

# PRESYS®

Dry Block  
Temperature  
Calibrators

Universal  
Process  
Calibrators

Automatic  
Pressure  
Calibrators

## SMART CALIBRATORS

Field Version



Desktop Version



### Ready for Metrology 4.0

**HART**  
COMMUNICATION PROTOCOL



Rack Mounting Version  
For use in 19" rack

## MCS-XV Advanced Multifunction Process Calibrator

Integrating real advanced documenting  
and communication functions

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[www.presys.com.br](http://www.presys.com.br)

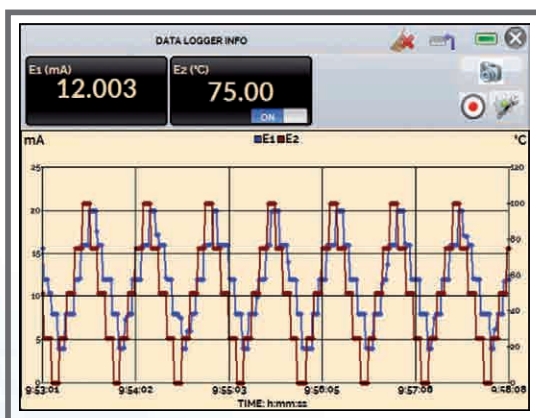
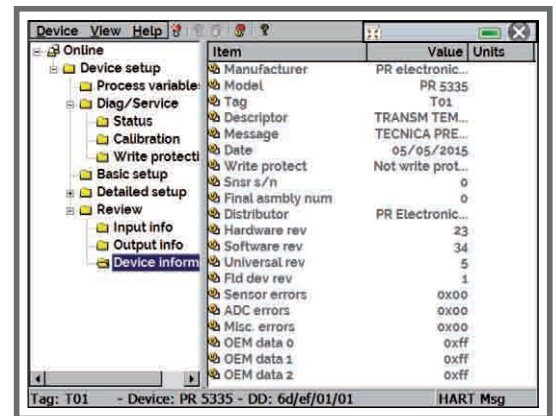
# Universal Process Calibrator MCS-XV

- ✓ Operates all instrumentation signals: electrical, temperature, frequency and pressure.
- ✓ Up to four pressure sensors from 250 mmH<sub>2</sub>O to 10,000 psi.
- ✓ Optional Barometric Reference.



- ✓ Touch Screen display provides easy-to-read data and showing 2 simultaneous variables.
- ✓ Intuitive menu navigation helps in identifying calibrator information for any operational mode.

- ✓ Full Hart configurator (optional), which configures all available HART<sup>®</sup> devices, with DD library from FieldComm Group.
- ✓ 24 Vdc power supply for 2-wire transmitters, 250 Ω internal resistor configurable.



- ✓ Data Logger function for data acquisition and graphical visualization.
- ✓ Ethernet, Wi-Fi, Pen drive, Hart, USB connection Host / Device.

- ✓ Automated calibrations and generation of calibration report on direct connected USB printer or generation of PDF file.

POINT	EXPECTED	OBTAINED	ABS. ERR.	SPAN E
0.00 °C	4.0000 mA	3.9998 mA	-0.0002 mA	-0.001
25.00 °C	8.0000 mA	8.0007 mA	0.0007 mA	0.0045
50.00 °C	12.0000 mA	12.0012 mA	0.0012 mA	0.0075
75.00 °C	16.0000 mA	16.0003 mA	0.0003 mA	0.0025
100.00 °C	20.0000 mA	20.0006 mA	0.0006 mA	0.0045

CALIBRATION REPORT FOR TAG TT-0101					
CUSTOMER: Presys Instruments					
TAG: TT-0101	MODEL: Temperature Transmitter				
SERIAL NUMBER: 100919	MANUFACTURER: Presys				
OUTPUT RANGE: 4 to 20 mA					
MAX ERROR = 1% SPAN (SPAN = 16 mA)					
INPUT RANGE: 0 to 100 °C (RTD)					
STANDARD:					
MANUFACTURER	SERIAL NUMBER	MODEL	NEXT CAL.	CERT. NUMBER	
PRESYS	269.01.17	MCS-XV	08/01/21	RS555.01.19	
As-td performed by: John					
DATE: 18/9/2019					
POINT	EXPECTED	OBTAINED	ERROR	SPAN ERR.	PASS/FAIL
0.00 °C	4.0000 mA	3.9998 mA	-0.0002 mA	-0.001%	Pass
25.00 °C	8.0000 mA	8.0007 mA	0.0007 mA	0.008%	Pass
50.00 °C	12.0000 mA	12.0012 mA	0.0012 mA	0.007%	Pass
75.00 °C	16.0000 mA	16.0003 mA	0.0003 mA	0.002%	Pass
100.00 °C	20.0000 mA	20.0006 mA	0.0006 mA	0.004%	Pass
DOCUMENT CREATED ON: 09/18/2019					
RESPONSIBLE: <i>John</i>					

# Technical Specifications

## Specifications - Inputs

Input Ranges	Resolution	Accuracy	Remarks
<b>millivolt</b>	-150 to 150 mV	0.001 mV	$\pm 0.01\% \text{ FS}^{***}$
	-500 to -150 mV	0.01 mV	$\pm 0.02\% \text{ FS}$
	150 to 2450 mV	0.01 mV	$\pm 0.02\% \text{ FS}$
<b>volt</b>	-10 to 45 V	0.0001 V	$\pm 0.02\% \text{ FS}$
<b>mA</b>	-5 to 24.5 mA	0.0001 mA	$\pm 0.01\% \text{ FS}$
<b>resistance</b>	0 to 400 $\Omega$	0.01 $\Omega$	$\pm 0.01\% \text{ FS}$
	400 to 2500 $\Omega$	0.01 $\Omega$	$\pm 0.03\% \text{ FS}$
<b>frequency*</b>	0 to 600 Hz	0.01 Hz	$\pm 0.04 \text{ Hz}$
	600 to 1300 Hz	0.1 Hz	$\pm 0.2 \text{ Hz}$
	1300 to 5000 Hz	1 Hz	$\pm 2 \text{ Hz}$
<b>counter*</b>	0 to $10^8 - 1$ count	1 count	—
<b>Pt-100</b>	-200 to 850 °C / -328 to 1562 °F	0.01 °C / 0.01 °F	$\pm 0.1\% \text{ C} / \pm 0.2\% \text{ F}$
<b>Pt-500</b>	-200 to 850 °C / -328 to 1562 °F	0.01 °C / 0.01 °F	$\pm 0.1\% \text{ C} / \pm 0.1\% \text{ F}$
<b>Pt-1000</b>	-200 to 400 °C / -328 to 752 °F	0.1 °C / 0.1 °F	$\pm 0.1\% \text{ C} / \pm 0.2\% \text{ F}$
<b>Cu-10</b>	-200 to 260 °C / -328 to 500 °F	0.1 °C / 0.1 °F	$\pm 2.0\% \text{ C} / \pm 4.0\% \text{ F}$
<b>Ni-100</b>	-60 to 250 °C / -76 to 482 °F	0.1 °C / 0.1 °F	$\pm 0.2\% \text{ C} / \pm 0.4\% \text{ F}$
<b>Ni-120</b>	-80 to 260 °C / -112 to 500 °F	0.1 °C / 0.1 °F	$\pm 0.01\% \text{ C} / \pm 0.1\% \text{ F}$
<b>probe**</b>	-200 to 850 °C / -328 to 1562 °F	0.01 °C / 0.01 °F	$\pm 0.1\% \text{ C} / \pm 0.2\% \text{ F}$
<b>TC-J</b>	-210 to 1200 °C / -346 to 2192 °F	0.1 °C / 0.1 °F	$\pm 0.2\% \text{ C} / \pm 0.4\% \text{ F}$
<b>TC-K</b>	-270 to -150 °C / -454 to -238 °F	0.1 °C / 0.1 °F	$\pm 0.5\% \text{ C} / \pm 1.0\% \text{ F}$
	-150 to 1370 °C / -238 to 2498 °F	0.1 °C / 0.1 °F	$\pm 0.2\% \text{ C} / \pm 0.4\% \text{ F}$
<b>TC-T</b>	-260 to -200 °C / -436 to -328 °F	0.1 °C / 0.1 °F	$\pm 0.6\% \text{ C} / \pm 1.2\% \text{ F}$
	-200 to -75 °C / -328 to -103 °F	0.1 °C / 0.1 °F	$\pm 0.4\% \text{ C} / \pm 0.8\% \text{ F}$
	-75 to 400 °C / -103 to 752 °F	0.1 °C / 0.1 °F	$\pm 0.2\% \text{ C} / \pm 0.4\% \text{ F}$
<b>TC-B</b>	50 to 250 °C / 122 to 482 °F	0.1 °C / 0.1 °F	$\pm 2.5\% \text{ C} / \pm 5.0\% \text{ F}$
	250 to 500 °C / 482 to 932 °F	0.1 °C / 0.1 °F	$\pm 1.5\% \text{ C} / \pm 3.0\% \text{ F}$
	500 to 1200 °C / 932 to 2192 °F	0.1 °C / 0.1 °F	$\pm 1.0\% \text{ C} / \pm 2.0\% \text{ F}$
	1200 to 1820 °C / 2192 to 3308 °F	0.1 °C / 0.1 °F	$\pm 0.7\% \text{ C} / \pm 1.4\% \text{ F}$
<b>TC-R</b>	-50 to 300 °C / -58 to 572 °F	0.1 °C / 0.1 °F	$\pm 1.0\% \text{ C} / \pm 2.0\% \text{ F}$
	300 to 1760 °C / 572 to 3200 °F	0.1 °C / 0.1 °F	$\pm 0.7\% \text{ C} / \pm 1.4\% \text{ F}$
<b>TC-S</b>	-50 to 300 °C / -58 to 572 °F	0.1 °C / 0.1 °F	$\pm 1.0\% \text{ C} / \pm 2.0\% \text{ F}$
	300 to 1760 °C / 572 to 3200 °F	0.1 °C / 0.1 °F	$\pm 0.7\% \text{ C} / \pm 1.4\% \text{ F}$
<b>TC-E</b>	-270 to -150 °C / -454 to -238 °F	0.1 °C / 0.1 °F	$\pm 0.3\% \text{ C} / \pm 0.6\% \text{ F}$
	-150 to 1000 °C / -238 to 1832 °F	0.1 °C / 0.1 °F	$\pm 0.1\% \text{ C} / \pm 0.2\% \text{ F}$
<b>TC-N</b>	-260 to -200 °C / -436 to -328 °F	0.1 °C / 0.1 °F	$\pm 1.0\% \text{ C} / \pm 2.0\% \text{ F}$
	-200 to -20 °C / -328 to -4 °F	0.1 °C / 0.1 °F	$\pm 0.4\% \text{ C} / \pm 0.8\% \text{ F}$
	-20 to 1300 °C / -4 to 2372 °F	0.1 °C / 0.1 °F	$\pm 0.2\% \text{ C} / \pm 0.4\% \text{ F}$
<b>TC-L</b>	-200 to 900 °C / -328 to 1652 °F	0.1 °C / 0.1 °F	$\pm 0.2\% \text{ C} / \pm 0.4\% \text{ F}$
<b>TC-U</b>	-200 to 600 °C / -328 to 1112 °F	0.1 °C / 0.1 °F	$\pm 0.2\% \text{ C} / \pm 0.4\% \text{ F}$
<b>TC-C</b>	0 to 1500 °C / 32 to 2732 °F	0.1 °C / 0.1 °F	$\pm 0.5\% \text{ C} / \pm 1.0\% \text{ F}$
	1500 to 2320 °C / 2732 to 4208 °F	0.1 °C / 0.1 °F	$\pm 0.7\% \text{ C} / \pm 1.4\% \text{ F}$

Special temperature sensor curve on request.

(\*) Function available since the frequency output is not configured.

(\*\*) The Probe is a separate input used as reference thermometer. The related accuracy is relative only to the MCS-XV.

(\*\*\*) FS = Full Scale.

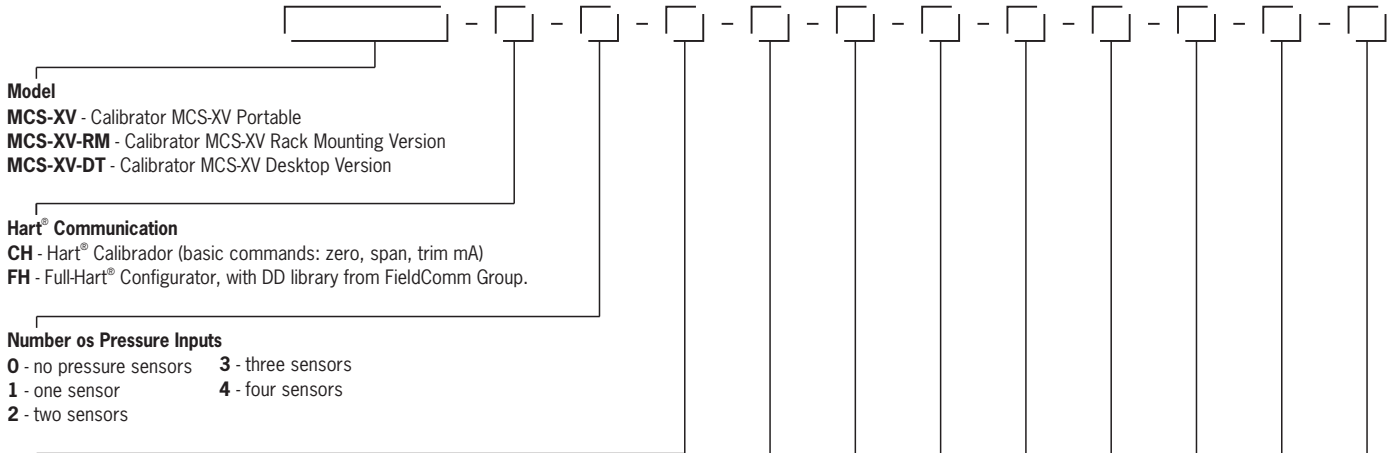
## Specifications - Outputs

Outputs Ranges	Resolution	Accuracy	Remarks
<b>millivolt</b>	-10 to 110 mV	0.001 mV	$\pm 0.02\% \text{ FS}^{**}$
<b>volt</b>	-0.5 to 12 V	0.0001 V	$\pm 0.02\% \text{ FS}$
<b>mA</b>	0 to 24 mA	0.0001 mA	$\pm 0.02\% \text{ FS}$
<b>2-wire transmitter (XTR)</b>	4 to 24 mA	0.0001 mA	$\pm 0.02\% \text{ FS}$
<b>resistance</b>	0 to 400 $\Omega$	0.01 $\Omega$	$\pm 0.02\% \text{ FS}$
	0 to 2500 $\Omega$	0.1 $\Omega$	$\pm 0.03\% \text{ FS}$
<b>frequency*</b>	0 to 100 Hz	0.01 Hz	$\pm 0.02 \text{ Hz}$
	0 to 10000 Hz	1 Hz	$\pm 2 \text{ Hz}$
<b>pulse*</b>	0 to $10^8 - 1$ pulse	1 pulse	—
<b>Pt-100</b>	-200 to 850 °C / -328 to 1562 °F	0.01 °C / 0.01 °F	$\pm 0.2\% \text{ C} / \pm 0.4\% \text{ F}$
<b>Pt-500</b>	-200 to 850 °C / -328 to 1562 °F	0.01 °C / 0.01 °F	$\pm 0.2\% \text{ C} / \pm 0.4\% \text{ F}$
<b>Pt-1000</b>	-200 to 400 °C / -328 to 752 °F	0.1 °C / 0.1 °F	$\pm 0.1\% \text{ C} / \pm 0.2\% \text{ F}$
<b>Cu-10</b>	-200 to 260 °C / -328 to 500 °F	0.1 °C / 0.1 °F	$\pm 2.0\% \text{ C} / \pm 4.0\% \text{ F}$
<b>Ni-100</b>	-60 to 250 °C / -76 to 482 °F	0.1 °C / 0.1 °F	$\pm 0.2\% \text{ C} / \pm 0.4\% \text{ F}$
<b>Ni-120</b>	-80 to 260 °C / -112 to 500 °F	0.1 °C / 0.1 °F	$\pm 0.2\% \text{ C} / \pm 0.4\% \text{ F}$
<b>TC-J</b>	-210 to 1200 °C / -346 to 2192 °F	0.1 °C / 0.1 °F	$\pm 0.4\% \text{ C} / \pm 0.8\% \text{ F}$
<b>TC-K</b>	-270 to -150 °C / -454 to -238 °F	0.1 °C / 0.1 °F	$\pm 1.0\% \text{ C} / \pm 2.0\% \text{ F}$
	-150 to 1370 °C / -238 to 2498 °F	0.1 °C / 0.1 °F	$\pm 0.4\% \text{ C} / \pm 0.8\% \text{ F}$
<b>TC-T</b>	-260 to -200 °C / -436 to -328 °F	0.1 °C / 0.1 °F	$\pm 1.2\% \text{ C} / \pm 2.4\% \text{ F}$
	-200 to -75 °C / -328 to -103 °F	0.1 °C / 0.1 °F	$\pm 0.8\% \text{ C} / \pm 1.6\% \text{ F}$
	-75 to 400 °C / -103 to 752 °F	0.1 °C / 0.1 °F	$\pm 0.4\% \text{ C} / \pm 0.8\% \text{ F}$
<b>TC-B</b>	50 to 250 °C / 122 to 482 °F	0.1 °C / 0.1 °F	$\pm 5.0\% \text{ C} / \pm 10.0\% \text{ F}$
	250 to 500 °C / 482 to 932 °F	0.1 °C / 0.1 °F	$\pm 3.0\% \text{ C} / \pm 6.0\% \text{ F}$
	500 to 1200 °C / 932 to 2192 °F	0.1 °C / 0.1 °F	$\pm 2.0\% \text{ C} / \pm 4.0\% \text{ F}$
	1200 to 1820 °C / 2192 to 3308 °F	0.1 °C / 0.1 °F	$\pm 1.4\% \text{ C} / \pm 2.8\% \text{ F}$
<b>TC-R</b>	-50 to 300 °C / -58 to 572 °F	0.1 °C / 0.1 °F	$\pm 2.0\% \text{ C} / \pm 4.0\% \text{ F}$
	300 to 1760 °C / 572 to 3200 °F	0.1 °C / 0.1 °F	$\pm 1.4\% \text{ C} / \pm 2.8\% \text{ F}$
<b>TC-S</b>	-50 to 300 °C / -58 to 572 °F	0.1 °C / 0.1 °F	$\pm 2.0\% \text{ C} / \pm 4.0\% \text{ F}$
	300 to 1760 °C / 572 to 3200 °F	0.1 °C / 0.1 °F	$\pm 1.4\% \text{ C} / \pm 2.8\% \text{ F}$
<b>TC-E</b>	-270 to -150 °C / -454 to -238 °F	0.1 °C / 0.1 °F	$\pm 0.6\% \text{ C} / \pm 1.2\% \text{ F}$
	-150 to 1000 °C / -238 to 1832 °F	0.1 °C / 0.1 °F	$\pm 0.2\% \text{ C} / \pm 0.4\% \text{ F}$
<b>TC-N</b>	-260 to -200 °C / -436 to -328 °F	0.1 °C / 0.1 °F	$\pm 2.0\% \text{ C} / \pm 4.0\% \text{ F}$
	-200 to -20 °C / -328 to -4 °F	0.1 °C / 0.1 °F	$\pm 0.8\% \text{ C} / \pm 1.6\% \text{ F}$
	-20 to 1300 °C / -4 to 2372 °F	0.1 °C / 0.1 °F	$\pm 0.4\% \text{ C} / \pm 0.8\% \text{ F}$
<b>TC-L</b>	-200 to 900 °C / -328 to 1652 °F	0.1 °C / 0.1 °F	$\pm 0.4\% \text{ C} / \pm 0.8\% \text{ F}$
<b>TC-U</b>	-200 to 600 °C / -328 to 1112 °F	0.1 °C / 0.1 °F	$\pm 0.2\% \text{ C} / \pm 0.4\% \text{ F}$
<b>TC-C</b>	0 to 1500 °C / 32 to 2732 °F	0.1 °C / 0.1 °F	$\pm 0.5\% \text{ C} / \pm 1.0\% \text{ F}$
	1500 to 2320 °C / 2732 to 4208 °F	0.1 °C / 0.1 °F	$\pm 0.7\% \text{ C} / \pm 1.4\% \text{ F}$

(\*) Function available since the frequency input is not configured. (\*\*) FS = Full Scale.

The values of accuracy cover one year period and for a temperature range between 20 and 26 °C. Outside this range, the thermal stability is 0.001% FS / °C with reference to 23 °C. Thermocouple with internal cold junction compensation, one must consider the error of this cold junction compensation of up to  $\pm 0.2\% \text{ C}$  or  $\pm 0.4\% \text{ F}$ .

# Order Code



**Model**  
**MCS-XV** - Calibrator MCS-XV Portable  
**MCS-XV-RM** - Calibrator MCS-XV Rack Mounting Version  
**MCS-XV-DT** - Calibrator MCS-XV Desktop Version

**Hart® Communication**  
**CH** - Hart® Calibrator (basic commands: zero, span, trim mA)  
**FH** - Full-Hart® Configurator, with DD library from FieldComm Group.

**Number of Pressure Inputs**  
**0** - no pressure sensors     **3** - three sensors  
**1** - one sensor                 **4** - four sensors  
**2** - two sensors

RANGE Input 1	RESOLUTION	ACCURACY*	REMARKS
(0) 25 mbar	0.0001	± 0.05 % FS*	Gage pressure
(1) 70 mbar	0.001	± 0.05 % FS	Used with air or inert gases
(2) 350 mbar	0.01	± 0.025 % FS	
(3) 1 bar	0.00001	± 0.025 % FS	Gage or absolute pressure
(4) 2 bar	0.00001	± 0.025 % FS	
(5) 7 bar	0.0001	± 0.025 % FS	Used with fluids (Gases or liquids) compatible with 316 L stainless steel
(6) 20 bar	0.0001	± 0.025 % FS	
(7) 35 bar	0.001	± 0.025 % FS	
(8) 70 bar	0.001	± 0.025 % FS	
(9) 210 bar	0.001	± 0.025 % FS	
(10) 350 bar	0.01	± 0.025 % FS	
(11) 700 bar	0.01	± 0.05 % FS	
(12) Others on request			

**Pressure Type Input 1** (Only for version with one sensor or more)  
**A - Absolute** (Only for ranges 3 to 8)     **C - Compound\*\*\*\*** (Only for ranges 3 to 8)  
**G - Gage** (Ranges 0 to 11)     **D - Differential\*\*\*\*\*** (Only for ranges 0 to 2)  
**V - Vacuum** (Only for range 3)

**RANGE Input 2\*\*** (Only for version with two sensors or more) \_\_\_\_\_  
**Pressure Type Input 2\*\*** \_\_\_\_\_  
**RANGE Input 3\*\*** (Only for version with three sensors or more) \_\_\_\_\_  
**Pressure Type Input 3\*\*** \_\_\_\_\_  
**RANGE Input 4\*\*** (Only for version with four sensors or more) \_\_\_\_\_  
**Pressure Type Input 4\*\*** \_\_\_\_\_

**Optional** (Only for version with up to three sensors) \_\_\_\_\_  
**BR** - Barometric Reference (1 barA - Accuracy: 0.2 mbar)  
 Sensor for ambient pressure measurement. Can be used for simulated indication of absolute pressure on the other sensors.

(\*) Percentage of full scale (\*\*\*) Same code as input 1  
 (\*\*\*\*) From -1 bar to full scale of range (\*\*\*\*\*) The differential sensor occupies two pressure outlets.  
 Accuracy values are valid within a year and for a temperature range between 20 and 26 °C. Outside these limits add 0.005 % FS / °C, taking 23 °C as the reference temperature.

**Engineering units:** Presion: psi, bar, mbar, MPa, kPa, Pa, atm, at, mmH<sub>2</sub>O@4°C, cmH<sub>2</sub>O@4°C, ftH<sub>2</sub>O@4°C, inH<sub>2</sub>O@4°C, inH<sub>2</sub>O@60°F, torr, mmHg@0°C, cmHg@0°C, inHg@0°C, inHg@60°F, gf/cm<sup>2</sup>, kgf/cm<sup>2</sup>, kgf/m<sup>2</sup>. Temperature: °C, °F, K.  
**Pneumatic Connection:** 1/4" NPTF (Note: 1/8" NPTF only for range 0 - 10000 psi).  
**Overpressure:** up to twice the sensor full scale pressure (for capsules to 5000 psi).  
**Operating ambient:** 0 to 50 °C and 90 % maximum relative humidity.  
**Dimensions:** Portable: 140 mm x 250 mm x 80 mm (HxWxD) / Desktop: 132 mm x 308 mm x 275 mm (HxWxD) / Rack Mounting: 132 mm x 483 mm x 250 mm (HxWxD).  
**Weight:** Portable: 1.7 kg approx. / Desktop: 3.0 kg approx. / Rack Mounting: 2.0 kg approx.  
**Warranty:** 1 year, except for battery.

- Included accessories:**
- Technical manual;
  - Carrying bag (only for portable version);
  - Set of test leads;
  - Fuse;
  - Charger 100 - 240 Vac 50/60Hz (only for portable version).
  - Ethernet Cable / USB Cable / Touch Screen Pen.
  - USB Wi-Fi Adapter - Order code: 06.04.0004-00.

- Optional accessories:**
- Temperature Sensor: Probe 1/5 DIN R - Order code: 04.06.0101-00;
  - Probe 1/5 DIN A - Order code: 04.06.0107-00;
  - Probe 1/5 DIN A-L - Order code: 04.06.0102-00.

