

Hand-held thermometer

Precision version

Models CTH6500 and CTH6510

WIKA data sheet CT 55.10



For further approvals,
see page 5

Applications

- Calibration of thermometers
- Temperature measurement for the purposes of quality assurance
- Measurements in service and maintenance applications
- Long-term monitoring and online documentation

Special features

- High accuracy of 0.03 K with Pt100
- 1- and 2-channel version
- Connection possibility for various probe types
- Intrinsically safe version, Ex ib IIB T4 Gb (model CTH6510)



Hand-held thermometer model CTH6500

Configurator



Description

The all-purpose model CTH6500 hand-held thermometer, for superior mobile temperature measurement, is notable for its precision, flexibility and ease of handling.

In addition to Pt100 resistance thermometers, it can also process signals from typical thermocouples. Thus temperatures from -200 ... +1,500 °C [-328 ... +2,732 °F] can be measured. The explosion-protected version is available only in combination with a Pt100 resistance thermometer.

Through its high accuracy of 0.03 K in ranges from -100 ... +150 °C [-148 ... +302 °F], this instrument can also be used as a reference instrument in biotechnology, pharmaceutical and food industries. The CTH6500 is thus ideal for all service and maintenance tasks.

Low-drift measuring amplifiers ensure small measuring deviations, while easy-to-use adjustment features considerably simplify adjustments and calibrations. Further calibration functions would be:

- Calibration by code for fast setting of standard probes via key data

- Physical calibration of probe and indication at one, two or three different temperatures

In this way it is possible to reduce measuring deviations to a minimum and ensure a high indication accuracy.

Additional application areas

The instrument has been primarily designed for temperature measurement, though it can, with the appropriate probes, also be used for:

- Humidity measurement with a combined temperature-humidity probe
- Flow measurement from 0.1 ... 40 m/s with a vane sensor

The calibration and adjustment possibilities above are also applicable to these measurands.

Complete test and service cases

For the secure transport and storage of the instrument and accessories, a rugged service case is available as a sensible addition. The service case can carry one model CTH6500 digital indicator and several temperature probes.

Certified accuracy

For each temperature probe, the accuracy for the complete measuring chain is certified by a factory calibration certificate which accompanies the instrument.

On request, a DAkkS calibration certificate will be provided for this instrument.

Overview of version

Version	Description
CTH6500	Hand-held thermometer as standard version
CTH6510	Hand-held thermometer as explosion-protected version

Specifications of the entire measuring chain

Basic information	
Probe	
CTH6500	■ Resistance thermometer Pt100 ■ Thermocouples ■ Humidity probe ■ Vane flow probe
CTH6510	Resistance thermometer Pt100
Measuring inputs	
■ 1-channel version ■ 2-channel version	
Measuring ranges	
Pt100	-200 ... +600 °C [-328 ... +1,112 °F]
Thermocouples	-200 ... +1,500 °C [-328 ... + 2,732 °F]
Humidity	0 ... 100 % r. h.
Flow	0 ... 40 m/s

Accuracy specifications		
Resistance thermometer	Pt100	→ For more detailed information, see table „Accuracy specifications of the measuring chain with the Pt100 probe“
Thermocouple		
Base-metal types	Type K Type J Type N Type T	→ For more detailed information, see table „Accuracy specifications of the measuring chain with a thermocouple probe“
Noble-metal types	Type R Type S	→ For more detailed information, see table „Accuracy specifications of the measuring chain with a thermocouple probe“
Humidity	±1.5 % relative humidity and + 0.2 K	
Flow	0.5 % of end value	
Reference conditions	23 °C [73 °F] and 50 % relative humidity	

Accuracy specifications of the measuring chain with the Pt100 probe			
Temperature t_{90} in °C	-50 ... +199.99 °C [-58 ... +394.98 °F]	-200 ... +199.99 °C [-328 ... +394.98 °F]	-200 ... -450 °C [-328 ... +842 °F]
	±0.03 K	±0.05 K	±0.5 % of reading min. ±0.10 K
-200	-	±0.05	±0.10
-150	-	±0.05	±0.10

Accuracy specifications of the measuring chain with the Pt100 probe			
Temperature t_{90} in °C	-50 ... +199.99 °C [-58 ... +394.98 °F]	-200 ... +199.99 °C [-328 ... +394.98 °F]	-200 ... -450 °C [-328 ... +842 °F]
	±0.03 K	±0.05 K	±0.5 % of reading min. ±0.10 K
-100	-	±0.05	±0.10
-50	±0.03	±0.05	±0.10
-40	±0.03	±0.05	±0.10
0	±0.03	±0.05	±0.10
50	±0.03	±0.05	±0.10
100	±0.03	±0.05	±0.10
150	±0.03	±0.05	±0.10
199.99	±0.03	±0.05	±0.10
200	-	-	±0.1
250	-	-	±0.1
300	-	-	±0.2
350	-	-	±0.2
400	-	-	±0.2
450	-	-	±0.2

Accuracy specifications of the measuring chain with a thermocouple probe				
Temperature t_{90} in °C	Type K, J, N and T		Type R and S	
	200 ... 600 °C [392 ... 1,112 °F]	0 ... 1,300 °C [32 ... 2,372 °F]	600 ... 1,200 °C [1,112 ... 2,192 °F]	0 ... 1,300 °C [32 ... 2,372 °F]
	±0.8 K	±1 K + 0.1 % of reading	±0.5 K	±1 K
0	-	±1.00	-	±1.00
50	-	±1.05	-	±1.00
100	-	±1.10	-	±1.00
150	-	±1.15	-	±1.00
199.99	-	±1.20	-	±1.00
200	±0.8	±1.2	-	±1.0
250	±0.8	±1.3	-	±1.0
300	±0.8	±1.3	-	±1.0
350	±0.8	±1.4	-	±1.0
400	±0.8	±1.4	-	±1.0
450	±0.8	±1.5	-	±1.0
500	±0.8	±1.5	-	±1.0
600	±0.8	±1.6	±0.5	±1.0
700	-	±1.7	±0.5	±1.0
800	-	±1.8	±0.5	±1.0
900	-	±1.9	±0.5	±1.0
1,000	-	±2.0	±0.5	±1.0
1,100	-	±2.1	±0.5	±1.0
1,200	-	±2.2	±0.5	±1.0
1,300	-	±2.3	-	±1.0

The stated accuracies apply provided that the range of use falls within the defined accuracy range. If this range is exceeded or not reached, the next higher accuracy range that covers the entire range of use applies. Customer-specific ranges can be defined on request.

Specifications of the digital display instrument

Digital display instrument	
Digital display	
Display range	-19999 ... 19999
Display resolution	Max. 4 ½-digit 0.01 K to 200 °C [392 °F] 0.1 K ≥ 200 °C [392 °F]
Type of display	Large 2-line LC display with backlighting For display of two temperature values and additional information
Functions	
Measuring rate	Speed of measurement 1/s ("slow" - slow measurement) 4/s ("fast" - fast measurement)
Real-time clock	Integrated clock with date
Min./Max. memory	Minimum or maximum measured value
Hold	Holding the last measured value
Zero point adjustment	Tare or zero point adjustment
Voltage supply	
Voltage	9 V battery 9 V rechargeable battery (do not use with CTH65I0)
Battery life	Approx. 20 hours of operation with battery
Electrical connection	
Temperature probe	Connection socket, 8-pin, for DIN circular connector
Case	
Material	Impact-resistant ABS plastic Transparent screen
Weight	350 g [0.77 lb] (incl. battery)

Communication	
Interface	USB, type B
Baud rate	2400
USB specification	2.0

Operating conditions	
Operating altitude	≤ 2,000 m [6,562 ft] above sea level
Medium temperature range	Depending on the temperature probe
Operating temperature range	0 ... 40 °C [32 ... 104 °F]
Storage temperature range	-10 ... +50 °C [14 ... 122 °F]
Humidity	1 ... 95 % relative humidity
Condensation	Non-condensing
Immersion depth	Depending on the temperature probe
Ingress protection (IP code) per IEC 60529	IP44

Specifications for the temperature probes

Immersion probe	
Measuring element	Temperature range
Pt100	-200 ... +450 °C [-328 ... +842 °F]
Type K	-100 ... +1,100 °C [-148 ... +2,012 °F]
Probe tube length	
Pt100	■ Ø = 3 mm, l = 150 mm [Ø = 0.12 in, l = 5.91 in] ■ Ø = 3 mm, l = 300 mm [Ø = 0.12 in, l = 11.81 in] ■ Ø = 3 mm, l = 1,000 mm [Ø = 0.16 in, l = 39.37 in] ■ Ø = 6 mm, l = 300 mm [Ø = 0.24 in, l = 11.81 in]
Type K	■ Ø = 3 mm, l = 300 mm [Ø = 0.12 in, l = 11.81 in] ■ Ø = 3 mm, l = 500 mm [Ø = 0.12 in, l = 19.69 in]
Cable length	
Pt100	1,500 mm [59.06 in]
Type K	1,000 mm [39.37 in]
Cable material	PVC
Connection to CTH65x0	8-pin, DIN circular connector
Dimensions (L x W x H)	→ For details, see technical drawing

Surface probe	
Temperature range	-40 ... +900 °C [-40 ... +1,652 °F]
Measuring element	Type K
Sensor dimensions	Ø = 3 mm, l = 150 mm [Ø = 0.12 in, l = 5.91 in] Spring with thermocouple strip
Cable length	1,000 mm [39.37 in]
Cable material	PVC
Connection to CTH6500	8-pin, DIN circular connector

Combined temperature-humidity probe	
Temperature range	-30 ... +80 °C [-22 ... +176 °F]
Humidity	0 ... 100 % relative humidity
Sensor dimensions	Ø = 20 mm, l = 120 mm [Ø = 0.79 in, l = 4.72 in]
Cable length	1,000 mm [39.37 in]
Cable material	PVC/PVC
Connection to CTH6500	8-pin, DIN circular connector

Approvals

Logo	Description	Region
	EU declaration of conformity for the CTH6500	European Union
	EMC Directive EN 61326 emission (group 1, class B) and immunity (portable test and measuring equipment)	
	RoHS directive	
	EU declaration of conformity for the CTH6510	European Union
	EMC Directive EN 61326 emission (group 1, class B) and immunity (portable test and measuring equipment)	
	RoHS directive	

Optional approvals

Logo	Description	Region
	EU declaration of conformity for the CTH6510 ATEX directive Hazardous areas - Ex i Zone 1 gas II 2G Ex ib IIB T4 Gb T4 at 0 ... 40 °C	European Union
	IECEx for the CTH6510 Hazardous areas Ex i Zone 1 gas Ex ib IIB T4 Gb T4 at 0 ... 40 °C	International
-	PAC Ukraine Metrology, measurement technology	Ukraine

Certificates

Description	
Calibration	■ 3.1 inspection certificate per EN 10204 ■ DAkkS calibration certificate (traceable and accredited in accordance with ISO/IEC 17025)
Recommended calibration interval	1 year (dependent on conditions of use)

→ For approvals and certificates, see website

Safety-related characteristic values (Ex)

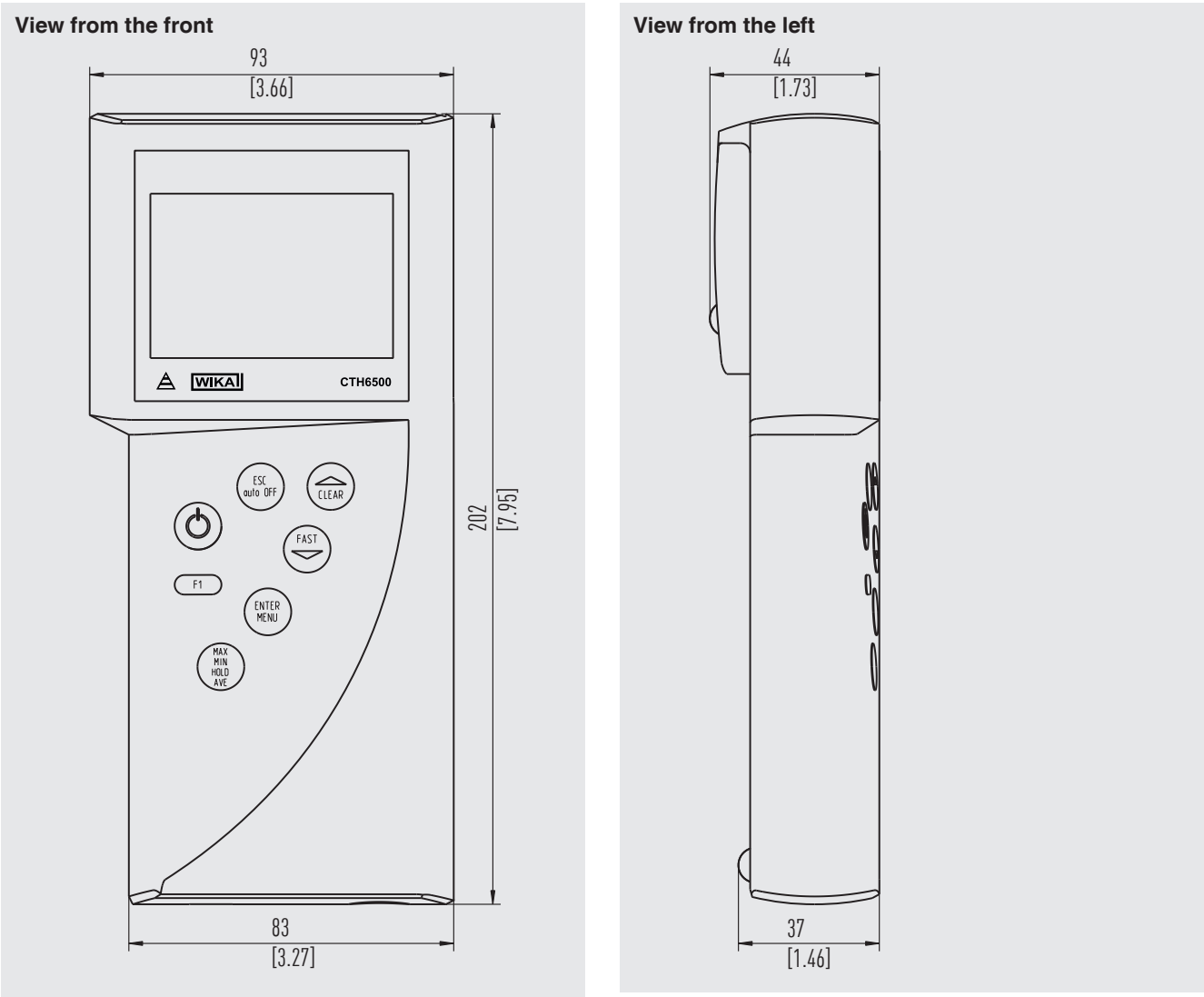
Ex marking	
Ex marking	II 2G Ex ib IIB T4 Gb
Temperature class	T4 at 0 ... 40 °C

Measuring channels 1 and 2	
Connection values of sensor circuit	
Max. output voltage U_0	DC 9.9 V
Max. output power P_0	330 mW
Max. external capacitance C_0	8 μ F
Max. external inductance L_0	10 μ H

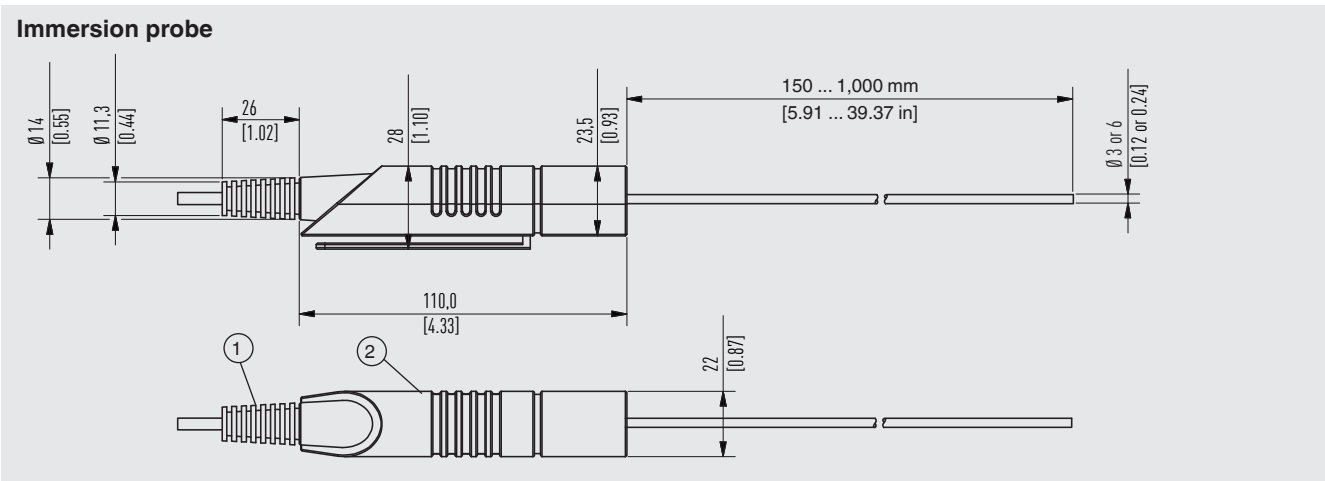
USB port	
Connection values	
Max. input voltage U_i	DC 9.9 V
Effective internal capacitance C_i	14 μ F
Effective internal inductance L_i	10 μ H
Max. output voltage U_0	DC 9.9 V
Max. output power P_0 (gas)	330 mW
Max. external capacitance C_0	8 μ F
Max. external inductance L_0	10 μ H

Dimensions in mm [in]

Hand-held thermometer



Temperature probe

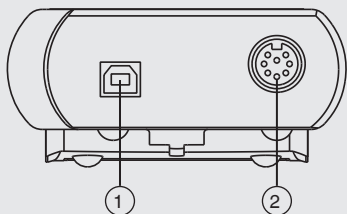


① Strain relief

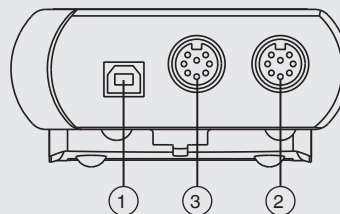
② Handle

Electrical connections

1-channel version



2-channel version



- ① Connection USB interface, type B
- ② Connection temperature probe 1 (only with CTH6500 or CTH6510 as 1-channel version)
- ③ Connection temperature probe 2 (only with CTH6500 or CTH6510 as 2-channel version)

Features of the hand-held thermometer

- Easy handling
- Large display with dual temperature display and bar graph
- Min./Max. value for monitoring of temperature limits
- Mean value function for statistical evaluation
- "Fast mode" for faster measurements up to 4/s
- Selectable channel can be switched off to improve the clarity of the display data
- Recording and visualisation of temperature cycles with the help of the DE-Graph software
- Data logger (available)

- ① Probe holder
- ② First connection port for temperature probe
- ③ Second connection port for temperature probe
- ④ USB connection port for PC
- ⑤ Keyboard
- ⑥ Large LC display



Accessories and spare parts

Accessories for CTH6500		Order code
Description ¹⁾		CTX-A-H4
	Immersion probe Pt100 Dimensions: Ø = 3 mm, l = 150 mm [Ø = 0.12 in, l = 5.91 in] Temperature range: -200 ... +450 °C [-328 ... +842 °F]	-10-
	Pt100 Dimensions: Ø = 3 mm, l = 300 mm [Ø = 0.12 in, l = 11.81 in] Temperature range: -200 ... +450 °C [-328 ... +842 °F]	-20-
	Pt100 Dimensions: Ø = 6 mm, l = 300 mm [Ø = 0.24 in, l = 11.81 in] Temperature range: -200 ... +450 °C [-328 ... +842 °F]	-45-
	Type K Dimensions: Ø = 3 mm, l = 300 mm [Ø = 0.12 in, l = 11.81 in] Temperature range: -100 ... +1,100 °C [-148 ... +2,012 °F]	-50-
	Type K Dimensions: Ø = 3 mm, l = 500 mm [Ø = 0.12 in, l = 19.69 in] Temperature range: -100 ... +1,100 °C [-148 ... +2,012 °F]	-60-
	Surface probe Type K Spring with thermocouple strip Temperature range: -40 ... +900 °C [-40 ... +1,652 °F]	-SU-
	Combined temperature-humidity probe Dimensions: Ø = 20 mm, l = 120 mm [Ø = 0.79 in, l = 4.72 in] Humidity range: 0 ... 100 % relative humidity Temperature range: -30 ... +80 °C [-22 ... +176 °F]	-FT-
	Adapters for thermocouples type K DIN to TC miniature connector	-AD-
	Spare DIN connector for the probe	-CN-
	Case set Consisting of: ■ Transport case, robust ■ 9 V battery ■ Interface cable ■ Software	-CR-
	Case set Consisting of: ■ Transport case, robust ■ 9 V rechargeable battery and battery charger ■ Power supply unit ■ Interface cable ■ Software	-CS-
	Case set Consisting of: ■ Transport case, robust ■ Power supply AC 100 ... 260 V ■ Interface cable ■ Software	-CU-
	Service case with foam insert Material: Plastic	-SC-
-	Protective bag against dirt and humidity Material: Plastic	-PS-

Accessories for CTH6500		Order code
Description ¹⁾		CTX-A-H4
	9 V battery	-DB-
	9 V rechargeable battery	-RB-
	Battery charger For 9 V rechargeable batteries	-AC-
	USB interface cable USB type A to USB type B	-UB-
-	Calibration software DE-Graph software for Windows	-SG-
-	Other accessories on request	-??-
Ordering information for the enquiry:		
1. Order code: CPX-A-H4 2. Option:		↓ []

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

Accessories for CTH6510, explosion-protected version		Order code
Description ¹⁾		CTX-A-H5
	Immersion probe Pt100 Dimensions: Ø = 3 mm, l = 150 mm [Ø = 0.12 in, l = 5.91 in] Temperature range: -200 ... +450 °C [-328 ... +842 °F]	-10-
	Pt100 Dimensions: Ø = 3 mm, l = 300 mm [Ø = 0.12 in, l = 11.81 in] Temperature range: -200 ... +450 °C [-328 ... +842 °F]	-20-
	Pt100 Dimensions: Ø = 6 mm, l = 300 mm [Ø = 0.24 in, l = 11.81 in] Temperature range: -200 ... +450 °C [-328 ... +842 °F]	-45-
	Spare DIN connector for the probe	-CN-
	Case set Consisting of: ■ Transport case, robust ■ 9 V battery ■ Interface cable ■ Software ⚠ May not be used in Ex areas!	-CR-

Accessories for CTH6510, explosion-protected version		Order code
Description ¹⁾		CTX-A-H5
	Service case with foam insert Material: Plastic	-SC-
-	Protective bag against dirt and humidity Material: Plastic	-PS-
	9 V battery	-DB-
	USB interface cable USB type A to USB type B  May not be used in Ex areas!	-UB-
-	Calibration software DE-Graph software for Windows	-SG-
-	Other accessories on request	-??-
Ordering information for the enquiry:		
1. Order code: CPX-A-H5 2. Option:		↓ []

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

Other probes are available on request	
	Penetration probe
	Vane flow probe
-	Customer-specific probes

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

Scope of delivery

- Hand-held thermometer model CTH6500 or intrinsically safe hand-held thermometer model CTH65I0
- 9 V battery
- Calibration certificate
- Choice of temperature probes



**Intrinsically safe hand-held thermometer,
model CTH65I0**

Ordering information

CTH6500 / Version / Data logger / Probe at input 1 / Calibration for probe 1 / Test points for calibration probe 1 / Number of test points probe 1 / Probe at input 2 / Calibration for probe 2 / Test points for calibration probe 2 / Number of test points probe 2 / Case set / Further approvals / Additional ordering information

CTH65I0 / Version / Data logger / Probe at input 1 / Probe at input 2 / Case set / Calibration / Test points for calibration certificate / Number of test points / Further approvals / Additional ordering information

Configurator



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