

Altivar 21

0.75 to 7.5 kW - IP54 range

Product Environmental Profile



Product Environmental Profile - PEP

Product overview

The main function of the Altivar 21 range is control and variable speed control of an asynchronous electric motor, mainly for HVAC applications.

This range consists of products from 0.75 to 75 kW operating at both 200 and 480 V, single-phase or three-phase.

The representative product used in the study is the complete Altivar 21 rated 0.75 kW 400 V (ref. ATV21W075N4).

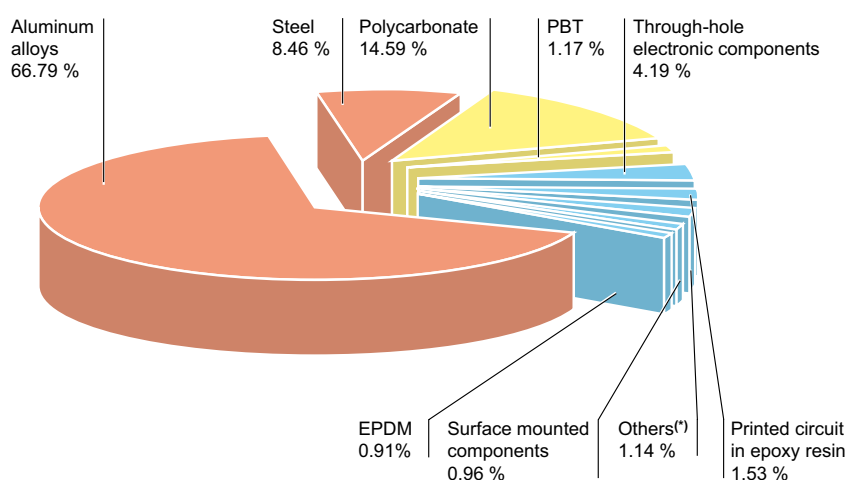
It is representative of the whole ATV21 0.75 to 7.5 kW IP54 range. The other products in the range are created with the same technology, using the same manufacturing process.

The environmental analysis has been conducted in accordance with standard ISO 14040

«Environmental management: analysis of the life cycle, principles and framework». It takes account of the various stages in the product life cycle.

Constituent materials

The weight of products in the range varies from 7,000 g to 10,950 g. It is 7,000 g excluding packaging for the analyzed Altivar 21 0.75 kW 400 V. The constituent materials are divided as follows:



(*) The "Others" category includes all elements present at less than 1%.

All possible measures should be taken by our services, suppliers, and subcontractors so that materials used to make up products in the Altivar 21 range do not contain any substances prohibited by the current regulations⁽¹⁾ at the time of its release onto the market.

As standard, this range contains neither batteries, nor storage batteries. The site where this product range was designed is certified ISO 14001 for its eco-friendly design process.

(1) List available on request.

Manufacturing

This range is manufactured on a Schneider Electric production site that has implemented an environmental management system certified ISO 14001.

Constant process improvement has allowed us to reduce the site's annual energy consumption by an average of 5 %.

Complete sorting of waste has allowed us to attain a recycling rate of 99 %.

Distribution

The packaging has been designed to be lighter and less bulky in compliance with the European Union packaging directive 94/62/EC. The total weight of the packaging is 165 g, consisting solely of cardboard. Inside the packaging, a 200 g user manual and a CD-ROM weighing 23 g are also included.

Product distribution channels have been optimized by the setting up of local distribution centers close to the areas where products are purchased.

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Utilization

Products in the Altivar 21 - 0.75 to 7.5 kW IP54 range do not pose any particular nuisance requiring special operating instructions (noise, emissions, etc.).

The electrical energy consumed depends on the product setup and operating conditions.

Their power consumption varies from 55 W to 291 W. It is 55 W for the Altivar 21 0.75 kW 400 V and represents less than 7.5 % of the total power that flows through the product.

End of life

At the end of life, products in the Altivar 21 range should be dismantled in order to recycle as many as possible of the various constituent materials. The potential recycling rate is more than 96 %.

This percentage includes ferrous metals, aluminum alloys and plastics marked with the recycling symbol.

Products in this range also incorporate electronic boards which can be extracted and sent to specialist recycling companies.

End-of-life data is described in detail in the product end-of-life datasheet.

Environmental impacts



The Life Cycle Analysis (LCA) was conducted using EIME (Environmental Impact and Management Explorer) software version 1.6 and its database version 5.4.

The product's hypothetical usable life is 10 years and the electrical energy model used is the European model.

The scope of the analysis consists of an Altivar 21 0.75 kW 400 V IP54.

The environmental impacts were analyzed on the following stages: Manufacturing (M) including production of raw materials, Distribution (D) and Use (U).

Presentation of the product's environmental impacts:

Indicators	Unit	ATV21 IP54 0.75 kW 400 V SE (1.000 unit)			
		S = M + D + U	M	D	U
Raw Material Depletion	Y-1	$2.71 \cdot 10^{-13}$	$2.42 \cdot 10^{-13}$	$7.20 \cdot 10^{-18}$	$2.93 \cdot 10^{-14}$
Energy Depletion	MJ	$3.43 \cdot 10^4$	$1.36 \cdot 10^3$	9.46	$3.29 \cdot 10^4$
Water Depletion	dm ³	$4.66 \cdot 10^3$	$3.75 \cdot 10^2$	7.98	$4.28 \cdot 10^3$
Global Warming	g _{CO₂}	$2.15 \cdot 10^6$	$8.71 \cdot 10^4$	$2.88 \cdot 10^2$	$2.06 \cdot 10^6$
Ozone Depletion	g _{CFC-11}	$2.75 \cdot 10^{-1}$	$1.97 \cdot 10^{-2}$	$1.63 \cdot 10^{-4}$	$2.55 \cdot 10^{-1}$
Air Toxicity	m ³	$4.45 \cdot 10^8$	$2.15 \cdot 10^7$	$2.23 \cdot 10^5$	$4.23 \cdot 10^8$
Photochemical Ozone Creation	g _{C₂H₄}	$7.72 \cdot 10^2$	44.2	$2.52 \cdot 10^{-1}$	$7.28 \cdot 10^2$
Air Acidification	g _{H⁺}	$3.66 \cdot 10^2$	16.2	$1.82 \cdot 10^{-1}$	$3.50 \cdot 10^2$
Water Toxicity	dm ³	$2.14 \cdot 10^5$	$9.26 \cdot 10^4$	$1.28 \cdot 10^2$	$1.21 \cdot 10^5$
Water Eutrophication	g _{PO₄}	$1.28 \cdot 10^2$	$1.20 \cdot 10^2$	$5.46 \cdot 10^{-2}$	7.98
Hazardous Waste Production	kg	30.2	$6.25 \cdot 10^{-1}$	$2.62 \cdot 10^{-4}$	29.5

The product life cycle analysis demonstrates that the product use phase (phase U) is the phase which has most impact on the majority of environmental indicators.

The analysis also shows that the indicators for this phase are strongly influenced by the "product heat dissipation" parameter.

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System approach

The variable speed drive can produce energy savings by optimizing the operating cycles of asynchronous electric motors.
In transient state, products in the Altivar 21 range can reduce an installation's energy consumption by over half.

The environmental impact values given above are only valid for the specific context mentioned. They must not be used directly to draw up the installation's environmental report.

Glossary

Raw Material Depletion (RMD)

This indicator quantifies the consumption of raw materials during the life cycle of the product. It is expressed as the fraction of natural resources that disappear each year, with respect to all the annual reserves of the material.

Energy Depletion (ED)

This indicator gives the quantity of energy consumed, whether it be from fossil, hydroelectric, nuclear or other sources.
This indicator takes into account the energy from the material produced during combustion. It is expressed in MJ.

Water Depletion (WD)

This indicator calculates the volume of water consumed, including drinking water and water from industrial sources. It is expressed in dm³.

Global Warming Potential (GWP)

The global warming of the planet is the result of the increase in the greenhouse effect due to the sunlight reflected by the earth's surface being absorbed by certain gases known as «greenhouse-effect» gases. The effect is quantified in gram equivalent of CO₂.

Ozone Depletion (OD)

This indicator defines the contribution to the phenomenon of the disappearance of the stratospheric ozone layer due to the emission of certain specific gases. The effect is expressed in gram equivalent of CFC-11.

Photochemical Ozone Creation (POC)

This indicator quantifies the contribution to the «smog» phenomenon (the photochemical oxidation of certain gases which generates ozone) and is expressed in gram equivalent of methane (C₂H₄).

Air Acidification (AA)

The acid substances present in the atmosphere are carried by rain. A high level of acidity in the rain can cause damage to forests. The contribution of acidification is calculated using the acidification potentials of the substances concerned and is expressed in mode equivalent of H⁺.

Hazardous Waste Production (HWP)

This indicator calculates the quantity of specially treated waste created during all the life cycle phases (manufacturing, distribution and utilization). For example, special industrial waste in the manufacturing phase, waste associated with the production of electrical power, etc. It is expressed in kg.



We are committed to safeguarding our planet by "Combining innovation and continuous improvement to meet the new environmental challenges".

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