

# CLMS-22-1125-22-09460-112-h

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**Request by**

Comap SA  
77 boulevard de la bataille de Stalingrad  
69100 Villeurbanne

## Water Floor Heating Revised

**Date of the test report : 03/21/2022**

## Laboratory

**CSTB**

290 Route des Lucioles  
06940 Sophia-Antipolis

## Licensee

**Comap SA**

77 boulevard de la bataille de Stalingrad  
69100 Villeurbanne

## Client

**Comap SA**

77 boulevard de la bataille de Stalingrad  
69100 Villeurbanne

## Manufacturer

**Lacroix Electronics**

Lacroix Electronics  
ZAC Anjou Actiparc,  
Rue Léonard de Vinci  
49600 Beaupréau en Mauges

## 1. Test conditions

<b>Specifications</b>	EN15500-1:2017 eu.bac CERT PART 1 - General rules - Version 15 - February 2016 eu.bac CERT PART 2-1 – Specific rules - IZC version 5.0 – April 2019
<b>Application</b>	Water Floor Heating Revised
<b>Test Mode</b>	Heating
<b>Operating modes</b>	Comfort, Economic, Frost Protection

## 2. Controller

<b>Product identification</b>	Régulateur filaire Chaud/Froid 10 voies 230V
<b>Software version</b>	Not Specified
<b>Production date</b>	Not Specified
<b>Serial number</b>	Not Specified
<b>Manufacturer product identification</b>	C412012001x
<b>Laboratory identification</b>	22-09460

## 3. Test components

### 3.1. Room unit

<b>Product identification</b>	Thermostat CSH
<b>Production date</b>	Not Specified
<b>Serial number</b>	AA18205FA552
<b>Manufacturer product identification</b>	DXCL25204
<b>Laboratory identification</b>	22-09460

### 3.2. Valve

<b>Product identification</b>	COMAP C321020001
<b>Serial number</b>	Not Specified
<b>Laboratory identification</b>	22-09460

<b>Characteristic</b>	Linear (data provided by manufacturer)
<b>Type</b>	Globe (data provided by manufacturer)
<b>Stroke [mm]</b>	3.2

### 3.3. Valve Actuator

<b>Product identification</b>	COMAP
<b>Serial number</b>	Not Specified
<b>Laboratory identification</b>	Not Specified
<b>Running time [s]</b>	150
<b>Type</b>	Thermal (data provided by manufacturer)

### 3.4. Temperature sensor

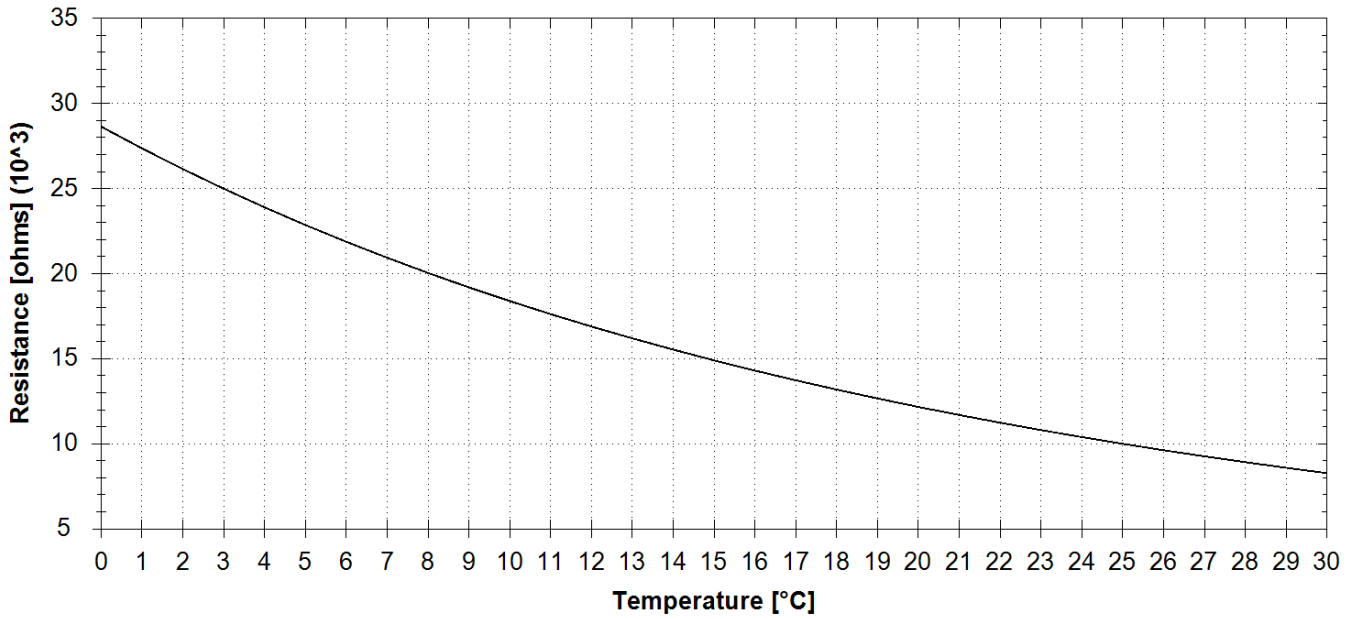
<b>Sensor type</b>	COMAP_NTC10K_6
<b>Time constant (minutes)</b>	6 (data provided by manufacturer)

#### Temperatures resistances table

0°C	28642Ω
1°C	27361Ω
2°C	26145Ω
3°C	24992Ω
4°C	23897Ω
5°C	22858Ω
6°C	21871Ω
7°C	20933Ω
8°C	20041Ω
9°C	19193Ω
10°C	18387Ω
11°C	17620Ω
12°C	16890Ω
13°C	16196Ω
14°C	15534Ω
15°C	14903Ω

16°C	14303Ω
17°C	13730Ω
18°C	13184Ω
19°C	12663Ω
20°C	12166Ω
21°C	11692Ω
22°C	11240Ω
23°C	10807Ω
24°C	10394Ω
25°C	10000Ω
26°C	9623Ω
27°C	9262Ω
28°C	8918Ω
29°C	8588Ω
30°C	8273Ω

### Temperature Sensor Calibration



## 4. Test schedule

Operator	Adam TCHA-KONDOR (Operator)
Supervisor	Jean-Charles CORBIN (Laboratory Manager)
Begin of test	03/16/2022 11:51:48
End of test	03/21/2022 10:17:31

## 5. Results

The test results presented in this report relate only to item(s) tested.

### 5.1. Comfort mode

Test periods, time range and extreme temperatures

#### Comfort mode 1

Period	Internal gain	Time range [h]	T min [°C]	T max [°C]
2	0%	17:00 - 23:00	19.92	20.01
4	30%	26:00 - 32:00	19.61	20.21
6	60%	35:00 - 41:00	19.82	20.19

#### Comfort mode 2

Period	Internal gain	Time range [h]	T min [°C]	T max [°C]
2	0%	17:00 - 23:00	19.92	20.05
4	30%	26:00 - 32:00	19.67	20.19
6	60%	35:00 - 41:00	19.87	20.24

#### Temperature control accuracy

$$CV = \frac{\max_{period2,4,6}(T_{in,max}) - \min_{period2,4,6}(T_{in,min})}{2}$$

$$CSD = \frac{\max_{period2,4,6}(T_{in,max}) + \min_{period2,4,6}(T_{in,min})}{2} - T_{setpoint}$$

**Comfort mode 1**

Control accuracy :	CA = 0.3
Control setpoint deviation :	CSD = -0.1
Control variation :	CV = 0.3

**Comfort mode 2**

Control accuracy :	CA = 0.3
Control setpoint deviation :	CSD = 0.0
Control variation :	CV = 0.3

Simulation graphics are available in the appendix

**5.2. Economic mode**

The set point temperature for economic mode is 17.00°C

First time the setpoint tolerance is reached	Measured mean value of the temperature [°C]
0:55	17.05

Simulation graphics are available in the appendix

**5.3. Frost protection**

The set point temperature for frost protection mode is 12.00°C

Simulation graphics are available in the appendix

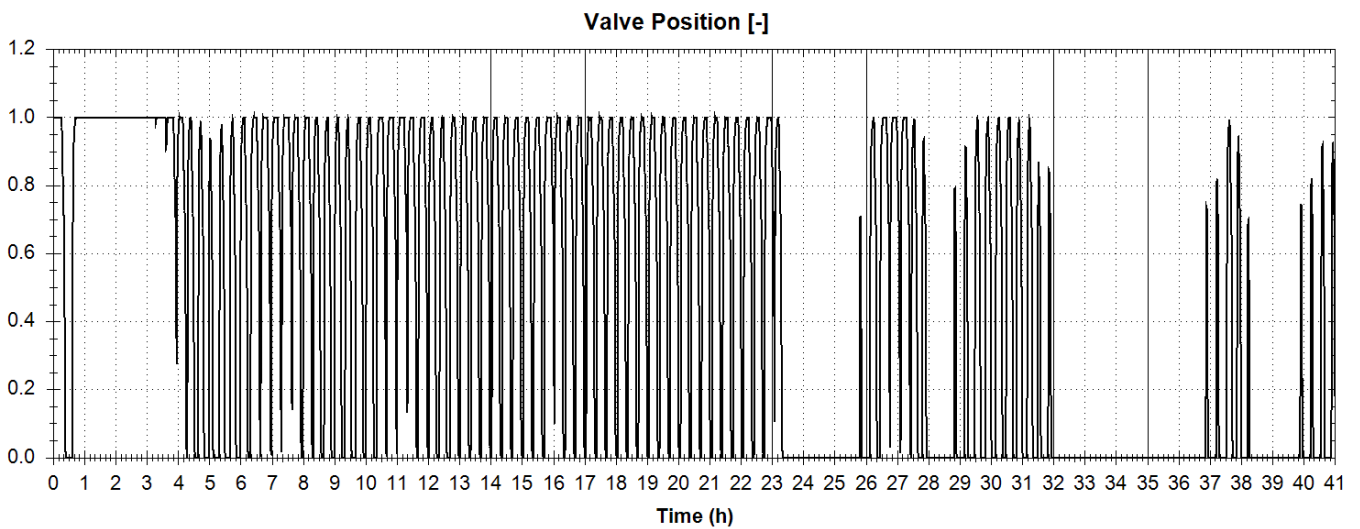
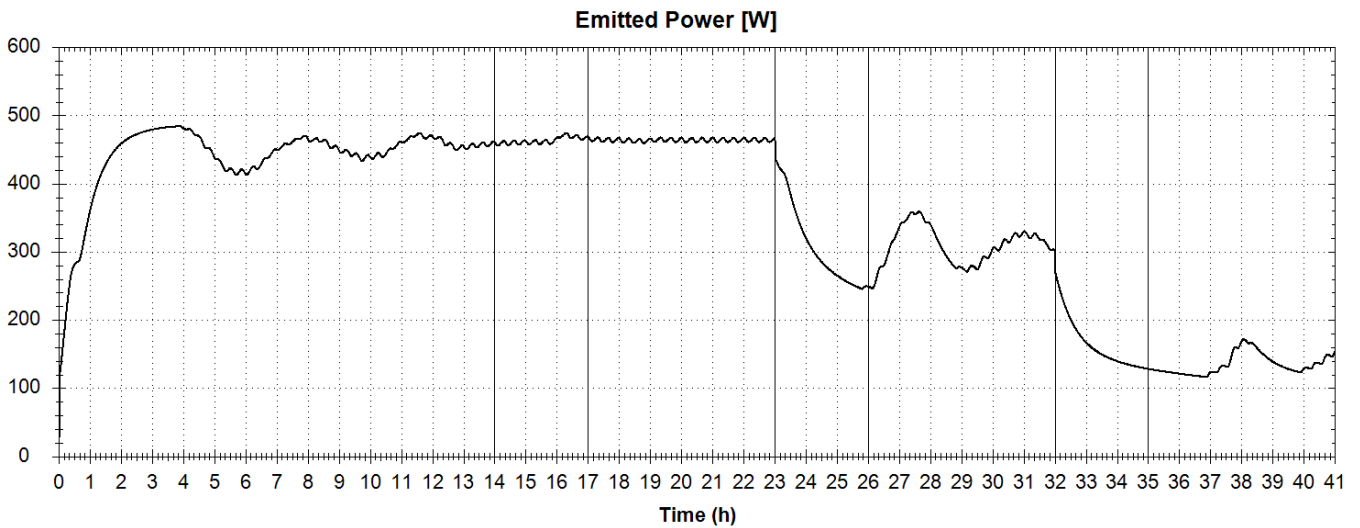
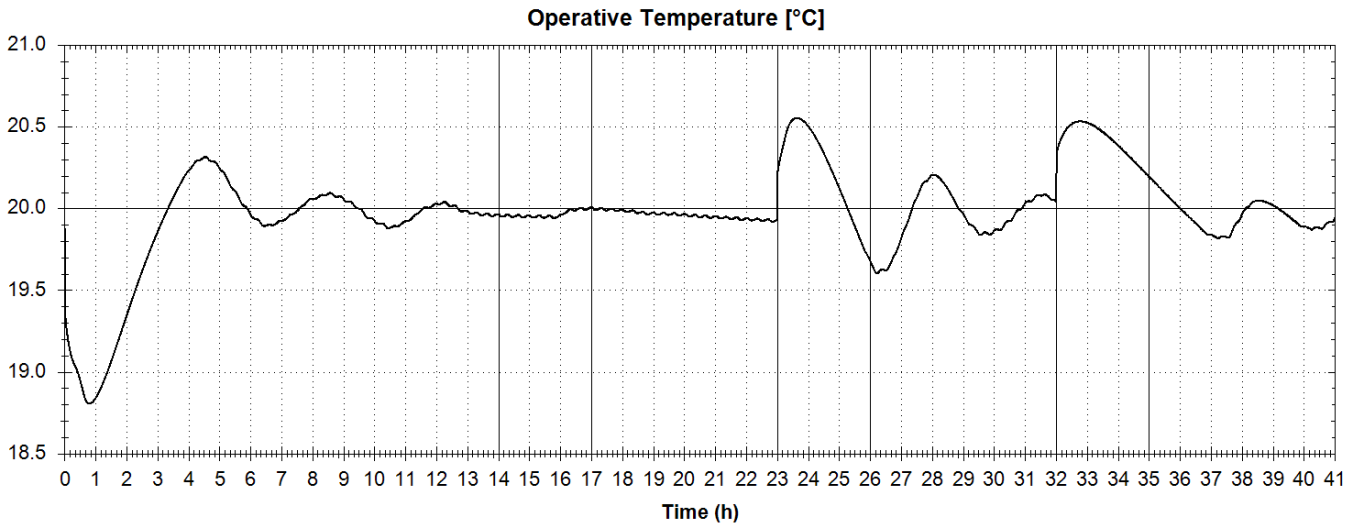
**6. Results summary**

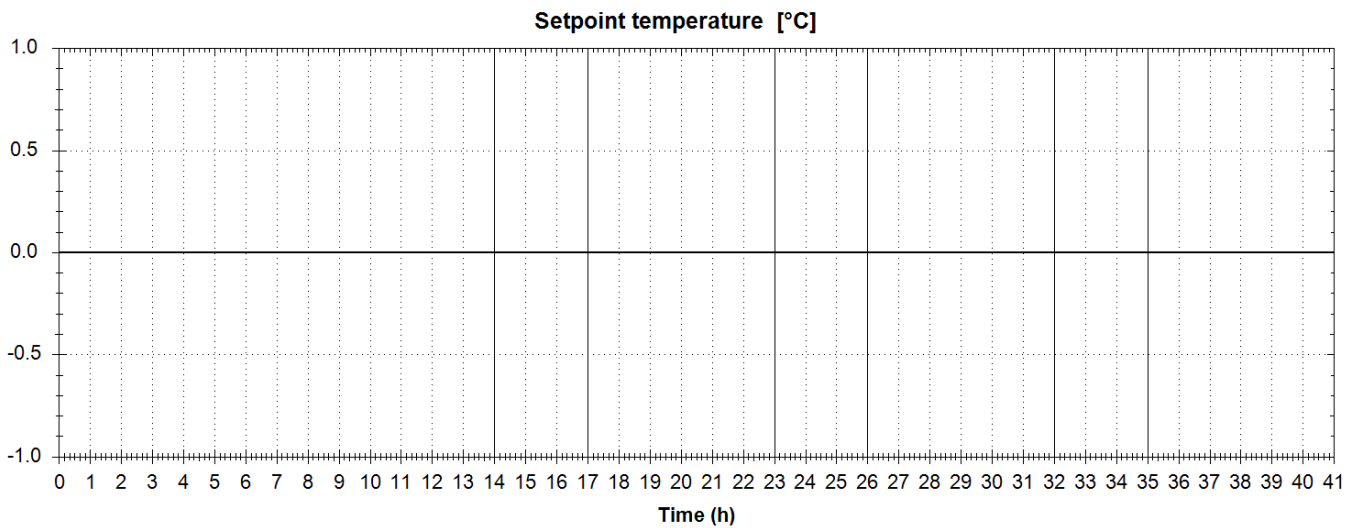
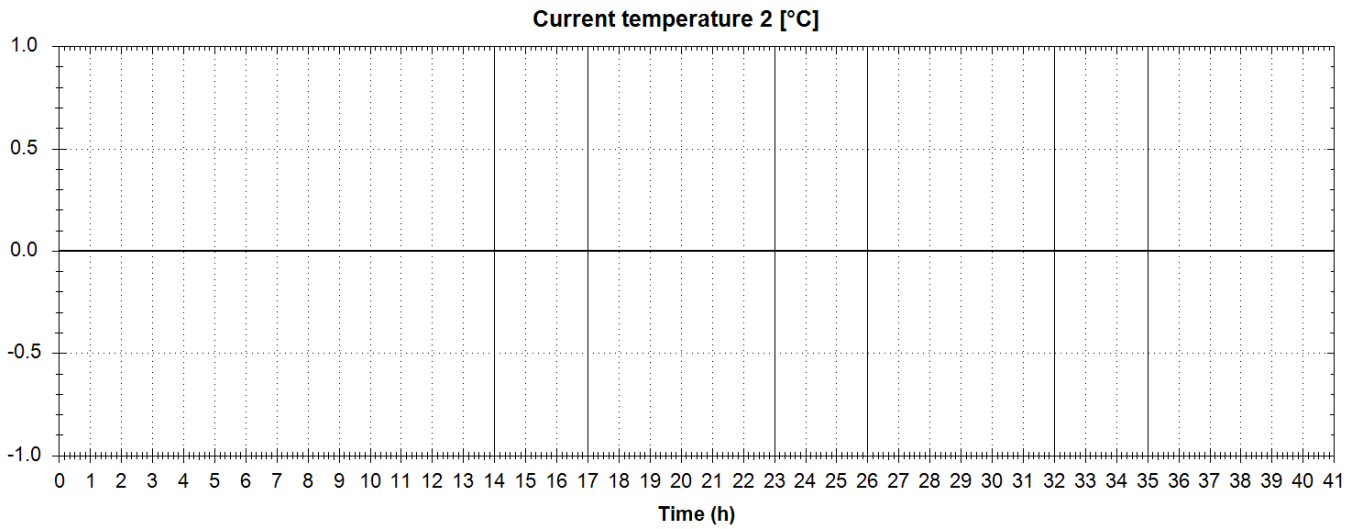
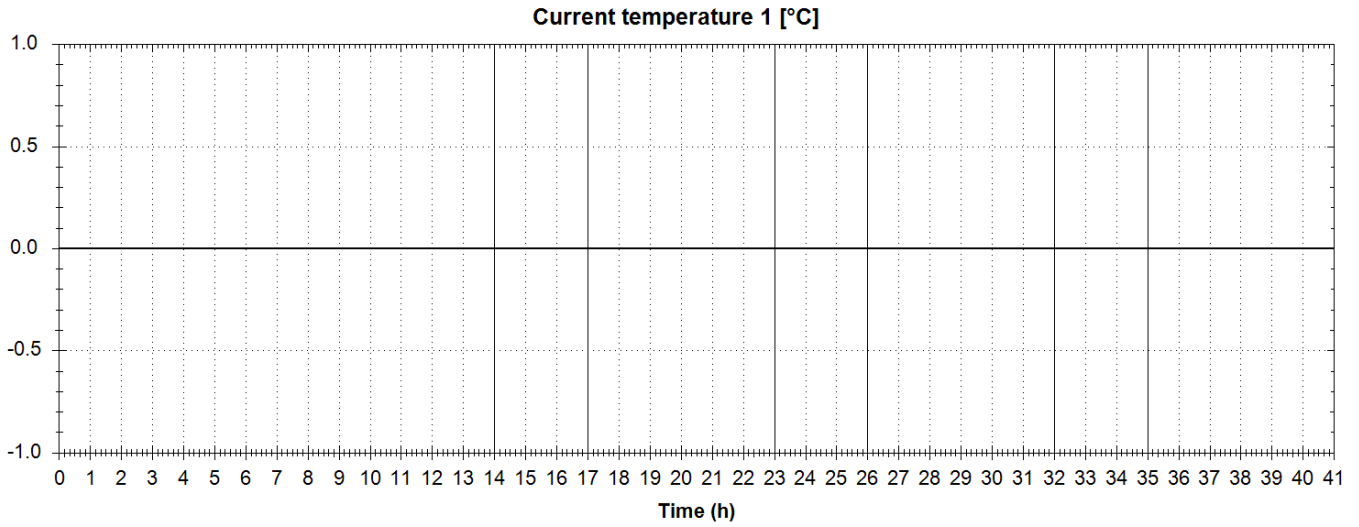
Test type	Results	Conditions	Approval
Comfort Mode	CA = 0.30°C	CA < 1.40°C	yes
Economic Mode	TM = 17.05°C	Teco - 1 < TM < Teco + 1	yes
Frost protection		Starting	yes

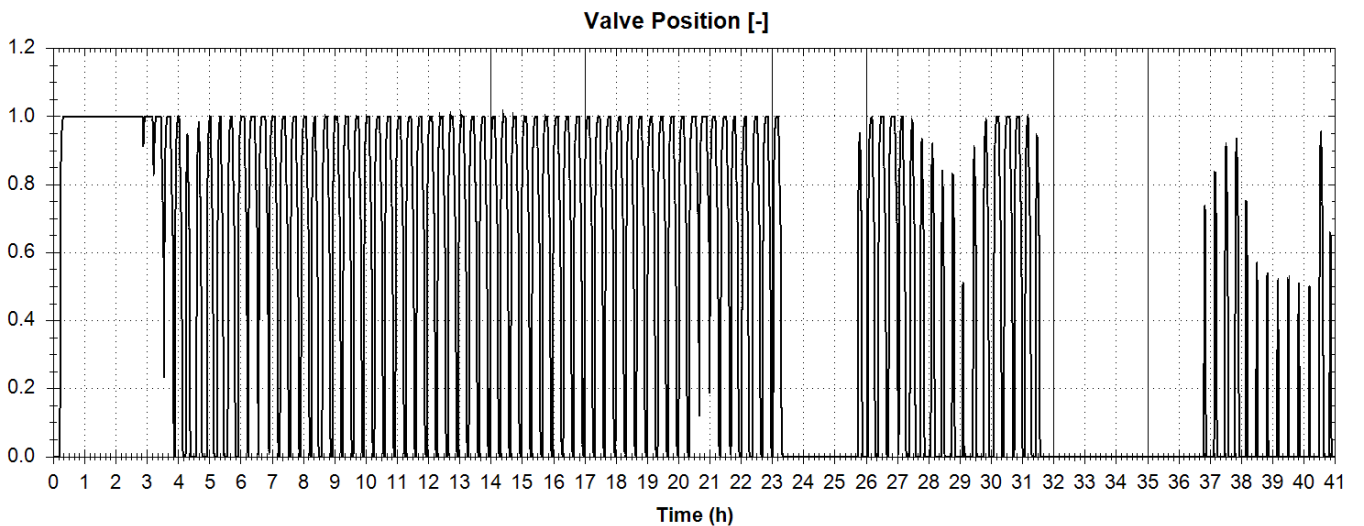
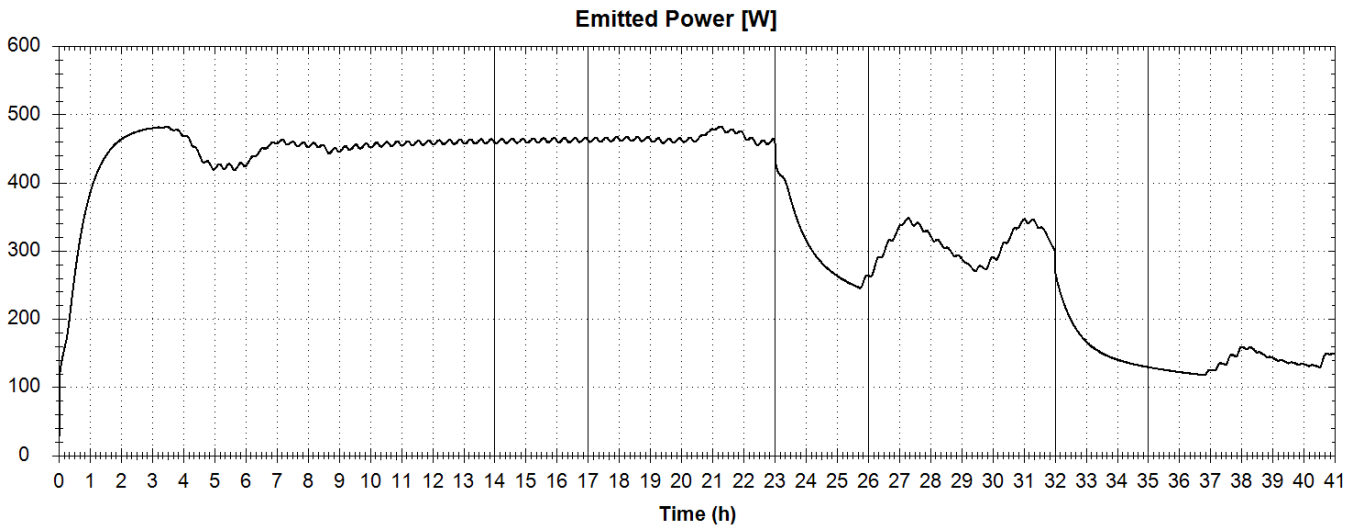
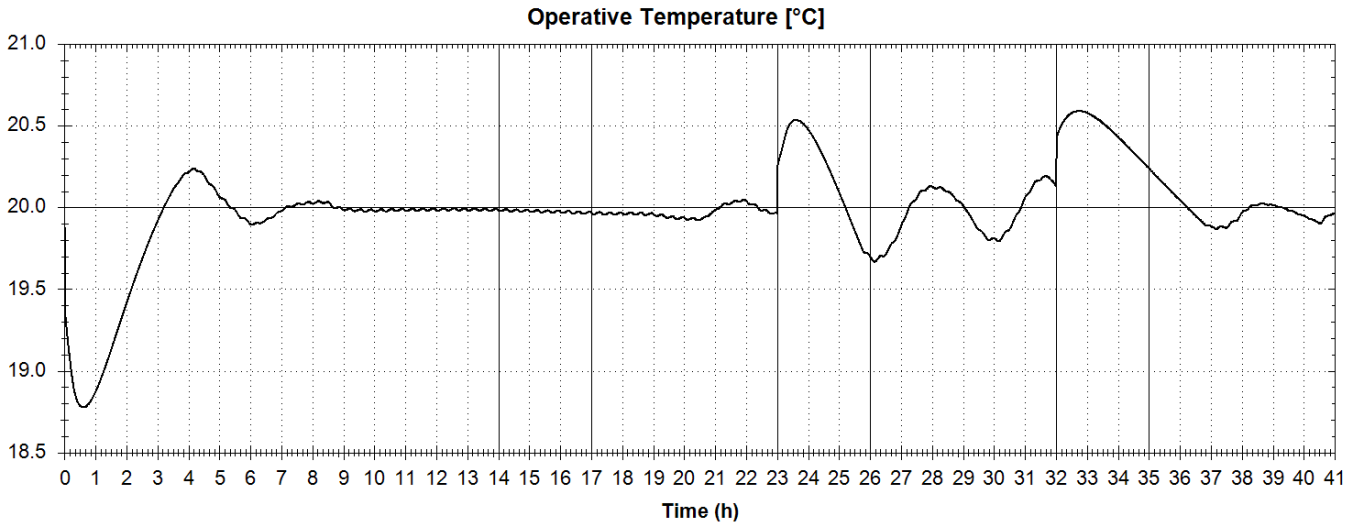
To declare, or not, the compliance with the specifications, the standard uncertainty of the laboratory was added to the test results.

# Appendix

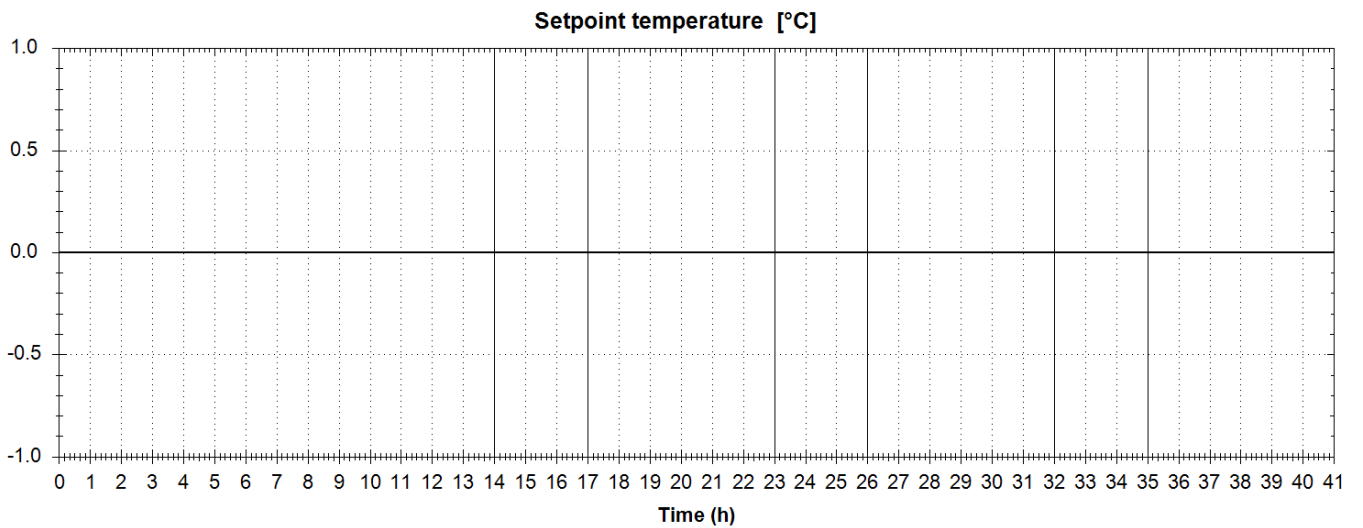
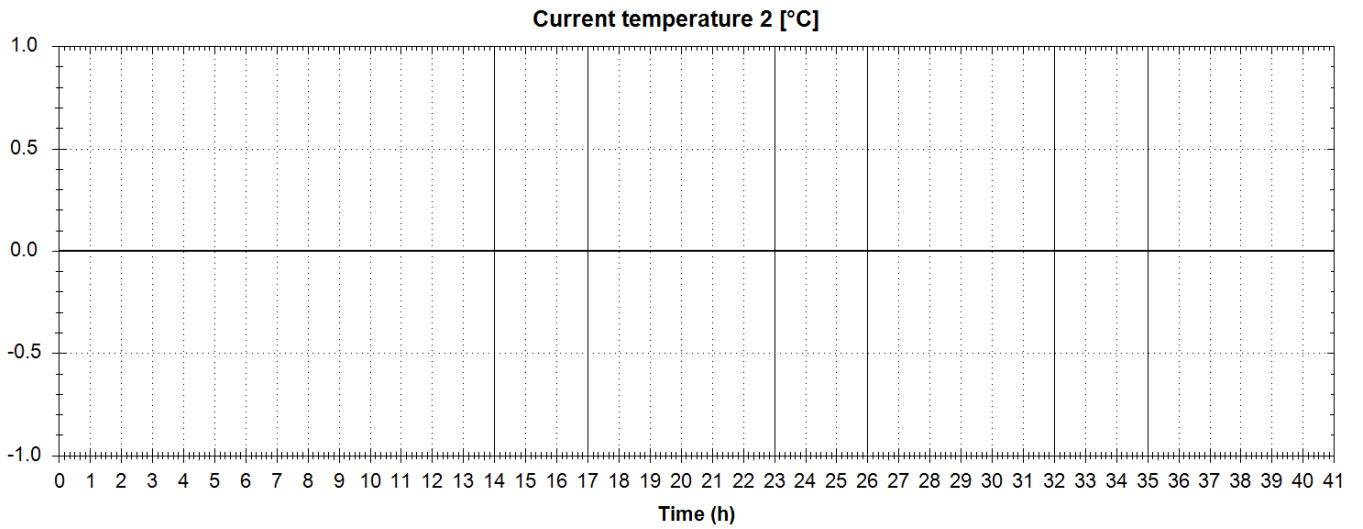
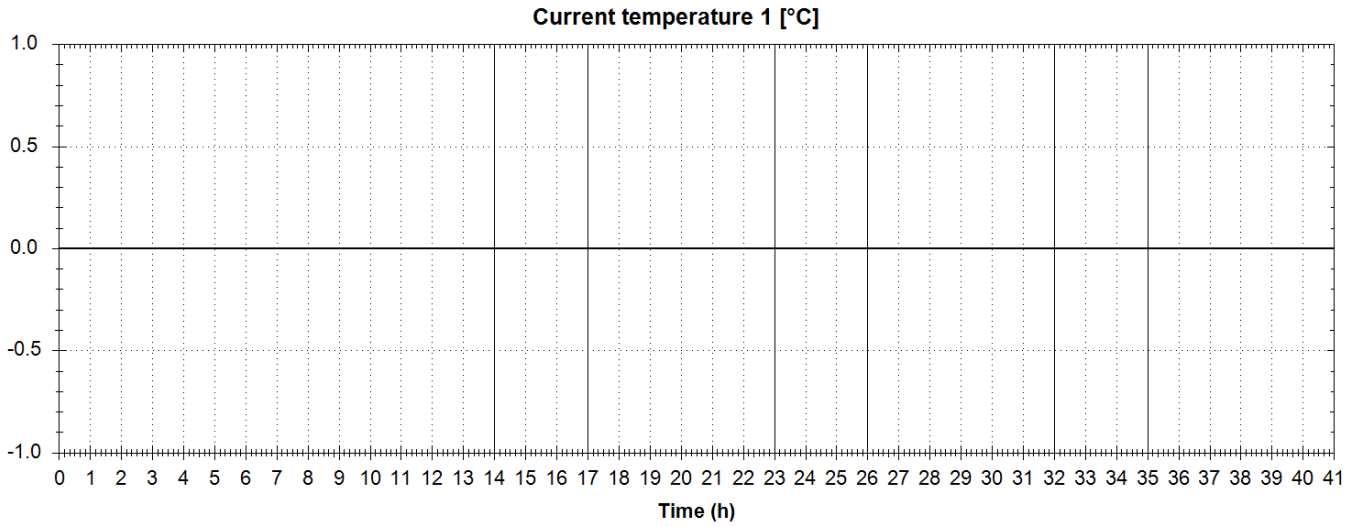
## Comfort Mode : curves of the simulation results

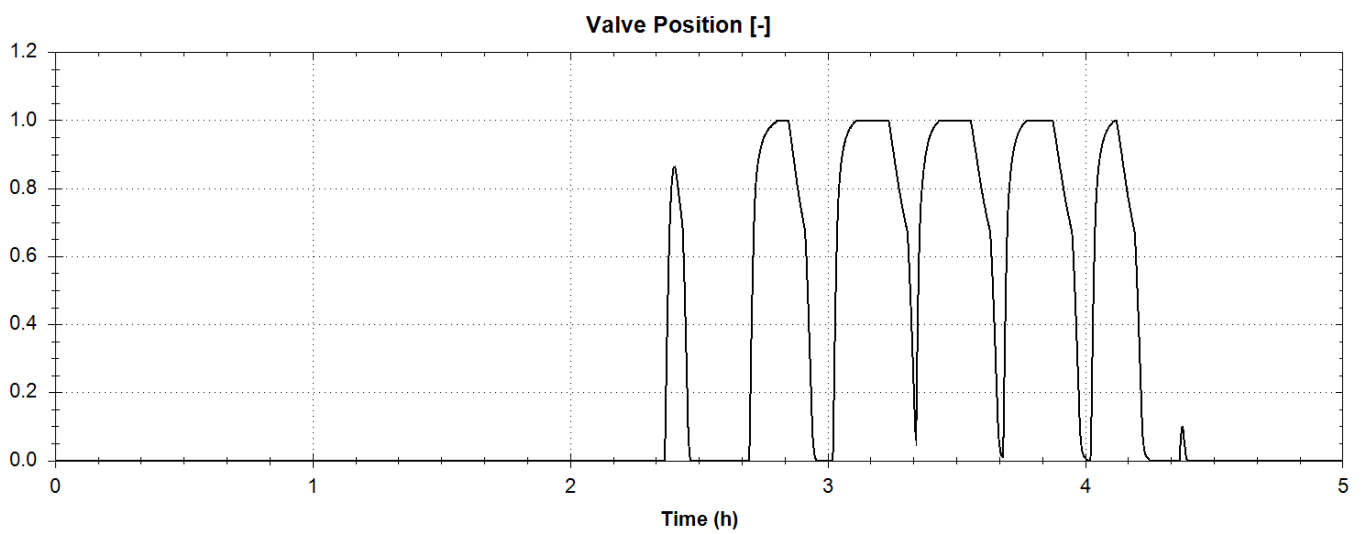
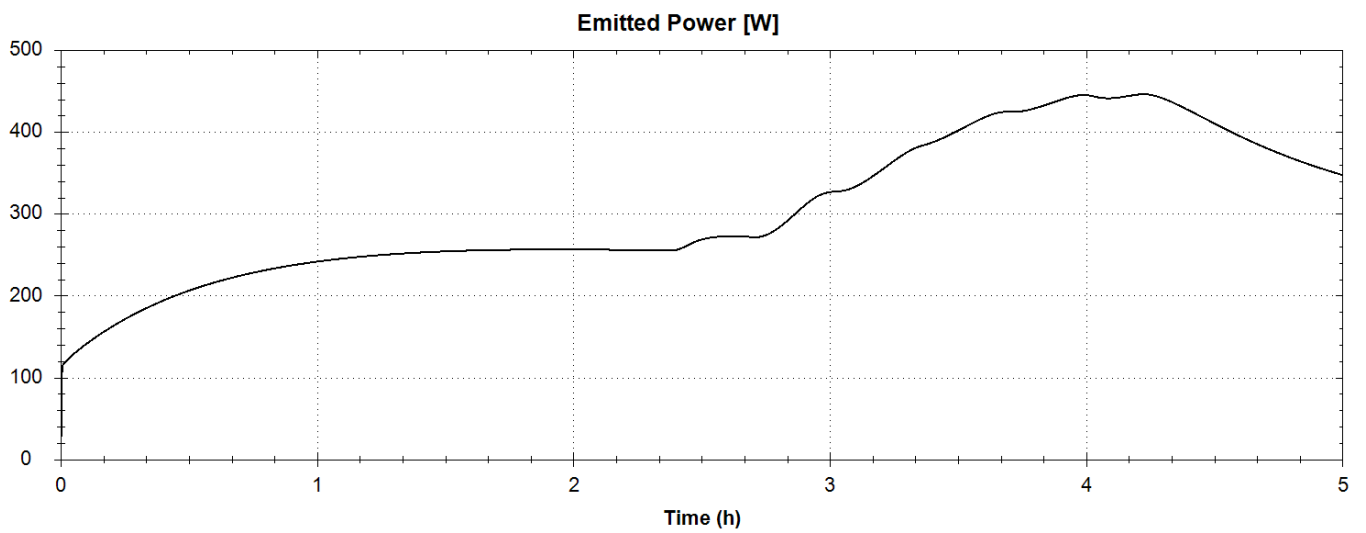
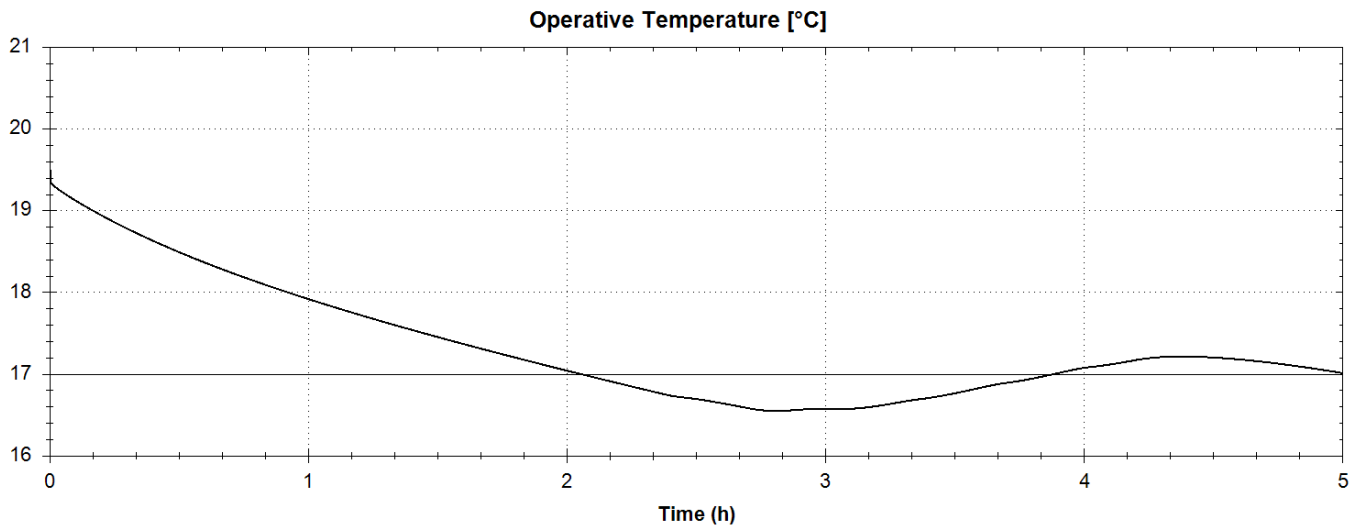


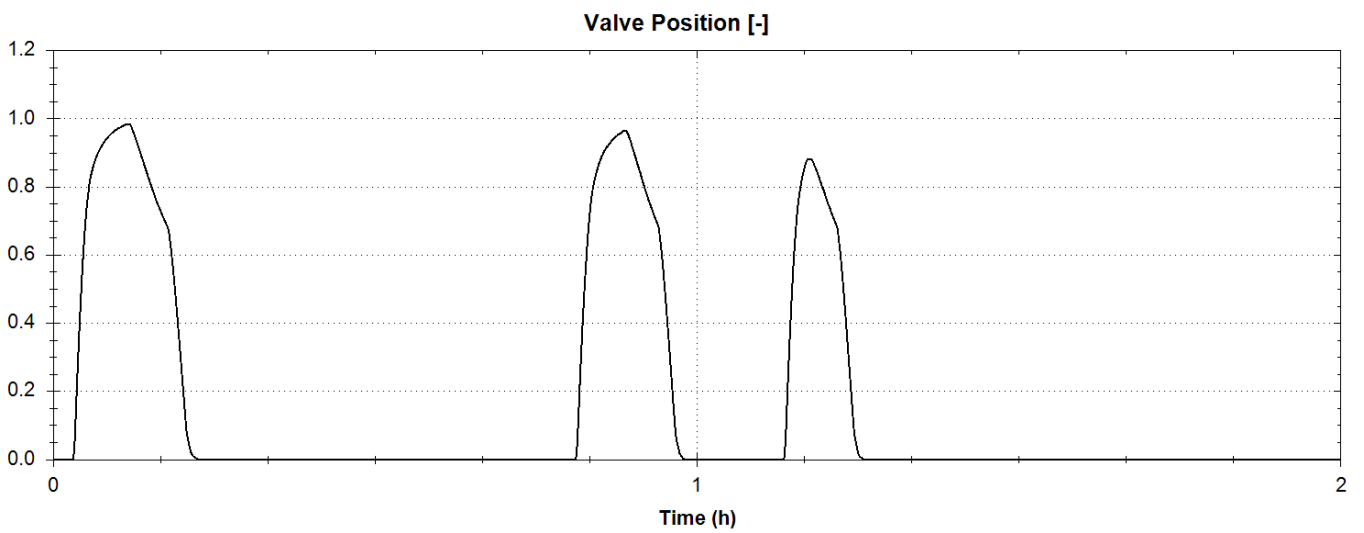
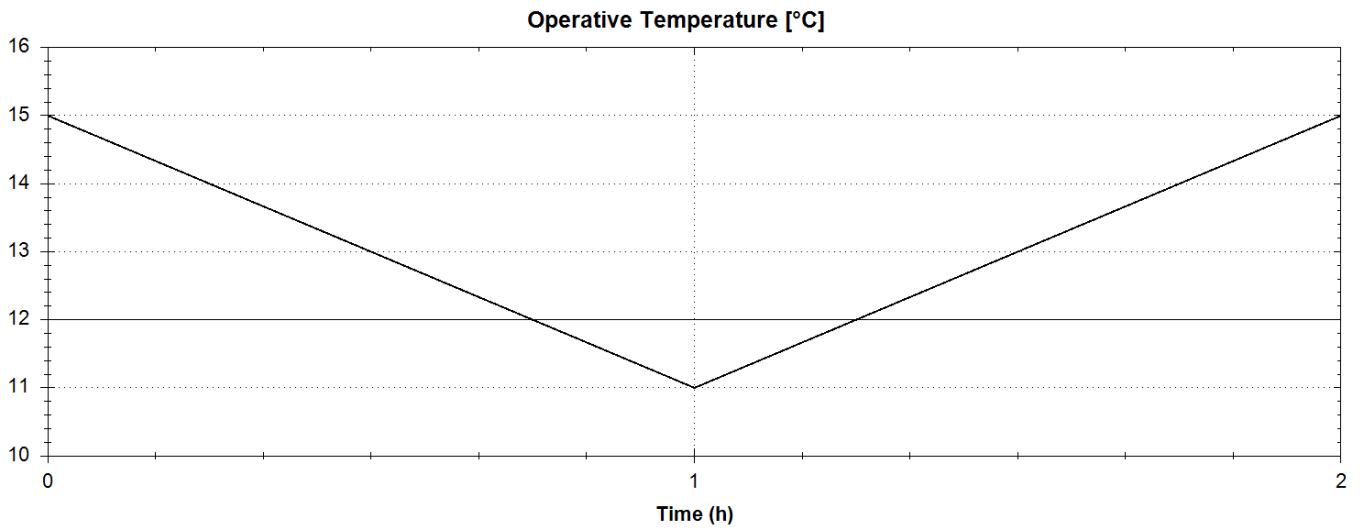








**Economic Mode : curves of the simulation results**

**Frost protection : curves of the simulation results**

**Laboratory equipments****Resistance box**

<b>Name</b>	11 0425
<b>Laboratory identification</b>	11 0425
<b>Slope [<math>\Omega/\Omega</math>]</b>	1
<b>Y-intercept [<math>\Omega</math>]</b>	-0.05
<b>Calibration report name</b>	CEC F0/07838 (Valid until 23/06/2022)

**Stroke measurement sensor**

<b>Name</b>	99 0015
<b>Laboratory identification</b>	CSTB
<b>Slope [mm/V]</b>	1.69181
<b>Y-intercept [mm]</b>	-0.01444
<b>Calibration report name</b>	DT 21-0047 (Valid until 11/02/2023)

**Software**

ETT IZC Version 6.0.1.1

License number : 6C308FA2-401B-4AB3-86B2-F3089B7DEFC3

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