

Controlled temperature calibration micro baths

LR-Cal FLUID 100-N: -18...+140°C

LR-Cal FLUID 100-45: -35...+140°C

(stated temperature range valid at ambient temperature+20°C)

The portable temperature calibration micro baths **LR-Cal FLUID 100-N** and **LR-Cal FLUID 100-45** serve as temperature source and reference instrument in one. For testing, adjusting and calibrating all types of temperature measuring instruments. They are also particularly suitable for laboratory and glass thermometer as well as temperature probes with e.g. 90° bends.



Technical data (at +20°C ambient temperature):

Model:	LR-Cal FLUID 100-N	LR-Cal FLUID 100-45
Temperature range at +20°C ambient temperature:	-18...+140°C	-35...+140°C
Accuracy of the temperature indication:	±0.15°C	±0.15°C
Display resolution (switchable):	0.01° / 0.1°	0.01° / 0.1°
Temperature units (selectable):	°C / °F / K	°C / °F / K
Stability of regulated temperature:	±0.02°C (1)	±0.02°C (1)
Mean heating time from T _{amb} to 140°C (incl. stabilization):	approx. 55 min.	approx. 40 min.
Mean cooling time from 140°C to T _{amb} (incl. stabilization):	approx. 50 min.	approx. 100 min.
Radial temperature uniformity at 40 mm depth:	±0.07°C (at 140°C)	±0.02°C (at 0°C)
Axial temperature uniformity:	±0.05°C ±0,03°C	±0.05°C
Reservoir depth:	170 mm	170 mm
Reservoir diameter:	60 mm	45 mm
Display:	LED, 2 lines	LED, 2 lines
Interface:	RS232 (Option: USB-converter)	RS232 (Option: USB-converter)
Inputs for 2 external probes: (2)	Option (version -2I)	Option (version -2I)
Ramp function (slope):	•	•
Thermostat test function and connection:	•	•
Power supply (50/60 Hz):	230 VAC (3)	230 VAC (3)
Power consumption:	300 VA	350 VA
Weight:	11 kgs	11 kgs
Housing dimensions:	160 x 360 x 350 mm	160 x 360 x 350 mm

(1) Maximum temperature difference at a stable temperature over 30 min.

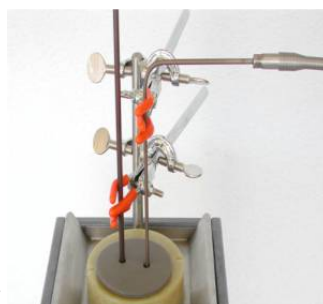
(2) e.g. 1 x for external reference probe + 1 x for probe under test (Pt 100 oder TC)

(3) optional for 115 VAC

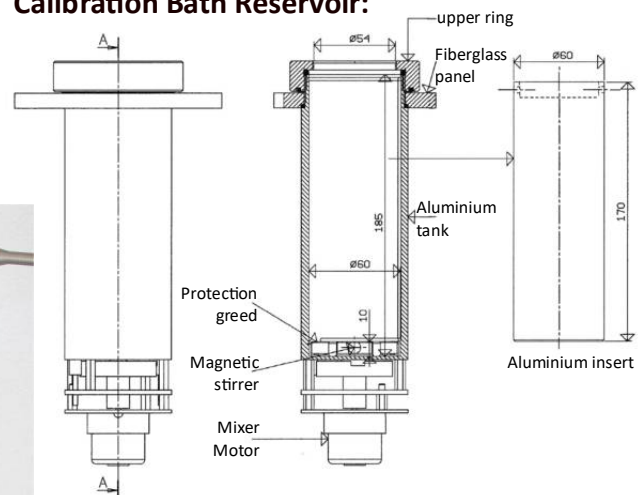
Versions LR-Cal FLUID 100-N-2I
and LR-Cal FLUID 100-45-2I:
with 2 measuring inputs for Pt 100
and thermocouples, programmable.
For unit under test and/or external
reference. (Details see page 3.)



Extraction of the magnetic stirrer



Calibration Bath Reservoir:



FLUID 100-N
FLUID 100-45

Portable temperature calibration
Micro baths -18...+140°C or -35...+140°C



Versions LR-Cal FLUID 100-N-2I and LR-Cal FLUID 100-45-2I:

With data acquisition card and two input devices to measure resistance thermometer probes and thermocouples.
Details - see next page.

Included in scope of standard delivery:

- Temperature micro bath **LR-Cal FLUID 100-N** or **LR-Cal FLUID 100-45**
- Spare fuses
- Support for fixing units under test
- Connection cable for thermostat tests
- 1 Bottle (500 cm³) with silicone oil 47V10
- Closing lids for transport purposes
- Carrying bag with shoulder strap
- Operating manual (German/English)
- Test certificate (factory certificate of calibration)



Additional at versions LR-Cal FLUID 100-N-2I and LR-Cal FLUID 100-45-2I (with 2 measuring inputs):

- Set of electrical connection cables (red/black)
- Set of clamping plugs (red/black)



Optional Accessories:

- External reference temperature sensors (see datasheet **LR-Cal LTC-F**)
- PC-Windows **software AQ2sp** incl. special RS232 connection cable.
With the **AQ2sp** software, the calibrator can be completely controlled from the PC, manual or automatic calibration of one or more units under test, load of one or more test items, load and lifetime tests, creation of calibration certificates. Order-Code **590.0.000.0003.0** incl. RS232 cable.



- **Extension tube** for **LR-Cal FLUID 100-N** for increasing the immersion depth, total length 250 mm usable immersion depth 230 mm. Minimum temperature -9°C at 20°C ambient temperature. When used with silicone oil 200C5: working range -9...+130°C, radial temperature uniformity ±0.1°C (measured 50 mm from the bottom), axial temperature uniformity ±0.1°C (or ±0.15°C at temperatures below 0°C) measured in the range 0...150 mm above the bottom. Order-Code **FLUID100-ER**.



- **RS232-USB interface converter**

- **Various test liquids:** Please enquire with description of your application: dt-export@leitenberger.de, or see →



- **Conversion to dry block temperature calibrator**
See next page

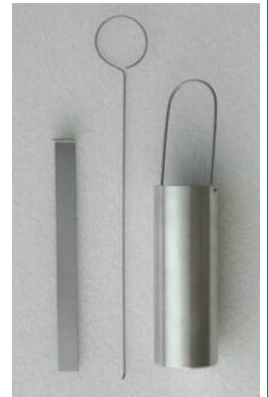
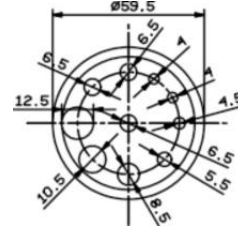


• **Conversion of the micro bath LR-Cal FLUID 100-N to a dry block temperature calibrator:**

- Temperature range: -10...+125°C
- Block made of aluminium, diameter 60 mm, depth 170 mm
- Heating time from -10 to +110°C: 45 min
- Cooling time from 20°C to -10°C: 47 min
- Stability of regulated temperature: $\pm 0.04^\circ\text{C}$
- Vertical temperature uniformity: $\pm 0.03^\circ\text{C}$ at 0°C; $\pm 0.06^\circ\text{C}$ at 80°C

- Block insert without holes (for self-drilling): Order-Code **FLUID-INS-0**

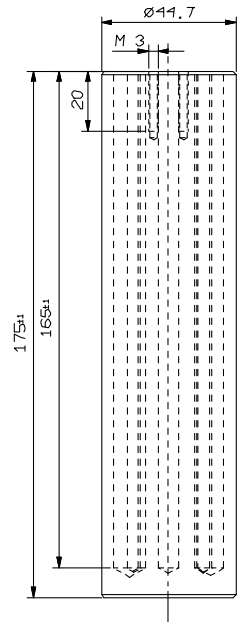
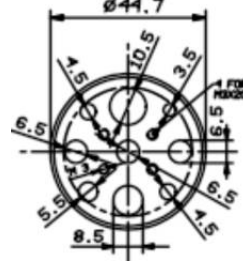
- Block insert with 9 drillings (4.0+4.0+4.5+5.5+6.5+6.5+8.5+10.5+12.5 mm diameter):
Order-Code **FLUID-INS-9**



• **Conversion of the micro bath LR-Cal FLUID 100-45 to a dry block temperature calibrator:**

as above, but diameter 44.7 mm, depth 175 mm

- Block insert with 8 drillings (3.5+4.5+4.5+6.5+6.5+6.5+8.5+10.5 mm diameter):
Order-Code **FLUID-100-45-INS**



Versions LR-Cal FLUID 100-N-2I and LR-Cal FLUID 100-45-2I:

Instrument version with 2 measuring inputs, both suitable for resistance thermometers Pt 100 (2-, 3- or 4-wire) or Pt 100 as well as thermocouples (incl. cold junction compensation) types B, E, J, K, N, R, S and T. The signals of up to two external temperature sensors can be displayed additionally.



Accuracy of the two measuring inputs:

Accuracy (max. deviation) of the optional measuring inputs at instrument version "-2I":

Resistance thermometer:				
Pt 100	at -40°C: $\pm 0.09^\circ\text{C}$	at 0°C: $\pm 0.08^\circ\text{C}$	at +150°C: $\pm 0.11^\circ\text{C}$	at +300°C: $\pm 0.14^\circ\text{C}$
Pt 1000	at -40°C: $\pm 0.09^\circ\text{C}$	at 0°C: $\pm 0.08^\circ\text{C}$	at +150°C: $\pm 0.11^\circ\text{C}$	at +300°C: $\pm 0.14^\circ\text{C}$
Thermocouples:				
Type B	at +950°C: $\pm 0.97^\circ\text{C}$	at 1050°C: $\pm 1.03^\circ\text{C}$	at +1200°C: $\pm 1.12^\circ\text{C}$	
Type E	at -40°C: $\pm 0.42^\circ\text{C}$	at 0°C: $\pm 0.40^\circ\text{C}$	at +350°C: $\pm 0.61^\circ\text{C}$	
Type J	at +200°C: $\pm 0.52^\circ\text{C}$	at +450°C: $\pm 0.67^\circ\text{C}$	at +700°C: $\pm 0.82^\circ\text{C}$	
Types K + N + R + S	at +400°C: $\pm 0.64^\circ\text{C}$	at +700°C: $\pm 0.82^\circ\text{C}$	at +1000°C: $\pm 1.00^\circ\text{C}$	
Type T	at -40°C: $\pm 0.42^\circ\text{C}$	at 0°C: $\pm 0.40^\circ\text{C}$	at +350°C: $\pm 0.61^\circ\text{C}$	