

Product Environmental Profile

Air/Water heat pump

Media Potencia PBM4-i
AURIGA HP+



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Independent verification of the declaration and data in compliance with ISO 14025: 2006 Internal: External: X	
The PCR review was conducted by a panel of experts chaired by Julie Orgelet (DDemain)	
PEPs are compliant with XP C08-100-1:2016 or EN 50693:2019 The components of the present PEP may not be compared with components from any other program	
Document complies with ISO 14025:2010 "Environmental labels and declarations. Type III environmental declarations"	



General information

Product category

Reversible air-water heat pump monobloc for collective residential and commercial use.

Declared unit

To produce heating and cooling thanks to an air-to-water heat pump of 20 kW* (heating capacity) according to the appropriate usage scenario and during the 22-year reference lifetime of the product.

*The capacity is to be adjusted according to the product considered in the range.

Functional unit

To produce 1 kW of heating or 1 kW of cooling according to the appropriate usage scenario defined in the EN 14825 standard and during the 22-year reference lifetime of the product.

Product information

Reference product: Platinum BC Monobloc Media Potencia PBM4-I 20 - reference 7832037

Technical characteristics of the reference product

$P_{designh}$ Design load for heating	20.0 kW (1)	$P_{designc}$ Design load for cooling	20.0 kW (2)
SCOP Seasonal coefficient of performance	5.0 (1)	SEER Seasonal cooling efficiency	5.29 (2)
Weight without packaging*	360.5 kg	R290 coolant fluid weight	4.45 kg

(*) The indicated weight corresponds to the weight of the product within the framework of the PEP and may present slight variations with the indicated weight in the technical documentation.

(1) According to EN 14825 - outside air temperature +7°C - water temperature 30/35°C

(2) According to EN 14825 - outside air temperature 35°C - average water temperature 18/23°C

Constituent materials

Metals		Plastics		Others	
Steel	66.2 %	Elastomer	0.9 %	Wood	3.9 %
Copper	10.4 %	Polyamide	0.6 %	Electronic components	1.6 %
Aluminum	9.7 %	Polypropylene	0.3 %	Frigorific R290	1.2 %
Ferrite	0.8 %	Polyvinyl chloride	0.2 %	Painting	0.9 %
Brass	0.7 %	Polycarbonate	0.1 %	Electric cable	0.7 %
Other metals	0.5 %	Other plastics	0.3 %	Other materials	1.0 %
Total	88.3 %		2.4 %		9.3 %

Total weight of the modeled product: 378.0 kg (including 17.5 kg of primary packaging)

Products cover by this PEP declaration

This PEP declaration covers all the products in the same environmental homogeneous family below.

BAXI Spain

Media Potencia PBM4-i 20 - 7832037

Media Potencia PBM4-i 30 - 7832038

Media Potencia PBM4-i 20 PS - 7837272

Media Potencia PBM4-i 30 PS - 7837273

BAXI Italy

AURIGA HP+ 20T - 7832039

AURIGA HP+ 30T - 7832040

AURIGA HP+/TX 20T - 7837274

AURIGA HP+/TX 30T - 7837275

The product must be controlled by an external regulation, not included in this modeling: it may be an input signal coming from a BMS (Building Management System) / CTM (Centralised Technical Management) or from a BAXI controller.

Life Cycle Assessment methodology

Methodology

The Product Environmental Profile (PEP) is based on Life Cycle Assessment in accordance with the rules published by PEP Ecopassport program (for more information on the program, consult the website www.pep-ecopassport.org).

All system boundaries are considered (manufacturing, distribution, installation, use, end of life) as well as benefits and costs beyond the life cycle.

This PEP declaration is representative of manufacturing in Spain and distribution, installation, use and end of life in Europe.

The results were obtained using EIME V6.1.3-1 software with its database “2023-02”.

Manufacturing stage

Raw materials and components	The production of 99.7% of the reference product weight (materials, components and packaging), as well as the shaping and assembly processes of the components were taken into account.
Raw materials and components packaging	The production and end of life of the packaging used for the transport of materials and components from the suppliers to the production site have been recorded.
Manufacturing waste	<p>We have identified the scrap rates and associated end of life of certain parts. For the other parts, we considered a amount of waste compliant to the PSR, i.e.:</p> <ul style="list-style-type: none">• 0.05 times for the amount of material for plastic injection processes and elastomer.• 0.3 times for the amount of material for all other materials and other shaping processes. <p>The default end of life scenario for waste id modelling as follows: 100% of incinerated waste without energy recovery.</p> <p>A transport distance of 100 km is applied for the collection of waste to the treatment centre.</p>
Product manufacturing	The modelling integrates the flows of our manufacturing site in Spain (energy, water, consumables of the industrial processes of the production site and the emissions of refrigerant).
Transport	The upstream transport of materials and components (with their packaging) is taken into account according to 3 models: local, intra-continental and inter-continental transport.

Distribution stage

Transport	<p>The distribution stage includes the transport by truck of the packaged product over a distance of 3500 km from our last logistics platforms to the distributor, then to the place of implementation in Europe.</p> <p>No reconditioning packaging was considered.</p>
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Installation stage

Accessory	<p>The installation phase includes a rubber feet and floor installation support and a water filter. For each of these accessories, we modeled material and production scrap, shaping process, packaging, end of life of scrap and transport to the place of implementation. 2 concrete sleepers are also modeled.</p> <p>No additional refrigerant charge was considered during the installation stage.</p>																		
Packaging waste	<p>The disposal (evacuation and treatment) of the packaging of the reference product and the safety group is modelled according to the European scenario below.</p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th></th> <th>Cardboard & Papers</th> <th>Wood</th> <th>Plastics</th> </tr> </thead> <tbody> <tr> <td>Recycling</td> <td>82%</td> <td>31%</td> <td>41%</td> </tr> <tr> <td>Energy recovery</td> <td>9%</td> <td>31%</td> <td>37%</td> </tr> <tr> <td>Not recovered (100% buried)</td> <td>9%</td> <td>38%</td> <td>22%</td> </tr> </tbody> </table>				Cardboard & Papers	Wood	Plastics	Recycling	82%	31%	41%	Energy recovery	9%	31%	37%	Not recovered (100% buried)	9%	38%	22%
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Recycling	82%	31%	41%																
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A European energy mix was used for this phase.

Use stage

Electricity consumption is calculated as below:

$$C_{tot} = \left(\frac{Ph}{SCOP * \left(1 + \frac{Fregul}{100}\right)} * t_{calorific} + \frac{Pc}{SEER} * t_{cooling} \right) * RLT$$

With:

Electricity consumption

- Ctot expressed in kWh
- SCOP, seasonal coefficient of performance defined according to EN 14825 (1)
- SEER, seasonal cooling efficiency defined according to EN 14825 (2)
- Fregul= 4, default setting for the water heating application
- Tcalorific, equivalent annual operating hours of the unit in active heating mode.
- Tcooling, equivalent annual operating hours of the unit in active cooling mode.
- Ph = Pdesignh, heat load according to regulation n° 813/2013 (1)
- Pc = Pdesignc, cooling load, according to regulation n° 813/2013 (2)
- RLT, reference lifetime of the device

(1) Outside air temperature +7°C - water temperature 30/35°C

(2) Outside air temperature 35°C - average water temperature 18/23°C

The electrical energy model considered for European use is:

Electricity Mix; Production mix; Low voltage; UE-27, (reference year: 2018)

Maintenance	<p>A biennial inspection, considering the travel of a technician over 100km, is modelled for the entire life of the product, which means 10 control visits.</p>
Refrigerant leaks	<p>The leak of R290 refrigerant into the air are taken into account at 3 g/year. There's no fluid refill considered during use of the equipment.</p>

End of life stage

Product end of life	The Heat pump falls within the scope of the WEEE directive (2012/19/EU). The end of life must therefore be managed by a local EEE waste treatment sector. We used The Life Cycle Inventories (LCI) developed by ECOSYSTEM*. <i>*ECOSYSTEM is the organisation in charge of ensuring the extended producer responsibility for WEEE in France.</i>
Refrigerant end of life	The refrigerant end of life follows the following scenario: 10% of fluid not collected, 90% of the fluid collected incinerated without recovery.
Transport	The considered transport to the treatment center is 1000 km for the refrigerant and 100 km for the product.

A European energy mix was used for this phase.

Benefits and loads

Loads	Loads related to the use of recycled materials are considered.
Benefits	The benefits related to the recycling of the packaging (at installation stage) and the product (at end-of-life stage) are considered. The Life Cycle Inventories (LCI) developed by ECOSYSTEM were used to model product recycling.

The method EF3.0 is applied for this declaration.

Environmental impacts

Environmental impacts at the declared unit per device, corresponding to the reference product

Impact indicators	Unit	Total	Manufacturing	Distribution	Installation	Use					End of life	Benefits and loads
		A-C	A1-A3	A4	A5	B1-B7	B1	B2	B6	B3-B5, B7	C1-C4	D
Mandatory indicators												
Climate change - total (IPCC 2013)	kg CO ₂ eq.	9.55E+04	2.63E+03	8.50E+01	5.32E+01	9.24E+04	0.00E+00	2.77E+02	9.21E+04	0.00E+00	3.38E+02	-9.01E+02
Climate change - fossil fuels	kg CO ₂ eq.	9.53E+04	2.57E+03	8.50E+01	5.19E+01	9.23E+04	0.00E+00	2.77E+02	9.20E+04	0.00E+00	3.21E+02	-8.83E+02
Climate change - biogenics	kg CO ₂ eq.	2.01E+02	6.06E+01	0.00E+00	1.28E+00	1.23E+02	0.00E+00	0.00E+00	1.23E+02	0.00E+00	1.67E+01	-1.73E+01
Climate change - land use and land use transformation	kg CO ₂ eq.	6.50E-04	6.50E-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
Ozone depletion (WMO 2014)	kg CFC-11 eq.	8.62E-04	2.07E-04	1.30E-07	3.92E-06	6.12E-04	0.00E+00	2.18E-04	3.94E-04	0.00E+00	3.86E-05	-3.81E-05
Acidification (AP)	mol H ⁺ eq.	5.52E+02	2.15E+01	5.38E-01	2.59E-01	5.27E+02	0.00E+00	1.18E+00	5.26E+02	0.00E+00	3.16E+00	-2.33E+01
Freshwater eutrophication	kg P eq.	2.79E-01	1.70E-02	3.19E-05	1.67E-04	2.52E-01	0.00E+00	3.09E-05	2.52E-01	0.00E+00	9.64E-03	-2.12E+00
Marine aquatic eutrophication	kg N eq.	6.39E+01	1.99E+00	2.52E-01	4.21E-02	6.01E+01	0.00E+00	3.85E-01	5.97E+01	0.00E+00	1.51E+00	-1.81E+00
Terrestrial eutrophication	mol N eq.	9.31E+02	2.19E+01	2.77E+00	4.44E-01	9.02E+02	0.00E+00	4.80E+00	8.97E+02	0.00E+00	3.47E+00	-1.87E+01
Photochemical ozone formation	kg NMVOC eq.	2.03E+02	7.74E+00	6.98E-01	1.41E-01	1.94E+02	1.96E-02	1.98E+00	1.92E+02	0.00E+00	1.04E+00	-6.22E+00
Abiotic resource depletion - metals and minerals	kg SB eq.	1.55E-01	1.46E-01	3.34E-06	7.62E-04	6.67E-03	0.00E+00	4.80E-08	6.67E-03	0.00E+00	7.85E-04	-9.22E-02
Abiotic resource depletion - fossils	MJ	2.48E+06	1.19E+05	1.19E+03	1.08E+03	2.35E+06	0.00E+00	3.38E+03	2.35E+06	0.00E+00	5.56E+03	-8.01E+03
Water requirement	m ³	1.05E+05	1.21E+03	3.23E-01	1.15E+01	3.27E+03	0.00E+00	1.39E+01	3.26E+03	0.00E+00	1.01E+05	-4.34E+05
Optional indicators												
Emission of fine particles	Disease occurrence	4.24E-03	1.36E-04	4.38E-06	1.38E-06	4.08E-03	0.00E+00	4.53E-06	4.08E-03	0.00E+00	1.77E-05	-9.57E-05
Ionizing radiation, human health	kg U235 eq.	1.65E+05	2.76E+04	2.07E-01	4.60E+02	1.37E+05	0.00E+00	1.21E+00	1.37E+05	0.00E+00	3.71E+01	-2.46E+02
Ecotoxicity (freshwater)	CTUe	1.20E+06	1.51E+05	5.72E+01	1.45E+03	9.93E+05	2.16E-04	1.06E+03	9.92E+05	0.00E+00	5.75E+04	-1.75E+05
Human toxicity, carcinogenic effects	CTUh	8.96E-04	8.76E-04	1.49E-09	9.21E-06	1.08E-05	0.00E+00	2.47E-08	1.07E-05	0.00E+00	3.39E-07	-1.22E-05
Human toxicity, non-carcinogenic effects	CTUh	6.20E-04	1.60E-04	1.62E-07	2.84E-06	4.36E-04	5.52E-11	1.02E-05	4.26E-04	0.00E+00	2.09E-05	-2.41E-04
Impacts related to land use/soil quality	-	2.74E+03	5.00E+01	0.00E+00	2.13E+00	1.83E+03	0.00E+00	0.00E+00	1.83E+03	0.00E+00	8.59E+02	-3.59E+03

B1: Use; B2: Maintenance; B3: Repair; B4: Replacement; B5: Restoration; B6: Energy requirements; B7: Water requirements

Environmental impacts to the declared unit per device, corresponding to the reference product

Impact indicators	Unit	Total A-C	Manufacturing A1-A3	Distribution A4	Installation A5	Use					End of life C1-C4	Benefits and loads D
						B1-B7	B1	B2	B6	B3-B5,B7		
Resource use indicators												
Total use of primary energy during the life cycle	MJ	2.93E+06	1.22E+05	1.19E+03	1.16E+03	2.80E+06	0.00E+00	3.38E+03	2.80E+06	0.00E+00	6.04E+03	-1.04E+04
Use of renewable primary energy, excluding renewable primary energy resources used as raw materials	MJ	4.53E+05	2.34E+03	1.58E+00	7.84E+01	4.51E+05	0.00E+00	4.45E-02	4.51E+05	0.00E+00	4.79E+02	-2.39E+03
Use of renewable primary energy resources used as raw materials	MJ	4.07E+02	4.00E+02	0.00E+00	6.79E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources	MJ	4.54E+05	2.73E+03	1.58E+00	8.51E+01	4.51E+05	0.00E+00	4.45E-02	4.51E+05	0.00E+00	4.79E+02	-2.39E+03
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials	MJ	2.48E+06	1.19E+05	1.19E+03	1.07E+03	2.35E+06	0.00E+00	3.38E+03	2.35E+06	0.00E+00	5.56E+03	-8.01E+03
Use of non-renewable primary energy resources used as raw materials	MJ	7.37E+02	7.28E+02	0.00E+00	8.95E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources	MJ	2.48E+06	1.19E+05	1.19E+03	1.08E+03	2.35E+06	0.00E+00	3.38E+03	2.35E+06	0.00E+00	5.56E+03	-8.01E+03
Use of secondary materials, water and energy resources												
Use of secondary materials	kg	1.49E+01	1.49E+01	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 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
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
Net use of freshwater	m ³	3.10E+03	2.70E+01	7.51E-03	2.67E-01	7.62E+01	0.00E+00	3.23E-01	7.59E+01	0.00E+00	3.00E+03	-1.09E+04
Waste category indicators												
Hazardous waste disposed	kg	7.94E+03	6.16E+03	0.00E+00	5.86E+01	1.72E+03	0.00E+00	3.78E-01	1.72E+03	0.00E+00	6.18E-04	-3.08E-01
Non hazardous waste disposed	kg	1.50E+04	1.68E+03	2.98E+00	1.72E+01	1.33E+04	0.00E+00	5.01E-01	1.33E+04	0.00E+00	4.21E+00	2.71E+01
Radioactive waste disposed	kg	3.98E+00	1.15E+00	2.12E-03	2.62E-03	2.82E+00	0.00E+00	4.97E-02	2.77E+00	0.00E+00	1.44E-04	-3.83E-03
Output flow indicators												
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
Materials for recycling	kg	3.40E+02	4.78E+01	0.00E+00	5.68E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.86E+02	0.00E+00
Materials for energy recovery	kg	4.86E+01	4.31E+00	0.00E+00	4.91E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.94E+01	0.00E+00
Exported Energy	MJ	8.15E+00	3.26E+00	0.00E+00	4.89E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

B1: Use; B2: Maintenance; B3: Repair; B4: Replacement; B5: Restoration; B6: Energy requirements; B7: Water requirements

Biogenic carbon content (assessment methodology 0/0)

- Biogenic carbon content of the product: 0.00E+00 kg C
- Biogenic carbon content of the associated packaging: 6.29E+00 kg C

Environmental impacts per kW, corresponding to the functional unit

The PEP was drawn up under the assumption 1 kW of heating or cooling power being supplied. The real impact of the stages of the life cycle of a product installed in an actual situation is calculated by the user of the PEP by multiplying the impact concerned by the total heating and cooling capacity of 20.0 kW.

Impact indicators	Unit	Total A-C	Manufacturing A1-A3	Distribution A4	Installation A5	Use					End of life C1-C4	Benefits and loads D
						B1-B7	B1	B2	B6	B3-B5,B7		
Mandatory indicators												
Climate change - total (IPCC 2013)	kg CO ₂ eq.	4.77E+03	1.32E+02	4.25E+00	2.66E+00	4.62E+03	0.00E+00	1.39E+01	4.61E+03	0.00E+00	1.69E+01	-4.50E+01
Climate change - fossil fuels	kg CO ₂ eq.	4.76E+03	1.29E+02	4.25E+00	2.60E+00	4.61E+03	0.00E+00	1.39E+01	4.60E+03	0.00E+00	1.61E+01	-4.42E+01
Climate change - biogenics	kg CO ₂ eq.	1.01E+01	3.03E+00	0.00E+00	6.40E-02	6.14E+00	0.00E+00	0.00E+00	6.14E+00	0.00E+00	8.35E-01	-8.64E-01
Climate change - land use and land use transformation	kg CO ₂ eq.	3.25E-05	3.25E-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
Ozone depletion (WMO 2014)	kg CFC-11 eq.	4.31E-05	1.04E-05	6.51E-09	1.96E-07	3.06E-05	0.00E+00	1.09E-05	1.97E-05	0.00E+00	1.93E-06	-1.91E-06
Acidification (AP)	mol H ⁺ eq.	2.76E+01	1.08E+00	2.69E-02	1.29E-02	2.63E+01	0.00E+00	5.88E-02	2.63E+01	0.00E+00	1.58E-01	-1.16E+00
Freshwater eutrophication	kg P eq.	1.40E-02	8.49E-04	1.59E-06	8.35E-06	1.26E-02	0.00E+00	1.54E-06	1.26E-02	0.00E+00	4.82E-04	-1.06E-01
Marine aquatic eutrophication	kg N eq.	3.19E+00	9.95E-02	1.26E-02	2.10E-03	3.00E+00	0.00E+00	1.92E-02	2.99E+00	0.00E+00	7.54E-02	-9.03E-02
Terrestrial eutrophication	mol N eq.	4.65E+01	1.09E+00	1.38E-01	2.22E-02	4.51E+01	0.00E+00	2.40E-01	4.49E+01	0.00E+00	1.73E-01	-9.36E-01
Photochemical ozone formation	kg NMVOC eq.	1.02E+01	3.87E-01	3.49E-02	7.05E-03	9.69E+00	9.80E-04	9.92E-02	9.59E+00	0.00E+00	5.22E-02	-3.11E-01
Abiotic resource depletion - metals and minerals	kg SB eq.	7.73E-03	7.32E-03	1.67E-07	3.81E-05	3.34E-04	0.00E+00	2.40E-09	3.34E-04	0.00E+00	3.92E-05	-4.61E-03
Abiotic resource depletion - fossils	MJ	1.24E+05	5.96E+03	5.93E+01	5.39E+01	1.17E+05	0.00E+00	1.69E+02	1.17E+05	0.00E+00	2.78E+02	-4.01E+02
Water requirement	m ³	5.26E+03	6.03E+01	1.61E-02	5.74E-01	1.64E+02	0.00E+00	6.94E-01	1.63E+02	0.00E+00	5.03E+03	-2.17E+04
Optional indicators												
Emission of fine particles	Disease occurrence	2.12E-04	6.82E-06	2.19E-07	6.90E-08	2.04E-04	0.00E+00	2.27E-07	2.04E-04	0.00E+00	8.85E-07	-4.78E-06
Ionizing radiation, human health	kg U235 eq.	8.25E+03	1.38E+03	1.03E-02	2.30E+01	6.85E+03	0.00E+00	6.04E-02	6.85E+03	0.00E+00	1.85E+00	-1.23E+01
Ecotoxicity (freshwater)	CTUe	6.01E+04	7.55E+03	2.86E+00	7.24E+01	4.96E+04	1.08E-05	5.28E+01	4.96E+04	0.00E+00	2.87E+03	-8.73E+03
Human toxicity, carcinogenic effects	CTUh	4.48E-05	4.38E-05	7.46E-11	4.60E-07	5.38E-07	0.00E+00	1.24E-09	5.37E-07	0.00E+00	1.69E-08	-6.08E-07
Human toxicity, non-carcinogenic effects	CTUh	3.10E-05	8.01E-06	8.08E-09	1.42E-07	2.18E-05	2.76E-12	5.10E-07	2.13E-05	0.00E+00	1.04E-06	-1.20E-05
Impacts related to land use/soil quality	-	1.37E+02	2.50E+00	0.00E+00	1.07E-01	9.16E+01	0.00E+00	0.00E+00	9.16E+01	0.00E+00	4.30E+01	-1.79E+02

B1: Use; B2: Maintenance; B3: Repair; B4: Replacement; B5: Restoration; B6: Energy requirements; B7: Water requirements

Environmental impacts per kW, corresponding to the functional unit

The PEP was drawn up under the assumption 1 kW of heating or cooling power being supplied. The real impact of the stages of the life cycle of a product installed in an actual situation is calculated by the user of the PEP by multiplying the impact concerned by the total heating and cooling capacity of 20.0 kW.

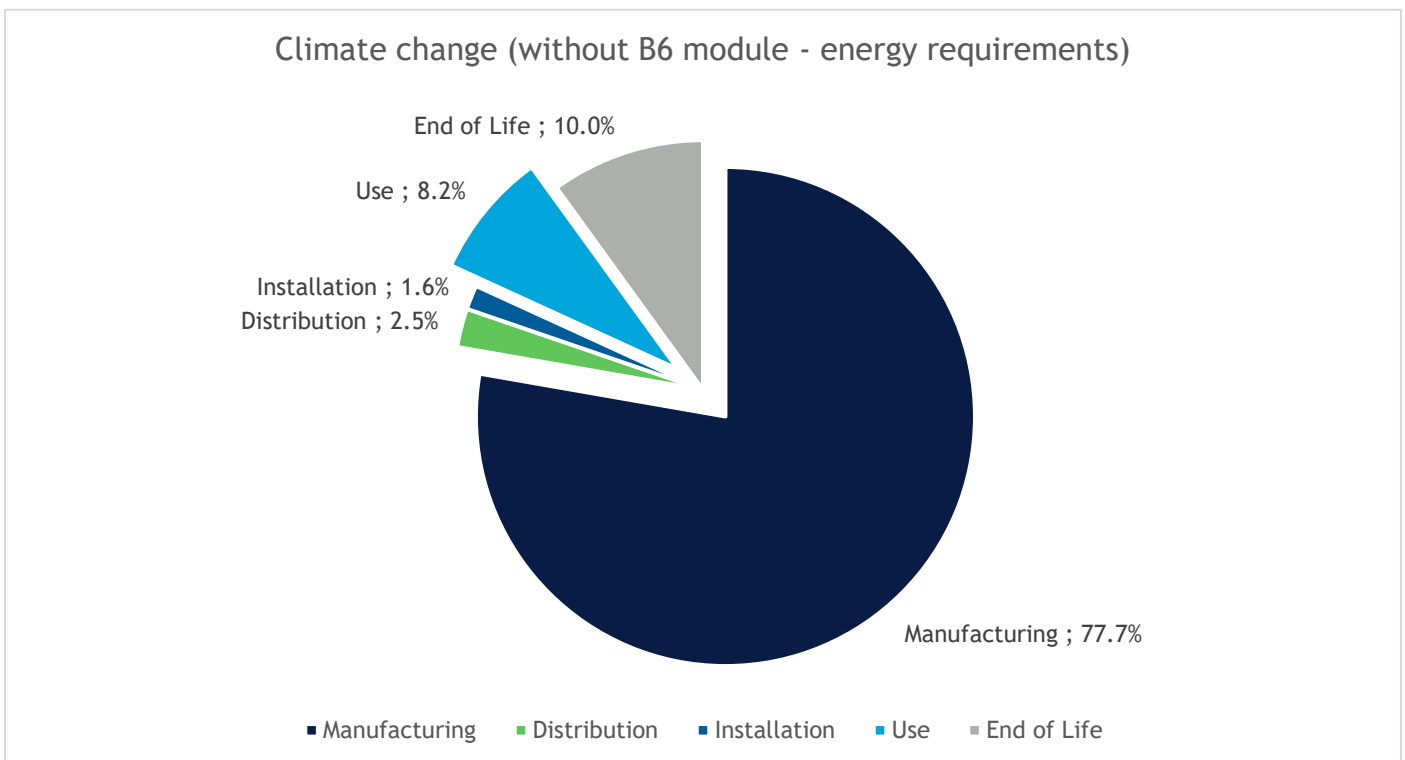
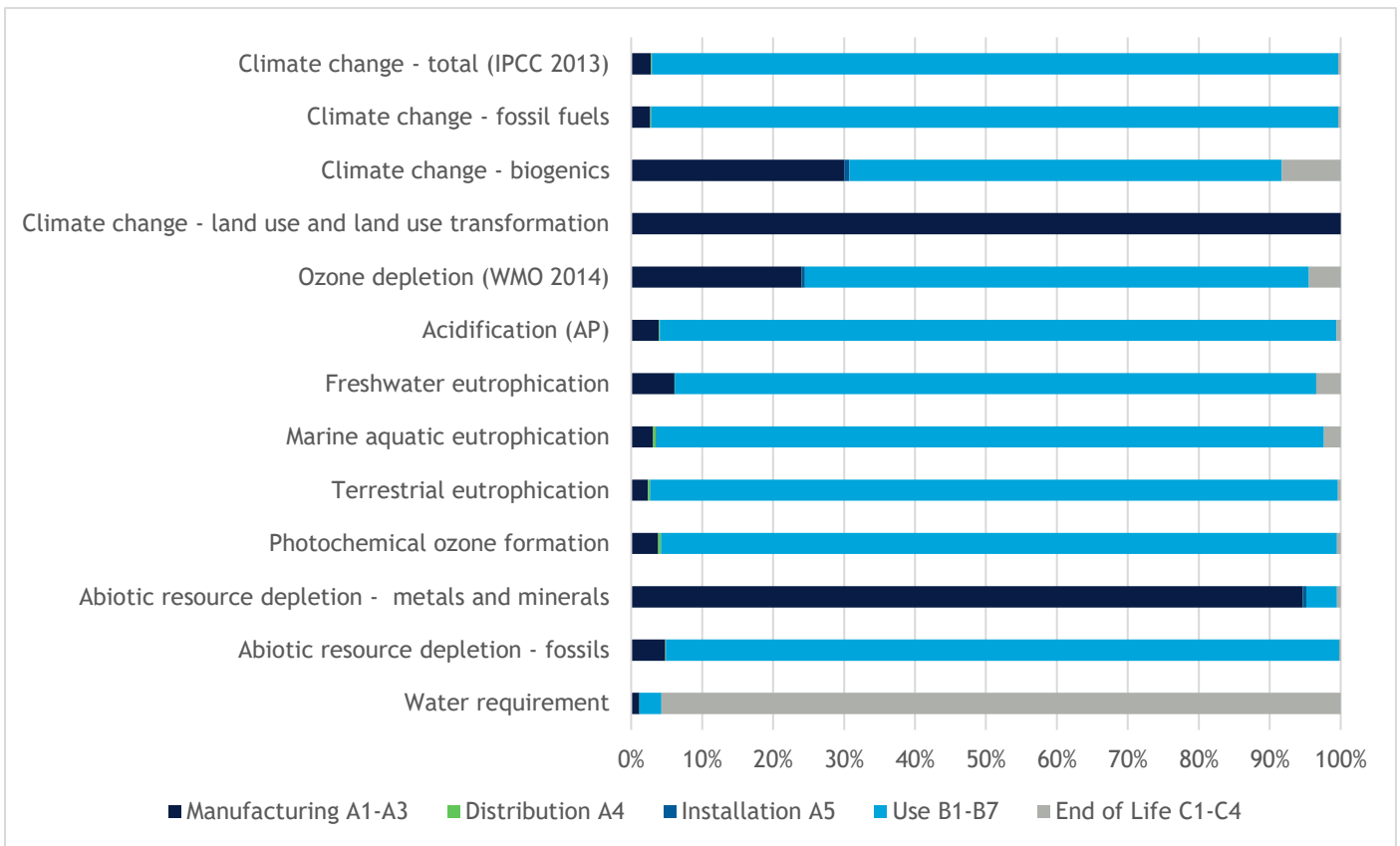
Impact indicators	Unit	Total A-C	Manufacturing A1-A3	Distribution A4	Installation A5	Use					End of life C1-C4	Benefits and loads D
						B1-B7	B1	B2	B6	B3-B5,B7		
Resource use indicators												
Total use of primary energy during the life cycle	MJ	1.47E+05	6.10E+03	5.93E+01	5.82E+01	1.40E+05	0.00E+00	1.69E+02	1.40E+05	0.00E+00	3.02E+02	-5.20E+02
Use of renewable primary energy, excluding renewable primary energy resources used as raw materials	MJ	2.27E+04	1.17E+02	7.91E-02	3.92E+00	2.25E+04	0.00E+00	2.23E-03	2.25E+04	0.00E+00	2.40E+01	-1.20E+02
Use of renewable primary energy resources used as raw materials	MJ	2.03E+01	2.00E+01	0.00E+00	3.39E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources	MJ	2.27E+04	1.37E+02	7.91E-02	4.26E+00	2.25E+04	0.00E+00	2.23E-03	2.25E+04	0.00E+00	2.40E+01	-1.20E+02
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials	MJ	1.24E+05	5.93E+03	5.93E+01	5.35E+01	1.17E+05	0.00E+00	1.69E+02	1.17E+05	0.00E+00	2.78E+02	-4.01E+02
Use of non-renewable primary energy resources used as raw materials	MJ	3.69E+01	3.64E+01	0.00E+00	4.47E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources	MJ	1.24E+05	5.96E+03	5.93E+01	5.39E+01	1.17E+05	0.00E+00	1.69E+02	1.17E+05	0.00E+00	2.78E+02	-4.01E+02
Use of secondary materials, water and energy resources												
Use of secondary materials	kg	7.43E-01	7.43E-01	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 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
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
Net use of freshwater	m ³	1.55E+02	1.35E+00	3.76E-04	1.34E-02	3.81E+00	0.00E+00	1.62E-02	3.79E+00	0.00E+00	1.50E+02	-5.45E+02
Waste category indicators												
Hazardous waste disposed	kg	3.97E+02	3.08E+02	0.00E+00	2.93E+00	8.61E+01	0.00E+00	1.89E-02	8.60E+01	0.00E+00	3.09E-05	-1.54E-02
Non hazardous waste disposed	kg	7.48E+02	8.39E+01	1.49E-01	8.58E-01	6.63E+02	0.00E+00	2.51E-02	6.63E+02	0.00E+00	2.10E-01	1.35E+00
Radioactive waste disposed	kg	1.99E-01	5.77E-02	1.06E-04	1.31E-04	1.41E-01	0.00E+00	2.49E-03	1.39E-01	0.00E+00	7.19E-06	-1.91E-04
Output flow indicators												
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
Materials for recycling	kg	1.70E+01	2.39E+00	0.00E+00	2.84E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.43E+01	0.00E+00
Materials for energy recovery	kg	2.43E+00	2.15E-01	0.00E+00	2.46E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.97E+00	0.00E+00
Exported Energy	MJ	4.08E-01	1.63E-01	0.00E+00	2.45E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

B1: Use; B2: Maintenance; B3: Repair; B4: Replacement; B5: Restoration; B6: Energy requirements; B7: Water requirements

Biogenic carbon content (assessment methodology 0/0)

- Biogenic carbon content of the product: 0.00E+00 kg C
- Biogenic carbon content of the associated packaging: 3.15E-01 kg C

Distribution of environmental impacts



Extrapolation rules

Calculation formula

At the declared unit, the environmental impacts for other covered references can be determined based on the formulas below and the data for each reference.

Phase	Extrapolation rules applied for the declared unit
Manufacturing	$\frac{\text{Mass of product considered} + \text{Mass of packaging of the product considered (kg)}}{\text{Mass of the reference product} + \text{Mass of packaging of the reference product (kg)}}$
Distribution	$\frac{\text{Mass of product considered} + \text{Mass of packaging of the product considered (kg)}}{\text{Mass of the reference product} + \text{Mass of packaging of the reference product (kg)}}$
Installation	$\frac{\text{Mass of packaging of the product considered (kg)}}{\text{Mass of packaging of the reference product (kg)}}$
Use - Emissions	1
Use - Maintenance	1
Use - Energy consumption	$\frac{\text{Total energy consumption of the product considered (kWh)}}{\text{Total energy consumption of the reference product (kWh)}}$
End of life	$\frac{\text{Mass of the product considered (kg)}}{\text{Mass of the reference product (kg)}}$
Benefits and loads	$\frac{\text{Mass of product considered} + \text{Mass of packaging of the product considered (kg)}}{\text{Mass of the reference product} + \text{Mass of packaging of the reference product (kg)}}$
Biogenic carbon content of the associated packaging	$\frac{\text{Mass of packaging of the product considered (kg)}}{\text{Mass of packaging of the reference product (kg)}}$

To determine the coefficients at the functional unit level, the coefficients at the declared unit level must be multiplied by the ratio between the rated power of the reference product and the rated power of the product considered.

$$\text{Extrapolation coefficient at the declared unit} \times \left(\frac{\text{Capacity of the reference product}}{\text{Capacity of the product considered}} \right)$$

The capacity of the product corresponding here at the rated load of the device in cold and hot modes, with respect to the operating time in each of the modes expressed in kW and defined by the following formula:

$$P_{rev} = \frac{t_{calorific} \times P_h + t_{cooling} \times P_c}{t_{calorific} + t_{cooling}}$$

With:

- Tcalorific, equivalent annual operating hours of the unit in active heating mode (2066 h)
- Tcooling, equivalent annual operating hours of the unit in active cooling mode (600 h)
- Ph = Pdesignh, heat load
- Pc = Pdesignc, cooling load

Input data to calculate the environmental impacts of other products in the range

Heat pump designation	Weight ⁽¹⁾ (kg)		Capacity ⁽²⁾ (kW)	Total electricity consumption (kWh)
	Product (without packaging)	Packaging		
Media Potencia... AURIGA...				
...PBM4-I 20 ...HP+ 20T	360.5	17.5	20.0	224721
...PBM4-I 30 ...HP+ 30T	379.5	17.5	30.0	328177
...PBM4-I 20 PS ...HP+/TX 20T	360.5	17.5	20.0	224721
...PBM4-I 30 PS ...HP+/TX 30T	379.5	17.5	30.0	328177

(1) The indicated weight corresponds to the weight of the product within the framework of the PEP and may present slight variations with the indicated weight in the technical documentation.

(2) Capacity: Prev - rated load of the device in cold and hot modes, with respect to the operating time in each of the modes

Extrapolation coefficient at the declared unit

For each stage of the life cycle, the environmental impacts of the product concerned are calculated by multiplying the impacts of the declaration corresponding to the reference product by the extrapolation coefficient. The "Total" column should be calculated by adding the environmental impacts of each stage of the life cycle.

Electric backup

Media Potencia...	...PBM4-i 20	...PBM4-i 30	...PBM4-i 20 PS	...PBM4-i 30 PS
AURIGA...	...HP+ 20T	...HP+ 30T	...HP+/TX 20T	...HP+/TX 30T
Manufacturing	1.000	1.050	1.000	1.050
Distribution	1.000	1.050	1.000	1.050
Installation	1.000	1.000	1.000	1.000
Use - Emissions	1.000	1.000	1.000	1.000
Use - Maintenance	1.000	1.000	1.000	1.000
Use - Energy consumption	1.000	1.460	1.000	1.460
End of life	1.000	1.053	1.000	1.053
Benefits and loads	1.000	1.053	1.000	1.053

Further information

For any other additional information on the PEP, please contact us at PEP-HP@BDRThermea.com