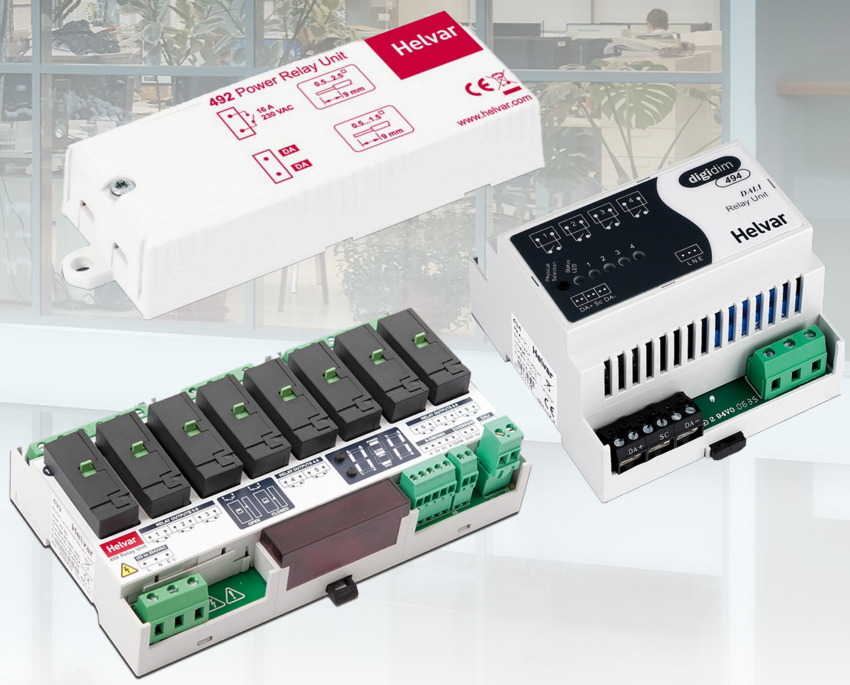
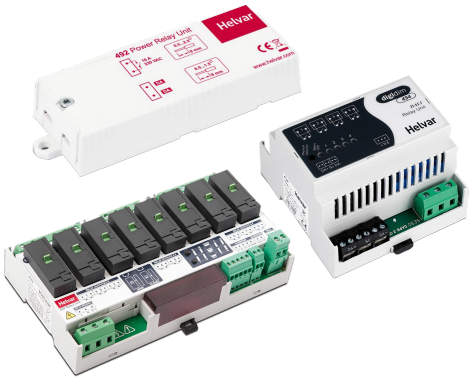
Environmental Product Declaration

Helvar



DIN rail and Inline Relays

Helvar EPD



Owner of the type II EPD:	Helvar Oy Ab
Name of the product:	DIN rail and Inline Relays
Document number:	D010095
Document version:	1.1
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Signatures:	Lotta Marjamäki Lotta Marjamäki

GENERAL INFORMATION, PURPOSE OF THE ENVIRONMENTAL DECLARATION (TYPE II)

1. Owner of the declaration

Helvar Oy Ab

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2. Product name and number

DIN rail and Inline Relays

3. Place of production

Produced in Malaysia.

4. Additional information

499 8-Channel Latching Relay Unit is used as the representative product for this document. However, this EPD can also be used to benchmark against other Helvar products: 490, 492, 493, 494 and 498.

Additional information from Lotta Marjamäki.

Lotta Marjamäki

Sustainability Engineer

Helvar Oy Ab

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5. Product Category Rules and the scope of the declaration

The declaration has been prepared in accordance with EN ISO 14021:2001, EN 15804:2019+A2 and ISO 14025:2006 standards and the additional requirements stated in the RTS PCR (English version, 26.8.2020)

The LCA study was made using excel-tool built for the purpose, which connects the primary product data and scenarios to appropriate ecoivent 3.9. LCIA and LCI dataset results. The dataset results have been calculated for the excel-tool using OpenLCA 10.1. and EN15804+A2 impact method.

6. Author of the lifecycle assessment and declaration

Helvar Oy Ab

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7. Verification

This is a type II EPD made with Helvar's proprietary inhouse tool. It has not undergone external verification according to any PCR program, but the tool has been reviewed by a third-party consultant for functionality.

Product information

Product description

Helvar offers a range of DALI-compatible relay units for lighting systems, allowing control of non-dimmable luminaires and devices such as blinds and curtains across diverse application areas. The product category EPD is based on one representative product. The 499 8 x 20 A latching relay unit is the heaviest non wall mount relay unit in Helvar's product catalogue. It represents the entire DIN rail and inline relay product category, e.g. 490, 492, 493, 494, 498, as the core structure is similar across the range. Being the heaviest configuration, it represents the maximum potential environmental impact of any relay unit in the category.

Product standards

Conformity and standards	
Conformity:	CE UK CA
EMC emission:	EN 55015
EMC immunity:	EN 61547
DALI:	IEC 62386
Safety:	EN 61347-2-11
SDIM:	Helvar protocol (RS485, 115 kbps)
DMX:	DMX512-A protocol (max. refresh rate: 33 Hz)
Environment:	Complies with WEEE, RoHS and REACH directives.

Raw materials of the product and product information (used in production)

Product structure/composition/ raw material	Quantity p%	Renewable	Non-renewable	Recycled	Origin of the raw materials
Plastic mechanics	20%	0%	0%	0%	Asia
Printed circuit board	64%	0%	0%	0%	Asia
Paper/cardboard/corrugated board	16%	100%	0%	0%	Asia
Total:	100%	17%	83%	0%	

LCA information

Scope of lifecycle assessment

Production			Installation		Use stage							End-of-Life				Next product system
Raw material supply (extraction, processing, recycled material)	Transport to manufacturer	Manufacturing	Transport to building site	Installation into building	Use / application	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction / demolition	Transport to EoL	Waste processing for reuse, recovery or recycling	Disposal	Reuse, recovery or recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

MND = Module not Declared.

A1 – Component production and production process

The product is manufactured at a factory in Finland. The manufacturing process comprises of mounting and soldering of the electronic components, and the assembly of the printed circuit board and the plastic and metal casing. Then the finished product is packed and sent to warehousing. There are two ways to mount the components, and both ways can be used on a single board. The components can be surface mounted or through-hole mounted. After mounting, the components are wave soldered, reflow soldered, or both. Sometimes larger or more complex components are soldered by hand. Then the printed circuit board is assembled with the product casing (plastic or metal) and packaged. The module is modelled with secondary data but based on primary product information (such as Bill of Materials), and supplier locations and electricity consumption.

A2 – Transportation of components to the assembly site

Includes transportation from component manufacturers to the assembly facility and transportation to warehouse. Modelled with secondary data, based on assumed distances based on supplier locations.

A3 – Assembly site operations

Includes production of product packaging and ancillary materials based on their amounts and ecoinvent datasets, and the waste treatment operations (incl. transportation) of production loss.

A4 – Transportation to the customer

Transportation efforts to the customer, based on Searates.com transportation distances from warehousing location to the customer in Central Europe.

A5 – Waste treatment of packaging

Includes recycling of the cardboard and plastic packaging. Based on actual amounts of packaging used for the product.

C1 – Deconstruction

The product is dismantled at the end of its life cycle. The module's results are assumed to be zero, as no material or energy flows are involved, and thus is not included in the result tables.

C2 – Transportation to the waste treatment

Transportation to recycling (estimated 200 km) and waste treatment based on actual material shares in the product. Transportation dataset considers region (EU).

C3 – Waste treatment operations

Includes manual dismantling and shredding of the product, and the energy recovery (incineration) of the non-recyclable plastic material. Based on the actual material shares in the product.

C4 – Waste disposal

Disposal of ceramic materials in the product, by incineration.

D – Benefit beyond the product system

Module D includes the avoided production from recycling of packaging, based on actual amounts of recyclable packaging materials, and the avoided production from product recycling, based on known amounts of metals in the product.

Functional / declared unit

Functional unit:	1 product, including packaging, over its lifetime
Reference service life:	87600 hours; 10 years

System boundary

This EPD covers the following modules: A1 (Raw material supply), A2 (Transport) and A3 (Manufacturing). The construction stage includes modules A4 (Transport to the site), A5 (Treatment of packaging waste). B6 module is ruled out of the scope of the study, as electricity consumption calculation representative of the actual use of product could not be determined in time for this EPD version. In addition, in the end-of-life stage is included information from C1- C4 and beyond the life cycle information from D module.

Cut-off criteria

The cut-off criteria used is 1% of the total mass input unit of the process, and 1% of the renewable and non-renewable primary energy usage. Expert judgement and comparison and assumption are used to demonstrate compliance with the criteria. The main processes cut-off from the study were the product sticker, and some product handling processes deemed not relevant for the results (such as any possible use of hand tools in installing the product).

Allocation

The allocation used for waste materials only, and it is based on the mass of waste materials directed to recycling and energy recovery. The system boundary of the product system after disposal is drawn where the outputs of the system

under study, such as materials, products or components, have achieved the state of complete waste treatment. Consequently, the processes of waste treatment of the material flows for each module of the product system are defined within the system boundaries of the corresponding module as above. The end-of-waste stage for recycled material is set at the point where the material intended for recycling is separated from other materials and ready to be used as a raw material in other manufacturing process.

Data and data quality

Primary data used in the study includes product data from Bill of Materials, i.e. types of components and materials and their amounts in the products, product energy consumption, and electricity consumption in the manufacturing. The transportation distances and End-of-Life treatment of product parts are assumed and estimated. Secondary data is used to model component and material manufacturing, transportation methods, electricity profiles and end-of-life treatment processes.

The data quality assessment is done according to EN 15804+A2 annex E, using data quality level and criteria of the UN Environment Global Guidance on LCA database development. Life cycle inventory data, i.e. primary data, was evaluated based on how it was collected and allocated to the product, on geographical, technical and time representativeness.

Results of the lifecycle assessment

Environmental impacts

The results of the impact assessment are relative. They do not predict the effects on the weighted values of the categories, the exceedance limits, safety margins and risks. The unit is expressed per functional or declared unit. Environmental impact data for A4 and C2 is to be reported per kilometre.

Lifecycle indicator	Unit	A1–A3	A4	A5	C2	C3	C4	D
GWP - total	kg CO2e.	6,34E+00	2,63E-01	1,08E-01	2,43E-02	1,98E-01	1,93E+00	-6,81E-02
GWP - fossil	kg CO2e.	6,41E+00	2,63E-01	2,38E-02	2,43E-02	1,98E-01	1,93E+00	-6,80E-02
GWP - biogenic	kg CO2e.	-8,25E-02	0,00E+00	8,25E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP - LULUC	kg CO2e.	1,15E-02	1,36E-04	1,43E-03	1,25E-05	7,10E-05	1,02E-05	-1,02E-04
ODP	kg CFC 11 eq.	2,04E-07	3,93E-09	9,51E-10	3,64E-10	4,44E-10	1,50E-09	-7,08E-10
AP	mol H* eq.	4,53E-02	9,47E-04	1,99E-04	8,60E-05	2,78E-04	5,34E-04	-1,69E-03
EP, aq. freshwater	kg P eq.	5,54E-03	2,13E-05	2,14E-05	1,98E-06	1,84E-05	1,19E-05	-1,19E-03
EP, aq. marine	kg N eq.	7,88E-03	3,05E-04	1,63E-04	2,78E-05	6,74E-05	3,46E-04	-4,89E-04
EP, terrestrial	mol N eq.	8,41E-02	3,29E-03	5,51E-04	3,00E-04	7,59E-04	2,77E-03	-7,10E-03
POCP	kg NMVOC eq.	2,92E-02	1,27E-03	1,05E-04	1,16E-04	1,77E-04	7,15E-04	-1,40E-03
ADPE*	kg Sb eq.	1,04E-03	8,59E-07	3,91E-07	7,96E-08	4,09E-07	9,87E-08	-2,18E-05
ADPF*	MJ, net calorific value	5,65E+01	3,73E+00	2,24E-01	3,45E-01	5,06E-01	4,90E-01	-7,80E-01
WDP*	m3 world eq. deprived	2,66E+00	1,75E-02	4,94E-02	1,62E-03	1,52E-02	6,02E-02	-3,01E-02

*The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

Other indicators

Lifecycle indicator	Unit	A1–A3	A4	A5	C2	C3	C4	D
PERE	MJ	9,46E+00	4,70E-02	0,00E+00	4,35E-03	7,44E-02	1,48E-02	-3,17E-01
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	9,46E+00	4,70E-02	0,00E+00	4,35E-03	7,44E-02	1,48E-02	-3,17E-01
PENRE	MJ	9,11E+01	3,41E+00	2,89E-04	3,15E-01	4,94E-01	4,58E-01	-7,52E-01
PENRM	MJ	1,66E+00	0,00E+00	0,00E+00	0,00E+00	-1,66E+00	0,00E+00	-1,65E-03
PENRT	MJ	9,28E+01	3,41E+00	2,89E-04	3,15E-01	-1,17E+00	4,58E-01	-7,54E-01
FW	m3	5,97E-02	4,37E-04	1,18E-03	4,05E-05	4,56E-04	1,19E-03	-7,37E-04
RSF	kg	7,20E-02	3,42E-04	1,44E-04	3,16E-05	5,74E-04	2,59E-04	-5,94E-04
NRSF	kg	1,55E-01	1,54E-03	2,89E-04	1,43E-04	1,53E-03	3,84E-02	-1,65E-03
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Waste	Unit	A1–A3	A4	A5	C2	C3	C4	D
HWD	kg	3,25E-01	4,26E-03	6,90E-04	3,94E-04	4,45E-03	2,42E-02	-1,31E-02
NHWD	kg	1,15E+00	1,75E-01	7,41E-03	1,62E-02	1,20E-02	7,74E-01	-1,29E-02
RWD	kg	1,38E-04	7,49E-07	3,73E-07	6,93E-08	1,16E-06	2,34E-07	-1,20E-06

Waste	Unit	A1–A3	A4	A5	C2	C3	C4	D
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	3,03E-01	0,00E+00	4,25E-04	0,00E+00	3,82E-01	0,00E+00	-1,62E-03
MER	kg	5,63E-06	0,00E+00	0,00E+00	0,00E+00	2,22E-01	0,00E+00	0,00E+00
EE	MJ	8,97E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Scenarios and additional technical information

Energy in the manufacturing phase

Name	Value	Unit	Data quality
Electricity consumption in the manufacturing	0.16	kWh/unit	Data from supplier, calculated using consumption mix for the region.

Technical information of transportation (A2) for components

Transportation mode	Distance	Unit	Data quality
Lorry, 16-32 t, EURO6:	527	km	Data estimated from Searates.com
Container ship:	15076	km	Data estimated from Searates.com

Technical information of transportation (A4) from production plant to building site

Transportation mode	Distance	Unit	Data quality
Lorry, 16-32t, EURO6:	1800	km	Data estimated from Searates.com
Container ship:	82	km	Data estimated from Searates.com

End-of-life process description, module C

Name	Value	Unit	Data quality
Collected separately waste type	0.633	kg	Total mass collected separately as Waste from Electrical and Electric Equipment
Collected as mixed construction waste	0	kg	Product is WEEE waste.
Reuse	0	kg	No reuse scenario
Recovered material	0.382	kg	WEEE recycling assumed due to EU-wide extended producer responsibility system.
Energy recovery	0.222	kg	Plastic mechanics and plastic and ceramic portions of the PCB are incinerated.
Landfilling	0.029	kg	Ceramic residual material landfill

Reference of the common information

ISO 14021

ISO 14021:2001 Environmental labels and declarations. Self-declared environmental claims (Type II environmental labelling)

ISO 14025

ISO 14025:2011-10 Environmental labels and declarations. Type III environmental declarations. Principles and procedures

EN 15804

EN15804:2019 Sustainability of construction works. Environmental Product Declarations. Core rules for the product category of construction products.

RTS

The Building Information Foundation RTS (RTS EPD Product Category Rules). Rakennustietosäätiö RTS sr (RTS EPD PCR menetelmäohje 15804:2019)

Institut Bauen und Umwelt

Institut Bauen und Umwelt e.V., Berlin(pub.):Generation of Environmental Product Declarations (EPDs), www.bau-umwelt.de

General principles

for the EPD range of Institute Bauen und Umwelt e.V. (IBU), 2013/04

PCR Part A

Institute Construction and Environment e.V (IBU) :Product Category Rules for Building-Related Products

Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report , Version 1.4

PCR Part B

Institute Construction and Environment e.V (IBU) : PCR Guidance-Texts for Building-Related Products and Services

Part B: Requirements of the EPD for the Luminaires, lamps and components for luminaires Version 1.6

Ecoinvent 3.9.

Ecoinvent Centre www.ecoinvent.org

OpenLCA 1.11.0

OpenLCA www.openlca.org/