

METROLOGY DIVISION

SMALL ENOUGH
TO CARE
BIG ENOUGH
TO DARE

The logo for Kambič features the name in a stylized, italicized font with a 3D effect. A red swoosh underline is positioned below the text, starting from the left and curving under the 'č'.

Kambič

Who we are

A Slovenian-based family company.

With 30 years of experience, Kambič is a specialized supplier in the field of design, production and validation of metrology equipment.

Our goal is to be the preferred partner delivering the ideal balance between optimized solutions, quality and investment costs.



What we do



All under one roof:

- R&D of mechanical components and solutions
- R&D of electronics and SW
- Manufacturing
- Testing, calibrating and validating
- Customer support, on-site service

Temperature



Relative humidity



Vacuum & pressure



Environment simulation



SMALL ENOUGH TO CARE BIG ENOUGH TO DARE



Partnership counts!



Superior customer support!

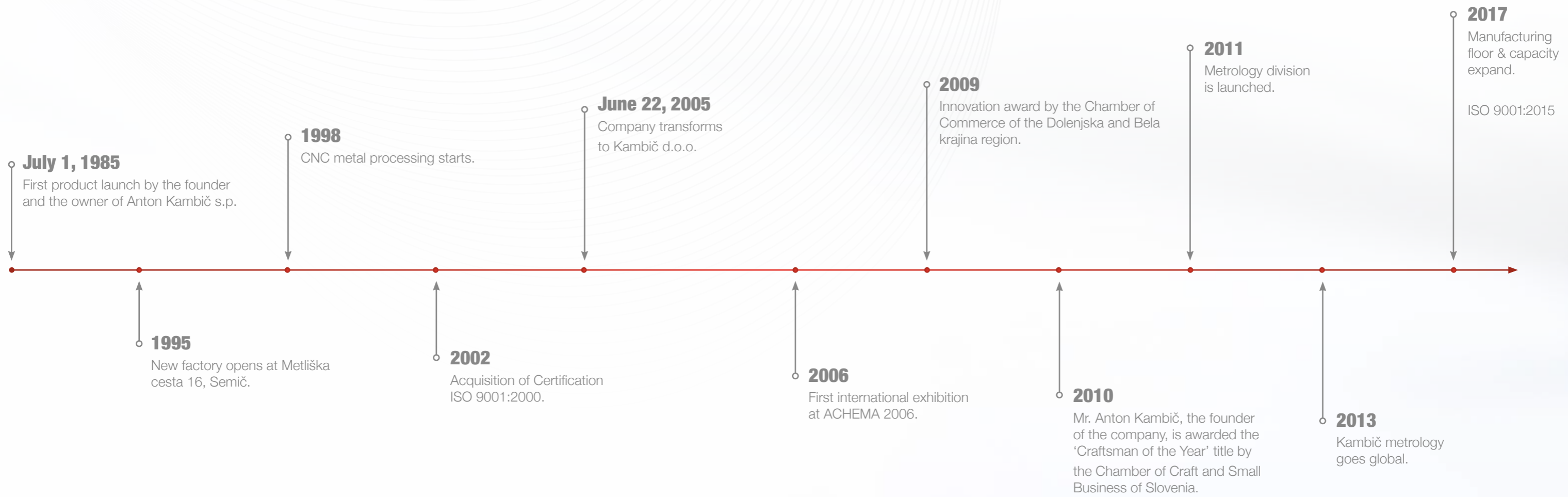


Tailoring available!



Ultimate price-performance ratio!

Tradition



Product families

Calibration Baths

Black Body Cavity Ready Calibration Baths

Triple Point of Water Maintenance Baths

Ultra Stable Standard Resistor Maintenance Baths

Air Baths

Temperature Chambers

Climatic Chambers

Calibration Climatic Chamber

Peltier Based Climatic Chambers

Tailored Equipment

Accessories

- Spider
- Oils



Calibration Baths

- Uniformity and stability in mK range
- Calibrate sensors of any dimension
- Fluid ensures perfect heat transfer
- Immersion depth of up to 500 mm
- Unique vertical flow design
- Several bath sizes available
- Three different temperature ranges

OB

(+ 40 °C ...+ 250 °C)



Models:

OB-7/2

OB-22/2

OB-50/2

OB-LT

(- 40 °C ...+ 130 °C)



Models:

OB-7/2 LT

OB-22/2 LT

OB-50/2 LT

OB-ULT

(- 90 °C ...+ 130 °C)



Models:

OB-22/2 ULT

OB-50/2 ULT

Ultra-Low Temperature Calibration Bath

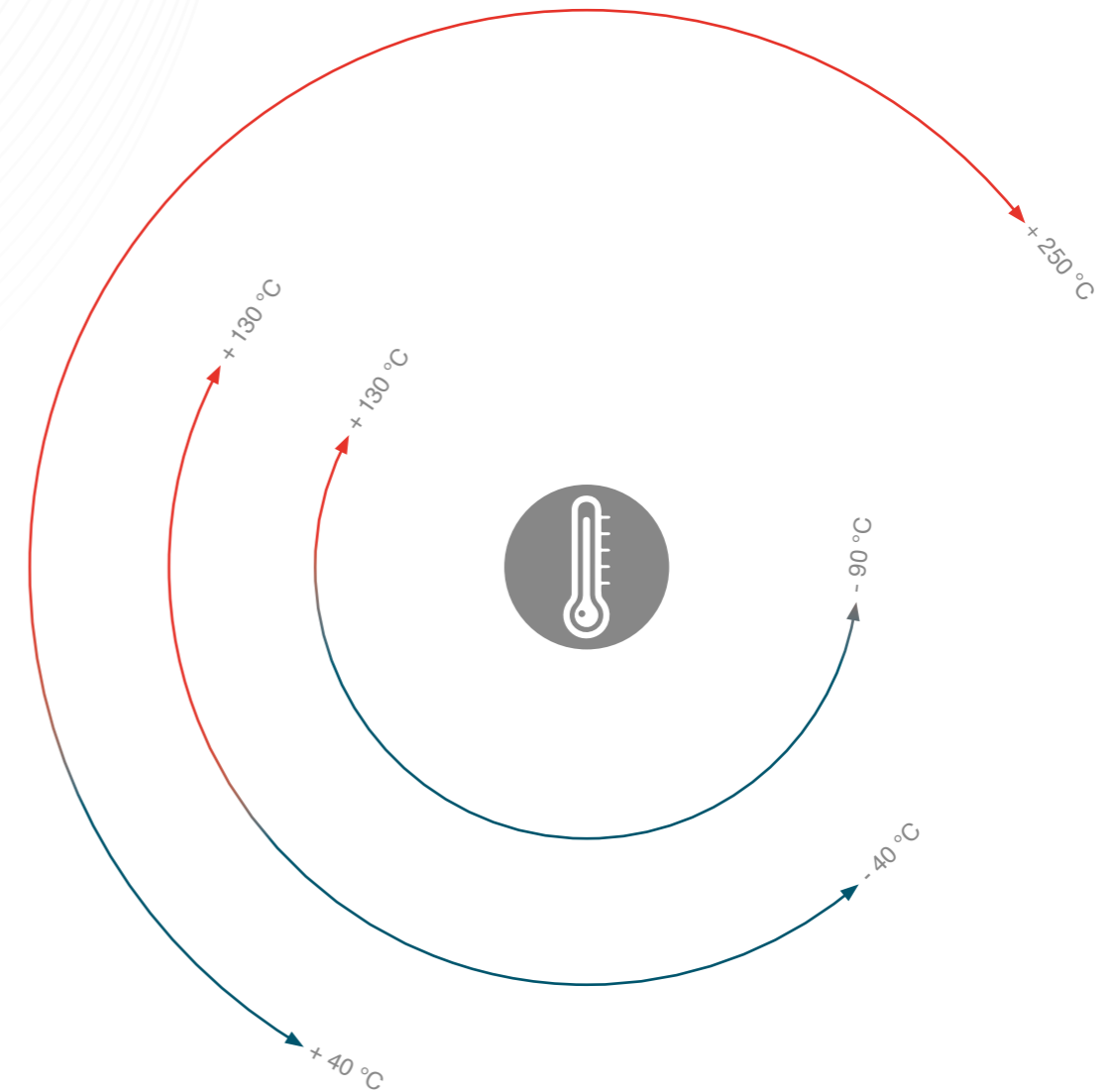
Model: **OB-22/2 ULT**

Volume: ~ 22 L

Temperature range: - 90 °C ...+ 130 °C

Temperature stability: ± 0.005 °C @ - 90 °C

Temperature uniformity: ± 0.007 °C @ - 90 °C



BATH SIZE
(VOLUME IN LITERS)

7/2 (7)

22/2 (20)

50/2 (50)

ACCESS OPENING DIAMETER
[mm]

100

147

320

IMMERSION DEPTH
[mm]

270

500

500



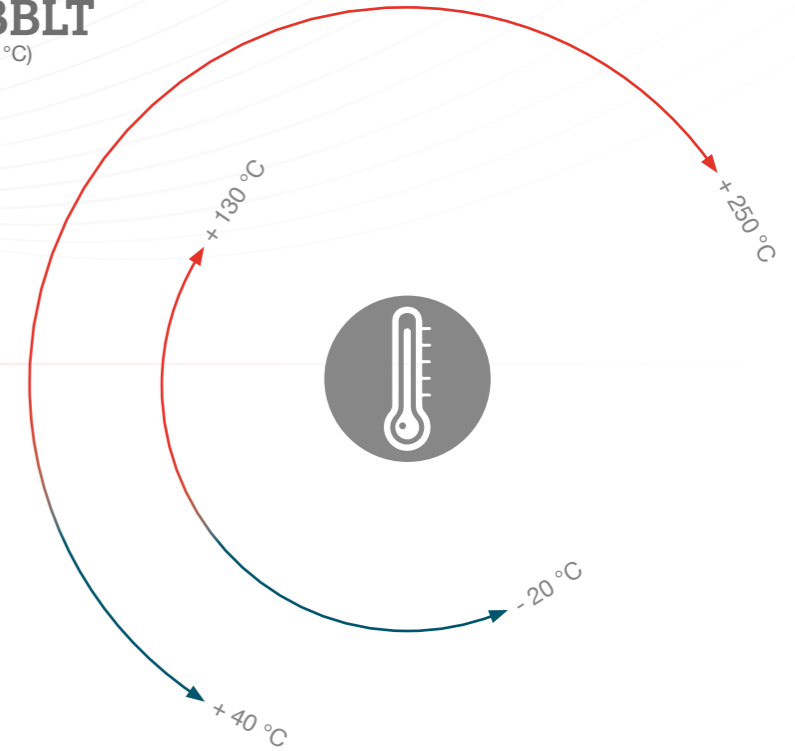
Black Body Cavity Ready Calibration Baths

- Perfect solution for calibrating IR thermometers and other thermographic equipment
- Fluid ensures perfect heat transfer
- Various shapes Black Body Cavities available
- Unique vertical flow design
- Metrology performance
- Uniformity and stability in mK range
- Two temperature ranges available
- State of the art solution

OB-15/2 BB
(+ 40 °C ...+ 250 °C)



OB-15/2 BBLT
(- 20 °C ...+ 130 °C)



Black Body Cavity Ready Calibration Baths

Model: **OB-15/2 BBLT**

Volume: ~ 15 L

- Temperature range: - 20 °C ...+ 130 °C
- Temperature stability: ± 0.006 °C @ - 20 °C
- ± 0.005 °C @ 0 °C
- ± 0.003 °C @ + 100 °C
- Temperature uniformity: ± 0.007 °C @ - 20 °C

Available Black Body Cavity types:



| BATH SIZE (VOLUME IN LITERS) | ACCESS OPENING DIAMETER [mm] | IMMERSION DEPTH [mm] | EXTERIOR DIMENSIONS (WXHXD) [mm] |
|------------------------------|------------------------------|----------------------|----------------------------------|
| OB-15/2 BB (15 L) | Ø 225 | 270 | 530 x 1090 x 470 |
| OB-15/2 BBLT (15 L) | Ø 225 | 270 | 530 x 1090 x 470 |



Triple Point of Water Maintenance Baths

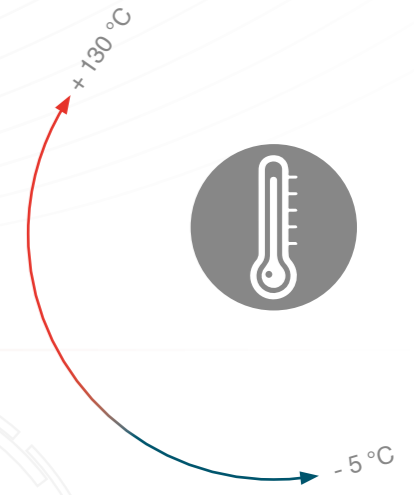
Ultra stable triple point of water maintenance bath with metrology performance.

- Uniformity and stability in mK range
- 500 mm immersion depth
- Fluid ensures perfect heat transfer
- State of the art solution
- Independent frost protection
- Cycling function
- Unique vertical flow design
- Two bath sizes

OB-22/2 TPW
(- 5 °C ...+ 130 °C)



OB-50/2 TPW
(- 5 °C ...+ 130 °C)



Triple Point of Water Maintenance Bath

Model: **OB-50/2 TPW**

Volume: ~ 50 L

- Temperature range: - 5 °C ...+ 130 °C
- Temperature stability: ± 0.002 °C @ 0 °C
- ± 0.005 °C @ + 20 °C
- ± 0.002 °C @ + 100 °C
- Temperature uniformity: < ± 0.007 °C @ -20 °C



| BATH SIZE (VOLUME IN LITERS) | ACCESS OPENING DIAMETER [mm] | IMMERSION DEPTH [mm] | EXTERIOR DIMENSIONS (WXHXD) [mm] |
|---------------------------------|---------------------------------|-------------------------|-------------------------------------|
| OB-22/2 TPW (22 L) | Ø 147 | 500 | 600 x 1240 x 550 |
| OB-50/2 TPW (50 L) | Ø 320 | 500 | 745 x 1240 x 495 |



Ultra Stable Standard Resistor Maintenance Baths

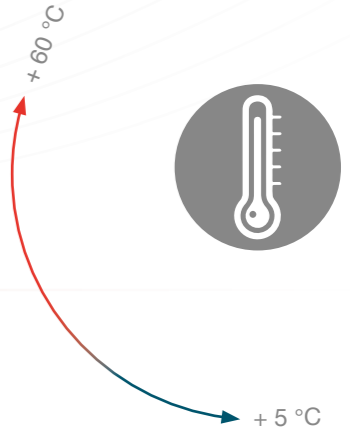
Standard resistor maintenance baths with exceptional metrology performance.

- Uniformity and stability in mK range
- State of the art solution
- Unique vertical flow design
- Multiple access ports
- Hinged transparent cover
- Two bath sizes available

OB-60/2 LTUS
(+ 5 °C ...+ 60 °C)



OB-100/2 LTUS
(+ 5 °C ...+ 60 °C)



Ultra Stable Standard Resistor Maintenance Bath

Model: **OB-100/2 LTUS**

Volume: ~ 100 L

- Temperature range: + 5 °C ...+ 60 °C
- Temperature stability: ± 0.003 °C @ + 23 °C
- Temperature uniformity: < ± 0.007 °C @ + 23 °C



| BATH SIZE (VOLUME IN LITERS) | INTERIOR DIMENSIONS (WXHXD) [mm] | EXTERIOR DIMENSIONS (WXHXD) [mm] |
|---------------------------------|-------------------------------------|-------------------------------------|
| OB-60/2 LTUS (60 L) | 550 x 320 x 268 | 1000 x 1035 x 550 |
| OB-100/2 LTUS (100 L) | 640 x 400 x 268 | 1100 x 1035 x 650 |



Air Baths

Refined solution for ultra-stable temperature environment 24/7, 365.

- Dry, clean, stable, silent, storage for standard resistors
- Perfect for checking temperature coefficients
- Peltier driven technology
- Keeping the temperature within 10mK over months
- Cascade PID control
- Side access ports for Cables & Probes

TK-50 US
(+ 15 °C ...+ 50 °C)

TK-105 US
(+ 15 °C ...+ 50 °C)

TK-190 US
(+ 15 °C ...+ 50 °C)

TK-300 US
(+ 18 °C ...+ 35 °C)



Air Bath

Model: **TK-190 US**

Volume: ~ 190 L

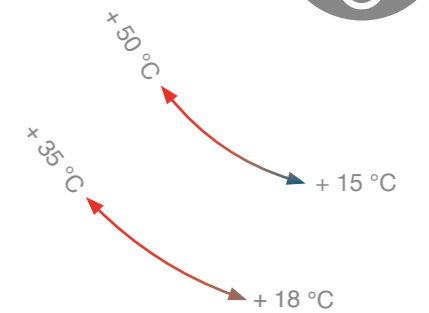
Temperature range: + 15 °C ...+ 50 °C

Temperature stability: ± 0.005 °C @ + 23 °C

Temperature uniformity: ± 0.02 °C @ + 23 °C



TK-300 US



CHAMBER SIZE = CHAMBER
(VOLUME IN LITERS)

INTERIOR DIMENSIONS
(WXHxD) [mm]

EXTERIOR DIMENSIONS
(WXHxD) [mm]

50

400 x 375 x 350

705 x 865 x 640

105

400 x 640 x 410

705 x 1130 x 700

190

570 x 810 x 410

875 x 1300 x 700

300

601 x 1000 x 500

905 x 1490 x 800



Temperature Chambers

- Material temperature resistance and product testing
- Temperature controlled test polygon
- Maintaining superior temperature stability
- World class metrology performance
- Sample conditioning prior to other tests
- Accelerated ageing
- Data loggers and sensors calibration

TK-CK (+ 5 °C...+ 180 °C)



- Models:
- TK-50 CK
 - TK-105 CK
 - TK-190 CK
 - TK-340 CK
 - TK-500 CK
 - TK-1000 CK

TK-CKLT (- 40 °C...+ 180 °C)



- Models:
- TK-50 CKLT
 - TK-105 CKLT
 - TK-190 CKLT
 - TK-340 CKLT
 - TK-500 CKLT
 - TK-1000 CKLT

TK-CKULT (- 75 °C...+ 180 °C)



- Models:
- TK-105 CKULT
 - TK-190 CKULT
 - TK-340 CKULT
 - TK-500 CKULT
 - TK-1000 CKULT

Temperature Chamber

Model: **TK-50 CKLT**

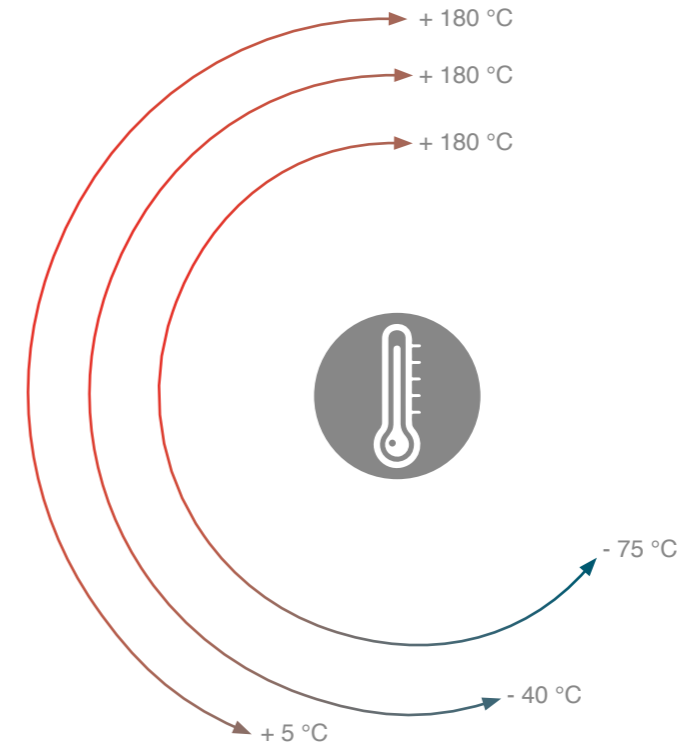
Volume: ~ 50 L

Temperature range: - 40 °C ...+ 180 °C

Temperature stability: ± 0.2 °C @ - 40 °C
 ± 0.05 °C @ + 50 °C
 ± 0.05 °C @ + 90 °C
 ± 0.1 °C @ + 180 °C

Temperature uniformity: ± 2.2 °C @ - 40 °C
 ± 0.4 °C @ + 50 °C
 ± 0.4 °C @ + 90 °C
 ± 1.5 °C @ + 180 °C

Accessories: **Observation window with chamber illumination**



| CHAMBER SIZE = CHAMBER VOLUME IN LITERS) | CHAMBER INTERIOR DIMENSIONS (WXHxD) [mm] for CH & CHLT models | CHAMBER INTERIOR DIMENSIONS (WXHxD) [mm] for models CHULT |
|--|---|---|
| 50 | 400 x 375 x 350 | / |
| 105 | 490 x 498 x 430 | 530 x 500 x 460 |
| 190 | 600 x 610 x 510 | 620 x 590 x 515 |
| 340 | 600 x 830 x 685 | 620 x 810 x 690 |
| 500 | 800 x 800 x 800 | 870 x 800 x 800 |
| 1000 | 1000 x 1000 x 1000 | 1000 x 1000 x 1000 |



Climatic Chambers

- Temperature and relative humidity control
- Maintaining superior temperature & Rh stability
- Data loggers and sensors calibration
- World-class metrology performance
- Accelerated ageing
- Stress tests

KK-CH (+ 5 °C...+ 180 °C)



Models:

- KK-50 CH
- KK-105 CH
- KK-190 CH
- KK-340 CH
- KK-500 CH
- KK-1000 CH

KK-CHLT (- 40 °C...+ 180 °C)



Models:

- KK-50 CHLT
- KK-105 CHLT
- KK-190 CHLT
- KK-340 CHLT
- KK-500 CHLT
- KK-1000 CHLT

KK-CHULT (- 75 °C...+ 180 °C)



Models:

- KK-105 CHULT
- KK-190 CHULT
- KK-340 CHULT
- KK-500 CHULT
- KK-1000 CHULT

Climatic Chamber

Model: **KK-50 CHLT**

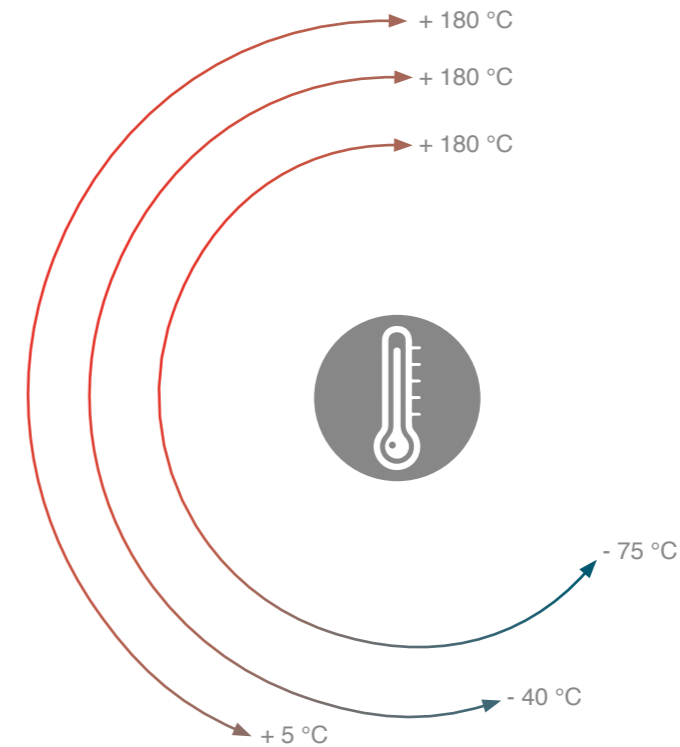
Volume: ~ 50 L

Temperature range: - 40 °C ...+ 180 °C

Temperature stability: ± 0.2 °C @ - 40 °C
 ± 0.05 °C @ + 50 °C 50 % Rh
 ± 0.05 °C @ + 90 °C 90 % Rh
 ± 0.1 °C @ + 180 °C

Temperature uniformity: ± 2.2 °C @ - 40 °C
 ± 0.4 °C @ + 50 °C 50 % Rh
 ± 0.4 °C @ + 90 °C 90 % Rh
 ± 1.5 °C @ + 180 °C

Accessories: **Observation window with chamber illumination**



| CHAMBER SIZE = CHAMBER VOLUME IN LITERS) | CHAMBER INTERIOR DIMENSIONS (WXHXD) [mm] for CH & CHLT models | CHAMBER INTERIOR DIMENSIONS (WXHXD) [mm] for models CHULT |
|--|---|---|
| 50 | 400 x 375 x 350 | / |
| 105 | 490 x 498 x 430 | 530 x 500 x 460 |
| 190 | 600 x 610 x 510 | 620 x 590 x 515 |
| 340 | 600 x 830 x 685 | 620 x 810 x 690 |
| 500 | 800 x 800 x 800 | 870 x 800 x 800 |
| 1000 | 1000 x 1000 x 1000 | 1000 x 1000 x 1000 |



Calibration Climatic Chamber

- Temperature and relative humidity control
- Maintaining superior temperature & Rh stability
- Data loggers and sensors calibration
- World-class metrology performance

C3-50
(+ 10 °C ...+ 55 °C)



Calibration Climatic Chamber

Model: **C3-50**

Volume: ~ 57 L

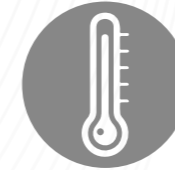
Temperature range: + 10 °C ...+ 55 °C

Temperature stability: ± 0.03 °C @ + 21 °C, 50 % Rh
(better than ± 0.08 °C in full temp. range)

Temperature uniformity: ± 0.2 °C @ + 21 °C, 50 % Rh

Accessories: **Door with 2 flanged ports**
(1 multilayer isolative glass & 1 isolative block with ports)

+ 55 °C



+ 10 °C



Model: **C3-50**
Standard



Door with 2 flanged ports & 2 multilayer isolative glass



Door with 2 flanged ports & 1 multilayer isolative glass & 1 isolative block with ports



Door with 2 flanged ports & 2 isolative blocks with ports



CHAMBER SIZE = CHAMBER
(VOLUME IN LITERS)

50

EXTERIOR DIMENSIONS
(WXHxD) [mm]

570 x 800 x 615

INTERIOR DIMENSIONS
(WXHxD) [mm]

400 x 400 x 360



Peltier Based Climatic Chambers

- Solely Peltier based temperature and humidity control
- Convenient- side access for cables & probes
- Stable, silent, vibration free climatic conditions
- Cascade PID control
- Keeping superior temperature & Rh stability

PKK-50
(+ 8 °C ...+ 55 °C)

PKK-125
(+ 10 °C ...+ 50 °C)



Peltier Based Climatic Chamber

Model: **PKK-125**

Volume: ~ 125 L

Temperature range: + 10 °C ...+ 50 °C

Temperature stability: ± 0.08 °C @ + 15 °C, 75 % Rh
 ± 0.05 °C @ + 20 °C, 60 % Rh
 ± 0.05 °C @ + 30 °C, 65 % Rh
 ± 0.10 °C @ + 50 °C, 75 % Rh
 ± 0.10 °C @ + 50 °C, 15 % Rh

Relative humidity range: 10 %...95 %

Temperature uniformity: ± 0.30 °C @ + 15 °C, 75 % Rh
 ± 0.25 °C @ + 20 °C, 60 % Rh
 ± 0.50 °C @ + 30 °C, 65 % Rh
 ± 0.60 °C @ + 50 °C, 75 % Rh
 ± 1.30 °C @ + 50 °C, 15 % Rh

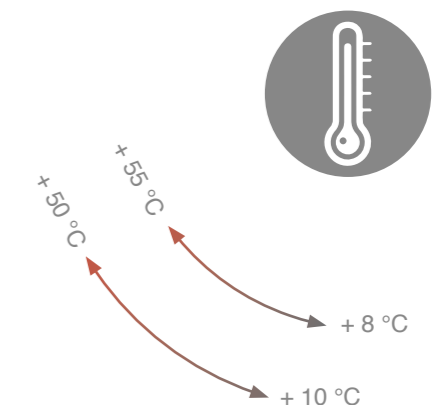
Accessories: **Observation window with chamber illumination**



Model: **PKK-50**

With accessories: **Trolley**

Observation window with chamber illumination



| CHAMBER SIZE = CHAMBER VOLUME IN LITERS) | INTERIOR DIMENSIONS (WXHxD) [mm] | EXTERIOR DIMENSIONS (WXHxD) [mm] |
|--|----------------------------------|----------------------------------|
| 50 | 400 x 400 x 360 | 570 x 800 x 660 |
| 125 | 500 x 500 x 500 | 670 x 1135 x 755 |



Tailored Equipment

- Custom-made calibration baths in any given temperature range
- Tailored black body cavities
- A wide variety of standard and made to fit accessories
- Extra-small to extra-large climatic chambers to fit any DUT
- Equipment compatibility with open communication protocols

Temperature Chamber for Testing and Calibration of Gas Flow Meters in Pass Through Design

Model: **TK-1800 CKLT**

Volume: ~1800 L

Temperature range: -40 °C ... +180 °C



Calibration Bath for IR and Thermographic Instruments Calibration Special Black Body Cavity Design

Model: **OB-55 LT**

Volume: ~61 L

Temperature range: -40 °C ... +5 °C

Temperature stability: ±0.005 °C @ -40 °C

Temperature uniformity: ±0.007 °C @ -40 °C



Ultra-Low Temperature Calibration Bath

Model: **OB-50/2 ULT
Square**

Volume: ~25 L

Temperature range: -90 °C ... +130 °C

Temperature stability: ±0.003 °C @ -90 °C

Temperature uniformity: ±0.007 °C @ -90 °C

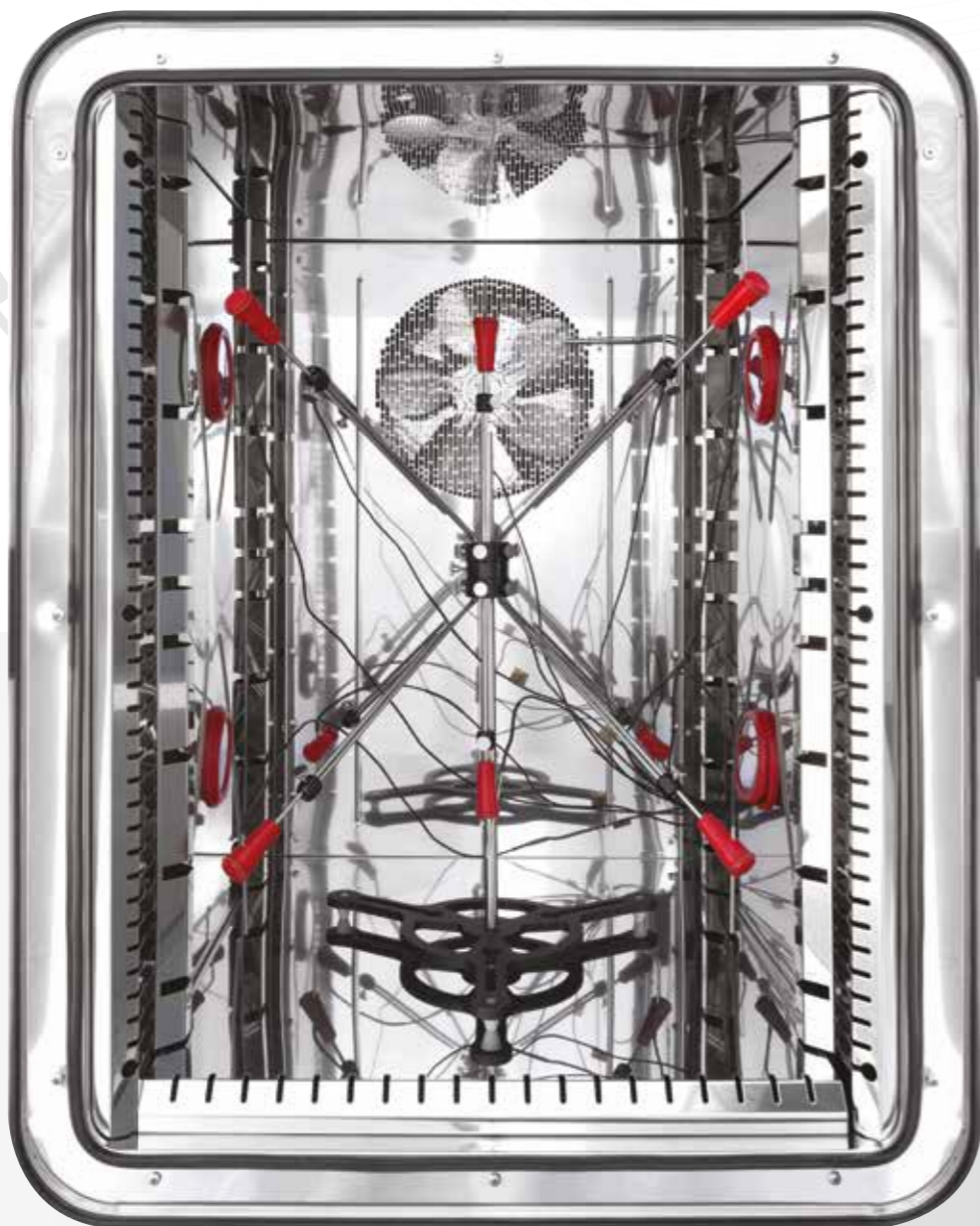




Spider

Applications:

- Temperature and Climatic Chamber mapping
- Chamber validation
- Chamber calibration
- Uniformity studies



Concept

The Spider facilitates flexible positioning of temperature sensors in climatic chambers. It simplifies the setup of chamber temperature tests, calibration and validation. It features eleven (11) sensor mounts made from flexible and insulating Silicone that isolates the temperature sensor from stainless-steel mounting rods.

Compatibility

The Spider is suitable for temperature sensors from 3 to 6mm in diameter, and working temperatures from - 50 to + 200 °C. It is suitable for use with any type of multichannel temperature measurement systems including the MBW T12 multichannel thermometer.

| Models: | MAX VOLUME (WXHxD) [mm] | MIN VOLUME (WXHxD) [mm] |
|--------------------|-------------------------|-------------------------|
| SPIDER 600 | 720 x 720 x 720 | 480 x 480 x 480 |
| SPIDER 1000 | 1200 x 1200 x 1200 | 720 x 720 x 720 |

Oils



| | |
|--|------|
| Silicone oil fluid KDC ULT (- 100 °C ... + 30 °C) | 700 |
| Silicone oil fluid KDC 200.05 (- 40 °C ... + 130 °C) | 645 |
| Silicone oil fluid KDC 200.20 (+ 10 °C ... + 230 °C) | 600 |
| Silicone oil fluid KDC 200.50 (+ 30 °C ... + 278 °C) | 631 |
| Silicone oil fluid KDC 710 (+ 80 °C ... + 300 °C) | 2782 |

Worldwide partners & customers:

Industries

- Pharmacy
- Electronics
- Chemical
- Mechanical
- Automotive
- Aviation
- Weather agencies
- Testing facilities
- R&D institutes
- Universities
- Biotechnology

References

- BAE Systems
- Krka
- Danfoss
- Samsung
- Trescal
- TDK
- Medico Support
- Mahle
- Novo Nordisk
- Sandoz
- Roche
- Broen Lab
- Exova Metech
- Ellab

National labs

- LMK Slovenia
- MIKES Finland
- DTI Denmark
- DFM A/S Denmark
- PTB Germany
- MBW AG Schweiz
- FPS Belgium
- INTiBS Poland
- INRIM Italy
- BIPM France
- NPL United Kingdom
- NSAI Ireland
- NIST USA
- HMI Croatia
- MBM Montenegro
- KRISS Korea
- NIMT Thailand
- NMC Singapore





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