

CLIMATIC Test Report

ONLY FOR THE INTERNAL APPLICATION

**No. 200011.001internal
for KFM 21_e**

Test Laboratory: Kontron Elektronik GmbH
Oskar von Miller Straße 1
85386 Eching
Germany

Applicant: Kontron Embedded Computers AG

Purpose of Testing: To show compliance with
IEC 60068 PT2-1
IEC 60068 PT2-2
IEC 60068 PT2-14
IEC 60068 PT2-30

Special Measurement: none
(see section "Reference Standards"
for identical national standards)

Note:

The test data of this report relate only to the individual item tested.
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Computers AG.

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1. Administrative Data

Equipment under test:	KFM21_e
<u>optional Equipment under test:</u>	
Options/accessories:	None
Serial number:	137868003
Version of EUT:	
Applicant (full address):	Kontron Elektronik GmbH
Contract identification:	none
Contact person:	none
Manufacturer:	Kontron Elektronik GmbH
Receipt of EUT:	12/07/2002
Date of test:	12/07/2002
Date of report	24/07/2002
Tested by:	Karlheinz Schiege Robert Hölzl
Test report by:	Karlheinz Schiege Robert Hölzl Ralf J. Wagner

2. Summary of Test Results

The tested sample fully complies with the requirements set forth in

IEC 60068 PT2-1

IEC 60068 PT2-2

IEC 60068 PT2-14

IEC 60068 PT2-30

(see section "Reference Standards" for identical national standards)

Ralf J. Wagner

Technical Manager

Ralf J. Wagner
Robert Hölzl

Test Engineer

3. Data of Operation Mode and Configuration of EUT

3.1 Operation Mode

Special Susceptibility tests: Windows Screen Saver

Susceptibility tests: none

3.2 Configuration of Cables of EUT

3.3 Configuration of EUT

Display	Samsung 21,3" UXGA LTM213U3-L07
Backlight-Inverter	Samsung SK2400H für LTM213U3-L07
Power supply	Bicker SNP-Z107
Receiver	Distec Prisma I (UXGA)
Power filter	Schaffner FN321-1/05
Operating-System 1	MS WIN 98

3.4 Configuration of Peripherals of EUT

Channel Multiplexer	8 Channel
Keyboard:	Cherry
Mouse:	none

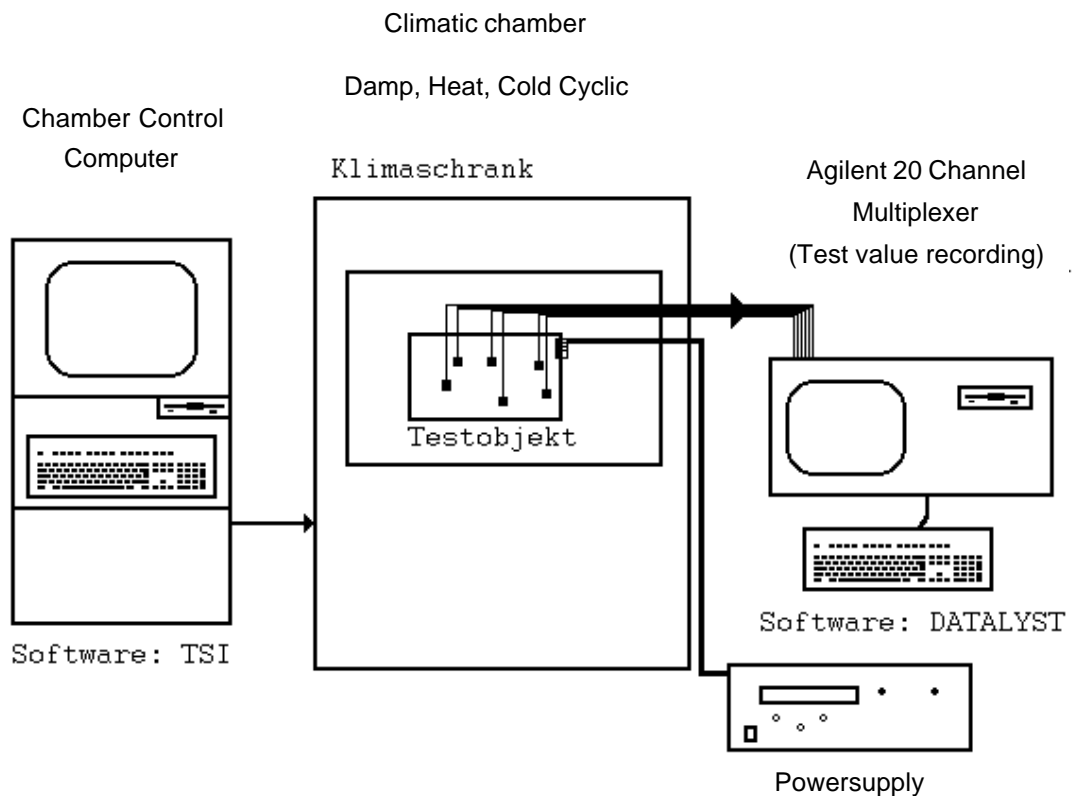
Configuration optional none

4. Performed Tests and Results

Test	Classification/Result	Note
IEC 60068 PT2-1	The requirements are fulfilled	No degradation or loss of function or performance.
IEC 60068 PT2-2	The requirements are fulfilled	No degradation or loss of function or performance.
IEC 60068 PT2-14	The requirements are fulfilled	No degradation or loss of function or performance.
IEC 60068 PT2-30	The requirements are fulfilled	No degradation or loss of function or performance.

5. Annotations to Performed Tests and to CE certification

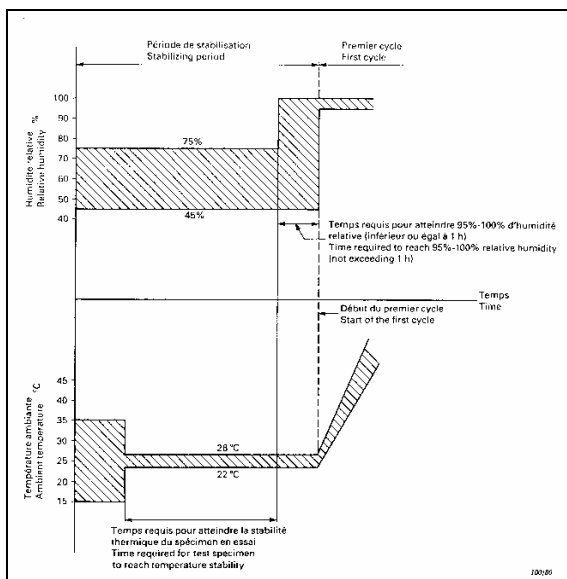
5.1 The Test in the Climatic Chamber



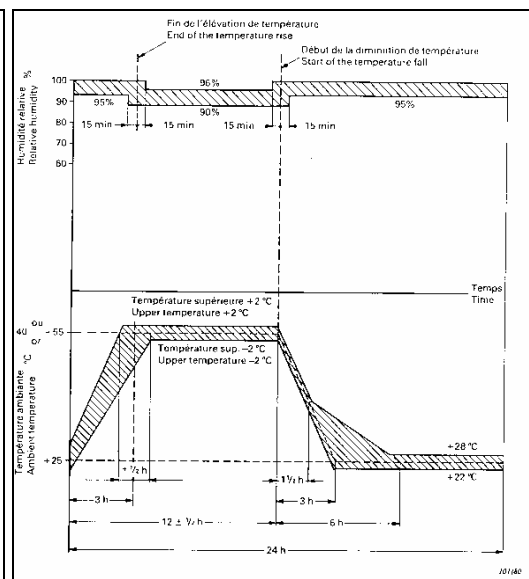
5.2 Basic environmental testing procedures

Test Db and guidance - damp heat, cyclic 12+12 HOUR CYCLE (IEC 60068 PT2-30)

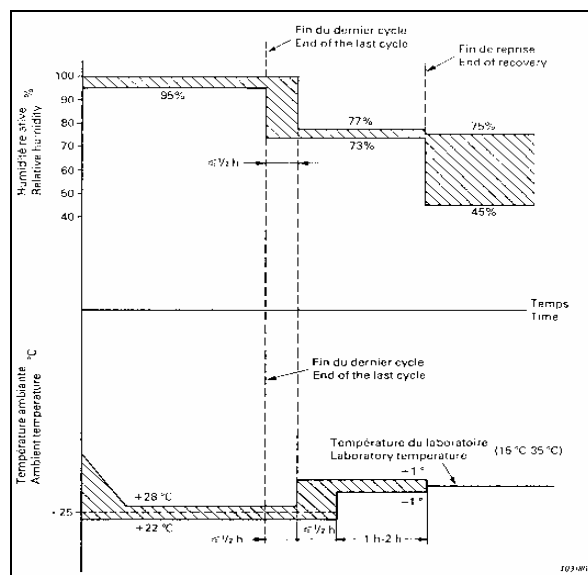
The object of the test is to determine the suitability of components, equipment or other articles for use and/or storage under conditions of high humidity when combined with cyclic temperature changes. This test replaces the original Test D in the Publication 68-2-4 for future applications (the parameters takes from the page 14)



Picture 1: Stabilizing period



Picture 2: Test Db - test cycle



Picture 3: Recovery at controlled conditions

6. Referenced Regulations

(see section "Reference Standards" for identical national standards)

Regulation	Comment
IEC 60068 PT2-1 :1994	ENVIRONMENTAL TESTING - TESTS A: COLD Concerns cold tests on both non-heat-dissipating and heat-dissipating specimens.
IEC 60068 PT2-2 :1994 EN 60068 PT2-2 :1993	ENVIRONMENTAL TESTING - TESTS B: DRY HEAT Contains Test Ba: Dry heat for non-heat-dissipating specimen with sudden change of temperature; Test Bb: Dry heat for non-heat-dissipating specimen with gradual change of temperature; Test Bc: Dry heat for heat-dissipating specimen with sudden change of temperature; Test Bd: Dry heat for heat-dissipating specimen with gradual change of temperature. The 1987 reprint includes IEC No. 62-2-2A.
IEC 60068 PT2-14 :1984 EN 60068-2-14 :1999	ENVIRONMENTAL TESTING - PART 2-14 - TESTS - TEST N - CHANGE OF TEMPERATURE Determines the ability of components, equipment and other articles to withstand rapid changes of ambient temperature. The exposure times to accomplish this depend upon the nature of the specimen.
IEC 60068 PT2-30 :1980 EN 60068-2-30 :1999	BASIC ENVIRONMENTAL TESTING PROCEDURES - TEST DB AND GUIDANCE - DAMP HEAT, CYCLIC (12+12 HOUR CYCLE) Determines the suitability of components, equipment and other articles for use and/or storage under conditions of high humidity when combined with cyclic temperature changes.
Special standard	

7. 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 Elektronik
✓	Measuring system	34970A	PM-EM-9519.01	not requested	HP/Agilent
✓	Control computer	Rx7000	PM-EM-9597.01	not requested	Kontron Elektronik

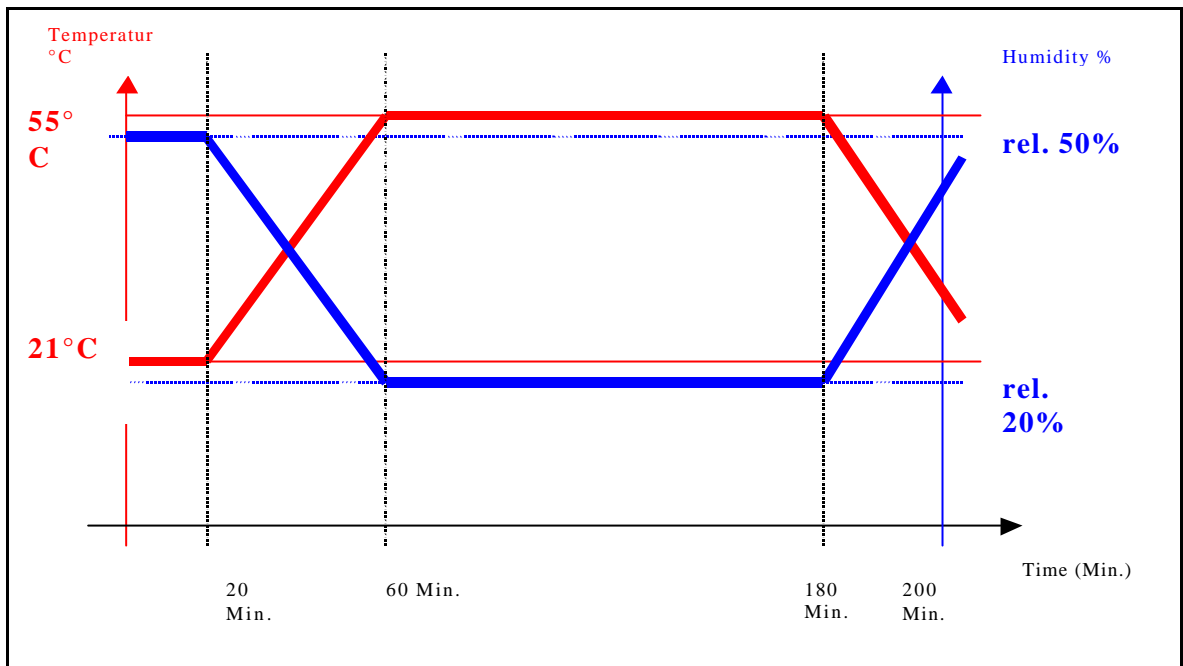
(check mark in 1st column) = tested with

8. Photographs of EUT and Test Setup



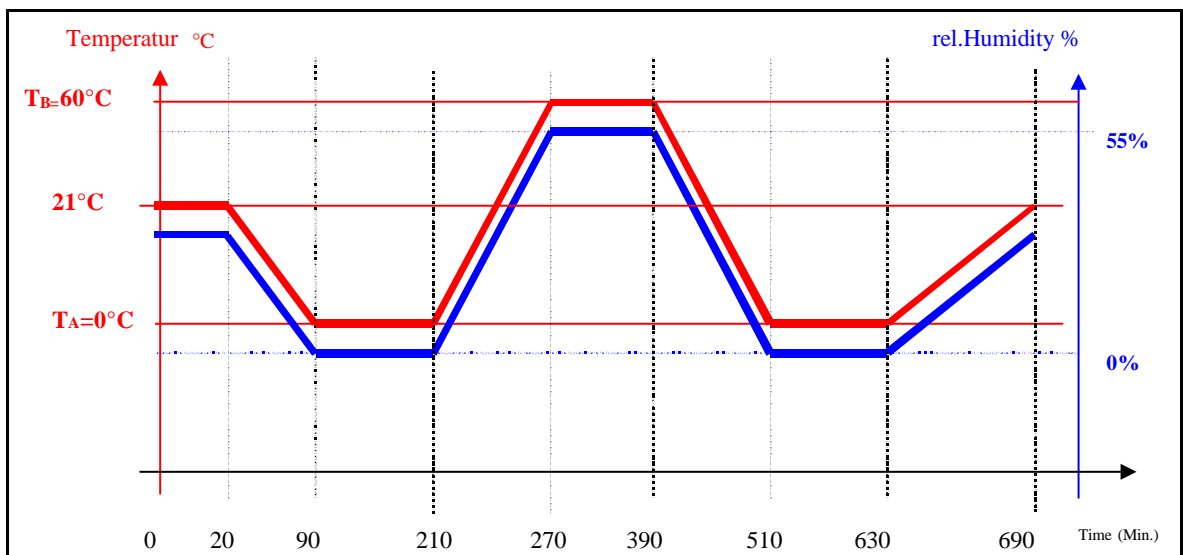
Picture 4 : IEC Climatic Chamber

9. Climatic conditions to IEC 60068



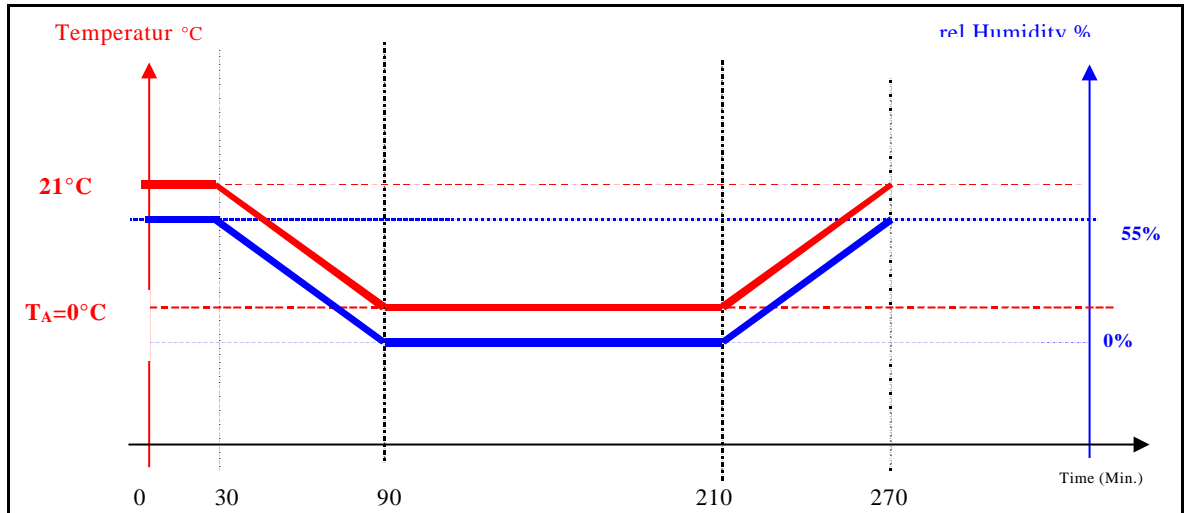
Picture 5: IEC 60068 PT2-2 Test Bb:

Dry heat for non-heat-dissipating specimen with gradual change of temperature



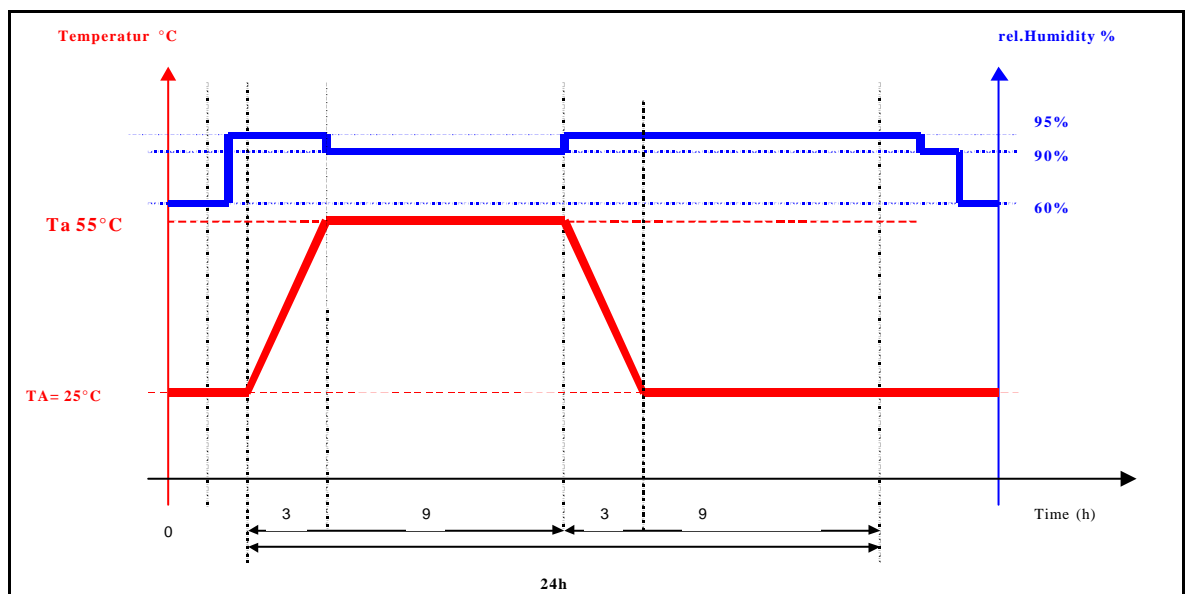
Picture 6: IEC 60068 PT2-14 Test Nb:

Change of temperature with specified rate of change



Picture 7: IEC 60068 PT2-1 Test Ab:

Cold for non heat-dissipating specimen with gradual change of temperature



Picture 8: IEC 60068 PT2-30, Test Db:

12+12 Hour Cycle

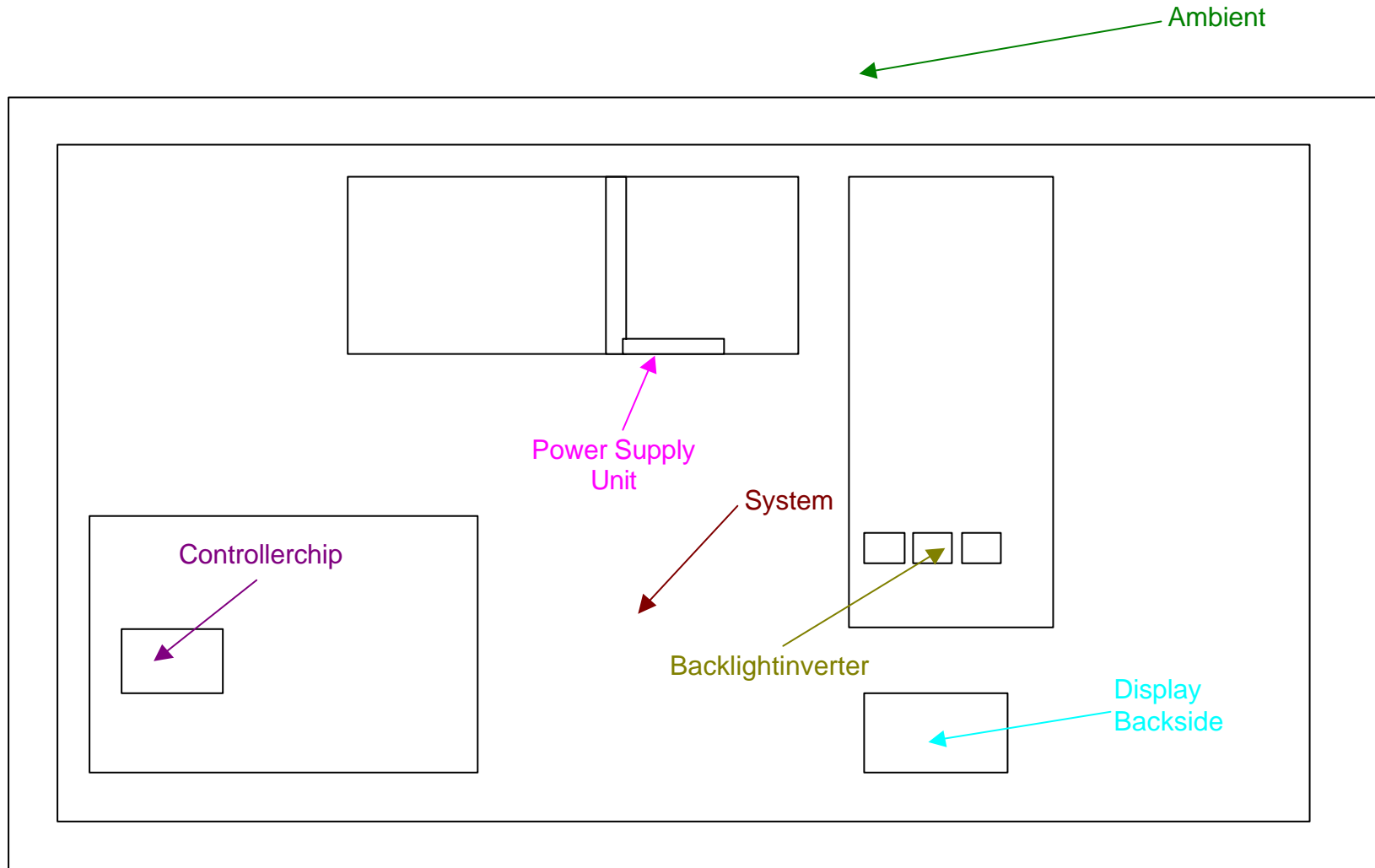
10. Temperature measurement

Inquiry of the temperature limits at temperature critical components.

Chosen critical components:

- Display Backside
- Controllerchip
- Power supply
- Backlight inverter
- System
- Ambient

10.1 Layout : Temperature sensors KFM21_e



Picture 9: Mounting positions of the temperature sensors

11. Temperature diagrams into dependence of the surroundings to IEC 60068 (temperature, atmospheric humidity)

11.1 IEC 60068 PT2-2 Non Operating

have been done, but without recording

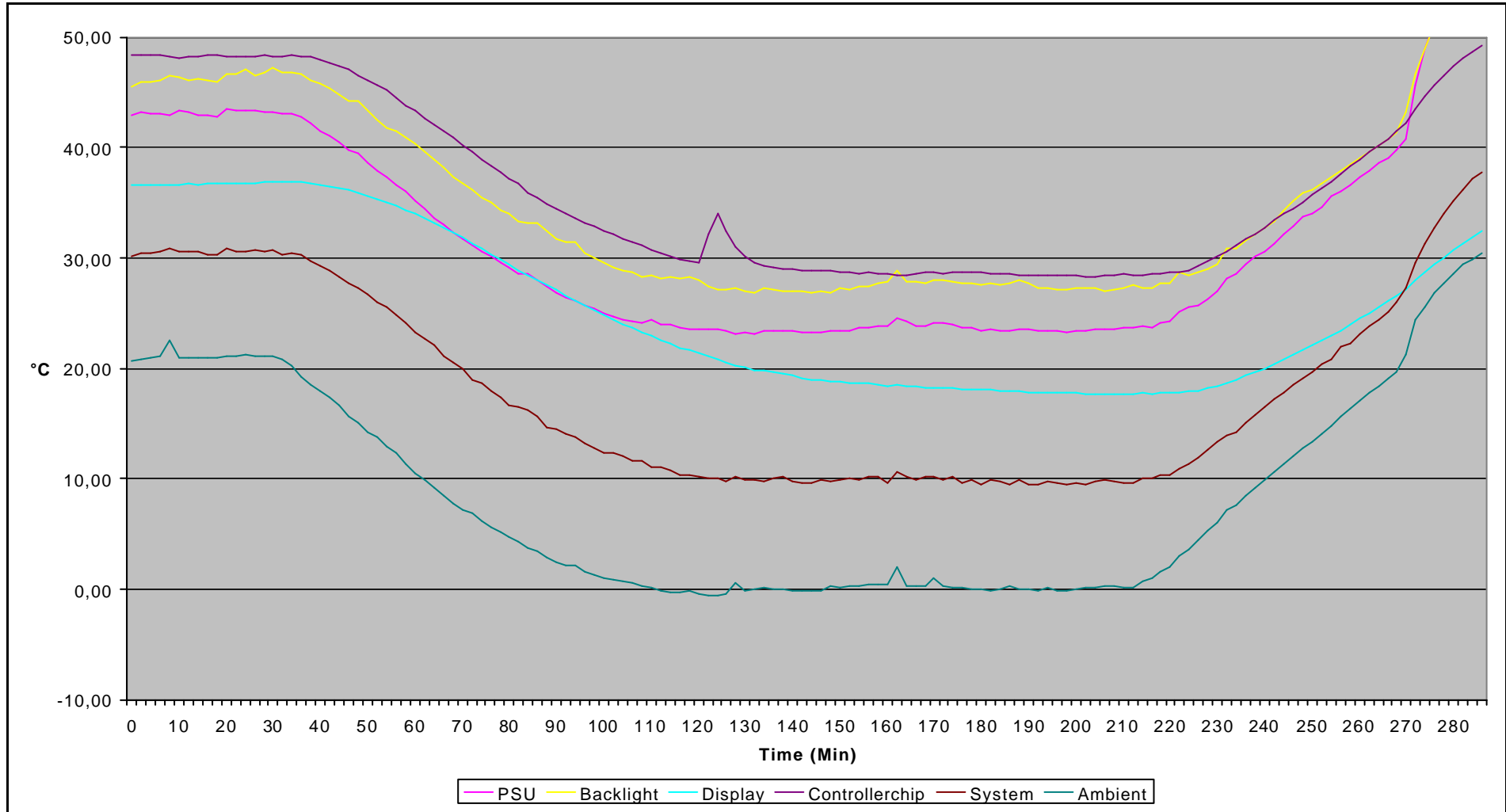
11.2 IEC 60068 PT2-1 Non Operating and

have been done, but without recording

11.3 IEC 60068 PT2-30 Non Operating

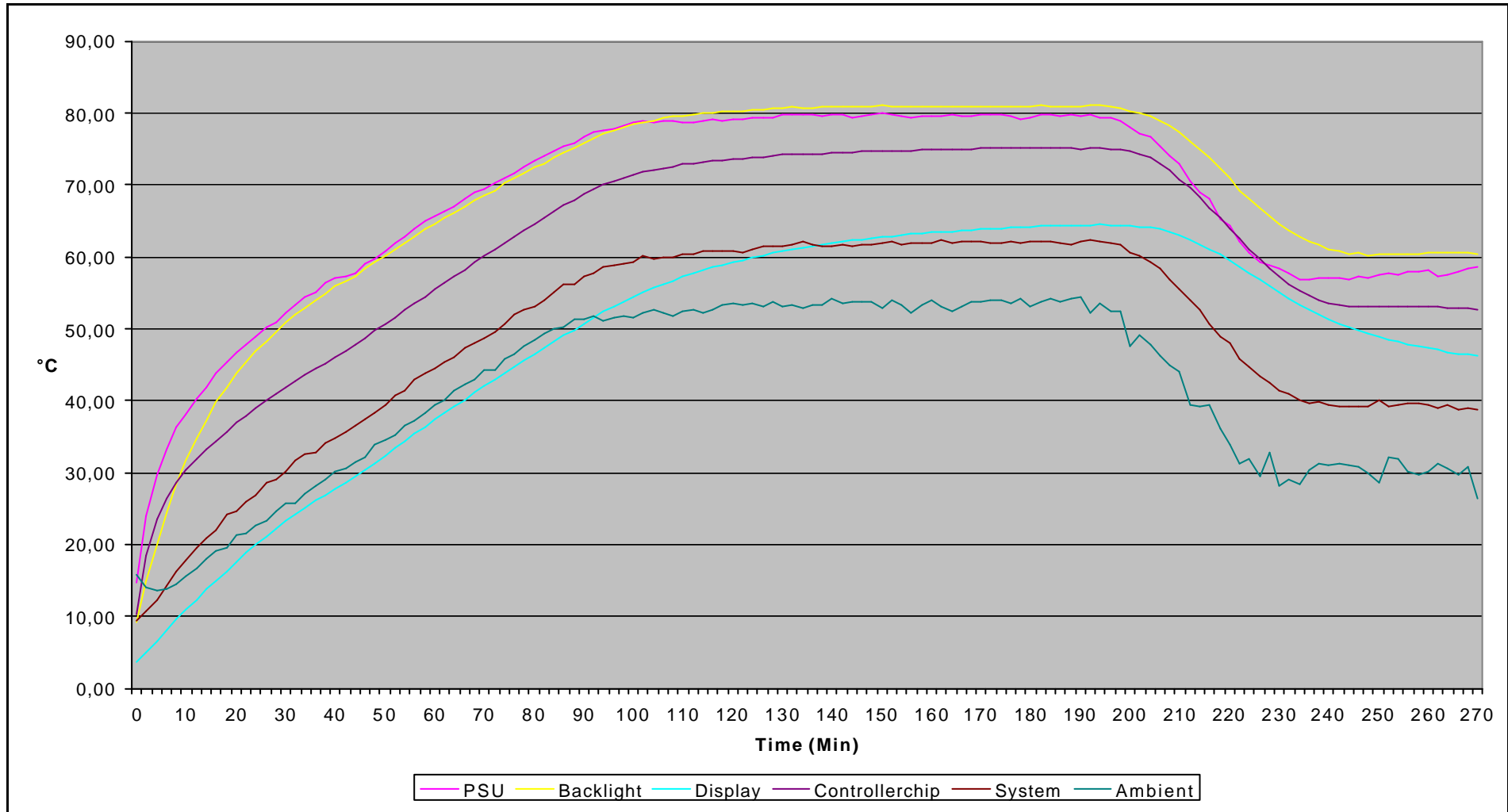
have been done, but without recording

11.4 IEC 68-2-1 Operating



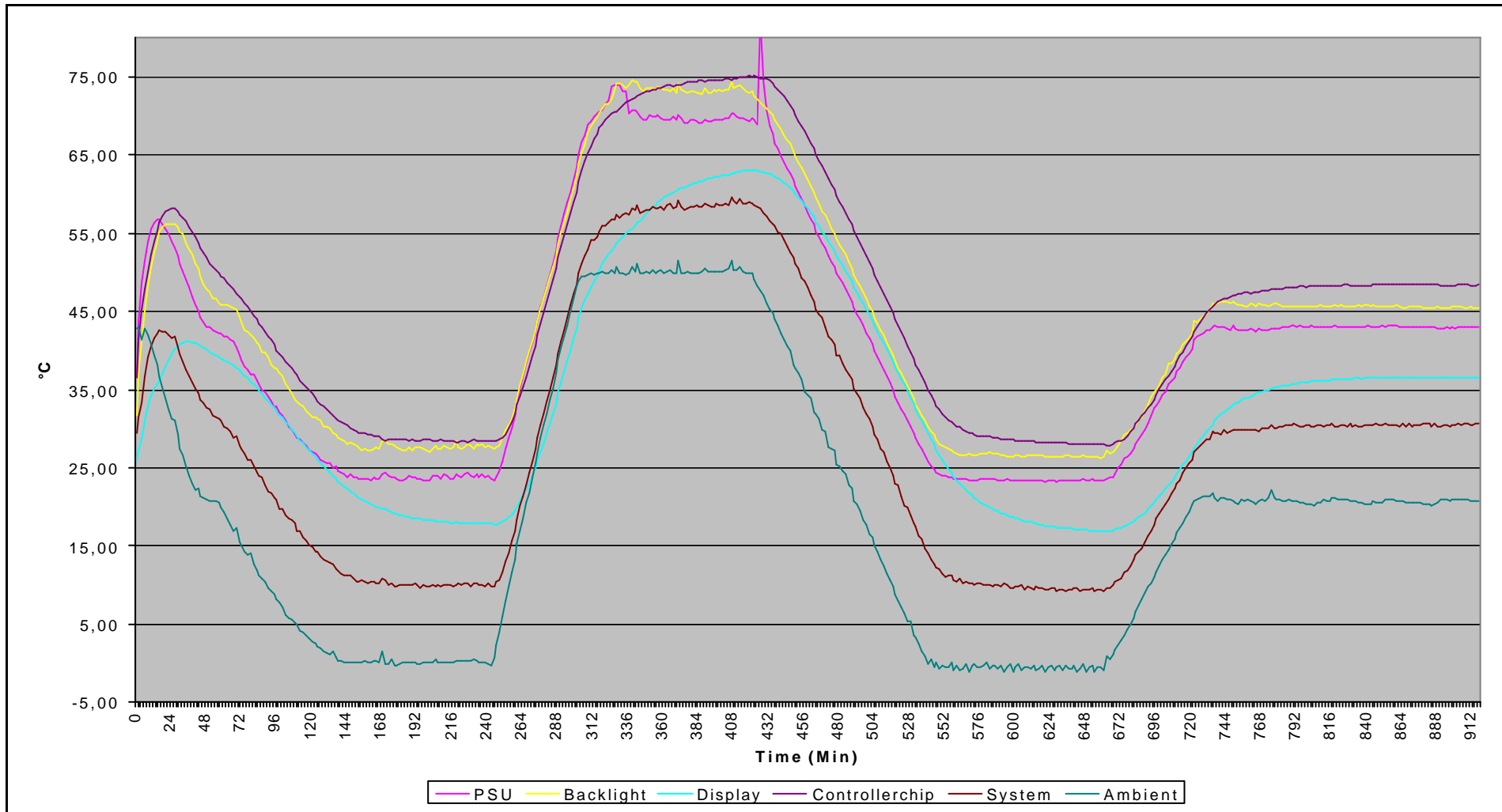
Picture 10: Diagram of IEC 68-2-1 operating measurement

11.5 IEC 68-2-2 Operating



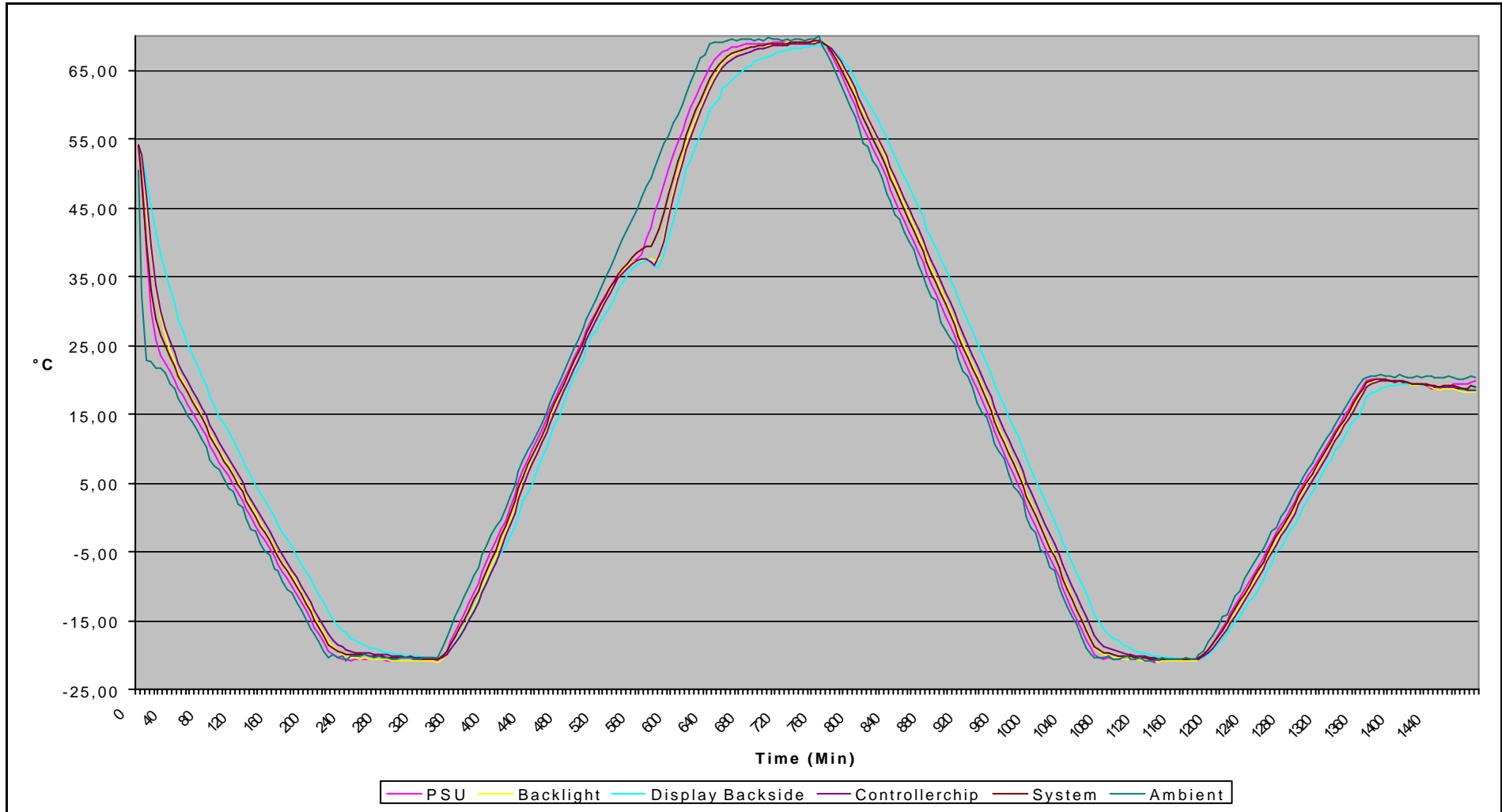
Picture 11: Diagram of IEC 68-2-2 operating measurement

11.6 IEC 68-2-14 Operating



Picture 12: Diagram of IEC 68-2-14 operating measurement

11.7 IEC 68-2-14 Non Operating



Picture 13: Diagram of IEC 68-2-14 non operating measurement

12. Reference Standards

Tested standard	Reference Standard (identical/similar to)
IEC 60068 PT2-1	Identical with: BS EN 60068 PT2-1 DIN EN 60068 PT2-1 DIN IEC 68 PT2-1 EN 60068 PT2-1 HD 323.2.1 JIS-C0020 NEN 10068-2-1 NFC 20-701 NF EN 60068-2-1 SEN 43 16 01 SS EN 60068
IEC 60068 PT2-2	Technical Equivalent to: AS 1099:PT2BA AS 1099:PT2BB AS 1099:PT2BC AS 1099:PT2BD JIS-C8938 Identical with: BS EN 60068 PT2-2 DIN EN 60068 PT2-2 DIN IEC 68 PT2-2 EN 60068 PT2-2 HD 323.2.2 JIS-C0021 JIS C0039 NEN 10068-2-2 NFC 20-702 NF EN 60068-2-2 SEN 43 16 02 SS EN 60068
IEC 60068 PT2-14	Technical Equivalent to: AS 1099:PT2N AS 1099:PT2NA AS 1099:PT2NB AS 1099:PT2NC DIN EN 60068-2-14 JIS-C0025 Identical with: BS 2011:PT2.1N(1985) BS EN 60068-2-14 DIN IEC 60068-2-14 DIN IEC 68 PT2-14 EN 60068-2-14 HD 323.2.14 NEN 10068-2-14 NEN EN IEC 60068-2-14 NFC 20-714 NF EN 60068-2-14 SEN 43 16 13 SS EN 60068

Tested standard	Reference Standard (identical/similar to)
IEC 60068 PT2 -30	Technical Equivalent to: AS 1099:PT2D JIS-C0027 Identical with: BS 2011:PT2.1DB(1981) BS EN 60068-2-30 DIN EN 60068-2-30 DIN IEC 60068-2-30 DIN IEC 68 PT2-30 EN 60068-2-30 HD 323.2.30 NEN 10068-2-30 NEN EN IEC 60068-2-30 NFC 20-730 SS EN 60068