Product Environmental Profile

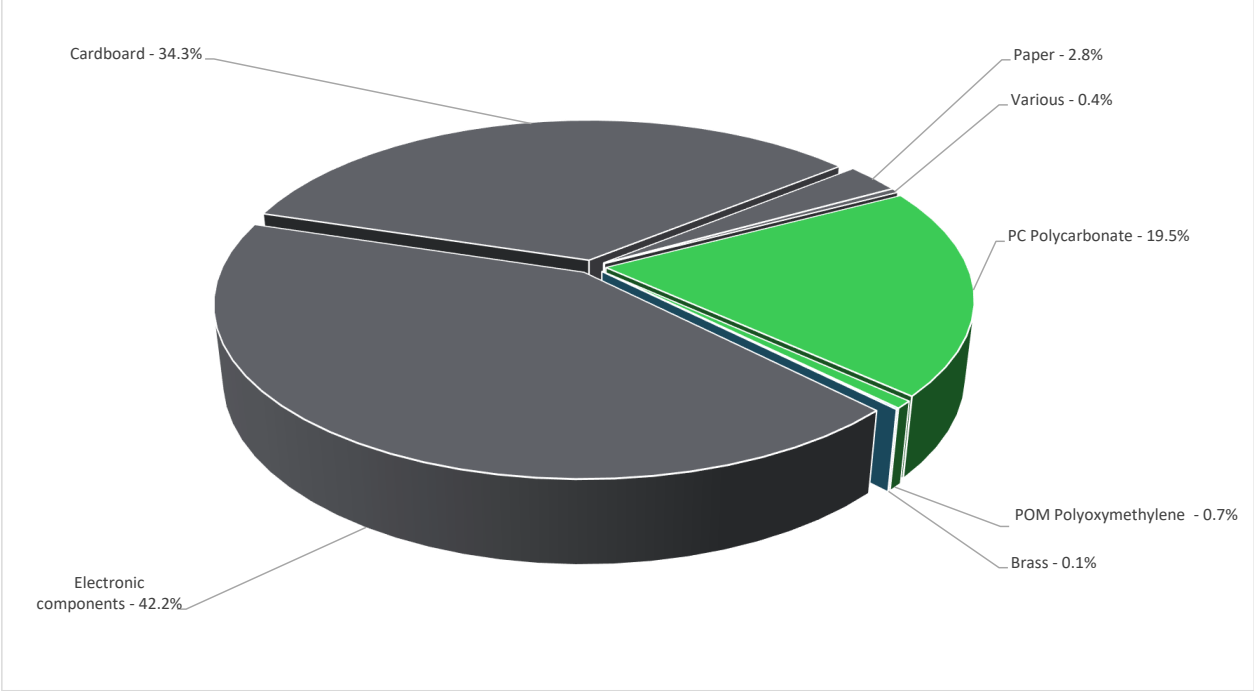
Modicon M221 Controllers

General information

Reference product	Modicon M221 Controllers - TM221CE24T
Description of the product	Designed for simple machines, the small dimensions of Modicon M221 logic controllers are ideal for optimizing the size of wall-mounted and floor standing control system enclosures. The Modicon M221 logic controller offers best-in-class performance. Available also in book format, it requires minimal installation and offers tremendous versatility
Functional unit	To perform control for applications using I/O communication from 16 to 40 I/Os, Ethernet (RJ45) or Serial Link (RJ45) communication, and optional I/O modules, 57,20% of the time for 10 years.
Specifications are:	U = Rated voltage(V) = 24V In = Rated current(A) = 0.58A IP= IP20 with protective cover in place Standards :- IEC 61131-2 UL 508 CAN/CSA C22.2 No. 213 IACS E10 ANSI/ISA 12-12-01

Constituent materials

Reference product mass	609.3 g	including the product, its packaging and additional elements and accessories



	Plastics	20.2%
	Metals	0.1%
	Others	79.7%

Substance assessment

Details of ROHS and REACH substances information are available on the Schneider-Electric Green Premium website
https://www.se.com/ww/en/work/support/green-premium/

Additional environmental information

End Of Life	Recyclability potential:	**0.1%**	The recyclability rate was calculated from the recycling rates of each material making up the product with the exception of data using the ESR database. For materials or components using the ESR database or the absence of data the conservative hypothesis "0% recyclability" was used.

Environmental impacts

Reference service life time	10 years			
Product category	Other equipments - Active product			
Installation elements	The product doesn't require special installation procedure and requires little to no energy to install			
Use scenario	The product is in active mode 57.20% of the time with a power use of 4.8W and in off mode 42.80% of the time with a power use of 0 W for 10 years			
Time representativeness	The collected data are representative of the year 2024			
Technological representativeness	The Modules of Technologies such as material production, manufacturing processes and transport technology used in the PEP analysis (LCA EIME in the case) are Similar and représentaive of the actual type of technologies used to make the product.			
Geographical representativeness	Europe			
Energy model used	**[A1 - A3]**	**[A5]**	**[B6]**	**[C1 - C4]**
	Electricity Mix; Low voltage; 2018; Taiwan, TW	Electricity Mix; Low voltage; 2018; Europe, EU-27	Electricity Mix; Low voltage; 2018; Europe, EU-27	Electricity Mix; Low voltage; 2018; Europe, EU-27

Detailed results of the optional indicators mentioned in PCRed4 are available in the LCA report and on demand in a digital format - Country Customer Care Center - http://www.schneider-electric.com/contact

Mandatory Indicators		**Modicon M221 Controllers - TM221CE24T**						
Impact indicators	**Unit**	**Total (without Module D)**	**[A1 - A3] - Manufacturing**	**[A4] - Distribution**	**[A5] - Installation**	**[B1 - B7] - Use**	**[C1 - C4] - End of life**	**[D] - Benefits and loads**
Contribution to climate change	kg CO2 eq	1.20E+02	1.96E+01	1.21E+00	0*	9.86E+01	1.15E+00	0.00E+00
Contribution to climate change-fossil	kg CO2 eq	1.20E+02	1.95E+01	1.21E+00	0*	9.84E+01	1.13E+00	0.00E+00
Contribution to climate change-biogenic	kg CO2 eq	2.32E-01	8.22E-02	0*	0*	1.32E-01	1.81E-02	0.00E+00
Contribution to climate change-land use and land use change	kg CO2 eq	1.89E-04	1.89E-04	0*	0*	0*	0*	0.00E+00
Contribution to ozone depletion	kg CFC-11 eq	4.14E-06	2.65E-06	1.06E-06	0*	4.22E-07	9.66E-10	0.00E+00
Contribution to acidification	mol H+ eq	7.14E-01	1.46E-01	4.97E-03	1.21E-04	5.63E-01	7.57E-04	0.00E+00
Contribution to eutrophication, freshwater	kg $(PO4)^{3-}$eq	3.24E-04	4.74E-05	1.41E-07	4.45E-08	2.70E-04	6.47E-06	0.00E+00
Contribution to eutrophication marine	kg N eq	8.14E-02	1.48E-02	2.26E-03	5.72E-05	6.39E-02	3.73E-04	0.00E+00
Contribution to eutrophication, terrestrial	mol N eq	1.15E+00	1.59E-01	2.45E-02	5.82E-04	9.60E-01	3.83E-03	0.00E+00
Contribution to photochemical ozone formation - human health	kg COVNM eq	2.68E-01	5.39E-02	8.17E-03	1.40E-04	2.05E-01	9.26E-04	0.00E+00
Contribution to resource use, minerals and metals	kg Sb eq	1.58E-03	1.57E-03	0*	0*	7.14E-06	0*	0.00E+00
Contribution to resource use, fossils	MJ	2.81E+03	2.80E+02	1.50E+01	0*	2.51E+03	1.42E+00	0.00E+00
Contribution to water use	m3 eq	1.10E+01	7.41E+00	6.11E-02	2.13E-02	3.49E+00	4.07E-02	0.00E+00

Inventory flows Indicators		Modicon M221 Controllers - TM221CE24T						
Inventory flows	Unit	Total (without Module D)	[A1 - A3] - Manufacturing	[A4] - Distribution	[A5] - Installation	[B1 - B7] - Use	[C1 - C4] - End of life	[D] - Benefits and loads
Contribution to use of renewable primary energy excluding renewable primary energy used as raw material	MJ	4.91E+02	8.65E+00	0*	0*	4.82E+02	0*	0.00E+00
Contribution to use of renewable primary energy resources used as raw material	MJ	4.76E+00	4.76E+00	0*	0*	0*	0*	0.00E+00
Contribution to total use of renewable primary energy resources	MJ	4.96E+02	1.34E+01	0*	0*	4.82E+02	0*	0.00E+00
Contribution to use of non renewable primary energy excluding non renewable primary energy used as raw material	MJ	2.80E+03	2.72E+02	1.50E+01	0*	2.51E+03	1.42E+00	0.00E+00
Contribution to use of non renewable primary energy resources used as raw material	MJ	7.30E+00	7.30E+00	0*	0*	0*	0*	0.00E+00
Contribution to total use of non-renewable primary energy resources	MJ	2.81E+03	2.80E+02	1.50E+01	0*	2.51E+03	1.42E+00	0.00E+00
Contribution to use of secondary material	kg	5.24E-05	5.24E-05	0*	0*	0*	0*	0.00E+00
Contribution to use of renewable secondary fuels	MJ	0.00E+00	0*	0*	0*	0*	0*	0.00E+00
Contribution to use of non renewable secondary fuels	MJ	0.00E+00	0*	0*	0*	0*	0*	0.00E+00
Contribution to net use of freshwater	m^3	2.59E-01	1.75E-01	1.42E-03	4.95E-04	8.12E-02	9.47E-04	0.00E+00
Contribution to hazardous waste disposed	kg	2.26E+01	2.05E+01	0*	0*	1.84E+00	2.39E-01	0.00E+00
Contribution to non hazardous waste disposed	kg	1.93E+01	4.72E+00	0*	2.33E-01	1.42E+01	1.66E-01	0.00E+00
Contribution to radioactive waste disposed	kg	5.71E-03	2.49E-03	2.39E-04	0*	2.97E-03	6.64E-06	0.00E+00
Contribution to components for reuse	kg	0.00E+00	0*	0*	0*	0*	0*	0.00E+00
Contribution to materials for recycling	kg	4.55E-04	6.20E-05	0*	0*	0*	3.93E-04	0.00E+00
Contribution to materials for energy recovery	kg	0.00E+00	0*	0*	0*	0*	0*	0.00E+00
Contribution to exported energy	MJ	1.61E-05	1.22E-05	0*	0*	0*	3.89E-06	0.00E+00

* represents less than 0.01% of the total life cycle of the reference flow

Contribution to biogenic carbon content of the product	kg of C	0.00E+00
Contribution to biogenic carbon content of the associated packaging	kg of C	6.68E-02

Mandatory Indicators		Modicon M221 Controllers - TM221CE24T							
Impact indicators	Unit	[B1 - B7] - Use	[B1]	[B2]	[B3]	[B4]	[B5]	[B6]	[B7]
Contribution to climate change	kg CO2 eq	9.86E+01	0*	0*	0*	0*	0*	9.86E+01	0*
Contribution to climate change-fossil	kg CO2 eq	9.84E+01	0*	0*	0*	0*	0*	9.84E+01	0*
Contribution to climate change-biogenic	kg CO2 eq	1.32E-01	0*	0*	0*	0*	0*	1.32E-01	0*
Contribution to climate change-land use and land use change	kg CO2 eq	0*	0*	0*	0*	0*	0*	0*	0*
Contribution to ozone depletion	kg CFC-11 eq	4.22E-07	0*	0*	0*	0*	0*	4.22E-07	0*
Contribution to acidification	mol H+ eq	5.63E-01	0*	0*	0*	0*	0*	5.63E-01	0*
Contribution to eutrophication, freshwater	kg $(PO4)^{3-}$eq	2.70E-04	0*	0*	0*	0*	0*	2.70E-04	0*
Contribution to eutrophication marine	kg N eq	6.39E-02	0*	0*	0*	0*	0*	6.39E-02	0*
Contribution to eutrophication, terrestrial	mol N eq	9.60E-01	0*	0*	0*	0*	0*	9.60E-01	0*
Contribution to photochemical ozone formation - human health	kg COVNM eq	2.05E-01	0*	0*	0*	0*	0*	2.05E-01	0*
Contribution to resource use, minerals and metals	kg Sb eq	7.14E-06	0*	0*	0*	0*	0*	7.14E-06	0*
Contribution to resource use, fossils	MJ	2.51E+03	0*	0*	0*	0*	0*	2.51E+03	0*
Contribution to water use	m3 eq	3.49E+00	0*	0*	0*	0*	0*	3.49E+00	0*

Inventory flows Indicators		Modicon M221 Controllers - TM221CE24T							
Inventory flows	Unit	[B1 - B7] - Use	[B1]	[B2]	[B3]	[B4]	[B5]	[B6]	[B7]
Contribution to use of renewable primary energy excluding renewable primary energy used as raw material	MJ	4.82E+02	0*	0*	0*	0*	0*	4.82E+02	0*
Contribution to use of renewable primary energy resources used as raw material	MJ	0*	0*	0*	0*	0*	0*	0*	0*
Contribution to total use of renewable primary energy resources	MJ	4.82E+02	0*	0*	0*	0*	0*	4.82E+02	0*
Contribution to use of non renewable primary energy excluding non renewable primary energy used as raw material	MJ	2.51E+03	0*	0*	0*	0*	0*	2.51E+03	0*
Contribution to use of non renewable primary energy resources used as raw material	MJ	0*	0*	0*	0*	0*	0*	0*	0*
Contribution to total use of non-renewable primary energy resources	MJ	2.51E+03	0*	0*	0*	0*	0*	2.51E+03	0*
Contribution to use of secondary material	kg	0*	0*	0*	0*	0*	0*	0*	0*
Contribution to use of renewable secondary fuels	MJ	0*	0*	0*	0*	0*	0*	0*	0*
Contribution to use of non renewable secondary fuels	MJ	0*	0*	0*	0*	0*	0*	0*	0*
Contribution to net use of freshwater	m^3	8.12E-02	0*	0*	0*	0*	0*	8.12E-02	0*
Contribution to hazardous waste disposed	kg	1.84E+00	0*	0*	0*	0*	0*	1.84E+00	0*
Contribution to non hazardous waste disposed	kg	1.42E+01	0*	0*	0*	0*	0*	1.42E+01	0*
Contribution to radioactive waste disposed	kg	2.97E-03	0*	0*	0*	0*	0*	2.97E-03	0*
Contribution to components for reuse	kg	0*	0*	0*	0*	0*	0*	0*	0*
Contribution to materials for recycling	kg	0*	0*	0*	0*	0*	0*	0*	0*
Contribution to materials for energy recovery	kg	0*	0*	0*	0*	0*	0*	0*	0*
Contribution to exported energy	MJ	0*	0*	0*	0*	0*	0*	0*	0*

** represents less than 0.01% of the total life cycle of the reference flow*

Life cycle assessment performed with EIME version v6.2.2, database version 2023-02 in compliance with ISO14044, EF 3.0 method is applied, for biogenic carbon storage, assessment methodology 0/0 is used

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.

Registration number :	ENVPEP1403012_V4	*Drafting rules*	PCR-4-ed4-EN-2021 09 06
		Supplemented by	PSR-0005-ed3.1-EN-2023 12 08
Date of issue	11-2024	*Information and reference documents*	www.pep-ecopassport.org
		Validity period	5 years

Independent verification of the declaration and data, in compliance with ISO 14021 : 2016

Internal X Extern al

The PCR review was conducted by a panel of experts chaired by Julie Orgelet (DDemain)

PEPs are compliant with XP C08-100-1:2016 and EN 50693:2019 or NF E38-500 :2022

The components of the present PEP may not be compared with components from any other program.

Document complies with ISO 14021:2016 "Environmental labels and declarations. Type II environmental declarations"

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