

Product Environmental Footprint

Reflex Variomat AT 8340E

Nordic Average



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Created with MÅLBAR LCA software by Armathec A/S

Self-assessment – Not third-party verified.

This LCA screening follows the Product Environmental Footprint (PEF) method developed by the European Commission. The report exclusively reports the climate footprint (kg CO₂ eq)

GENERAL INFORMATION

Product: Expansion vessel + packaging.

Product description: Unpressurized primary vessel, type VG, for pump-controlled pressurisation with active pressure maintenance, ensuring smooth and stable operation in heating and cooling systems. To achieve a complete pressurisation solution, select a suitable pump unit together with one or more expansion vessels of type VG/VF.

Functional Unit: Cradle-to-grave of one Expansion vessel with a reference service life of 15 years¹.

¹ The lifetime value used for calculation is a reference value and does not equate with the minimum, average or real lifetime.

DATA SUMMARY

Product type: Expansion vessel
Life cycle coverage: Cradle-to-grave

Total climate impact per Size:	kg CO ₂ eq.	Net Weight (kg)
200 L	208	33.7
300 L	275	45
400 L	358	59
500 L	452	75
600 L	500	83
800 L	641	107
1000 L	760	127
1500 L	1920	323.1
2000 L	2220	371.5
3000 L	3960	667
4000 L	4510	760
5000 L	5220	880
1000 -10 L	1450	242.5

LCA INFORMATION

Reference Service Life (time): 15 years

Method: Product Environmental Footprint (PEF) methodology developed by the European Commission, attributional approach.
Modeled using the software www.maalbar.dk

Databases: EF 3.1 and ecoinvent 3.11

Primary data: User-provided inputs from Armatec A/S (material weights, packaging, logistics).

Secondary data: EF 3.1 and ecoinvent 3.11 datasets.

Where primary data were unavailable, PEF compliant average assumptions were applied.

Geographical representativeness: Nordic estimate based on production in Wąbrzeźno (Poland) and warehouse locations in Vejle (Denmark), Glostrup (Denmark), Mölndal (Sweden), Trollåsen (Norway) and Vantaa (Finland). The product is primarily distributed to B2B customers across the European Union, North America and Asia.

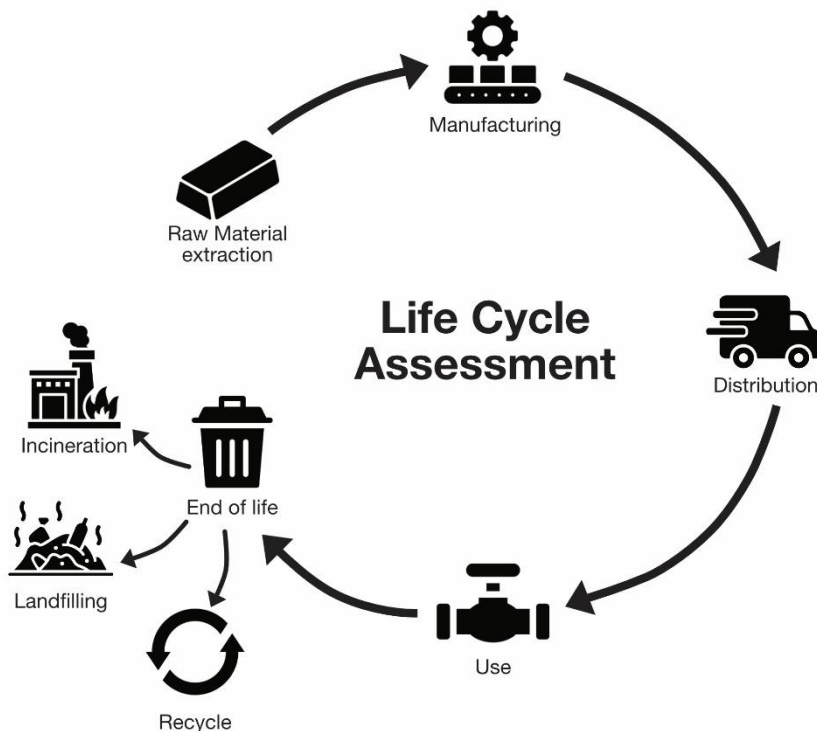
Purpose: The objective is to quantify the climate impact of the screened product using the Product Environmental Footprint (PEF) methodology. Other impact categories are not included in this assessment.

The report is a self-assessment, and the results are therefore intended for internal use only. Therefore, no independent third-party verification has been performed.

SYSTEM BOUNDARIES

Life cycle coverage: Cradle-to-grave.

Includes raw materials, preprocessing, component production, final manufacturing, packaging, distribution, use phase, and end of life treatment. The specific processes included in the life cycle can be found in the appendix 1 data qualification.



LIFE IMPACT ASSESSMENT

The assessment quantifies the cradle-to-grave climate impact (kg CO₂e) of the declared unit including both the expansion vessel and its associated packaging. The contribution of each lifecycle stage is presented in the table below, enabling identification of the primary impact sources throughout the product life cycle.

Lifecycle Stage/size	200 L PIM: [insert]	300 L PIM: [insert]	400 L PIM: [insert]	500 L PIM: [insert]	600 L PIM: [insert]
	Net: 33.7 kg Gross: 35.63 kg	Net: 45 kg Gross: 47 kg	Net: 59 kg Gross: 61.66 kg	Net: 75 kg Gross: 77.3 kg	Net: 83 kg Gross: 85 kg
	kg CO ₂ eq.	kg CO ₂ eq.	kg CO ₂ eq.	kg CO ₂ eq.	kg CO ₂ eq.
Material	119	157	205	260	287
Manufacturing	109	145	190	241	267
Distribution	13.5	16.9	21.1	26	28.4
Use Phase	0.828	1.09	1.42	1.8	1.99
End of life	-34.1	-45.8	-60.3	-76.9	-85.2
Total	208	275	358	452	500

Lifecycle Stage/size	800 L PIM: [insert]	1000 L PIM: [insert]	1500 L PIM: [insert]	2000 L PIM: [insert]	3000 L PIM: [insert]
	Net: 107 kg Gross: 109.6 kg	Net: 127 kg Gross: 130 kg	Net: 323.1 kg Gross: 327 kg	Net: 371.5 kg Gross: 378 kg	Net: 667 kg Gross: 676.3 kg
	kg CO ₂ eq.	kg CO ₂ eq.	kg CO ₂ eq.	kg CO ₂ eq.	kg CO ₂ eq.
Material	369	438	1110	1280	2290
Manufacturing	344	408	1040	1190	2140
Distribution	35.7	41.7	101	121	210
Use Phase	2.5	3.02	7.64	8.82	15.8
End of life	-110	-131	-334	-384	-690
Total	641	760	1920	2220	3960

Lifecycle Stage/size	4000 L PIM: [insert]	5000 L PIM: [insert]	1000 - 10 L PIM: [insert]
	Net: 760 kg Gross: 770 kg	Net: 880 kg Gross: 891 kg	Net: 242.5 kg Gross: 248 kg
	kg CO ₂ eq.	kg CO ₂ eq.	kg CO ₂ eq.
Material	2610	3020	837
Manufacturing	2440	2820	779
Distribution	238	275	81.7
Use Phase	18	20.8	5.79
End of life	-787	-911	-250
Total	4510	5220	1450

METHODS

Standard for calculation

This LCA screening follows the EU Product Environmental Footprint (PEF) methodology. When Armatec A/S data were unavailable, average values were used. All life cycle stages are included. For the post-factory gate stages, Use Phase and End of Life, PEF-based average assumptions are applied based on the geographical location. Data sources include EF 3.1 PEF, ecoinvent 3.11, and other PEF compliant datasets (see more at maalbar.dk/transparency).

Relationship to other methods and standards

Each PEF requirement is developed based on recommendations from recognized environmental accounting methods and guidance documents. The main methodological guides considered are:

A. EN ISO 14040:2006	G. EN ISO 14025:2010	M. Ecological Footprint Standard
B. EN ISO 14044:2006	H. ISO 14050:2020	N. Greenhouse Gas Protocol
C. EN ISO 14067:2018	I. CEN ISO/TS 14071:2016	O. BP X30-323-0:2015
D. ISO 14046:2014	J. ISO 17024:2012	P. PAS 2050:2011
E. EN ISO 14020:2001	K. PEF Guide	Q. ENVIFOOD Protocol
F. EN ISO 14021:2016	L. ILCD	R. FAO:2026

DISCLAIMER

Armatec A/S is solely responsible for all user-input data (including material weights, packaging weight and dimensions, origins of production, origins of material, transport information and warehouse and retail information). In cases where specific product data were not available, Armatec developed estimates to ensure completeness of the assessment.

The distribution modelling represents a Nordic average based on the included warehouse locations and standard market assumptions. Actual results may therefore vary slightly in practice depending on the specific destination and shipment route. See appendix 1 for a detailed explanation of the data.

REPORT DISCLAIMER

This report is based on an automatically generated assessment report produced using MÅLBAR LCA, with Armatec A/S conducting the self-assessment.

APPENDIX 1: DATA QUALIFICATION

This LCA-screening is based on user-input data from Armatec A/S, along with average data in conformity with PEF. Where no user-input has been applied, average assumptions have been used following PEF guidance. The modelling inputs used can be found in the tables below.

Data Input		Description	Assumptions and limitations
Component production and waste	Percentage share of the total weight		
Expansion Vessel	83%	Steel sheet	All weights distributions and production methods are estimates provided by the engineers at Armatec A/S. In cases where the correct material or production method is not available in the database, alternative options have been identified and estimated by the engineers at Armatec (Waste from material origin and during production is estimated based on PEF database standards.)
Membrane	9%	Thermoplastic component - pure polymers and ready-made composites. EPDM rubber BMC /with unknown amount of filler and additives). Compression moulding.	
Flanges and stub ends	4.5%	Carbon steel machined	
Powder Coating	1%	Powder coating on steel (kg)	
Plastic parts	1%	Thermoplastic component - pure polymers and ready-made composites. Polyamide (PA6) granulates. Injection moulding	
LIS sensor	0.5%	50 % Stainless steel, 25% PCB, 15% copper and 10% thermoplastic.	
Valves and Fittings	1%	½ Brass die cast and ½ steel investment cast (lost wax).	
Total:	100%		

Data Input		Description	Assumptions and limitations
Packaging: Half Pallet 200 L – 1500 L	Weight (kg)		
	0.0025	Molded polypropylene (PP) item	All component weights are estimates provided by Armatec A/S.
	0.0094	Paper w/ black & white print	In cases where the correct material or production method is not available in the database, alternative options have been identified and estimated by the engineers at Armatec
	0.005	Polyethylene bag (PE-LD)	Estimations have been made for the geographical location of packaging production.
	1.22	Paper for packaging	
	0.012	Plastic stretch film	
	0.018	Polypropylene strapping band	
	1.6	Solid softwood	It is estimated that there can be 1 package of this size on a pallet (80 cm× 60 cm).

Data Input		Description	Assumptions and limitations
Packaging: Full Pallet 2000 L – 5000 L	Weight (kg)		
	0.005	Molded polypropylene (PP) item	All component weights are estimates provided by Armatec A/S.
	0.0094	Paper w/ black & white print	In cases where the correct material or production method is not available in the database, alternative options have been identified and estimated by the engineers at Armatec
	0.005	Polyethylene bag (PE-LD)	Estimations have been made for the geographical location of packaging production.
	1.22	Paper for packaging	
	0.012	Plastic stretch film	
	0.018	Polypropylene strapping band	
	3.2	Solid softwood	It is estimated that there can be 1 package of this size on a pallet (120 cm× 80 cm).

Data Input	Description	Assumptions and limitations
Location Tier 1 Warehouse	Wąbrzeźno, Poland. Vejle, Denmark; Glostrup, Denmark; Mölndal, Sweden; Trollåsen, Norway; Vantaa, Finland	It is assumed that production and assembly takes place in Poland. Nordic distribution is estimated using warehouse locations in Vejle, Glostrup, Mölndal, Trollåsen and Vantaa. The origin of materials is modelled based on PEF database standards.
Routes Tier 1 -> Warehouse Warehouse -> b2b	Tier 1 → warehouse average: 723.925 km road Europe: approx. 1,000 km road USA/Canada: approx. 7,500 km total, incl. 6,500 km sea + 1,000 km road. Asia: approx. 27,000 km total, incl. 26,960 km sea + 40 km road.	Transport distances are estimated using EcoTransIT (www.ecotransit.org), while transport modes are based on standard logistics assumptions. Road transport is assumed to be by lorry (14-20 tonnes) and sea transport by container vessel. Additional transport modelling follows PEF database methodologies. An average transport distance between suppliers and warehouse locations has also been estimated, as the assessment is intended to represent the aggregated logistics network across all Nordic locations. This screening estimate uses Gadheim (Germany), Toronto (Canada), and Shanghai (China) as representative destinations for Europe, North America, and Asia for B2B estimation. Where specific logistics data are unavailable, Nordic average assumptions are applied. Actual transport routes and distances may vary.
Product replacements - Logistics	0.1%	Estimate provided by the engineers at Armatec A/S
Product replacements - Quality	0.4%	Estimate provided by the engineers at Armatec A/S
Use phase Product category	Expansion vessel, lifetime 15 years.	Consists of: Product replacements, Quality and Energy use (if relevant) Estimate provided by the engineers at Armatec A/S
EoL Country share 2025	95% B2B – Europe 2.5% B2B – North America 2.5% B2B – Asia	This is an estimate prepared by Armatec's Country Share for the year 2025. Country share is based on warehouse activity shares. Each warehouse is assumed to use the same market split.