Annex

For Product CS7801iLW 13 liquid-to-water heat pump

Bosch Thermotechnik GmbH

to the

ENVIRONMENTAL PRODUCT DECLARATION
as per /ISO 14025/ and /EN 15804+A2/

Owner of the Declaration	Bosch Thermotechnik GmbH
Declaration number	EPD-BSC-20260650-ICC1-EN
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Valid to	see EPD

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General Information

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General Information on use stages

1. LCA: Calculation rules

The unit CS7801iLW 17 in scope of the scenario analysis is presented in the following table and compared to the unit 13.

Technical specification	13	17	Unit
Declared unit	1	1	Pce.
Mass reference	226	226	Kg/pce.
SCOP (Average climate conditions, LT-system (35°C))	5.21	5.01	
Pheat, design (Power output at A7/W35 nominal)	8.62	8.62	
Eheating [kWh/a]	3,418.22	3,554.67	kWh/a
Euse [MJ]	246,111.75	255,936.57	MJ

The CS7801iLW 13 and 17 differ in terms of B6, operational energy use. Except for B6, the unit 17 is identical to the declared unit 13.

2. LCA: Scenarios and additional technical information

Operational energy use (B6)

The chassis of the 13 and 17 are identical; they differ in terms of electricity consumption.

Technical specification	Value	Unit
Electricity consumption 13	3.418,22	kWh/a
Electricity consumption 17	3.554,67	kWh/a

3. LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: declared unit and product

Core Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	[kg CO_2-Eq.]	1,57E+03	8,84E+01	6,19E+01	2,68E-03	0	1,29E+00	0	0	2,58E+04	0	0	3,83E+00	4,32E+01	4,07E+01	-2,91E+02
GWP-fossil	[kg CO_2-Eq.]	1,55E+03	8,83E+01	6,12E+01	2,68E-03	0	1,27E+00	0	0	1,27E+02	0	0	3,83E+00	4,06E+01	3,19E+01	-2,90E+02
GWP-biogenic	[kg CO_2-Eq.]	7,85E+00	2,57E-02	6,22E-01	0	0	1,81E-02	0	0	2,56E+04	0	0	1,12E-03	2,56E+00	8,76E+00	-1,75E-01
GWP-luluc	[kg CO_2-Eq.]	5,21E+00	4,38E-02	1,45E-01	0	0	2,39E-03	0	0	6,38E+01	0	0	1,89E-03	2,85E-02	5,08E-03	-4,76E-01
ODP	[kg CFC11-Eq.]	3,50E-05	1,92E-06	1,01E-06	0	0	3,15E-08	0	0	4,86E-04	0	0	8,33E-08	2,23E-07	1,36E-06	-5,26E-06
AP	[mol H^+-Eq.]	6,82E+00	1,67E-01	1,36E-01	0	0	5,22E-03	0	0	4,28E+01	0	0	6,75E-03	6,40E-02	1,97E-02	-1,28E+00
EP-freshwater	[kg P-Eq.]	1,75E+00	6,24E-03	2,08E-02	0	0	1,24E-03	0	0	2,42E+01	0	0	2,72E-04	7,47E-03	6,45E-03	-2,66E-01
EP-marine	[kg N-Eq.]	2,80E+00	5,48E-02	6,56E-02	0	0	1,91E-03	0	0	2,38E+01	0	0	2,12E-03	3,10E-02	2,50E-02	-3,70E-01
EP-terrestrial	[mol N-Eq.]	2,79E+01	5,59E-01	6,53E-01	0	0	2,05E-02	0	0	2,14E+02	0	0	2,14E-02	3,06E-01	8,59E-02	-4,17E+00
POCP	[kg NMVOC-Eq.]	9,22E+00	3,15E-01	2,41E-01	3,98E-02	0	7,04E-03	0	0	6,89E+01	0	0	1,30E-02	7,92E-02	3,43E-02	-1,58E+00
ADPE	[kg Sb-Eq.]	2,69E-01	2,87E-04	1,26E-03	0	0	2,28E-04	0	0	3,05E-01	0	0	1,25E-05	2,14E-04	2,63E-05	-3,67E-02
ADPF	[MJ]	2,13E+04	1,24E+03	8,73E+02	0	0	1,68E+01	0	0	3,56E+05	0	0	5,37E+01	2,26E+02	1,04E+02	-3,93E+03
WDP	[m^3 world-Eq deprived]	8,45E+02	7,72E+00	2,72E+01	0	0	8,39E-01	0	0	1,97E+04	0	0	3,36E-01	5,38E+00	2,93E+00	-1,80E+02

Caption	GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: declared unit and product

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	4,29E+03	1,96E+01	1,33E+02	0	0	3,06E+00	0	0	1,26E+05	0	0	8,56E-01	3,01E+01	4,36E+00	-6,87E+02
PERM	[MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PERT	[MJ]	4,29E+03	1,96E+01	1,33E+02	0	0	3,06E+00	0	0	1,26E+05	0	0	8,56E-01	3,01E+01	4,36E+00	-6,87E+02
PENRE	[MJ]	2,33E+04	1,27E+03	9,41E+02	0	0	1,88E+01	0	0	6,40E+05	0	0	5,49E+01	2,59E+02	1,10E+02	-4,10E+03
PENRM	[MJ]	4,27E+00	3,75E-02	1,33E-01	0	0	8,50E-04	0	0	3,72E+00	0	0	1,62E-03	9,93E-03	3,72E-03	-5,16E-02
PENRT	[MJ]	2,33E+04	1,27E+03	9,42E+02	0	0	1,88E+01	0	0	6,40E+05	0	0	5,49E+01	2,59E+02	1,10E+02	-4,10E+03
SM	[kg]	7,75E+01	0	3,22E+00	0	0	5,58E-01	0	0	0	0	0	0	0	0	0
RSF	[MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	[MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	[m^3]	1,97E+01	1,80E-01	6,34E-01	0	0	1,95E-02	0	0	4,58E+02	0	0	7,83E-03	1,25E-01	6,82E-02	-4,20E+00

Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: declared unit and product

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NHWD	[kg]	0	0	3,35E+00	0	0	2,77E-02	0	0	0	0	0	0	0	6,57E+01	0
RWD	[kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CRU	[kg]	0	0	0	0	0	0	0	0	0	0	0	1,00E+00	0	0	0
MFR	[kg]	2,13E+01	0	3,65E+00	0	0	3,94E-02	0	0	0	0	0	0	1,61E+02	0	0
MER	[kg]	2,58E+01	0	2,77E+00	0	0	7,73E-04	0	0	0	0	0	0	7,05E+00	0	0
EEE	[MJ]	7,58E+01	0	1,16E+01	0	0	0,00E+00	0	0	0	0	0	0	3,13E+01	0	0
EET	[MJ]	1,77E+02	0	2,71E+01	0	0	0,00E+00	0	0	0	0	0	0	7,31E+01	0	0

Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: [declared unit and product]

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PM	[Disease Incidence]	1,22E-04	5,19E-06	4,57E-06	0	0	9,21E-08	0	0	4,93E-04	0	0	2,26E-07	1,27E-06	3,73E-07	-2,23E-05
IRP	[kBq U235-Eq.]	1,18E+02	1,69E+00	4,04E+00	0	0	1,12E-01	0	0	1,62E+04	0	0	7,36E-02	2,03E+00	3,67E-01	-8,76E+00
ETP-fw	[CTUe]	1,96E+05	1,27E+03	1,94E+03	0	0	1,40E+02	0	0	5,00E+05	0	0	5,54E+01	1,09E+03	8,44E+02	-2,82E+04
HTP-c	[CTUh]	1,13E-05	4,25E-08	1,04E-06	0	0	9,47E-09	0	0	1,43E-05	0	0	1,84E-09	2,65E-08	1,44E-08	3,74E-07
HTP-nc	[CTUh]	2,59E-04	1,03E-06	1,55E-06	0	0	1,88E-07	0	0	5,39E-04	0	0	4,50E-08	1,10E-06	4,20E-07	-3,82E-05
SQP	[-]	1,65E+04	7,52E+02	3,10E+02	0	0	8,58E+00	0	0	1,17E+05	0	0	3,29E+01	3,07E+02	3,14E+01	-1,37E+03

Caption	PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”.
This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “potential soil quality index”.
The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.