PRODUCT ENVIRONMENTAL PROFILE

LUXOMAT® range - Presence detector

PD4-N-M-DACO-1C DALI-2



Registration N°: BEGL-00009-V01.03-EN	Drafting rules: **« PCR-ed4-EN-2021 09 06 » and « PSR-0005-ed3-EN-2023 06 06 »**
Verifier accreditation N°: VH08	Information and reference documents: **www.pep-ecopassport.org**
Date of issue: **03-2024**	Validity period: **5 years**
Independent verification of the declaration and data, in compliance with ISO 14025:2010 Internal ☐ External ☑	
The PCR review was conducted by a panel of experts chaired by Julie ORGELET (DDEMAIN)	
PEP are compliant with NF C08-100-1 :2016 and EN 50693 :2019 or NF E38-500 :2022 The components of the present PEP may not be compared with components from any other program.	
Document complies with ISO 14025:2006 « Environmental labels and declaration. Type III environmental declarations »	

GENERAL INFORMATION

REFERENCE PRODUCT

This environmental declaration covers the product range LUXOMAT® - Presence detectors. The reference product that is the subject of the environmental declaration is a presence detector whose commercial reference is PD4-N-M-DACO-1C DALI-2.

Table 1 - Technical specification

Technical specification	
Product category	360° presence detector
Reference	PD4-N-M-DACO-1C DALI-2 (item no. 93463)
Lifetime	10 years
Power (W)	2
Weight	238 g including 68.7 g of packaging
Dimensions (mm)	160 x 95
Finishing	RAL9010, UV-resistant housing
Geographical representativity	Manufacturing in China; last logistics platform in Germany; Distribution, installation, use and end of life in France

LUXOMAT® PRODUCT RANGE

Below are the references of the LUXOMAT® range - Presence detectors covered by the reference product PD4N-M-DACO-1C-DALI-2 (93463). This declaration covers the following products:

- PD4N-M-DACO-1C-DALI-2 (93463)
- PD4N-M-DACO-DALI-2 (93460)
- PD4N-KNXs-ST-FP (93514)
- PD4N-BMS DALI-2-FP (93546)
- PD4N-DALI-SYS (93340)
- PD4N-DALI-LINK (93377)
- PD4N-KNXs-DX-ST-FP (93516)
- PD4N-M-DACO-PRO DALI-2 (93353)
- PD4N-M-DACO-DUO DALI-2 (93461)

According to the manufacturer, the reference product is the product with the highest impact in the range, so its impacts are used to cover the other products in the range.

The products studied belong to the “Other equipment” category for so-called active products as defined in PSR-0005-ed3-EN-2023 06 06.

FUNCTIONAL UNIT

The functional unit studied is « Detect a presence at 360° causing the light to turn on, for 10 years » according to the rules of PCR Edition 4.

DECLARED UNIT

The declared unit studied is identical to the functional unit.

REFERENCE LIFETIME

The reference lifetime of the product studied is 10 years as defined in the PSR-0005-ed3-EN-2023 06 06.

CONSTITUENT MATERIALS

The total mass of the product is 238 g including 169 g of product and 68.7 g of packaging. The constituent materials are:

Table 2 - Constituent materials

Constituent materials	Metals		Plastics		Others	
	Stainless steel	2.1%	Polycarbonate	24.1%	Cardboard	27.2%
	Aluminium	1.3%	Polyamide	19.9%	Electronic	15.3%
			Polyethylene	4.3%	Paper	1.7%
			Polyoxymethylene	3.1%		
			Polypropylene	0.6%		
			PU foam	0.4%		
	Total	**3.4 %**	**Total**	**52.4 %**	**Total**	**44.2 %**

LIFE CYCLE ASSESSMENT METHODOLOGY

The Life Cycle Assessment of this declaration is compliant with the criteria imposed by the PCR-ed4-EN-2021 09 06 of PEP ecopassport® Program. The functional unit was developed according to the rules of PCR edition 4. The scenarios for distribution, installation, use and end-of-life are consistent with the assumptions set out in PSR-0005-ed3-EN-2023 06 06.

Results were obtained using EIME software version 6.0 and its most recent database “Database 2023-02”.

MANUFACTURING STAGE

The presence detector is manufactured and assembled in China. This concerns both the electronic components and the materials.

Energy model	**Electricity Mix; Production mix; Low voltage; 2018; China; CN**

The materials required for the manufacture of the product and packaging were considered. In accordance with PCR ed.4, the impacts related to the use of recycled materials are not considered.

Upstream transport and transport to the last logistics platform were considered. A truck load rate of 85% and an empty return rate of 20% were considered.
PEFCR source: https://ec.europa.eu/environment/eussd/smgp/pdf/PEFCR_guidance_v6.3.pdf

The waste rate of shaped elements and assembled elements was considered.

All treatments of waste or scrap generated during the manufacturing and assembly stage were considered. In accordance with the PCR, the impacts related to recycling are considered. No information could be provided to

justify specific treatment of scrap. In accordance with PSR 5, the following end-of-life scenario for the scraps was considered: 50% incineration without energy recovery / 50% landfill.

DISTRIBUTION STAGE

The distribution of the packaged product from the last logistics platform (Germany) to the installation sites (France) was modelled by a 27-ton truck transport over 3500 km (intracontinental transport scenario of PEP-PCR-ed4-EN-2021 09 06).

A truck load rate of 85% and an empty return rate of 20% were considered. Source PEFCR : https://ec.europa.eu/environment/eussd/smgp/pdf/PEFCR_guidance_v6.3.pdf

The transport does not require reconditioning packaging.

INSTALLATION STAGE

The installation of the product generates packaging whose treatment has been modelled in accordance with paragraph 3.1.5.2.1 of PSR-0005-ed3-EN-2023 06 06:

- A waste collection over 100 km
- The treatment of packaging waste has been modelled.

The modules used for the end of life of the packaging are representative of European modules.

Energetic model	**Electricity Mix; Production mix; Low voltage; 2018; Europe, UE-27**

USE STAGE

For each of the products that consume energy during their use, a typical usage scenario allowing the calculation of the environmental impacts related to this energy consumption has been defined. The product falls within the framework of the family of active products of "Other equipment".

In our case, the electricity consumption corresponds to the product of the energy consumed in one year by the lifespan of the product defined in its functional unit.

$$E = 8.97 * 10 = 89.7\ kW.h$$

The electricity consumed in one year was calculated from the following data:

Table 3 - Data used to calculate the electricity consumed in one year

	Data
Power in active mode	1.512 W
Power in standby mode	0.902 W
Percentage of time in active mode	20%
Percentage of time in standby mode	80%

The modeling was done with a French electricity mix.

Energy model	**Electricity Mix; Production mix; Low voltage; 2018; France, FR**

END OF LIFE STAGE

The end-of-life treatment of presence detectors has been modelled using Ecosystem's public LCI modules (called ESR) as recommended by PCR ed 4.

This is the only European database to assess the environmental footprint of electrical and electronic equipment at the end of its life cycle. 96 materials are modelled and broken down by the different flows processed, to quantify the environmental impacts and benefits of WEEE at the end of its life cycle.

The BOM (Bill Of Materials) of the product and electronic boards have been isolated in order to use ESR data specific to the end-of-life treatment of the materials contained in each of these elements.

ESR data without virgin material substitution benefits were used.

ESR data for the "Small Professional Elec. Equip. (Medical & Building & Industry & Research)" category was used.

Energetic model	**Electricity Mix; Average LCI for 2015-2017; France, FR (Ecosystem modelling)**

MODULE D

The recycling benefits occurring at the installation stage [A5] (benefits from packaging recycling) have been considered in the module D, according to the requirements of the PCR ed.4 (cf §1.1.3) methodology. These benefits correspond to the avoided impacts related to the material recycling. The impacts generated by the production of primary material are counted negatively.

BIOGENIC CARBON CONTENT

Table 4 – Biogenic carbon content of the product

	Product	Cardboard	Wood	Paper	Sum
	Carbon content	28%	39.52	37.80%	
	Mass (kg)	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
	Biogenic content (DU) (kg C)	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
1	Biogenic content (FU) (kg C)	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
	Source	ADEME	EN 16485	APESA/RECORD	

Table 5 - Biogenic carbon content of the packaging

	Packaging	Cardboard	Wood	Paper	Sum
	Carbon content	28%	39,52%	37.80%	
	Mass (kg)	6.47E-02	0.00E+00	4.02E-03	**6.87E-02**
	Biogenic content (DU) (kg C)	1.81E-02	0.00E+00	1.52E-03	**1.96E-02**
1	Biogenic content (FU) (kg C)	1.81E-02	0.00E+00	1.52E-03	**1.96E-02**
	Source	ADEME	EN 16485	APESA/RECORD	

Since the functional unit and the declared unit are identical, the biogenic carbon content is the same for both units.

ENVIRONMENTAL IMPACTS OF THE REFERENCE PRODUCT

The results of impacts presented below were obtained using the methods defined by the PCR-ed4-EN-2021 09 06 and the PSR-0005-ed3-EN-2023 06 06. The analysis of the contribution of elementary flows to environmental indicators is based on calculations from the EIME v6 life cycle analysis software. The set of indicators used is the set "Indicators for PEF EF 3.0 (Compliance: PEP ed.4, EN15804+A2)" developed by the CODDE department of Bureau Veritas in accordance with Annex A of PCR-ed4-EN-2021 09 06.

In this study, the declared unit and the functional unit are identical.

ENVIRONMENTAL IMPACTS OF THE REFERENCE PRODUCT

Table 6 - Results of environmental indicators of the typical reference flow over the life cycle at the functional unit and equipment level (values declared in the PEP)

MANDATORY INDICATORS																
Impacts indicators	Unit	Manufacturing	Distribution	Installation	Use								End-of-life	Total (Off D)	Benefits and loads
		A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	B1-B7	C1-C4		D
Climate change - total	kg CO2 eq	4.98E+00	5.35E-02	8.26E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.99E+00	0.00E+00	5.99E+00	2.54E-01	1.14E+01	-5.56E-01
Climate change – fossil fuels	kg CO2 eq	4.93E+00	5.35E-02	7.39E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.98E+00	0.00E+00	5.98E+00	2.34E-01	1.13E+01	-5.34E-01
Climate change - biogenics	kg CO2 eq	4.70E-02	0.00E+00	8.64E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.54E-02	0.00E+00	1.54E-02	1.97E-02	9.08E-02	-2.17E-02
Climate change – land use and land use transformation	kg CO2 eq	1.02E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.02E-04	0.00E+00
Ozone depletion	kg CFC-11 eq	5.54E-07	8.20E-11	2.00E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.82E-08	0.00E+00	8.82E-08	2.37E-08	6.68E-07	-2.50E-08
Acidification	mol H+ eq	3.34E-02	3.39E-04	2.53E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.47E-02	0.00E+00	3.47E-02	2.37E-03	7.10E-02	-5.46E-03
Freshwater eutrophication	kg $(PO4)^{3-}$eq	3.90E-05	2.01E-08	1.09E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.85E-04	0.00E+00	2.85E-04	3.51E-06	3.29E-04	-1.10E-03
Marine aquatic eutrophication	kg N eq	4.69E-03	1.59E-04	1.03E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.77E-03	0.00E+00	4.77E-03	1.21E-03	1.09E-02	-9.48E-04

Terrestrial eutrophication	mol N eq	4.93E-02	1.74E-03	7.05E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.86E-02	0.00E+00	6.86E-02	2.97E-03	1.23E-01	-1.19E-02
Photochemical ozone formation	kg COVNM eq	1.56E-02	4.39E-04	1.65E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.41E-02	0.00E+00	1.41E-02	9.13E-04	3.13E-02	-2.77E-03
Abiotic resource depletion – elements or resource depletion – metals and minerals	kg Sb eq	3.97E-04	2.11E-09	3.32E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.84E-06	0.00E+00	2.84E-06	1.19E-06	4.01E-04	-3.85E-04
Abiotic resources depletion – fossil fuels or resource depletion - fossils	MJ	7.49E+01	7.46E-01	8.01E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.15E+03	0.00E+00	1.15E+03	3.29E+00	1.23E+03	-4.54E+00
Water requirement	m3 eq	1.05E+00	2.03E-04	1.29E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.34E-01	0.00E+00	4.34E-01	4.33E+01	4.48E+01	-7.05E+01

Inventory flows	Unit	Manufacturing	Distribution	Installation	Use								End-of-life	Total (Off D)	Benefits and loads
		A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	B1-B7	C1-C4	B2	D
Use of renewable primary energy, excluding renewable primary energy resources used as raw materials	MJ	2.26E+00	9.95E-04	2.07E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.06E+02	0.00E+00	1.06E+02	2.14E-01	1.09E+02	-3.35E+00
Use of renewable primary energy resources used as raw materials	MJ	1.23E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.23E+00	0.00E+00
Total use of renewable primary energy resources	MJ	3.49E+00	9.95E-04	2.07E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.06E+02	0.00E+00	1.06E+02	2.14E-01	1.10E+02	-3.35E+00
Use of non-renewable primary energy, excluding non-renewable primary	MJ	7.07E+01	7.46E-01	8.01E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.15E+03	0.00E+00	1.15E+03	3.29E+00	1.23E+03	-4.54E+00

energy resources used as raw materials														
Use of non-renewable primary energy resources used as raw materials	MJ	4.19E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.19E+00	0.00E+00
Total use of non-renewable primary energy resources	MJ	7.49E+01	7.46E-01	8.01E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.15E+03	0.00E+00	1.15E+03	3.29E+00	1.23E+03	-4.54E+00
Use of secondary materials	kg	1.92E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.92E-04	0.00E+00
Use of renewable secondary fuels	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	m^3	2.57E-02	4.73E-06	3.00E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E-02	0.00E+00	1.01E-02	1.17E+00	1.21E+00	-1.92E+00
Hazardous waste disposed of	kg	4.47E+00	0.00E+00	1.91E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.93E-02	0.00E+00	8.93E-02	2.89E-06	4.56E+00	-5.33E-03
Non-hazardous waste disposed of	kg	1.93E+00	1.88E-03	2.63E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.76E-01	0.00E+00	5.76E-01	1.95E-02	2.55E+00	-4.45E-02
Radioactive waste disposed of	kg	1.82E-03	1.34E-06	3.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.42E-04	0.00E+00	2.42E-04	5.47E-07	2.06E-03	-2.07E-05
Components for reuse	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	5.41E-04	0.00E+00	3.66E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.93E-02	4.35E-02	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	MJ	3.45E-04	0.00E+00	9.21E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.38E-04	0.00E+00

OPTIONAL INDICATORS															
Impact indicators	**Unit**	**Manufacturing**	**Distribution**	**Installation**	**Use**								**End-of-life**	**Total (Off D)**	**Benefits and loads**
		A1-A3	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B1-B7**	**C1-C4**	**B2**	**D**
Total use of primary energy during the life cycle	MJ	7.84E+01	7.47E-01	1.01E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.26E+03	0.00E+00	1.26E+03	3.50E+00	1.34E+03	-7.89E+00
Emission of fine particles, expressed in incidence of diseases	death/Kg eq PM2.5	1.98E-07	2.75E-09	1.50E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.34E-06	0.00E+00	1.34E-06	1.36E-08	1.56E-06	-3.45E-08
Ionizing radiation, human health	kBq U235 eq	1.62E+01	1.30E-04	4.47E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.55E+02	0.00E+00	1.55E+02	1.27E-02	1.76E+02	-7.28E-02
Ecotoxicity (fresh water)	CTUe	5.50E+02	3.60E-02	9.24E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.23E+01	0.00E+00	4.23E+01	7.39E+01	6.67E+02	-8.71E+01
Human toxicity, carcinogenic effects	CTUh	1.25E-07	9.40E-13	8.64E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E-09	0.00E+00	1.00E-09	2.12E-10	1.35E-07	-8.19E-08
Human toxicity, non-carcinogenic effects	CTUh	1.29E-07	1.02E-10	3.21E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.33E-08	0.00E+00	4.33E-08	1.24E-08	1.85E-07	-4.74E-08
Impacts related to land use/soil quality	No dimension	-1.14E-01	0.00E+00	2.10E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.91E-01	0.00E+00	1.91E-01	5.21E-01	5.99E-01	-1.54E+01



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