

Product Environmental Profile

**RTC48
ZELIO Temperature Controller**



Product Environmental Profile - PEP

Product overview

The main purpose of the RTC48 Zelio Temperature controller is to regulate temperature in stand-alone installation for simple machine or more complex system in association with programmable logic controller (PLC), Human Machine Interface (HMI) through communication Modbus (RS485). This range consists of panel mounted temperature controller with input power supply from 24 VAC/DC or 110 to 240 VAC with combination of relay and or SSR output.

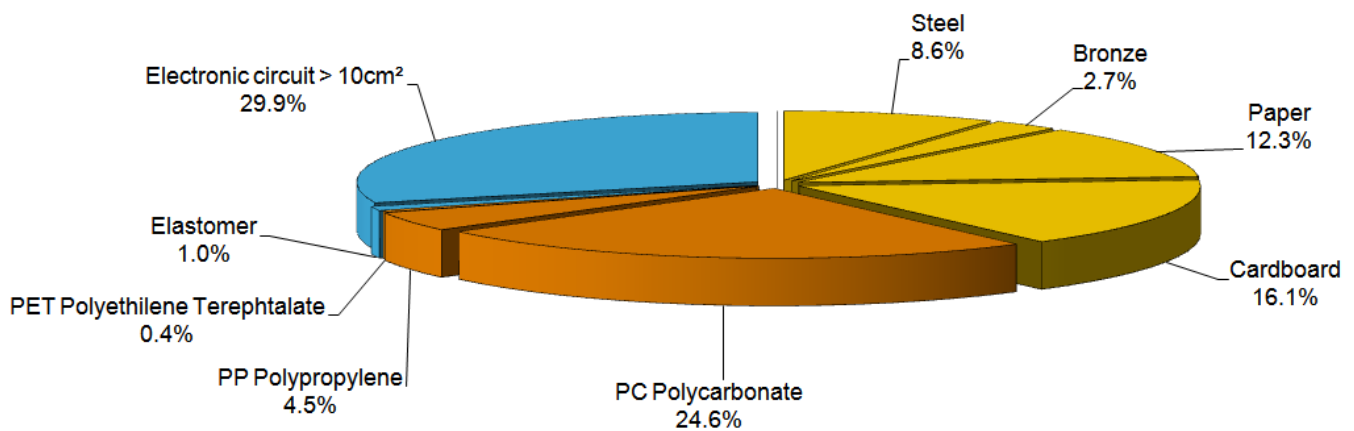
The representative product used for the analysis is Zelio RTC48PUNCRRLLU.

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 130 g and 170 g including packaging. It is 166 g for the RTC48PUNCRRLLU. The constituent materials are distributed as follows:



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 Schneider-Electric [Green Premium website](http://www2.schneider-electric.com/sites/corporate/en/products-services/green-premium/green-premium.page) .
(<http://www2.schneider-electric.com/sites/corporate/en/products-services/green-premium/green-premium.page>)

Manufacturing

The RTC48 Zelio temperature controller 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 RTC48 Zelio temperature controller packaging weight is 47 g. It consists of cardboard at 27 g and paper at 20 g.

Use

The products of the RTC48 Zelio temperature controller range 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 RTC48 Zelio temperature controller range is between 4 W and 8 W. It is 70% in active mode and 30% in standby mode for the referenced RTC48PUNCRRLLU.

The product range does not require special maintenance operations.

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End of life

At end of life, the products in the RTC48 Zelio temperature controller) have been optimized to decrease the amount of waste and allow recovery of the product components and materials.

This product range contains PCBA 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) (<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 without packaging is: 31%.

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 RTC48PUNCRRLLU
- 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 product: (assumed service life is 10 years and use scenario is: 70% of the time in active mode with 7.4 W consumed power and 30% of the time in standby mode with 4.1 W consumed power.
- the geographical representative area for the assessment is European zone 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	Representative product RTC48PUNCRRLLU					
		S = M + D + I + U + E	M	D	I	U	E
Air Acidification (AA)	kg H+ eq	6.99E-02	8.10E-04	2.58E-03	0.00E+00	6.65E-02	2.15E-06
Air toxicity (AT)	m ³	8.20E+07	1.01E+06	3.85E+06	0.00E+00	7.72E+07	3.20E+03
Energy Depletion (ED)	MJ	6.61E+03	5.54E+01	1.85E+02	0.00E+00	6.36E+03	1.54E-01
Global Warming Potential (GWP)	kg CO ₂ eq.	3.32E+02	4.45E+00	1.32E+01	0.00E+00	3.14E+02	1.10E-02
Hazardous Waste Production (HWP)	kg	1.22E-01	6.71E-02	1.63E-05	0.00E+00	5.47E-02	1.36E-08
Ozone Depletion Potential (ODP)	kg CFC-11 eq.	7.22E-05	4.80E-07	2.49E-08	0.00E+00	7.17E-05	2.08E-11
Photochemical Ozone Creation Potential (POCP)	kg C ₂ H ₄ eq.	2.38E-02	1.15E-03	3.28E-03	0.00E+00	1.94E-02	2.73E-06
Raw Material Depletion (RMD)	Y-1	4.15E-14	3.69E-14	2.69E-16	0.00E+00	4.25E-15	2.24E-19
Water Depletion (WD)	dm ³	8.78E+02	5.59E+01	1.37E+00	0.00E+00	8.20E+02	1.14E-03
Water Eutrophication (WE)	kg PO ₄ ³⁻ eq.	3.34E-03	3.39E-04	2.44E-05	0.00E+00	2.97E-03	2.04E-08
Water Toxicity (WT)	m ³	1.46E+02	1.02E+00	5.62E+00	0.00E+00	1.40E+02	4.69E-03

Note : Pay attention that order and unit of the environmental impacts has changed according to the EIME V5 version

Life cycle assessment has been performed with the EIME software (Environmental Impact and Management Explorer), version 5 and with its database version 2013-02

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

According to this environmental analysis, proportionality rules may be used to evaluate the impacts of other products of this range: depending on the impact analysis, the environmental indicators of other products in this family may be proportional extrapolated by the surface of PCB.

System approach

As the products of the 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

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 ₂ H 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.

PEP achieved with Schneider-Electric TT01 V9 and TT02 V16 procedures in compliance with ISO14040 series standards

PEP in line with PEPecopassport PCR : PEP-PCR-ed 2.1-EN-2012 12 11

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