



***Temperature Test***  
***Concept Box standard CB751***  
***Version 1.1***

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Date created: August, 10<sup>th</sup> 2009  
Last changes: January, 19<sup>th</sup> 2010  
File: 'Test\_Temperature\_protocol\_STD\_V1\_1.doc'  
Revision: 1.1  
Status: Finally version



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**Table of contents**

1. Administrative Data .....	3
2. Objective .....	4
3. Test- and Measurement- Equipment .....	5
3.1 Test Software .....	5
3.2 Data of Operation Mode and Configuration of EUT .....	5
3.2.1 Configuration of EUT .....	5
3.2.2 The Test in the Climatic Chamber .....	6
3.2.3 List of Test Equipment .....	6
3.2.4 Photographs of EUT and Test Setup .....	7
3.3 Performed Tests .....	8
3.3.1 Low Temperature Operating .....	8
3.3.2 High Temperature Operating .....	10
3.3.3 Temperature Cycling Operating .....	12
3.3.4 Humidity .....	14
3.3.5 Low Temperature Non-Operating .....	16
3.3.6 High Temperature Non-Operating .....	18
4. Conclusion .....	20
5. Appendix .....	21

## 1. Administrative Data

Equipment under test:	CB751-y
Options/accessories:	FSP-150-ABA lock
Serial number:	2-A0CJ-2XXX
Version of EUT:	DC
Receipt of EUT:	27.7.2009
Date of test:	28.7.2009
Date of report	10.8.2009
Version of test report	1.1
Tested by:	Ladislav Michal, Zdenek Zahradka
Test report written by:	Zdenek Zahradka

## 2. Objective

To measure Temperatures of CB751-y based on IEC Standards



### 3. Test- and Measurement- Equipment

#### 3.1 Test Software

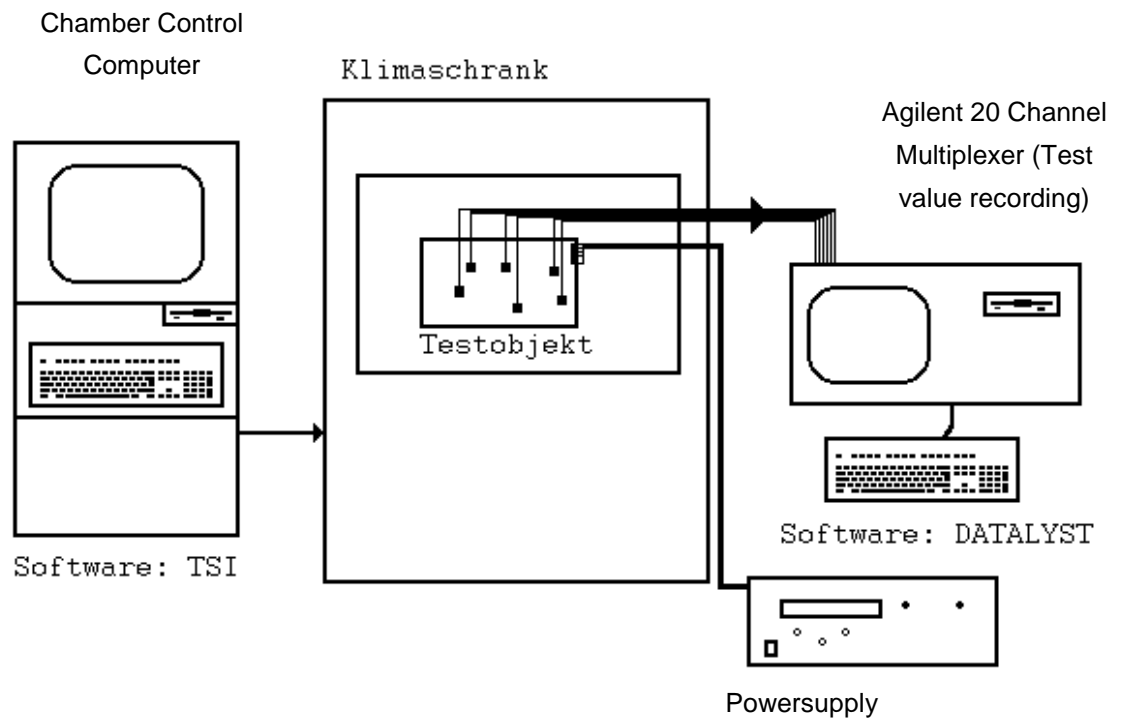
<i>Component</i>	<i>Model</i>	<i>Manufacturer</i>	<i>Ser. No.</i>	<i>Cal. until</i>
Testsoftware	Burn-in Test Pro 5.3	Passmark Software	-	-
MonitorSoftware	Monitor	Kontron		

#### 3.2 Data of Operation Mode and Configuration of EUT

##### 3.2.1 Configuration of EUT

Art. NR	Title	Ser. NR
9-9900-0040	986LCD-M/mitX BGA 1.66GHz ABS	00662329
1030-6924	BGPM UDIMM DDR2 1 GB MT8HTF12864AY-667	2 x
1022-5342	BGHD SATA150 2,5" 80GB MHY2080BH ESW	K44L92122NLC
1022-3341	BGSO ADD2-DVI-Dual PCI	00571052
1030-4974	BGNT M2-ATX-HV, 140W, 6-32V	
1030-7818	BGNT AC/DC 24V 150W FSP150-ABA lock	
	WXP Test Image	-
	SOWA 986LCD/mitX STD	

### 3.2.2 The Test in the Climatic Chamber



### 3.2.3 List of Test Equipment

	Equipment Type	Model	Equipment No.	Calibration valid until	Manufacturer
✓	Climatic Chamber	VUK 04-500	PM-EM-6160-1	08.99	Heraus-Vötsch
✓	Control computer	IPLite Color	PM-EM-9599.01	not requested	KONTRON Elektr.
✓	Measuring system	34970A	PM-EM-9519.01	not requested	HP/Agilent
✓	Control computer	Rx7000	PM-EM-9597.01	not requested	KONTRON Elkr.

(check mark in 1<sup>st</sup> column) = tested with

### 3.2.4 Photographs of EUT and Test Setup



*Picture01: IEC Climatic Chamber*

### 3.3 Performed Tests

#### 3.3.1 Low Temperature Operating

Pre-test parameter

<i>Parameter</i>	<i>Values, [References]</i>
Checks, measurements	<ul style="list-style-type: none"> <li>▪ Visual inspection</li> <li>▪ Functional test</li> </ul>

Test parameter

<i>Parameter</i>	<i>Values, [References]</i>
Conditions	<ul style="list-style-type: none"> <li>▪ Standard: IEC 60068-2-1</li> <li>▪ Test category: Ad</li> <li>▪ Temperature: 0 °C ± 3 °C</li> <li>▪ Duration: 2 h</li> <li>▪ Gradient: 20 K / h]</li> </ul>
Sample status	<ul style="list-style-type: none"> <li>▪ Non operating and Operating (refer to Fig. 1)</li> </ul>
Checks, measurements	<ul style="list-style-type: none"> <li>▪ Functional test</li> </ul>

Temperature Diagram

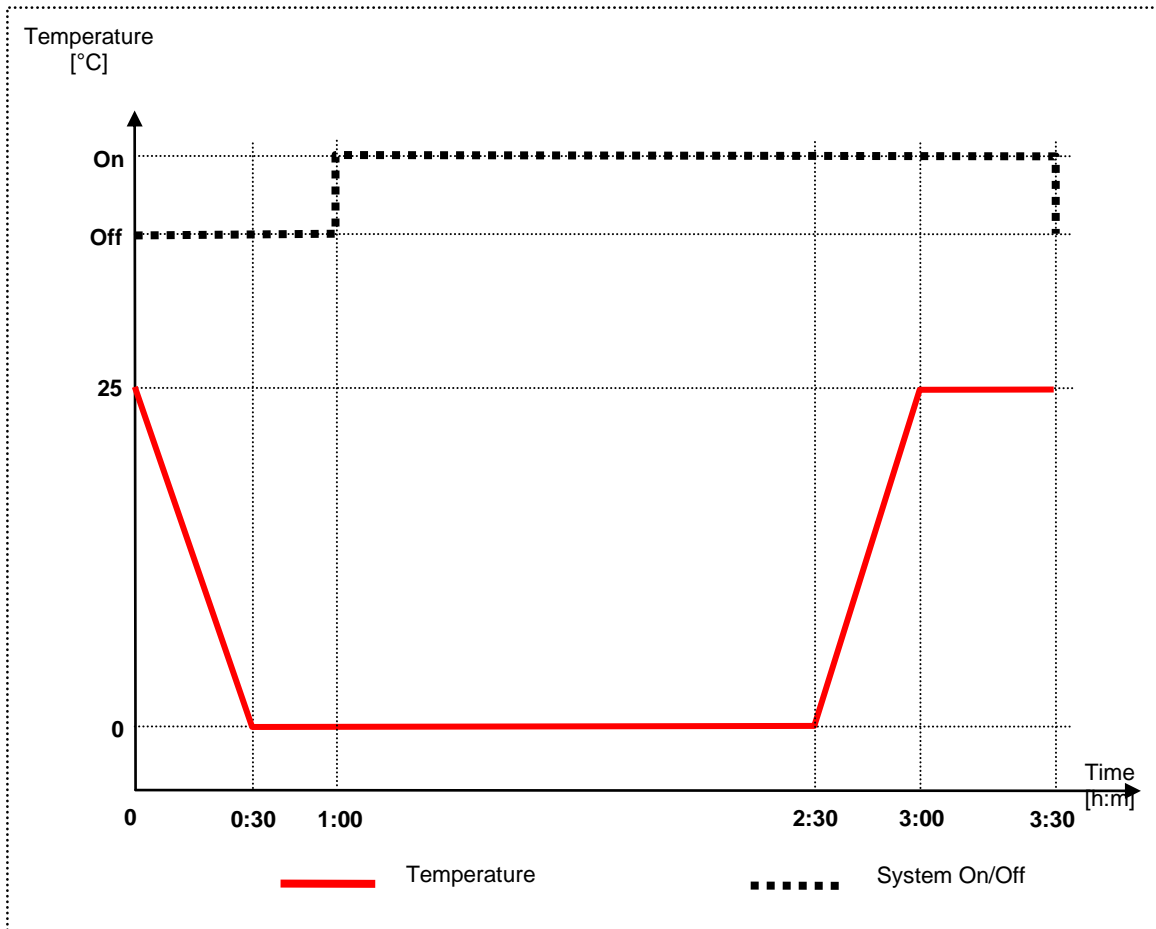


Fig 1: Temperature diagram: Low Temperature

Post-test parameter

<i>Parameter</i>	<i>Values, [References]</i>
Checks, measurements	<ul style="list-style-type: none"> <li>▪ Visual inspection</li> <li>▪ Functional test</li> </ul>

### 3.3.2 High Temperature Operating

Pre-test parameter

<b><i>Parameter</i></b>	<b><i>Values, [References]</i></b>
Checks, measurements	<ul style="list-style-type: none"> <li>▪ Visual inspection</li> <li>▪ Functional test</li> </ul>

Test parameter

<b><i>Parameter</i></b>	<b><i>Values, [References]</i></b>
Conditions	<ul style="list-style-type: none"> <li>▪ Standard: IEC 60068-2-2</li> <li>▪ Test category: Bd</li> <li>▪ Temperature: + 40 °C ± 2 °C</li> <li>▪ Duration: 2 h</li> <li>▪ Gradient: 20 K / h</li> </ul>
Sample status	<ul style="list-style-type: none"> <li>▪ Non operating / Operating (refer to Fig. 2)</li> </ul>
Checks, measurements	<ul style="list-style-type: none"> <li>▪ Functional test</li> </ul>

Temperature Diagram

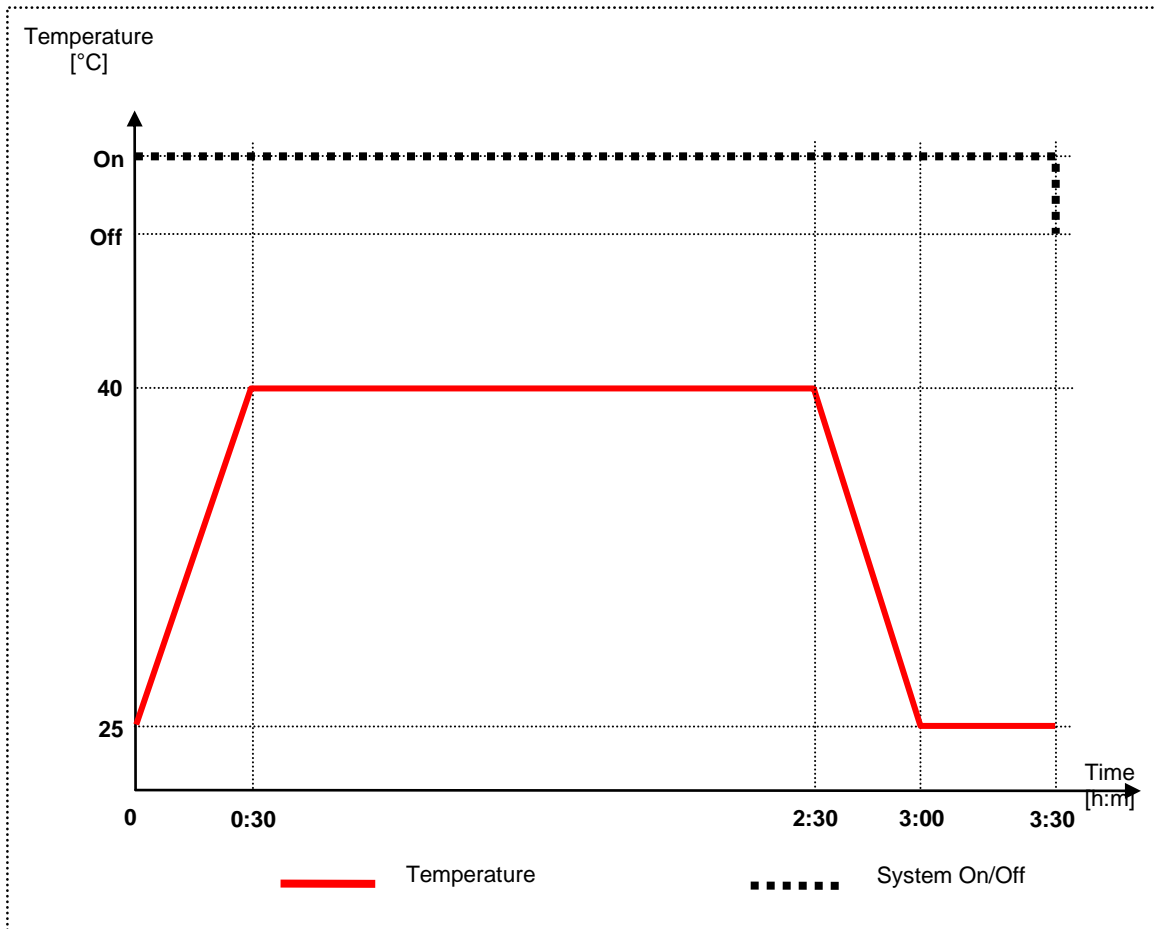


Fig 2: Temperature diagram: High Temperature

Post-test parameter

<i>Parameter</i>	<i>Values, [References]</i>
Checks, measurements	<ul style="list-style-type: none"> <li>▪ Visual inspection</li> <li>▪ Functional test</li> </ul>

### 3.3.3 Temperature Cycling Operating

Pre-test parameter

<i>Parameter</i>	<i>Values, [References]</i>
Checks, measurements	<ul style="list-style-type: none"> <li>▪ Visual inspection</li> <li>▪ Functional test</li> </ul>

Test parameter

<i>Parameter</i>	<i>Values, [References]</i>
Conditions	<ul style="list-style-type: none"> <li>▪ Standard: IEC 60068-2-14</li> <li>▪ Test category: Nb</li> <li>▪ Temperature: between 0 °C to + 40 °C ± 2 °C</li> <li>▪ Duration: 2 cycles (2 h)</li> <li>▪ Gradient: 20 K / h</li> </ul>
Sample status	<ul style="list-style-type: none"> <li>▪ Operating (refer to Fig. 3)</li> </ul>
Checks, measurements	<ul style="list-style-type: none"> <li>▪ Functional test</li> </ul>

Temperature Diagram

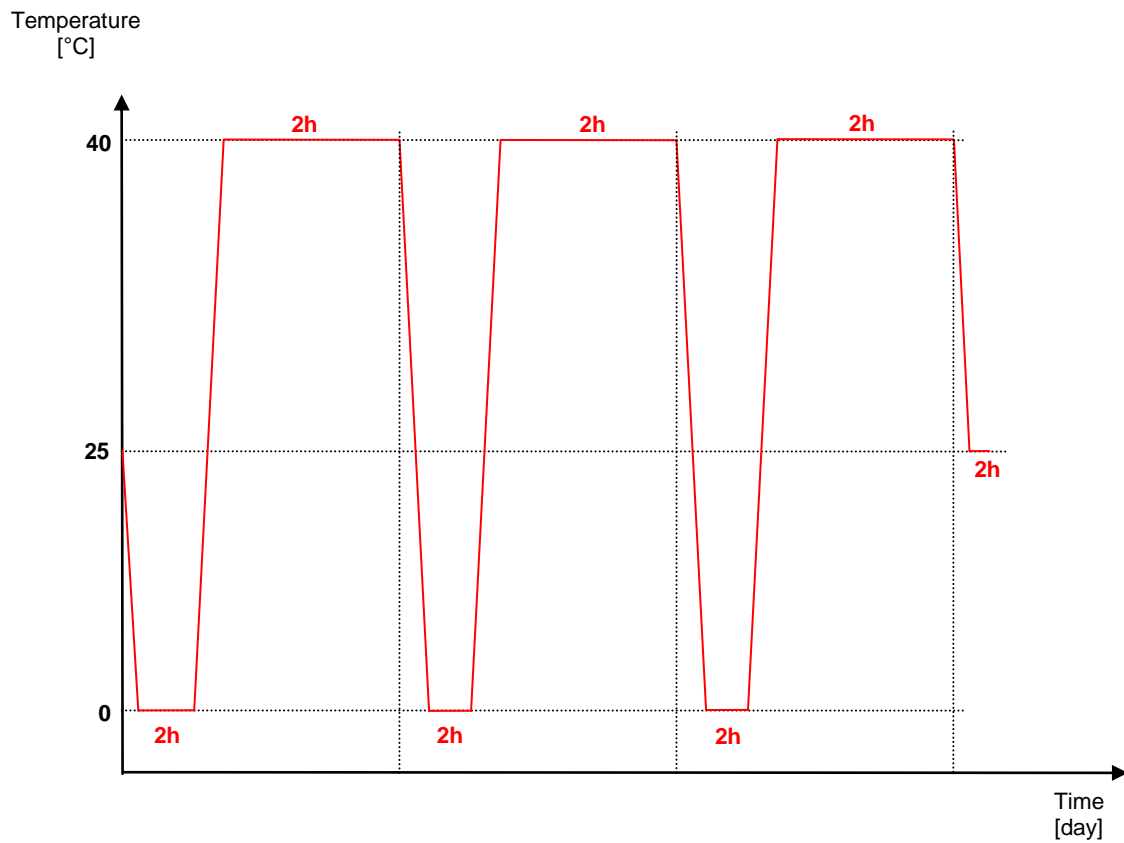


Fig 3: Temperature diagram: Thermal Cycle

Post-test parameter

<i>Parameter</i>	<i>Values, [References]</i>
Checks, measurements	<ul style="list-style-type: none"> <li>▪ Visual inspection</li> <li>▪ Functional test</li> </ul>

### 3.3.4 Humidity

Pre-test parameter

<b>Parameter</b>	<b>Values, [References]</b>
Checks, measurements	<ul style="list-style-type: none"> <li>▪ Visual inspection</li> <li>▪ Functional test</li> </ul>

Test parameter

<b>Parameter</b>	<b>Values, [References]</b>
Conditions	<ul style="list-style-type: none"> <li>▪ Standard: IEC 60068-2-30</li> <li>▪ Test category: Db</li> <li>▪ Temperature: + 40 °C ± 2 °C</li> <li>▪ Humidity: 95%</li> <li>▪ Duration: 12+12 h</li> <li>▪ Gradient: 20 K / h</li> </ul>
Sample status	<ul style="list-style-type: none"> <li>▪ Operating (refer to Fig. 3)</li> </ul>
Checks, measurements	<ul style="list-style-type: none"> <li>▪ Functional test</li> </ul>

Temperature Diagram

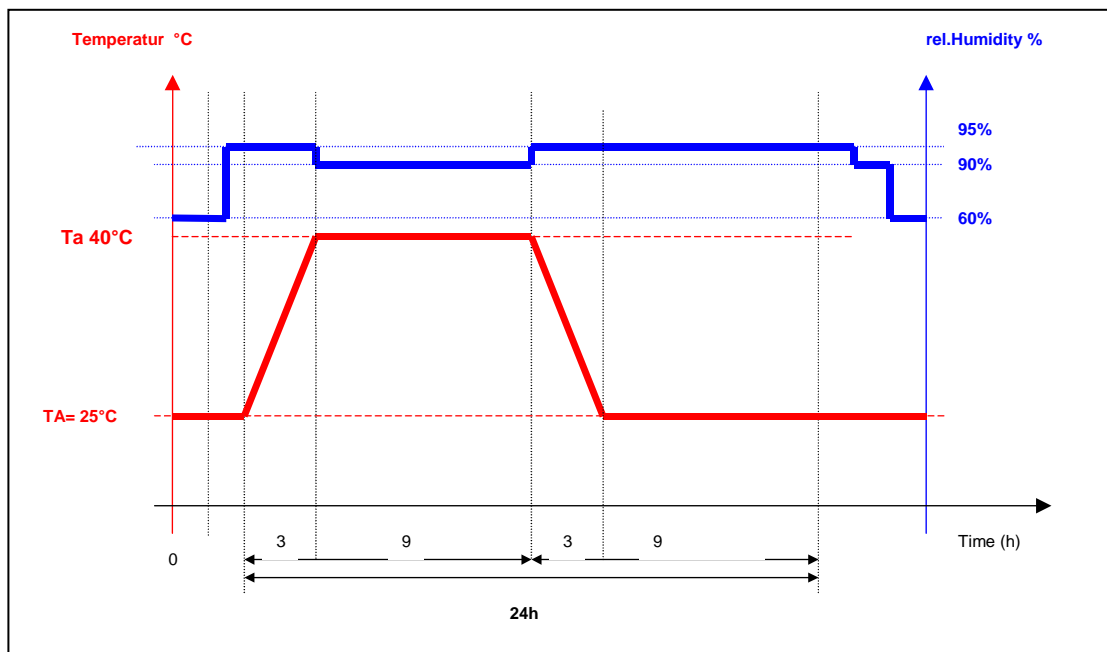


Fig 3: Temperature diagram: Humidity

Post-test parameter

Parameter	Values, [References]
Checks, measurements	<ul style="list-style-type: none"> <li>▪ Visual inspection</li> <li>▪ Functional test</li> </ul>

### 3.3.5 Low Temperature Non-Operating

Pre-test parameter

<b>Parameter</b>	<b>Values, [References]</b>
Checks, measurements	<ul style="list-style-type: none"><li>▪ Visual inspection</li><li>▪ Functional test</li></ul>

Test parameter

<b>Parameter</b>	<b>Values, [References]</b>
Conditions	<ul style="list-style-type: none"><li>▪ Temperature: -20 °C ± 3 °C</li><li>▪ Duration: 16 h</li><li>▪ Gradient: 20 K / h</li></ul>
Sample status	<ul style="list-style-type: none"><li>▪ Non operating (refer to Fig. 4)</li></ul>
Checks, measurements	<ul style="list-style-type: none"><li>▪ Functional test</li></ul>

Temperature Diagram

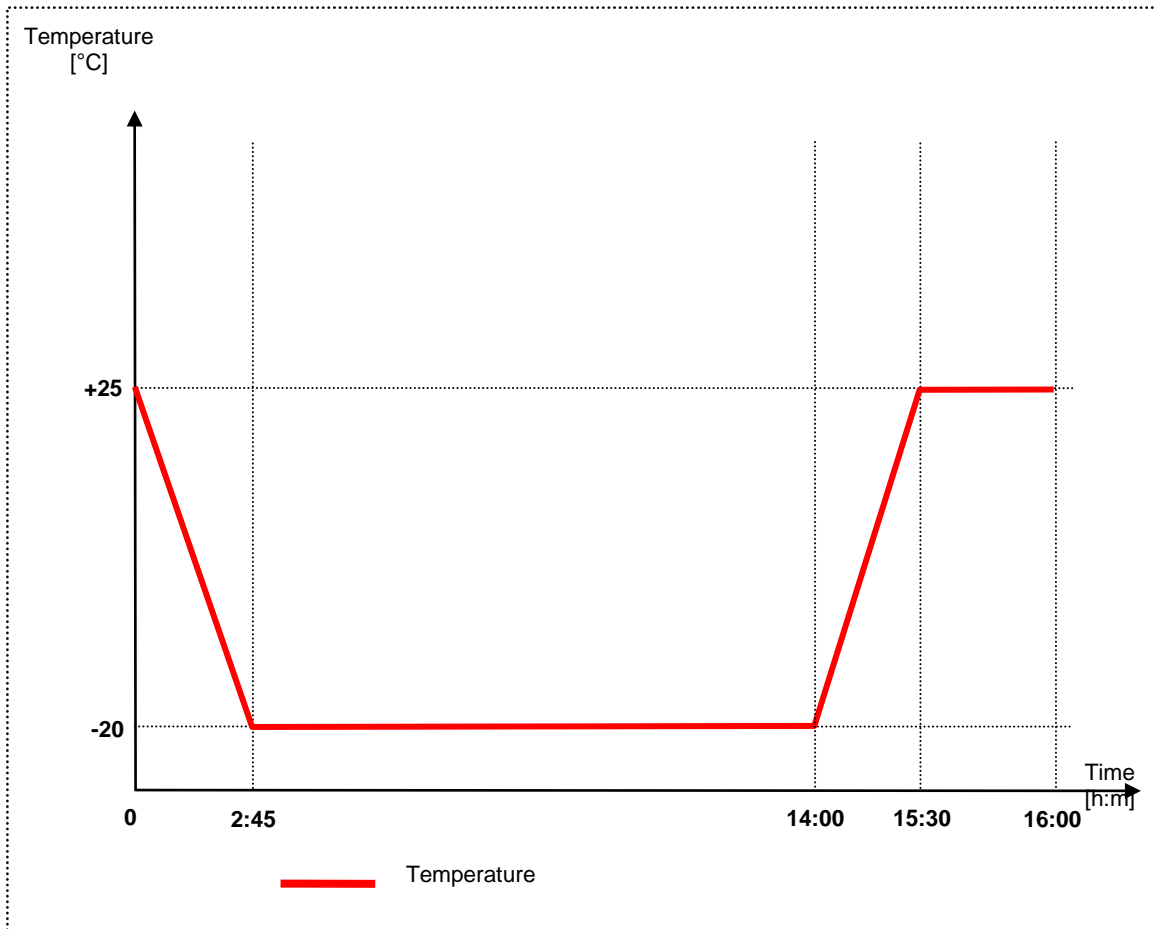


Fig 4: Temperature diagram: Low Temperature Non-Operating

Post-test parameter

<b>Parameter</b>	<b>Values, [References]</b>
Checks, measurements	<ul style="list-style-type: none"> <li>▪ Visual inspection</li> <li>▪ Functional test</li> </ul>

### 3.3.6 High Temperature Non-Operating

Pre-test parameter

<b>Parameter</b>	<b>Values, [References]</b>
Checks, measurements	<ul style="list-style-type: none"><li>▪ Visual inspection</li><li>▪ Functional test</li></ul>

Test parameter

<b>Parameter</b>	<b>Values, [References]</b>
Conditions	<ul style="list-style-type: none"><li>▪ Temperature: + 70 °C ± 2 °C</li><li>▪ Duration: 16 h</li><li>▪ Gradient: 20 K / h</li></ul>
Sample status	<ul style="list-style-type: none"><li>▪ Non operating (refer to Fig. 5)</li></ul>
Checks, measurements	<ul style="list-style-type: none"><li>▪ Functional test</li></ul>

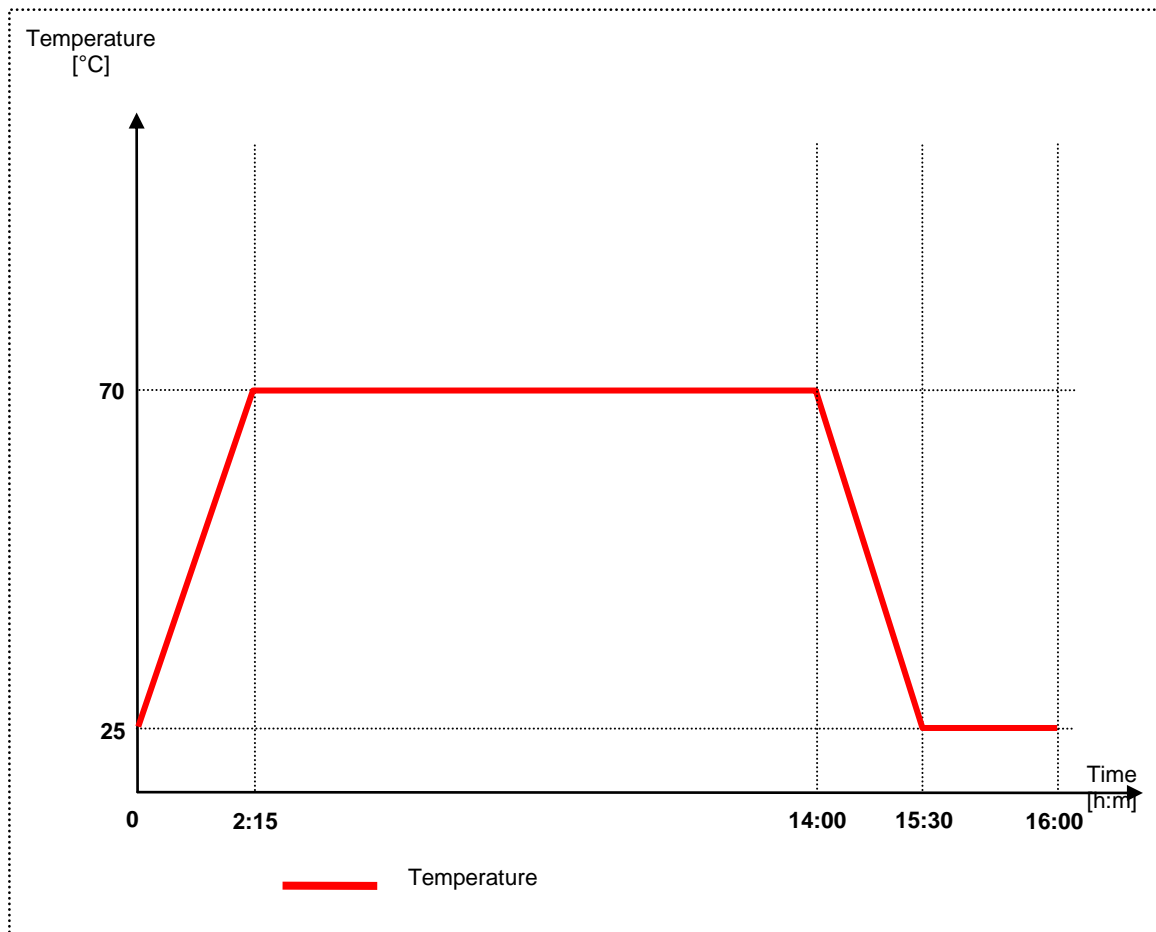
Temperature Diagram

Fig 5: Temperature diagram: High Temperature Non-Operating

## Post-test parameter

<b>Parameter</b>	<b>Values, [References]</b>
Checks, measurements	<ul style="list-style-type: none"> <li>▪ Visual inspection</li> <li>▪ Functional test</li> </ul>

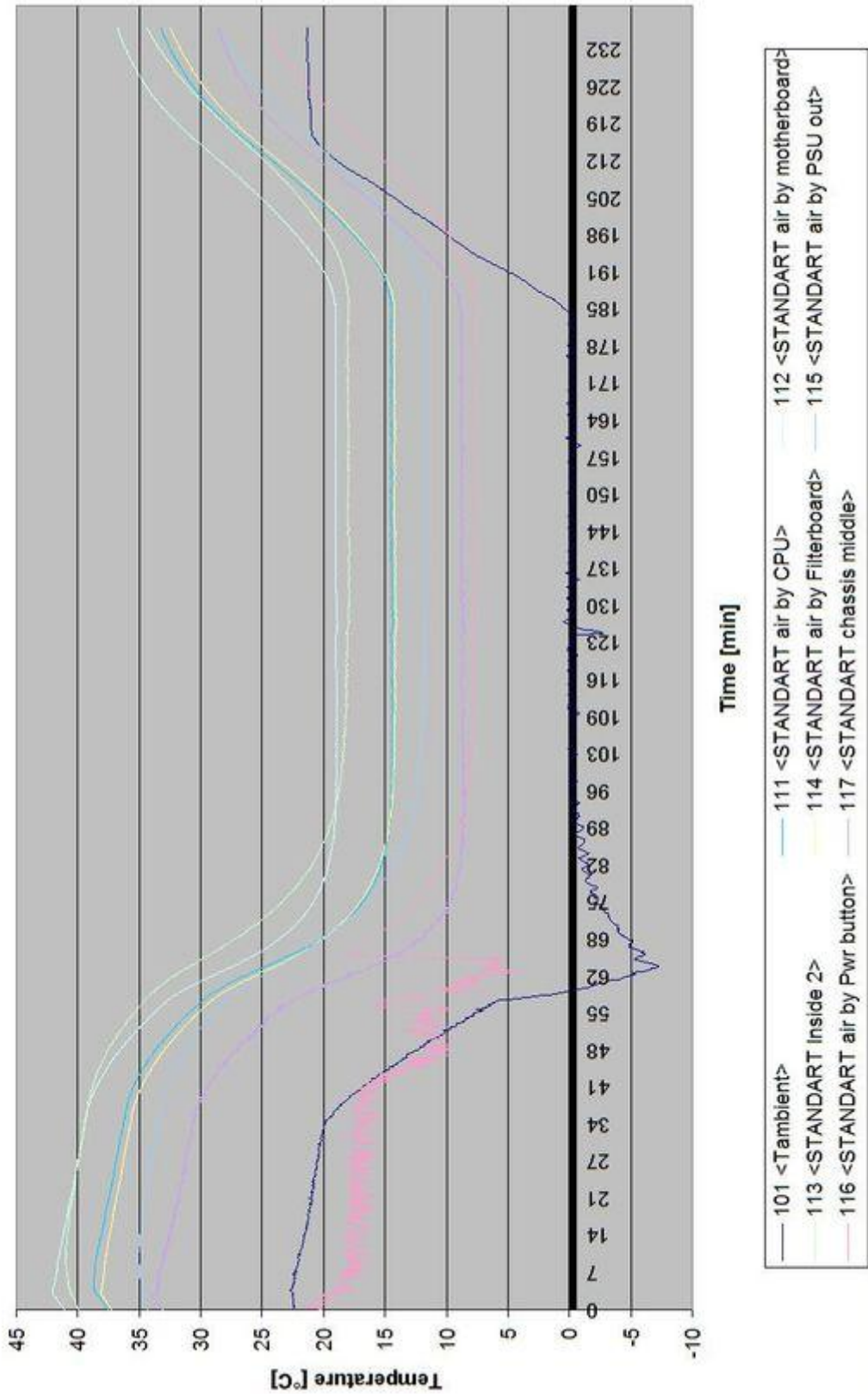
## 4. Conclusion

### Test results

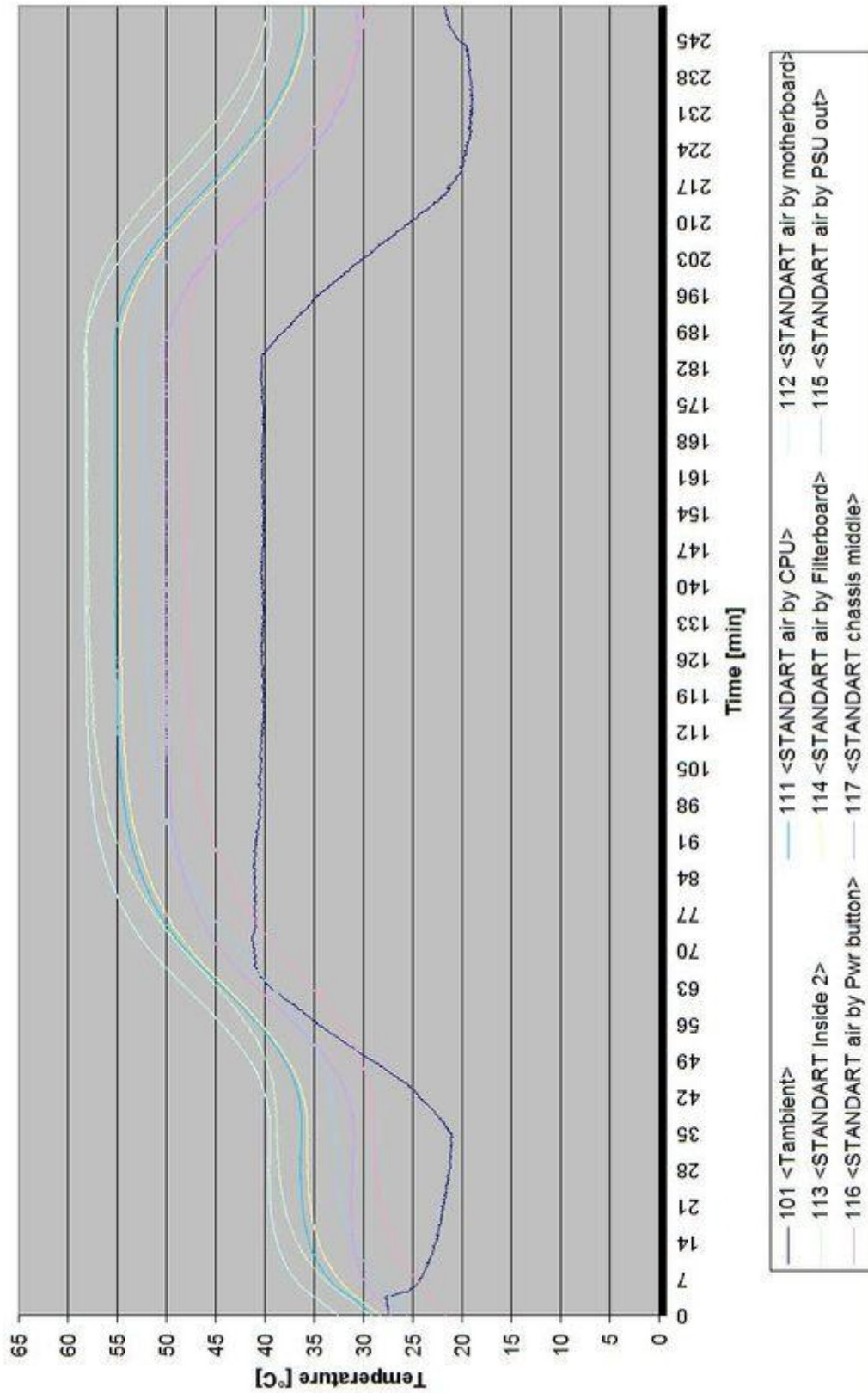
<b>Nr.</b>	<b>Test</b>	<b>Result</b>	<b>Comments</b>
1	Low Temperature operating, Temperature: 0 °C	Pass	System works without any deviation
2	High Temperature operating, Temperature: + 40 °C	Pass	System works without any deviation
3	Cycles, Temperature: 0 to + 40 °C	Pass	System works without any deviation
4	Humidity Temperature: 0 to + 40 °C Humidity: 95%	Pass	System works without any deviation
5	Low Temperature non-operating, Temperature: -20 °C	Pass	System works without any deviation
6	High Temperature non-operating Temperature: + 70 °C	Pass	System works without any deviation

### 5. Appendix

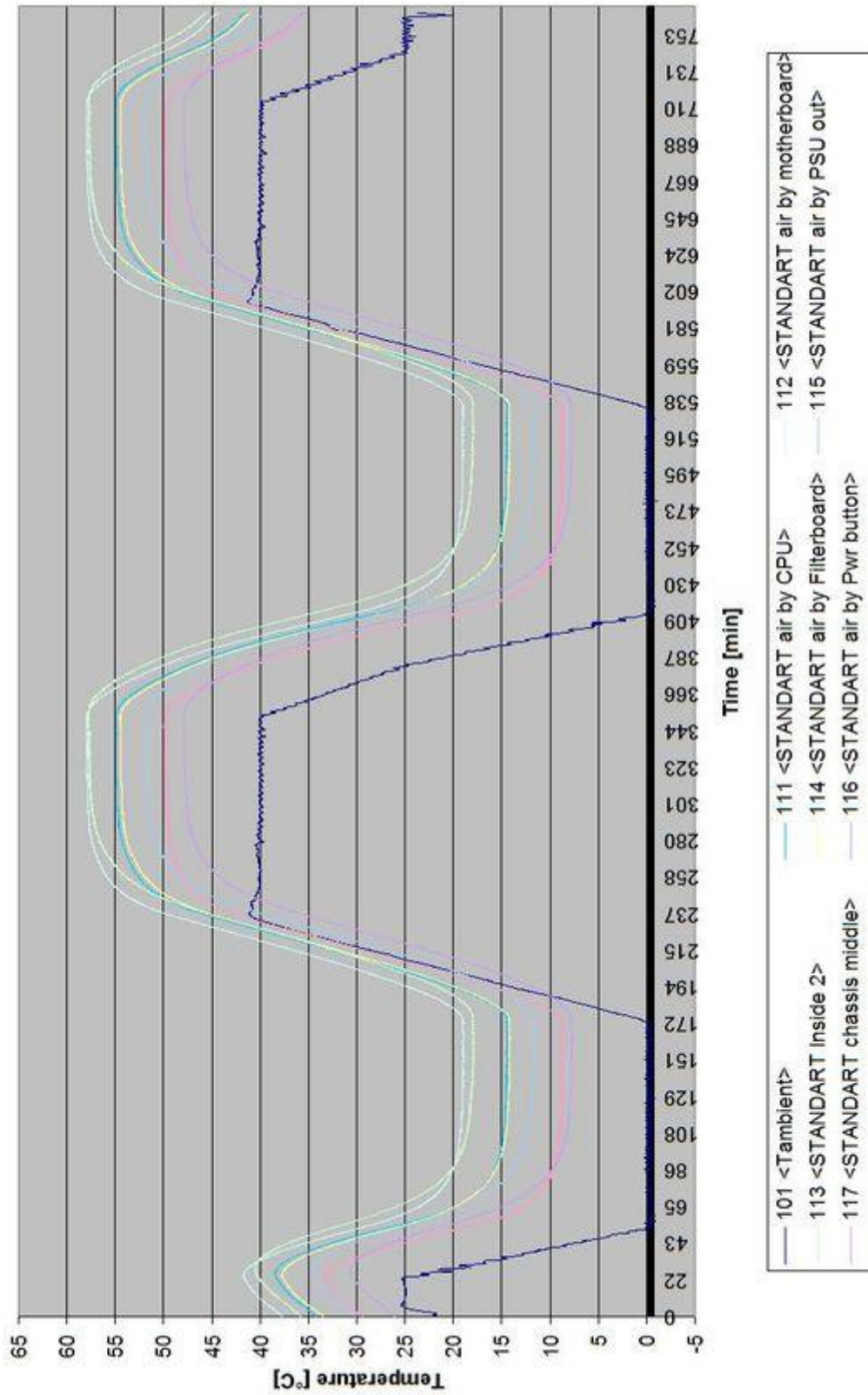
Temperature Measurement IEC-2-1 Tests Ab: Cold, Operating, 0°C



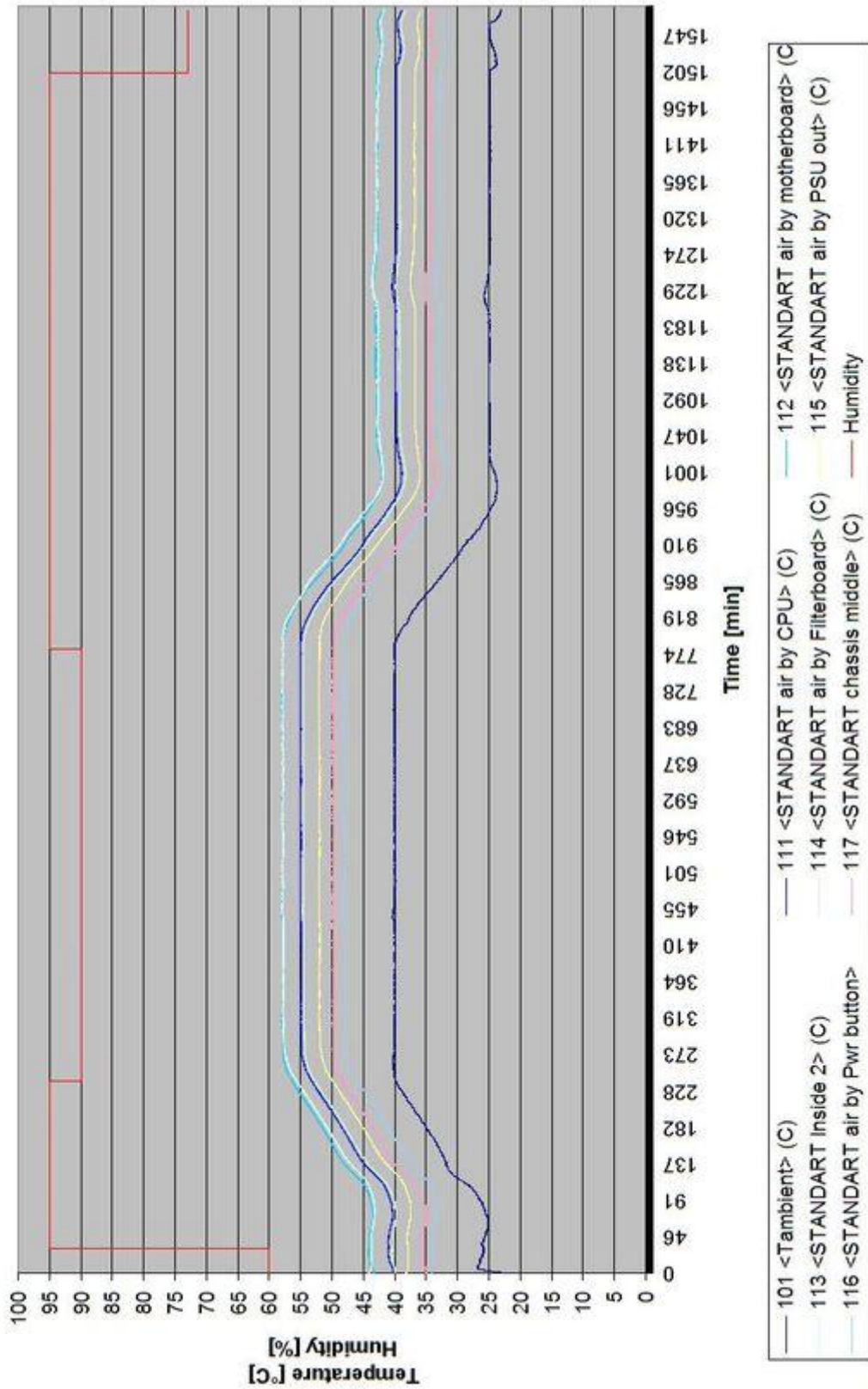
Temperature Test IEC 2-2 Tests Bb: Dry heat, Operating, 40°C



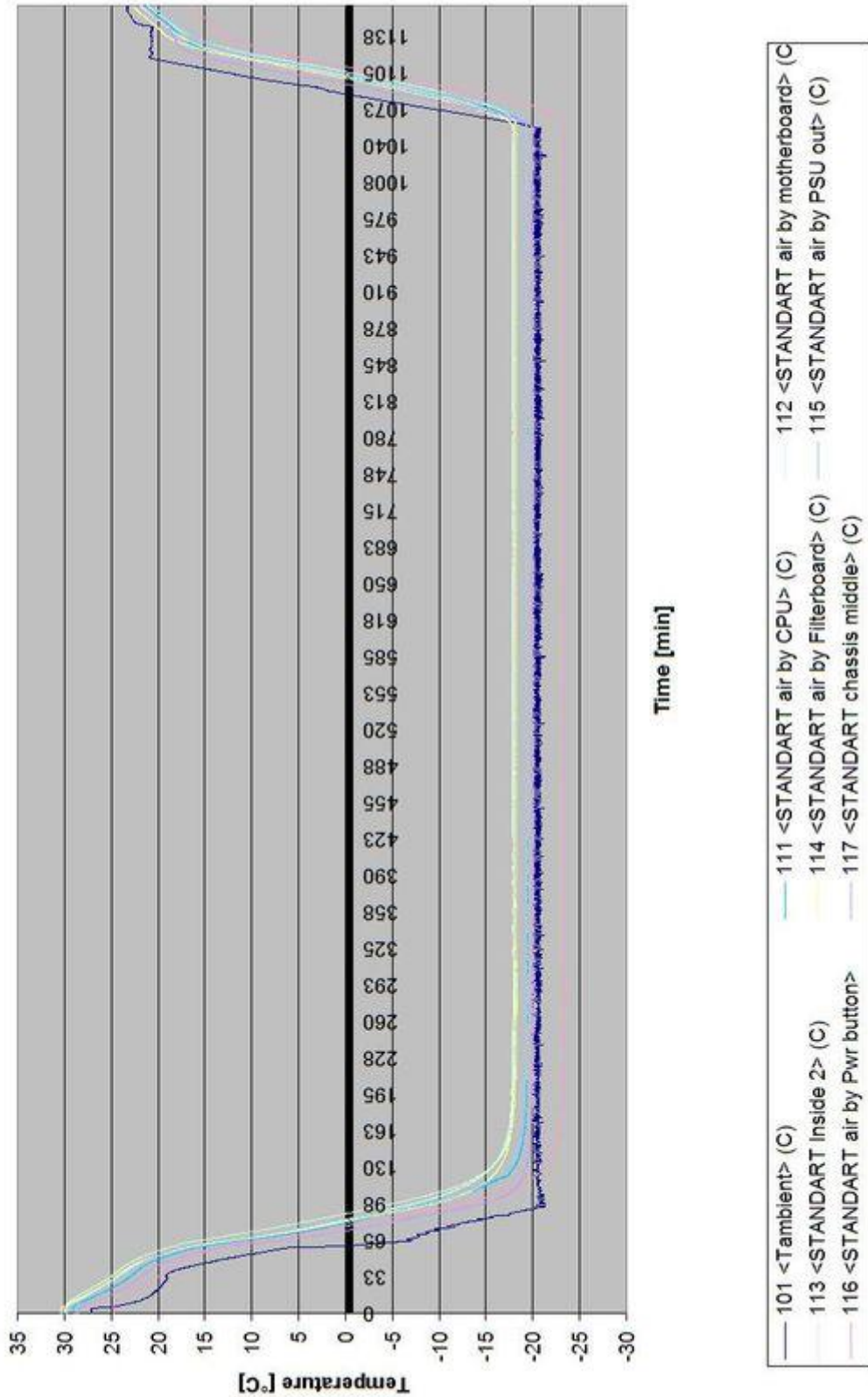
Temperature Measurement IEC-2-14 Test Nb: Change of temperature, Operating, 0°-40°C



Temperature Measurement IEC 2-30 Test Db: Damp heat, cyclic (12 h + 12 h cycle)



Temperature Measurement IEC-2-1 Tests Ab: Cold, Non Operating, -20°C



Temperature Measurement IEC-2-2 Tests Bb: Dry heat, Non Operating, 70°C

