CT124 8-Channel Temperature Monitor

- Protect motors, generators, transformers, other equipment.
- Monitor 1 to 8 resistance temperature detectors (RTD's)
- 4 internal relays and audible alarm with independent trip points.
- Overtemperature or undertemperature protection.
- Microprocessor based; fully programmable.
- Large, bright LED display shows °F or °C.
- Stores high and low temperature peaks.
- Trip points, programs, peaks stored in non-volatile memory.
- Programmable silence button.
- Versatile override switch permits manual relay toggling.
- Rugged enclosure with sealed front panel.

The CT124 8-channel Temperature Monitor offers flexible protection and control of temperature-critical equipment and processes. It scans up to eight RTD's and activates four relays plus a built-in audible alarm.

In a typical application, the CT124 provides early warning of possible large machine failure by monitoring the temperature of bearings, stators, transformer coils, and oil outlets. You can configure the CT124 to many other situations such as on/off control or undertemperature alarms. The CT124 can even monitor and control several loops at one time since you can group input zones with output relays in any combination.

Operation

The CT124 continuously scans all RTD inputs. The display normally shows the highest, lowest, or any other zone temperature according to your instructions. Press up and down arrows to display other zones, Peak Temp to recall high and low peaks, and Trip Temp to indicate trip temperatures.

Each relay has its own trip temperature, either high or low, and may be programmed to react to any or all scanned input zones. Relays may control cooling fans, remote alarms, contractors, or programmable controller inputs. You can set the audible alarm to sound when certain relays trip, and also at its own setpoint. The silence button quiets the alarm for a programmed length of time.

Programming

The setup sheet on page 4 lists the program options available to you. In the CT124's program mode you simply step through this sheet in sequence, change each parameter with the up and down and down arrows, and press Done to proceed. The CT124 retains all program data and setpoints with power off.

Installation

The CT124 fits in a standard ¾ DIN panel cutout. Plug-in terminal blocks at the rear let you remove the unit without disconnecting wires. Front panel keys and indicators are sealed against dust and moisture.

Special features

Override: The programmable Override button manually toggles a selected set of relays on and off. With it you can bypass automatic functions to assume direct control. For example, you could turn on fans or shut a machine down at temperatures below the trip point.

Sensor failure protection: If any scanned RTD circuit shorts or opens the CT124 sounds its alarm and locks out that zone. Other zones continue to scan normally. The Error light stays on until the faulty input is repaired and the self-test run.

Self-test: Press to test all panel lights and inputs. You can also program the Test button to trip relays connected to external alarms, fans, etc.

Zone Temperature (default display): Phase 3 of a transformer is reading 155°F. Relay 1, wired to cooling fans, has tripped.

Peak temperature: Zone 7 has reached a high of 175°C since the last time peaks were cleared. The Clr Peak button will reset the peak to the current reading in Zone 7.

Trip Temperature: Relay 3 will trip when temperature drops below 32°F in Zone 1 or 2.

Override: Override has been pressed and is active. It has switched on the cooling fans wired to Relay 2 regardless of temperature.

Alarm: The internal alarm has sounded and Relay 2 has tripped.

Silence: The Silence button has quieted the alarm but its light stays on until the alarm condition is cleared.

Program mode: The CT124 is in the program mode. The Alarm trip point (At) is set to 110°C. Press Up and Down arrows to change this number, Done to proceed to the next choice, or Undo to back up.

Input fault: Zone 5 has a shout circuit. It is locked out; other zones operate normally.

Intermittent fault: Zone 2 has experienced an intermittent short or open.

Specifications

Range: Platinum input: -40 to 530°C or -40 to 986°F
Copper or nickel input: -40 to 250°C or -40 to 500°F.

Input: 1 to 8 RTD's (Resistance Temperature Detectors), 2 or 3 wire. **Request Bulletin TS-102 for RTD's.**

Code	Element	TCR (Ω/Ω/°C)
CA	Copper, 10 Ω at 25°C	0.00427
NA	Nickel, 120 Ω at 0°C	0.00672
PA	Platinum, 100 Ω at 0°C	0.00392
PB	Platinum, 100 Ω at 0°C	0.00391
PD	Platinum, 100 Ω at 0°C	0.00385
PF	Platinum, 1000 Ω at 0°C	0.00385

Input scan rate: 8 readings per second.

Input fault detection: Open or shorted circuit sounds alarm and locks out faulty zone. Other zones unaffected.

Input protection: ±30 VDC continuous, any input to ground.

Output: 5 independent trip points: 4 relays and one audible alarm. Alarm may be programmed to sound when selected relays trip.

Relays: Form C, SPDT, 10 Amps at 250 VAC resistive load, ¼ HP at 120 VAC.

Trip point hysteresis (deadband): Programmable form 2 to 20°C or °F.

Display: 0.56" (14mm) LED, 1°C or 1°F resolution. 16 LED indicators.

Accuracy: ±2°C (3°F) at 10 to 30°C (50 to 86°F) ambient. ±3°C (5°F) at 0 to 55°C (32 to 131°F) ambient.

Zone and relay labels: Replaceable from rear for custom labeling.

Supply power: 115 or 230 VAC ±10%, 50/60 Hz. 15 W max. Selection switch inside enclosure. 24 VDC factory option.

Power loss protection: Trip points, peaks, and program parameters stored in non-volatile memory. Normal operation resumes when power is restored.

Keyboard: 10 membrane type keys with audible feedback.

Programming: Programmable from front panel. Access to program mode requires special key sequence. See setup sheet on page 4 for complete list of program sequence.

Program fault protection: Watchdog circuit resets microprocessor if it fails to perform program sequence.

Enclosure: ABS case, water and dust resistant front panel.

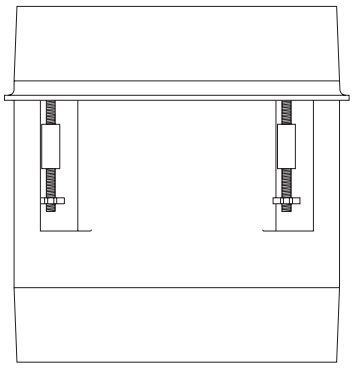
Ambient temperature rating: 0 to 55°C (32 to 131°F).

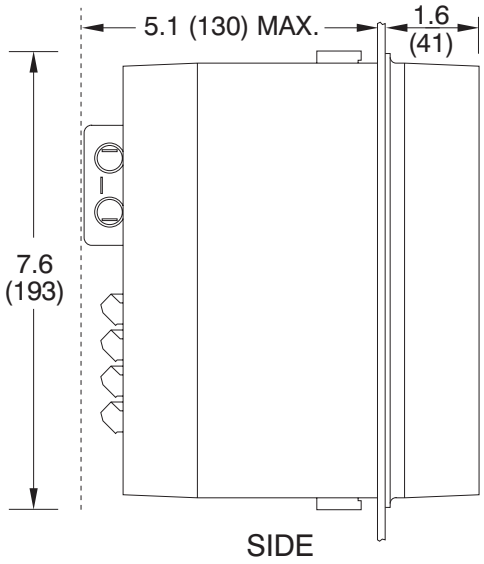
Connections: Plug-in terminal boards at rear accept wires to 14 AWG.

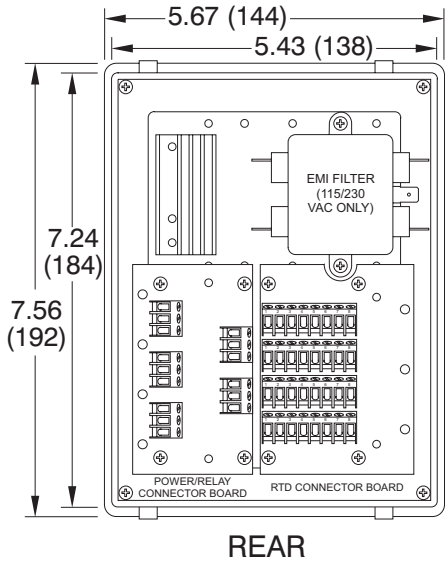
Mounting: ¾ DIN (DIN 43700). Panel-mounted in 5.47" x 7.32" (139 x 186mm) opening. Extends behind panel 5.0" (127 mm) max.

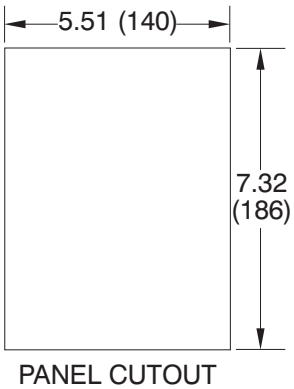
Instructions: Instruction manual and setup worksheets furnished with each unit.

Weight: 4 lb. (1.8 kg).









How to order:

CT124	**Model number CT124**
PA	**RTD type:** CA = 10 Ω copper NA = 120 Ω nickel PA = 100 Ω platinum, TCR = 0.00392 PB = 100 Ω platinum, TCR = 0.00391 PD = 100 Ω platinum, TCR = 0.00385 PF = 1000 Ω platinum, TCR = 0.00385
1	**Supply power:** 1 = 115/230 VAC 2 = 24 VDC
CT124PA1 ← Sample part number	

Sample setup worksheet

The CT124 Setup Worksheet shows all the functions the CT124 can perform under command of your program. Programming is simple. Just enter the program mode and follow the sheet as you step through each choice for display, output, and input zones. The display prompts you with a code at left. Press the up and down arrows to change choices, Done to proceed to the next step, Undo to back up. The CT124 Instruction Manual gives full details.

The sample sheet below shows a typical setup for motor protection. Remember, this is just an example. The versatile CT124 can handle nearly any temperature monitoring, control, or alarm situation. Call Minco to discuss your special needs.

If you send us a completed setup worksheet when you order your CT124, we'll program it to your specifications before shipping. We'll also label the input zones and output relays per your worksheet descriptions. Of course, you can change the program or labels at any time.

CT124 SETUP WORKSHEET

Use this worksheet to describe the setup parameters for the desired operation of the CT124.

Fill in a short description of the location and purpose of each temperature sensor, and save the worksheet for future reference.

Basic function description: Monitor motor windings and bearings

Description of Zones		Description of Relay Functions		Trip Temp.
Zone 1:	Stator #1	Relay 1:	Stator overtemp alarm	140°C
Zone 2:	Stator #2	Relay 2:	Stator shutdown	155°C
Zone 3:	Stator #3	Relay 3:	Bearing overtemp alarm	100°C
Zone 4:	Bearing #1	Relay 4:	Bearing shutdown	110°C
Zone 5:	Bearing #2			
Zone 6:		Alarm only:		
Zone 7:				
Zone 8:		Completed by:	BFJ	Date: 01/21/02

Circle the option desired. If the box is empty, fill in a number within the range given at the left. If shaded, there is no option to choose.

Code	Description	
dS	Temperature scale	°F, (°C)
dC	Zone to be displayed during normal operation:	Highest zone (HI) / Lowest zone LO / Any selected zone AnY

OUTPUTS - RELAYS AND ALARM		Relay 1	Relay 2	Relay 3	Relay 4	Alarm
rt or At	Trip temperature: -40 to 482 °F, -40 to 250 °C (to 530 °C or 986 °F with platinum RTD) or "OFF" if the output will not be used	140	155	100	110	OFF
rH or AH	Hysteresis (deadband): 2 to 20 °C or °F	2	2	2	2	
rP or AP	Trip on overtemperature (HI) or undertemperature (LO)	(HI) LO	(HI) LO	(HI) LO	(HI) LO	HI LO
rA	Sound audible alarm when this relay trips?	(YES) no	YES (no)	(YES) no	YES (no)	
rS	Return this relay to normal when silence is pressed?	(YES) no	YES (no)	(YES) no	YES (no)	
AS	Length of alarm silence: 1 to 60 minutes, "---" for stays off.					
rd or Ad	Trip this output during diagnostic test?	(YES) no	YES (no)	(YES) no	YES (no)	
ro or Ao	Effect of override button on output: No effect / Trip / Untrip	No On (OFF)	No On (OFF)	No On (OFF)	No On (OFF)	No On OFF

INPUT ZONES		Zone	Scan	Relay 1	Relay 2	Relay 3	Relay 4	Alarm
Sc.	First Column:	1	(YES) no	(YES) no	(YES) no	YES (no)	YES (no)	YES no
	Zones to be scanned:	2	(YES) no	(YES) no	(YES) no	YES (no)	YES (no)	YES no
	YES = scanned	3	(YES) no	(YES) no	(YES) no	YES (no)	YES (no)	YES no
	no = locked out	4	(YES) no	YES (no)	YES (no)	(YES) no	YES (no)	YES no
r. or A.	Remaining columns:	5	(YES) no	YES (no)	YES (no)	(YES) no	YES (no)	YES no
	Outputs which respond to each zone:	6	YES (no)	YES no	YES no	YES no	YES no	YES no
	YES = Output will trip on zone temperature	7	YES (no)	YES no	YES no	YES no	YES no	YES no
	no = Output not tied to that zone	8	YES (no)	YES no	YES no	YES no	YES no	YES no

CALIBRATION

CAL.	Press DONE unless you wish to recalibrate. See p. 20 of the Instruction Manual.

Monitor a motor with 3 RTD's in the stator windings and 2 in the bearings. Connect relays 1 and 3 to an external alarm, 2 and 4 to shutdown circuits.

Display the highest temperature sensed in °C.

Sound internal and external alarms if a stator reaches 140°C. Trip shutdown circuits at 155°C.

Sound internal and external alarms if a bearing reaches 100°C. Trip shutdown circuits at 110°C.

Press Silence to silence both internal and external alarms for 10 minutes.

Press Test to sound external alarms and test the CT124's display and inputs.

Press Override to cancel alarms and shutdowns regardless of temperature.

Link stator sensors in zones 1-3 to relays 1 and 2. Link bearing sensors in zones 4 and 5 to relays 3 and 4. Lock out zones 6-8.

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ISO 9001

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