



MODEL CUB4RT/TC - INTELLIGENT TEMPERATURE INDICATORS



UL Recognized Component,
File # E179259



- PROGRAMMABLE INPUTS
CUB4TC - Thermocouple types T, E, J, K, R, S, B, N, or mV
CUB4RT - RTD types Pt385, Pt392, Ni672, Cu427
- PROGRAMMABLE TEMPERATURE OFFSET
- SELECTABLE F or C WITH 1 or 0.1 RESOLUTION
- F OR C DISPLAY ANNUNCIATORS
- CONFORMS TO ITS-90 TEMPERATURE SCALE
- COLD JUNCTION COMPENSATION (Enable/Disable) CUB4TC
- 0.48 INCH (12.2 mm) HIGH DIGITS
- 5 DIGIT LCD, POSITIVE REFLECTIVE OR NEGATIVE TRANSMISSIVE WITH RED BACKLIGHT
- NEMA 4X/IP65 SEALED FRONT BEZEL

DESCRIPTION

These CUB4 temperature meters are 9 to 26 VDC powered, microprocessor based indicators, with a selectable decimal point. Models are available for use with RTD or Thermocouple sensors. The CUB4TC offers cold junction compensation and a mVDC display mode with a range of -10.00 to 60.00 mV. Programmable features include temperature type, Fahrenheit or Celsius display, input filtering range, and user offset.

SAFETY SUMMARY

All safety related regulations, local codes, and instructions that appear in the manual or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.



ORDERING INFORMATION

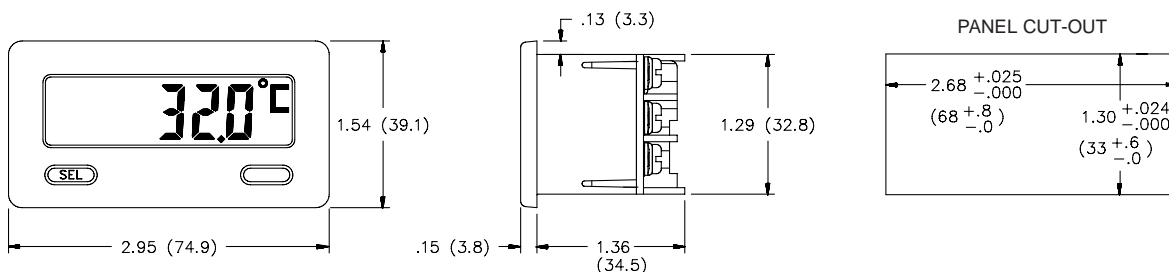
MODEL NO.	DESCRIPTION	PART NUMBER
CUB4RT	RTD Indicator, Reflective LCD	CUB4RT00
	RTD Indicator, Red Backlit Transmissive LCD	CUB4RT20
CUB4TC	Thermocouple Indicator, Reflective LCD	CUB4TC00
	Thermocouple Indicator, Red Backlit Transmissive LCD	CUB4TC20
MLPS	Micro Line/Sensor Power Supply	MLPS1000

SPECIFICATIONS

- DISPLAY:** Reflective LCD or Transmissive LCD with red backlight, 5 digit display 0.48"(12.2 mm) height, F or C annunciator.
- POWER:** 9 to 26 VDC @ 65 mA with backlight, 25 mA without backlight. Reverse polarity protected.
Must use the MLPS or a Class 2 or SELV rated power supply.
CUB4TC Backlight version: 0.15 °C/Volt CJC error if powered from other than 12 VDC. May be compensated with offset.
Example: 24 VDC supply, (24V-12V)*0.15 °C/V = 1.8 °C, Enter -1.8 °C user offset.
- TEMPERATURE EFFECTS:**
CUB4RT Span Drift: 100 ppm/°C Max
CUB4TC Span Drift: 150 ppm/°C Max.
Zero Drift: < 1 µV/°C Max.
- ENVIRONMENTAL CONDITIONS:**
Operating Temperature Range: 0 to 50 °C
Storage Temperature Range: -30 to 85 °C
Operating and Storage Humidity: 85% max. relative humidity (non-condensing) from 0 to 50 °C.
Altitude: Up to 2000 meters (6561 feet)
- MAIN SENSOR INPUT RANGES AND ACCURACIES**
Isolation: The sensor input and excitation, if applicable are not isolated from the power supply.
Response Time: 500 msec
Failed Sensor Display: OPEN
Overrange/Underrange Input: OLOL/ULUL
Overrange/Underrange Display: "....."/"-....."
Normal Mode Rejection: 40 dB @ 50/60 Hz
Common Mode Rejection: 100 dB @ DC to 60 Hz
Accuracies reflect ALL errors @ 12 VDC supply and 15 minute warm-up, except probe errors and lead resistance effects.

DIMENSIONS In inches (mm)

Note: Recommended minimum clearance (behind the panel) for mounting clip installation is 2.1" (53.3) H x 3.0" (76.2) W.



SPECIFICATIONS (Cont'd)

CUB4TC Thermocouple Inputs:

TC TYPE	DISPLAY	RANGE	ACCURACY* @ 23°C ±°C	ACCURACY* @ 0 to 50°C ±°C	WIRE COLOR	
					ANSI	BS 1843
T	t	-200 to 400°C -328 to 752°F	2.3	5.8	BLUE	WHITE
K	μ	-200 to 1372°C -328 to 2502°F	2.3	5.8	YELLOW	BROWN
J	∫	-200 to 760°C -328 to 1400°F	1.9	4.3	WHITE	YELLOW
R	r	0 to 1768°C 32 to 3214°F	4.5	15.0	BLACK	WHITE
S	5	0 to 1768°C 32 to 3214°F	4.5	15.0	BLACK	WHITE
B	b	200 to 1820°C 300 to 3308°F	9.1<540°C 4.5>540°C	42.6<540°C 15.0>540°C	GREY	NONE
E	E	-200 to 787°C -328 to 1448°F	2.7	4.9	VIOLET	BROWN
N	n	-200 to 1300°C -328 to 2372°F	2.8	8.1	ORANGE	ORANGE
mV	L #/#	-10.00 to 60.00	0.02 mV	0.08 mV	N/A	N/A

Input Impedance: 20 MΩ

Lead Resistance Effect: 0.03μV/ohm

Maximum Input Voltage: 30 VDC, TC+ to TC-

Maximum Input Voltage TC-: 3 VDC max. with respect to common

CUB4RT RTD Inputs:

Type	Jumper Position (See Wiring Diagram)	Nominal @ 0°C	Range	Accuracy * @ 23°C ±1LSD	Accuracy * @ 0 to 50°C ±1LSD
Pt392	B	100 Ohm	-200 to 850	±0.7°C	±2.7°C
Pt385	B	100 Ohm	-200 to 850	±0.7°C	±2.7°C
Ni672	B	120 Ohm	-80 to 260	±0.7°C	±1.5°C
Cu427	A	9.035 Ohm	-100 to 260	±0.9°C	±1.7°C

Lead Resistance:

Cu427: 3 ohms/lead, 6 ohms total

All others: 10 ohms/lead, 20 ohms total

Balanced Lead Resistance: Automatically compensated up to max per lead.

Unbalanced Lead Resistance: uncompensated

* After 20 min. warm-up. Accuracy specified for the 0 to 50°C operating range includes meter temperature coefficient and ice point tracking effects (TC only.) The accuracy specifications includes the A/D conversion errors, linearization conformity, and thermocouple ice point compensation (TC only.) Total system accuracy is the sum of the meter and probe errors. Accuracy may be improved by field calibrating the meter readout at the temperature of interest.

7. CERTIFICATIONS AND COMPLIANCES:

SAFETY

UL Recognized Component, File # E179259, UL3101-1, CSA 22.2 No. 1010-1

Recognized to U.S. and Canadian requirements under the Component Recognition Program of Underwriters Laboratories, Inc.

Type 4X Enclosure rating (Face only), **UL50**

IECEE CB Scheme Test Certificate #UL2356A-179259/USA,

CB Scheme Test Report #98ME60090-000098

Issued by Underwriters Laboratories Inc.

IEC 1010-1, EN 61010-1: Safety requirements for electrical equipment for measurement, control and laboratory use, Part 1.

IP65 Enclosure rating (Face only), **IEC 529**

ELECTROMAGNETIC COMPATIBILITY

Immunity to EN 50082-2

Electrostatic discharge	EN 61000-4-2	Level 2; 4 Kv contact Level 3; 8 Kv air
Electromagnetic RF fields	EN 61000-4-3	Level 3; 10 V/m ¹ 80 MHz - 1 GHz
Fast transients (burst)	EN 61000-4-4	Level 4; 2 Kv I/O Level 3; 2 Kv power
RF conducted interference	EN 61000-4-6	Level 3; 10 V/rms ² 150 KHz - 80 MHz
Simulation of cordless telephone	ENV 50204	Level 3; 10 V/m 900 MHz ± 5 MHz 200 Hz, 50% duty cycle

Emissions to EN 50081-1

RF interference	EN 55022	Enclosure class B
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Notes:

- Self-recoverable loss of performance during EMI disturbance at 10 V/m:
Process signal may deviate during EMI disturbance.
For operation without loss of performance:
Unit is panel mounted in a metal enclosure (Buckeye SM7013-0 or equivalent).
I/O cables routed in metal conduit connected to earth ground.*
- Self-recoverable loss of performance during EMI disturbance at 10 Vrms:
Process signal may deviate during EMI disturbance.
For operation without loss of performance:
Install power line filter, RLC#LFIL0000 or equivalent, at the unit.
Refer to EMC Installation Guidelines section of the bulletin for additional information.*

8. **CONNECTION:** Wire clamping screw terminals.

9. **CONSTRUCTION:** High impact plastic case with clear viewing window. (Panel gasket and mounting clips included.) Unit is rated for NEMA 4X/IP65 indoor use. Installation Category I, Pollution Degree 2.

10. **WEIGHT:** 3.3 oz. (93.5 g)