

IS Intrinsically Safe UNIVERSAL CALIBRATOR FOR INSTRUMENTATION MCS-12-IS

Group IIC, Zone 0 / Ex ia IIC T4 Ga



- ✓ Intrinsically safe Universal Process Calibrator Certified Ex ia IIC T4 Ga for usage in Ex-hazardous areas Zones 0,1 and 2.
- ✓ Portable, compact, powered by rechargeable batteries.
- ✓ Measures and generates mA, mV, volts, ohms, RTD, TC and Hz.
- ✓ Simultaneous input and output operation.
- ✓ 12 Vcc/ 30 mA Power supply for 2-wire transmitters.
- ✓ Includes input for optional temperature probe.
- ✓ Callendar-Van Dunsen coefficients for Probe input.

PRESYS[®]
Instrumentos e Sistemas

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EF0711-00

Specifications - Inputs

Input Ranges	Resolution	Accuracy	Remarks	
millivolt	-150 mV to 150 mV 150 mV to 2450 mV	0.001 mV 0.01 mV	$\pm 0.01\% \text{ FS}^{***}$ $\pm 0.02\% \text{ FS}$	$R_{\text{input}} > 10 \text{ M}\Omega$ auto-range
volt	-10 V to 11 V 11 V to 45 V	0.0001 V 0.0001 V	$\pm 0.02\% \text{ FS}$ $\pm 0.02\% \text{ FS}$	$R_{\text{input}} > 1 \text{ M}\Omega$
mA	-5 mA to 24.5 mA	0.0001 mA	$\pm 0.02\% \text{ FS}$	$R_{\text{input}} < 100 \Omega$
frequency*	0 to 600 Hz 600 to 1300 Hz 1300 to 10000 Hz	0.01 Hz 0.1 Hz 1 Hz	$\pm 0.02 \text{ Hz}$ $\pm 0.2 \text{ Hz}$ $\pm 2 \text{ Hz}$	$R_{\text{input}} > 50 \text{ k}\Omega$ Voltage DC $V_{\text{maximum}} = 30 \text{ V}$ AC Signal from 1.5 to 30 V auto-range
counter*	0 to 10^5-1 count	1 count	-----	Same remark as frequency Pulse Frequency $< 3000 \text{ Hz}$
resistance	0 to 400 Ω 400 to 2500 Ω	0.01 Ω 0.01 Ω	$\pm 0.01\% \text{ FS}$ $\pm 0.03\% \text{ FS}$	Excitation current 0.31 mA, auto-range
Pt-100	-200 to 850 $^{\circ}\text{C} / -328$ to 1562 $^{\circ}\text{F}$	0.01 $^{\circ}\text{C} / 0.01$ $^{\circ}\text{F}$	± 0.1 $^{\circ}\text{C} / \pm 0.2$ $^{\circ}\text{F}$	IEC-60751
Pt-1000	-200 to 400 $^{\circ}\text{C} / -328$ to 752 $^{\circ}\text{F}$	0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$	± 0.1 $^{\circ}\text{C} / \pm 0.2$ $^{\circ}\text{F}$	IEC-60751
Cu-10	-200 to 260 $^{\circ}\text{C} / -328$ to 500 $^{\circ}\text{F}$	0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$	± 2.0 $^{\circ}\text{C} / \pm 4.0$ $^{\circ}\text{F}$	MINCO 16-9
Ni-100	-60 to 250 $^{\circ}\text{C} / -76$ to 482 $^{\circ}\text{F}$	0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$	± 0.2 $^{\circ}\text{C} / \pm 0.4$ $^{\circ}\text{F}$	DIN-43760
probe**	-200 to 850 $^{\circ}\text{C} / -328$ to 1562 $^{\circ}\text{F}$	0.01 $^{\circ}\text{C} / 0.01$ $^{\circ}\text{F}$	± 0.1 $^{\circ}\text{C} / \pm 0.2$ $^{\circ}\text{F}$	IEC-60751
TC-J	-210 to 1200 $^{\circ}\text{C} / -346$ to 2192 $^{\circ}\text{F}$	0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$	± 0.2 $^{\circ}\text{C} / \pm 0.4$ $^{\circ}\text{F}$	IEC-60584
TC-K	-270 to -150 $^{\circ}\text{C} / -454$ to -238 $^{\circ}\text{F}$ -150 to 1370 $^{\circ}\text{C} / -238$ to 2498 $^{\circ}\text{F}$	0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$ 0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$	± 0.5 $^{\circ}\text{C} / \pm 1.0$ $^{\circ}\text{F}$ ± 0.2 $^{\circ}\text{C} / \pm 0.4$ $^{\circ}\text{F}$	IEC-60584
TC-T	-260 to -200 $^{\circ}\text{C} / -436$ to -328 $^{\circ}\text{F}$ -200 to -75 $^{\circ}\text{C} / -328$ to -103 $^{\circ}\text{F}$ -75 to 400 $^{\circ}\text{C} / -103$ to 752 $^{\circ}\text{F}$	0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$ 0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$ 0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$	± 0.6 $^{\circ}\text{C} / \pm 1.2$ $^{\circ}\text{F}$ ± 0.4 $^{\circ}\text{C} / \pm 0.8$ $^{\circ}\text{F}$ ± 0.2 $^{\circ}\text{C} / \pm 0.4$ $^{\circ}\text{F}$	IEC-60584
TC-B	50 to 250 $^{\circ}\text{C} / 122$ to 482 $^{\circ}\text{F}$ 250 to 500 $^{\circ}\text{C} / 482$ to 932 $^{\circ}\text{F}$ 500 to 1200 $^{\circ}\text{C} / 932$ to 2192 $^{\circ}\text{F}$ 1200 to 1820 $^{\circ}\text{C} / 2192$ to 3308 $^{\circ}\text{F}$	0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$ 0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$ 0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$ 0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$	± 2.5 $^{\circ}\text{C} / \pm 5.0$ $^{\circ}\text{F}$ ± 1.5 $^{\circ}\text{C} / \pm 3.0$ $^{\circ}\text{F}$ ± 1.0 $^{\circ}\text{C} / \pm 2.0$ $^{\circ}\text{F}$ ± 0.7 $^{\circ}\text{C} / \pm 1.4$ $^{\circ}\text{F}$	IEC-60584
TC-R	-50 to 300 $^{\circ}\text{C} / -58$ to 572 $^{\circ}\text{F}$ 300 to 1760 $^{\circ}\text{C} / 572$ to 3200 $^{\circ}\text{F}$	0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$ 0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$	± 1.0 $^{\circ}\text{C} / \pm 2.0$ $^{\circ}\text{F}$ ± 0.7 $^{\circ}\text{C} / \pm 1.4$ $^{\circ}\text{F}$	IEC-60584
TC-S	-50 to 300 $^{\circ}\text{C} / -58$ to 572 $^{\circ}\text{F}$ 300 to 1760 $^{\circ}\text{C} / 572$ to 3200 $^{\circ}\text{F}$	0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$ 0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$	± 1.0 $^{\circ}\text{C} / \pm 2.0$ $^{\circ}\text{F}$ ± 0.7 $^{\circ}\text{C} / \pm 1.4$ $^{\circ}\text{F}$	IEC-60584
TC-E	-270 to -150 $^{\circ}\text{C} / -454$ to -238 $^{\circ}\text{F}$ -150 to 1000 $^{\circ}\text{C} / -238$ to 1832 $^{\circ}\text{F}$	0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$ 0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$	± 0.3 $^{\circ}\text{C} / \pm 0.6$ $^{\circ}\text{F}$ ± 0.1 $^{\circ}\text{C} / \pm 0.2$ $^{\circ}\text{F}$	IEC-60584
TC-N	-260 to -200 $^{\circ}\text{C} / -436$ to -328 $^{\circ}\text{F}$ -200 to -20 $^{\circ}\text{C} / -328$ to -4 $^{\circ}\text{F}$ -20 to 1300 $^{\circ}\text{C} / -4$ to 2372 $^{\circ}\text{F}$	0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$ 0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$ 0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$	± 1.0 $^{\circ}\text{C} / \pm 2.0$ $^{\circ}\text{F}$ ± 0.4 $^{\circ}\text{C} / \pm 0.8$ $^{\circ}\text{F}$ ± 0.2 $^{\circ}\text{C} / \pm 0.4$ $^{\circ}\text{F}$	IEC-60584
TC-L	-200 to 900 $^{\circ}\text{C} / -328$ to 1652 $^{\circ}\text{F}$	0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$	± 0.2 $^{\circ}\text{C} / \pm 0.4$ $^{\circ}\text{F}$	DIN-43710
TC-C	0 to 1500 $^{\circ}\text{C} / 32$ to 2732 $^{\circ}\text{F}$ 1500 to 2320 $^{\circ}\text{C} / 2732$ to 4208 $^{\circ}\text{F}$	0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$ 0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$	± 0.5 $^{\circ}\text{C} / \pm 1.0$ $^{\circ}\text{F}$ ± 0.7 $^{\circ}\text{C} / \pm 1.4$ $^{\circ}\text{F}$	W5Re / W26Re 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	
millivolt	-10 mV to 110 mV	0.001 mV	$\pm 0.02\% \text{ FS}$	$R_{\text{output}} < 0.3 \Omega$
volt	-0.5 V to 12 V	0.0001 V	$\pm 0.02\% \text{ FS}$	$R_{\text{output}} < 0.3 \Omega$
mA	0 to 24 mA	0.0001 mA	$\pm 0.02\% \text{ FS}$	$R_{\text{maximum}} = 400 \Omega$
Two-wire transmitter (XTR)	4 to 24 mA	0.0001 mA	$\pm 0.02\% \text{ FS}$	$V_{\text{maximum}} = 30 \text{ V}$
frequency	0 to 100 Hz 0 to 10000 Hz	0.01 Hz 1 Hz	$\pm 0.02 \text{ Hz}$ $\pm 2 \text{ Hz}$	Peak Value: 12 V / 25 mA max.
pulse	0 to 10^5-1 pulse	1 pulse	-----	Peak Value: 12 V / 25 mA max. Pulse Frequency up to 10000 Hz For external excitation current of 1 mA
resistance	0 to 400 Ω 0 to 2500 Ω	0.01 Ω 0.1 Ω	$\pm 0.02\% \text{ FS}$ $\pm 0.03\% \text{ FS}$	
Pt-100	-200 to 850 $^{\circ}\text{C} / -328$ to 1562 $^{\circ}\text{F}$	0.01 $^{\circ}\text{C} / 0.01$ $^{\circ}\text{F}$	± 0.2 $^{\circ}\text{C} / \pm 0.4$ $^{\circ}\text{F}$	IEC-60751
Pt-1000	-200 to 400 $^{\circ}\text{C} / -328$ to 752 $^{\circ}\text{F}$	0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$	± 0.1 $^{\circ}\text{C} / \pm 0.2$ $^{\circ}\text{F}$	IEC-60751
Cu-10	-200 to 260 $^{\circ}\text{C} / -328$ to 500 $^{\circ}\text{F}$	0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$	± 2.0 $^{\circ}\text{C} / \pm 4.0$ $^{\circ}\text{F}$	MINCO 16-9
Ni-100	-60 to 250 $^{\circ}\text{C} / -76$ to 482 $^{\circ}\text{F}$	0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$	± 0.2 $^{\circ}\text{C} / \pm 0.4$ $^{\circ}\text{F}$	DIN-43760
TC-J	-210 to 1200 $^{\circ}\text{C} / -346$ to 2192 $^{\circ}\text{F}$	0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$	± 0.4 $^{\circ}\text{C} / \pm 0.8$ $^{\circ}\text{F}$	IEC-60584
TC-K	-270 to -150 $^{\circ}\text{C} / -454$ to -238 $^{\circ}\text{F}$ -150 to 1370 $^{\circ}\text{C} / -238$ to 2498 $^{\circ}\text{F}$	0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$ 0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$	± 1.0 $^{\circ}\text{C} / \pm 2.0$ $^{\circ}\text{F}$ ± 0.4 $^{\circ}\text{C} / \pm 0.8$ $^{\circ}\text{F}$	IEC-60584
TC-T	-260 to -200 $^{\circ}\text{C} / -436$ to -328 $^{\circ}\text{F}$ -200 to -75 $^{\circ}\text{C} / -328$ to -103 $^{\circ}\text{F}$ -75 to 400 $^{\circ}\text{C} / -103$ to 752 $^{\circ}\text{F}$	0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$ 0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$ 0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$	± 1.2 $^{\circ}\text{C} / \pm 2.4$ $^{\circ}\text{F}$ ± 0.8 $^{\circ}\text{C} / \pm 1.6$ $^{\circ}\text{F}$ ± 0.4 $^{\circ}\text{C} / \pm 0.8$ $^{\circ}\text{F}$	IEC-60584
TC-B	50 to 250 $^{\circ}\text{C} / 122$ to 482 $^{\circ}\text{F}$ 250 to 500 $^{\circ}\text{C} / 482$ to 932 $^{\circ}\text{F}$ 500 to 1200 $^{\circ}\text{C} / 932$ to 2192 $^{\circ}\text{F}$ 1200 to 1820 $^{\circ}\text{C} / 2192$ to 3308 $^{\circ}\text{F}$	0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$ 0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$ 0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$ 0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$	± 5.0 $^{\circ}\text{C} / \pm 10.0$ $^{\circ}\text{F}$ ± 3.0 $^{\circ}\text{C} / \pm 6.0$ $^{\circ}\text{F}$ ± 2.0 $^{\circ}\text{C} / \pm 4.0$ $^{\circ}\text{F}$ ± 1.4 $^{\circ}\text{C} / \pm 2.8$ $^{\circ}\text{F}$	IEC-60584
TC-R	-50 to 300 $^{\circ}\text{C} / -58$ to 572 $^{\circ}\text{F}$ 300 to 1760 $^{\circ}\text{C} / 572$ to 3200 $^{\circ}\text{F}$	0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$ 0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$	± 2.0 $^{\circ}\text{C} / \pm 4.0$ $^{\circ}\text{F}$ ± 1.4 $^{\circ}\text{C} / \pm 2.8$ $^{\circ}\text{F}$	IEC-60584
TC-S	-50 to 300 $^{\circ}\text{C} / -58$ to 572 $^{\circ}\text{F}$ 300 to 1760 $^{\circ}\text{C} / 572$ to 3200 $^{\circ}\text{F}$	0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$ 0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$	± 2.0 $^{\circ}\text{C} / \pm 4.0$ $^{\circ}\text{F}$ ± 1.4 $^{\circ}\text{C} / \pm 2.8$ $^{\circ}\text{F}$	IEC-60584
TC-E	-270 to -150 $^{\circ}\text{C} / -454$ to -238 $^{\circ}\text{F}$ -150 to 1000 $^{\circ}\text{C} / -238$ to 1832 $^{\circ}\text{F}$	0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$ 0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$	± 0.6 $^{\circ}\text{C} / \pm 1.2$ $^{\circ}\text{F}$ ± 0.2 $^{\circ}\text{C} / \pm 0.4$ $^{\circ}\text{F}$	IEC-60584
TC-N	-260 to -200 $^{\circ}\text{C} / -436$ to -328 $^{\circ}\text{F}$ -200 to -20 $^{\circ}\text{C} / -328$ to -4 $^{\circ}\text{F}$ -20 to 1300 $^{\circ}\text{C} / -4$ to 2372 $^{\circ}\text{F}$	0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$ 0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$ 0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$	± 2.0 $^{\circ}\text{C} / \pm 4.0$ $^{\circ}\text{F}$ ± 0.8 $^{\circ}\text{C} / \pm 1.6$ $^{\circ}\text{F}$ ± 0.4 $^{\circ}\text{C} / \pm 0.8$ $^{\circ}\text{F}$	IEC-60584
TC-L	-200 to 900 $^{\circ}\text{C} / -328$ to 1652 $^{\circ}\text{F}$	0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$	± 0.4 $^{\circ}\text{C} / \pm 0.8$ $^{\circ}\text{F}$	DIN-43710
TC-C	0 to 1500 $^{\circ}\text{C} / 32$ to 2732 $^{\circ}\text{F}$ 1500 to 2320 $^{\circ}\text{C} / 2732$ to 4208 $^{\circ}\text{F}$	0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$ 0.1 $^{\circ}\text{C} / 0.1$ $^{\circ}\text{F}$	± 1.0 $^{\circ}\text{C} / \pm 2.0$ $^{\circ}\text{F}$ ± 1.4 $^{\circ}\text{C} / \pm 2.8$ $^{\circ}\text{F}$	W5Re / W26Re W5Re / W26Re

Accuracy values are valid within one year and temperature range of 20 to 26 $^{\circ}\text{C}$. Outside these limits add 0.001 % FS / $^{\circ}\text{C}$, taking 23 $^{\circ}\text{C}$ as the reference temperature. For thermocouples using the internal cold junction compensation add a cold junction compensation error of ± 0.2 $^{\circ}\text{C}$ or ± 0.4 $^{\circ}\text{F}$.

Serial Communication: Modbus® RTU Protocol (RS-232/RS-485).

Dimensions: 140 mm x 225 mm x 80 mm (HxWxD).

Warranty: 1 year, except for rechargeable battery.

Included Items: carrying case, test leads, manual and battery charger.

Optional Accessories:

Temperature Sensors:

1/5 DIN-R Probe - Order Code: 04.06.0001-21;

1/5 DIN-A Probe - Order Code: 04.06.0007-21;

1/5 DIN-A-L Probe - Order Code: 04.06.0002-21;

Communication Interface - Order Code: 06.02.0007-00.