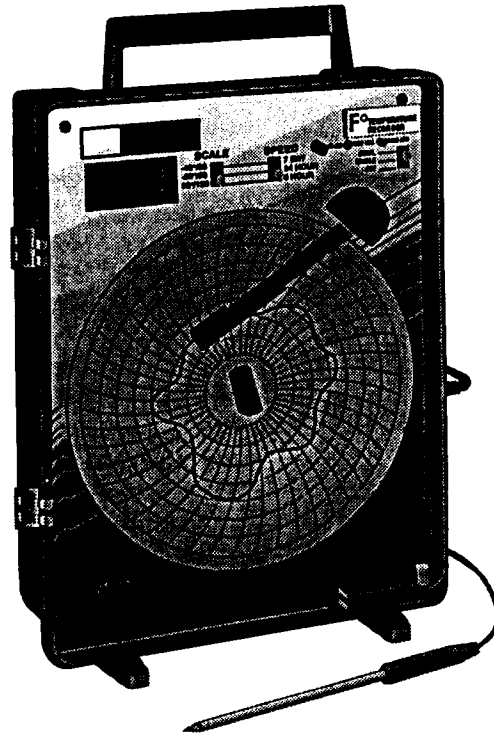


CT87 Series

Temperature Recorders



Operator's Manual



| | |
|---|--|
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|---|--|

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Tel: (514) 856-6928 FAX: (514) 856-6886

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It is the policy of OMEGA to comply with all worldwide safety and EMC/EMI regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification.

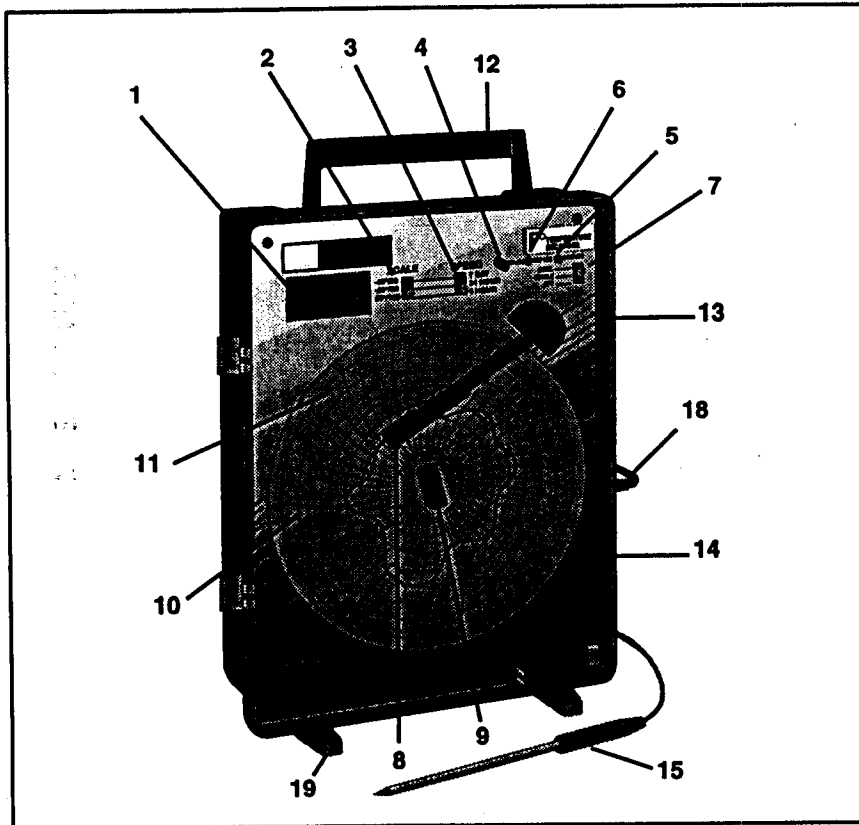


Figure 1. Front View

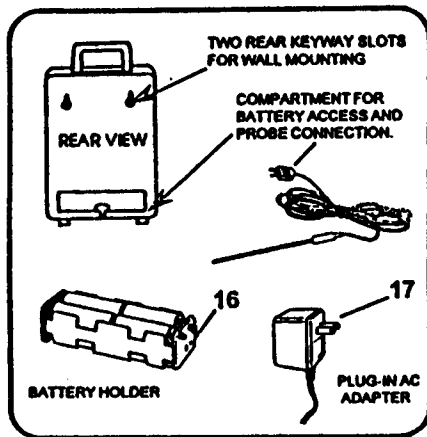


Figure 2. Rear View

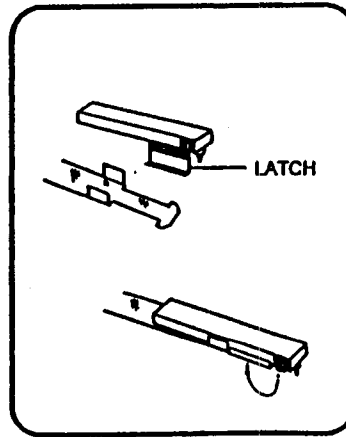


Figure 3. Changing Pens

Unpacking Instructions



Remove the Packing List and verify that you have received all equipment, including the following (quantities in parentheses):

- CT87 Temperature Recorder (1)
- Thermocouple Probe (1)
- AC Adaptor (1)
- Recording Pen (1)
- Chart Paper (1 pack)
- Leg Supports (2)
- Operator's Manual (1)

If you have any questions about the shipment, please call the OMEGA Customer Service Department.

When you receive the shipment, inspect the container and equipment for signs of damage. Note any evidence of rough handling in transit. Immediately report any damage to the shipping agent.

NOTE

The carrier will not honor damage claims unless all shipping material is saved for inspection. After examining and removing contents, save packing material and carton in the event reshipment is necessary.

From the Technical Library of _____

Introduction

The CT87 Series Temperature Recorder is a precision instrument used to monitor and record temperature on a 6" circular chart. The CT87 may be carried as a portable instrument or mounted in a fixed location. The CT87 offers a variety of features to meet any temperature recording requirements. A combination of three temperature ranges and three chart speeds provide a high degree of flexibility. In addition, the chart rotation may be set for single or continuous turn operation as required by a particular application. To protect the data being recorded, the CT87 uses an automatic battery backup to maintain operation during a power outage.

Available Models

| | |
|--------|------------------------------------|
| CT87LC | Low Temperature Model, Celsius |
| CT87LF | Low Temperature Model, Fahrenheit |
| CT87HC | High Temperature Model, Celsius |
| CT87HF | High Temperature Model, Fahrenheit |

Features and Controls

(Refer to Figures 1 and 2 on opposite page)

1. Temperature Display
2. Temperature Scale Selector
3. Chart Speed Selector
4. Pen Position Adjustment Knob
5. Chart Advance
6. Temperature Adjustment
7. Power On/Off/
Continuous/Single Chart Selector
8. Recording Pen
9. Chart Spindle
10. Paper Chart
11. Time Pointer
12. Carrying Handle
13. Keyhole Slots
14. Rear Compartment
15. Thermocouple Probe
16. Battery Holder
17. 12 VDC Adapter
18. Power Connector
19. Extra Support Legs

Description of Features and Controls

1. 3-Digit Temperature Display

The 3-digit temperature display provides precision temperature reading of the environment monitored by the thermocouple probe. When the CT87 is operating on battery power, the display will flash once every several seconds to indicate battery operation and to conserve battery power. When the batteries are nearly discharged, the display will alternate between the temperature reading and "LO" to advise the operator that the batteries are discharged and the CT87 will shortly cease operation.

CAUTION: The battery backup feature of the CT87 is primarily intended for use in situations where primary power is lost for short periods of 24 up to 48 hours. The CT87 is not intended to be used as a battery-powered instrument. If the CT87 is to be stored for an extended period, it is strongly advised to disconnect the battery pack and remove the batteries to avoid damage to the instrument from battery leakage.

2. Temperature Scale Selector

Allows the user to choose the desired temperature range for measurement.

3. Chart Speed Selector

Allows the user to select time of one full chart revolution. The corresponding chart is chosen according to the desired chart speed and temperature scale for a total of nine combinations of speed and temperature settings. OMEGA supplies nine different charts for the CT87 Series. Refer to the Accessories section.

4. Pen Position Adjustment Knob

Allows the user to adjust the position of the chart pen to match that of the digital display. Usually, this adjustment will be required after replacing the chart pen.

5. Chart Advance Button

To set the chart to the correct time, press and hold the Chart Advance button until the desired time lines up with the Time Pointer (Item 11). The chart is rotated counterclockwise only. Movement of the Chart Spindle (Item 9) by hand can cause permanent damage to the chart mechanism.

6. Temperature Adjustment

Allows the user to adjust the digital display during periodic calibration and certification. The CT87 has been factory calibrated and requires no adjustment to meet all published specifications.

7. Power On/Off/Continuous/Single Chart Selector

Allows the user to apply power to the CT87 and to select Continuous or Single Turn for the chart rotation. When power is first applied to the CT87, the display will show "888" to test each segment of the display, and the pen will move to the edge of the chart. The display will then show the temperature at the thermocouple probe and the pen will move to the correct position on the chart.

If the chart range does not match the temperature at the thermocouple probe, the pen will move to the upper or lower range of the chart, whichever is closest to the temperature at the probe, and stay there until the correct chart range is selected or the temperature at the thermocouple probe moves within the range of the chart being used. In the Continuous switch position, the chart will rotate until power is removed. In the Single turn switch position, the chart will make one complete revolution and stop. A blinking dot on the display (Item 1) will indicate that the chart has made one complete revolution and stopped. To reset the chart for another revolution, place the switch in the Continuous switch position until the blinking dot goes out and then slide the switch back to the Single Turn position. The chart will make one complete revolution and stop.

DO NOT move the pen by hand or interrupt the pen movement. Failure to observe this will cause the pen to read incorrectly and may result in damage to the pen mechanism.

8. Recording Pen

The recording pen contains special ink. The pen has a wrap-around arm latch which makes pen replacement simple.

To Replace the Pen (refer to Figure 3):

Gently lift up the pen arm (do not over bend pen arm), release the pen latch by pushing it down, and remove the pen. Place a new pen on top of the pen arm, align the notches on the pen arm with the notches on the pen latch, and close the latch by wrapping it around the pen holder until it is secured. Replace the cap on the pen tip when the CT87 is not being used to insure long pen life.

9. Chart Spindle

The chart spindle holds and rotates the chart during the recording operation. DO NOT ROTATE THE SPINDLE BY HAND AS IT MAY DAMAGE THE INTERNAL MECHANISM.

10. Paper Chart

The paper chart is 6" in diameter. Nine different charts may be used with the CT87 depending on the selected chart speed and the temperature range. The replacement charts are available from OMEGA in a box of 100 charts each. The chart part numbers are listed in the Accessories section.

To Install a New Chart:

Disconnect power from the CT87 by selecting OFF with the Power/Single or Continuous Chart Selector (Item 7). Place pen cap on pen point. Gently lift the pen arm and while holding it, remove the old chart. Slide a new chart under the pen holder and align the chart with the chart spindle. Apply power to the CT87 and rotate the chart by depressing the chart advance button until the time pointer is aligned with the line on the chart representing the right time of day. Remove pen cap. If necessary, adjust the pen position according to the front panel display reading (see Pen Position Adjustment Knob Item #4).

11. Time Pointer

The time pointer is simply a point against which the current time is being read during a chart rotation. Initially a new chart has to be rotated until the time pointer will show the right time and day when using a 7-day chart.

12. Carrying Handle

The carrying handle folds toward the back of the case to be out of the way when the CT87 is mounted on the panel or on the wall.

13. Keyhole Slots

Keyhole slots on the back of the case are provided for wall or panel mounting.

14. Rear Compartment

The rear compartment was designed to store the battery holder for battery back-up and the plug-in thermocouple probe while the CT87 is being carried or stored. The notch on the compartment cover allows the compartment to be closed with the probe extended.

15. Thermocouple Probe

The thermocouple probe is interchangeable. For the Low Temperature models, (CT87LF or CT87LC), the furnished probe's lead wire is 15 feet long. The probe has a 4" stainless steel tip and can be placed in almost any environment. For the High Temperature models (CT87HF or CT87HC), the probe lead wire is 6 feet long. The thermocouple probe is a Type J thermocouple and uses the industry standard connector for thermocouple probes.

The recorder should be placed outside the chamber being monitored. **DO NOT PLACE THE RECORDER DIRECTLY IN AREAS OF EXTREME TEMPERATURES, HIGH HUMIDITY OR HEAVY CHEMICALS.**

16. Battery Holder

The battery holder is stored in the rear compartment for back-up batteries. Use of alkaline "AA" batteries is required for proper operation of the instrument.

17. 12VDC Plug-In Wall Adapter

The wall adapter provides primary power for the CT87.

18. Power Connector

Connection point for the 12 VDC wall adapter.

19. Extra Support Legs snap on for greater stability.

Specifications

Temperature Scale (Selectable)

CT87LF: -40°F to +30°F
-20°F to +50°F
+50°F to +120°F

CT87LC: -40°C to 0°C
-30°C to +10°C
+10°C to +50°C

CT87HF: 0-250°F
0-500°F
500-1000°F

CT87HC: 0-120°C
0-250°C
250-500°C

Chart Speed (Selectable): 6 Hours, 24 Hours, 7 Days

Chart Speed Accuracy: ±1%

Chart Diameter: 6 inches

Temperature Display: 3 digit LED 0.5"

Temperature Accuracy: ±2°F (±1°C)

Temperature Probe

CT87LF or CT87LC: 15' probe with 4" stainless steel
submersible tip, Type J thermocouple

CT87HF or CT87HC: 6' lead wire probe, Type J thermocouple

Recording Pen: Ink type

Power Supply: Operating Power: 12 VDC
120 VAC adapter (240 VAC available)

Battery Backup: 8 Alkaline AA batteries (not included)

Battery Operating Time: 24-48 hours (typical)

**Operating Ambient
Temperature Range:** +32°F to +120°F;
0°C to 49°C

Relative Humidity: 96% maximum

Dimensions: 9-1/4" x 7-1/4" x 2-3/4"
(235mm x 184mm x 69.9mm)

Weight: 4 lbs., 7 oz. (2.04 kg)

Accessories

Charts (in boxes of 100)

Chart Part Number: CT87C-*/(**)

*Temperature Range in Degrees F or C

**Chart Rotation Time: 24H = 24 hours; 6H = 6 hours; 7D = 7 days

Low Temperature (CT87L) Chart Part Numbers

| | |
|---|--|
| CT87C-40-30F/24H CT87C-40-30F/6H CT87C-40-30F/7D | CT87C-40-0C/24H CT87C-40-0C/6H CT87C-40-0C/7D |
| CT87C-20-50F/24H CT87C-20-50F/6H CT87C-20-50F/7D | CT87C-30-10C/24H CT87C-30-10C/6H CT87C-30-10C/7D |
| CT87C-50-120F/24H CT87C-50-120F/6H CT87C-50-120F/7D | CT87C-10-50C/24H CT87C-10-50C/6H CT87C-10-50C/7D |
| CT87C-LF-MIX | CT87C-LC-MIX |

High Temperature (CT87H) Chart Part Numbers

| | |
|---|--|
| CT87C-0-250F/24H CT87C-0-250F/6H CT87C-0-250F/7D | CT87C-0-120C/24H CT87C-0-120C/6H CT87C-0-120C/7D |
| CT87C-0-500F/24H CT87C-0-500F/6H CT87C-0-500F/7D | CT87C-0-250C/24H CT87C-0-250C/6H CT87C-0-250C/7D |
| CT87C-500-1000F/24H CT87C-500-1000F/6H CT87C-500-1000F/7D | CT87C-250-500C/24H CT87C-250-500C/6H CT87C-250-500C/7D |
| CT87C-HF-MIX | CT87C-HC-MIX |

(MIX) Charts are an assortment of 10 of each type.

Other Accessories

CT87-PEN-BLACK 2 Replacement Pens
CT87-J-NP Low Temperature Replacement Probe
TC-GG-J-24-72-SMP-M High Temperature Replacement Probe

Other "J" Type probes are available - contact the OMEGA Sales Department.



WARRANTY/DISCLAIMER

OMEGA warrants this unit to be free of defects in materials and workmanship and to give satisfactory service for a period of **13 months** from date of purchase. OMEGA Warranty adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product. If the unit should malfunction, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective it will be repaired or replaced at no charge. However, this WARRANTY is VOID, if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear or which are damaged by misuse are not warranted. These include contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. Nevertheless, OMEGA only warrants that the parts manufactured by it will be as specified and free of defects.

OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED.

LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY / DISCLAIMER language, and additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

RETURN REQUESTS / INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA ENGINEERING Customer Service Department. **BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS).** The assigned AR number should then be marked on the outside of the return package and on any correspondence.

FOR **WARRANTY** RETURNS, please have the following information available **BEFORE** contacting OMEGA:

1. P.O. number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS OR **CALIBRATION**, consult OMEGA for current repair/calibration charges. Have the following information available **BEFORE** contacting OMEGA:

1. P.O. number to cover the **COST** of the repair/calibration,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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