



SHARKY 775 Radio 868 MHz & M-Bus DN15/110

Environmental Product Declaration

Declaration of general information

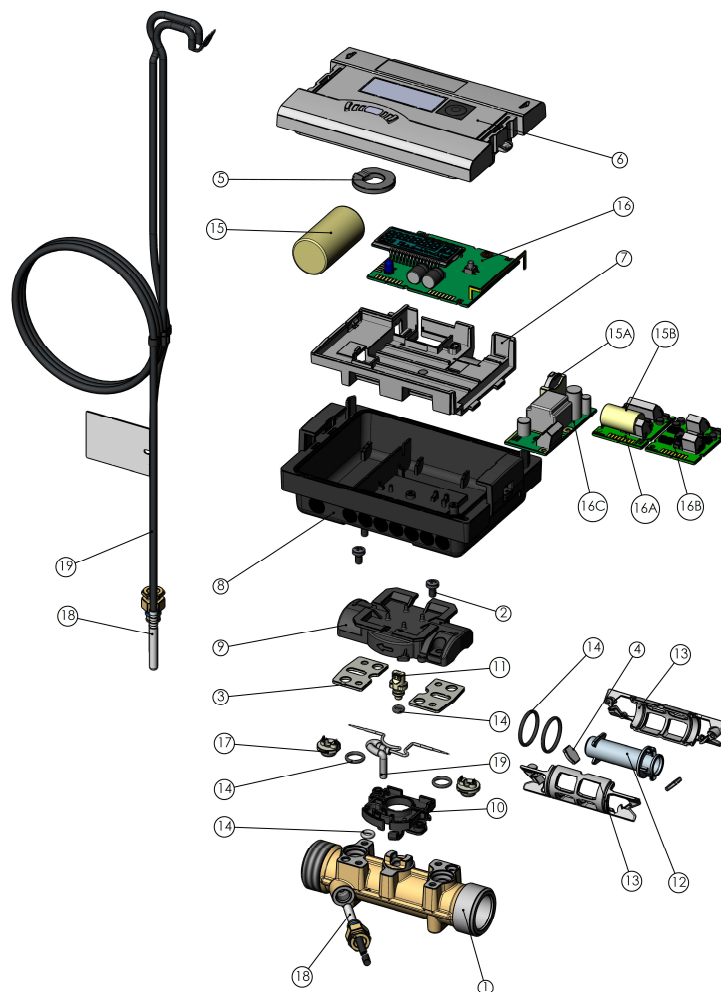
This Environmental Product Declaration (EPD) is based on a life cycle assessment (LCA) conducted by Diehl Metering. This study is part of Diehl Metering eco-design approach.

The EPD is dedicated to the communication between Diehl Metering and its customers (Business to Business).

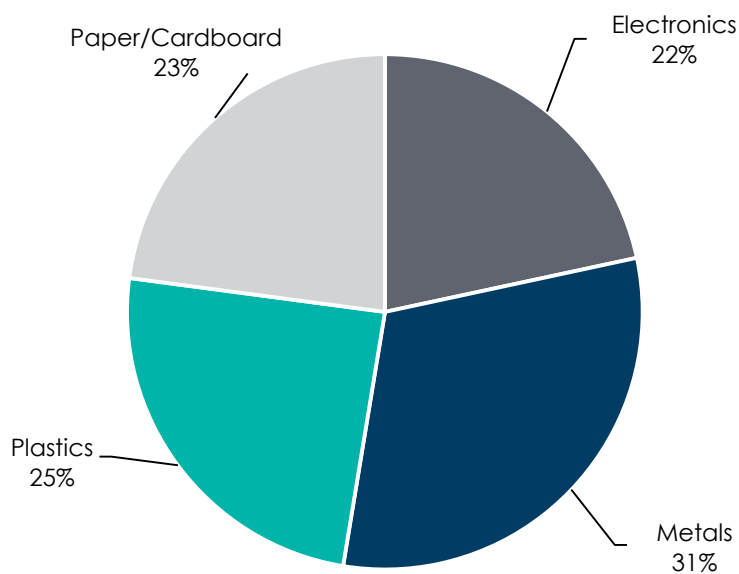
The corresponding project report has been published in April 2024.

The life cycle assessment of SHARKY 775 Radio 868 MHz DN15/110 has been performed with SimaPro 7.5 (preferred database: Ecoinvent v3.9; impact assessment according to Method EN 15804 A2 EPD Ev-DEC 1.09 ei3.8).

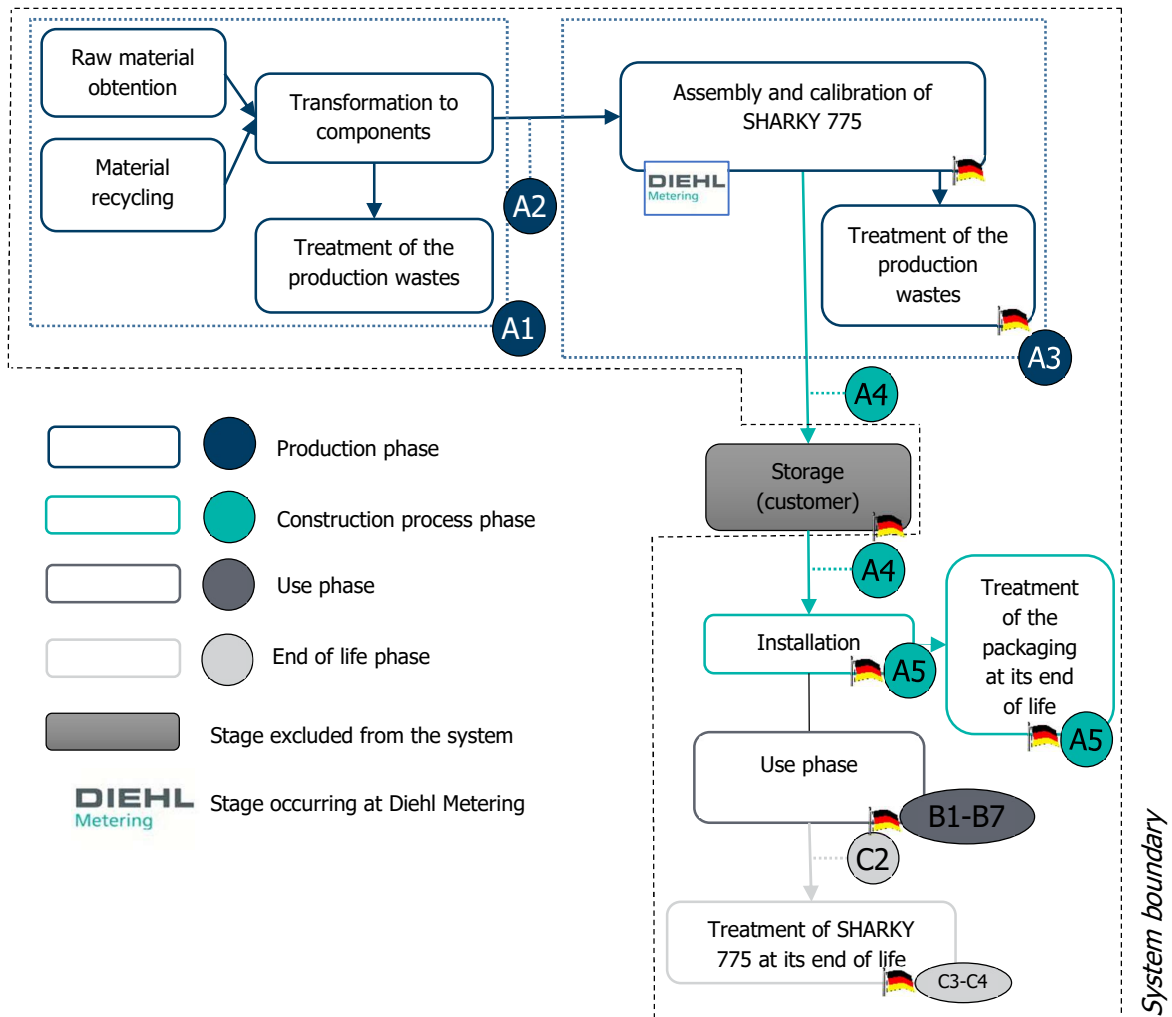
Description and declared unit	SHARKY 775 is a static heat meter operating on ultrasonic measuring technology. It has been developed within the framework of MID and complies with the European regulations.
Functional unit	Measure a thermal energy for DN15 body length 110 mm at a flow rate of 2,5 l/h to 3000 l/h at a medium temperature range between 5°C to 130°C in compliance with MID (Measuring Instrument Directive, 2014/32/EU directive) regulation and conformity declared according EN 1434: 2022, at a dynamic range 1:100 and transmit measured data via radio at 868 MHz or M-Bus during 16 years in standard use and temperatures conditions.
Packaging	The product is placed in a cardboard. The packaging of the raw material and the packaging of the components are considered (cardboard and pallet). Some of them are reusable packaging (mass allocation). They are considered to be reused 200 times.



	Component	Weight (g)
1	Body	320,8
2	Screws	9,4
3	Cover plate	14,4
4	Sheet (reflector)	2,5
5	Washer (optical head)	10
6	Calculator upper part	67,7
7	Calculator upper part inlet	27,5
8	Calculator lower part	107,4
9	Cover	22,2
10	Cable guide	6,4
11	Fixation pin	1
12	Measuring pipe	2,5
13	Bracket	7,3
14	O-Ring	2,4
15	Lithium cell	None
16	Electronic modules	93,8
17	Transducer	5,5
18	Temperature sensor	89,9
19	Cables	70,3
Total		911,6



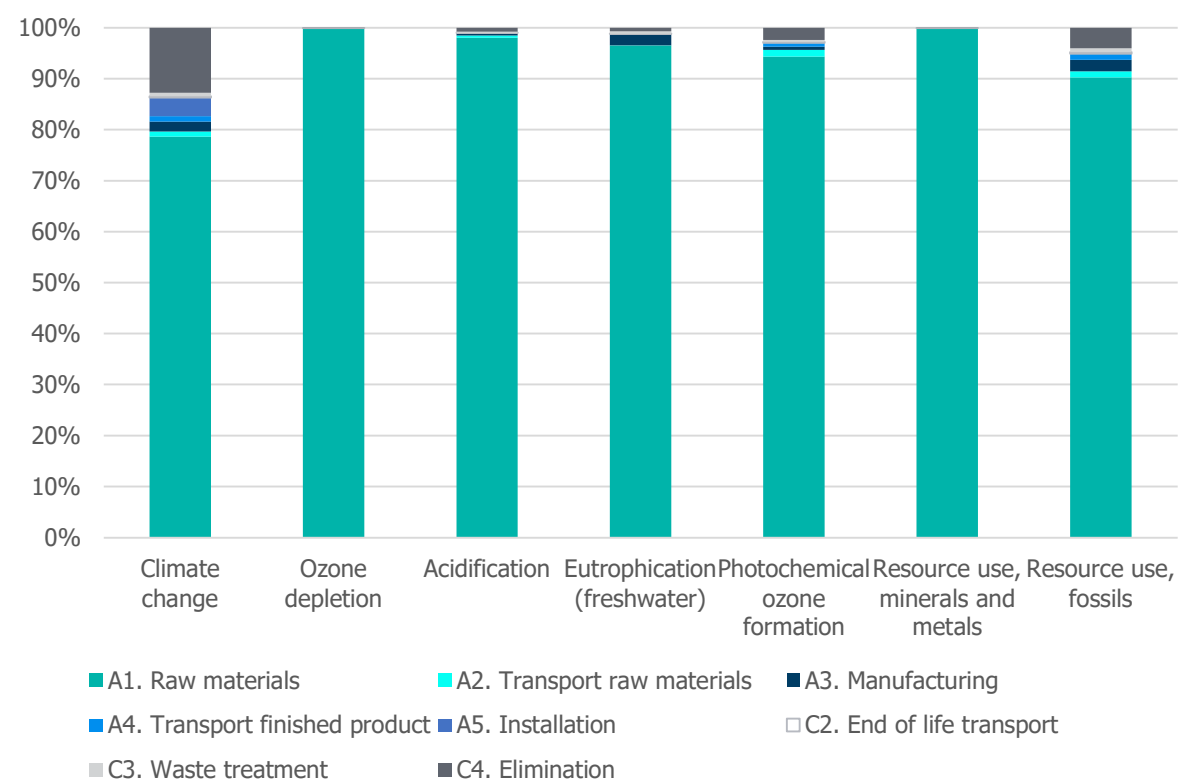
Declaration of environmental parameters derived from LCA.



Type of EPD	This is a "cradle to grave" EPD, the stages from raw material obtaining to the end-of-life treatment are covered as shown on the figure below.
System boundary	All modules according the standard EN 15804 are taken into account, shown in the figure above. In addition, module D (costs and benefits outside the system's borders) is considered.
Additional information on the release of dangerous substances in the indoor air, soil, and water during use stage	SHARKY 775 Radio 868 MHz & M-Bus DN15/110 is covered by no harmonised test method related to the measurement of the release of dangerous substances in the indoor air, soil, and water during use stage. Thus, according to chapter 7.4 of NF EN 15804 standard, this study does not need to contain this information.

Life cycle assessment results SHARKY 775 Radio 868 MHz & M-Bus DN15/110

Indicators describing environmental impacts per life cycle phase and per impact category.



Impact category	Unit	Total	A1. Raw materials	A2. Transport Raw materials	A3. Manufacturing	A4. Transport finished product	A5. Installation	C2. Transport	C3. Waste treatment	C4. Elimination	D. Benefits
Climate change – total	kg CO2 eq	12,61	9,92	0,13	0,25	0,13	0,46	0,03	0,08	1,61	-1,88
Climate change – fossil	kg CO2 eq	11,90	10,14	0,13	0,23	0,13	9,75E-04	0,03	0,08	1,15	-1,87
Climate change - biogenic	kg CO2 eq	0,70	-2,34E-01	4,99E-05	0,01	5,44E-05	0,46	1,22E-05	6,74E-04	0,46	-4,94E-03
Climate change - land use and change	kg CO2 eq	1,79E-02	0,02	6,73E-05	3,66E-04	6,39E-05	2,74E-07	1,43E-05	1,57E-04	9,04E-05	-3,37E-03
Ozone depletion	kg CFC11 eq	1,07E-05	1,07E-05	2,61E-09	2,04E-09	2,80E-09	2,39E-11	6,26E-10	6,44E-10	9,72E-09	-1,71E-08
Acidification	mol H+ eq	0,16	0,16	7,67E-04	4,85E-04	2,81E-04	7,49E-06	6,29E-05	3,67E-04	1,29E-03	-3,05E-02
Eutrophication, freshwater	kg P eq	1,43E-02	0,01	8,22E-06	3,20E-04	9,13E-06	2,04E-07	2,04E-06	6,45E-05	1,04E-04	-2,50E-03
Eutrophication, marine	kg N eq	1,67E-02	0,02	1,92E-04	1,63E-04	7,08E-05	4,18E-06	1,59E-05	7,58E-05	4,95E-04	-2,54E-03
Eutrophication, terrestrial	mol N eq	0,18	0,17	2,07E-03	1,16E-03	7,20E-04	3,53E-05	1,61E-04	7,50E-04	3,03E-03	-0,03
Photochemical ozone formation	kg NMVOC eq	0,06	0,05	7,61E-04	3,22E-04	4,36E-04	8,98E-06	9,76E-05	2,12E-04	1,33E-03	-0,01
Resource use, minerals and metals	kg Sb eq	2,87E-03	2,87E-03	3,70E-07	3,73E-07	4,22E-07	1,74E-09	9,45E-08	5,62E-07	7,30E-07	-3,36E-04
Resource use, fossils	MJ	148,45	134,01	1,74	3,33	1,82	6,21E-03	0,41	1,11	6,02	-23,97
Water use	m3 depriv.	7,97	7,89	6,87E-03	8,79E-03	7,62E-03	2,38E-04	1,71E-03	0,01	0,05	-0,62
Particulate Matter	disease inc.	7,33E-07	6,96E-07	8,52E-09	2,17E-09	9,57E-09	6,08E-11	2,14E-09	3,08E-09	1,19E-08	-1,10E-07
Ionising radiation, human health	kBq U-235 eq	1,06	0,98	2,17E-03	0,05	2,47E-03	9,86E-06	5,53E-04	0,01	3,40E-03	-0,22
Ecotoxicity, freshwater	CTUe	749,19	715,86	0,92	0,29	0,97	0,02	0,22	0,19	30,72	-28,06
Human toxicity, cancer	CTUh	2,90E-08	2,77E-08	5,66E-11	4,85E-11	5,85E-11	2,85E-12	1,31E-11	3,90E-11	1,12E-09	-4,14E-09
Human toxicity, non-cancer	CTUh	1,82E-06	1,81E-06	1,48E-09	1,83E-09	1,65E-09	1,12E-10	3,69E-10	2,27E-09	9,78E-09	-3,38E-07
Land use	Pt	97,61	93,73	0,94	0,48	1,10	2,73E-03	0,25	0,28	0,83	-10,31
Renewable primary energy excl. RM	MJ, net CV	15,13	14,17	0,03	0,67	0,03	1,89E-04	6,42E-03	0,17	0,05	-3,06
Renewable primary energy used as RM	MJ, net CV	3,57	3,57	0	0	0	0	0	0	0	0
Total renewable primary energy	MJ, net CV	18,70	17,74	0,03	0,67	0,03	1,89E-04	6,42E-03	0,17	0,05	-3,06

Impact category	Unit	Total	A1. Raw materials	A2. Transport Raw materials	A3. Manufacturing	A4. Transport finished product	A5. Installation	C2. Transport	C3. Waste treatment	C4. Elimination	D. Benefits
Non-renewable primary energy excl. RM	MJ, net CV	143,81	129,37	1,74	3,33	1,82	6,20E-03	0,41	1,11	6,02	-23,90
Non-renewable primary energy used as RM	MJ, net CV	22,18	22,18	0	0	0	0	0	0	0	0
Total non-renewable primary energy	MJ, net CV	148,05	133,61	1,74	3,33	1,82	6,20E-03	0,41	1,11	6,02	-23,90
Use of secondary material	kg	0,77	0,77	0	0	0	0	0	0	0	0
Use of renewable secondary fuels	MJ, net CV	0	0	0	0	0	0	0	0	0	0
Use of non-renewable secondary fuels	MJ, net CV	0	0	0	0	0	0	0	0	0	0
Net use of fresh water	m3	-3,14E-01	-3,11E-01	-5,92E-04	1,77E-04	-6,80E-04	-3,54E-05	-1,52E-04	-1,19E-03	-9,00E-04	0,10
Hazardous waste disposed	kg	1,52	1,20	1,69E-03	2,27E-03	1,76E-03	2,74E-03	3,94E-04	2,90E-03	0,32	-0,13
Non-hazardous waste disposed	kg	45,67	45,15	0,09	0,07	0,11	3,78E-04	0,02	0,06	0,17	-9,14
Radioactive waste disposed	kg	2,70E-04	2,49E-04	5,25E-07	1,58E-05	6,00E-07	2,48E-09	1,34E-07	3,70E-06	7,99E-07	-5,44E-05
Components for re-use	kg	0	0	0	0	0	0	0	0	0	0
Materials for recycling	kg	1,21	0	0	0,33	0	0,25	0	0	0,63	0
Materials for energy recovery	kg	0,50	0	0	4,20E-03	0	0,02	0	0	0,47	0
Exported energy - electricity	MJ	7,33	0	0	0,05	0	0,13	0	0	7,15	0
Exported energy - steam	MJ	12,61	9,92	0,13	0,25	0,13	0,46	0,03	0,08	1,61	-1,88
Exported energy - gas and process	MJ	11,90	10,14	0,13	0,23	0,13	9,75E-04	0,03	0,08	1,15	-1,87

B1-B7 and C1 stages are included to the scope of this study. There is no impact related to these stages whatever the impact category.