

# Calibration bath

## Stationary version with high stability

### Models CTB9600-COOL, CTB9600-150, CTB9600-300

WIKA data sheet CT 46.25

#### Applications

- Calibration in laboratories and also measurement and control laboratories
- Calibration of long temperature probes
- Simultaneous calibration of several probes
- Demanding calibrations in production and laboratory

#### Special features

- Easy operation via intuitive, user-friendly menus
- Large, easy-to-read touchscreen
- USB interfaces
- High-accuracy, reliable temperature control



#### Calibration bath, CTB9600 series

#### Description

The high-precision calibration baths of the CTB9600 series have been specifically developed for the temperature calibration of thermometers, temperature switches/thermostats, resistance thermometers and thermocouples between  $-85 \dots +300 \text{ }^{\circ}\text{C}$  [ $-121 \dots +572 \text{ }^{\circ}\text{F}$ ]. A uniform vertical flow of liquid in the bath ensures compliance with the specifications.

The powerful microprocessor controller controls the instrument. It is also equipped with a communication module so that the bath can be controlled remotely. For safety, the calibration bath is fitted with an independently operating thermal fuse that, in the event of an overtemperature inside the case, switches off the current supply to the heater.

All internal and wetted parts are made entirely of AISI 304 stainless steel, which ensures a long service life and easy maintenance.

The entire outer case is made of sheet metal and has a high-quality powder coating.

#### Easy to use

The calibration baths feature a temperature-controlled liquid tank with a usable depth of 500 mm [19.69 in]. The maximum immersion depth of the test items of 450 mm [17.72 in] reduces heat dissipation errors, which leads to smaller measurement uncertainties.

#### Temperature ranges from $-85 \dots +300 \text{ }^{\circ}\text{C}$ [ $-121 \dots +572 \text{ }^{\circ}\text{F}$ ]

The calibration baths are available in three different versions:

- Model CTB9600-COOL for  $-85 \dots +130 \text{ }^{\circ}\text{C}$  [ $-121 \dots +266 \text{ }^{\circ}\text{F}$ ]
- Model CTB9600-150 for  $-40 \dots +150 \text{ }^{\circ}\text{C}$  [ $-40 \dots +302 \text{ }^{\circ}\text{F}$ ]
- Model CTB9600-300 for  $40 \dots 300 \text{ }^{\circ}\text{C}$  [ $104 \dots 572 \text{ }^{\circ}\text{F}$ ]

The instruments are typically used in calibration laboratories and in measurement and control workshops for calibrating thermometers.

## Specifications

| Basic information                        |                                                                                                           |  |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------|--|
| Temperature range                        |                                                                                                           |  |
| Model CTB9600-COOL                       | -85 ... +130 °C [-121 ... +266 °F]                                                                        |  |
| Model CTB9600-150                        | -40 ... +150 °C [-40 ... +302 °F]                                                                         |  |
| Model CTB9600-300                        | 40 ... 300 °C [104 ... 572 °F]                                                                            |  |
| Tank dimensions                          |                                                                                                           |  |
| Bath volume                              | Approx. 22 litres                                                                                         |  |
| Maximum filling volume                   | Approx. 21 litres                                                                                         |  |
| Bath opening, L x W                      | 135 x 135 mm [5.31 x 5.31 in]                                                                             |  |
| Bath depth                               | 500 mm [19.69 in]                                                                                         |  |
| Immersion depth of the temperature probe | Min. 20 times the diameter + sensitive length of the sensor for optimum results<br>Max. 450 mm [17.72 in] |  |
| Temperature controller                   | PID                                                                                                       |  |
| Weight (empty)                           |                                                                                                           |  |
| Model CTB9600-COOL                       | 123 kg [271.2 lb]                                                                                         |  |
| Model CTB9600-150                        | 90 kg [198.5 lb]                                                                                          |  |
| Model CTB9600-300                        | Approx. 70 kg [154.4 lb]                                                                                  |  |

| Accuracy specifications               |                                                                                           |  |
|---------------------------------------|-------------------------------------------------------------------------------------------|--|
| Temperature stability <sup>1)</sup>   |                                                                                           |  |
| Model CTB9600-COOL                    | ±0.008 K                                                                                  |  |
| Model CTB9600-150                     | ±0.008 K                                                                                  |  |
| Model CTB9600-300                     | ±0.008 K at 40 ... 150 °C [104 ... 302 °F]<br>±0.015 K at 150 ... 300 °C [302 ... 572 °F] |  |
| Temperature homogeneity <sup>2)</sup> |                                                                                           |  |
| Model CTB9600-COOL                    | ±0.010 K                                                                                  |  |
| Model CTB9600-150                     | ±0.010 K                                                                                  |  |
| Model CTB9600-300                     | ±0.010 K at 40 ... 150 °C [104 ... 302 °F]<br>±0.015 K at 150 ... 300 °C [302 ... 572 °F] |  |

1) Maximum temperature fluctuation at a stable temperature over 30 minutes, centrally positioned.

2) Maximum temperature difference within the calibration volume.

| Temperature control |                                                 |  |                 |
|---------------------|-------------------------------------------------|--|-----------------|
| Heating time        |                                                 |  |                 |
| Model CTB9600-COOL  | From -85 °C to -40 °C [from -121 °F to -40 °F]  |  | Approx. 40 min  |
|                     | From -85 °C to 20 °C [from -121 °F to 68 °F]    |  | Approx. 90 min  |
| Model CTB9600-150   | From -40 °C to 0 °C [from -40 °F to +32 °F]     |  | Approx. 15 min  |
|                     | From 0 °C to 20 °C [from 32 °F to 68 °F]        |  | Approx. 10 min  |
|                     | From 30 °C to 140 °C [from 86 °F to 284 °F]     |  | Approx. 30 min  |
| Model CTB9600-300   | From 50 °C to 100 °C [from 122 °F to 212 °F]    |  | Approx. 30 min  |
|                     | From 100 °C to 150 °C [from 212 °F to 302 °F]   |  | Approx. 20 min  |
|                     | From 150 °C to 200 °C [from 302 °F to 392 °F]   |  | Approx. 20 min  |
| Cooling time        |                                                 |  |                 |
| Model CTB9600-COOL  | From +20 °C to -85 °C [from +68 °F to -121 °F]  |  | Approx. 340 min |
| Model CTB9600-150   | From +20 °C to -40 °C [from +68 °F to -40 °F]   |  | Approx. 120 min |
|                     | From +100 °C to -40 °C [from +212 °F to -40 °F] |  | Approx. 200 min |
| Model CTB9600-300   | From 300 °C to 150 °C [from 572 °F to 302 °F]   |  | Approx. 9 h     |

## Temperature control

|                                         |                                                                        |
|-----------------------------------------|------------------------------------------------------------------------|
| <b>Stabilisation time</b> <sup>1)</sup> | Dependent on the calibration liquid, temperature and temperature probe |
|-----------------------------------------|------------------------------------------------------------------------|

1) Time before reaching a stable value.

### All characteristics are determined under the following conditions:

- With the calibration liquid Kryo95 for CTB9600-COOL (-85 ... +130 °C [-121 ... +266 °F])
- With the calibration liquids KDC 200.05 and KDC 200.10 for CTB9600-150 (-40 ... +150 °C [-40 ... +302 °F])
- With the calibration liquid KDC 200.50 for CTB9600-300 (40 ... 300 °C [104 ... 572 °F])
- With a controlled ambient temperature ( $T_{amb} = 23\text{ °C} \pm 2\text{ °C}$  [73 °F  $\pm 2$  K])

Accessories can affect the characteristics.

## Digital display

|                           |                                                                                                                                                                                                                                       |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Display</b>            | Colour TFT display including projective capacitive touchscreen with a resolution of 800 x 480 pixels                                                                                                                                  |
| <b>Display range</b>      | -85 ... +300 °C [-121 ... +572 °F]                                                                                                                                                                                                    |
| <b>Display resolution</b> | 0.001 °C                                                                                                                                                                                                                              |
| <b>Units</b>              | Adjustable via menu<br>°C<br>°F                                                                                                                                                                                                       |
| <b>Menu languages</b>     | Adjustable via menu<br>English<br>German                                                                                                                                                                                              |
| <b>Functions</b>          |                                                                                                                                                                                                                                       |
| Adjustable via menu       | Setting of the speed for the stirrer (recommendation 100 %)<br>Definition of the adjustable min./max. temperatures<br>Definition of the favoured temperatures for quick selection<br>Specification of desired temperature stabilities |
| Decimal separator         | Switching of the decimal separator between full stop (.) and comma (,)                                                                                                                                                                |
| Sound                     | Setting the key tone and alarm                                                                                                                                                                                                        |
| Time                      | Setting the real time and format                                                                                                                                                                                                      |
| Brightness                | Setting of the screen brightness                                                                                                                                                                                                      |

## Communication

|                       |                                                                                            |
|-----------------------|--------------------------------------------------------------------------------------------|
| <b>Interface</b>      | USB                                                                                        |
| <b>Connectivity</b>   | Serial communication<br>Details and further possibilities on request                       |
| <b>Baud rate</b>      | Adjustable via menu<br>2400<br>4800<br>9600<br>19200<br>38400<br>57600<br>115200<br>230400 |
| <b>Response time</b>  | < 10 ms                                                                                    |
| <b>Measuring rate</b> | For display and interface<br>Update rate = 1 measured value per second                     |

| Voltage supply and performance data |                                                                                    |
|-------------------------------------|------------------------------------------------------------------------------------|
| <b>Operating voltage</b>            |                                                                                    |
| Model CTB9600-COOL                  | AC 230 V, 50/60 Hz (±10 %)                                                         |
| Model CTB9600-150                   | <div>■ AC 230 V, 50/60 Hz (±10 %)</div> <div>■ AC 115 V, 50/60 Hz (±10 %)</div>    |
| Model CTB9600-300                   | <div>■ AC 230 V, 50/60 Hz (±10 %)</div> <div>■ AC 115 V, 50/60 Hz (±10 %)</div>    |
| <b>Power consumption</b>            |                                                                                    |
| Model CTB9600-COOL                  | Max. 3,600 W                                                                       |
| Model CTB9600-150                   | Max. 3,200 W                                                                       |
| Model CTB9600-300                   | Max. 2,100 W                                                                       |
| <b>Fuse</b>                         |                                                                                    |
| Model CTB9600-COOL                  | Microfuse, slow blow 16 A / AC 150 V                                               |
| Model CTB9600-150                   | Microfuse, slow blow 16 A / AC 250 V                                               |
| Model CTB9600-300                   | Microfuse, slow blow 10 A at AC 230 V                                              |
| <b>Power cord</b>                   | AC 230 V<br>The conductor cross-section must be a minimum of 1.5 mm <sup>2</sup> . |

| Operating conditions                           |                                                                         |
|------------------------------------------------|-------------------------------------------------------------------------|
| <b>Place of use</b>                            | For indoor use only                                                     |
| <b>Operating altitude</b>                      | Up to 2,000 m [6,562 ft] above sea level                                |
| <b>Medium temperature range</b>                | -95 ... +278 °C [-139 ... +532 °F]; dependent on the calibration liquid |
| <b>Ambient temperature range</b>               | 23 °C ±2 °C [73 °F ±2 K]                                                |
| <b>Storage and transport temperature range</b> | -10 ... +60 °C [14 ... 140 °F]                                          |
| <b>Humidity</b>                                |                                                                         |
| Ambient                                        | 15 ... 75 % relative humidity                                           |
| Storage                                        | 30 ... 70 % relative humidity                                           |
| <b>Condensation</b>                            | Non-condensing                                                          |
| <b>Mounting position</b>                       | Upright / vertical standing                                             |

| Calibration liquid                               | Calibration range                   | Flash point <sup>1)</sup> |
|--------------------------------------------------|-------------------------------------|---------------------------|
| <b>Distilled water (quality 15 µS or better)</b> | 5 ... 90 °C [51 ... 194 °F]         | -                         |
| <b>Silicone oil</b>                              |                                     |                           |
| DC 200.05 CS                                     | -40 ... +123 °C [-40 ... +253 °F]   | 133 °C [271 °F]           |
| DC 200.10 CS                                     | -35 ... +160 °C [-31 ... +320 °F]   | 163 °C [325 °F]           |
| DC 200.20 CS                                     | 7 ... 230 °C [45 ... 446 °F]        | 232 °C [450 °F]           |
| DC 200.50 CS                                     | 30 ... 278 °C [86 ... 532 °F]       | 280 °C [536 °F]           |
| <b>Ethanol 98 %</b>                              | -95 ... +10 °C [-139 ... +50 °F]    | 16 °C [61 °F]             |
| <b>Syltherm XLT</b>                              | -100 ... + 40 °C [-148 ... +104 °C] | 40 °C [104 °F]            |
| <b>Kryo 95</b>                                   | -95 ... +60 °C [-139 ... 140 °F]    | 64 °C [147 °F]            |

1) FP = flash point open cup

Other liquids could be used as agreed, provided that the temperature range and viscosity are suitable for the application.

When using other liquids, the flash point must always be considered.

## Approvals

| Logo                                                                              | Description                                                                 | Region         |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------|----------------|
|  | <b>EU declaration of conformity</b>                                         | European Union |
|                                                                                   | EMC directive <sup>1)</sup>                                                 |                |
|                                                                                   | EN 61326 emission (group 1, class A) and immunity (industrial environments) |                |
|                                                                                   | Low Voltage Directive                                                       |                |
|                                                                                   | RoHS directive                                                              |                |

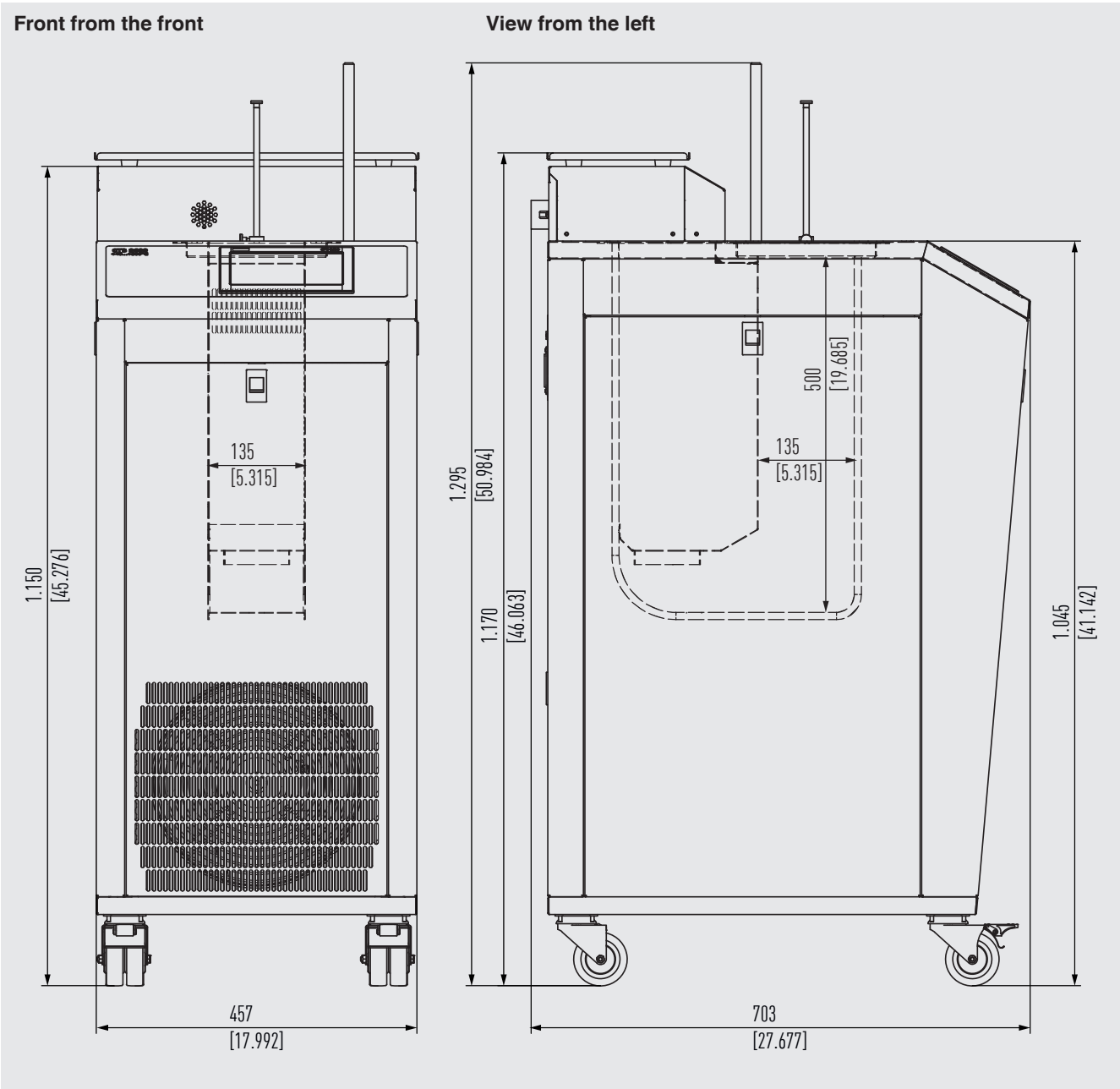
1) This is class A equipment for emitted interference and is intended for use in industrial environments. In other environments, e.g. residential or commercial installations, it can interfere with other equipment under certain conditions. In such circumstances the operator is expected to take the appropriate measures.

## Certificates

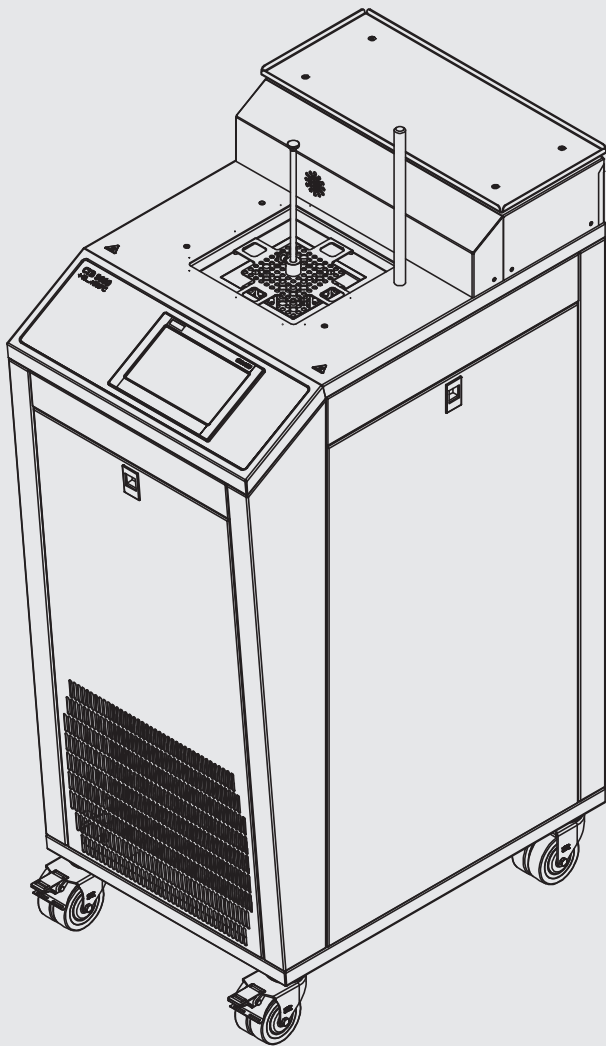
| Description  |                  |
|--------------|------------------|
| Certificates | Stability report |

→ For approvals and certificates, see website

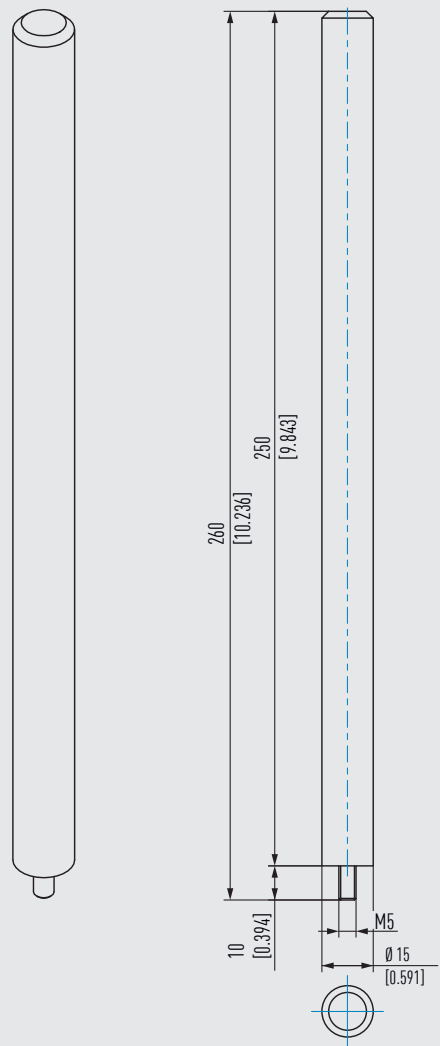
Dimensions in mm [in]



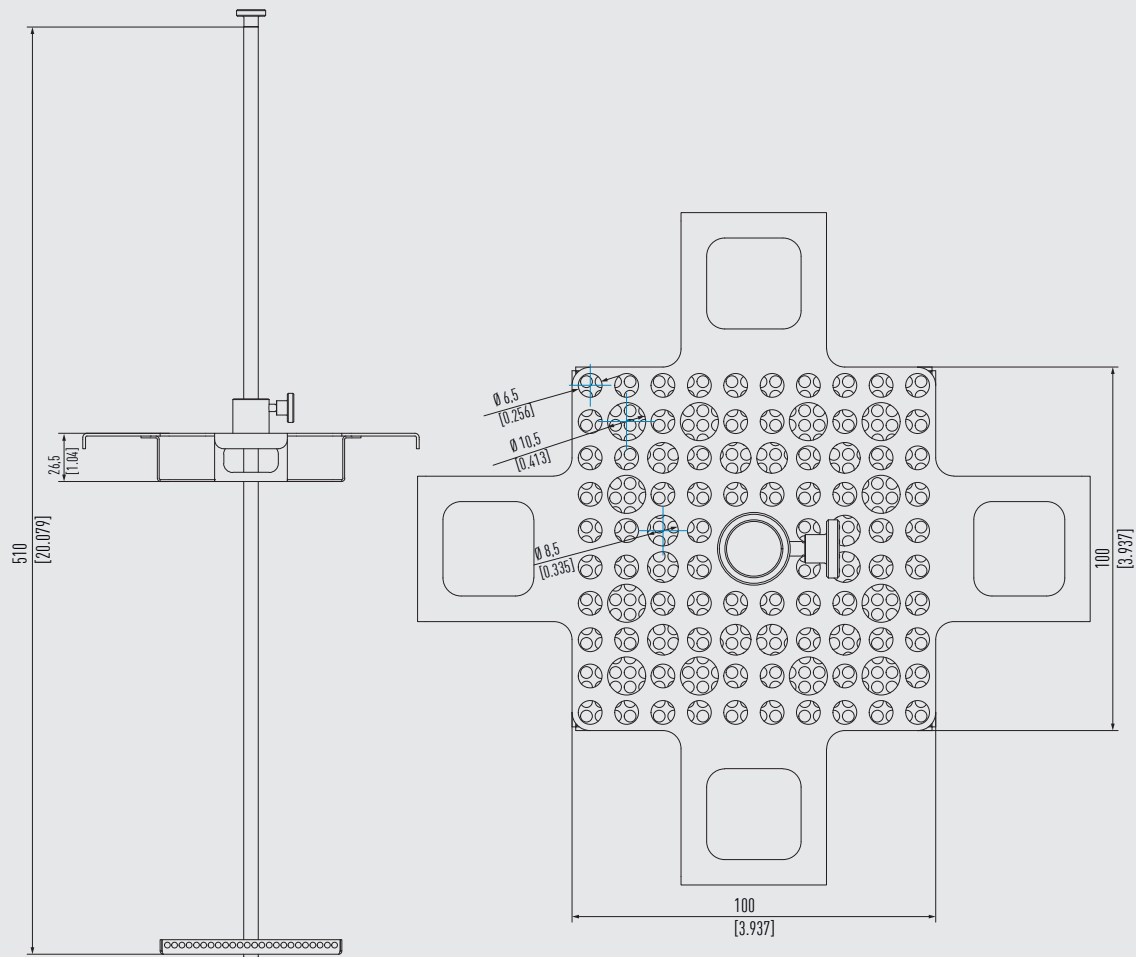
Isometric view CTB9600



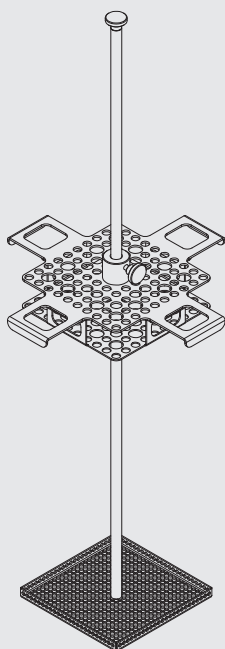
Vertical fixture



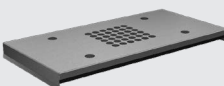
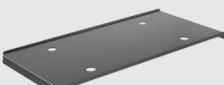
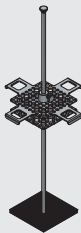
## Probe basket



## Isometric view



## Accessories and spare parts

| Description <sup>1)</sup>                                                           |                                                                                                                                                                                                                                         | Order code |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
|                                                                                     |                                                                                                                                                                                                                                         | CTX-A-B5   |
|    | <b>Silicone oil DC 200.05</b><br>In 10-litre plastic container<br>For temperature range -40 ... +130 °C [-40 ... +266 °F]; FP = 133 °C [271.4 °F]                                                                                       | -1-        |
|                                                                                     | <b>Silicone oil DC 200.10</b><br>In 10-litre plastic container<br>For temperature range -35 ... -160 °C [-31 ... +320 °F]; FP = 163 °C [325 °F]                                                                                         | -2-        |
|                                                                                     | <b>Silicone oil DC 200.20</b><br>In 10-litre plastic container<br>For temperature range 10 ... 220 °C [50 ... 428 °F]; FP = 230 °C [446 °F]                                                                                             | -3-        |
|                                                                                     | <b>Silicone oil DC 200.50</b><br>In 10-litre plastic container<br>For temperature range 25 ... 250 °C [77 ... 482 °F]; FP = 280 °C [536 °F]                                                                                             | -4-        |
|                                                                                     | <b>Kryo 95</b><br>In 10-litre plastic container<br>For temperature range -95 ... +60 °C [-139 ... 140 °F]; FP = 64 °C [147 °F]                                                                                                          | - K -      |
|                                                                                     | <b>Syltherm XLT</b><br>In 10-litre plastic container<br>For temperature range -100 ... +40 °C [-148 ... +104 °C]; FP = 40 °C [104 °F]                                                                                                   | - X -      |
|    | <b>Tray for read-out instruments</b>                                                                                                                                                                                                    | -A-        |
|    | <b>Power cord</b><br>Length: 1.5 m [5 ft] with safety plug<br>For the EU                                                                                                                                                                | -E-        |
|  | <b>Bath cover for cooling instruments</b><br>Stainless steel<br>With insulation                                                                                                                                                         | -I-        |
|  | <b>Bath cover for heating instruments</b><br>Stainless steel<br>Without insulation                                                                                                                                                      | -N-        |
|  | <b>Probe basket</b><br>Plate consist of several holes for the different thermometers with diameters of 6.5 mm [0.256 in], 8.5 mm [0.335 in] and 10.5 mm [0.413 in]<br>High: 510 mm [20.079 in]<br>→ For details, see technical drawings | -S-        |
|  | <b>Vertical fixture set</b><br>Consisting of:<br>1 x rod with M5 threads<br>1 x universal sleeve<br>1 x three-fingered clamp                                                                                                            | -V-        |
| <b>Ordering information for the enquiry:</b>                                        |                                                                                                                                                                                                                                         |            |
| <b>1. Order code: CTX-A-B5</b><br><b>2. Option:</b>                                 |                                                                                                                                                                                                                                         | ↓<br>[   ] |

1) The figures are an example and may change depending on the state of the art in design, material composition and representation

## Scope of delivery

- Calibration bath model CTB9600
- Power cord
- Operating instructions
- Stability report

## Packaging and shipping method

- Delivered on a wooden pallet
- Dimensions (L x B x H)  
152 x 82 x 75 cm [59.84 x 32.28 x 29.53 in]



### Packaging and shipping method

## Ordering information

Model / Temperature range / Auxiliary power / Additional cover / Calibration / Further approvals / Additional ordering information

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