

# Technical Description

# LABCAL H 101



Climats

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## NOTES

The performance data refers to +25 °C ambient temperature, at given nominal voltage, without test specimen, without optional accessories and without heat compensation. These are average values of the basic equipment. The test chamber is designed for installation inside dry and ventilated spaces with max. degree of contamination “2” according to EN 50178:1997. The permissible ambient temperature during operation is between +10 °C and +27 °C. The max. permissible humidity must not exceed 75% RH and the max. dew point must not exceed +20 °C. Protect the system from sunlight and avoid proximity to heat sources.

## HIGHLIGHT AT A GLANCE

### NATURAL REFERENT WITH GWP 1

The test chamber contains CO<sub>2</sub> (R744) as a refrigerant. This natural refrigerant is F-Gas compliant. Test more environmentally friendly than ever before and help your company achieve its environmental goals.

### COMPACT DESIGN

Maximize your lab's potential with our space-saving design, under 1 sqm footprint.

### INTEGRATED WEB PANEL

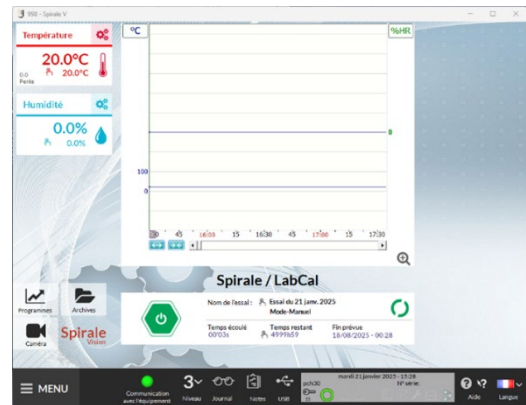
Operating/programming and monitoring unit with 18 cm (7") web panel, attached to the door with WEBSeason® remote control software.

## SPIRALE SUPERVISOR



The full suite of applications is available on USB keys for connection to the user's PC as standard. This includes:

- ▶ VisuWin test visualisation
- ▶ CycleWin test recording
- ▶ ProgWin programme editor
- ▶ Spirale LabCal control interface



## STANDARDS

### LOW TEMPERATURE TESTS

MIL-STD 810G, Meth. 502.5  
ETSI EN 300019-2-4, Test Ab/Ad  
IEC 60068-2-1, Test A (LV 124 K-03)  
ISO 614750-4, Low temperature  
JESD22-A119

### ALTERNATING TEMPERATURE TESTS

ETSI EN 300019-2-4, Test Nb  
IEC 60068-2-14, Test Nb (LV 124 L-03)  
ISO 16750-4, Temp. steps  
ISO 16750-4, Temp. cycling

### CONSTANT CLIMATE TEST

ISO 16750-4, Damp heat steady  
IEC 60068-2-78 (LV 124 K-14)  
ETSI EN 300019-2-4, Test Cb  
MIL-STD-202 G, Meth. 103B  
JESD22-A101C  
IEC 60068-2-67

### HIGH TEMPERATURE TESTS

JESD22-A103D  
IEC 60068-2-2, Test B  
ISO 16750-4, High temperature  
ETSI EN 300019-2-4, Test Bb/Bd  
MIL-STD-202 G, Meth. 108A  
MIL-STD-883 J, Meth. 1008.2  
MIL-STD-810 G, Meth. 501.5

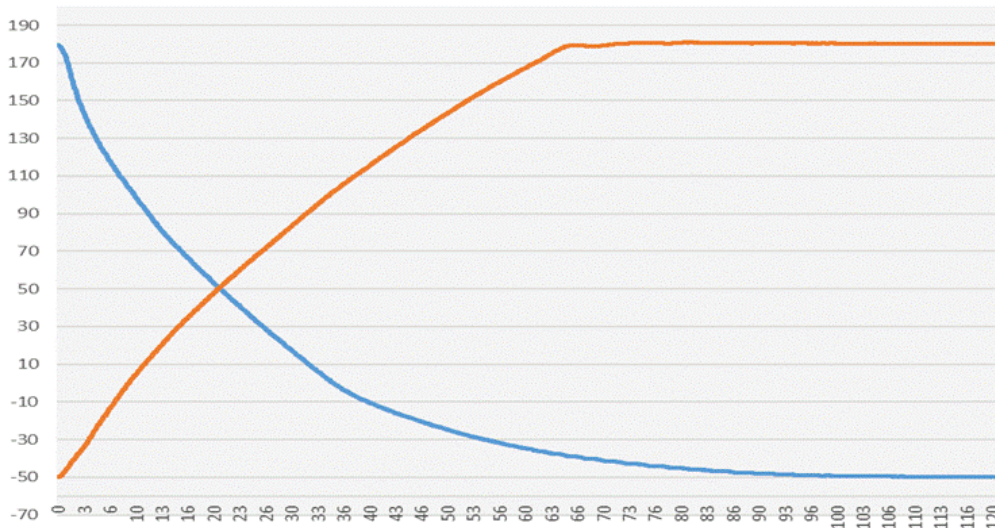
YOUR STANDARD IS NOT LISTED ? CONTACT US!

# PERFORMANCE DATA

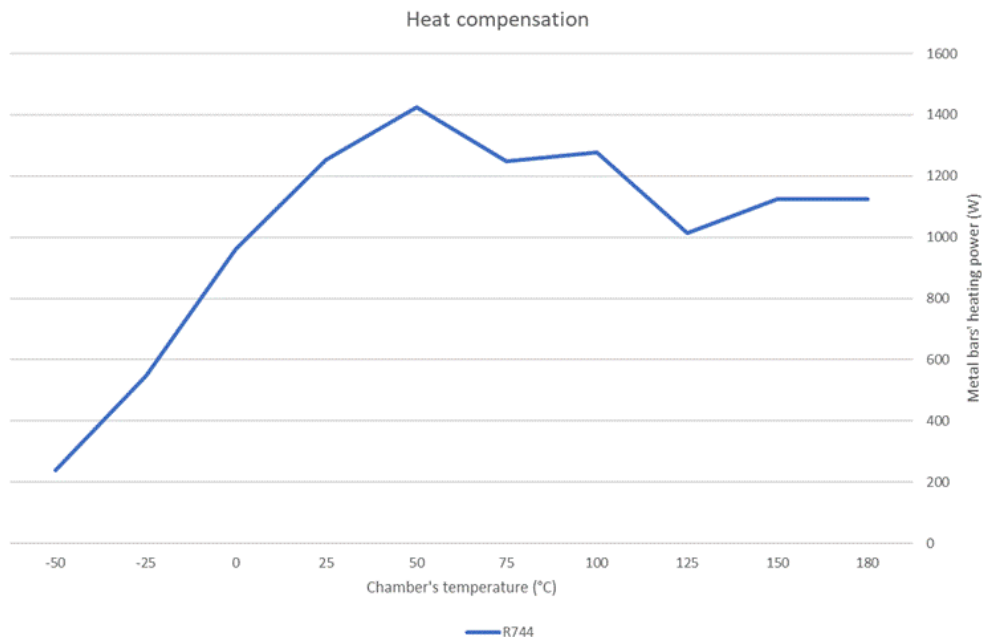
## TEMPERATURE TESTS

Maximum temperature	180°C
Minimum temperature <sup>1</sup>	-50°C
Rate of temperature change <sup>2</sup> cooling	4,0 K/min
Rate of temperature change <sup>2</sup> heating	3,0 K/min
Temperature deviation <sup>3</sup> , in time	±0,3 K to ±1,0 K
Temperature homogeneity <sup>4</sup> , in space	±0,5 K to ±2,0 K
Heat compensation <sup>5</sup> , max	1500 W
Factory calibration values <sup>6</sup>	+23 °C and 80 °C

## RATE OF TEMPERATURE CHANGE FOR COOLING AND HEATING <sup>8</sup>



## HEAT COMPENSATION <sup>9</sup>



## CLIMATE TESTS

Maximum temperature	+95°C
Minimum temperature	+10°C
Temperature deviation <sup>3</sup> , in time	±0,3 K to ±0,5 K
Temperature homogeneity <sup>4</sup> , in space	±0,5 K to ±1,5 K
Dew point temperature range	4,8 °C to +93,6°C
Humidity range	10 % RH to 95 % RH
Humidity deviation, in time	±1 % RH to ±3 % RH
Heat compensation <sup>7</sup> , max.	Value available shortly
Factory calibration values <sup>6</sup>	+23 °C/50 % RH and +80 °C/50% RH

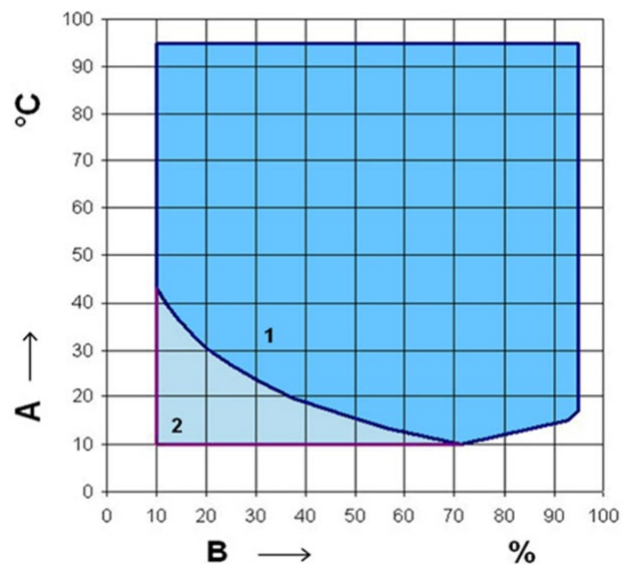
## CLIMATE CHART

A → Test space temperature in °C

B → Relative humidity in %

1 → Standard climate chart

2 → Climate chart with optional air dryer and capacitive humidity measuring system



Control sensor + independent safety sensor + Psychrometric sensor



Underflow arrow

1- Temperatures >+5 °C are permitted in continuous operation; temperatures <+5 °C are permitted discontinuously or with the additional equipment "compressed air dryer".

2 - According to IEC 60068-3-5; average, measured in the supply air.

3 - In the middle of the test space when it is empty and at steady state, without specimen, without heat radiation and without additional equipment, depending on temperature.

4 - Relative to the selected set point in the temperature range from the minimum temperature up to +150 °C and/or at humidity >20 % RH (without measuring tolerance).

5 - At +20 °C for temperature tests.

6 - The factory calibration of the temperature and humidity values is carried out with DAkkS-calibrated measuring equipment in the middle of the test space and documented with a certificate. A DAkkS calibration, as well as a spatial factory or a spatial DAkkS calibration, can be provided on request.

7 - At +20 °C / 60 % RH

8 - Without test specimen, without heat radiation, measured at the control sensor in the supply air.

9 - Temperature measured at the control sensor in the supply air at steady state .

## TECHNICAL DATA

### DIMENSIONS

Test space volume	100 l
Test space dimensions (H x W x D)	500mm x 490mm x 405mm
Exterior housing dimensions (H x W x D)	1191mm x 801mm x 1130mm
Exterior dimensions inc. optional mobile design (H x W x D)	1872mm x 801mm x 1130mm
Loading max	75 kg
Load of the test space floor	25kg
Load per insertion shelf <sup>11</sup>	10 kg
Load per insertion shelf support, max	50 kg
Total weight	217 kg

### AIR COOLED DESIGN

Heat dissipation to the installation room, max. <sup>21</sup>	3,2 kW
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### ELECTRIC DATA

Voltage rating <sup>13,14</sup>	1/N/PE AC 230 V ±10 % 50/60 Hz
Power rating, max.	2,1 kW
Current rating <sup>15</sup>	10,2 A
Power supply	CEE plug 16 A 3p 6h 230 V blue CT 316/6H
Power supply cable	3,5 m
Fuse protection <sup>16</sup>	16 AgG
Protection class of switchgear cabinet and control unit	IP 54
Sound pressure level <sup>18</sup>	56 dB(A)



### REFRIGERATION UNIT

Standard design	Air-cooled	Refrigerant	GWP	Fill quantity	CO <sub>2</sub> -equivalent
Refrigerant <sup>20</sup>	Stage Main cooling	R744 (CO <sub>2</sub> )	1,0	0,5 kg	0t

10 - For transport and move-in. Parts can be removed at additional expenses.

11 - Max. load as surface load.

12 - Without loading and additional equipment.

13 - The chamber can also be operated with 1/N/PE AC 220 V ±10 % 50/60 Hz. In this case the heating rate is reduced by approx. 10 %.

14 - If you wish to connect a Residual Current Device (RCD), please note the following: The test chamber may exceed the tripping limit on an RCD with 30 mA. We recommend using an RCD with 300 mA. (type A, according to IEC 60755).

15 - Neutral conductor under load.

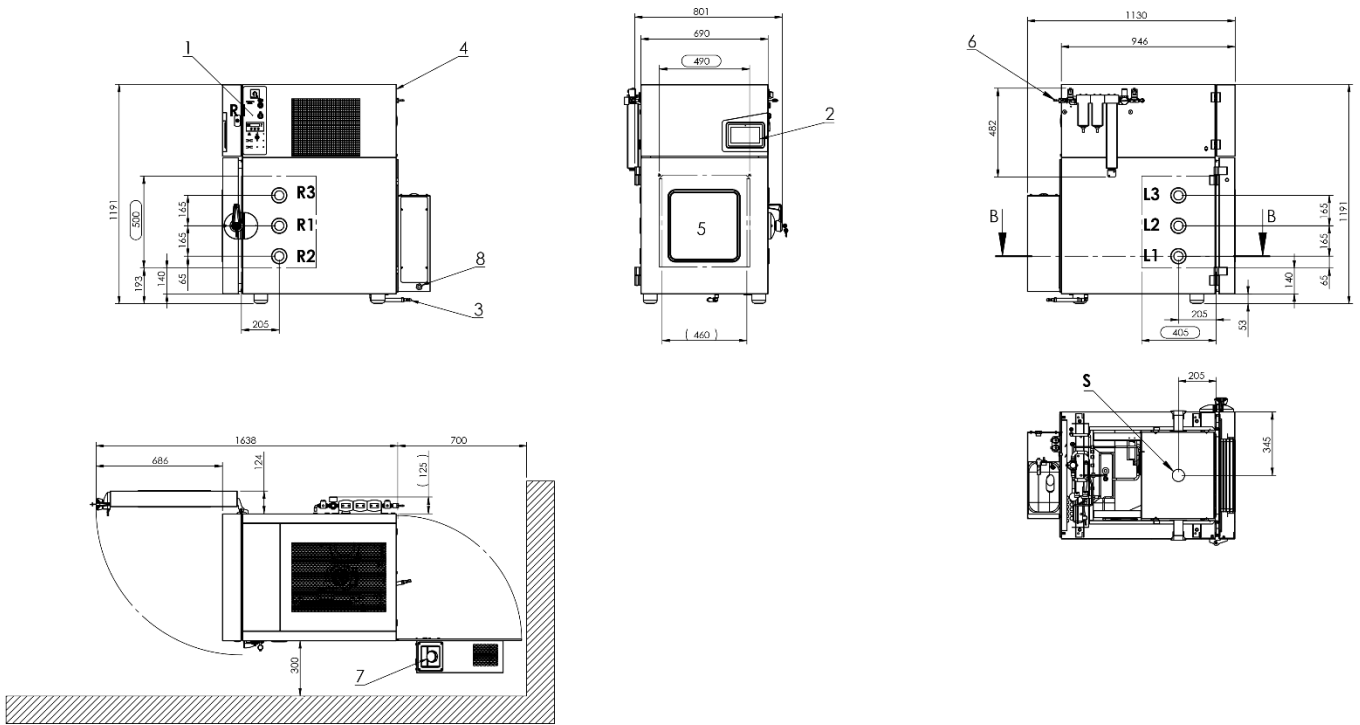
16 - Provided by the customer

17 - EMC tests and information about emitted interference according to EN 61000-6-3 / EN 61000-6-4. Interference immunity is in accordance with EN 61000-6-2.

18 - Measured at a distance of 1 m from the front of the test chamber and a height of 1.6 m in free-field measurement according to EN ISO 11201.

20 - In accordance with DIN EN 378-4, stationary refrigeration and air-conditioning units with a filling capacity of between 3 and 30 kg must be checked for leaks at least once a year; there is no obligation to check systems with a filling quantity of less than 3 kg, but we recommend checking them as a part of maintenance.

## INSTALLATION DRAWING



### EQUIPMENT

- 1 → Main switch
- 2 → Webpanel
- 3 → Overflow/condensate drain, backpressure-free, hose connection Ø12 mm
- 4 → Electrical cable
- 5 → Door with window
- 6 → Compressed air connection/air dryer (optional)
- 7 → Water storage tank (only for climate chambers)
- 8 → Connection for demineralised water (option, only for climate chambers)

### ACCESS PORT

- R1 → Installation position right Ø 50 mm
- R2-R3 → Additional installation positions right (optional)
- L1-L3 → Additional installation positions left (optional)

### ADDITIONAL INFORMATION

- S → Additional installation position on the bottom (optional)
- (...) → Useable width

**Mobile design, with base frame is optionally available to convert the table top unit into a mobile standalone unit with a table top working level. The equipment will be delivered with four castors, two of which equipped with arresting device, when ordering this option.**



Shelf



Main switch



Porthole

## OUR BASIC EQUIPMENT

### EXTERIOR HOUSING

Material	Galvanized steel sheet
Finish	RAL 9002, grey-white, solvent free, powder coated
Door	One-hand operation, lockable, hinged on the left side with window 400x400 mm
Base	Adjustable feet, vibration-absorbing, colour: RAL 7016, anthracite grey

### HUMIDIFICATION SYSTEM

Humidification	Humidification bath with tempered water, aerosol free humidification and dehumidification
Humidification water	Water reservoir (approx. 13 l), pre-installed equipment for automatic water supply with warning in case of water shortage
Humidification water quality	pH value 6-7, demineralised, conductivity 5 to 20 µs/cm
Overflow / condensate drain	Backpressure-free, hose connection Ø 12 mm
Condensation protection	Dehumidifier to avoid condensation of test specimen

### TEST SPACE <sup>22</sup>

Material floor	Stainless steel 1.4301, surface III D polished
Material wall	Stainless steel 1.4301, surface III D polished <sup>23</sup> , embossed slide rails on the side, vertical spacing 62 mm
Insertion shelf	1 pc., stainless steel, max. number of insertion shelves possible: 6
Equipment access port right side <sup>24</sup>	1 pc., 50 mm Ø stainless steel, incl. closed silicone plug and slotted foam silicone plug
Air circulation conditioning	At rear wall, with axial flow fan
Air flow	Air inlet via perforated floor element, air outlet suction at the upper back
Test space illumination	Halogen lamp 230 V, 40 W, G9

### MESUREMENT SENSOR

Temperature	Pt 100 platinum temperature sensor
Climate	Psychrometric humidity measurement with automatically wetted wet bulb temperature sensor Pt 100

<sup>22</sup> - The use of tempered silicone parts means that the test space produces only low emissions. If the test space has to be emissions-free, this requires technical clarification; please contact us to request an offer.

<sup>23</sup> - For test setups a wall distance of at least 20 mm must be maintained.

<sup>24</sup> - Production-related tolerances of up to ±3 mm are possible.

## REGULATION AND CONTROL

Digital measuring and control system with I/O unit and WEBSeason®-Software, remote controllable through integration into network.

Operating/programming and monitoring unit with 17.8 cm (7 «) webpanel, integrated in the door.

Customer protocols SimServ to control the climate test chamber via Ethernet interface

## SUPERVISION

Spirale Supervisor

The full suite of applications is available on USB keys for connection to the user's PC as standard. This includes:

- VisuWin test visualisation
- CycleWin test recording
- ProgWin programme editor
- Spirale LabCal control interface



*Integrating the Spirale Labcal supervisor into a touch-screen PC is an option that should be considered.*

*It would offer a cutting-edge replacement for the standard WEBSeason.*

## COMMUNICATION

Network

1 Ethernet interface (100/1000 megabits) for integration in a network

USB

1 USB interface for recording of measuring data on a flash drive<sup>24</sup>

Customer protocols

SimServ text protocol for data recording and control of the test chamber via Ethernet interface using external applications

## SAFETY

Test specimen protection

Independent adjustable temperature limiter tmin/tmax, separate sensor installed in the test space.

Software temperature limiter tmin/tmax, individually adjustable fixed value

Test chamber protection

Temperature limiter for protection against overtemperature in the test chamber

Specimen switch-off

Potential-free contact specifically for test specimens that emit heat, on female connector, max. load 24 V, 0,5 A

<sup>24</sup> - Flash drive is not included in the scope of delivery.



**ADDITIONAL  
OPTIONS**



