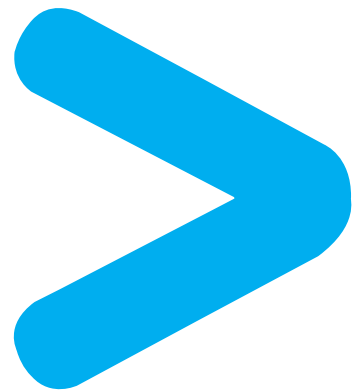
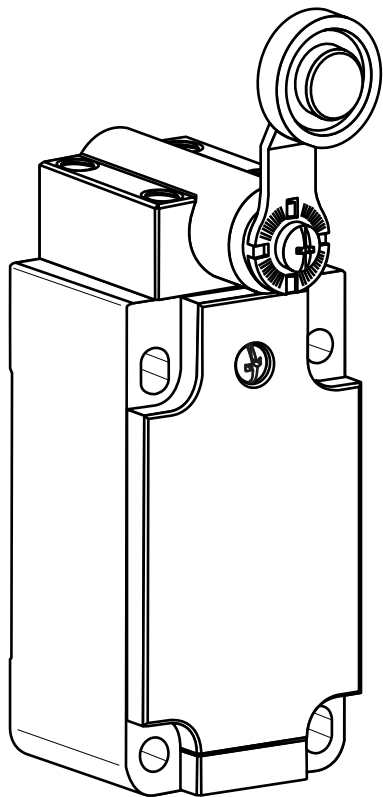


Product Environmental Profile

Plastic Limit Switch



Product overview

The main purpose of XCKS131 and more generally of any plastic 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.

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

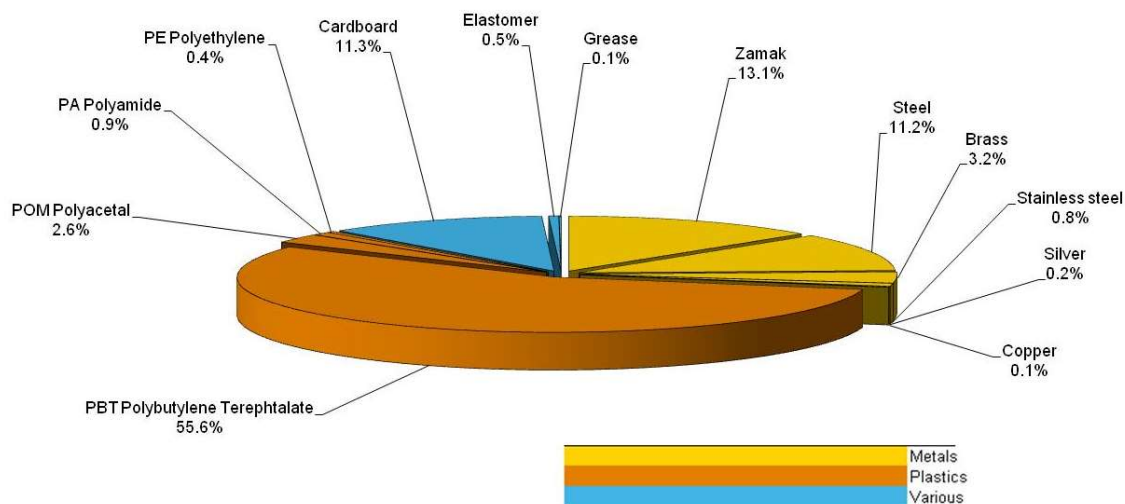
The functional unit is to establish, support and break the assigned currents (power supply of programmable logic controllers, relays typically estimated between 2 mA and 3 A) under the normal conditions during 20 years with IP67 and IK05 protection degrees.

The representative product used for the analysis is XCKS131 (including its packaging and its installation components). The environmental analysis was performed in conformity with ISO 14040.

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. However to know the accurate environmental impacts of other products in the XCKS range, complementary calculation has to be done, **please contact us at: global-green-sensors@schneider-electric.com**

Constituent materials

The mass of XCKS131 Plastic Limit Switch is 176 g including packaging (20g packaging). The constituent materials are distributed as follows (the installation components are not taken into account):



The total mass of XCKS131 and of its installation components (the assumption is made that four M5 hexagon socket cap screws are used) is 208 g and the materials are distributed as follows:

Category	Material	Percentage
Metals	Brass	2.7%
	Copper	0.1%
	Silver	0.1%
	Stainless steel	0.7%
	Steel	24.8%
	Zamak	11.1%
Plastics	PA Polyamide	0.8%
	PBT Polybutylene Terephthalate	47.0%
	PE Polyethylene	0.3%
	POM Polyacetal	2.2%
Various	Elastomer	0.4%
	Grease	0.1%
	Cardboard	9.5%

Substance assessment

Products of this range are designed in conformity with the requirements of the European RoHS Directive 2011/65/EU 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

Details of ROHS and REACH substances information are available on the Telemecanique Sensors website (<https://tesensors.com/global/en/support/reach-rohs-compliance>)

Manufacturing

XCKS131 is manufactured at a Schneider Electric production site on which an ISO14001 certified environmental management system has been established (referenced 195539-18-UK).

Distribution

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

XCKS131 packaging weight is 20 g. It consists of cardboard and paper.

Use

The products of the XCKS* 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. For the purpose of this modelling the dissipated power is estimated to 0.0225 mW.

The product range does not require special maintenance operations.

End of life

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

This product range contains a body and a cover 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 Telemecanique Sensors website (<https://tesensors.com/global/en/support/reach-rohs-compliance>).

The recyclability potential of the products has been evaluated using the “ECO DEE 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: 26%.

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 XCKS131.
- Product packaging is included.
- Installation components: *assumption is done that 4 zinc-electroplated M5 hexagon socket cap screws are used (8 g steel each – 800 mm² zinc-electroplated surface each),*
- Scenario for the Use phase: this product range is included in the category 1 (passive product) with assumed service life is 20 years.
For the purpose of this modelling product dissipation is assumed to be 0.0225 mW (R=25 mohms and I=30 mA) and service uptime 30%.
- The geographical representative area for the assessment is Europe and 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 XCKS131					
		S = M + D + I + U + E	M	D	I	U	E
Air Acidification (AA)	g H+ eq	2.44E-01	2.17E-01	1.91E-03	2.19E-02	1.51E-04	2.30E-03
Air toxicity (AT)	m ³	5.29E+05	4.85E+05	2.84E+03	3.76E+04	1.75E+02	3.43E+03
Energy Depletion (ED)	MJ	2.42E+01	2.06E+01	1.43E-01	3.30E+00	1.41E-02	1.65E-01
Global Warming Potential (GWP)	g CO ₂ eq.	1.13E+03	9.63E+02	1.02E+01	1.43E+02	6.99E-01	1.17E+01
Hazardous Waste Production (HWP)	kg	1.47E-02	1.34E-02	1.26E-08	1.26E-03	1.20E-07	1.45E-08
Ozone Depletion Potential (ODP)	g CFC-11 eq.	1.55E-04	1.37E-04	1.92E-08	1.80E-05	1.59E-07	2.22E-08
Photochemical Ozone Creation Potential (POCP)	g C ₂ H ₄ eq.	1.17E+00	1.14E+00	2.62E-03	2.40E-02	4.32E-05	2.92E-03
Raw Material Depletion (RMD)	γ-1	6.07E-14	5.91E-14	2.08E-19	1.56E-15	9.43E-21	2.40E-19
Water Depletion (WD)	dm ³	9.95E+00	7.62E+00	1.05E-03	2.33E+00	1.82E-03	1.22E-03
Water Eutrophication (WE)	g PO ₄ ³⁻ eq.	1.34E-01	1.22E-01	1.89E-05	1.24E-02	6.64E-06	2.18E-05
Water Toxicity (WT)	m ³	7.22E-01	6.48E-01	4.34E-03	6.48E-02	3.11E-04	5.02E-03

Life cycle assessment has been performed with the EIME software (Environmental Impact and Management Explorer), version 5 and with its database version 2015-04

The manufacturing phase is the life cycle phase which has the greatest impact on the majority of environmental indicators as shown in the table hereafter showing the contribution of each phase to the environmental indicators.

Product Environmental Profile – PEP

Repatriation of the product environmental impacts

Environmental indicators	Unit	Weight of each phase				
		M	D	I	U	E
Air Acidification (AA)	kg H+ eq	89%	1%	9%	0%	1%
Air toxicity (AT)	m ³	92%	1%	7%	0%	1%
Energy Depletion (ED)	MJ	85%	1%	14%	0%	1%
Global Warming Potential (GWP)	kg CO ₂ eq.	85%	1%	13%	0%	1%
Hazardous Waste Production (HWP)	kg	91%	0%	9%	0%	0%
Ozone Depletion Potential (ODP)	kg CFC-11 eq.	88%	0%	12%	0%	0%
Photochemical Ozone Creation Potential (POCP)	kg C ₂ H ₄ eq.	97%	0%	2%	0%	0%
Raw Material Depletion (RMD)	Y-1	97%	0%	3%	0%	0%
Water Depletion (WD)	dm ³	77%	0%	23%	0%	0%
Water Eutrophication (WE)	kg PO ₄ ³⁻ eq.	91%	0%	9%	0%	0%
Water Toxicity (WT)	m ³	90%	1%	9%	0%	1%

System approach

As the products of the XCKS* range are designed in accordance with the European RoHS Directive 2011/65/EU, 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

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 mole equivalent of H ⁺ .
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.
Energy Depletion (ED)	This indicator gives the quantity of energy consumed, whether it is from fossil, hydroelectric, nuclear or other sources. It takes into account the energy from the material produced during combustion. It is expressed in MJ.
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 .
Hazardous Waste Production (HWP)	This indicator quantifies 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.
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 ethylene (C ₂ H ₄).
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.
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 .
Water Eutrophication (WE)	Eutrophication is a natural process defined as the enrichment in mineral salts of marine or lake waters or a process accelerated by human intervention, defined as the enrichment in nutritive elements (phosphorous compounds, nitrogen compounds and organic matter). This indicator represents the water eutrophication of lakes and marine waters by the release of specific substances in the effluents. It is expressed in grams equivalency of PO ₄ ³⁻ (phosphate).
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.

PEP achieved with Schneider-Electric TT01 V10 and TT02 V19 procedures in compliance with ISO14040 series standards

Registration N°: ENVPEP1307066_V3		Applicable PCR : PEP-PCR-ed 2.1-EN-2012 12 11	
Date of review: 01-2020		Date of issue: 10-2015	
Period of validity: 4 years		Program information: www.pep-ecopassport.org	
Independent verification of the declaration and data, according to ISO 14025:2006			
Internal	X	External	
In compliance with ISO 14025:2006 type II environmental declarations			
PCR review was conducted by an expert panel chaired by J. Chevalier (CSTB).			
The elements of the actual PEP cannot be compared with elements from another program.			

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