

# PRESYS®

## Universal Process Calibrator

### MCS-XV

[www.mcsxv.com](http://www.mcsxv.com)

MCS-XV is the new Presys advanced multifunction field calibrator and HART® communicator combining multiple software and hardware resources as well as communication features to achieve productivity gains in day-to-day calibration operation.



### MCS-XV Portable Version



Direct Printing of Calibration Report (pass / fail)  
(PDF or connected USB printer)

### MCS-XV-DT Desktop Version



### MCS-XV-RM Rack Mounting Version For use in 19" rack



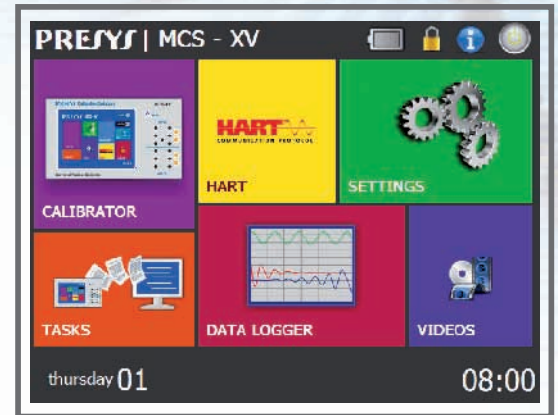
# PRESYS

Instruments Inc.

[www.presyscorp.com](http://www.presyscorp.com)

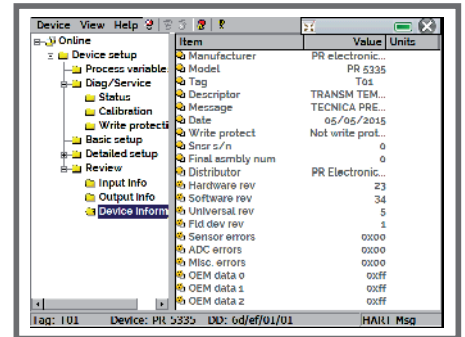
# Universal Process Calibrator MCS-XV

- ✓ 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 ERR.
0.00 °C	4.0000 mA	3.9955 mA	-0.0045 mA	-0.028%
25.00 °C	8.0000 mA	7.9949 mA	-0.0051 mA	-0.058%
50.00 °C	12.0000 mA	11.9897 mA	-0.0103 mA	-0.064%
75.00 °C	16.0000 mA	15.9934 mA	-0.0066 mA	-0.041%
100.00 °C	20.0000 mA	19.9968 mA	-0.0032 mA	-0.020%

POINT	EXPECTED	OBTAINED	ABS. ERR.	SPAN ERR.
0.00 °C	4.0000 mA	4.0001 mA	0.0001 mA	0.001%
25.00 °C	8.0000 mA	7.9949 mA	-0.0051 mA	-0.032%
50.00 °C	12.0000 mA	11.9911 mA	-0.0089 mA	-0.056%
75.00 °C	16.0000 mA	15.9932 mA	-0.0068 mA	-0.042%
100.00 °C	20.0000 mA	19.9957 mA	-0.0043 mA	-0.027%

**Calibration report for tag T01**

CREATED IN: 02/02/2016  
 INSTRUMENT DETAILS:  
 TAG: T01  
 SERIAL NUMBER: 001 01 15  
 MODEL: RTD Transmitter  
 MANUFACTURER: Presys  
 INPUT RANGE: 0 TO 100 °C (RTD)  
 OUTPUT RANGE: 4 TO 20 mA  
 MAX ERROR: ± 0.1% SPAN (SPAN = 16 mA)  
 LEAD TIME: 10 SECONDS

POINT	EXPECTED	OBTAINED	DIFFER.	SPAN ERR.	PASS/FAIL
0.00 °C	4.0000 mA	3.9955 mA	-0.0045 mA	-0.028%	Pass
25.00 °C	8.0000 mA	7.9949 mA	-0.0051 mA	-0.058%	Pass
50.00 °C	12.0000 mA	11.9897 mA	-0.0103 mA	-0.064%	Pass
75.00 °C	16.0000 mA	15.9934 mA	-0.0066 mA	-0.041%	Pass
100.00 °C	20.0000 mA	19.9968 mA	-0.0032 mA	-0.020%	Pass

POINT	EXPECTED	OBTAINED	DIFFER.	SPAN ERR.	PASS/FAIL
0.00 °C	4.0000 mA	4.0001 mA	0.0001 mA	0.001%	Pass
25.00 °C	8.0000 mA	7.9949 mA	-0.0051 mA	-0.032%	Pass
50.00 °C	12.0000 mA	11.9911 mA	-0.0089 mA	-0.056%	Pass
75.00 °C	16.0000 mA	15.9932 mA	-0.0068 mA	-0.042%	Pass
100.00 °C	20.0000 mA	19.9957 mA	-0.0043 mA	-0.027%	Pass

Standard serial numbers 112-11-10  
 Standard test calibrations 12/11/2015  
 Operator signature

# Technical Specifications

## Specifications - Inputs

Input Ranges	Resolution	Accuracy	Remarks	
<b>millivolt</b>	-150 to 150 mV	0.001 mV	$\pm 0.01\% \text{ FS}^{***}$	$R_{\text{input}} > 10 \text{ M}\Omega$ auto-ranging
	-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	$\pm 0.02\% \text{ FS}$	$R_{\text{input}} > 1 \text{ M}\Omega$
<b>mA</b>	-5 to 24.5 mA	0.0001 mA	$\pm 0.02\% \text{ FS}$	$R_{\text{input}} < 120 \Omega$
<b>resistance</b>	0 to 400 $\Omega$	0.01 $\Omega$	$\pm 0.01\% \text{ FS}$	Excitation current 0.85 mA
	400 to 2500 $\Omega$	0.01 $\Omega$	$\pm 0.03\% \text{ FS}$	auto-ranging
<b>frequency*</b>	0 to 600 Hz	0.01 Hz	$\pm 0.04 \text{ Hz}$	$R_{\text{input}} > 50 \text{ k}\Omega$
	600 to 1300 Hz	0.1 Hz	$\pm 0.2 \text{ Hz}$	Voltage DC <sub>max</sub> = 30 V
	1300 to 5000 Hz	1 Hz	$\pm 2 \text{ Hz}$	AC Signal from 0.3 to 30 V auto-ranging
<b>counter*</b>	0 to 10 <sup>6</sup> - 1 count	1 count		The same remark as frequency Pulses Frequency < 3000 Hz
<b>Pt-100</b>	-200 to 850 °C / -328 to 1562 °F	0.01 °C / 0.01 °F	$\pm 0.1 \text{ °C} / \pm 0.2 \text{ °F}$	IEC-751
<b>Pt-1000</b>	-200 to 400 °C / -328 to 752 °F	0.1 °C / 0.1 °F	$\pm 0.1 \text{ °C} / \pm 0.2 \text{ °F}$	IEC-751
<b>Cu-10</b>	-200 to 260 °C / -328 to 500 °F	0.1 °C / 0.1 °F	$\pm 2.0 \text{ °C} / \pm 4.0 \text{ °F}$	Minco 16-9
<b>Ni-100</b>	-60 to 250 °C / -76 to 482 °F	0.1 °C / 0.1 °F	$\pm 0.2 \text{ °C} / \pm 0.4 \text{ °F}$	DIN-43760
<b>probe**</b>	-200 to 850 °C / -328 to 1562 °F	0.01 °C / 0.01 °F	$\pm 0.1 \text{ °C} / \pm 0.2 \text{ °F}$	IEC-751
<b>TC-J</b>	-210 to 1200 °C / -346 to 2192 °F	0.1 °C / 0.1 °F	$\pm 0.2 \text{ °C} / \pm 0.4 \text{ °F}$	IEC-584
<b>TC-K</b>	-270 to -150 °C / -454 to -238 °F	0.1 °C / 0.1 °F	$\pm 0.5 \text{ °C} / \pm 1.0 \text{ °F}$	IEC-584
	-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	$\pm 0.6 \text{ °C} / \pm 1.2 \text{ °F}$	IEC-584
	-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	$\pm 2.5 \text{ °C} / \pm 5.0 \text{ °F}$	IEC-584
	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	$\pm 1.0 \text{ °C} / \pm 2.0 \text{ °F}$	IEC-584
	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	$\pm 1.0 \text{ °C} / \pm 2.0 \text{ °F}$	IEC-584
	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	$\pm 0.3 \text{ °C} / \pm 0.6 \text{ °F}$	IEC-584
	-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	$\pm 1.0 \text{ °C} / \pm 2.0 \text{ °F}$	IEC-584
	-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	$\pm 0.2 \text{ °C} / \pm 0.4 \text{ °F}$	DIN-43710
<b>TC-C</b>	0 to 1500 °C / 32 to 2732 °F	0.1 °C / 0.1 °F	$\pm 0.5 \text{ °C} / \pm 1.0 \text{ °F}$	W5Re / W26Re
	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

(\*) Accuracy valid 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	$\pm 0.02\% \text{ FS}$	$R_{\text{out}} < 0,3 \Omega$
<b>volt</b>	-0.5 to 12 V	0.0001 V	$\pm 0.02\% \text{ FS}$	$R_{\text{out}} < 0,3 \Omega$
<b>mA</b>	0 to 24 mA	0.0001 mA	$\pm 0.02\% \text{ FS}$	$R_{\text{max}} = 700 \Omega$
<b>2-wire transmitter (XTR)</b>	4 to 24 mA	0.0001 mA	$\pm 0.02\% \text{ FS}$	$V_{\text{max}} = 60 \text{ V}$
<b>resistance</b>	0 to 400 $\Omega$	0.01 $\Omega$	$\pm 0.02\% \text{ FS}$	For external excitation current of 1.0 mA
	0 to 2500 $\Omega$	0.1 $\Omega$	$\pm 0.03\% \text{ FS}$	
<b>frequency</b>	0 to 100 Hz	0.01 Hz	$\pm 0.02 \text{ Hz}$	Peak value: 22 V / 25 mA max.
	0 to 10000 Hz	1 Hz	$\pm 2 \text{ Hz}$	
<b>pulse</b>	0 to 10 <sup>5</sup> - 1 pulse	1 pulse		Peak value: 22 V / 25 mA max. Pulses frequency up to 10000 Hz
<b>Pt-100</b>	-200 to 850 °C / -328 to 1562 °F	0.01 °C / 0.01 °F	$\pm 0.2 \text{ °C} / \pm 0.4 \text{ °F}$	IEC-751
<b>Pt-1000</b>	-200 to 400 °C / -328 to 752 °F	0.1 °C / 0.1 °F	$\pm 0.1 \text{ °C} / \pm 0.2 \text{ °F}$	IEC-751
<b>Cu-10</b>	-200 to 260 °C / -328 to 500 °F	0.1 °C / 0.1 °F	$\pm 2.0 \text{ °C} / \pm 4.0 \text{ °F}$	Minco 16-9
<b>Ni-100</b>	-60 to 250 °C / -76 to 482 °F	0.1 °C / 0.1 °F	$\pm 0.2 \text{ °C} / \pm 0.4 \text{ °F}$	DIN-43760
<b>TC-J</b>	-210 to 1200 °C / -346 to 2192 °F	0.1 °C / 0.1 °F	$\pm 0.4 \text{ °C} / \pm 0.8 \text{ °F}$	IEC-584
<b>TC-K</b>	-270 to -150 °C / -454 to -238 °F	0.1 °C / 0.1 °F	$\pm 1.0 \text{ °C} / \pm 2.0 \text{ °F}$	IEC-584
	-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	$\pm 1.2 \text{ °C} / \pm 2.4 \text{ °F}$	IEC-584
	-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	$\pm 5.0 \text{ °C} / \pm 10.0 \text{ °F}$	IEC-584
	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	$\pm 2.0 \text{ °C} / \pm 4.0 \text{ °F}$	IEC-584
	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	$\pm 2.0 \text{ °C} / \pm 4.0 \text{ °F}$	IEC-584
	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	$\pm 0.6 \text{ °C} / \pm 1.2 \text{ °F}$	IEC-584
	-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	$\pm 2.0 \text{ °C} / \pm 4.0 \text{ °F}$	IEC-584
	-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	$\pm 0.4 \text{ °C} / \pm 0.8 \text{ °F}$	DIN-43710
<b>TC-C</b>	0 to 1500 °C / 32 to 2732 °F	0.1 °C / 0.1 °F	$\pm 0.5 \text{ °C} / \pm 1.0 \text{ °F}$	W5Re / W26Re
	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

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

## Hart® Communication

- NH** - No Hart® Communication
- CH** - Hart Calibrator (basic commands: zero, span, trim mA)
- FH** - Full-Hart Configurator, with DD library from FieldComm Group and one-year upgrade.

## Number of Pressure Inputs

- 0** - no pressure sensors
- 1** - one sensor
- 2** - two sensors
- 3** - three sensors
- 4** - four sensors

RANGE	Input 1	RESOLUTION	ACCURACY*	REMARKS
(0)	0 – 250 mmH <sub>2</sub> O	0.001	± 0.05 % FS*	Gage pressure
(1)	0 – 1 psi	0.0001	± 0.05 % FS	Used with air or inert gases
(2)	0 – 5 psi	0.0001	± 0.025 % FS	
(3)	0 – 15 psi	0.0001	± 0.025 % FS	Gage or absolute pressure
(4)	0 – 30 psi	0.0001	± 0.025 % FS	
(5)	0 – 100 psi	0.001	± 0.025 % FS	Used with fluids
(6)	0 – 250 psi	0.001	± 0.025 % FS	(Gases or liquids)
(7)	0 – 500 psi	0.01	± 0.025 % FS	compatible with 316 L stainless steel
(8)	0 – 1000 psi	0.01	± 0.025 % FS	
(9)	0 – 3000 psi	0.01	± 0.025 % FS	
(10)	0 – 5000 psi	0.1	± 0.025 % FS	
(11)	0 – 10000 psi	0.1	± 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)

**Pressure Type** Input 4\*\*

**Optional** (Only for version with up to three sensors)

**BR** - Barometric Reference (15 psia)

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 -15 psi to full scale of range

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:** Temperature: °C, °F, K, °R; Pressure: 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<sub>2</sub>, kgf/cm<sub>2</sub>, kgf/m<sup>2</sup>.

**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 160 mm (HxWxD).

**Weight:** Portable: 2.6 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).

### Optional accessories:

- Temperature Sensor: Probe 1/5 DIN R - Order code: 04.06.0101-21;
- Probe 1/5 DIN A - Order code: 04.06.0107-21;
- Probe 1/5 DIN A-L - Order code: 04.06.0102-21.

# PRESYS®

