E+0
GWP-luluc	[kg CO ₂ -Eq.]	5.91E-1	2.45E-5	3.38E-5	2.25E-1	0.00E+0	1.20E-5	4.93E-4	3.78E-4	-1.49E-1
ODP	[kg CFC11-Eq.]	4.96E-10	1.09E-16	3.68E-16	4.30E-12	0.00E+0	5.34E-17	4.41E-15	4.87E-16	-3.20E-9
AP	[mol H ⁺ -Eq.]	3.86E+0	1.00E-3	5.65E-4	4.52E+0	0.00E+0	5.06E-4	2.00E-3	9.42E-4	-1.91E+0
EP-freshwater	[kg P-Eq.]	8.48E-4	2.20E-7	7.18E-8	4.38E-4	0.00E+0	1.08E-7	7.03E-7	2.26E-7	-2.57E-4
EP-marine	[kg N-Eq.]	5.19E-1	3.28E-4	2.04E-4	9.67E-1	0.00E+0	1.61E-4	3.62E-4	2.43E-4	-2.44E-1
EP-terrestrial	[mol N-Eq.]	5.65E+0	4.00E-3	3.00E-3	1.06E+1	0.00E+0	2.00E-3	7.00E-3	3.00E-3	-2.64E+0
POCP	[kg NMVOC-Eq.]	1.62E+0	9.27E-4	5.40E-4	2.69E+0	0.00E+0	4.55E-4	1.00E-3	7.34E-4	-7.83E-1
ADPE	[kg Sb-Eq.]	2.00E-2	3.09E-8	5.80E-9	6.31E-5	0.00E+0	1.52E-8	6.06E-8	1.18E-8	-1.00E-2
ADPF	[MJ]	1.02E+4	1.46E+1	6.40E-1	1.04E+4	0.00E+0	7.17E+0	4.10E+0	1.72E+0	-6.53E+3
WDP	[m ³ world-Eq deprived]	1.30E+2	2.00E-3	2.50E-1	3.57E+2	0.00E+0	9.91E-4	9.50E-1	1.40E-2	-3.95E+1

Caption: 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 AL 401 sliding door operator

Indicator	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
PERE	[MJ]	3.73E+3	4.60E-2	1.71E+1	1.59E+3	0.00E+0	2.30E-2	1.15E+1	2.26E-1	-2.82E+3
PERM	[MJ]	2.74E+1	0.00E+0	-1.70E+1	0.00E+0	0.00E+0	0.00E+0	-1.04E+1	0.00E+0	0.00E+0
PERT	[MJ]	3.75E+3	4.60E-2	1.17E-1	1.59E+3	0.00E+0	2.30E-2	1.06E+0	2.26E-1	-2.82E+3
PENRE	[MJ]	1.01E+4	1.46E+1	8.55E-1	1.04E+4	0.00E+0	7.18E+0	1.27E+2	1.72E+0	-6.53E+3
PENRM	[MJ]	1.23E+2	0.00E+0	-2.15E-1	0.00E+0	0.00E+0	0.00E+0	-1.23E+2	0.00E+0	0.00E+0
PENRT	[MJ]	1.02E+4	1.46E+1	6.40E-1	1.04E+4	0.00E+0	7.18E+0	4.10E+0	1.72E+0	-6.53E+3
SM	[kg]	1.28E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	[m ³]	9.71E+0	8.26E-5	6.00E-3	5.01E+0	0.00E+0	4.06E-5	2.30E-2	4.35E-4	-5.57E+0

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 used as raw materials; 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 AL 401 sliding door operator

Indicator	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
HWD	[kg]	1.55E-5	1.42E-9	9.57E-10	1.69E-6	0.00E+0	6.96E-10	1.54E-8	2.63E-8	-4.50E-5
NHWD	[kg]	1.75E+2	1.00E-3	6.40E-2	2.69E+0	0.00E+0	7.34E-4	9.01E-1	8.67E+0	-1.09E+2
RWD	[kg]	5.27E-1	1.57E-5	3.35E-5	2.00E-3	0.00E+0	7.70E-6	1.54E-4	1.96E-5	-6.49E-1
CRU	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.09E+2	0.00E+0	0.00E+0
MER	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EEE	[MJ]	0.00E+0	0.00E+0	3.06E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	[MJ]	0.00E+0	0.00E+0	5.56E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0

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

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 piece AL 401 sliding door operator

Indicator	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
PM	[Disease Incidence]	4.23E-5	5.42E-9	3.14E-9	4.60E-5	0.00E+0	2.66E-9	2.01E-8	1.17E-8	-3.04E-5
IRP	[kBq U235-Eq.]	1.02E+2	2.00E-3	5.00E-3	2.53E-1	0.00E+0	1.00E-3	1.40E-2	2.00E-3	-1.30E+2
ETP-fw	[CTUe]	3.65E+3	1.04E+1	3.03E-1	1.43E+3	0.00E+0	5.08E+0	1.55E+0	9.84E-1	-2.44E+3
HTP-c	[CTUh]	1.49E-5	1.95E-10	1.61E-11	8.40E-8	0.00E+0	9.56E-11	1.35E-10	1.46E-10	-1.86E-7
HTP-nc	[CTUh]	1.08E-5	8.33E-9	7.09E-10	3.09E-6	0.00E+0	4.09E-9	1.33E-8	1.61E-8	-3.35E-6
SQP	[-]	1.37E+3	3.80E-2	1.70E-1	9.75E+2	0.00E+0	1.80E-2	1.23E+0	3.59E-1	-2.47E+2
Caption	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

Standards

AS 5007

AS 5007 -2007

Powered doors for pedestrian access and egress.

Further References

2011/65/EU ROHS3 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.

IBU 2021

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

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

GaBi ts documentation

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

LCA-tool dormakaba

LCA tool, ENS (drive system)
LCA tool No.: IBU-DOR-202108-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 Re-port 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, 2020.

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