Microprocessor-Based Circular Chart Recorders

CT9000 Series



Remember to Order Extra Pager and Pens!

1-, 2-, 3-, or 4-Pen Version Programmable for 254, 280, or 305 mm (10, 11, or 12") Charts Accepts Thermocouple, RTD, V, mV, mA, or Switch Signals 40-Character Display **Up to 4 Alarms per Variable** 16 Profiles

The CT9000 microprocessor-based circular recorder offers 1 to 4 trends with 1 color per channel. The latter allows future trend addition upgrades and improves chart annotation of times, dates, scale values, trend line tags, and user-configurable real-time actuated chart messages. This instrument can accept up to 8 inputs. Some inputs do not have to be associated with the trend pens (i.e., display only). Up to 4 process values can be displayed at one time on the 40-character vacuum fluorescent display (2 lines of 20 characters each). Full English prompts allow easy configuration. With the recorder's proven dotting head print technology, there is no time difference between trend lines. This feature, along with the straight radial time line (compared with the curved lines on other recorders) allows for more accurate reading of data. The unit uses plain paper charts with pre-printed rings to further enhance readability and provide better long-term storage.

Specifications General

T/C Accuracy: Typically 1°C (1.8°F) Chart Accuracy: 0.3% of span Chart Rotation Accuracy: 0.2 minutes for 24 hours

Ambient Temperature Error: ±0.01% of span per °C (1.8°F) deviation from 25°C (77°F) Isolation: 500 Vdc/350 Vac CMR: 120 dB minimum

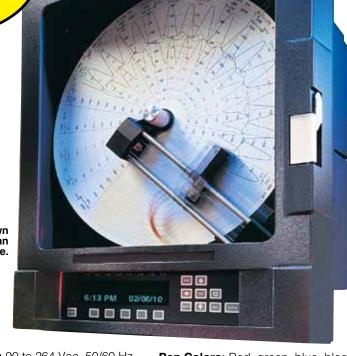
NMR: 100 dB @ 60 Hz or greater Scan Rate: 2 scans/s on each input

Operating Temperature: 0 to 50°C (32 to 122°F) Storage Temperature: -40 to 65°C (-40 to 149°F)

Humidity: 10 to 90% RH, non-condensing

Vibration: 0.3 to 100 Hz @ 0.2 g

CT9144 shown smaller than actual size.



Line Voltage: 90 to 264 Vac, 50/60 Hz Power Consumption: 60 VA max **Enclosure:** Gasketed cover,

case and window NEMA Rating: NEMA 3 (IP54) Mounting: Panel or optional wall

mounting

Mounting Position:

Up to 30° forward or backward tilt from vertical; up to 10° side tilt from vertical

Overall Dimensions:

358.65 W x 425.96 H x 196.85 mm D

(14.12 x 16.77 x 7.75") **Panel Cutout:** 322.58 W x 322.58 mm H (12.7 x 12.7") **Panel Depth:** 133.35 mm (5.25") Panel Protrusion: 63.5 mm (2.5")

Weight: 11.34 kg (25 lb)
Clock Accuracy: 1 min/month typically,

4 min/month worst case

Battery Backup: 5 years minimum, 10 years typically; lithium battery (included)

Operator Interface

Display: 2-line, 40-character VFD with 5 mm (0.21") high characters

Status Indicator: 8 user configurable, red LED status indicator

Keypad: 15 keys for programming and

unit operation Display Formats: 3 Operator Messages: 12 Operator Inputs: 12

Recording Pen Type: Disposable 4-pen fiber-tip

marker assembly

Pen Colors: Red, green, blue, black Chart Drive: DC stepper motor Chart Size: Programmable for 10-, 11- or 12-inch charts (12-inch charts are actually 11.875")

Chart Rotation:

6 to 9999 hours per revolution

Recorded Values: Any of over 20 values

can be trended/recorded **Recording Methods:**

Drag pen simulation, instantaneous value, connect the values, average value, connect the averages

Action on New Chart: Print scales and range list, begin normal recording

Chart Messages: 12 **Input Ranges** Thermocouple

hermocouple
J: -200 to 1200°C (-328 to 2192°F)
K: -250 to 1370°C (-418 to 2498°F)
E: -250 to 1000°C (-418 to 1832°F)
N: -250 to 1300°C (-418 to 2372°F)
T: -250 to 400°C (-418 to 752°F)
R: 200 to 1700°C (392 to 3092°F)
S: 250 to 1750°C (482 to 3182°F)
B: 200 to 1800°C (392 to 3272°F)
G: 0 to 2300°C (32 to 4172°F)

G: 0 to 2300°C (32 to 4172°F) **C:** 0 to 2300°C (32 to 4172°F) **D:** 0 to 2300°C (32 to 4172°F)

NNM: 0 to 1370°C (32 to 4172°F) **PLATINEL II:** 0 to 1400°C (32 to 2552°F) **RTD:** -200 to 480°C (-328 to 896°F) 100 Ω platinum with 385 curve 2- or 3-wire, also available with 392 curve or 100 Ω nickel

Volts DC: To 25 mV, 0 to 100 mV,

0 to 1V, 0 to 10V

Contact Closure:

Open/closed switch sensing without external voltages or resistors **Processing:** Square root and exponential functions for linear inputs

Value Cutoff: None, at value, to zero below value, to zero near zero Measurement Error: ±0.025% of measurement span reference accuracy

Cold-Junction Compensation Accuracy: ±0.2°C @ 25°C (±0.36°F @ 77°F)

Cold-Junction Compensation

Rejection: 0.04°/° deviation from 25°C (77°F)

Thermocouple Linearization Error: $\pm 0.25^{\circ}$ C (1.45°F) typical, $\pm 0.5^{\circ}$ C (0.9°F) worst case with exceptions; RTD: ±0.1°C (0.18°F) typical, ±0.3°C (0.54°F) worst case

Sensor Fault Detection: Sensor break on all T/Cs, RTDs, 1V, 1 to 5V, 4 to 20 mA and mV ranges; sensors high and low on all inputs, 5% above or below range

Sensor Break: Up-scale or down-scale

On/Off Outputs On/Off Actuators:

Any of over 100 digital values/states can be used to actuate on/off outputs

Relays: SPDT contacts rated 5 A resistive @ 115 Vac **Solid State Relays:**

Open-collector output, can provide 40 mA @ 3 Vdc or 20 mA @ 4 Vdc **Pulsed Outputs:** 50 ms pulse when used with totalizer pulsed outputs

Current Outputs

Drivers: Any of 20 values can be used

to drive analog outputs

Output Span:

To 20 mA or 4 to 20 mA, nominal

Resolution:

12 bits based on 0 to 25.6 mA span Accuracy: ±0.1% of 20 mA span Compliance: 650Ω load

Totalizers:

Number: 4 are included in the option

Digits: 9, displayable with or

without commas

Types: Continuous, prelude count down, and pulse counting Presets: 1 per totalizer

Pulsed Outputs: Fully configurable

computing capabilities **Derived Variables:** 12

Math Functions: Add, subtract, multiply, divide, average, exponential, log 10, log e, power 10, power e **Built-In Equations:** Linear, polynomial,

 $^{\circ}\text{C}$ to $^{\circ}\text{F},\,^{\circ}\text{F}$ to $^{\circ}\text{C},$ linear mass flow, DP mass flow, BTU, RH, F0, ZrO2

Other Functions: High select, low select, high peak, low peak, track and hold, 1 of 2 selector, convert actuator Custom Curves: Four 20-point curves, usable in multiple calculations

Logic Capabilities

Actuators:

Over 100 digital values are accessible

Derived Actuators:

24 combinations of 24 items

Logic Operators:

NOT, OR, AND, parentheses

Timers: 4

Time/Date Combination Actuators: 6

Alarms

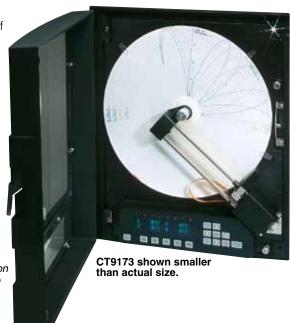
Number: Up to 4 alarms for each of

4 process variables Type: Process high or low,

rate rising or falling Hysteresis: Fully adjustable



OMEGACARESM extended warranty program is available for models shown on this page. Ask your sales representative for full details when placing an order. OMEGACARESM covers parts, labor and equivalent loaners.



To Order		
Model No.*	Description	
CT9111	1-pen, 1-color recorder with 1 input	
CT9122	2-pen, 2-color recorder with 2 inputs	
CT9133	3-pen, 3-color recorder with 3 inputs	
CT9144	4-pen, 4-color recorder with 4 inputs	
CT9151	1-pen, 4-color recorder with 1 input	
CT9162	2-pen, 4-color recorder with 2 inputs	
CT9173	3-pen, 4-color recorder with 3 inputs	

Options

Order Suffix	Description
-AL**	2, 4, 6 or 8 relay outputs
-SR**	2, 4, 6 or 8 SSRs
-MA1	One 4 to 20 mA output
-MA2	Two 4 to 20 mA outputs
-MT1	Math (computing and logic capabilities)
-MT2	Totalizer
-MT3	Math and totalizer
-EN3	Plastic window (glass is standard)

^{**} Total relays and SSRs may not exceed 8.

Accessories

Model No.	Description
CT9000C-RC-GR	Pen cartridge—green/red
CT9000C-RC-GRB	Pen cartridge—green/red/blue
CT9000C-RC-GRBB	Pen cartridge—green/red/blue/black
CT9000C-12-100	Paper, 305 mm (12"), 100 div. 100 sheets
CT9000C-12-70	Paper, 305 mm (12"), 70 div. 100 sheets
CT9000C-10-100	Paper, 254 mm (10"), 100 div. 100 sheets
CT9000C-11-100	Paper, 280 mm (11"), 100 div. 100 sheets
CT9000-WALL	Wall mounting brackets

Comes complete with a package of charts, pen cartridge and operator's manual.

Ordering Examples: CT9111, single-pen programmable recorder. The total number of inputs for an additional cost per input beyond standard number of fered (e.g., CT9144, 4-pen recorder with 4 inputs.) OCW-1 OMEGACARE™ extends standard 2-year warranty to a total of 3 years. CT9151, 1-pen, 4-color recorder.