Electronic DIN-Rail thermostats
TH4 and TH7 with ambient sensor

Product Environmental Profile

Product Environmental Profile - PEP

Product overview

The main function of the DIN-Rail thermostats product range is to control temperature in residential and tertiary applications. This range consists of DIN-rail thermostats TH4 and TH7. Ref: CCT15840 and Ref: CCT15841

The representative product used for the analysis is DIN-rail thermostat Ref: CCT15841 with ambient sensor Ref: CCT15846.

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

The extrapolation rules are described in the following chapters.

The environmental analysis was performed in conformity with ISO14040.

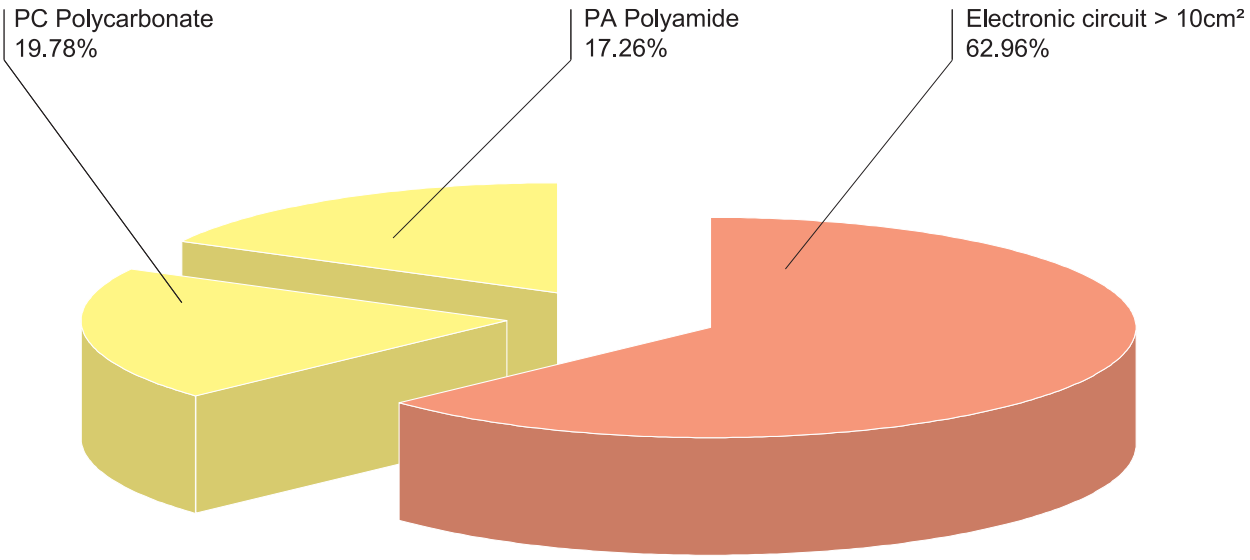
This analysis takes the stages of the life cycle of the product into account.

Constituent materials

The mass of the product range is from 244 g and 250 g not including packaging.

It is 245.7 g for the DIN-Rail thermostat Ref: CCT15841 with ambient sensor Ref: CCT15846.

The constituent materials are distributed as follows:



Substance assesment

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, polybromodiphenylthers PBDE) as mentioned in the Directive.

Manufacturing

The Electronic DIN-Rail Thermostats TH4 and TH7 with ambient sensor 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 reduced, in compliance with the European Union's packaging directive.

The DIN-Rail thermostat TH4 packaging weight is 38.8 g.

It consists of Cardboard (96% recycled, grey board) 32 g, PE (Low Density, LDPE, Film) 1.8 g, Paper (Recycled, With Deinking) 5 g.

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

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Utilization

The products of the DIN-Rail thermostat range do not generate environmental pollution requiring special precautionary measures (noise, emissions, and so on) in using phase.

The dissipated power depends on the conditions under which the product is implemented and used.

The electrical power consumed by the DIN-Rail thermostats range spreads out between 1 W and 1.5 W. It is 1.5 W in active mode and 40% in standby mode for the referenced DIN-Rail thermostat Ref: CCT15841 with ambient sensor Ref: CCT15846.

End of life

At end of life, the products in the DIN-Rail thermostats have been optimized to decrease the amount of waste and valorise the components and materials of the product in the usual end of life treatment process.

The potential of recyclability of the products has been evaluated using the Codde" recyclability and recoverability calculation method" (version V1, 20 Sep. 2008) and published by ADEME (French Agency for Environment and Energy Management).

By this method, this product range does not contain recyclable materials as the lack of processes for recycling these plastics types.

The recommendations to optimize the recycling performance are detailed in the product "End of Life Instructions" of this product range.

Environmental impacts

This product range is included in the category Energy consuming product (assumed lifetime service is 10 years and using scenario: Loading rate is 100% and uptime percentage is 80%).

The EIME (Environmental Impact and Management Explorer) software, version 4.0, and its database, version 10.0 were used for the life cycle assessment (LCA).

The calculation has been done on DIN-Rail thermostat Ref: CCT15841 with ambient sensor Ref: CCT15846.

The environmental impacts were analysed for the Manufacturing (M) phases, the Distribution (D) and the Utilisation (U) phases.

The electrical power model used is European.

Presentation of the environmental impacts

Environmental indicators	Short	Unit	For 1 DIN-rail thermostat Ref: CCT15841 with ambient sensor CCT15846			
			S = M + D + U	M	D	U
Raw Material Depletion	RMD	Y-1	$4.52E^{-14}$	$4.42E^{-14}$	$2.69E^{-18}$	$9.98E^{-16}$
Energy Depletion	ED	MJ	$9.51E^{+02}$	56.985	2.079	$8.92E^{+02}$
Water Depletion	WD	dm^3	$1.57E^{+02}$	18.402	$5.34E^{-01}$	$1.38E^{+02}$
Global Warming	GW	g ~CO_2	$4.86E^{+04}$	$2.89E^{+03}$	$9.94E^{+01}$	$4.56E^{+04}$
Ozone Depletion	OD	g ~CFC-11	$4.34E^{-03}$	$3.51E^{-04}$	$6.62E^{-05}$	$3.92E^{-03}$
Air Toxicity	AT	m^3	$9.69E^{+06}$	$8.73E^{+05}$	$2.91E^{+04}$	$8.78E^{+06}$
Photochemical Ozone Creation	POC	g ~C_2H_4	16.944	1.04	$8.81E^{-02}$	$1.58E^{+01}$
Air Acidification	AA	g ~H+	7.77	$5.34E^{-01}$	$2.21E^{-02}$	7.22
Water Toxicity	WT	dm^3	$1.18E^{+04}$	$7.24E^{+02}$	17.941	$1.11E^{+04}$
Water Eutrophication	WE	g ~PO_4	$3.47E^{-01}$	$2.12E^{-01}$	$4.58E^{-03}$	$1.30E^{-01}$
Hazardous Waste Production	HWP	kg	$8.13E^{-01}$	$8.65E^{-02}$	$1.08E^{-04}$	$7.27E^{-01}$

The life cycle analysis shows that the U phase (M, D or U phase) is the life cycle phase which has the greatest impact on the majority of environmental indicators. The environmental parameters of this phase have been optimized at the design stage.

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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.

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 material 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 this material.

Energy Depletion (ED)

This indicator gives the quantity of energy consumed, whether it will be from fossil, hydroelectric, nuclear or other resources. 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 resources. It is expressed in m^3.

Global Warming Potential (GWP)

The global warming of the planet is the results of the increase of the green house effect due to the sunlight reflected by the earth's surface being absorbed by certain gases known as "greenhouse-effect" gases. This effect is quantified in gram equivalent 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. This 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_2H_4).

Air Acidification (AA)

The acid substances present in the atmosphere are carried by the rains. A high level of acidity in 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^+.

Hazardous Waste Production (HWP)

This indicator gives the quantity of waste, produced along the life cycle of the product (manufacturing, distribution, use, including production of energy), that requires special treatments. It is expressed in kg.

Air Toxicity (AT)

This indicator calculates the air toxicity in a human environment, taking into account the usually accepted concentrations tolerated for several gases ant the quantity released. It gives a volume of bad air, expressed in m^3.

Water Toxicity (WT)

This indicator calculates the water toxicity taking into consideration the usually accepted concentrations tolerated for several substances and the quantity released. It is expressed as a volume of bad water 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 calculates the water eutrophication of lakes and marine waters by the release of specific substances in the effluents. It is expressed in grams equivalency of PO43-(phosphate).

We are committed to safeguarding our planet by "Combining innovation and continuous improvement to meet the new environmental challenges".

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