Product Environmental Profile

Altivar 212 range: 0.75 to 18.5 kW – IP21

Schneider Electric

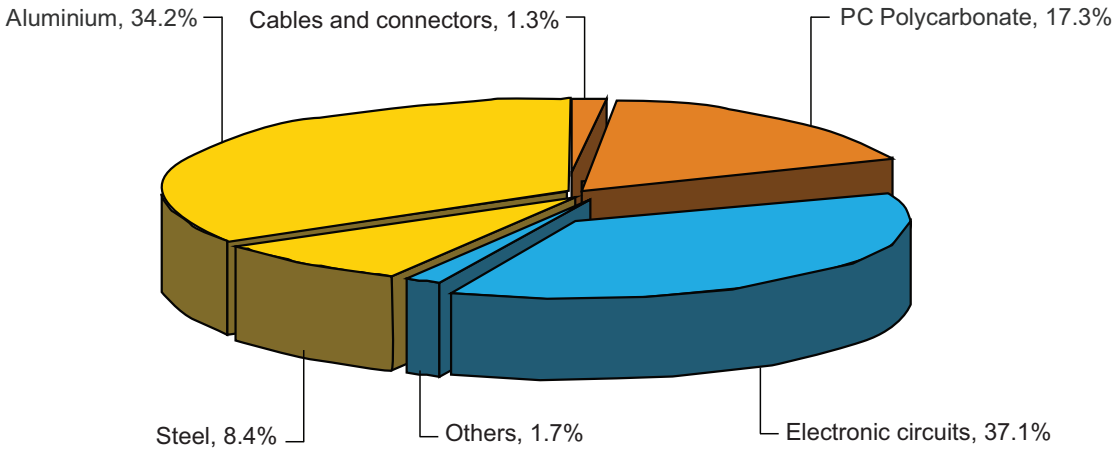
Product Environmental Profile - PEP

Product Overview

The main function of the Altivar 212 – 0.75 to 18.5 kW product range is to intend for the control and variation of the rotational speed of an asynchronous electric motor for HVAC applications.
This range consists of products with ratings from 0.75 to 18.5 kW for operation from 200/240 and 380/480 V, 3 phases supplies.
The representative product used for the analysis is the Altivar 212 / 0.75 kW / 200 V / 3PH (ref. ATV212H075M3X).
The environmental impacts of this referenced product are representative of the impacts of the other products of the range which are developed with the similar technology.
The environmental analysis was performed in conformity with standard ISO 14040.
This analysis takes the stages of the life cycle of the product into account.

Constituent materials

The mass of the product range included in this analysis is from 1 200 g to 8 850 g no including packaging. It is 1288 g for the Altivar 212 / 0.75 kW / 200 V / 3PH.
The constituent materials are distributed as follows:



Products of this range are designed in conformity with the requirements of the RoHS directive (directive 2002/95/CE of 27 of January 2003) and do not contain, or in the authorised proportions, lead, mercury, cadmium, hexavalent chromium, flame retardant (polybromobiphenyles PBB, polybromodiphenylethers PBDE) as mentioned in the directive.

Manufacturing

The Altivar 212 – 0.75 to 18.5 kW product range is manufactured at a Schneider Electric production site on which an ISO 14001 certified environmental management system has been established.

Distribution

The mass and volumes of the packaging have been reduced, in compliance with the European Union's packaging directive.
The Altivar 212 – 0.75 to 18.5 kW packaging mass is 417 g which mainly consists of recyclable cardboard and polyethylene bags for accessories.
No foam chock, or staple is used.

Utilisation

The products of the Altivar 212 – 0.75 to 18.5 kW range do not generate any environmental pollution requiring special precautionary measures (noise, emissions, and so on) in using phase.
The dissipated power depends on the conditions under which the product is implemented and used.
Their internal power consumption ranges from 55 W to 698 W. It is 63 W for the Altivar 212 / 0.75 kW / 240 V / 3PH and accounts for 8 % of the total power flowing through the product.

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End of life

At end of life, the products in the Altivar 212 – 0.75 to 18.5 kW range have been optimized to decrease the amount of waste and valorise the components and materials of the product in the usual end of life treatment process.
The design has been achieved so as components are able to enter the usual end of life treatment processes as appropriate: depollution if recommended, reuse and/or dismantling if recommended so as to increase the recycling performances and shredding for separating the rest of materials.
The potential of recyclability of the products has been evaluated using the CODDE “recyclability and recoverability calculation method” (version V1, 20 Sep. 2008) and published by ADEME (French Agency for Environment and Energy Management).
According this method, the potential recyclability ratio is: 68 %.
The recommendations to optimize the recycling performance are detailed in the “End of Life Instructions” of this product range.

Environmental impacts

The environmental impacts were analysed for the Manufacturing (**M**), the Distribution (**D**) and the Utilisation (**U**) phases.
This product range is included in the category Energy consuming products (assumed life time is 10 years).
The scenario taken into account in this analysis for the Using phase (U) is as follows:

- Active phase: consumed power: 63 W for 60 % uptime,
- Idle phase: consumed power: 11 W for 10 % uptime,
- Sleep phase: consumed power: 0 W for 30 % uptime,
- 24 hours per day, during 10 years.

The EIME (Environmental Information and Management Explorer) software version V4.0 and its database version V11 were used for the life cycle assessment (LCA).
The calculation has been done on Altivar 212 / 0.75 kW / 200 V / 3PH (ref ATV212H075M3X).
The electric power model used is the European model.

Presentation of the environmental impacts:

Environmental indicators	Unit	ATV212H075M3X			
		S = M+D+U	M	D	U
Raw Material Depletion	Y-1	**3.04E^{-13}**	2.60E^{-13}	1.04E^{-17}	4.43E^{-14}
Energy Depletion	MJ	**3.94E^{+04}**	3.67E^{+02}	7.61	3.90E^{+04}
Water Depletion	dm^3	**5.79E^{+03}**	1.47E^{+02}	7.22E^{-01}	5.64E^{+03}
Global Warming Potential	g≈CO_2	**1.99E^{+06}**	1.98E^{+04}	6.02E^{+02}	1.97E^{+06}
Ozone Depletion	g≈CFC-11	**1.11E^{-01}**	3.61E^{-03}	4.26E^{-04}	1.07E^{-01}
Air Toxicity	m^3	**3.33E^{+08}**	5.76E^{+06}	1.13E^{+05}	3.27E^{+08}
Photochemical Ozone Creation	g≈C_2H_4	**6.74E^{+02}**	7.46	5.15E^{-01}	6.66E^{+02}
Air Acidification	g≈H^+	**2.70E^{+02}**	3.84	7.68E^{-02}	2.66E^{+02}
Water Toxicity	dm^3	**5.67E^{+05}**	5.08E^{+03}	75.30	5.62E^{+05}
Water Eutrophication	g≈PO_4	**5.46**	8.26E^{-01}	1.00E^{-02}	4.63
Hazardous Waste Production	kg	**33.58**	9.17E^{-01}	2.24E^{-04}	32.67

The Life Cycle Analysis of the product shows that the usage phase (stage U) is the life cycle phase that has the greatest impact on the majority of the environmental indicators.

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System approach

The variable speed drive saves energy by optimising the operating cycles of the machines used for HVAC applications.
Under transient conditions, products in the Altivar 212 range can usually reduce up to 50 % the energy consumption of an installation and for certain applications, saving can rise up to 70 %.

As the products of the range Altivar 212 are designed in accordance with the RoHS directive (European Directive 2002/95/EC of 27 January 2003). they can be incorporated without any restriction within an assembly or an installation submitted to this Directive.

N.B.: Please note that the environmental impacts of the product depend on the use and installation conditions of the product.Impact values given above are only valid within the context specified and cannot be directly used to draw up the environmental assessment of the installation.

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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 is 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 dm^3.

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 CO_2.

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.

Air Toxicity (AT)

The AT indicator is representing the air toxicity in a human environment. taking into account the usually accepted concentrations tolerated for several gases and the quantity released. The given indication corresponds to the air volume necessary to dilute "contaminated air".

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 (C_2H_4).

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^+.

Water Toxicity (WT)

This indicator takes into consideration the usually accepted concentrations tolerated for several substances and the quantity released. The given indication corresponds to the air volume necessary to dilute "contaminated water".

Water Eutrophication (WE)

This indicator is representing the water eutrophication (enrichment in nutritive elements) of lakes and marine waters by the release of specific substances in the effluents. It is expressed in grams of PO43-. as if all substances were PO43-. using equivalency in their nitrification potential.

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.

Heat Ventilation & Air Conditionning (HVAC)

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

Schneider Electric Industries SAS
35, rue Joseph Monier
CS30323
F - 92506 Rueil Malmaison Cedex

RCS Nanterre 954 503 439
Capital social 896 313 776 €
www.schneider-electric.com

This document is based on ISO 14020 which relates to the general principles of environmental declarations and the ISO 14025 technical report relating to type III environmental declarations. Product Environmental Profiles Drafting Guide version 12.

It has to be noticed that the data of this PEP cannot be directly compared with datas of programs which don't use the same LCA rules

Published by: Schneider Electric