

Integrated temperature test and calibration bench

Model CBS-SC4000

scandura

WIKA data sheet CT 92.33

Applications

- Testing and calibration of temperature measuring instruments such as:
 - Mercury thermometers
 - Thermocouples
 - NTC/PTC
 - Thermistors
 - Resistance Temperature Detectors (RTD)
 - Thermostats
 - Pneumatic and electronic transmitters
 - Temperature controllers
 - Temperature recorders

Main features

- Calibration of direct indicating instruments by comparison with the Standard thermometers or thermo-elements supplied with each bath
- Test and supply of the readout of pneumatic temperature transmitters
- Test and supply of electronic temperature transmitters and switches
- The system may be based on 1, 2, 3 and 4 baths
- Temperature ranges between $-40 \dots +600 \text{ }^{\circ}\text{C}$
- Lower part of bench giving free space for spares and consumable
- Air set for cleaning purpose. including pressure reducer, gauge and flexible hose with air jet

Description

General Information

System CBS-SC4000 ensure the exhaustive testing and verifications capabilities to almost any type of temperature devices regardless their principle of operations: mechanical, pneumatic or electronic.

System CBS-SC4000 allows calibration procedures to be carried out by using the comparison method, as most demanding international standards require

This method implies that both temperature device under test and reference temperature sensor are exposed to the same temperature. This clearly confirms the importance of temperature uniformity and stability.



Calibration bench, model CBS-SC4000

In order to calculate the error of the device under test, each measurement, relevant to each calibration point, must be compared with the corresponding measurement taken from a reference sensor.

Each temperature bath does not use the reference sensor as sensing element of the temperature PID Controller. It uses, instead, a standard commercial type of RTD or, depending on the models, a thermocouple.

This ensures a much longer life to the reference sensor and improves the reliability and availability of both reference sensor and temperature bath.

Specifications

Bath type 1

Temperature range	-40 ... +80°C
Temperature stability	± 0.02 °C (1)
Temperature uniformity	± 0.03 °C
Tank size (W x D x H)	350 x 200 x 430 mm
Tank capacity	25 liters
Working volume	180 x 180 x 400 mm
Heater power	1.5 kW
Heating rate	50 °C/h (water)
Cooling rate	50 °C/h (ethylene glycol)
Safety devices	Over temperature cut-off & fuses
Power supply	AC 220/240 V 50/60 Hz
Power requirement	2.3 kW
Air supply	-
Environmental	0 ... 50 °C, r.h. < 95%
Fluid media recommended	Water and/or anti-freeze fluid (ethylene glycol) range from -40 ... +100 °C

Temperature control panel

Temperature controller	PID
Control sensor	Pt 1000
Set point resolution	0.1 °C
Display resolution	0.01 °C
Engineering units	°C / °F
Serial interface	RS 232

(1 Performances significantly improved using equalizing block

The refrigeration unit is operated by a motor-driven compressor, located inside the structure. The semi-vertical panel is complete with all regulating units and includes a digital temperature indicator controller with serial interface RS 232. PID actions resolution 0.01 °C for indication and 0.1 °C for set point.

The liquid is not included in the standard supply and it must be purchased locally according to the use of the bath. The reference thermometer holder and two glass precision thermometers, range -50 ... +50 °C and -5 ... 100 °C provided with 3.1 calibration certificate are included in the standard supply.

Bath type 2

Temperature range	-30 ... 150 °C (1)
Temperature stability	± 0.02 °C (1)
Temperature uniformity	± 0.02 °C
Tank size (W x D x H)	350 x 200 x 430 mm
Tank capacity	25 liters
Working volume	180 x 180 x 400 mm
Heater power	1.5 kW
Heating rate	50 °C/h (water)
Cooling rate	-
Safety devices	Over temperature cut-off & fuses
Power supply	AC 220/240 V 50/60Hz
Power requirement	1.6 kW
Air supply	-
Environmental	0 ... 50 °C, r.h. < 95%
Fluid media recommended	Water and/or polyglycole fluid type E 400 range up to 150 °C

Temperature control panel

Temperature controller	PID
Control sensor	Pt 1000
Set point resolution	0.1 °C
Display resolution	0.01 °C
Engineering units	°C / °F
Serial interface	RS 232

(1 At 20 °C ambient temperature

(2 Performances significantly improved using equalizing block

The semi-vertical panel is complete with all necessary regulating units and includes a digital temperature indicator. The liquid is not included with the standard supply and it must be purchased locally according to the use of the bath

Complete with reference thermometer holder and two-glass precision thermometers, range -38 ... +50°C and from -5 ... 100 °C, provided with 3.1 calibration certificate are included in the standard supply.

Bath type 3

Temperature range	80 ... 230°C
Temperature stability	± 0.03 °C (1)
Temperature uniformity	± 0.05 °C
Tank size (W x D x H)	350 x 200 x 430 mm
Tank capacity	25 liters
Working volume	180 x 180 x 400 mm
Heater power	1.5 kW
Heating rate	120 °C/h (DC 710)
Cooling rate	-
Safety devices	Over temperature cut-off & fuses
Power supply	AC 220/240 V 50/60Hz
Power requirement	1.6 kW
Air supply	-
Environmental	0 ... 50 °C, r.h. < 95%
Fluid media recommended	Silicone oil thermal fluid type DC710 range 50 ... 270 °C flash point at 270 °C (no free flames allowed nearby)

Temperature control panel

Temperature controller	PID
Control sensor	Pt 1000
Set Point resolution	0.1 °C
Display resolution	0.01 °C
Engineering units	°C / °F
Serial interface	RS 232

(1 Performances significantly improved using equalizing clock)

The semi-vertical panel is complete with all necessary regulating units and includes a digital temperature indicator controller with serial interface RS 232. PID actions - resolution 0.01°C for indication and 0.1°C for set point.

The liquid is not included with the standard supply and it must be purchased locally according to the use of the bath. Complete with reference thermometer holder and one-glass precision thermometer, range from -10 ... +360°C, provided with 3.1 calibration certificate are included in the standard supply.

Bath type 4

Temperature range	80 ... 600°C
Temperature stability	± 0.25 °C (at 600 °C) ⁽¹⁾
Temperature uniformity	± 0.5 °C (at 600 °C)
Tank size	Ø 230 mm x 420 mm depth
Tank capacity	16 kg (alum. oxide)
Working volume	Ø 165 mm x 406 mm depth
Heater power	3 kW
Heating rate	250 °C/h (alum. oxide)
Cooling rate	-
Safety devices	Magneto thermic cut-off
Power supply	AC 220/240 V 50/60Hz
Power requirement	3 kW
Air supply	5 bar/130 l/min
Environmental	0 to 50 °C, RH < 95%
Fluid media recommended	Alumina powder range up to 600 °C

Temperature control panel

Temperature controller	PID
Control sensor	Pt 1000
Set point resolution	0.1 °C
Display resolution	0.01 °C
Engineering units	°C / °F
Serial interface	RS 232

(1) Performances improved up to ± 0.02°C using equalizing block

The semi-vertical panel is complete with all necessary regulating units and includes one flowmeter for the control of the air for the bath medium fluidization. The bath is supplied complete with one charge of the special bath medium.

Complete with reference thermometer holder and two-glass precision thermometers, ranges from -10 ... +480 °C and from 200 ... 610 °C, provided with 3.1 calibration certificate are included in the standard supply.

Mechanical

The system CBS-SC4000 Cabinet is a robust, 2 mm thick, wild steel framework, painted in RAL 7032. The front panels are made of 5 mm thick anodised and engraved aluminium. Fully wired & interconnected for immediate calibration operations.

Working surface in stainless steel. Removable back doors with fans for forced air circulation.

The architecture of each system may be based on 1, 2, 3 and 4 baths.

Four wheels (from 2-bath version) are located at the base to move system CBS-SC4000 during installation and maintenance.

In normal use, the castors are retrieved to keep the system in stable position by four adjustable feet.

Air

External "instrument air" (clean, dry and oil free) supply is required, at 7 bar pressure. An internal air filter with automatic drain is fitted. If air is according to the "instrument air" specification, the amount of condensation is irrelevant.

Dimensions

■ System CBS-SC4000-1

Single bath 550 x 420 x 960 mm

(W x D x H)

Packing 750 x 560 x 1,220 mm

(W x D x H)

Net weight as bath 1 65 kg

Gross weight as bath 1 84 kg

Net weight as bath 2 33 kg

Gross weight as bath 2 53 kg

Net weight as bath 3 33 kg

Gross weight as bath 3 53 kg

Net weight as bath 4 60 kg

Gross weight as bath 4 80 kg

Electrical safety

The system CBS-SC4000 featured for the electrical safety, it includes:

- Approved mains switch
- Earth leakage circuit breaker to standard IEC-1010-1 for personnel and fire protection by detecting an earth leakage fault current in excess of 30 mA and disconnecting the mains supply within 200 ms
- 'Double isolation' protection in connecting the external main supply to the system main switch, by completely enclosing live connections in an insulating case
- Protective transparent covers over live connections inside the equipment

Power requirement

- Main supply AC 230 V \pm 10%, 50/60 Hz
- Power consumption 5700 VA
- Main switch rating 32 A
- Operating environment:
Specified for 0 ... 50°C
Specified to 80% r.h. at 35 °C, not condensing
- Storage environment: -40° ... 70°C

■ System CBS-SC4000-2

Two baths 1,150 x 850 x 1,260 mm

(W x D x H)

Packing 1,450 x 1,050 x 1,550 mm

(W x D x H)

Net weight approx⁽¹⁾ 240 kg

Gross weight approx⁽¹⁾ 385 kg

■ System CBS-SC4000-3

Three baths 1,800 x 850 x 1,260 mm

(W x D x H)

Packing 2,100 x 1,050 x 1,550 mm

(W x D x H)

Net weight approx⁽¹⁾ 485 kg

Gross weight approx⁽¹⁾ 710 kg

■ System CBS-SC4000-4

Four baths 2,400 x 850 x 1,260 mm

(W x D x H)

Case 2,700 x 1050 x 1,550 mm

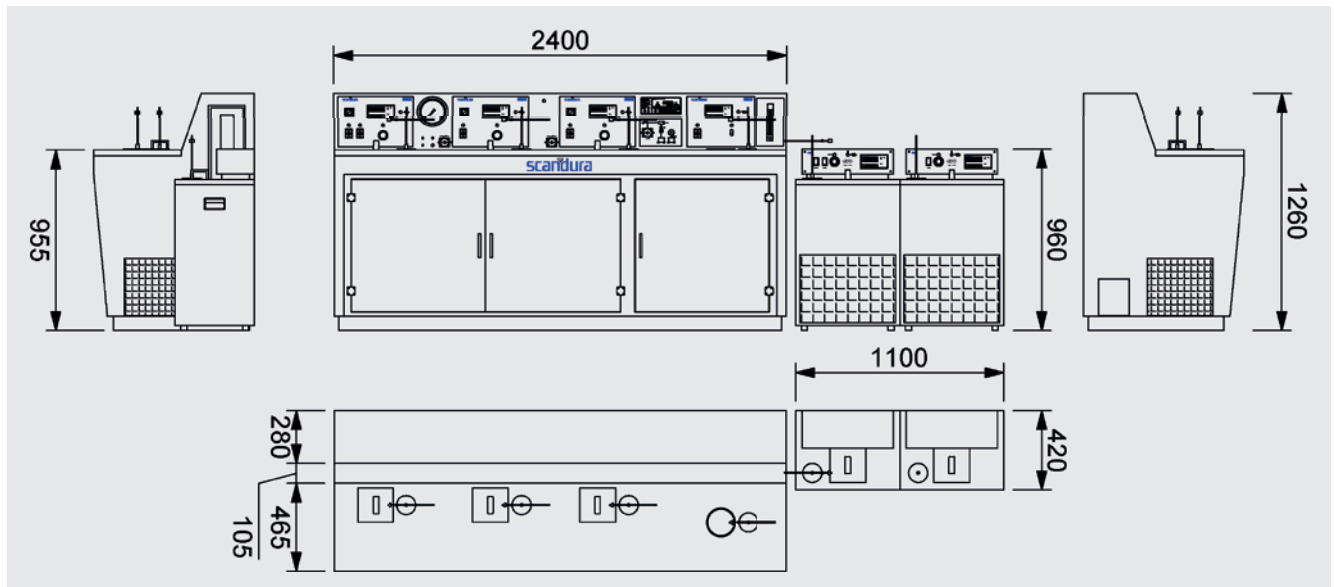
(W x D x H)

Net weight 600 kg

Gross weight 800 kg

(1 Depending on bath combinations (Example 1-3-4 or 1-2-3 or 1-2 etc...))

Dimensions in mm



Supply connections

- Mains Cable gland with 16 mm I.D., located at the bottom on the left hand side of the system. Actual cable connection in a terminal junction box inside the system. Recommended cable: 3 wire, 2½ mm² cross section
- Air 1/4" BSP female, located on the left hand side of the system.

Standard certification

- Certificate of conformity.
- Calibration reports

Certification on request

- Certificate of calibration, against reference masters, traceable to national and international standards (E.A.).
- Official certificates issued by accredited laboratories of the Italian National Service (ACCREDIA) membership of the E.A. (European Accreditation Laboratory).

Standard supply

- 5 meters PVC tube, ¼ "
- 5 off T connections for external circuits
- 5 off cross connections for external circuits
- 5 off linear connections for external circuits
- Kit of fuses
- The system is complete with one set of supports for the instrument under test, types GZ-2/5, GZ-3/4 and GZ-6
- One fixed stem GZ-X is fitted on the System working surface

Technical documentation

Two sets of the Installation, Operating and Maintenance manual.



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