PRESYS®


HART COMMUNICATION PROTOCOL

# IS Intrinsically Safe Advanced Multifunction Process Calibrator MCS-XV-IS

www.presys.com.br

# Universal Process Calibrator

# MCS-XV-IS

✓ Operates all instrumentation signals: electrical, temperature, frequency and pressure.

✓ Up to two pressure sensors from 250 $mmH_2O$ to 10,000 psi.

✓ Optional Barometric Reference.

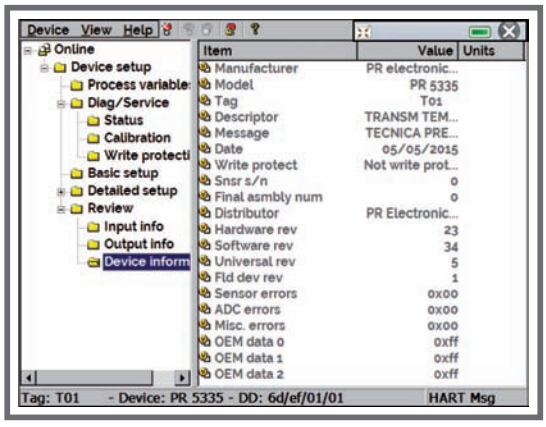


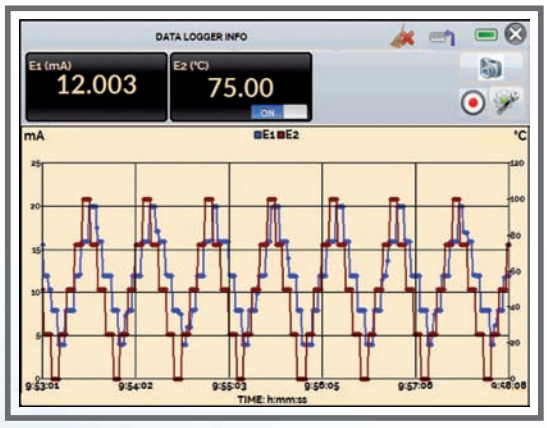
✓ Touch Screen display provides easy-to-read data and showing 2 simultaneous variables.

✓ Intuitive menu navigation helps in identifying calibrator information for any operational mode.

✓ Full Hart configurator (optional), which configures all available HART® devices, with DD library from FieldComm Group.

✓ 15 Vdc power supply for 2-wire transmitters, 250 Ω internal resistor configurable.

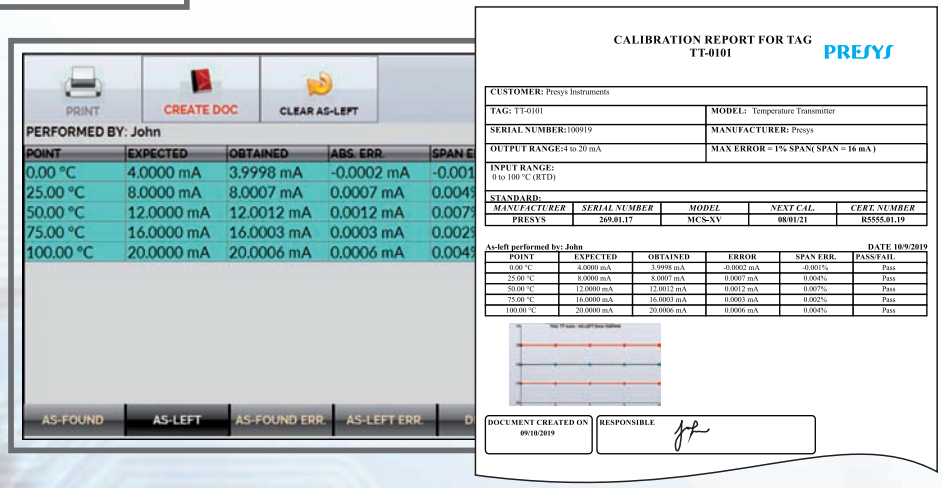



✓ Data Logger function for data acquisition and graphical visualization.

✓ 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.



# Technical Specifications

## Specifications - Inputs

### Input Ranges

| | | Resolution | Accuracy | Remarks |
|---|---|---|---|---|
| **milivolt** | -150 mV to 150 mV | 0.001 mV | ± 0.01 % FS *** | $R_{input}$ > 10 MΩ |
| | 150 mV to 2450 mV | 0.01m V | ± 0.02 % FS | auto-range |
| **volt** | -0,5 V to 11 V | 0.0001 V | ± 0.02 % FS | $R_{input}$ > 1 MΩ |
| | 11 V to 30 V | 0.0001 V | ± 0.02 % FS | |
| **mA** | -5 mA to 24.5 mA | 0.0001 mA | ± 0.01 % FS | $R_{input}$ < 120 Ω |
| **frequency*** | 0 to 600 Hz | 0.01 Hz | ± 0.04 Hz | $R_{input}$ > 50 kΩ |
| | 600 to 1300 Hz | 0.1 Hz | ± 0.2 Hz | Voltage DC $_{imaximum}$ = 30 V |
| | 1300 to 5000 Hz | 1 Hz | ± 2 Hz | AC Signal from 0.3 to 30 V auto-ranging |
| **counter*** | 0 to $10^8$-1 count | 1 count | _____ | Same remark as frequency<br>Pulse Frequency < 3000 Hz |
| **resistance** | 0 to 400 Ω | 0.01 Ω | ± 0.01 % FS | Excitation current 0.85 mA, |
| | 400 to 2050 Ω | 0.01 Ω | ± 0.03 % FS | auto-ranging |
| **Pt-100** | -200 to 850 °C / -328 to 1562 °F | 0.01 °C / 0.01 °F | ± 0.1 °C / ± 0.2 °F | IEC-60751 |
| **Pt-1000** | -200 to 280 °C / -328 to 536 °F | 0.1 °C / 0.1 °F | ± 0.1 °C / ± 0.2 °F | IEC-60751 |
| **Cu-10** | -200 to 260 °C / -328 to 500 °F | 0.1 °C / 0.1 °F | ± 2.0 °C / ± 4.0 °F | MINCO 16-9 |
| **Ni-100** | -60 to 250 °C / -76 to 482 °F | 0.1 °C / 0.1 °F | ± 0.2 °C / ± 0.4 °F | DIN-43760 |
| **probe**** | -200 to 850 °C / -328 to 1562 °F | 0.01 °C / 0.01 °F | ± 0.1 °C / ± 0.2 °F | IEC-60751 |
| **TC-J** | -210 to 1200 °C / -346 to 2192 °F | 0.1 °C / 0.1 °F | ± 0.2 °C / ± 0.4 °F | IEC-60584 |
| **TC-K** | -270 to -150 °C / -454 to -238 °F | 0.1 °C / 0.1 °F | ± 0.5 °C / ± 1.0 °F | IEC-60584 |
| | -150 to 1370 °C / -238 to 2498 °F | 0.1 °C / 0.1 °F | ± 0.2 °C / ± 0.4 °F | |
| **TC-T** | -260 to -200 °C / -436 to -328 °F | 0.1 °C / 0.1 °F | ± 0.6 °C / ± 1.2 °F | IEC-60584 |
| | -200 to -75 °C / -328 to -103 °F | 0.1 °C / 0.1 °F | ± 0.4 °C / ± 0.8 °F | |
| | -75 to 400 °C / -103 to 752 °F | 0.1 °C / 0.1 °F | ± 0.2 °C / ± 0.4 °F | |
| **TC-B** | 50 to 250 °C / 122 to 482 °F | 0.1 °C / 0.1 °F | ± 2.5 °C / ± 5.0 °F | IEC-60584 |
| | 250 to 500 °C / 482 to 932 °F | 0.1 °C / 0.1 °F | ± 1.5 °C / ± 3.0 °F | |
| | 500 to 1200 °C / 932 to 2192 °F | 0.1 °C / 0.1 °F | ± 1.0 °C / ± 2.0 °F | |
| | 1200 to 1820 °C / 2192 to 3308 °F | 0.1 °C / 0.1 °F | ± 0.7 °C / ± 1.4 °F | |
| **TC-R** | -50 to 300 °C / -58 to 572 °F | 0.1 °C / 0.1 °F | ± 1.0 °C / ± 2.0 °F | IEC-60584 |
| | 300 to 1760 °C / 572 to 3200 °F | 0.1 °C / 0.1 °F | ± 0.7 °C / ± 1.4 °F | |
| **TC-S** | -50 to 300 °C / -58 to 572 °F | 0.1 °C / 0.1 °F | ± 1.0 °C / ± 2.0 °F | IEC-60584 |
| | 300 to 1760 °C / 572 to 3200 °F | 0.1 °C / 0.1 °F | ± 0.7 °C / ± 1.4 °F | |
| **TC-E** | -270 to -150 °C / -454 to -238 °F | 0.1 °C / 0.1 °F | ± 0.3 °C / ± 0.6 °F | IEC-60584 |
| | -150 to 1000 °C / -238 to 1832 °F | 0.1 °C / 0.1 °F | ± 0.1 °C / ± 0.2 °F | |
| **TC-N** | -260 to -200 °C / -436 to - 328 °F | 0.1 °C / 0.1 °F | ± 1.0 °C / ± 2.0 °F | IEC-60584 |
| | -200 to -20 °C / -328 to -4 °F | 0.1 °C / 0.1 °F | ± 0.4 °C / ± 0.8 °F | |
| | -20 to 1300 °C / -4 to 2372 °F | 0.1 °C / 0.1 °F | ± 0.2 °C / ± 0.4 °F | |
| **TC-L** | -200 to 900 °C / -328 to 1652 °F | 0.1 °C / 0.1 °F | ± 0.2 °C / ± 0.4 °F | DIN-43710 |
| **TC-C** | 0 to1500 °C / 32 to 2732 °F | 0.1 °C / 0.1 °F | ± 0.5 °C / ± 1.0 °F | W5Re / W26Re |
| | 1500 to 2320 °C / 2732 to 4208 °F | 0.1 °C / 0.1 °F | ± 0.7 °C / ± 1.4 °F | W5Re / W26Re |

(*) Accuracy since frequency output is not configured. (**) Probe is a spare input for a reference RTD in order to use as standard thermometer.
The accuracy is related to calibrator only. (***) FS = Full Scale.

## Specifications - Output

### Output Ranges

| | | Resolution | Accuracy | Remarks |
|---|---|---|---|---|
| **milivolt** | -10 mV to 110 mV | 0.001 mV | ± 0.02 % FS | $R_{output}$ < 0.3 Ω |
| **volt** | -0.5 V to 12 V | 0.0001 V | ± 0.02 % FS | $R_{output}$ < 0.3 Ω |
| **mA** | 0 to 24 mA | 0.0001 mA | ± 0.02 % FS | $R_{maximum}$ = 250 Ω |
| **Two-wire transmitter (XTR)** | 4 to 24 mA | 0.0001 mA | ± 0.02 % FS | $V_{maximum}$ = 60 V |
| **frequency** | 0 to 100 Hz | 0.01 Hz | ± 0.02 Hz | Peak Value: 22 V / 25 mA max. |
| | 0 to 10000 Hz | 1 Hz | ± 2 Hz | |
| **pulse** | 0 to $10^8$-1 pulse | 1 pulse | _____ | Peak Value: 22 V / 25 mA max.<br>Pulse Frequency up to 10000 Hz |
| **resistance** | 0 to 400 Ω | 0.01 Ω | ± 0.02 % FS | For external excitation current of 1 mA |
| | 0 to 2500 Ω | 0.1 Ω | ± 0.03 % FS | |
| **Pt-100** | -200 to 850 °C / -328 to 1562 °F | 0.01 °C / 0.01 °F | ± 0.2 °C / ± 0.4 °F | IEC-60751 |
| **Pt-1000** | -200 to 400 °C / -328 to 752 °F | 0.1 °C / 0.1 °F | ± 0.1 °C / ± 0.2 °F | IEC-60751 |
| **Cu-10** | -200 to 260 °C / -328 to 500 °F | 0.1 °C / 0.1 °F | ± 2.0 °C / ± 4.0 °F | MINCO 16-9 |
| **Ni-100** | -60 to 250 °C / -76 to 482 °F | 0.1 °C / 0.1 °F | ± 0.2 °C / ± 0.4 °F | DIN-43760 |
| **TC-J** | -210 to 1200 °C / -346 to 2192 °F | 0.1 °C / 0.1 °F | ± 0.4 °C / ± 0.8 °F | IEC-60584 |
| **TC-K** | -270 to -150 °C / -454 to -238 °F | 0.1 °C / 0.1 °F | ± 1.0 °C / ± 2.0 °F | IEC-60584 |
| | -150 to 1370 °C / -238 to 2498 °F | 0.1 °C / 0.1 °F | ± 0.4 °C / ± 0.8 °F | |
| **TC-T** | -260 to -200 °C / -436 to -328 °F | 0.1 °C / 0.1 °F | ± 1.2 °C / ± 2.4 °F | IEC-60584 |
| | -200 to -75 °C / -328 to -103 °F | 0.1 °C / 0.1 °F | ± 0.8 °C / ± 1.6 °F | |
| | -75 to 400 °C / -103 to 752 °F | 0.1 °C / 0.1 °F | ± 0.4 °C / ± 0.8 °F | |
| **TC-B** | 50 to 250 °C / 122 to 482 °F | 0.1 °C / 0.1 °F | ± 5.0 °C / ± 10.0 °F | IEC-60584 |
| | 250 to 500 °C / 482 to 932 °F | 0.1 °C / 0.1 °F | ± 3.0 °C / ± 6.0 °F | |
| | 500 to 1200 °C / 932 to 2192 °F | 0.1 °C / 0.1 °F | ± 2.0 °C / ± 4.0 °F | |
| | 1200 to 1820 °C / 2192 to 3308 °F | 0.1 °C / 0.1 °F | ± 1.4 °C / ± 2.8 °F | |
| **TC-R** | -50 to 300 °C / -58 to 572 °F | 0.1 °C / 0.1 °F | ± 2.0 °C / ± 4.0 °F | IEC-60584 |
| | 300 to 1760 °C / 572 to 3200 °F | 0.1 °C / 0.1 °F | ± 1.4 °C / ± 2.8 °F | |
| **TC-S** | -50 to 300 °C / -58 to 572 °F | 0.1 °C / 0.1 °F | ± 2.0 °C / ± 4.0 °F | IEC-60584 |
| | 300 to 1760 °C / 572 to 3200 °F | 0.1 °C / 0.1 °F | ± 1.4 °C / ± 2.8 °F | |
| **TC-E** | -270 to -150 °C / -454 to -238 °F | 0.1 °C / 0.1 °F | ± 0.6 °C / ± 1.2 °F | IEC-60584 |
| | -150 to 1000 °C / -238 to 1832 °F | 0.1 °C / 0.1 °F | ± 0.2 °C / ± 0.4 °F | |
| **TC-N** | -260 to -200 °C / -436 to -328 °F | 0.1 °C / 0.1 °F | ± 2.0 °C / ± 4.0 °F | IEC-60584 |
| | -200 to -20 °C / -328 to -4 °F | 0.1 °C / 0.1 °F | ± 0.8 °C / ± 1.6 °F | |
| | -20 to 1300 °C / -4 to 2372 °F | 0.1 °C / 0.1 °F | ± 0.4 °C / ± 0.8 °F | |
| **TC-L** | -200 to 900 °C / -328 to 1652 °F | 0.1 °C / 0.1 °F | ± 0.4 °C / ± 0.8 °F | DIN-43710 |
| **TC-C** | 0 to 1500 °C / 32 to 2732 °F | 0.1 °C / 0.1 °F | ± 1.0 °C / ± 2.0 °F | W5Re / W26Re |
| | 1500 to 2320 °C / 2732 to 4208 °F | 0.1 °C / 0.1 °F | ± 1.4 °C / ± 2.8 °F | W5Re / W26Re |

The accuracy is given for the MCS-XV-IS only. Accuracy values are valid within one year and temperature range of 20 to 26 °C. Outside these limits add 0.001 % FS / °C, taking 23 °C as t he reference temperature. For thermocouples using the internal cold junction compensation add a cold junction compensation error of ± 0.2 °C or ± 0.4 °F.

# Order Code

**MCS-XV-IS** – □ – □ – □ – □ – □ – □

**Model**
**MCS-XV-IS** - Calibrator MCS-XV-IS Portable

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

**Number os Pressure Inputs**
**0** - no pressure sensors
**1** - one sensor
**2** - two sensors

| RANGE Input 1 | RESOLUTION | ACCURACY* | REMARKS |
|---|---|---|---|
| (0) 25 mbar | 0.0001 | ± 0.05 % FS* | Gauge pressure Used with air or inert gases |
| (1) 70 mbar | 0.001 | ± 0.05 % FS | |
| (2) 350 mbar | 0.01 | ± 0.025 % FS | |
| (3) 1 bar | 0.00001 | ± 0.025 % FS | Gauge or absolute pressure Used with fluids (Gases or liquids) compatible with 316 L stainless steel |
| (4) 2 bar | 0.00001 | ± 0.025 % FS | |
| (5) 7 bar | 0.0001 | ± 0.025 % FS | |
| (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)
**G - Gauge** (Ranges 0 to 11)
**V - Vacuum** (Only for range 3)
**C - Compound***** (Only for ranges 3 to 8)
**D - Differential****** (Only for ranges 0 to 2)

**RANGE** Input 2** (Only for version with two sensors or more)

**Pressure Type** Input 2**

(*) Percentage of full scale (**) Same code as input 1
(***) From -1 bar to full scale of range (****) The differential sensor ocupies 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:** Pressure: psi, bar, mbar, MPa, kPa, hPa, Pa, atm, at, $mmH_2O$, $mmH_2O$@4°C, $cmH_2O$, $cmH_2O$@4°C, $mH_2O$, $mH_2O$@4°C, $ftH_2O$, $ftH_2O$@4°C, $inH_2O$, $inH_2O$@4°C, $inH_2O$@60°F, torr, mmHg, mmHg@0°C, cmHg, cmHg@0°C, inHg, inHg@0°C, inHg@60°F, $gf/cm^2$, $kgf/cm^2$, $kgf/m^2$. 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:** 137 mm x 227 mm x 73 mm (HxWxD)

**Weight:** 2.7 kg.

**Warranty:** 1 year.
**Battery autonomy:** 8 hours.

**Included accessories:**
- Technical manual;
- Bag;
- Set of test leads;
- Charger 100 - 240 Vac 50/60Hz;
- USB Cable / Touch Screen Pen.
- USB Wi-Fi Adapter - Order code: 06.04.0004-00.

Safety
INMETRO OCP 0034
Ex ia IIC T4 Ga
NCC 12.1094X

**Group IIC, Zone 0 / Ex ia IIC T4 Ga**

PRESYS®

CAL 0193

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