ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	Wilo SE
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-WIL-20230512-IBA1-EN
Issue date	25.06.2025
Valid to	24.06.2030

Wilo-Para MAXO 25-180-11-F02

WILO SE

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD VERIFIED

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

1. General Information

WILO SE

Programme holder

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

Declaration number

EPD-WIL-20230512-IBA1-EN

This declaration is based on the product category rules:

Pumps for liquids and liquids with solids, 01.08.2021
(PCR checked and approved by the SVR)

Issue date

25.06.2025

Valid to

24.06.2030

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

Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

Wilo-Para MAXO 25-180-11-F02

Owner of the declaration

Wilo SE
Wilopark 1
44263 Dortmund
Germany

Declared product / declared unit

1 Piece of Wilo-Para MAXO 25-180-11-F02

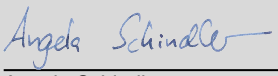
Scope:

The declared product is one piece of the pump Wilo-Para MAXO 25-180-11-F02. The product is produced in Dortmund, Germany, and the life cycle assessment is based on the collected data at the production site.
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*.

Verification

The standard EN 15804 serves as the core PCR
Independent verification of the declaration and data according to ISO 14025:2011
☐ internally ☒ externally



Angela Schindler,
(Independent verifier)

2. Product

2.1 Product description/Product definition

The Wilo-Para MAXO is a glandless circulator with a screwed connection, EC motor, automatic power adjustment and self-protecting modes - specifically designed for the original equipment market (OEM) market.

The pump is suitable for HVAC systems of all kinds (Heating, Air conditioning, Cooling) as well as for solar applications.

The EPD is a representative EPD as it focuses on the top seller variant of the product range.

Legal Provisions
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:

M*achinery Directive (2006/42/EC)*

Electromagnetic Compatibility Directive (2014/30/EU)

Energy-Related Products Directive (2009/125/EC)

Restriction of the use of certain hazardous substances 2011/65/EU + 2015/863

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.

2.2 Application

The pump is designed for circulating liquids in the following systems:

- Heating
- Floor heating
- Solar thermal
- Geothermal
- Cooling and air conditioning
- Domestic Hot Water

2.3 Technical Data

The relevant technical specifications according to the *PCR Part B* is given in the table below.

Constructional data

Name	Value	Unit
Frequency	50/60	Hz
Flow range (max)	5	m^3/h
Power input Average (from load profile describing use)	0.054	kW
nominal capacity	0.1307	kW
Voltage	1~230	V
energy efficiency class	≤ 0,20	-
Pumped liquid (e.g. water)	Water, R290, R32	-
Head max.	11	m

The performance data of the product according to the harmonised norms, based on the harmonised provisions above apply.

2.4 Delivery status

The scope of delivery of the pump includes the following items:

- Pump
- Installation and operating instruction

2.5 Base materials/Ancillary materials

Name	Value	Unit
Aluminium casting	18,2	%
Aluminium oxide	0,05	%
Brass	0,6	%
Chromium steel	2,5	%
Copper	3,5	%
Electronics	7,4	%
Grey cast iron	47,1	%
Magnet	1,6	%
Plastics	5,9	%
Rubber	0,1	%
Galvanized steel	1,4	%
Steel	11,4	%
Synthetic charcoal	0,1	%
TOTAL	100	%

This product contains substances listed in the *candidate list* (date: 28.03.2023) exceeding 0,1 percentage by mass: yes.
Lead:
CAS 7439-92-1
Concentration range: > 0,1 % w/w and ≤ 100 % w/w

Lead monoxide (lead oxide):
CAS 1317-36-8
Concentration range; >0,1 % w/w and ≤ 100 % w/w

This product contains other carcinogenic, mutagenic, reprotoxic (CMR) substances in categories 1A or 1B which are not on the *candidate list*, exceeding 0,1 percentage by mass: no

Biocide products were added to this construction product or it has been treated with biocide products (this then concerns a treated product as defined by the *(EU) Ordinance on Biocide Products No. 528/2012)*: no.

2.6 Manufacture

The manufacturing of the Wilo-Para MAXO is divided into the two areas of Electronics and
Mechanics. Both areas are supplied with materials by the intralogistics.

Electronics:
In the first step, the delivered printed circuit board (PCB)s are assembled fully automatically by
SMT (Surface Mounted Technology), then separated into individual printed circuit board (PCB)s by cutting processes (depaneling) and manually assembled in the second assembly step by THT (Through Hole Technology), before being assembled with the other components of the electronics module in the final module assembly.

Mechanics:
The mechanics´ area is subdivided as follows:
Mechanical production: this is where the machining of the components takes place; motor housings made of aluminium, impellers made of plastic, and motor shields made of brass are

the main components here.
Engine production: Here there are two main components; in the stator production the stators are wound and assembled, in the rotor production the rotors are assembled, then welded and magnetised.
Final assembly: here the previously machined components and the purchased parts are assembled into complete pumps, final tested and packed ready for dispatch.

2.7 Environment and health during manufacturing

Wilo-HSE-Management ensures the implementation of standards and tools to avoid personal-, property-, environmental damages and financial losses as well as reducing liability risks by applying preventive actions.
Main Elements:

- Risk management
- Definition and implementation of protection rules
- Management of chemical products
- Emergency Management
- Ensure safe operation of technical equipment
- Analysis of nonconformities and action follow-up

- The production site is *ISO 14001*, *ISO 50001* and *ISO 45001* certified.

2.8 Product processing/Installation

The Wilo-Para MAXO is an OEM product that is installed by an OEM company into the end product. Wilo has no influence on how the product is installed.

2.9 Packaging

The finished product is packed in cardboard and transported on pallets to a logistics warehouse with a quantity of 108 pumps per pallet.

2.10 Condition of use

The pump is maintenance-free

2.11 Environment and health during use

In the operating phase, the pump does not emit any pollutants that are hazardous to the environment or health.

2.12 Reference service life

No usage level scenario is given that relates to the life of the product.

According to Appendix 7: EUP Lot 11, Circulators in buildings with a RSL of 10 years can be used to facilitate calculations. [CC1]

[CC1]*Appendix 7: EUP Lot 11, Circulators in buildings AEA Energy & Environment for the European Commission, April 2008. Based on the DIRECTIVE 2009/125/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 October 2009.*

The RSL of the declared product does not directly affect the results of this study because no scenario of the declared use level depends on the RSL; the B6 module of the use level is declared per year according to PCR Part B.

2.13 Extraordinary effects

Fire
not applicable

Water
not applicable

Mechanical destruction
not applicable

2.14 Re-use phase

The following possibilities arise in terms of material composition:

Material recycling
The materials suitable for material recycling largely comprise the metallurgical materials processed in the product.

Energy recovery
The materials suitable for energy recovery primarily comprise the plastics contained in the product.

Landfilling
The entire product system must not be landfilled and must be recycled or recovered.

2.15 Disposal

Manufacturing

Cuttings of the impeller (2.2 % by mass of the item) incurred during the manufacture phase are directed to the waste incineration.

Waste code in accordance with the *European Waste Catalogue* EWC 2001 118 EC:
EWC 07 02 13 plastic waste
Other non-specific production waste is sent for incineration as inert material. For waste codes see EoL.

Packaging
The cardboard components produced during installation are incinerated. The pallets made of wood are reused.

- *EWC 15 01 01 Paper and cardboard*
- *EWC 15 01 03 Wooden packaging*

EoL
The possible recycling rate of a Wilo pump is almost 100 %. Together with recycling partners, Wilo aims to collect all dismantled old pumps and recycle them in a qualified manner. For the return of old products, Wilo has set up a collection process via wholesalers, through which installers can return their old dismantled pumps.

- E*WC 16 02 14 Used devices with the exception of those included in 16 02 09 to 16 02 13*
- *EWC 16 02 16 Components removed from used devices with the exception of those included in 16 02 15*
- *EWC 17 02 03 Plastic*
- *EWC 17 04 01 Copper, bronze, brass*
- *EWC 17 04 02 Aluminium*
- *EWC 17 04 05 iron and steel*
- *EWC 17 04 11 Cables with the exception of those included in 17 04 10*

Disposal of the drive unit in Europe is subject to the *Waste from Electrical and Electronical Equipment (WEEE) Directive 2012/19/EU.*

2.16 Further information

www.wilo.com

3. LCA: Calculation rules

3.1 Declared Unit

The declared unit is 1 piece (pce) of product.

Declared unit

Name	Value	Unit
Declared unit	1	pce.
Mass reference	3.1	kg/pce

3.2 System boundary

The EPD is cradle-to-gate with options.

The following modules were considered for calculating the LCA:

- A1: Raw material supply and processing
- A2: Transport and delivery of the base material
- A3: Production process
- A4: Transporting the pumps to the logistic warehouse and building
- A5: Handling waste from product packaging
- B6: Operational energy use (1 year)
- C1: deconstruction of the product from the building
- C2: Transport EoL
- C3: Waste processing for reuse, recovery or recycling
- C4: waste disposal
- D: Re-use, recovery and/or recycling

The product stage (A1-A3) includes raw material supply, processing, transport and the manufacturing process according to *EN 15804+A2.* The input of biogenic carbon from the production of packaging material (cardboard, pallet) is considered in module A3. Green electricity is used during manufacturing at WILO´s production site.

The proportion of the electricity demand (during the manufacturing phase) covered by green electricity and the total electricity demand (B6, C3) is 5 %.

Use stage (B1-B7):
The contribution to operational energy use during the use phase (B6) is derived from the electricity consumption of the product. The RSL of 10 years is based on *Appendix 7: EUP Lot 11, Circulators in building*. For this study, the calculation principle recommended by the *PCR Part B* is used. For the Calculation of the energy demand of the pump, the absorbed power according to the *RAL-UZ 105, Blauer Engel für Heizungsumwälzpumpe* is applied. The running time of 5000h per year is estimated based on *VDMA-Technical Report*. The consumption grid mix is used for the electricity demand during the use phase (B6)

The End-of-Life stage (C1-C4):
At the end of life stage, the pump is manually disassembled from the system in which it has been installed. The definition of the applied end-of-life scenario in this EPD follows the requirements in the *PCR Part A*, 6.2 regarding complex products, with a combination of recycling and incineration of waste. 100 % of the material is considered in the end-of-life scenario as required in the PCR. C3 includes the mechanical seperation of the product followed by sorting steps. The residual electricity grid mix is used for these steps.

For the waste incineration of the WILO Para MAXO material specific waste incineration plants are taken into account. Based on the specific R1 values of these processes C3 and C4 are considered in the calculation. Relevant energy recoveries from the incineration processes of the product outside the product system under consideration are declared in the module D.

Beyond system boundary (D):

Where relevant, module D declares potential loads and benefits beyond the system boundaries considering secondary material use and energy recovery for pump materials leaving the product system. Module D recognizes the 'design for reuse, recycling and recovery' concept for buildings by indicating the potential benefits of avoided future use of primary materials while considering the loads associated with the recycling and recovery processes beyond the system boundary. Following *EN 15804+A2* a net flow analysis is used. The factors per kg material to evaluate the potential benefit are calculated.

3.3 Estimates and assumptions

Wherever available, primary data was used for all production processes. Generic data was used for the production of the materials used. Assumptions were made for Modules A4 (Transport to the logistics warehouse and customer), A5 (Handling waste from product packaging), C2 (Transport EoL) C3 (waste processing for reuse, recovery or recycling) and D (Re-use, recovery and/or recycling potential).

The pumps are delivered to a nearby logistic warehouse and from there they are delivered to the customers. Since no typical customer distance could be determined, an assumption of 300 km is made, with an average capacity of 80 % weighted by frequency. The transport in the EoL-stage (C2) is assumed with 100 km.

The pumps have an approximate RSL of 10 years and no scheduled maintenance or repairs are required. A typical recycling rate for electrical equipment of 86 % is assumed. Incineration is assumed for the remaining 14 %.

3.4 Cut-off criteria

No cut-off criteria in terms of the primary data supplied by the manufacturer are used. Therefore even the smallest volumes of input materials (less than five per cent by mass) are taken into account using generic data in the LCA.
During the manufacturing phase cuttings of the impeller (2.2 % by mass of the item) incurred as waste. Due to low impact, plastic incineration without energy recovery is assumed.

3.5 Background data

The software system *LCA for Experts* developed by Sphera was used for modelling the product's LCA. The data sets contained therein are either from the *MLC* database (by Sphera) (v 2024.2) or from the e*coinvent* database (v 3.10).

3.6 Data quality

The *LCA for Experts* software system for life-cycle analyses and the *MLC* database (v 2024.2), as well as the *ecoinvent* database (v 3.10) were used for the life-cycle modelling of the assessed products. The produced quantities for 2024 were gathered by Wilo.

Corresponding data sets were available for the input materials used. The age of the background data used (2014– 2023) is less than 10 years and can be regarded as representative for the assessment period.

For manufacturing in WILO´s production site, "Ökostrom DEW21" from "Dortmunder Energie-und Wasserversorgung GmbH" is used. The European electricity consumption mix is used for the operation.

3.7 Period under review

2024 was selected as the period of review. All internal data was collected for this period.

3.8 Geographic Representativeness

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

3.9 Allocation

No co-products arise during the manufacture of the pump which is why no allocations on the product level were necessary.

For the foreground system modelling of the in-house manufacturing (electricity, therm. energy, nitrogen, water) at WILO´s production site, a weight-based allocation of the environmental impacts at the production site level was performed.

The allocation procedures for the background data are described in the documentation of the data set used. The allocation is done either by physical (weight/energy) or economic values.

Material that is recycled (~ 82 % of the pump) is considered as an input for the next product system boundary.

3.10 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 data was taken from the *MLC database (v 2024.2)*. To fill occasional gaps, datasets from the e*coinvent database (v 3.10)* were used.

4. LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

The biogenic carbon content of the cardboard for packaging is 0,46 kg C/kg cardboard and for the palette for packaging 0,57 kg C/ kg pallet. The pallet is eight times reused.

Information on describing the biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in product	0	kg C
Biogenic carbon content in accompanying packaging	0.011	kg C

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO_2.

Information about the green electricity mix in A3:

The GWP total equals 0.013 kg CO_2e./kWh

Transport from the gate to the site (A4)

Name	Value	Unit
Litres of fuel	0.00934	l/100km
Transport distance	300	km
Capacity utilisation (including empty runs)	80	%

Assembly (A5)

Name	Value	Unit
Packaging waste for incineration (cardboard)	0.006	kg
Packaging waste for reuse (pallet)	0.204	kg

An RSL of 10 years can be used for building calculations according to Appendix 7: EUP Lot 11, Circulators in buildings.

Reference service life

Name	Value	Unit
Life Span according to the manufacturer	10	a

Operational energy use (B6)

According to *PCR Part B* the electricity consumption is declared per year

Name	Value	Unit
Electricity consumption	270.13	kWh

End of life (C1-C4)

Name	Value	Unit
Collected as mixed construction waste	3.1	kg
Transport distance	100	km
Recycling	2.66	kg
Incineration w/ energy recovery	0.43	kg
Incineration inert material	0.01	kg

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

Module D includes energy recoveries from the incineration processes (i.e., electricity and steam from plastics incineration) and material credits for product recycling. These credits are based on German average data for electrical and thermal energy and electronics production.

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

Name	Value	Unit
plastics for incineration, w/ energy recovery	0.19	kg
electronics for incineration w/ energy recovery	0.24	kg
Grey cast iron for recycling (net amount)	0.35	kg
Aluminium for recycling (net amount)	0.54	kg
Steel for recycling (net amount)	-0.30	kg
Stainless steel for recycling (net amount)	0.02	kg
Copper for recycling (net amount)	0.10	kg
Magnet for recycling (net amount)	0.05	kg

5. LCA: Results

Characterization model: *EN 15804 - 2012+A2 - 2019* (based on EF 3.1 (IPCC AR6). By Decision no. 20170712-n of the IBU SVR, the modules B3, B4, B5 are marked as MNR (module not relevant) as default. The LCA results in module B6 are given over a period of one year, according to *PCR Part B*. To obtain the results from module B6 over the entire life cycle, the LCA results of module B6 must be multiplied by the estimated RSL of 10 years. The indicator results in module B6 are given for Wilo-Para Maxo 25-180-11-F02.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = 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 pce Wilo-Para MAXO 25-180-11-F02

Parameter	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	3.46E+01	8.54E-02	3.88E-01	8.15E+01	0	2.14E-02	9.52E-01	3.53E-03	-6.38E+00
GWP-fossil	kg CO_2 eq	3.48E+01	8.33E-02	3.45E-04	8.07E+01	0	2.1E-02	8.61E-01	3.53E-03	-6.43E+00
GWP-biogenic	kg CO_2 eq	-2.83E-01	4.77E-04	3.88E-01	7.26E-01	0	8.09E-05	9.15E-02	-1.06E-05	4.94E-02
GWP-luluc	kg CO_2 eq	5.11E-02	1.6E-03	2.6E-07	1.23E-02	0	3.46E-04	1.22E-04	1.34E-05	-5.95E-03
ODP	kg CFC11 eq	1.07E-06	2.63E-14	1.94E-15	1.83E-09	0	3.04E-15	1.16E-09	1.46E-14	-5.99E-08
AP	mol H^+ eq	5.18E-01	1.37E-04	2.16E-06	1.56E-01	0	4.12E-05	8.63E-04	1.89E-05	-3.23E-02
EP-freshwater	kg P eq	1.88E-02	2.27E-07	6.48E-10	3.35E-04	0	8.8E-08	2.5E-05	7.8E-09	-6.1E-04
EP-marine	kg N eq	8.3E-02	5.41E-05	7.49E-07	3.89E-02	0	1.73E-05	3.2E-04	4.74E-06	-4.21E-02
EP-terrestrial	mol N eq	4.88E-01	6.39E-04	1.01E-05	4.08E-01	0	1.97E-04	2.9E-03	5.2E-05	-6.5E-02
POCP	kg NMVOC eq	1.67E-01	1.33E-04	1.95E-06	1.03E-01	0	4.06E-05	7.58E-04	1.47E-05	-1.77E-02
ADPE	kg Sb eq	4.95E-03	1.42E-08	1.75E-11	1.51E-05	0	1.79E-09	1.17E-06	2.36E-10	-3.23E-04
ADPF	MJ	5.04E+02	1.09E+00	2.63E-03	1.69E+03	0	2.71E-01	2.85E+00	5.69E-02	-7.9E+01
WDP	m^3 world eq deprived	3.08E+01	5.98E-04	8.75E-04	2.23E+01	0	3.19E-04	1.1E-01	1.01E-03	-1.02E+00

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 pce Wilo-Para MAXO 25-180-11-F02

Parameter	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
PERE	MJ	1.56E+02	1.21E-01	3.46E+00	1.22E+03	0	2.34E-02	4.22E-01	9.11E-03	-3.66E+01
PERM	MJ	3.46E+00	0	-3.46E+00	0	0	0	0	0	0
PERT	MJ	1.59E+02	1.21E-01	9.48E-04	1.22E+03	0	2.34E-02	4.22E-01	9.11E-03	-3.66E+01
PENRE	MJ	5.04E+02	1.09E+00	2.63E-03	1.69E+03	0	2.71E-01	9.35E+00	5.69E-02	-7.9E+01
PENRM	MJ	6.5E+00	0	0	0	0	0	-6.5E+00	0	0
PENRT	MJ	5.1E+02	1.09E+00	2.63E-03	1.69E+03	0	2.71E-01	2.85E+00	5.69E-02	-7.9E+01
SM	kg	1.65E+03	0	0	0	0	0	0	0	1.15E+03
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	8.63E-01	1.13E-04	2.07E-05	9.37E-01	0	2.6E-05	2.8E-03	2.71E-05	1.65E-02

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 pce Wilo-Para MAXO 25-180-11-F02

Parameter	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
HWD	kg	2.3E-05	5.33E-11	2.17E-12	2.45E-06	0	1.04E-11	4.72E-10	1.52E-11	-1.04E-05
NHWD	kg	3.22E+00	1.85E-04	2.11E-04	1.4E+00	0	4.43E-05	8.4E-02	1.34E-01	-1.7E+00
RWD	kg	4.39E-03	1.74E-06	8.35E-08	2.71E-01	0	4.94E-07	2.18E-04	1.38E-06	-3.45E-03
CRU	kg	0	0	0	0	0	0	0	0	0
MFR	kg	0	0	2.04E-01	0	0	0	2.66E+03	0	0

MER	kg	0	0	0	0	0	0	0	0	0
EEE	MJ	0	0	0	0	0	0	2.62E+00	0	0
EET	MJ	0	0	0	0	0	0	2.67E+00	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 pce Wilo-Para MAXO 25-180-11-F02

Parameter	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
PM	Disease incidence	2.18E-06	1.15E-09	1.49E-11	1.3E-06	0	3.29E-10	1.08E-08	2.43E-10	-4.79E-07
IR	kBq U235 eq	3.63E+00	1.84E-04	8.88E-06	4.46E+01	0	7.17E-05	3.99E-02	1.92E-04	-1.19E+00
ETP-fw	CTUe	5.52E+02	8.49E-01	1.08E-03	4.91E+02	0	2.01E-01	1.11E+00	3.03E-02	-1.57E+02
HTP-c	CTUh	6.08E-08	1.69E-11	7.64E-14	2.76E-08	0	4.07E-12	1.72E-10	7.17E-13	-6.9E-09
HTP-nc	CTUh	8.24E-07	7.14E-10	3.19E-12	4.23E-07	0	1.83E-10	3.78E-09	2.56E-11	-8.15E-08
SQP	SQP	1.75E+02	7.28E-01	9.95E-04	7.13E+02	0	1.34E-01	2.92E+00	1.07E-02	-5.37E+01

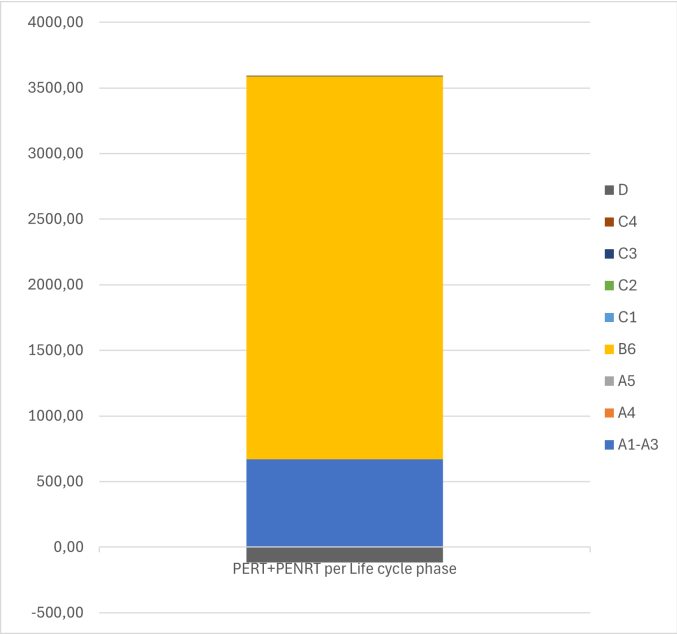
PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic);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

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”. 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 or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “potential soil quality index”. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.

6. LCA: Interpretation

In order to interpret the results of the LCA, both the aggregate indicators of the Life Cycle Inventory Analysis and the estimated impact were analysed in a dominance analysis. The largest share of the total primary energy demand (renewable+ non-renewable) is attributed to the operational energy use (B6) for one year (approx. 2900 MJ, 84 %). The modules A1-A3 account for approximately 670 MJ and 19 %.



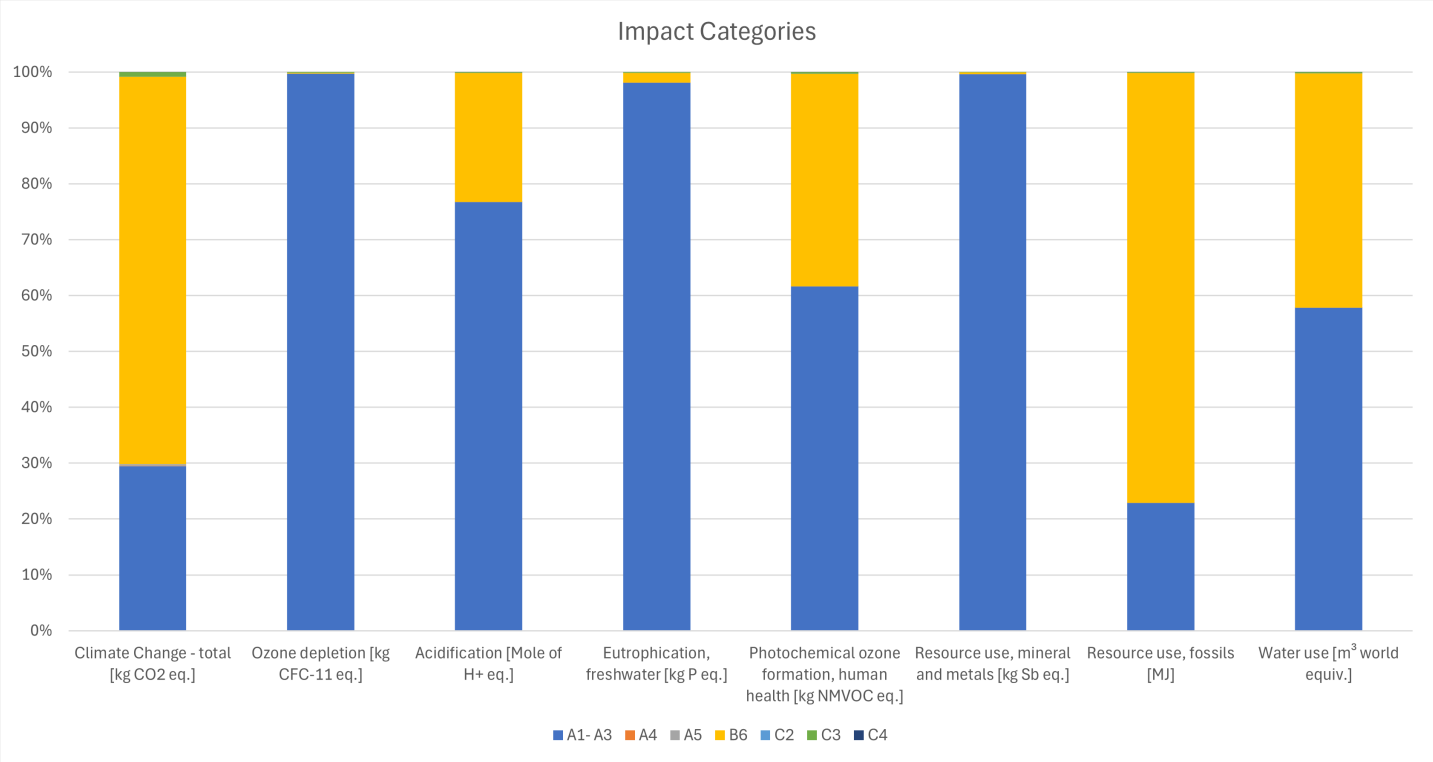
The environmental impact categories are significantly influenced by the provision of raw materials or the operational energy use. The transportation processes, packaging and disposal are not having a significant impact on the environmental impacts of the product.

Dominated by the electricity mix of Europe for the operation (one year) are the following impact categories (B6):

- Global warming potential
- Resource use, fossils

Dominated by the provision of raw materials (A1) are the following impact categories:

- Land use and land use change
- Ozone depletion
- Acidification
- Eutrophication
- Resource use, mineral and metals
- Water use



7. Requisite evidence

Requisite evidence is not required by the specific PCR Part B.

8. References

Standards

EN 15804
DIN EN 15804:2012-04+A2:2019+AC:2021, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.

ISO 9001
DIN EN ISO 9001:2015, Quality management systems– Requirements.

ISO 14001
DIN EN ISO 14001:2015, Environmental management systems - Requirements with guidance for use.

ISO 14021
DIN EN ISO 14021:2016, Environmental labels and declarations – Self-declared environmental claims (Type II environmental labeling).

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

ISO 50001
DIN EN ISO 50001:2018, Energy management systems - Requirements with guidance for use.

Further Literature

Appendix 7: EUP Lot 11, Circulators in buildings
AEA Energy & Environment for the European Commission, April 2008. Based on the DIRECTIVE 2009/125/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 October 2009.

Candidate List/ REACH
Candidate List of Substances of Very High Concern for Authorisation, ECHA , 2019.
Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

CPR Regulation
Regulation (EU) No 305/2011 of the European Parliament and of the Council of March 2011, laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC

Ecodesign Directive/Energy-Related Products Directive
DIRECTIVE 2009/125/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 October 2009 establishing a

framework for the setting of ecodesign requirements for energy-related products.

Electromagnetic Compatibility Directive
DIRECTIVE 2014/30/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL o 26th February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility.

European Waste Catalogue
Commission Decision of 16 January 2001 amending Decision 2000/532/EC as regards the list of wastes (relevant codes: EWC 07 02 13, EWC 12 01 01, EWC 12 01 03, EWC 15 01 01, EWC 15 01 02, EWC 15 01 03, EWC 16 02 14, EWC 16 02 16, EWC 16 06 01, EWC 17 02 03, EWC 17 04 02, EWC 17 04 05, EWC 17 04 11).

Machinery Directive
DIRECTIVE 2006/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17th May 2006 on machinery

Ordinance on Biocide Products
REGULATION (EU) No 528/2012 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 22 May 2012 concerning the making available on the market and use of biocidal products.

RAL-UZ 105, Blauer Engel für Heizungsumwälzpumpen
Blauer Engel für Heizungsumwälzpumpen, RAL DEUTSCHES INSTITUT FUR GUTESICHERUNG UND KENNZEICHNUNG E.V., 2007.

Restriction of the use of certain hazardous substances in electrical and electronic equipment
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.

WEEE Directive 2012/19/EU
DIRECTIVE 2012/19/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012, regulates waste electrical and electronic equipment (WEEE).

Software and databases

Ecoinvent database
Ecoinvent database version 3.10, 2024

Sphera´s Managed LCA Content (MLC)
Sphera MLC database, 2024.2

Specific literature

IBU 2021
Institut Bauen und Umwelt e.V.: General guide for the EPD program of the Institut Bauen und Umwelt e.V.(IBU). Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021. www.ibuepd.com

PCR part A
Product category rules for building-related products and services. Part A: Calculation rules for the LCA and requirements for the background report, v. 1.4. Berlin: Institut Bauen und Umwelt e.V. (publisher), 2024.

PCR Part B: Pumps for liquids and liquids with solids
PCR Guidance-Text for Building-Related Products and Services, Part B: Requirements on the EPD for Pumps for liquids and liquids with solids, Version 1.11. Berlin: Institut Bauen und Umwelt e.V., 2024.

Publisher

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

+49 (0)30 3087748- 0
info@ibu-epd.com
www.ibu-epd.com

Programme holder

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

+49 (0)30 3087748- 0
info@ibu-epd.com
www.ibu-epd.com

Author of the Life Cycle Assessment

TÜV Rheinland Energy & Environment GmbH
Am Grauen Stein 33
51105 Köln
Germany

+49 (0)221 806 0
carbon@de.tuv.com
www.tuv.com

Owner of the Declaration

Wilo SE
Wilopark 1
44263 Dortmund
Germany

0231 41027070
wilo@wilo.com
www.wilo.com