# Product Environmental Profile

**For the VLVAF4P03512AB**
**VarSet Low voltage capacitor banks**

Schneider Electric

# Product overview

**The main purpose of the VarSet - Low voltage capacitor banks is to correct Power Factor in Low Voltage electrical Network**

**This range consists of 134 products from 6 Kvar to 1200 Kvar, Voltage 400-415V and Frequency 50/60Hz**

**The representative product used for the analysis is VLVAF4P03512AB VarSet capacitor bank equivalent to 200 Kvar.**

**The referenced equipment is composed of different products presented hereunder and of specific components of the family range Varset Low voltage capacitor bank.**

**List of specific components: capacitors supports, detuned reactors supports, cable management rail, power cables, auxiliary cables, screws, nuts, washers, …**

**The environmental analysis was performed in conformity with ISO 14040.**


| Rep | Designation | Family | Reference | Qty | PEP number |
|---|---|---|---|---|---|
| 1 | Regulator NR6 | Varlogic | 52448 | 1 | - |
| 2 | Rotary handle | Compact NSX | LV432598 | 1 | ENVPEP110804EN |
| 3 | Auxiliary Transformer | Phaseo | ABL6TS40U | 1 | ENVPEP121202EN |

| | | | | | |
|---|---|---|---|---|---|
| 4a | Auxiliary protection | A9 IC60 N | A9F75202 | 1 | ENVPEP091002EN |
| 4b | Auxiliary protection | A9 IC60 N | A9F74602 | 1 | ENVPEP091002EN |
| 5 | Step circuit breaker | Compact NSX | LV430631 | 4 | ENVPEP120606EN |
| 6 | Enclosure 200x800x300 | Spacial S3D | NSYS3D128030 | 2 | ENVPEP100104EN |
| 7 | Filterfan | ClimaSys CV | NSYCVF300M230PF | 2 | ENVPEP110717EN |
| 8 | Door 1200x800x20 | Spacial S3D | NSYS3D12830 | 2 | ENVPEP100104EN |
| 9 | Detuned reactor | Detuned reactor | LVR05500A40T | 4 | ENVPEP121215EN |
| 10 | Capacitor can | Varpluscan | BLRCH680A000B48 | 4 | ENVPEP121218EN |
| 11 | Contactor | Tesys D | LC1D95P7 | 4 | ENVPEP111274EN |
| 12 | Main circuit breaker NSX 400 | Compact NSX | LV432676 | 1 | ENVPEP070806EN |

# Constituent materials

The mass of the product range is from 25 kg and 1904 kg including packaging. It is 300.6kg for the VLVAF4P03512AB VarSet Low voltage capacitor bank. The constituent materials are distributed as follows:

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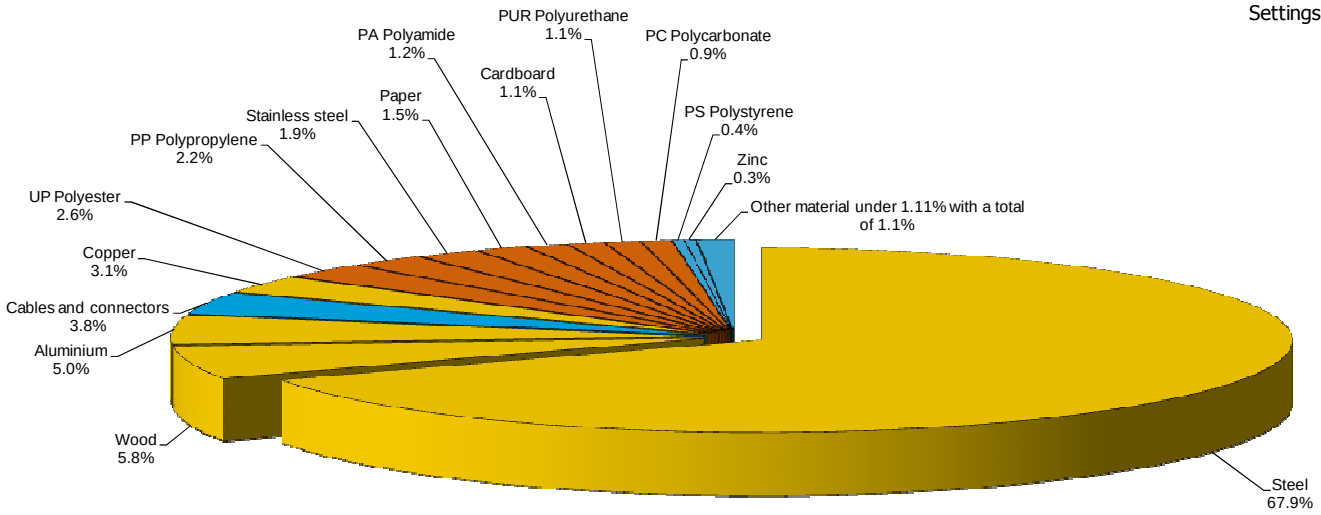


# Substance assessment

Details of ROHS and REACH substances information are available on the Schneider-Electric Green Premium website . (http://www2.schneider-electric.com/sites/corporate/en/products-services/green-premium/green-premium.page )

If you have a main circuit breaker NS 630-1600A, see PEP n°ENVPEP130103EN

# Manufacturing

The VarSet Low voltage capacitor banks product range is manufactured at a Schneider Electric production site on which an ISO14001 certified environmental management system has been established.

# Distribution

The weight and volume of the packaging have been optimized, based on the European Union's packaging directive.

The VLVAF4P03512AB VarSet Low voltage capacitor banks packaging weight is 15,3 *kg*. It consists of wood 14,15 *kg*, Polyethylene 0.63 kg, Cardboard 0,25 *kg,* paper 0,14 *kg,* Polypropylene 0.12kg, Polystyrene 0.015 kg,

# Use

The products of the VarSet Low voltage capacitor banks range do not generate environmental pollution (noise, emissions) requiring special precautionary measures in standard use.

The dissipated power depends on the conditions under which the product is implemented and used. It is 3035 W in nominal rating for the referenced VLVAF4P03512AB VarSet Low voltage capacitor bank . This thermal dissipation represents 1.51% of the power which passes through the product.

For maintenance Utilities have to be replaced :
4 capacitors+4 contactors are changed every 7 years at 35℃
4 filters are changed every 2 years

# End of life

At end of life, the products in the VarSet Low voltage capacitor banks have been optimized to decrease the amount of waste and allow recovery of the product components and materials.

This product range contains electronic boards in regulator (rep1) and in circuit-breakers (rep 5 and 12) that should be separated from the stream of waste so as to optimize end-of-life treatment by special treatments. The location of these components and other recommendations are given in the End of Life Instruction document which is available for this product range on the Schneider-Electric Green Premium website
Green Premium website
( http://www2.schneider-electric.com/sites/corporate/en/products-services/green-premium/green-premium.page ).

The recyclability potential of the products has been evaluated using the “ECO DEEE recyclability and recoverability calculation method” (version V1, 20 Sep. 2008 presented to the French Agency for Environment and Energy Management: ADEME).
According to this method, the potential recyclability ratio is: 44.7%.
As described in the recyclability calculation method this ratio includes only metals and plastics which have proven industrial recycling processes.

# Environmental impacts

Life cycle assessment has been performed on the following life cycle phases: Materials and Manufacturing (M), Distribution (D), Installation (I) Use (U), and End of life (E).
Modeling hypothesis and method:
- the calculation was performed on the VLVAF4P03512AB VarSet Low voltage capacitor bank
- product packaging: is included
- scenario for the Use phase: this product range is included in the category Power Factor Correction equipment: (assumed service life is 15 years and use scenario is: Energy passing product 3kW at nominal rate is applied on nominal current and service uptimes: 50%)
.
- the geographical representative area for the assessment is European and the electrical power model used for calculation is European model.

For maintenance during 15 years, utilities:one pack of capacitors (at 35℃)

Calculation convention in Product Environmental and Substance Assessment HRB6441100_00

End of life impacts are based on a worst case transport distance to the recycling plant (1000km)

**Presentation of the product environmental impacts**

| Environmental indicators | Unit | For give the name and commercial reference or description of the representative product | | | | | |
|---|---|---|---|---|---|---|---|
| | | S = M + D + I + U + E | M | D | I | U | E |
| Raw Material Depletion | Y-1 | 2.25E-11 | 1.47E-11 | 4.10E-16 | 0.00E+00 | 7.81E-12 | 6.61E-16 |
| Energy Depletion | MJ | 2.31E+06 | 2.04E+04 | 3.01E+02 | 0.00E+00 | 2.29E+06 | 4.84E+02 |
| Water depletion | $dm^3$ | 3.39E+05 | 7.57E+03 | 2.85E+01 | 0.00E+00 | 3.31E+05 | 4.60E+01 |
| Global Warming | g≈$CO_2$ | 1.17E+08 | 1.24E+06 | 2.38E+04 | 0.00E+00 | 1.15E+08 | 3.84E+04 |
| Ozone Depletion | g≈CFC-11 | 6.54E+00 | 2.20E-01 | 1.68E-02 | 0.00E+00 | 6.28E+00 | 2.71E-02 |
| Air Toxicity | $m^3$ | 1.95E+10 | 3.44E+08 | 4.49E+06 | 0.00E+00 | 1.92E+10 | 7.23E+06 |
| Photochemical Ozone Creation | g≈$C_2H_4$ | 3.96E+04 | 5.28E+02 | 2.03E+01 | 0.00E+00 | 3.91E+04 | 3.28E+01 |
| Air acidification | g≈$H^+$ | 1.58E+04 | 2.27E+02 | 3.03E+00 | 0.00E+00 | 1.56E+04 | 4.89E+00 |
| Water Toxicity | $dm^3$ | 3.33E+07 | 3.01E+05 | 2.98E+03 | 0.00E+00 | 3.30E+07 | 4.80E+03 |
| Water Eutrophication | g≈$PO_4$ | 3.62E+02 | 6.58E+01 | 3.96E-01 | 0.00E+00 | 2.95E+02 | 6.38E-01 |
| Hazardous waste production | kg | 1.97E+03 | 5.15E+01 | 8.85E-03 | 0.00E+00 | 1.92E+03 | 1.43E-02 |

Life cycle assessment has been performed with the EIME software (Environmental Impact and Management Explorer), version V4.0, and with its database version 11.
The Using phase is the life cycle phase which has the greatest impact on the majority of environmental indicators.

# System approach

Optimize energy consumption, increase power availability, insure efficiency and productivity



If the EHF is RoHS compliant:
As the products of the range are designed in accordance with the RoHS Directive (European Directive 2002/95/EC of 27 January 2003), they can be incorporated without any restriction in an assembly or an installation subject to this Directive.
Please note that the values given above are only valid within the context specified and cannot be used directly to draw up the environmental assessment of an installation.

If you have a main circuit breaker NS 630-1600A  See PEP n°ENVPEP130103EN

# 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.<br>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 (GW)** | 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)** | This indicator represents the air toxicity in a human environment. It takes into account the usually accepted concentrations for several gases in the air and the quantity of gas released over the life cycle. The indication given corresponds to the air volume needed to dilute these gases down to acceptable concentrations. |
| **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 ethylene ($C_2H_4$). |
| **Air Acidification (AA)** | The acid substances present in the atmosphere are carried by rain.<br>A high level of acidity in the rain can cause damage to forests.<br>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 represents the water toxicity. It takes into account the usually accepted concentrations for several substances in water and the quantity of substances released over the life cycle. The indication given corresponds to the water volume needed to dilute these substances down to acceptable concentrations. |
| **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.<br>It is expressed in kg. |

PEP achieved with Schneider-Electric TT01 V5 and TT02 V15 procedures in compliance with ISO14040 series standards

PEP established according to PEPecopassport PCR : PEP- PCR-ed 2-EN-2011 12 09 rules

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