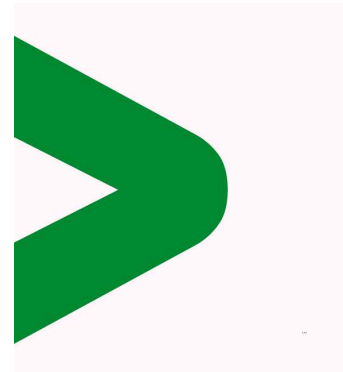


Product Environmental Profile

KNX Heating actuators



Product Environmental Profile - PEP

Product overview

The KNX heating Actuators allows to control electrothermic valve drives for heating- and cooling.

This range consists of KNX heating Actuators.

The representative product used for the analysis is KNX Heating actuator REG-K/6x230/0.05A light grey, Ref: MTN645129.

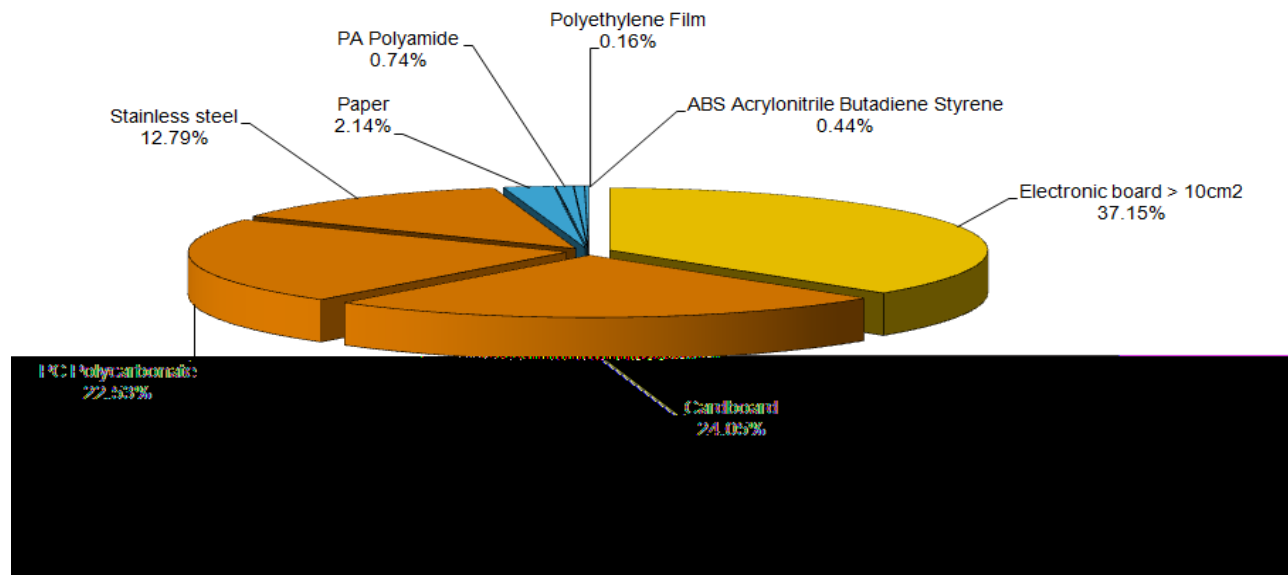
The environmental impacts of this referenced product are representative of the impacts of the other products of the range which are developed with a similar technology.

The environmental analysis was performed in conformity with ISO 14040.

Constituent materials

The mass of the product range is from 300 g to 350 g including packaging. It is 330 g for the KNX Heating actuator REG-K/6x230/0.05A light grey, Ref: MTN645129.

The constituent materials are distributed as follows:



Substance assessment

Products of this range are designed in conformity with the requirements of the RoHS directive (European Directive 2002/95/EC of 27 January 2003) and do not contain, or only contain in the authorised proportions, lead, mercury, cadmium, hexavalent chromium or flame retardants (polybrominated biphenyls - PBB, polybrominated diphenyl ethers - PBDE) as mentioned in the Directive .

Manufacturing

The KNX Heating actuators product range is manufactured at a production site which complies with the regulations governing industrial sites.

Distribution

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

The KNX heating Actuators packaging weight is 86.56 g. It consists of paper (7.02 g), cardboard (79 g), polyethylene (0.54g).

Product Environmental Profile - PEP

Use

The KNX heating actuators do not generate environmental pollution (noise, emissions) requiring special precautionary measures in standard use. The electrical power consumption depends on the conditions under which the product is implemented and used. The electrical power consumed by The KNX heating actuators is between 0.1 W and 0.24 W. It is 0.15 W for the referenced KNX Heating actuator REG-K/6x230/0.05A light grey, Ref: MTN645129.

End of life

At end of life, the products in the referenced KNX heating actuators have been optimized to decrease the amount of waste and allow recovery of the product components and materials. This product range contains PCB's and plastic parts 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.

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: **61%**.

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).

Modelling hypothesis and method:

- The calculation was performed on the referenced KNX Heating actuator REG-K/6x230/0.05A light grey, Ref: MTN645129.
 - Product packaging: Is included.
 - Installation components: No special components included.
 - Scenario for the Use phase: This product range is included in the category "**Energy consuming**" (assumed service life is 10 years and use scenario is: The consumed power is 0.125 W and 100% service uptime. The electrical power model used for calculation is European model.
- 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 KNX Heating actuator REG-K/6x230/0,05A light grey, Ref: MTN645129 | | | | | |
|---|--------------------------------------|---|----------|----------|----------|----------|----------|
| | | S = M + D + I + U + E | M | D | I | U | E |
| Air Acidification (AA for PEP) | kg H+ eq | 3.60E-03 | 8.72E-04 | 1.83E-03 | 0.00E+00 | 8.49E-04 | 4.67E-05 |
| Air toxicity (AT for PEP) | m³ | 5.00E+06 | 1.15E+06 | 2.73E+06 | 0.00E+00 | 1.05E+06 | 6.95E+04 |
| Energy Depletion (ED for PEP) | MJ | 3.44E+02 | 7.60E+01 | 1.39E+02 | 0.00E+00 | 1.25E+02 | 3.35E+00 |
| Global Warming Potential (GWP for PEP) | kg CO ₂ eq. | 2.11E+01 | 4.62E+00 | 9.86E+00 | 0.00E+00 | 6.33E+00 | 2.38E-01 |
| Hazardous Waste Production (HWP for PEP) | kg | 2.16E-01 | 1.11E-01 | 1.22E-05 | 0.00E+00 | 1.05E-01 | 2.94E-07 |
| Ozone Depletion Potential (ODP for PEP) | kg CFC-11 eq. | 8.14E-07 | 4.51E-07 | 1.87E-08 | 0.00E+00 | 3.44E-07 | 4.51E-10 |
| Photochemical Ozone Creation Potential (POCP for PEP) | kg C ₂ H ₄ eq. | 5.99E-03 | 1.52E-03 | 2.20E-03 | 0.00E+00 | 2.21E-03 | 5.92E-05 |
| Raw Material Depletion (RMD for PEP) | Y-1 | 1.83E-14 | 1.79E-14 | 2.02E-16 | 0.00E+00 | 1.42E-16 | 4.86E-18 |
| Water Depletion (WD for PEP) | dm ³ | 4.58E+01 | 2.66E+01 | 1.03E+00 | 0.00E+00 | 1.81E+01 | 2.47E-02 |
| Water Eutrophication (WE for PEP) | kg PO ₄ ³⁻ eq. | 3.34E-04 | 3.00E-04 | 1.83E-05 | 0.00E+00 | 1.49E-05 | 4.42E-07 |
| Water Toxicity (WT for PEP) | m³ | 7.41E+00 | 1.27E+00 | 4.22E+00 | 0.00E+00 | 1.82E+00 | 1.02E-01 |

Life cycle assessment has been performed with the EIME software (Environmental Impact and Management Explorer), version 5.1, and with its database version 2013-02.

The D phase is the life cycle phase which has the greatest impact on the majority of environmental indicators.

System approach

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.

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 consume

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