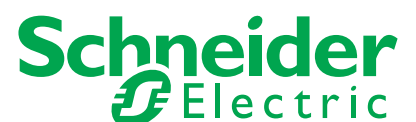
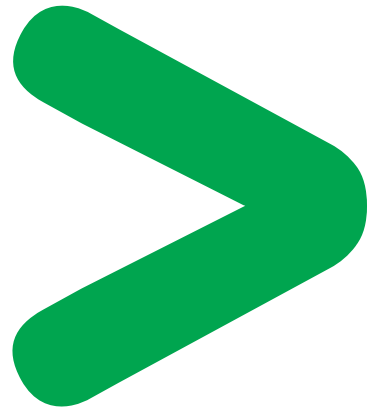
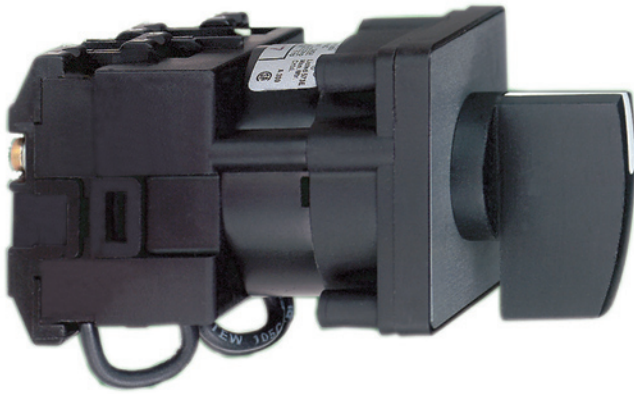


Product Environmental Profile

Harmony K1/K2
Cam switches



Product Environmental Profile - PEP

Product Overview

The main purpose of the Harmony K1/K2 series range of cam switches is to directly control simple machines and to provide process control in industry and buildings. This range consists of 12 A and 20 A switches which can be classified as follows, according to their function:

- Switches
- 2 to 5-position stepping switches
- 1-pole to 4-pole changeover switches
- Ammeter and voltmeter selector switches
- Lockable key switches.

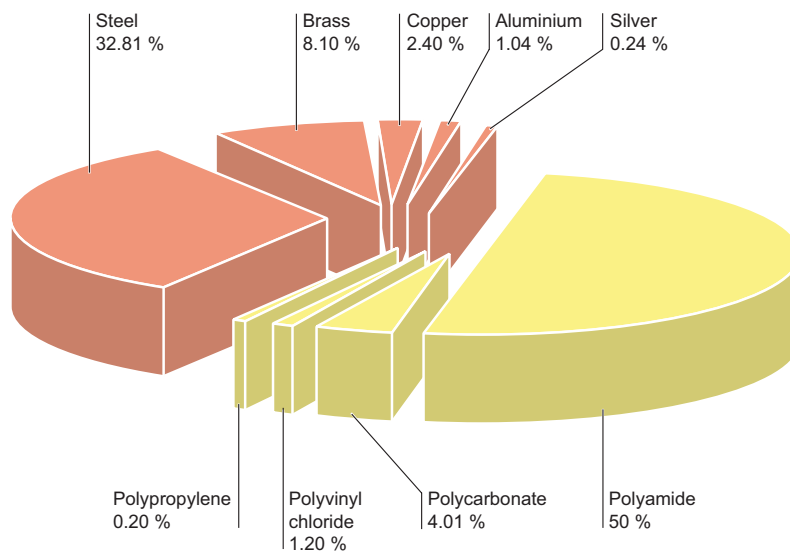
The representative product used for the analysis is the K1F027MLH which is a 7-position voltmeter-selector cam switch. The environmental impacts of this referenced product are representative of the impacts of the other products in the range for which the same technology is used.

The environmental analysis was performed in conformity with ISO 14040 "Environmental Management: Life cycle assessment - Principle and framework".

This analysis takes the stages in the life cycle of the product into account.

Constituent materials

The mass of the products in the range is from 115 g to 215 g, not including the packaging. It is 146 g for the K1F027MLH analysed. 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 in the authorised proportions, lead, mercury, cadmium, chromium hexavalent, flame retardant (polybromobiphenyles PBB, polybromodiphenylthethers PBDE) as mentioned in the Directive.

Manufacturing

The Harmony K1/K2 series range is manufactured at a Schneider Electric production site on which an ISO 14001 certified environmental management system has been established.

Distribution

The weight and volume of the packaging have been reduced in compliance with the European Union's packaging directive. The weight of the packaging of the K1F027MLH is 28 g. It consists almost exclusively of cardboard and paper, which are 100 % recyclable materials. The product distribution flows have been optimised by setting up local distribution centres close to the market areas.

Product Environmental Profile - PEP

Utilization

The products in the Harmony K1/K2 series range do not generate any environmental pollution requiring special precautionary measures (noise, emissions, etc.). They do not use any energy, as the losses due to the Joule effect in the contacts are negligible

End of life

At end of life, the products in the Harmony K1/K2 series range have to be dismantled to facilitate the recovery of the various constituent materials. The recycling potential is more than 46 %. This percentage mainly includes the steel, brass and non-filled plastics.

Environmental impacts

The EIME (Environmental Impact and Management Explorer) software, version 1.6, and its database, version 5.4, were used for the Life Cycle Assessment (LCA).

The assumed service life of the product is 10 years.

The analysis focused on a K1F027MLH.

The environmental impacts were analysed for the Manufacturing (M) phase, including the processing of raw materials, and for the Distribution (D) and Utilization (U) phases.

Presentation of product environmental impacts:

Environmental indicators	Unit	For a K1F027MLH			
		S = M + D + U	M	D	U
Raw Material Depletion	Y-1	3.59 10 ⁻¹⁵	99.96 %	0.04 %	0.00 %
Water Depletion	dm ³	15.37	94.73 %	5.27 %	0.00 %
Global Warming	g≈CO ₂	1045.8	92.13 %	7.87 %	0.00 %
Ozone Depletion	g≈CFC-11	1.34 10 ⁻⁰⁴	63.39 %	36.61 %	0.00 %
Photochemical Ozone Creation	g≈C ₂ H ₄	1.044	85.29 %	14.72 %	0.00 %
Air Acidification	g≈H ⁺	1.883	99.15 %	0.81 %	0.00 %
Hazardous Waste Production	kg	2.68 10 ⁻⁰³	98.66 %	1.35 %	0.00 %

The life cycle analysis showed that the Manufacturing phase (phase M) has the greatest impact on most of the environmental indicators and the environmental parameters of this phase were optimised at the design stage.

Product Environmental Profile - PEP

System approach

As the product 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 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.

Impacts values given above are only valid within the context specified and cannot be directly used to draw up the environmental assessment of the 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 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.

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