

Model CUB®5TC - Miniature Electronic 5-Digit Thermocouple Meter

Installation Guide

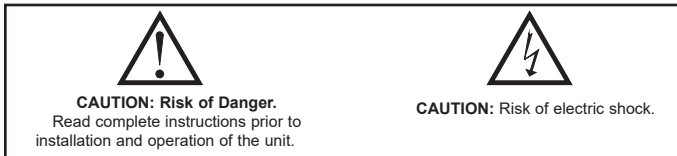


See the Red Lion website at www.redlion.net for full user manual.

SAFETY SUMMARY

All safety related regulations, local codes as well as instructions that appear in this document or on equipment must be observed to ensure personal safety and to prevent damage to either the device or equipment connected to it.

Do not use these products to replace proper safety interlocking. No software-based device (or any other solid-state device) should ever be designed to be responsible for the maintenance of personnel safety or consequential equipment not equipped with safeguards. Red Lion disclaims any responsibility for damages, either direct or consequential, that result from the use of this equipment in a manner not consistent with these specifications.

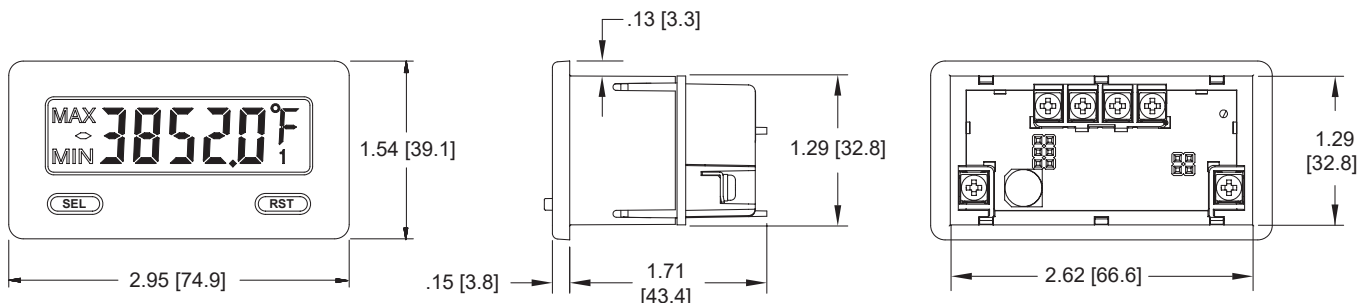


ORDERING INFORMATION

DESCRIPTION	PART NUMBER
Thermocouple Meter with Reflective Display	CUB5TCR0
Thermocouple Meter with Backlight Display	CUB5TCB0

DIMENSIONS In inches [mm]

Note: Recommended minimum clearance (behind the panel) for mounting clip installation is 2.15" (54.6) H x 3.00" (76.2) W.



SPECIFICATIONS

- POWER:** Input voltage range is +9 to +28 VDC with short circuit and input polarity protection. Must use an RLC model MLPS or an NEC Class 2 or Limited Power Source (LPS) rated power supply.

MODEL NO.	DISPLAY COLOR	INPUT CURRENT @ 9 VDC WITHOUT CUB5RLY0	INPUT CURRENT @ 9 VDC WITH CUB5RLY0
CUB5TCR0	---	10 mA	40 mA
CUB5TCB0	Red (max intensity)	85 mA	115 mA
CUB5TCB0	Green (max intensity)	95 mA	125 mA

- DISPLAY:** 5 digit LCD 0.48" (12.2 mm) high digits
 CUB5TCR0: Reflective LCD with full viewing angle
 CUB5TCB0: Transmissive LCD with selectable red or green LED backlight, viewing angle optimized. Display color change capability with output state when using an output module.
- THERMOCOUPLE INPUTS:**
 Isolation: TC+ and TC- terminals are not electrically isolated from the power supply or optional comms cards.
Note: Non-grounded (isolated) thermocouple probes must be used when the DC power supply's common is not at ground potential, or measurement errors will occur.
 Maximum Input Voltage: 30 VDC, TC+ to TC-
 Maximum Input Voltage TC-: 3 VDC max. with respect to common
 TC Types: T, E, J, K, R, S, B, N or mV scale
- RESPONSE TIME:**
 Display: 500 msec min.
 Output: 800 msec max (with input filter setting of 0)

5. **USER INPUT (USR):** Programmable input. Connect terminal to common (USR COMM) to activate function. Internal 10KΩ pull-up resistor to +9 to 28 VDC.

Threshold Levels: $V_{IL} = 0.7 \text{ V max}$; $V_{IH} = 2.4 \text{ V min}$; $V_{MAX} = 28 \text{ VDC}$

Response Time: 5 msec typ.; 50 msec debounce (activation and release)

6. **ENVIRONMENTAL CONDITIONS:**

Operating Temperature Range for CUB5TCR0: -35 to 75°C

Operating Temperature Range for CUB5TCB0 depends on display color and intensity level as per below:

	INTENSITY LEVEL	TEMPERATURE
Red Display	1 & 2	-35 to 75°C
	3	-35 to 70°C
	4	-35 to 60°C
	5	-35 to 50°C
Green Display	1 & 2	-35 to 75°C
	3	-35 to 65°C
	4	-35 to 50°C
	5	-35 to 35°C

Storage Temperature: -35 to 85°C

Operating and Storage Humidity: 0 to 85% max. relative humidity (non-condensing)

Vibration to IEC 68-2-6: Operational 5-500 Hz, 5 g

Shock to IEC 68-2-27: Operational 30 g

Altitude: Up to 2000 meters

7. **CERTIFICATIONS AND COMPLIANCES:**

CE Approved

EN 61326-1 Immunity to Industrial Locations

Emission CISPR 11 Class A

EN 61010-1: General Requirements

EN 61010-2-030: Particular Requirements for Testing and Measuring Circuits

RoHS Compliant

UL Recognized: File #E179259

UL Listed: File #E137808

Type 4X Indoor/Outdoor Enclosure rating (Face only)

IP65 Enclosure rating (Face only)

IP20 Enclosure rating (Rear of unit)

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

Wire Strip Length: 0.3" (7.5 mm)

Wire Gage: 30-14 AWG copper wire

Torque: 3.5 inch-lbs (0.395 N-m) max.

9. **CONSTRUCTION:** This unit is rated for Type 4X/IP65 requirements for indoor/outdoor use. Installation Category I, Pollution Degree 2. High impact plastic case with clear viewing window. Panel gasket and mounting clip included.

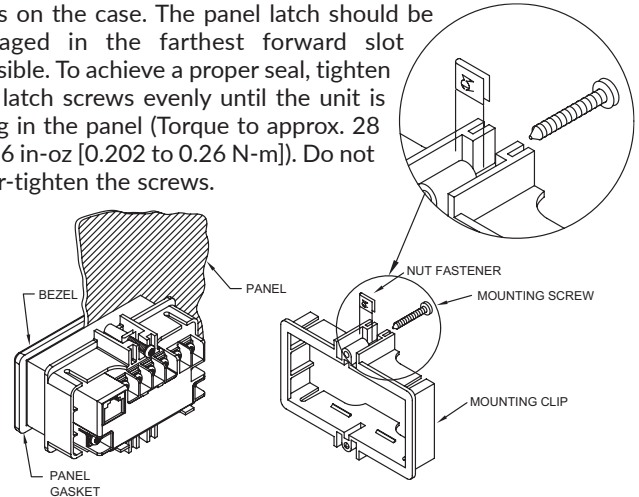
10. **WEIGHT:** 3.2 oz (100 g)

INSTALLING THE METER

Installation

The meter meets NEMA 4X/IP65 requirements when properly installed. The unit is intended to be mounted into an enclosed panel. Prepare the panel cutout to the dimensions shown. Remove the panel latch from the unit. Slide the panel gasket over the rear of the unit to the back of the bezel. The unit should be installed fully assembled. Insert the unit into the panel cutout.

While holding the unit in place, push the panel latch over the rear of the unit so that the tabs of the panel latch engage in the slots on the case. The panel latch should be engaged in the farthest forward slot possible. To achieve a proper seal, tighten the latch screws evenly until the unit is snug in the panel (Torque to approx. 28 to 36 in-oz [0.202 to 0.26 N-m]). Do not over-tighten the screws.

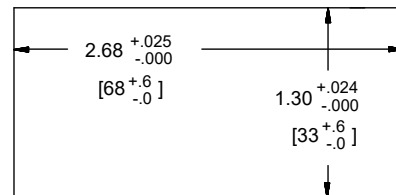


Installation Environment

The unit should be installed in a location that does not exceed the operating temperature and provides good air circulation. Placing the unit near devices that generate excessive heat should be avoided.

The bezel should only be cleaned with a soft cloth and neutral soap product. Do NOT use solvents. Continuous exposure to direct sunlight may accelerate the aging process of the bezel.

Do not use tools of any kind (screwdrivers, pens, pencils, etc.) to operate the keypad of the unit.



WIRING THE METER

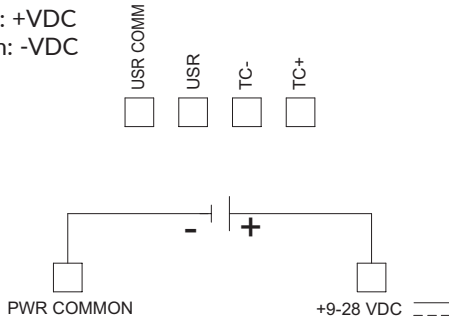
Wiring Overview

Electrical connections are made via screw-clamp terminals located on the back of the meter. All conductors should conform to the meter's voltage and current ratings. All cabling should conform to appropriate standards of good installation, local codes and regulations. It is recommended that the power supplied to the meter (DC or AC) be protected by a fuse or circuit breaker.

Power Wiring

DC Power

+9 to +28 VDC: +VDC
Power Common: -VDC

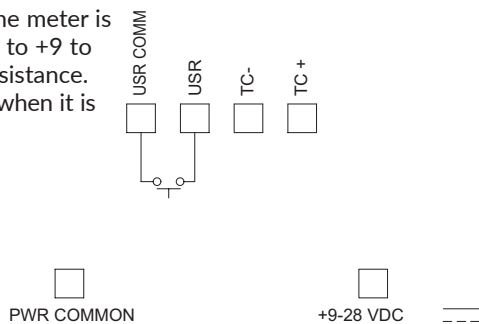


User Input Wiring

Sinking Logic

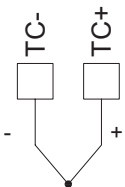
USR COMM } Connect external switching device between the
USR } User Input terminal and User Input Common.

The user input of the meter is internally pulled up to +9 to +28 V with 10 K resistance. The input is active when it is pulled low (<0.7 V).



Input Wiring

Thermocouple

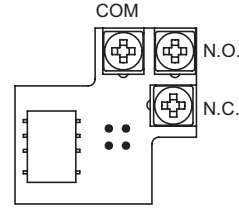


CAUTION: Power input common and sensor input common are NOT isolated from user input common. In order to preserve the safety of the meter application, the power input common and the sensor input common must be suitably isolated from hazardous live earth referenced voltages; or input common must be at protective earth ground potential. If not, hazardous live voltage may be present at the User Inputs and User Input Common terminals.

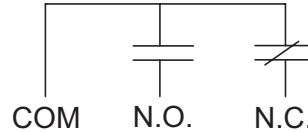
Appropriate considerations must then be given to the potential of the user input common with respect to earth common; and the common of the isolated plug-in cards with respect to input common.

Setpoint (Output) Wiring

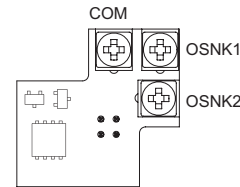
SINGLE SETPOINT RELAY PLUG-IN CARD



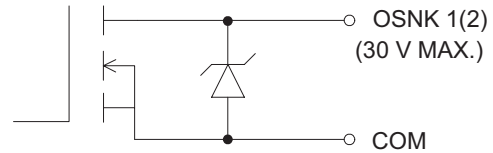
ELECTRICAL CONNECTIONS



DUAL SETPOINT N-FET OPEN DRAIN PLUG-IN CARD



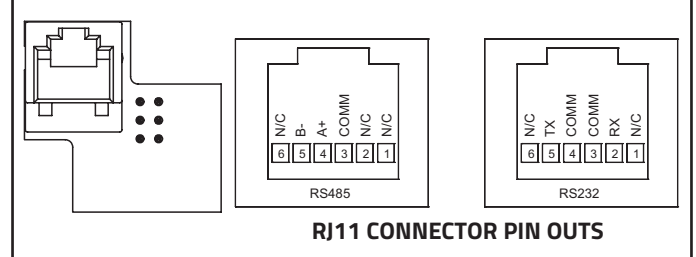
ELECTRICAL CONNECTIONS



Output Common is not isolated from DC Power Common. Load must be wired between OSNK terminal and V+ of the load supply.

Serial Communication Wiring

SERIAL COMMUNICATIONS PLUG-IN CARD



RJ11 CONNECTOR PIN OUTS

RED LION CONTROLS TECHNICAL SUPPORT

If for any reason you have trouble operating, connecting, or simply have questions concerning your new product, contact Red Lion's technical support.

Support: support.redlion.net

Website: www.redlion.net

Inside US: +1 (877) 432-9908

Outside US: +1 (717) 767-6511

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