UNICAL

PRECISION CALIBRATORS FOR THERMOCOUPLES, RTD'S, RESISTANCE, mV, V AND mA

UniCal Precision Calibrators come in four models, all of which offer programmable scale factors, engineering units, quick-step simulation procedures, and averaging. Output values are easily set digitally via the tactile keypad. Input fuse protection prevents damage from inappropriate connections. The units are made to last with rugged shock resistant cases and an internal metal coating for shielding.

The UniCal series is our best selling single function calibrator. With advanced functions, better accuracy and simple operation, there is no better value on the market.



KEY FEATURES

- **Source and Measure**
- **0.04% of Reading**
- **Program Storage for Common Calibrations**
- **Alkaline or Rechargeable NiCd Powered Units**
- **Digital Interface**
- **Advanced Input and Output Protection**

UniCal RTD+

- Basic accuracy 0.04% of reading
- Measure and simulate 14 RTD types and resistance
- Single value, multi-step or continuous ramp/soak simulation
- Programmable scale factor and averaging
- Selectable temperature scale (IPTS68 & ITS90)

UniCal TC+

- Basic 0.04% of reading accuracy, 0.1°F/C resolution
- Source or measure all DIN, JIS, or IEC thermocouples plus mV
- Program and store up to seven simulation programs using up to sixty values enabling quick calibrations
- Fast internal or external cold junction compensation
- Selectable temperature scale (IPTS68 & ITS90)

UniCal V and UniCal mA

- Measurement and simulation on passive or active external loops
- Electrical and technical unit (%) indication
- Average, scale factor, square root and technical unit conversion algorithms
- Unical V: 0 to 10V
  Unical mA: 0 to 22 mA

ORDERING INFORMATION

UNICAL TC+	Unical thermocouple simulator & measurement
UNICAL RTD+	Unical RTD simulator & measurement
UNICAL mA+	Unical milliamp simulator & measurement
UNICAL V+	Unical voltage simulator & measurement

UNICAL GENERAL SPECIFICATIONS

COMMON MODE REJECTION	>130 dB at 50/60 Hz
NORMAL MODE REJECTION	>60 dB at 50/60 Hz
DISPLAY	High contrast dot matrix LCD display
BATTERY LIFE	>16 hours continuous operation in measurement mode
SCALE FACTOR	Zero and span programmable within -10000 and +10000
SQUARE ROOT	In combination with scale factor (display limits 0 and 2500)
WORKING TEMPERATURE LIMITS	-5 to 50°C
STORING TEMPERATURE	-20 to 60°C
CASE	ABS injection molding with internal metal coating for EMC compliance
EXTERNAL DIMENSIONS	4.7 x 2.4 x 9 in. (120 x 60 x 230 mm)
WEIGHT	net 1.8 lb. (0.8 kg). Gross with packing 2.6 lb. (1.2 kg)

UNICAL RTD+ SPECIFICATIONS

INPUT TYPES	RANGES	RESOLUTION	ACCURACY(%RDG)*
PT100 (α=3850/3926/3910)	-328 to 1562°F (-200 to 850°C)	0.1°F (0.1°C)	±[0.04% +0.18°F (0.1°C)]
PT100 (α=3902)	-328 to 1202°F (-200 to 650°C)	0.1°F (0/1°C)	±[0.04% +0.18°F(0.1°C)]
PT100 (α=3923/3916)	-328 to 1112°F (-200 to 600°C)	0.1°F (0.1°C)	±[0.04% +0.36°F(0.2°C)]
NI100 (α=617)	-76 to 356°F (-60 to 180°C)	0.1°F (0.1°C)	±[0.04% +0.36°F(0.2°C)]
NI120 (α=672)	32 to 302°F (0 to 150°C)	0.1°F (0.1°C)	±[0.04% +0.54°F(0.3°C)]
CU10 (α=42)	-94 to 302°F (-70 to 150°C)	1°F (1°C)	±[0.04% +0.54°F(0.3°C)]
CU100 (α=42)	-292 to 302°F (-180 to 150°C)	0.1°F (0.1°C)	±[0.04% +0.18°F (0.1°C)]
PT200 (α=3850)	-328 to 1562°F (-200 to 760°C)	0.1°F (0.1°C)	±[0.04% +0.18°F (0.1°C)]
PT500/1000 (α=3850/3910)	-328 to 1562°F (-200 to 850°C)	0.1°F (0/1°C)	±[0.04% +0.18°F (0.1°C)]
Ω IN	0 to 300Ω 0 to 400Ω 20 to 3000Ω 20 to 4000Ω	10mΩ 0.01Ω 0.1Ω 1Ω	±0.04% +27mΩ ±0.04% +27mΩ ±0.04% +270mΩ ±0.04% +270mΩ
Ω OUT	0 to 300Ω 0 to 400Ω 20 to 3000Ω 20 to 4000Ω	10mΩ 0.01Ω 0.1Ω 1Ω	±0.04% +35mΩ ±0.04% +35mΩ ±0.04% +350mΩ ±0.04% +350mΩ
SIMULATION EXCITATION CURRENT	0.3 to 3 mA (up to 400Ω) 0.03 to 0.3 mA (up to 4000Ω)		
MEASUREMENT EXCITATION CURRENT	0.5 (up to 400Ω) 0.05 (up to 4000Ω)		
RTD CABLE COMPENSATION	100Ω max		
TEMPERATURE STABILITY	SPAN ±0.01% of reading /°C	ZERO ±0.2 µΩ/°C	

UNICAL TC+ SPECIFICATIONS

INPUT TYPE	RANGE	RESOLUTION	ACCURACY (%RDG)*
J	-202 to 2192°F (-130 to 1200°C)	0.1°C (0.1°F)	±(0.04% +0.54°F)
K	-76 to 2372°F (-60 to 1300°C)	0.1°C (0.1°F)	±(0.04% +0.54°F)
T	-58 to 752°F (-50 to 400°C)	0.1°C (0.1°F)	±(0.04% +0.54°F)
R/S	1472 to 3092°F (800 to 1700°C)	0.1°C (0.1°F)	±(0.04% +1.26°F)
B	2192 to 3308°F (1200 to 1820°C)	0.1°C (0.1°F)	±(0.04% +1.26°F)
C	32 to 4172°F (0 to 2300°C)	0.1°C (0.1°F)	±(0.04% +1.8°F)
mV	0 to 100 mV	0.1°C (0.1°F)	±(0.04% +12µV)
U	-58 to 752°F (-50 to 400°C)	0.1°C (0.1°F)	±(0.04% +0.54°F)
L	-202 to 1400°F (-130 to 760°C)	0.1°C (0.1°F)	±(0.04% +0.54°F)
N	176 to 2372°F (80 to 1300°C)	0.1°C (0.1°F)	±(0.04% +0.72°F)
E	-238 to 1832°F (-150 to 1000°C)	0.1°C (0.1°F)	±(0.04% +0.54°F)
F	176 to 2552°F (80 to 1400°C)	0.1°C (0.1°F)	±(0.04% +0.54°F)
REFERENCE JUNCTION COMPENSATION			
INTERNAL	23° to 122°F (-5° to 50°C)		
EXTERNAL	-58° to 212°F (-50° to +100°C)		
RCJ COMPENSATION DRIFT	±0.015°C/°C		
RCJ COMPENSATION ERROR	±0.15°C		
TEMPERATURE STABILITY	SPAN ±0.0025% rdg./°C	ZERO ±0.2 µV/°C	
OUTPUT IMPEDANCE	<0.5Ω with maximum current of 0.5A		
INPUT IMPEDANCE	>10MΩ		
MAX INPUT VOLTAGE	50V		
SCALE FACTOR	Zero and span programmable ±10000		

** The accuracies stated above are for 90 days at a temperature of 23°C. Typical 1-year accuracy can be estimated by multiplying the % of reading by 1.6 (TC & RTD). All input ranges: additional error ±1 digit.*

UNICAL V & UNICAL mA SPECIFICATIONS

IN/OUT PARAMETER			
UNICAL V	Volts and %		
UNICAL mA	mA and %		
ELECTRICAL RANGES	RANGE	RESOLUTION	ACCURACY (%RDG)*
UNICAL V	0.0 to 100.0mV 0.000 to 1.000 V 1.000 to 5.000 V 0.000 to 10.000 V	0.1 mV 0.1 mV 1mV 1mV	±(0.1%+0.6 mV) ±(0.1%+0.6 mV) ±(0.1%+6 mV) ±(0.1%+6 mV)
UNICAL mA	0.00 to 22.00 mA 4.00 to 20.00 mA	0.01 mA 0.01 mA	±(0.05%+10 A) ±(0.05%+10 A)
V/mA TO % CONVERSION	Linear or square		

**The accuracies indicated above are stated at 90 days for a temperature of +23°C ±2°C. The typical 1 year's accuracy can be estimated by multiplying the "% of reading" specifications by 1.4. All input ranges have an additional error of ±1 digit.*

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