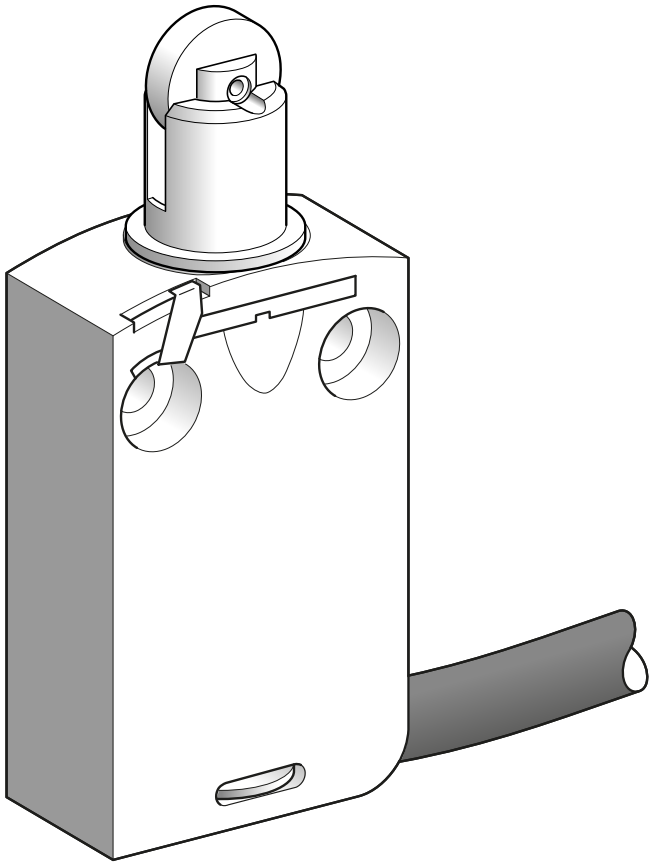
Product Environmental Profile

XCMD2102L1 Metallic Limit Switch



Telemecanique
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Product overview

The main purpose of XCMD2102L1 and more generally of any limit switch, installed in automated installations, is to transmit to the information system the information of presence or absence, flow, positioning or end of travel.

This range consists in metallic limit switches with different mechanical actuators, and electrical contact blocks including two to four contacts.

The representative product used for the analysis is XCMD2102L1.

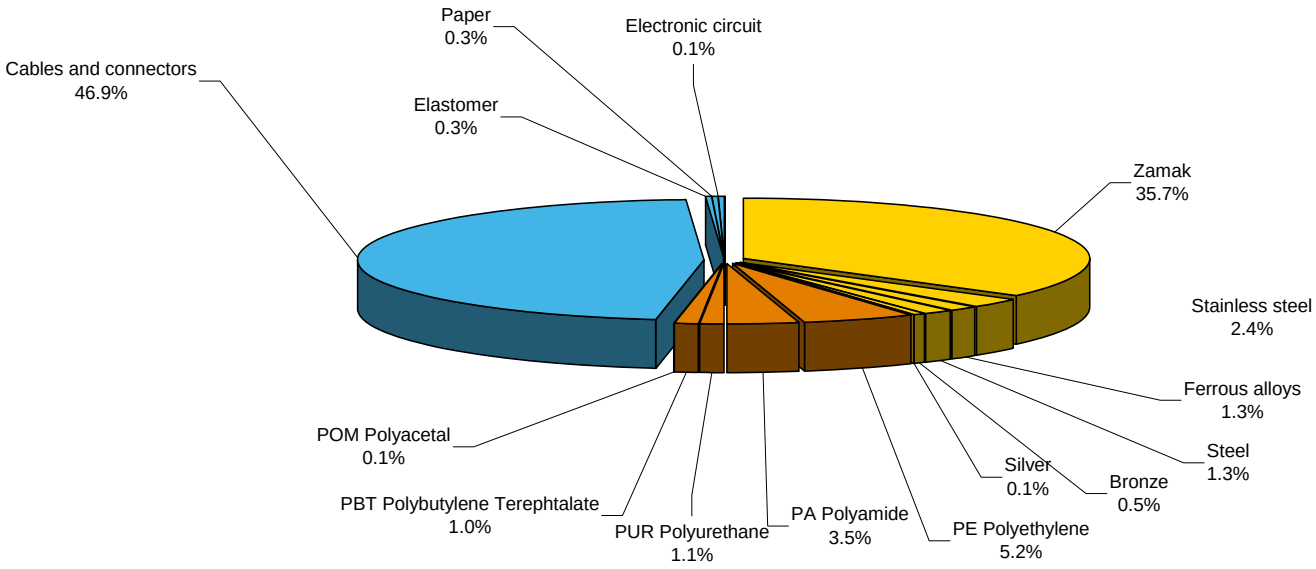
The environmental impacts of this referenced product are representative of the impacts of the other products of the range which are developed with a similar technology.

The environmental analysis was performed in conformity with ISO 14040.

For more information please contact us at: global-green-sensors@schneider-electric.com

Constituent materials

The mass of the product range is from 150 g to about 1,000 g including packaging. It is 175 g for XCMD2102L1.
The constituent materials are distributed as follows for XCMD2102L1:



Substance assessment

The representative product of this range XCMD2102L1 is designed in conformity with the requirements of the RoHS directive (European Directive 2002/95/EC of 27 January 2003) and does not contain, or only contains 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

XCMD 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.
XCMD2102L1 packaging weight is *9.7 g*. It consists of polyethylene and paper.

The product distribution flows have been optimised by setting up local distribution centres close to the market areas.

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Use

The limit switches range does not generate environmental pollution (noise, emissions) requiring special precautionary measures in standard use and does not need special maintenance operation.

End of life

At end of life, the XCMD products have been optimized to decrease the amount of waste and allow recovery of the product components and materials.

Some products of this range such as XCMD2102L1 are equipped with an external electrical cable 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 “Codde- BV 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 for XCMD2102L1 is: 41%.
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 XCMD2102L1.
- product packaging: is included
- installation components: no special components included.
- scenario for the Use phase: this product range is included in the category 3: (assumed service life is 20 years and no energy consumption in use scenario).

End of life impacts are based on a worst case transport distance to the recycling plant (1,000km).

Presentation of the product environmental impacts

Environmental indicators	Unit	For XCMD2102L1					
		S = M + D + I + U + E	M	D	I	U	E
Raw Material Depletion	**Y-1**	3.90E-15	3.90E-15	6.50E-19	0.00E+00	0.00E+00	3.57E-19
Energy Depletion	**MJ**	2.50E+01	2.42E+01	4.77E-01	0.00E+00	0.00E+00	2.62E-01
Water depletion	**dm^3**	1.83E+01	1.82E+01	4.53E-02	0.00E+00	0.00E+00	2.49E-02
Global Warming	**g≈CO_2**	1.60E+03	1.53E+03	4.86E+01	0.00E+00	0.00E+00	2.08E+01
Ozone Depletion	**g≈CFC-11**	6.21E-04	5.80E-04	2.67E-05	0.00E+00	0.00E+00	1.47E-05
Air Toxicity	**m^3**	5.59E+05	5.36E+05	1.92E+04	0.00E+00	0.00E+00	3.91E+03
Photochemical Ozone Creation	**g≈C_2H_4**	6.82E-01	6.32E-01	3.23E-02	0.00E+00	0.00E+00	1.77E-02
Air acidification	**g≈H^+**	4.44E-01	4.27E-01	1.45E-02	0.00E+00	0.00E+00	2.65E-03
Water Toxicity	**dm^3**	2.61E+02	2.53E+02	4.72E+00	0.00E+00	0.00E+00	2.59E+00
Water Eutrophication	**g≈PO_4**	5.72E-02	5.62E-02	6.26E-04	0.00E+00	0.00E+00	3.45E-04
Hazardous waste production	**kg**	8.60E-02	8.60E-02	1.42E-05	0.00E+00	0.00E+00	7.72E-06

Life cycle assessment has been performed with the EIME software (Environmental Impact and Management Explorer), version V4.1, and with its database version 10.
The manufacturing phase is the life cycle phase which has the greatest impact on the environmental indicators.

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The cable length has a major impact on the product environmental impacts of the products. For example, the following environmental impacts can be considered for the same product equipped with a 10 m long cable (commercial reference: XCMD2102L10).

Presentation of the product environmental impacts

Environmental indicators	Unit	For XCMD2102L10					
		S = M + D + I + U + E	M	D	I	U	E
Raw Material Depletion	**Y-1**	1.19E-14	1.19E-14	3.39E-18	0.00E+00	0.00E+00	1.87E-18
Energy Depletion	**MJ**	1.10E+02	1.06E+02	2.49E+00	0.00E+00	0.00E+00	1.37E+00
Water depletion	**dm^3**	1.61E+02	1.60E+02	2.36E-01	0.00E+00	0.00E+00	1.30E-01
Global Warming	**g≈CO_2**	6.09E+03	5.73E+03	2.54E+02	0.00E+00	0.00E+00	1.08E+02
Ozone Depletion	**g≈CFC-11**	1.89E-03	1.68E-03	1.39E-04	0.00E+00	0.00E+00	7.67E-05
Air Toxicity	**m^3**	2.58E+06	2.46E+06	1.00E+05	0.00E+00	0.00E+00	2.04E+04
Photochemical Ozone Creation	**g≈C_2H_4**	2.56E+00	2.29E+00	1.69E-01	0.00E+00	0.00E+00	9.27E-02
Air acidification	**g≈H^+**	2.21E+00	2.12E+00	7.56E-02	0.00E+00	0.00E+00	1.38E-02
Water Toxicity	**dm^3**	1.10E+03	1.06E+03	2.46E+01	0.00E+00	0.00E+00	1.36E+01
Water Eutrophication	**g≈PO_4**	1.13E-01	1.08E-01	3.27E-03	0.00E+00	0.00E+00	1.80E-03
Hazardous waste production	**kg**	1.21E-01	1.21E-01	7.41E-05	0.00E+00	0.00E+00	4.03E-05

System approach

As almost all products of the range and particularly XCMD2102L1 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 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 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. 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 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. It is expressed in kg.

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Independant verification of the declaration and data Internal X External	
The elements of the present PEP cannot be compared with elements form another program. *Documents in compliance with ISO 14021:2016 "Environmental labels and declarations – Self-declared environmental claims (Type II environmental labelling)"*	

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