Rel. 20210805

Dry metal block temperature calibrator LR-*Cal* QUARTZ-35

Temperature range: -30...+150°C (at +20°C ambient temperature)
Version LR-*Cal* QUARTZ-35-2I additional with 2 inputs Pt 100 / TC for external reference and unit under test

Dry metal block temperature calibrator LR-*Cal* QUARZ-50

Temperature range: -50...+150°C (at +20°C ambient temperature)
Version LR-*Cal* QUARTZ-50-2I additional with 2 inputs Pt 100 / TC for external reference and unit under test

Cooling and heating with efficient peltier elements.
Fans electronically controlled

Typical applications:

- Testing, checking and calibrating all kind of temperature instruments
- Testing and adjustment of temperature switches / thermostats
- Computer aided calibration via computer interface

Technical data:

Model:	LR-*Cal* QUARTZ-35	LR-*Cal* QUARTZ-50
Temperature range at +20°C ambient temperature:	-30°C...+150°C	-50°C...+150°C
Accuracy of built-in temperature indication:	±0.15°C	±0.15°C
Display resolution (user-selectable):	0.01° / 0.1°	0.01° / 0.1°
Temperature units (user-selectable):	°C / °F / K	°C / °F / K
Stability of regulated temperature (at 0°C):	±0.03°C	±0.02°C
Heating time (incl. time to stability):	Ø 20°C per minute	ambient...+150°C: 30 min
Average cooling time:	Ø 22°C per minute	ambient...-50°C: 60 min
Radial temperature uniformity (at 0°C):	±0.02°C (at 40 mm ins. depth)	±0.02°C (at 40 mm ins. depth)
Axial temperature uniformity (at 0°C):	±0.1°C (at 60 mm from bottom)	±0.1°C (at 60 mm from bottom)
Immersion depth:	130 mm	135 mm
Insert diameter:	35 mm	35 mm
Display:	LCD 2-zeilig	LCD 2-zeilig
Interface:	RS232 (option: USB-converter)	RS232 (option: USB-converter)
Inputs for 2 external probes: *(1)*	Option (version **-2I**)	Option (version **-2I**)
Ramp function (fully programmable):	•	•
Thermostat test function and connection: *(2)*	•	•
Power supply (50/60 Hz):	230 VAC *(3)*	230 VAC
Power consumption:	300 VA	300 VA
Weight:	10 kg	8 kg
Housing dimensions:	340 x 160 x 330 mm	350 x 160 x 365 mm

(1) e.g. 1 x for external reference probe + 1 x for probe under test (Pt 100 oder TC)
(2) with automatic log of switch open and switch close
(3) optional for 115 VAC

Additional for versions LR-*Cal* QUARTZ-35-2I and LR-*Cal* QUARTZ-50-2I:

With data acquisition card and 2 input devices to measure Pt 100 (3- or 4-wire, range -100...+700°C, accuracy ±0.3°C) and thermcouples type J (0...1000°C, ±1°C and thermocouples types K/N/R/S (range 0...1300°C, accuracy ±1°C). Indication of values of external probes on the calibrators display. Set of cables and plugs (red/black).

QUARTZ-35
QUARTZ-50

Dry metal block temperature calibrator
-30°C...+150°C or -50°C...+150°C

Scope of standard delivery:

- Temperature calibrator **LR-*Cal* QUARTZ-35(-2I)** or **LR-*Cal* QUARTZ-50(-2I)**
- Power supply cable
- Spare fuse(s)
- Connection cable for thermostat tests
- Tweezer for removing block insert
- 1 insert with holes 3.5 - 4.5 - 5.5 - 6.5 - 8.5 - 10.5 mm diameter
- Factory certificate of performance and calibration
- Operating manual

Additional for versions **LR-*Cal* QUARTZ-35-2I** and **LR-*Cal* QUARTZ-50-2I**:

- Set of red/black cables and plugs for the connection of external sensors

Optional accessories:

Code **507.0.999.0008.0**: Insert without drillings (to be drilled by customer)
Code **507.0.999.0010.0**: Insert with 2 holes 6.5 - 19.5 mm diameter
Code **INS-SPEC-633-3**: Insert with 1-3 holes as per customers request, 3.2...20 mm diameter
Code **INS-SPEC-633-6**: Insert with mit 4-6 holes as per customers request, 3.2...20 mm diameter
Code **INS-SPEC-633-10**: Insert with 7-10 holes as per customers request, 3.2...20 mm diam.
Code **INSERT-QUARTZ**: Insert „black body“, 26 mm inner diameter (for Infrared thermometers)
Code **BB-SENSOR-01**: Reference probe Pt 100 for black body insert, 3 mm, Class A

Code **TEMPKAL-TASCHE**: Soft bag with shoulder trap

Code **TEMPKAL-KOFFER**: Aluminium hard case with foam insert

Code **599.0.000.0003.0**: PC software „**AQ2sp**“ incl. special RS232 cable
With the MS-Windows software „**AQ2sp**“ it is possible to remote-control the temperature calibrator with a PC. Automatic or manual calibration of one or more test specimen, stress tests, life cycle tests and thermostat tests can be carried out. Creation of certificates of calibration.

Code **RS232-USB-KONV**: Converter RS232 --> USB

LR-*Cal* **Portable Temperature Calibrator**
Dry Block Calibrator, up to +600°C

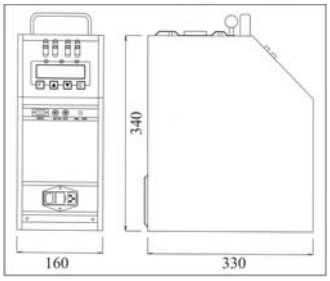
PULSAR-35CU

Rel. 20181011

Dry Block Temperature Calibrator LR-*Cal* PULSAR-35CU

- **for mobile or stationary use**
- **micro processor controlled (PID)**
- **RAMP function**
- **Thermostat test feature**

Typical applications:
- Calibration and checking of all kind of thermometer
- Calibration and checking of thermostats
- Computer aided calibration via RS232 interface



Technical Data:

Order-Code: PULSAR-35CU
Temperature range: Ambient temperatur up to +600°C
Resolution of display: 0.01 / 0.1°C (display switchable °C/°F/K)
Stability of regulated temperature: ±0.05%°C at 450°C
Mean heating time: 20°C per minute
Mean cooling time: 25°C per minute
Uniformity (at 450°C): radial ±0.15°C; axial ±0.35°C
Accuracy of internal temperature measurement: ±0.3°C
Internal reference probe: RTD Pt100 (3-wire)
Ventilation: internal, electronical driven/regulated
Interface: RS232
RAMP function: 0.1°C per minute
Dry block: diameter 35 mm, depth 190 mm, material: copper
Test wells: 1 hole diameter 35 mm x depth 185 mm
Insert included: 1 insert with 5 drillings 3.5 / 5.0 / 6.5 / 8.5 / 12.5 mm; **Optional:** inserts with 1 to 9 drillings 3.5...20 mm as per customers request, or blank insert, or insert with BLACK BODY and external reference probe.
Power supply: 230 VAC (optional: version for 115 VAC)
Power consumption: 800 VA
Housing: metal
Dimension: 160 x 340 x 330 mm
Weight: 10.1 kg net (shipping weight: 18.2 kg)
NOTE: the stated accuracy is valid for ambient temperature +10...+40°C and is guaranteed for one year.

Version PULSAR-35CU-2I:

With data acquisition card and two input devices to measure Pt100 (3-/4-wire, -100...+700°C, ±0.3°C), TC type J (0...1000°C, ±1°C) and TC types K/N/R/S (0...1300°C, ±1°C)
Order-Code: PULSAR-35CU-2I

Accessories:

Soft bag
Order-Code:
TEMPKAL-TASCHE

Alu Case
Order-Code:
TEMPKAL-KOFFER

Windows-PC Software AQ2sp
incl. RS232 cable
Order-Code: 599.0.000.0003.0

With the software **AQ2sp** ist is possible to remote-control the calibrator via PC. Automatic or manual calibtration of one or more test items, stress tests, thermostat tests, printing of calibration certificates.

Further Accessories:

- Inserts with customer specific drillings
- Blank insert
- BLACK BODY insert for infrared thermometer
- External Reference Probes

LR-*Cal* **Dry block Temperature Calibrator up to 550°C, insertion depth 275 mm** **PULSAR-80Cu**

Rel. 20180125

Portable dry block temperature calibrator
LR-*Cal* PULSAR-80Cu

- Range: ambient temperature to +550°C.
- Metal block outer diameter 80 x 300 mm, Inner diameter 60 x 275 mm suitable for appropriate reduction inserts
- Insertion depth of the holes of the insert: 275 mm.
- For checking and calibration of temperature sensors and thermostats with long bulbs.
- Reduction inserts available to customers request.

The temperature calibrator **LR-*Cal* PULSAR-80Cu** consists of a metal block diameter 80 mm x length 300 mm, heated by a resistance which winds around the outer surface of the block. A hole with diameter 60 mm and depth 275 mm is made in the block for the appropriate reduction inserts.

The **LR-*Cal* PULSAR-80Cu** is equipped with a counter-current forced air cooling system, which keeps the temperature in the upper part of the well low. This system enables to check even very short probes, without heating the connection head or the handgrip. The calibrator is equipped iwth a PID microprocessor controller with a resolution up to 0.01°C, setting of the standard of measurement in °C, °F and K, programming of ascent/descent ramps and storage of a thermostats' operative temperature.

The version **LR-*Cal* PULSAR-80Cu** is equipped with an acquisition card, having two adjustable inputs, able to read Pt 100 3/4-wires and thermocouples J, E, K, N, R and S with automatic compensation of the cold junction. The values of up to two connected probes can be displayed on instruments' display simultaneously with the values of temperature set point and measured temperature of the internal reference temperature probe.

Furthermore, the **LR-*Cal* PULSAR-80Cu** is equipped with a RS232 serial interface. It can operate in automatic mode connected to a PC by means of the optional AQ2sp software which enables to carry out probe calibrations and cyclical life tests. Test results can be stored and printed, so they are easily traceable in compliance with ISO 9001 standards.

Scope of standard delivery:
- Dry block temperature calibrator model **LR-*Cal* PULSAR-80Cu** or model **LR-*Cal* PULSAR-80Cu-2I**
- Power supply cable, fuses kit
- Thermostats connection cable
- Block extractor (tool)
- Test-Report (factory certificate: accuracy and stability)
- Operating manual
- Version **LR-*Cal* PULSAR-80Cu-2I**: kit of clamps connection

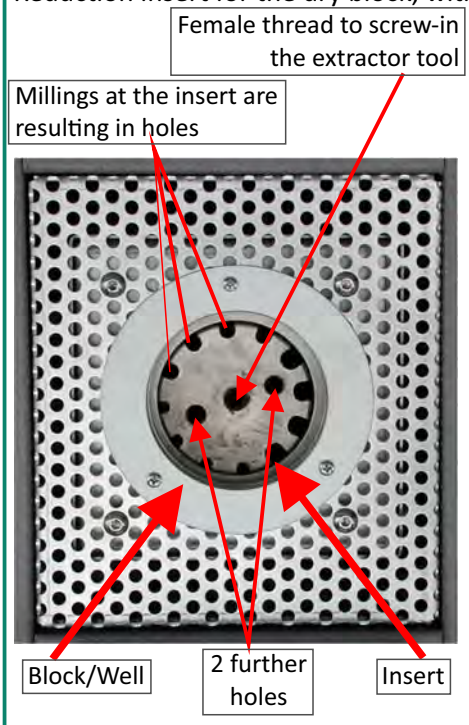
PULSAR-80Cu

Dry block Temperature Calibrator up to 550°C, insertion depth 275 mm

Operating range: Ambient temperature to +550°C (1022°F)
Stability: ±0.05°C (at 450°C); ±0.09°F (at 842°F)
Radial temperature uniformity: ±0.1°C (at 100 mm depth); ±0.1°F (at 100 mm depth)
Axial temperature uniformity: ±0.3°C (at 120 mm from the bottom); ±0.5°F (at 120 mm from the bottom)
Maximum heating time: 9°C/min. (48°F/min.)
Maximum cooling time: 1.6°C/min. (35°F/min.)
Display resolution: 0.1°C (0.01° F)
Display accuracy: ±0.3°C (±0.5°F)
Temperature units: °C, °F, K
Interface: RS232 serial interface
Well diameter: 60 mm (2.3 in.)
Insert hole depth: 275 mm (10.8 in.)
Supply: 230 VAC - 50/60 Hz
Power consumtion: 1700 W
Dimensions: 170 x 450 x 330 mm (6.6 x 17.7 x 12.9 in.)
Weight: 23 kg (50 lb)
Shipping size: 240 x 410 x 515 mm (9.4 x 16 x 20.2 in.)
Shipping weight incl. optional carrying case: 30 kg (60 lb)

Model **LR-*Cal* PULSAR-80Cu-2I** with two measuring inputs and indication of measured values on display of the calibrator:
for Pt 100 (3-/4-wire), range -100...+700°C, accuracy ±0.3°C, or
for thermocouples J and E, range 0...1000°C, accuracy ±1°C, or
for thermocouples K, N, R and S, range 0...1300°C, accuracy ±1°C

Please order separately:
Reduction insert for the dry block, with customer specific holes, order-code **PULSAR-80CU-INS-12**



Inner diameter of the metal dry block:
60 mm diameter x 275 mm depth.
Reduction inserts 59,5 x 275 mm available, which can be equipped with customer-specific holes (millings):
- maximal 12 drillings (resulting in holes, when inserted)
- Holes for probes with diameter 3.5 mm to 6.0 mm (please state your requirements in your order)
- Female thread in the center of the insert to screw-in the extractor-tool (and addional two drillings/holes).

Further accessories and options:
- Trolley case, order-code **PULSAR-80CU-KOFFER**
- AQ2sp-Software (Windows-PC) incl. RS232 cable, order-code **599.0.000.0003.0**
- DAkkS certification (in place of factory test report)

LR-*Cal* LR

Metal dry block temperature calibrator
+200...+1100°C or +200...+1200°C

SOLAR
SOLAR-1200

Rel. 20210713

Dry block temperature calibrator LR-*Cal* SOLAR and LR-*Cal* SOLAR-1200

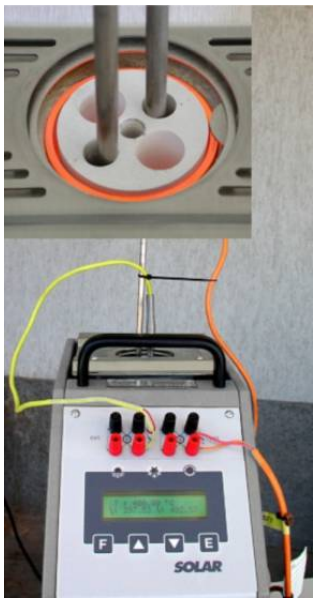
- **Temperature range: +200...+1100°C or +200...+1200°C**
- **For mobile and stationary use**
- **Microprocessor operated**
- **Ramp function, thermostat tests**

Typical Applications:

- Calibration and checking of all kinds of thermometer
- Calibration and checking of thermostats
- Computer aided calibration via computer interface

Model:	LR-*Cal* SOLAR	LR-*Cal* SOLAR-1200
Temperature range at +20°C ambient temperature:	+200°C...+1100°C	+200°C...+1200°C
Accuracy of built-in temperature indication:	±3°C	±3°C
Displey resolution (user-selectable):	0.01° / 0.1°	0.1°C
Temperature units (user-selectable):	°C / °F / K	°C / °F / K
Stability of regulated temperature (at 1000°C):	±0.3°C	±0.3°C
Heating time:	Ø 18°C per minute	Ø 15°C per minute
Cooling time:	Ø 6°C per minute	Ø 7°C per minute
Radial temperature conformity (at 1000°C):	±0.4°C (at 40 mm depth)	±2°C (at 40 mm depth)
Axial temperature uniformity:	±3°C	±3°C
Block depth:	220 mm *(1)*	160 mm *(1)*
Block diameter:	44 mm	35 mm
Display:	LCD 2 lines	LCD 2 lines
Interface:	RS232 (Option: with USB converter)	RS232 (Option: with USB converter)
Inputs for 2 external probes:	Option (version **-2I**) *(2)*	-
Ramp function (fully programmable):	●	-
Thermostat test function and connection:	● *(3)*	-
Power supply (50/60 Hz):	230 VAC *(4)*	230 VAC
Power consumption:	850 VA	700 VA
Weight:	12 kg	10.5 kg
Metal housing dimensions:	450 x 170 x 330	350 x 160 x 390

(1) including upper insulation
(2) e.g. 1 x for external reference + 1 x for probe under test (Pt 100 or TC)
(3) with automatic log of switch open and switch close
(4) optional for 115 VAC



Scopy of standard delivery:

- Temperature calibrator LR-*Cal* **SOLAR** or LR-*Cal* **SOLAR-2I** or LR-*Cal* **SOLAR-1200**
- Mains power cable
- Ceramic block with 4 holes, including suitable upper insulation:
  LR-*Cal* **SOLAR (-2I)**: 7 - 9 - 11 - 13.5 mm; LR-*Cal* **SOLAR-1200**: 4.8 - 6.4 - 9.5 - 12.8 mm
- Tool for removing block insert
- Spare fuses
- Connection cable for thermostat tests (not at model LR-*Cal* **SOLAR-1200**)
- Operating manual and factory certificate (accuracy, performance, stability)

Only at version LR-*Cal* SOLAR-2I:

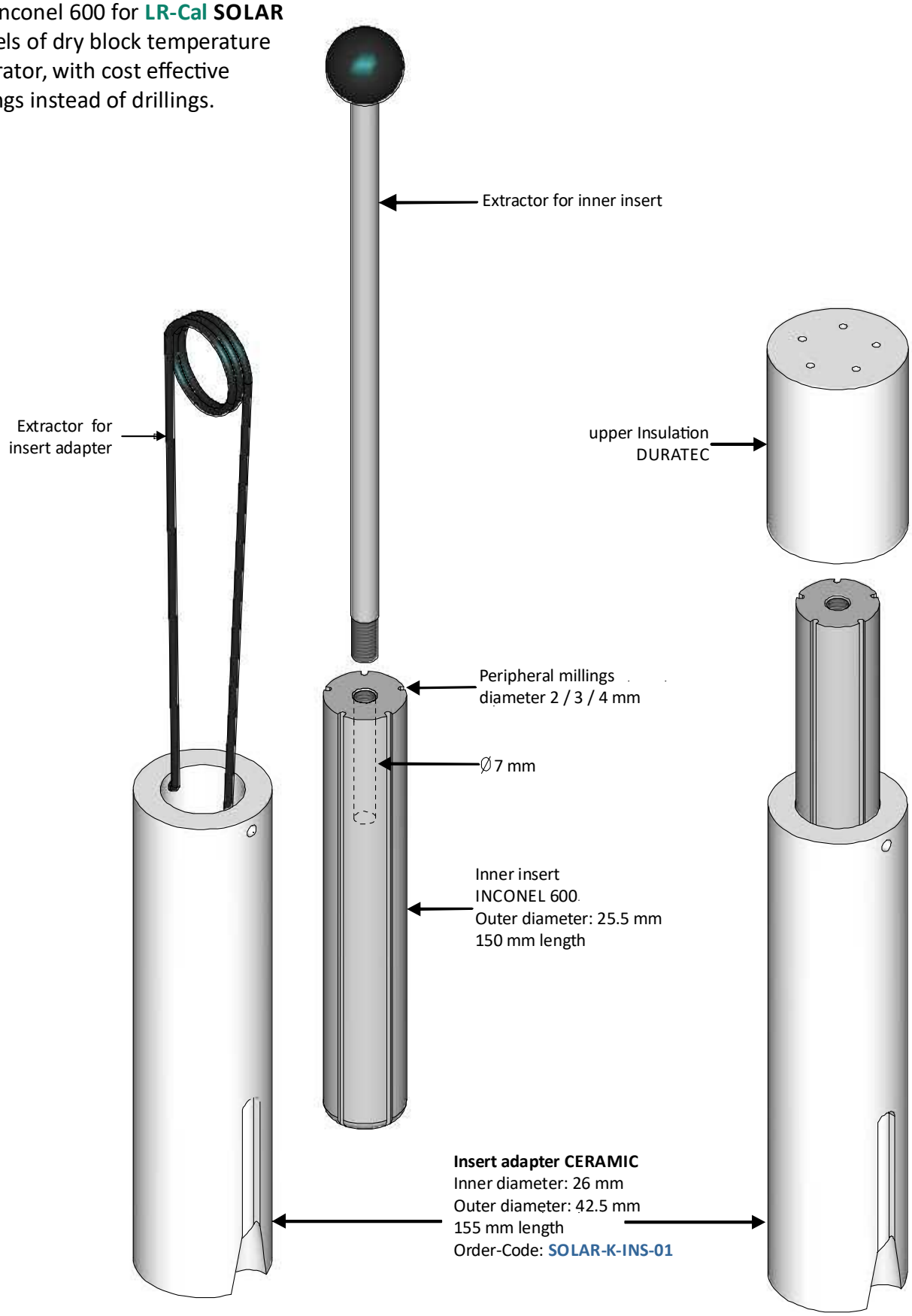
- Two measuring inputs for RTD and TC, programmable: Pt 100 IEC 3-/4 wire, range -100...+700°C, accuracy ±0.3°C; Thermo couple type J, 0...1000°C; types K/N/R/S , 0...1300°C, accuracy ±1°C
- Set of test cables and plugs (red/black)

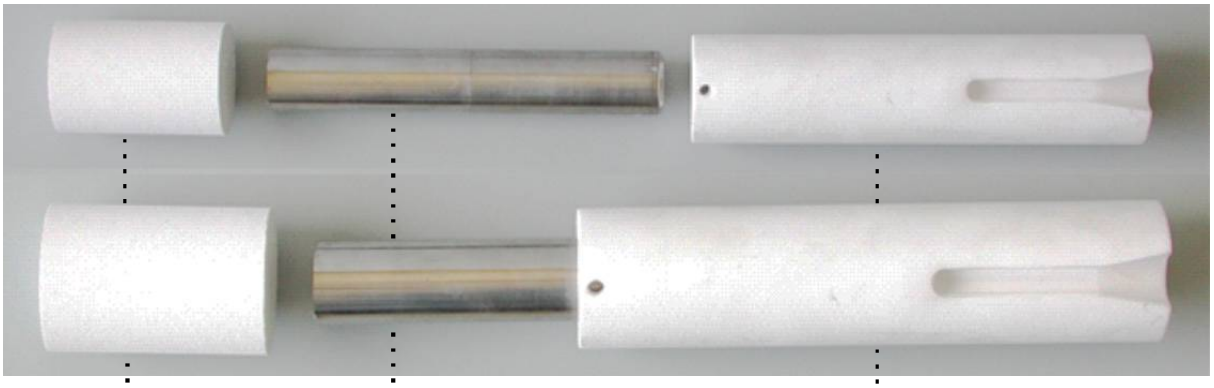
SOLAR
SOLAR-1200

Metal dry block temperature calibrator
+200...+1100°C or +200...+1200°C

LR-Cal LR

Multi-part insert made in ceramic and Inconel 600 for **LR-Cal SOLAR** models of dry block temperature calibrator, with cost effective millings instead of drillings.





Insulation
DURATEC

Insert
INCONEL 600

Insert adapter CERAMICS
Order-Code: **SOLAR-K-INS-0**

Basically, the inner inserts made in inconel can be supplied with **millings between 2 and 6 mm** diameter or **drillings between 7 and 18 mm** diameter (total number of possible drillings or millings are depending on their diameter).

Block inserts for models LR-*Cal* SOLAR and LR-*Cal* SOLAR-1200:

We offer you a wide range of options for testing and calibrating test items (thermometers, thermostats, sensors, resistanc thermometers, thermocouples of all kinds) as effectively as possible with the metal dry block temperature calibrator.

- Ceramic or Inconel 600 block
- Inserts, adapter inserts and insulating covers with holes and cout-outs with various dimensions and diameters to suit your requirements
- Black body insert for testing infrared thermometers

Please let us know your requirements with all details of your test specimens, we will be pleased to submit our delivery proposal to you.

Further optional Accessories:

- Robust aluminium case with foam insert
- LR-*Cal* **AQ2Sp** software for Windows-PC
  The calibrator can operate in automatic mode connected to a PC by means of this optional software, which enables to carry out probe calibrations and cyclical life testes. Test results can be stored and printed, so they are easily traceable in compliance with ISO 9000 standards.
- External reference probe thermocouple type S, incl. certificate of calibration
- RS232 - USB interface converter

Dry Block Temperature Calibrators **LR-*Cal* PYROS 140**

- **LR-*Cal* PYROS 140-1L**: -24°C...+140°C, 1 block 19 mm
- **LR-*Cal* PYROS 140-2L**: -24°C...+140°C, 2 blocks each 13 mm

at +20°C ambient temperature

For testing and calibrating of all kind of temperature instruments, e.g. dial thermometer, digital thermometer, temperature probes and sensors.

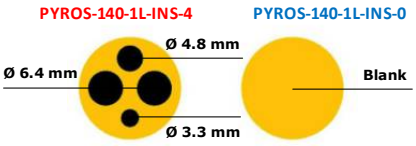
These innovative dry block temperature calibrator **LR-*Cal* PYROS 140** has been designed for on-site applications and for the severe conditions of the naval and marine sectors. Its ease of use, compact and practical design, make it unbeatable in industrial processes where the verification of the temperature mesurement systems are a key issue for the control of the process and the quality of the final product.

Special attention was paid to reduce the weight, to the small size and sound design obtained by using an aluminium body and aluminium and stainless steel for many internal parts.

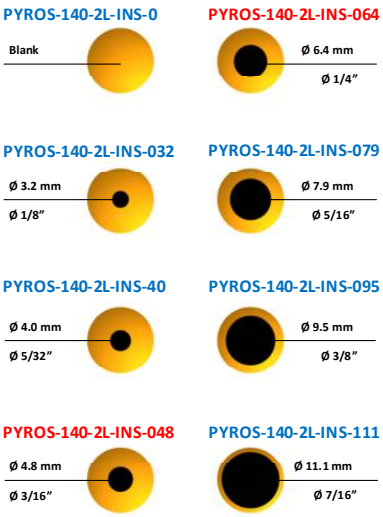
The appliance innovative ventilation system allows the calibrator to keep the temperature on the top of the oven lower compared to competitors' oven. The flow of air on the upper part of the oven is diverted to the rear of the appliance by a tangential flow that touches the calibration well. As a result, the heads of the test items remain at a considerably lower temperature reducing very much the compensation errors produced by the heads heating.

Available block Inserts:

LR-*Cal* PYROS Basic 140-1L inserts:
with 1 block (aluminium) 19 mm diameter.



LR-*Cal* PYROS Basic 140-2L inserts:
mit 2 blocks (copper) each 13 mm diameter
distance between the two holes: 20 mm



Blue = order-code
Red = included in scope of standard delivery

PYROS 140

Portable Dry Block Temperature Calibrators

TECHNICAL DATA	PYROS 140-2L	PYROS 140-1L
Temperature range	-24…+140°C	
Average heating time (incl. stabilization)	20 min. (+20…+120°C)	
Average cooling time (incl. stabilization)	17 min. (+20…-20°C)	
Axial temperature uniformity at **40 mm** depth	±0,05°C bei -20°C ±0,04°C bei 0°C ±0,10°C bei +100°C	
Axial temperature uniformity at **60 mm** depth	±0,15°C bei -20°C ±0,08°C bei 0°C ±0,2°C bei 100°C	
Radial temperature uniformity	±0,02°C bei -20°C ±0,02°C bei 0°C ±0,05°C bei 100°C	
Usable insertion depth in dry well (metal block)	104 mm	
Opening diameter	2 x 13 mm	1 x 19 mm
Indication accuracy	±0,25°C ±1 Digit	
Interface (with optional converter)	RS232 (USB)	
Stability	±0,1°C	
Display resolution	0,1°C	
Temperature units	°C / °F	
Overtemperature switch	nein	
Thermostat test	5 VDC	
Display	LED 9 mm 2-zeilig	
Dimensions	130 x 260 x 280 mm	
Ambient temperature	+5...+45°C	
Weight	4,9 kg	
Supply (±10%, 50/60 Hz)	100...240 VAC	
Power consumption	80W	

All values valid at ambient temperature +20°C

Values measured with following type of probe:

LR-*Cal* **PYROS 140-2L** + LR-*Cal* **PYROS 140-1L**: Pt 100 diameter 3 mm

Standard scope of delivery

PYROS Basic 140-2L	PYROS-BASIC-140-2L
PYROS Basic 140-1L	PYROS-BASIC-140-1L

- Dry block calibrator
- Tweezers for insert removing
- Kit of spare fuses
- Connection cables for thermostat testing
- Operating manual
- Test certificate

PYROS Basic 140 2L:

- 1 insert with 1 hole 4.8 mm
- 1 insert with 1 hole 6.4 mm

PYROS Basic 140 1L:

- 1 insert with 4 holes 3.3 + 4.8 + 6.4 + 6.4 mm

Optional accessories	
for PYROS Basic 140-2L	Order-Code
1 blank insert	PYROS-140-2L-INS-0
1 insert with 1 hole 3.2 mm	PYROS-140-2L-INS-032
1 insert with 1 hole 4.0 mm	PYROS-140-2L-INS-040
1 insert with 1 hole 4.8 mm	PYROS-140-2L-INS-048
1 insert with 1 hole 6.4 mm	PYROS-140-2L-INS-064
1 insert with 1 hole 7.9 mm	PYROS-140-2L-INS-079
1 insert with 1 hole 9.5 mm	PYROS-140-2L-INS-095
1 insert with 1 hole 11.1 mm	PYROS-140-2L-INS-111
1 insert with 1 customer specific hole	PYROS-140-2L-INS-KW
1 soft bag	PYROS-TASCHE
1 plastic marine case IP67	PYROS-KOFFER
for PYROS Basic 140-2L	Order-Code
1 blank insert	PYROS-140-1L-INS-0
1 insert with 4 holes 3.3 + 4.8 + 6.4 + 6.4 mm	PYROS-140-1L-INS-4
1 soft bag	PYROS-TASCHE
1 plastic marine case IP67	PYROS-KOFFER

LR-*Cal* — Portable Dry Block Temperature Calibrators with DNV-GL type approval

PYROS-375
PYROS-650

Rel. 20210616

Dry Block Temperature Calibrators **LR-*Cal* PYROS** series

- **LR-*Cal* PYROS-375**: +30°C...+375°C
- **LR-*Cal* PYROS-650**: +35°C...+650°C

at +20°C ambient temperature

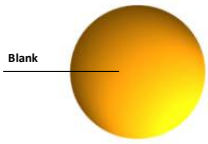
This calibrators are type approved by **DNV-GL** (No. TAA00002CX). For testing and calibrating of all kind of temperature instruments, e.g. dial thermometer, digital thermometer, temperature probes and sensors.

These innovative dry block temperature calibrators have been designed for on-site applications and for the severe conditions of the naval and marine sectors. Theirs ease of use, compact and practical design, make them unbeatable in industrial processes where the verification of the temperature measurement systems are a key issue for the control of the process and the quality of the final product.
Special attention was paid to reduce the weight, to the small size and sound design obtained by using an aluminium body and aluminium and stainless steel for many internal parts.
The appliance innovative ventilation system allows the calibrator to keep the temperature on the top of the oven lower compared to competitors' oven. The flow of air on the upper part of the oven is diverted to the rear of the appliance by a tangential flow that touches the calibration well. As a result, the heads of the test items remain at a considerybly lower temperature reducing very much the compensation errors produced by the heads heating.

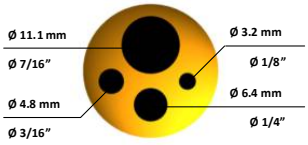
Available block inserts:

LR-*Cal* PYROS-375 inserts:

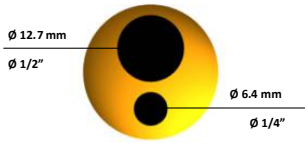
PYROS-375-INS-0



PYROS-375-INS-4

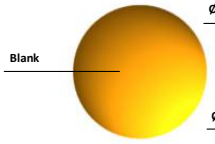


PYROS-375-INS-2

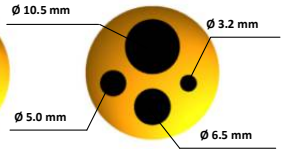


LR-*Cal* PYROS-650 inserts:

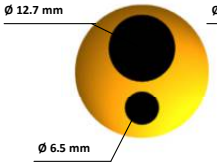
PYROS-650-INS-0



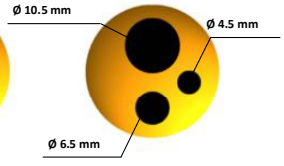
PYROS-650-INS-4S



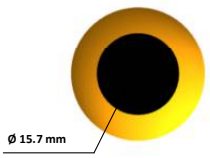
PYROS-650-INS-2



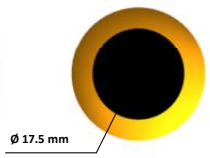
PYROS-650-INS-3S



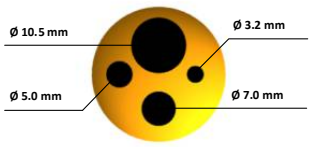
PYROS-650-INS-1



PYROS-650-INS-1S



PYROS-650-INS-4



Blue = order-code
Red = included in scope of standard delivery

PYROS-375 **Portable Dry Block Temperature**
PYROS-650 **Calibrators with DNV-GL type approval**

LR-Cal

TECHNICAL DATA	PYROS-375		PYROS-650
Temperature range	+30…+375°C		+35…+650°C
Mean heating time (incl. stabilization)	20 min. (+30…+375°C)		35 min. (+50…+650°C)
Mean cooling time (incl. stabilization)	40 min. (+375…+100°C)		60 min. (+650…+100°C)
Axial temperature uniformity	a) ±0.10°C at +50°C a) ±0.20°C at +150°C a) ±0.30°C at +375°C	b) ±0.02°C at +50°C b) ±0.05°C at +150°C b) ±0.15°C at +375°C	±0.13°C at +250°C ±0.15°C at +450°C ±0.35°C at +650°C
Radial temperature uniformity (at 40 mm depth)	a) ±0.10°C at +50°C a) ±0.15°C at +150°C a) ±0.20°C at +375°C	b) ±0.05°C at +50°C b) ±0.10°C at +150°C b) ±0.15°C at +375°C	±0.22°C
Usable insertion depth in the metal block	150 mm		
Hole diameter	26 mm		
Display accuracy	±0.25°C at +150°C ±0.35°C at +375°C		±0.50°C
Stability	a) ±0.15°C	b) ±0.10°C	±0.30°C
Display resolution	0.1°C		
Temperature units	°C / °F		
Over temperature cut out	yes		
Thermostat/Switch test	5 VDC		
Display	LED, 2 lines		
Interface	RS232		
Slope rate	yes		
Calibration	From 1 to 10 points calibration		
Dimension	130 x 260 x 280 mm		
Weight	5.4 kg		
Power supply (±10%, 50/60 Hz)	115/230 VAC		
Power consumption	600W		

All values are valid at ambient temperature +20°C

Diameter of the sensor, used for testing the performances:
LR-Cal PYROS-375 : Pt 100 a) diameter 6 mm / b) diameter 3 mm
LR-Cal PYROS-650 : Pt 100 diameter 4,5 mm

Standard scope of delivery

PYROS-375 PYROS-DNV-375

- Dry block calibrator
- Tweezers for insert removing
- Kit of spare fuses
- Connection cables for thermostat testing
- Operation manual
- Test certificate
- 1 insert with 4 holes 3.2 + 4.8 + 6.4 + 11.1 mm

PYROS-650 PYROS-DNV-650

- Dry block calibrator
- Tweezers for insert removing
- Kit of spare fuses
- Connection cables for thermostat testing
- Operation manual
- Test certificate
- 1 insert with 4 holes 3.2 + 5.0 + 7.0 + 10.5 mm

Optional accessories

for PYROS-375	Order Code
1 blank insert	PYROS-375-INS-0
1 insert with 4 holes 3.2 + 4.8 + 6.4 + 11.1 mm	PYROS-375-INS-4
1 insert with 2 holes 6.4 + 12.7 mm	PYROS-375-INS-2
1 soft bag	PYROS-TASCHE
1 plastic marine case IP67	PYROS-KOFFER

for PYROS-650	Order Code
1 blank insert	PYROS-650-INS-0
1 insert with 2 holes 6.5 + 12.7 mm	PYROS-650-INS-2
1 insert with 3 holes 4.5 + 6.5 + 10.5 mm	PYROS-650-INS-3S
1 insert with 4 holes 3.2 + 5.0 + 7.0 + 10.5 mm	PYROS-650-INS-4
1 insert with 4 holes 3.2 + 5.0 + 6.5 + 10.5 mm	PYROS-650-INS-4S
1 insert with 1 hole 15.7 mm	PYROS-650-INS-1
1 insert with 1 hole 17.5 mm	PYROS-650-INS-1S
1 soft bag	PYROS-TASCHE
1 plastic marine case IP67	PYROS-KOFFER

PYROS-TASCHE
Schultertragetasche
400 x 170 x 285 mm

PYROS-KOFFER
Wasserdichter „Marine"-Koffer IP 67
mit Druckausgleichsventil
410 x 535 x 220 mm

Rel. 20191008

Temperature Calibrator LR-*Cal* PYROS-BB for Infrared Thermometer, with „Black Body“

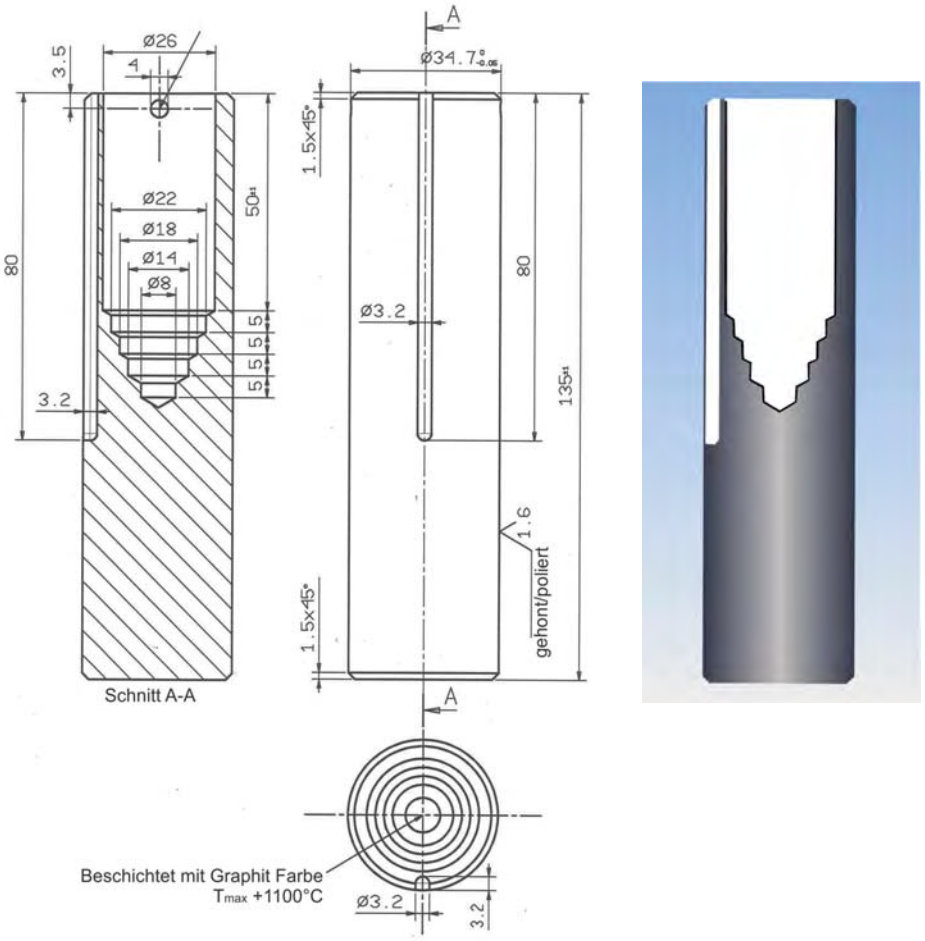
- Temperature range: +24°C...+600°C (at +20°C ambient temperature)
- Inclusive precision digital handheld thermometer as reference, with factory certificate of calibration
- For mobile and stationary usage

Typical Application:

- Check and calibration of (non-contacting) infrared thermometer

Scope of standard delivery:

1 Dry block temperature calibrator model **LR-*Cal* PYROS 650**
1 special insert with Black Body, painted with black graphity paint, outer diameter 25.5 mm, depth 150 mm, inner depth 70 mm, incl. hole 3.2 mm for reference probe
1 Handheld reference thermometer **LR-*Cal* LRT 750** with probe and factory certificate of calibration



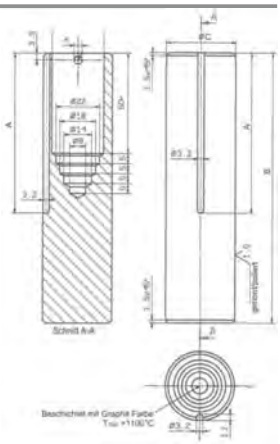
BB-INSERT „Black Body“ - inserts for LR-*Cal* temperature calibrators

LR-*Cal*

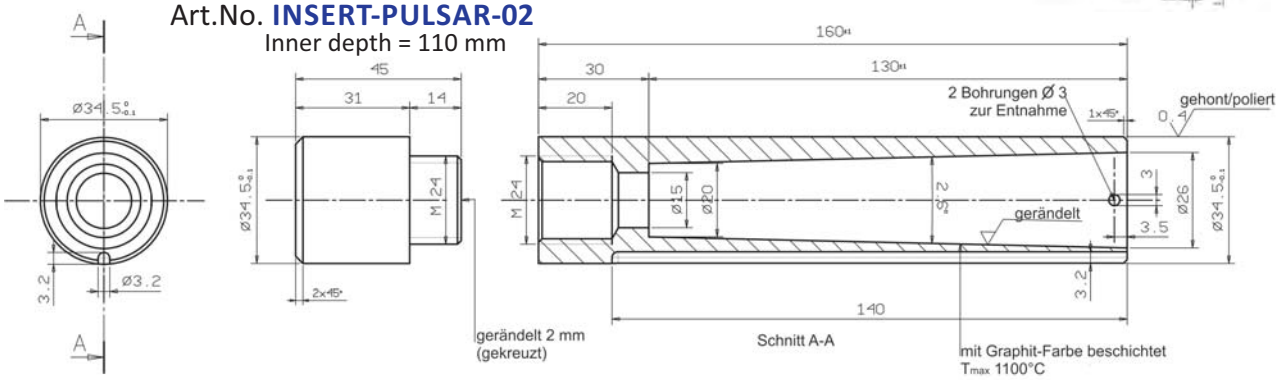
„Black Body“ inserts for LR-*Cal* dry block temperature calibrators
for expansion of possibility to check and calibrate infrared thermometers.

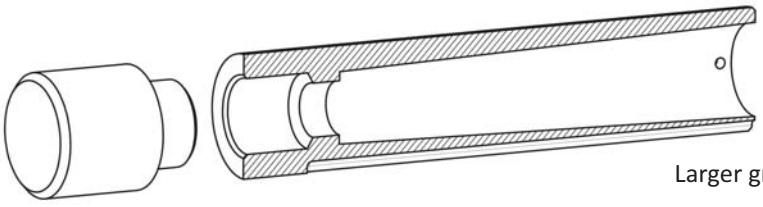
For Model **LR-*Cal* PYROS 375**:	Insert: Reference:	Art.No. **INSERT-PYROS** Art.No. **LRT-750-WKZ**	
For Model **LR-*Cal* PYROS 650**:	Insert: Reference:	Art.No. **INSERT-PYROS** Art.No. **LRT-750-WKZ**	
For Model **LR-*Cal* QUARTZ-35**:	Insert: Reference:	Art.No. **INSERT-QUARTZ** Art.No. **LRT-750-WKZ**	
For Model **LR-*Cal* QUARTZ-35-2I**: (Referenztemperaturanzeige direkt am Gerät)	Insert: Reference:	Art.No. **INSERT-QUARTZ** Art.No. **BB-SENSOR-01**	
For Model **LR-*Cal* PULSAR-35Cu**:	Insert: Reference:	Art.No. **INSERT-PULSAR-01**, or Art.No. **INSERT-PULSAR-02** Art.No. **LRT-750-WKZ**	
For Model **LR-*Cal* PULSAR-35Cu-2I**: (Referenztemperaturanzeige direkt am Gerät)	Insert: Reference:	Art.No. **INSERT-PULSAR-01**, or Art.No. **INSERT-PULSAR-02** Art.No. **BB-SENSOR-01**	

No. **INSERT-PYROS**: Inner depth 70 mm A = 80 mm B = 150 mm C = 25,5 mm
No. **INSERT-QUARTZ**: Inner depth 70 mm A = 80 mm B = 135 mm C = 34,7 mm
No. **INSERT-PULSAR-01**: Inner depth 70 mm A = 80 mm B = 190 mm C = 34,5 mm



Art.No. **INSERT-PULSAR-02**
Inner depth = 110 mm





Advantage compared with Art.No. INSERT-PULSAR-01:
Larger grade of emissivity, lager depth, better accuracy.

LR-*Cal* Portable Temperature Calibration Micro Baths -18...+150°C or -30...+150°C

FLUID 100-N
FLUID 100-45

Rel. 20220203

Controlled temperature calibration micro baths

LR-*Cal* FLUID 100-N: -18...+150°C
LR-*Cal* FLUID 100-45: -30...+150°C
(stated temperature range valid at ambient temperature+20°C)

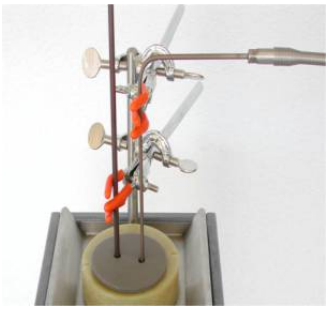
The portable temperature calibration micro baths **LR-*Cal* FLUID 100-N** and **LR-*Cal* FLUID 100-45** serve as temperature source and reference instrument in one. For testing, adjusting and calibrating all types of temperature measuring instruments. They are also particularly suitable for laboratory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

Technical data:

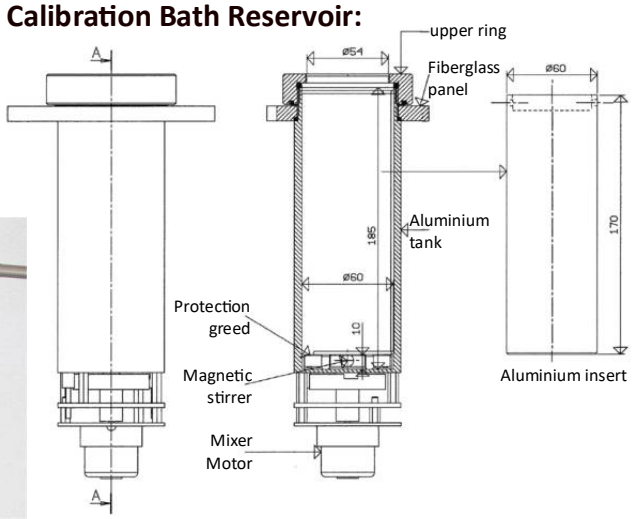
Model:	LR-*Cal* FLUID 100-N	LR-*Cal* FLUID 100-45
Temperature range at +20°C ambient temperature:	-18...+150°C	-30...+150°C
Accuracy of the temperature indication:	±0.15°C	±0.015°C
Display resolution (switchable):	0.01° / 0.1°	0.01° / 0.1°
Temperature units (selectable):	°C / °F / K	°C / °F / K
Stability of regulated temperature:	±0.02°C *(1)*	±0.02°C *(1)*
Average heating time:	12°C per minute	3.5°C per minute
Average cooling time:	5°C per minute	1°C per minute
Radial temperature uniformity:	±0.04°C *(2)*	±0.04°C *(2)*
Axial temperature uniformity (in the holes):	±0.05°C	±0.05°C
Reservoir depth:	185 mm (usable: 150 mm)	185 mm (usable: 150 mm)
Reservoir diameter:	54 mm	45 mm
Display:	LED, 2 lines	LED, 2 lines
Interface:	RS232 (Option: USB-converter)	RS232 (Option: USB-converter)
Inputs for 2 external probes: *(3)*	Option (version **-2I**)	Option (version **-2I**)
Ramp function (slope):	•	•
Thermostat test function and connection:	•	•
Power supply (50/60 Hz):	230 VAC *(4)*	230 VAC
Power consumption:	300 VA	300 VA
Weight:	8 kgs	10.2 kgs
Housing dimensions:	340 x 160 x 330 mm	350 x 160 x 365 mm

(1) at -5°C
(2) at 0°C and 50 mm insertion depth
(3) e.g. 1 x for external reference probe + 1 x for probe under test (Pt 100 oder TC)
(4) 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 nex page.)



Calibration Bath Reservoir:

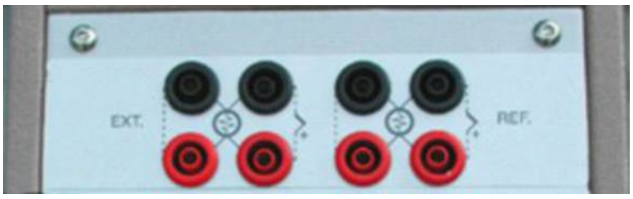


FLUID 100-N
FLUID 100-45

Portable Temperature Calibration
Micro Baths -18...+150°C or -30...+150°C

LR-*Cal*

Additional at versions LR-*Cal* FLUID 100-N-2I and LR-*Cal* FLUID 100-45-2I:



Two measuring inputs for Pt 100 / Thermocouples, programmable:

- Pt 100 IEC 3-/4-wire, range -100...+700°C, accuracy ±0.3°C
- Thermocouple type J, range 0...1000°C, accuracy ±1°C or types K/N/R/S, range 0...1300°C, accuracy ±1°C

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
- Cosing lids for transport purposes
- Carrying bag with shoulder strap
- Operating manual (German/English)
- Test certificatel (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)

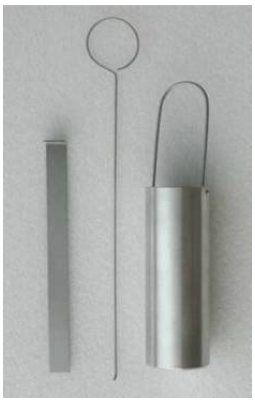
Optional Accessories:

- 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.**

- **Conversion** of the LR-*Cal* **FLUID 100-N** calibration bath into a **dry block** temperature calibrator: Temperature range: -10...+125°C Block made of aluminium, diameter 60 mm, useful depth 170 mm. Heating time from -10 to +110°C: 45 min. Cooling time from 20°C to -10°C: 47 min. Stability of controlled temperature: ±0.04°C. Vertical temperature uniformity: ±0.03°C at 0°C; ±0.06°C at 80°C
  - Block without holes (for self-drilling): Order-Code **FLUID-INS-0**
  - Block with 9 holes (4.0 - 4.0 - 4.5 - 5.5 - 6.5 - 6.5 - 8.5 - 10.5 - 12.5 mm): Order-Code **FLUID-INS-9**



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

- RS232-USB interface converter

LR-*Cal*

Advanced Micro Baths for Temperature Calibration -35...+165°C, -40...+165°C and +30...+225°C

LTC 100-F
LTC 100-F-PLUS
LTC 200-F

Rel. 200324

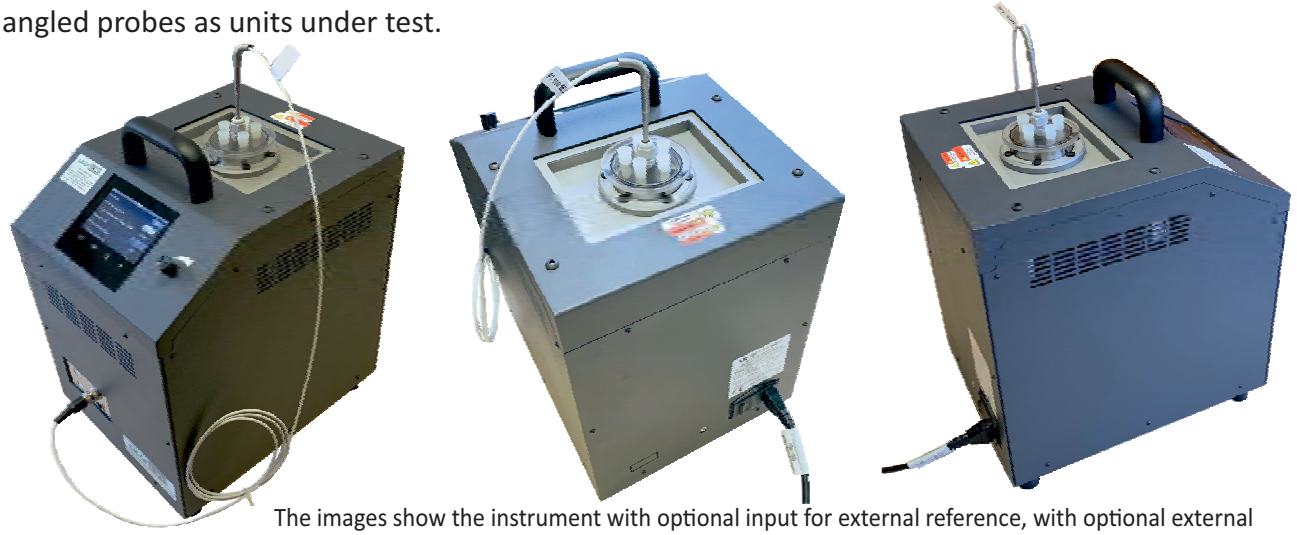
Advanced temperature calibration micro baths

LR-*Cal* LTC 100-F: **-35...+165°C / -31...+329°F**
LR-*Cal* LTC 100-F-PLUS: **-40...+165°C / -40...+329°F**
LR-*Cal* LTC 200-F: **+30...+225°C / +86...+437°F**

- PID temperature controller with 4.3 inch touch screen
- Large reservoir volume 0.7 liter, depth 190 mm / 7.48 inch, diameter 60 mm / 2.36 inch
- Accuracy ±0.1°C / ±0.2°F
- Temperature uniformity ±0.05°C / ±0.09°F
- Temperature stability ±0.01°C / ±0.02°F
- Very easy operation via touch screen
- Programs (ramps), Alarm, Events
- Data logging, trend graphs
- Adjustable speed magnetic stirrer
- Optional with 2nd. PID for external reference sensor, switchable via touch screen
- 10-point calibration for internal and optional external reference sensor possible, menu-driven
- Optional conversion to dry block calibrator

The image shows the instrument with optional input for external reference and with external probe.

The advanced temperature micro baths **LR-*Cal* LTC 100-F**, **LR-*Cal* LTC 100-F-PLUS** and **LR-*Cal* LTC 200-F** are portable stirred liquid baths. The instruments are suitable for checking, adjusting and calibrating temperature sensors and thermometers of all sizes, diameters and shapes, without the need of specifically drilled metal blocks. Ideal for glass thermometers and 90° angled probes as units under test.



The images show the instrument with optional input for external reference, with optional external reference probe and with optional tank lid with 6 holes for fixing units under test.

All 3 models are equipped with a large reservoir of 0.7 l volume, 190 mm depth and 60 mm diameter.

All 3 models are equipped with 2 USB sockets and 1 ethernet socket as well as a socket for an optional external reference probe.

LTC 100-F
LTC 100-F-PLUS
LTC 200-F

Advanced Micro Baths for Temperature Calibration -35...+165°C, -40...+165°C and +30...+225°C

LR-Cal

Technical data

Model:	LR-Cal LTC 100-F	LR-Cal LTC 100-F-PLUS	LR-Cal LTC 200-F
Operating temperature range:	-35°C...+165°C / -31°F...+229°F *)	-40°C...+165°C / -40°F...+229°F **)	+30°C...+225°C / +86°F...+437°F
Temperature regulation:	internal Pt 100 sensor, PID temperature controller OPTION: additional for external reference probe, switchable		
Temperature stability:	±0.01°C / ±0.02°F		
Temperature uniformity:	±0.05°C / ±0.09°F		
Temperature circulation:	adjustable magnetic stirrer, made in Teflon		
Display:	4,3" colour Touch-Screen		
Display resolution:	0.1°C / 0.01°C / 0.001°C		
Accuracy:	±0.1°C / ±0.2°F		
Functions:	Programs (ramps), Trends, Data logging, 10-point calibration, alarm, events		
Reservoir aperture:	60 mm / 2.36 inch diameter		
Insertion depth:	190 mm / 7.48 inch		
Max. filling level:	150 mm		
Reservoir volume	0.7 liter		
Temperature generation:	peltier elements	advanced peltier elements	heating elements
Heating time (typical): ***)	-5...+100°C / +23...+215°F: 25 min	-5...+100°C / +23...+215°F: 25 min	+25...+220°C / +77...+428°F: 42 min
Cooling time (typical): ***)	+25...-30°C / +77...-13°F: 48 min	+25...-40°C / +77...-40°F: 1 h 40 min	+220...+100°C / +428...+212°F: 35 min
Interfaces:	2 x USB + 1 x Ethernet		
Supply:	115...230 VAC 50/60 Hz		
Power consumption:	max. 310 W		max. 320 W
Dimension:	280 x 370 x 490 mm		
Weight:	15.2 kg		
Storage conditions:	Temperature -10...+60°C rel. humidity 30...95% r.h. (non-condensing)		
Order-Code instrument:	**LTC100-F**	**LTC100-F-PLUS**	**LTC200-F**
Order-Code for optional input for external reference:	LTC-EXTSENS		

*) the minimum temperature is 55°C / 131°F below ambient temperature, absolute minimum temperature -35°C / -31°F.

**) the minimum temperature is 60°C / 140°F below ambient temperature, absolute minimum temperature -40°C / -40°F.

***) measured with 1 probe with 6 mm diameter at ambient temperature 22°C ±1°C.

This micro bath can be optional converted to a dry block temperature calibrator. See „Accessories“.

Easy operation via colour touch screen

Scope of standard delivery

Advanced micro bath for temperature calibration

Reservoir lid (for transport and storage purposes)

Mains power cable (EU)

Syringe for charging/discharging the reservoir with operating fluid

Operating manual

Factory certificate of calibration EN 10204 3.1

Operating fluids (silicone oil), to be ordered seperately

Bottle with 1 l silicone oil

Specific heat: 1.5 KJ/kg K.
Thermal conductivity: 0.140 W/m K.

Order-Code	Operating temp. Range	Flash-point	for LR-*Cal* LTC 100-F	for LR-*Cal* LTC 100-F-PLUS	for LR-*Cal* LTC 200-F
LTC-F-AC05	-40...+160°C	170°C	**Recommended**	**Recommended**	not recommended
LTC-F-AC10	-30...+160°C	170°C	**Recommended**	**Recommended**	not recommended
LTC-F-AC20	-20...+200°C	240°C	**Recommended**	**Recommended**	**Recommended**
LTC-F-AC50	+30...+220°C	280°C	not recommended	not recommended	**Recommended**
LTC-F-AC100	+70...+288°C	315°C	not recommended	not recommended	**Recommended**

Options and Accessories

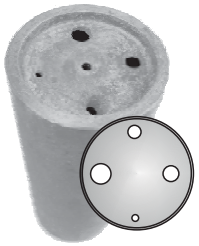
Order-Code: **LTC-F-EXTSENS**
If you like to use the instrument with an external reference sensor (which is placed directly in the reservoir, very close to the units under test:
Option with 2nd. PID for external reference sensor incl. FA-DIN 6 plug for 3-/4-wire Pt 100 probe (incl. wiring diagram).
If a probe is required from us, please order code LTC-F-PT100 in addition.

Order-Code: **LTC-F-PT100**
External reference temperature probe Pt 100
complete with FA-DIN 6 plug for direct connection to the socket at the front of the calibrator. Temperature range -40...+500°C, probe diameter 4 mm, length 300 mm. For using this thermometer with the calibrator, LTC-F-EXTSENS must be ordered in addition. If this probe is ordered (also with LTC-F-EXTSENS) together with the instrument, the supplied factory certificate also indicates the values of this external probe.

Order-Code: **LTC-F-DECKEL-05**
Tank lid made in transparent methacrylate.
With 5 drillings for units under test plus 1 sender drilling for the optional external reference probe, can be used also with 6 items under test.
This accessory supports easy fixing of units under test and avoids temperature drops, caused by open reservoir.

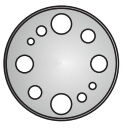
Order-Code: **DKD-T-KAL-TK-6T**
DAkkS certificate of calibration (instead of factory certificate of calibration).

Order-Code: **LTC-F-KOFFER**
Robust aluminium trolley with handle and reinforced wheels and with high density foam.

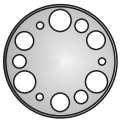


Option: Conversion to dry block temperature calibrator

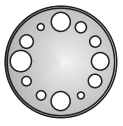
Order-Code: **LTC-F-MB-04**
Dry block option to use the micro bath as dry block temperature calibrator
Material: aluminium. Dimension: 59.5 x 165 mm
Incl. 1 insert with 4 drillings: 1x3.5 + 1x6.5 + 1x8.5 + 1x10.5 mm diameter



Order-Code: **LTC-F-INSERT-10**
Insert with 10 drillings: 2x3.5 + 2x4.5 + 2x6.5 + 2x8.5 + 2x10.5 mm diameter



Order-Code: **LTC-F-INSERT-12**
Insert with 12 drillings: 3x2.5 + 3x6.5 + 3x8.5 + 3x10.5 mm diameter



Order-Code: L**TC-F-INSERT-10S**
Insert with 12 drillings: 2x3.5 + 2x4.5 + 2x5.5 + 2x6.5 + 1x8.5 + 2x9.5 + 1x10.5 mm

Order-Code: **LTC-F-INSERT-B**
Insert without drillings (holes to be drilled by customer)

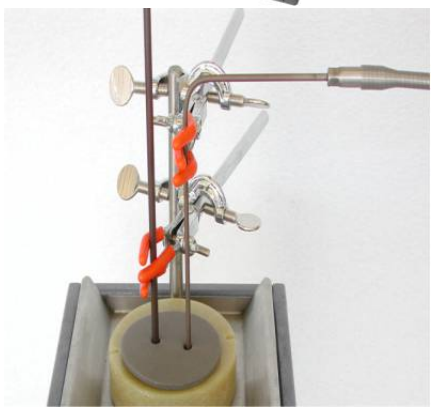
Controlled temperature calibration micro baths

LR-*Cal* FLUID 200 Ambient temperature...+200°C
LR-*Cal* FLUID 200-H: Ambient temperature...+250°C

The portable temperature calibration micro baths **LR-*Cal* FLUID 200** and **LR-*Cal* FLUID 200-H** 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.

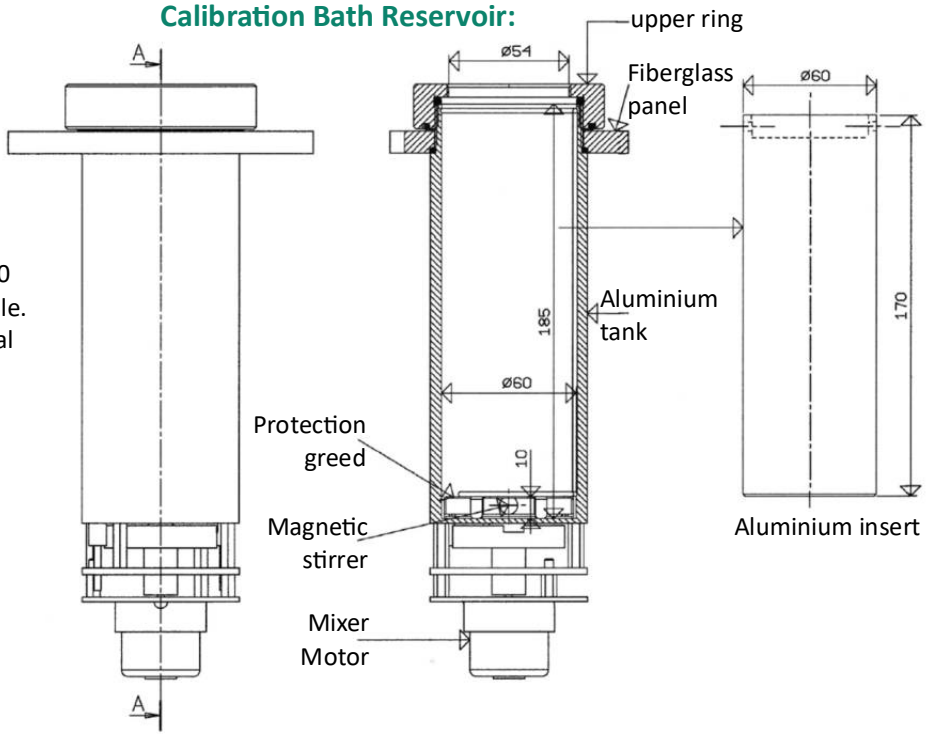
Technical Data:

Temperature range:
Models **LR-*Cal* FLUID 200** and **LR-*Cal* FLUID 200-2I**: Ambient temp...+200°C
Models **LR-*Cal* FLUID 200-H** and **LR-*Cal* FLUID 200-H-2I**: Ambient temp...+250°C
Temperature indication: Accuracy ±0.15°C; Resolution 0.001°/0.1° (°C or °F)
Stability of controlled temperature:
Models **LR-*Cal* FLUID 200** and **LR-*Cal* FLUID 200-2I**: ±0.02°C at 50°C
Models **LR-*Cal* FLUID 200-H** and **LR-*Cal* FLUID 200-H-2I**: ±0.03°C at 150°C
Heating time: max. 10°C per minute / **Cooling:** max. 4...5°C per Minute
Radial temperature uniformity bei 0°C and 50 mm depth: ± 0.05°C
Axial temperature uniformity: (measured at 60 mm from the bottom)
Models **LR-*Cal* FLUID 200** and **LR-*Cal* FLUID 200-2I**: ±0.02°C at 100°C
Models **LR-*Cal* FLUID 200-H** and **LR-*Cal* FLUID 200-H-2I**: ±0.05°C at 100°C
Calibration medium (liquid): <80°C: water-glycole-mixture;
<125°C: silicone oil 200C5; <220°C: silicone oil 47V100
Calibration bath reservoir: Volume approx. 500 cm³, material Aluminium
Usable reservoir depth: 170 mm
Container opening diameter: 54 mm
Power supply: 230 VAC (optional 115 VAC)
Power consumption: 300 VA
Interface: RS232
Housing material: Metal
Weight: approx. 8 kg
Dimensions:
approx. 160 x 340 x 330 mm



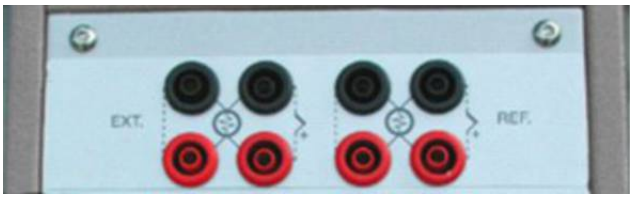
Versions LR-*Cal* FLUID 100-2I and LR-*Cal* FLUID 100-N-2I:
with 2 measuring inputs for Pt 100 and thermocouples, programmable. For unit under test and/or external reference. (Details see nex page.)

Calibration Bath Reservoir:



FLUID 200 **Portable Temperature Calibration Micro Baths**
FLUID 200-H **LR-*Cal* FLUID 200/-H, ambient...+200/250°C**

Additional at versions LR-*Cal* FLUID 200-2I and LR-*Cal* FLUID 200-H-2I:



Two measuring inputs for Pt 100 / Thermocouples, programmable:

- Pt 100 IEC 3-/4-wire, range -100...+700°C, accuracy ±0.3°C
- Thermocouple type J, range 0...1000°C, accuracy ±1°C or types K/N/R/S, range 0...1300°C, accuracy ±1°C

Included in scope of standard delivery:

- Temperature micro bath **LR-*Cal* FLUID 200** or **LR-*Cal* FLUID 200-H**
- Spare fuses
- Support for fixing units under test
- Connection cable for thermostat tests
- 1 Bottle***)*** 500 cm³ with silicone oil 47V20 or 47V50, see below
- Cosing lids for transport purposes
- Carrying bag with shoulder strap
- Operating manual (German/English)
- Test certificatel (factory certificate of calibration)

***)* LR-*Cal* FLUID 200**: 47V20, **LR-*Cal* FLUID 200-H**: 47V50

Additional at versions LR-*Cal* FLUID 200-2I and LR-*Cal* FLUID 200-H-2I (with 2 measuring inputs):

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

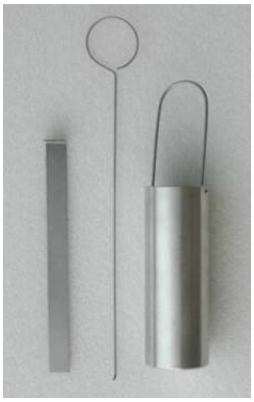
Optional Accessories:

- 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 increasing the immersion depth, total length 250 mm, usable immersion depth 230 mm. When used with silicone oil 47V20: working range 90...+200°C, radial temperature uniformity ±0.2°C (measured 50 mm from bottom), axial temperature uniformity ±0.1°C (measured in the range 0...150 mm from bottom) Order-Code **FLUID200-ER.**

- **Cooling coil** in stainless steel for shortening the cooling time (needs cold water connection). Also the minimum calibration temperature can be decreased. Order-Code **FLUID200-KS**



- **Conversion** of the **LR-*Cal* FLUID** calibration bath into a **dry block** temperature calibrator: Temperature range: -10...+125°C Block made of aluminium, diameter 60 mm, useful depth 170 mm. Heating time from -10 to +110°C: 45 min. Cooling time from 20°C to -10°C: 47 min. Stability of controlled temperature: ±0.04°C. Vertical temperature uniformity: ±0.03°C at 0°C; ±0.06°C at 80°C
  - Block without holes (for self-drilling): Order-Code **FLUID-INS-0**
  - Block with 9 holes (4.0 - 4.0 - 4.5 - 5.5 - 6.5 - 6.5 - 8.5 - 10.5 - 12.5 mm): Order-Code **FLUID-INS-9**

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

LR-Cal

BK 40 M

CRYOSTATIC BATH

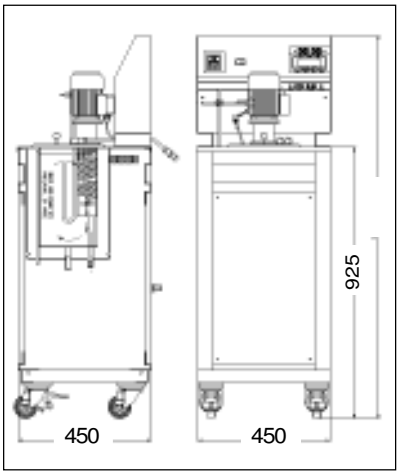
Operating range: *-40/+125 °C*

Applications: *Control calibration of temperature sensors in laboratory, in conformity with ISO 9000 standards; Control of thermostats; Automatic computer-controlled calibrations*

LR-Cal

BK 40 M

Fluid level adapter



The BK40M bath is an instrument used to calibrate transducers, RTD and temperature-measuring sensors in the field and in the laboratory. The possibility to generate positive and negative temperature ramps makes it suitable for use in calibrating and testing thermostats.

TECHNICAL CHARACTERISTICS

The BK40 M bath consists of a stainless tank with capacity of 10 litres, useful height 340 mm and diameter 85 mm. The bath is equipped with a stainless steel mixer with electrical motor power, a safety thermostat, drain cock and overflow drain pipe.

BK40M is equipped with a new PID microprocessor controller with a resolution up to 0.01 °C, setting of the standard of measurement in °C/°F, programming of ascent/descent ramps and storage of the thermostats' operative temperature.

The instrument is also equipped with an acquisition card having two adjustable inputs (Pt100 3/4 wires; thermocouples: J, K, N, R, S) with bushes fitted with gold-plated contacts and automatic compensation of the cold junction.

The first input is provided for the reference sample probe, thus obtaining a complete calibration system which can be certified by SIT centres, in compliance with ISO 9000 regulations.

The second input is provided for probes that are being tested; hence, the instrument can display the temperatures of the furnaces, the temperature of the sensor to be checked and of the reference sample probe, at the same time.

Furthermore, BK40M is equipped with the RS232 serial interface; it can operate in automatic mode connected to the PC by means of the AQ2SP software which enables to carry out probe calibrations and cyclical life tests; test results can be stored and printed, so they are easily traceable in compliance with ISO 9000 standards.

The BK40 M with the software AQ2sp for Windows can carry out:

- *complete control of the bath from the PC,*
- *manual or automatic calibration of one or more probes,*
- *cyclic life or stress tests on temperature sensors,*
- *automatic threshold thermostat test,*
- *filing and printing of the results obtained, guaranteeing ISO 9000 standards*

FLUID LEVEL ADAPTER (by request)

The fluid level adapter slides directly into the test wells of the BK40 M bath is designed for customers that needing to calibrate glass thermometers.

The fluid level adapter creates a positive bath fluid surface. The bath fluid is pumped up through the test well to the surface of the bath and kept there. In relation to the liquid viscosity the operator can regulate the level rotating the adapter tube.

The clear adapter cover protects the bath fluid from ambient temperature effects for better bath stability. The cover can be drilled for any size probe.

STANDARD EQUIPMENT

- **BK40 M** : base version
- **BK40 M/TR** : version with fluid level adapter

ACCESSORIES BY REQUEST

- 9 Kg tan of glycol
- 9 Kg tan of Silicon Oil 47 V20

Operative range	Recommended fluid	Stability	Uniformity	Descent time
-40 ÷ 80 °C	Ethylenic Glycol	±0.05 °C (a-20 °C)	±0.05 °C	0.4 °C/1'
-40 ÷ 125 °C	Silicone oil 47V20	±0.05 °C (a-20 °C)	±0.1 °C	1 °C/1'

NOTE: for version with **fluid level adapter** it is absolutely necessary to use the operation fluid **GLYCOL** for range **-1...+40°C** and operation fluid **200C5** for range **0...+125°C.**

CE

TECHNICAL DATA (with mix of glycol / water)	
Operative range	-40/+125 °C
Stability	±0.05 °C
Display resolution	0.01/0.1 °C
Reading accuracy	±0.2 °C a 120 °C
Ascent rate	2 °C min (-40/+50 °C)
Descent rate	0.5 °C min (30/-20 °C)
Power supply	230 V - 50Hz.
Power	2500 W
Weight	60 Kg
Size mm	450 x 450 x 1300
Shipping weight	74 Kg

CERTIFICATION

All the instrument are supplied with final testing, stability and accuracy certification traceable to standards

LR-Cal

TB 300 M

THERMOSTATIC BATH

Operating range: *Amb./+300 °C*

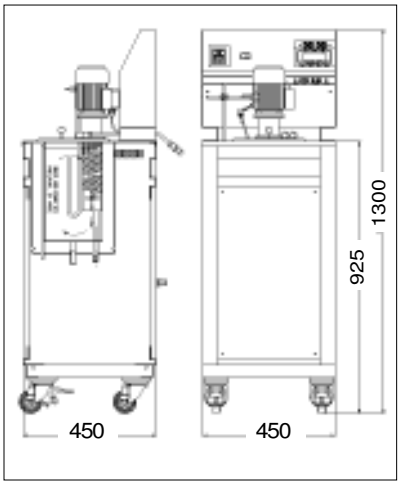
Applications: *Control calibration of temperature sensors in laboratory, in conformity with ISO 9000 standards; Control of thermostats; Automatic computer-controlled calibrations*

LR-Cal

TB 300 M

THERMOST

Fluid level adapter



The TB300M bath is an instrument used to calibrate transducers, RTD and temperature-measuring sensors in the field and in the laboratory. The possibility to generate positive and negative temperature ramps makes it suitable for use in calibrating and testing thermostats.

TECHNICAL CHARACTERISTICS

The TB300 M bath consists of a stainless tank with capacity of 10 litres, useful height 340 mm and diameter 85 mm. The bath is equipped with a stainless steel mixer with electrical motor power, a safety thermostat, drain cock and overflow drain pipe.
TB300M is equipped with a new PID microprocessor controller with a resolution up to 0.01 °C, setting of the standard of measurement in °C/°F, programming of ascent/descent ramps and storage of the thermostats' operative temperature.
The instrument is also equipped with an acquisition card having two adjustable inputs (Pt100 3/4 wires; thermocouples: J, K, N, R, S) with bushes fitted with gold-plated contacts and automatic compensation of the cold junction.
The first input is provided for the reference sample probe, thus obtaining a complete calibration system which can be certified by SIT centres, in compliance with ISO 9000 regulations.
The second input is provided for probes that are being tested; hence, the instrument can display the temperatures of the furnaces, the temperature of the sensor to be checked and of the reference sample probe, at the same time.
Furthermore, TB300M is equipped with the RS232 serial interface; it can operate in automatic mode connected to the PC by means of the AQ2SP software which enables to carry out probe calibrations and cyclical life tests; test results can be stored and printed, so they are easily traceable in compliance with ISO 9000 standards.
The TB300 M with the software AQ2sp for Windows can carry out:

- *complete control of the bath from the PC,*
- *manual or automatic calibration of one or more probes,*
- *cyclic life or stress tests on temperature sensors,*
- *automatic threshold thermostat test,*
- *filing and printing of the results obtained, guaranteeing ISO 9000 standards*

FLUID LEVEL ADAPTER (by request)

The fluid level adapter slides directly into the test wells of the TB300 M bath is designed for customers that needing to calibrate glass thermometers.
The fluid level adapter creates a positive bath fluid surface. The bath fluid is pumped up through the test well to the surface of the bath and kept there. In relation to the liquid viscosity the operator can regulate the level rotating the adapter tube.
The clear adapter cover protects the bath fluid from ambient temperature effects for better bath stability. The cover can be drilled for any size probe.

STANDARD EQUIPMENT

- **TB300 M** : base version
- **TB300 M/TR** : version with fluid level adapter

Operative range	Recommended fluid	Stability	Uniformity	Descent time
Amb. ÷ 80°C	Water	±0.03°C (@ 80°C)	±0.04°C	2°C/1'
Amb. ÷ 125°C	Silicon Oil 47V20	±0.04°C (@ 100°C)	±0.05°C	5°C/1'
50 ÷ 180°C	Silicon Oil 47V100	±0.05°C (@ 200°C)	±0.05°C	6°C/1'
80 ÷ 280°C	Silicon Oil 47V710	±0.05°C (@ 200°C)	±0.05°C	6°C/1'

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ACCESSORIES BY REQUEST

- 9 Kg tan of Silicon Oil 47V20
- 9 Kg tan of Silicon Oil 47V100
- 9 Kg tan of Silicon Oil 47V710

TECHNICAL DATA	
Operating range	Amb./+300°C
Stability	±0.05°C
Resolution	0.01/0.1°C
Reading precision	±0.2°C @ 150°C
Power supply	230 V - 50Hz.
Power	1600 W
Weight	26 Kg
Dimensions	325 x 360 x 860
Overall size	400 x 500 x 950
Shipping weight	35 Kg