CHART-TEMP®

Temperature Recorders

CT-100 Series

MADE IN USA · 1 YEAR WARRANTY · CE
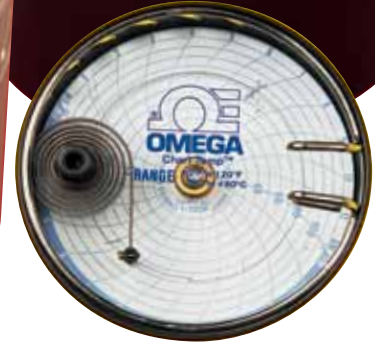
Comes with Extra Charts!

CT-300F-1H shown smaller than actual size.

From -40 to 260°C (-40 to 500°F)

Low-Temperature Recorders with Ranges Up to 104°C (220°F) and Either 1- or 7-Day Charts and 2% Accuracy

Oven Recorders with Ranges Up to 260°C (500°F) and Either 1- or 24-Hour Charts with 3% Accuracy

OMEGA® CHART-TEMP® recorders are dry-stylus, spring-wound, clock-driven circular chart recorders. Simply rewind the drive when replacing the chart. These recorders are excellent for recording temperatures inside buildings, refrigerators, or ovens. Units with ranges up to 260°C (500°F) are available.

OMEGACARE℠ Extended Warranty Program

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

Specifications

Dimensions: 82.5 H x 100 mm diameter (3.26 x 3.94")

Weight:
High-Temp Models: 397 g (14 oz)
Low-Temp Models: 600 g (21 oz)

Low-Temperature Recorders

To Order		
Model No.	**Temperature Range**	**Charts Model No.**
CT-100AF-(*)	0 to 100°F	**(*)-100F**
CT-120AF-(*)	20 to 120°F	**(*)-120F**
CT-160AF-(*)	-40 to 160°F	**(*)-160F**
CT-220AF-(*)	20 to 220°F	**(*)-220F**
CT-70AF-(*)	-30 to 70°F	**(*)-70F**

* Insert "1" for 1-day or "7" for 7-day recorder. Units with "-7" suffix are 7-day recorders.
***Ordering Examples: CT-100AF-1,** 1 hr recorder with 0 to 100°F temperature range.*
***OCW-3,** OMEGACARE℠ extends standard 1-year warranty to a total of 4 years.*

High-Temperature Recorders

Model No.	Temperature Range	Charts Model No.
CT-300F-(*)	70 to 300°F	**(*)-300F-CHART**
CT-400F-1H	70 to 400°F	**(*)-400F-CHART**
CT-500F-(*)	70 to 500°F	**(*)-500F-CHART**
CT-150C-1H	20 to 150°F	**1H-150C-CHART**
CT-200C-1H	20 to 200°C	**1H-200C-CHART**
CT-260C-1H	20 to 260°C	**1H-260C-CHART**

* Insert "1H" for 1-hour or "24H" for 24-hour recorder. Units with "-1H" suffix are 1-hour recorders.
***Ordering Example: CT-500F-1,** 1-hour recorder with 70 to 500°F temperature range.*
***OCW-3,** OMEGACARE℠ extends standard 1-year warranty to a total of 4 years.*

1- or 2-Channel
Circular Recorders

CT5100 Series

2 YEAR WARRANTY CE
Optional†

✔ **254 mm (10") Chart**
✔ **1- or 2-Pen Versions**
✔ **Programmable Inputs: Thermocouple, RTD, DC Current, or Voltage**
✔ **4-Digit, 14 mm H (0.56") LED Display**

CT5100 Series circular chart recorders can measure and display up to 2 process variables. Choose from a variety of programmable inputs. All recorder and alarm functions are easily configured with the 3 front-panel keys. Required panel depth is only 64 mm (2.5"), with only a 33 mm (1.3") protrusion.
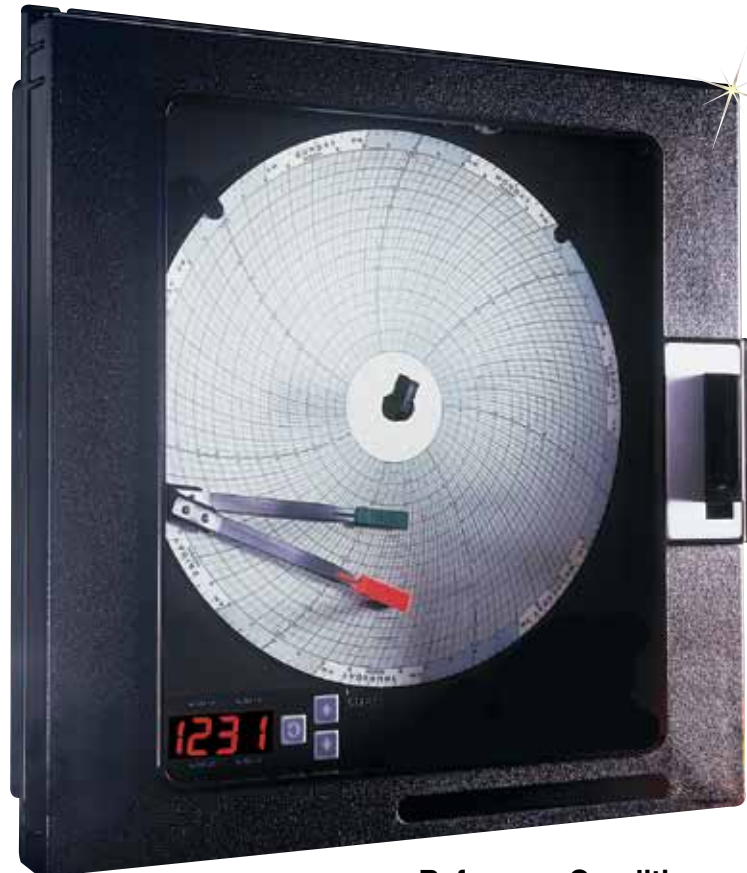
CT5110 shown smaller than actual size.

Specifications
Inputs:
Input Types/Range:
  Thermocouple: J, K, T, R, S
  RTD: 100 Ω platinum, 0.00385 Ω/Ω/°C
  DC Current: 0 to 20 mA, 4 to 20 mA; internal 4.7 Ω shunt resistor
  DC Voltage: 0 to 25 mV, 0 to 50 mV, 10 to 50 mV, 0 to 5 V, 1 to 5 V
Impedance: >100 MΩ for T/C and mV inputs, 100 kΩ for 5 V inputs, 4.7 Ω for µA inputs
RTD Excitation Current: 150 µA, typical
Input Scan Rate: 1 scan per second for non-RTD inputs; 1 scan per 1.2 seconds for RTD inputs
Input Correction: Offset adjustment: 999 to 999 units
Sensor Fault Detection: Display goes to "SnSr" and pen goes up-scale if a sensor break is detected. No sensor break can be detected for zero-based volt and milliamp ranges. Display goes to "Hi" 10% above span; display goes to "Lo" 10% below span or zero, whichever is higher.

Input Performance
Under Reference Conditions:
Measurement Error: Type J, K, T, R, S and RTD: ±0.25% of span ±1 degree; mA, mV and Vdc: ±0.25% of scaled span plus 1 least-significant digit
Cold-Junction Compensation Error: ±0.2°C @ 25°C (±0.36°F @ 77°F)
Cold-Junction Compensation Rejection: 0.04°/°C deviation from 25°C (0.07°/°F from 77°F)
Linearization Error:
  T/Cs: ±0.25°C (0.45°F) typical, ±0.5°C (0.9°F) worst case
  RTDs: ±0.1°C (0.18°F) typical, ±0.3°C (0.54°F) worst case
Ambient Temperature Error: ±0.01% of span per °C (1.8°F) deviation from 25°C (77°F)
Common Mode Rejection: >120 dB @ 50/60 Hz, 260 Vac max
Normal Mode Rejection: 85 db minimum @ 60 Hz or greater
Isolation: 350 Vac, 500 Vdc; inputs share a common signal ground

Reference Conditions:
Ambient Temperature: 25°C (77°F)
Relative Humidity: 60 to 70% RH
Supply Voltage: 115 Vac, 60 Hz
Source Resistance: <10 Ω for T/C input
Lead Resistance: <0.1 Ω (Pt100)
Recording:
Pen Type: Disposable fiber tip
Pen Color: Pen 1—red; pen 2—green
Chart Size: 254 mm D (10")
Chart Drive: Stepper motor
Chart Rotation: User configurable: 8 hours, 12 hours, 24 hours, 48 hours or 7 days
Chart Span: Bottom and top of span, -9999 to 9999 units
Recording Performance:
Chart Recording Accuracy: 0.5% of chart span reference accuracy
Chart Rotation Accuracy: ±0.5% of rotation time, assuming all backlash removed
Operator Interface
Display: 4-digit, 14 mm H (0.56"), red, 7-segment, LED display
Status Indicators: 5 red LED alarm status indicators, 1 green LED pen 2 indicator
†Refer to footnote on next page for CE ordering information.

Ranges

Sensor Type	Sensor Specs	Code	Reference Range °C	Reference Range °F
T/C	Iron-constantan	J	0 to 760	0 to 1400
	CHROMEGA®-ALOMEGA®	K	0 to 1360	0 to 2500
	Copper-constantan	T	-200 to 400	-330 to 752
	Platinum 13% rhodium-platinum	R	200 to 1650	400 to 3000
	Platinum 10% rhodium-platinum	S	200 to 1650	400 to 3000
RTD	100 Ω platinum, 0.00385 Ω/Ω/°C	Pt100	-140 to 400	-220 to 752

Keypad: 3 keys for programming and unit operation

Display Modes: Normal: process value(s) or blank

Alarms

Number: Up to 2 process alarms for each of 2 inputs

Type: Process high or low

Limit Device: Optional high/low limits for each input with latching output; normally open output latches open; red reset button to the right of the display

Hysteresis: Fully adjustable, 0 to 200 units, single sided

Security: Alarm setpoint changes can be prohibited

Sensor Fault Action: Alarm works normally in "Hi" and "Lo" conditions; alarm relays are de-energized in a "SnSr" sensor break condition

Relay Outputs:

Relays: SPDT; contacts rated 5 A resistive @ 115 Vac, 2.5 A resistive @ 230 Vac, ⅛ hp @ 230 Vac (single phase), 250 VA @ 115/230 Vac

Power Requirements:

Line Voltage: 90/264 Vac, 50/60 Hz; optional: 20 to 50 Vac, 50/60 Hz, or 22 to 65 Vdc

Power Consumption: 18 VA max

Construction:

Enclosure: Injection-molded Noryl® case and cover with acrylic window

NEMA Rating: NEMA 3 (IP54)

Conduit Openings: 3 openings on the right side

Mounting: Panel or wall

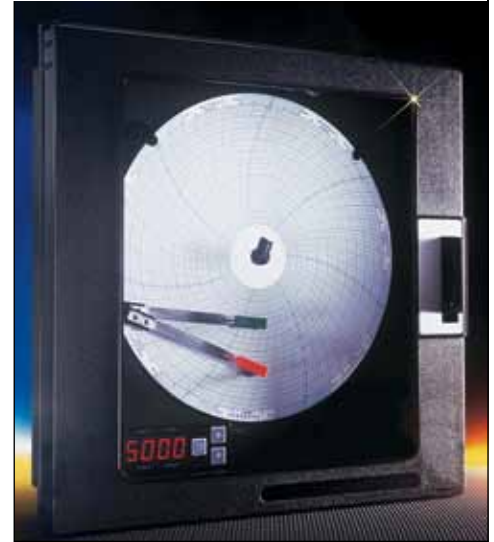**Overall Dimensions:** 355.6 W x 355.6 H x 96.5 mm D (14 x 14 x 3.8")

Panel Cutout: 322.58 W x 322.58 mm H (12.7 x 12.7")

Panel Depth: 64 mm (2.5")

Panel Protrusion: 33 mm (1.3")

Weight: 8.8 kg (15 lb) max

Retrofit: With adaptor plate, will fit CT7000 cutout

CT5100 shown smaller than actual size.

Environmental and Operating Conditions:

Operating Temperature: 0 to 50°C (32 to 122°F)

Storage Temperature: -40 to 65°C (-4 to 149°F)

Humidity: 10 to 90% RH, non-condensing

General Reference Data:

Data Backup: EEPROM for configuration parameters and calibration data; EEPROM for alarm setpoints

Approvals and Compliance:

Safety:
  UL Approved for USA: UL 1092, UL 916 and QUXY, pending
  UL Certified for Canada: CSA Spec 142, pending
Limit/Device: FM, pending

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

Accessories

Model No.	Description
CT7000-GREEN	Green pens, pkg. of 5, channel 2 only
CT7000-RED	Red pens, pkg. of 5, channel 1 only
CT7000C-0-100/24	Circular paper, 100 qty., 24-hr
CT7000C-0-100/7	Circular paper, 100 qty., 7-day
CT7000C-0-300/24	Circular paper, 100 qty., 24-hr
CT7000C-0-300/7	Circular paper, 100 qty., 7-day
CT7000C-0-2500/24	Circular paper, 100 qty., 24-hr
CT7000C-GENERIC/24HR	Circular paper, 100 qty., 24-hr

To Order *Visit omega.com/ct5100 for Pricing and Details*	
Model No.	**Description**
CT5100	1-pen recorder
CT5101	1-pen recorder with 1 alarm relay
CT5102	1-pen recorder with 2 alarm relays
CT5100-LOCK	1-pen recorder with door lock
CT5110	2-pen recorder
CT5112	2-pen recorder with 1 alarm relay per channel
CT5114	2-pen recorder with 2 alarm relays per channel
CT5110-LOCK	2-pen recorder with door lock

Comes complete with package of paper, 1 pen per channel and operator's manual.
*For transmitter power supply, add "**-XPS**" to model number.*
*To order CE approval, add suffix "**-CE**" to model number.*
***Ordering Examples: CT5100,** 1-pen recorder and **CT7000C-0-100/7,** 100 sheets of chart paper.*
***CT5102,** 1-pen recorder with 2 alarm relays.*
***OCW-1** OMEGACARE^SM extends standard 2-year warranty to a total of 3 years.*

Note: Other ranges available. Consult Sales for details.

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Microprocessor-Based Circular Chart Recorder

CT6100 Series

✔ **Accepts Thermocouple, RTD, Vdc, and mA DC Inputs**

✔ **High Accuracy and Stability**

✔ **User Configurable via Front-Panel Keypad**

✔ **Easy-to-Use Menu-Driven Interface for Rapid Configuration and Calibration**

✔ **Available in 1-, 2-, or 3-Pen Versions**

✔ **Large-Character Alphanumeric LCD with Backlight**

✔ **Simultaneous Digital Display of Process Variable for Each Channel**

✔ **Programmable Locks for Security**

CT6103 shown smaller than actual size.

The CT6100 Series microprocessor-based circular chart recorders are available in 1-, 2-, or 3-channel variants. They combine the simplicity and clarity of pen drawing with the versatility of microprocessor control. Each channel is compatible with all industry-standard sensors and signals, including thermocouple Types J, K, T, E, N, R, S, and B; Pt100 platinum RTDs; and 4 or 20 mA current loops.

Low and high measurement ranges are provided for each input type; separate range cards are not required. Multi-input versions feature optoelectronic isolation of the input stages to eliminate troublesome installation ground loops. Multislope integrating 16-bit A/D converters ensure precise measurement by sampling the input every 0.5 seconds.

Thermocouple and RTD characteristics are fully linearized. The recorders use automatic cold-junction compensation for thermocouple measurement.

All CT6100 Series models feature alarm relays. Single-pen recorders are equipped with 3 fail-safe single-pole changeover relays; 6 relays are standard on the 2- and 3-pen versions. Color-coded LEDs indicate the status of each relay. All relay functions are user selectable; setpoint values and hysteresis levels are entered directly via the keypad, while relay action and channel assignment are selected from user-friendly menus. Circuit precision is matched by the backlash-free pen-drive mechanism, which has a positioning resolution

greater than 0.1%. An integral feedback potentiometer enables closed-loop monitoring of each pen position.

Each recorder uses a low-maintenance stepper motor. The rotation speed of the 244 mm diameter chart is microprocessor controlled and user programmable.

All CT6100 recorders are housed in a strong molded case that can be panel or surface mounted. A gasket-lockable door protects internal components from harsh industrial environments and offers protection rated to NEMA 12 (IP55). A tough acrylic window lets the user view the chart trace, digital channel readings, and alarm status with the recorder's door closed.

Be the [text obscured]
to Order Additional Recorder Paper!

Specifications

Inputs

Input Types: Thermocouple K, T, J, N, E, B, R, S; Platinum RTD (Pt100) 3-wire; ±2V, +20 Vdc; ±2 mA, ±20 mA

Input Ranges: Thermocouples to BS4937 (type B minimum temp 200°C); RTD to BS1904:1984

Cold Junction Compensation: Automatic; ±0.02°C/°C stability

Input Resistance:
Thermocouple: 10 MΩ
±2 mA: 200 Ω
±20 mA: 20 Ω
±2V, ±20V: >1 MΩ

Min Span: 5°C (9°F), thermocouples K, J, T, E, N and RTD; 50°C (90°F) other thermocouple types, 50 mV, 200 mA

T/C BURN-OUT: Pull-up or pull-down, selectable

RTD Lead Resistance: 3-wire, compensated up to 10 Ω maximum per lead

Input Protection: ±50 Vdc on signal inputs

Input Isolation: Optoelectronic on 2 and 3 input models 500 Vrms channel-to-channel, 500 Vrms channel-to-ground

Sensor/Transmitter Power: 12 or 24 Vdc, 25 mA, selectable; for current loop inputs

Performance
Accuracy:
RTD, Low Range (-200 to 200°C): ±0.2°C
RTD, High Range (200 to 850°C): ±0.8°C
Thermocouple: ±0.25% full scale
Voltage/Current: ±0.2% full scale
Temperature Stability: ±0.02% FS/°C

Linearization Accuracy:
T/C Types J, K, T, N, E: ±0.1°C, -50 to 200°C, ±1°C maximum
T/C Types R and S: ±0.2°C, -50 to 200°C, ±1°C maximum
T/C Type B: ±1°C maximum
RTD: ±0.1°C, -200 to 850°C

Calibration Shift: ±10°C user programmable to eliminate sensor errors (thermocouple and RTD)

Chart and Display

Chart Size: 244 mm (9.6") diameter
Chart [Divisions]: 40, 50, 60, 70 or 80 linear divisions
Chart Drive: DC stepper motor
Chart Speeds: 1 to 24 hours in steps of one hour, 2 to 31 days in steps of 1 day

Writing Method: Disposable ink cartridges; pen 1-red; pen 2-green; pen 3-blue

Pen Positioner: DC stepper motor
Positioning Resolution: >0.1% full scale

Response Time: Zero to full scale in 4.5 seconds

Pen Lift: Powered, activated from front panel; chart fast time advance possible with pens raised

Display: 2 line x 20 character dot matrix liquid crystal with backlight and automatic temperature compensation; 9.6 mm (0.37") character height

Display Resolution: 0.1°C for temperature inputs, software programmable for voltage/ current inputs

Alarm Display: Relay status shown by red and green front panel LEDs

Relays

Type: SPDT; 30 Vdc or 250 Vac @ 6 A maximum; 150 W DC, 1660 Vac non-inductive

Action: Software selectable from: high alarm/low alarm/deviation alarm/control relay (high)/control relay (low); relays de-energize in alarm state; assignable to any channel

Hysteresis: User programmable 0.0 to 10% span

Snubber Network: 22 nF and 100 Ω across each contact

Analog Output (Option)

Type: 0 to 20 [mA or 4 to 20 mA], any channel, range selectable within any segment of chart range

Resolution: 12-bit
Compliance: 20V approx
Isolation: Optoelectronic
Action: direct or reverse

General

Security: 3-level software lock including password protection, internal hardware jumper lock, lockable door

Power: 115 or 230 Vac ±10%, switch selectable, 50/60 Hz: terminal block connection

Power Requirements: <25 W

Operating Ambient: 0 to 55°C (32 to 131°F), 0 to 90% RH (non condensing)

Case: Steel, with glass-filled polyester resin door with acrylic window

Protection: NEMA 12 (IP55)

Mounting: Panel or surface

Dimensions: 336 W x 396 H x 171 mm D (13.2 x 15.6 x 6.7")

Weight: From single pen: 7 kg (15.4 lb) to three pen: 7.7 kg (17.0 lb)

Panel Cutout: 288 W x 356 mm H (11.3 x 14.0")

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

To Order *Visit omega.com/ct6100 for Pricing and Details*	
Model No.	**Description**
CT6101	1-pen recorder with 3 relays and transmitter power supply
CT6102	2-pen recorder with 6 relays and transmitter power supply
CT6103	3-pen recorder with 6 relays and transmitter power supply

Accessories

Model No.	Description
CT6100-RED	Red pens, pack of 3
CT6100-GREEN	Green pens, pack of 3
CT6100-BLUE	Blue pens, pack of 3
CT6100-0-100/24H	100 chart papers, 24 hours
CT6100-0-100-31D	100 chart papers, 31 days
POWERCORD-SE	Power cord with one end stripped

Option*

Order Suffix	Description
-PV	Analog output of 0 to 20 mA or 4 to 20 mA, assignable to any channel

* Option is not field installable. It must be ordered at the time of purchase.
Comes complete with 1 package of 24 hour chart paper, pen(s) and operator's manual.
***Ordering Example: CT6101,** 1-pen recorder with 3 relays and transmitter power supply and* **POWERCORD-SE,** *power cord.*
***OCW-3,** OMEGACARE℠ extends standard 1-year warranty to a total of 4 years.*

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Circular Recorders

CT7000 Series

3 YEAR WARRANTY

✔ **1- or 2-Pen Versions**
✔ **254 mm (10") Chart**
✔ **Accepts Thermocouple, RTD, V, mV, or mA Signals**
✔ **Programmable Inputs, Speed, and Alarms**
✔ **4-Digit Display per Pen**
✔ **Isolated Inputs**

The CT7000 microprocessor-based circular chart recorder measures, displays, records, and controls up to 2 process variables from a variety of inputs. Record and control functions, alarm settings, and other parameters are easily configured via the 3 front keys. The CT7000 offers a 254 mm (10") circular chart and 4-digit LED display(s). Display resolution and filters are user configurable.

Each pen has 2 alarm settings. Alarms are user configurable as process high or low, deviation from setpoint (above or below), or deviation band (open or closed within band). Alarm hysteresis adjustment is also user configurable. Optional control capability includes on/off and PID control. Output type selections include SPST relay, SSR driver, and 4 to 20 mA DC (user configurable to 0 to 20 mA DC). Also, 4 to 20 mA DC outputs may be used for retransmitting the process value. Digital communications is optional.

Low-noise thermocouple probes sold separately, GKQSS-316G-12, GTQSS-316G-12
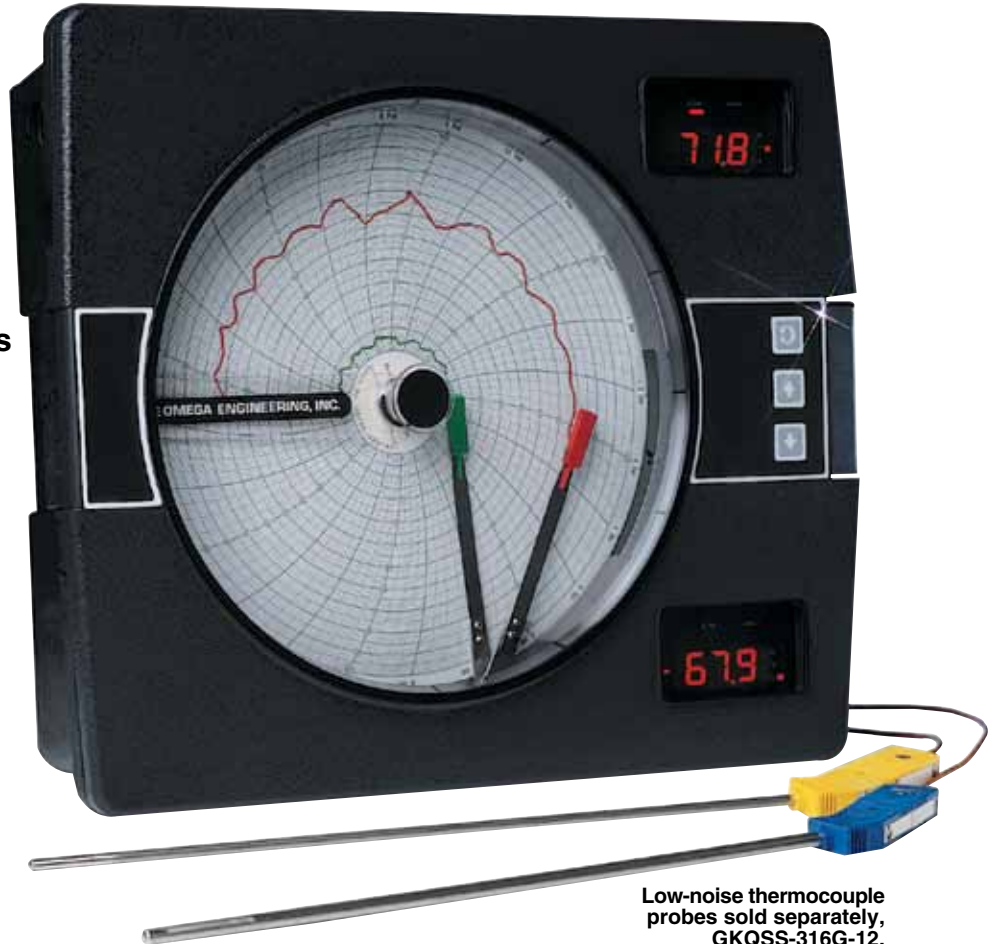
Specifications
Input Ranges
Thermocouple:
J: 0 to 760°C (0 to 1400°F)
K: 0 to 1360°C (0 to 2500°F)
T: -220 to 400°C (-330 to 750°F)
E: 0 to 750°C (0 to 1400°F)
N: 0 to 1300°C (0 to 2370°F)
R: 200 to 1650°C (400 to 3000°F)
S: 200 to 1650°C (400 to 3000°F)
B: 200 to 1800°C (400 to 3300°F)
C: 200 to 2300°C (390 to 4170°F)
RTD:
100 Ω (0.00385 Ω/Ω/°C), -140 to 400°C (-220 to 750°F)
Volts DC: 0 to 25 mV, 0 to 50 mV, 10 to 50 mV, 0 to 5 V, 1 to 5 V

Milliamps: 4 to 20 mA DC (via appropriate external shunt resistor)
Performance
Measurement Error Limit
Thermocouple Types J, K, T, E, N and RTD: ±0.25% of reading + 1° @ 25°C (77°F)
Type R, S, B, C Thermocouples: ±0.25% of span @ 25°C (77°F)
mVdc and Vdc: ±0.25% of scaled span plus 1 least-significant digit
Ambient Temperature Error Limit: 0.01% of span per °C (1.8°F) deviation from 25°C (77°F)
Process Value Output Error Limit: ±0.5% of span
Record Error Limit: ±0.5% of chart span or better, typically; ±1.0% of chart span maximum
Display/Record Filter: 1 to 20 scans averaging
Pen Resolution: 0.15% of chart span
Recording Deadband: 0.3% of chart span

Process Filter: 1 to 20 scans averaging
Pen Response (Full Scale Deflection): 20 s
Display Resolution
    T/C and RTD: 0.1 or 1°
    mVdc and Vdc: 0.001, 0.01, 0.1 or 1
Calibration Drift: Self-compensating for ambient temperature; all calibration values are stored in memory
Sensor Fault Detection: Displays "Hi" or "Lo" process input (10% above or below range) and sensor break "SnSr"; pen action on error condition is user configurable to 0 or 100% of chart span; on/off outputs go "off"; proportional outputs go to user-defined value from 0 to 100%
Record Chart: 254 mm (10") circular chart
Chart Range: -9999 to 9999
Chart Drive: DC stepper motor

User configurable from 0.1 to 999.9 hours per revolution

Pen Type: Disposable fiber-tip

Pen Color: Pen 1, red; pen 2, green

Display

Digital Displays:
2 possible: 1 per installed pen; (4) 7-segment digits, 14 mm (0.56") high, red LEDs, automatic (-) positioning, decimal point positioning

Alarm Display:
2 alarm indications possible per pen; ALRM1 and ALRM2; red LEDs; single ALRM indication provided for controller pens

Status Display:
LED indicates Out 1, Out 2, Man, Ramp, Soak, Seg 1 through Seg 6, process units as applicable

Alarms: Process, deviation (with hysteresis), deviation band

Outputs (Optional)

Relay: SPST, 115 Vac: 250 VA, 230 Vac: 250 VA

SSR Driver: Open-collector output, short circuit protected @ 100 mA maximum, provided 4 Vdc at 20 mA or 3 Vdc @ 40 mA

Current:
0 to 20 or 4 to 20 mA DC into 650 Ω max (control or process value)

Control Parameters

Proportional Band Output:
1 to 3000 units

Manual Reset (Integral):
-1500 to 1500 units

Auto Reset (Integral):
0 to 100 repeats/min

Rate (Derivative): 0 to 10 min

Cycle Time Output: 1 to 240 s

Physical

Dimensions:
335 H x 384 W x 92 mm D (13.2 x 15.1 x 3.6")

Panel Cutout:
321 H x 343 mm W (12.6 x 13.5")

Weight: 9.1 kg (20 lb), maximum

Vibration: 0.5 to 100 Hz @ 0.2 g

Keypad: Located on front cover, tactile feedback membrane keys

Enclosure: Gasketed cover; black, structural foam

Windows: Plexiglass standard

Memory Backup:
Battery, 5-year minimum life

Common-Mode Rejection:
90 dB minimum; 24 Vac maximum for RTD input; 15 Vac maximum for other inputs

Normal-Mode Rejection:
85 dB minimum @ 60 Hz or greater

Line Voltage:
115/230 Vac ±10%, 50/60 Hz

Power Consumption: 25 VA max

Operating Temperature:
0 to 55°C (32 to 131°F)

Storage Temperature:
-40 to 65°C (-40 to 149°F)

Humidity:
0 to 90% RH, non-condensing

Transmitter Power Supply:
Provides up to 40 mA at 24 Vdc

ESD: No effect from 5000 V static charge over surface area

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

To Order

Model No.	Description
CT7100	Recorder, circular, 1 pen
CT7110	Recorder, circular, 2 pens
CT7102	Recorder, 1 pen, 2 relays
CT7102-XPS	Recorder, 1 pen, 2 relays, transmitter power supply
CT7114	Recorder, 2 pens, 4 relays
CT7202	Recorder, control, 1 pen, 2 relays
CT7224	Recorder, control, 2 pens, 4 relays

Comes complete with operator's manual, pens and 100 charts. OMEGACARE℠ extended warranty program is available for models shown on this page. Ask your sales representative for full details when placing an order.

Accessories

Model No.	Description
CT7000-GREEN	Pens, green, package of 5, channel 2 only
CT7000-RED	Pens, red, package of 5, channel 1 only
CT7000C-0-100/24	Paper, circular, 100 qty
CT7000C- (range/time*)	Paper, circular, 100 qty

★ Other standard ranges: 0-600/24, 0-400/24, 0-200/24, 30-230F/24, 0-100/7, 0-1000/24, 0-300/24, 0-300/7, 0-800/24, 0-2000/24, -50-50/7, 0-200/7, 0-2500/24, 0-1200/24, 60-180F/24, 0-14PH/24, -50-50/24.

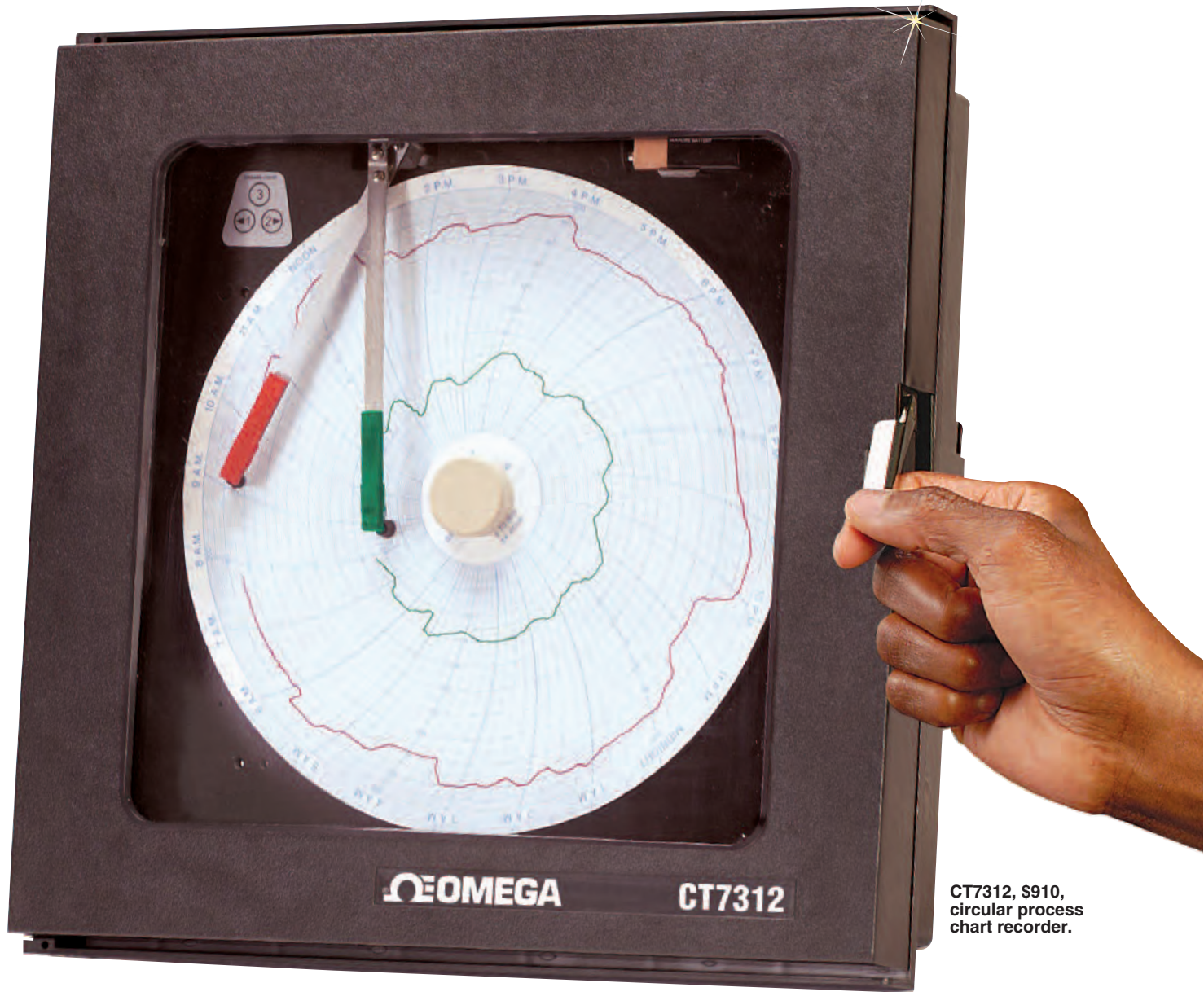***Note:*** *Recorder may be supplied with other configurations of options.*

Ordering Examples: CT7110, *2-pen circular recorder,* ***CT7000-RED, CT7000-GREEN,*** *spare pens,* ***CT7000C-0-100/24,*** *spare paper, and* ***CT7202,*** *recorder control, 1 pen, 2 relays.*

OCW-1, *OMEGACARE℠ extends standard 2-year warranty to a total of 3 years.*

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Economical 2-Pen Circular
Process Recorder

CT7312, $910, circular process chart recorder.

CT7300 Starts at

$**845**

✔ **Universal Input**
✔ **2-Pen Circular Process Recorder with 254 mm (10") Chart**
✔ **Quick, Easy Setup**
✔ **Easy-to-Replace Paper Chart with Magnetic Hub**

✔ **LED Display Indication (Optional)**
✔ **No "DIP Switches" to Set During Configuration**
✔ **Up to 48 Hours of Battery Backup Recording Time**
✔ **Latching or Non-Latching Programmable Relays**
✔ **Built-In Chart Lights**

The CT7300 Series consists of economical 2-pen circular process chart recorders that measure and record up to 2 process variables from a variety of inputs. Settings are easily configured for multiple applications. To protect the user's process, the battery backup will continuously record up to 48 hours if a power loss occurs.

Specifications
Power
Line Voltage: 110/220 Vac, 50/60 Hz
Power Consumption: 15 VA maximum
Input
Thermocouple Types: J, K, T, R, B, S
RTD (3-Wire): Pt100 ν RTD (385 curve)
Linear: 4 to 20 mA, 0 to 5 Vdc
Common Mode Rejection: >120 dB at 60 Hz

from each other (share common ground)

Cold Junction Accuracy:
±0.2°C/°F @ 25°C (77°F) ambient
Ambient Error: ±0.01% span/°C
from 25°C ambient
Isolation: PV inputs isolated from all
alarm outputs

Input Range Table:

Type	Range
J	-130°C to 760°C (-202°F to 1400°F)
K	-130°C to 1370°C (-202°F to 2498°F)
T	-200°C to 400°C (-328°F to 752°F)
B	100°C to 1824°C (212°F to 3315°F)
R	0°C to 1650°C (32°F to 3002°F)
S	0°C to 1649°C (32°F to 3000°F)
Pt100 (DIN)	-210°C to 440°C (-346°F to 824°F)
mA	4 to 20 mA
V	0 to 5 Vdc

Note: Thermocouples and RTDs are scalable within range

Recording
Chart Size: 254 mm (10")
Recording Accuracy:
±0.5% of span (100-division span)
Sensor Break:
Full scale pen <10 seconds
Chart Speed: Configurable—4, 8, 12, 24, 48 and 168 hours of rotation
Input Filtering:
Programmable up to 120 seconds
Battery Backup:
9V, up to 48 hours of recording time
Options
Relay: DPDT, 1.0 A @ 120 Vac resistive
Relay Program:
Process, band, non-latching, latching
Error Protection:
De-energized during sensor break
Hysteresis:
Set at 2 units; activation is safe-sided

Environmental and Physical
Operating Temperature:
0 to 60°C (32 to 140°F)
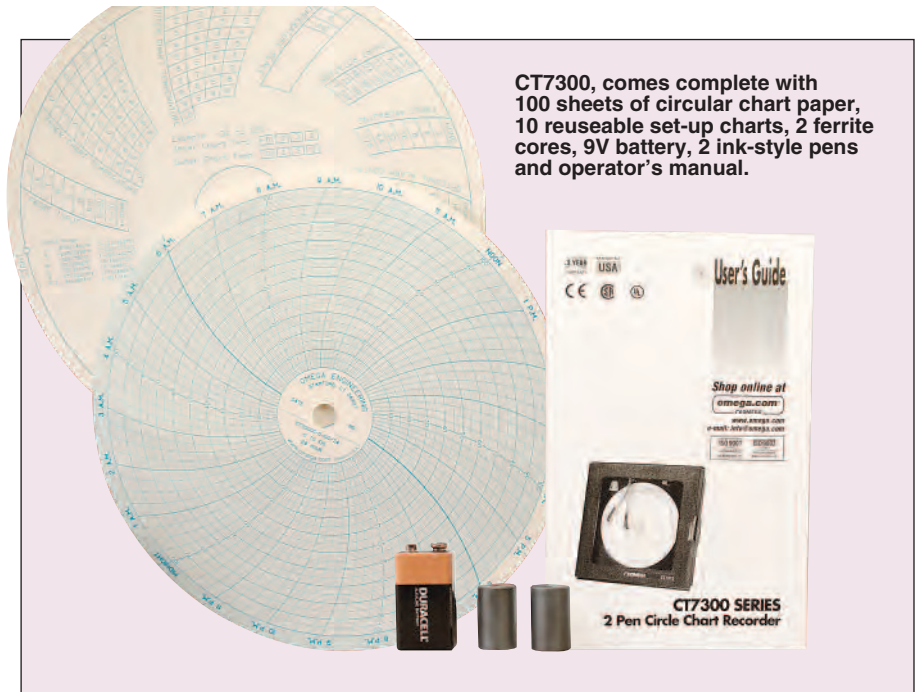**Storage Temperature:**
-40 to 65°C (-40 to 149°F)
Humidity:
0 to 90% RH (non-condensing)
Vibration: 0.3 to 100 Hz @ 0.2 g
Mounting: ±20 degrees of vertical, ±10 degrees of horizontal
Panel Rating: NEMA 12X standard [NEMA 4 (IP65) optional]

CT7300, comes complete with 100 sheets of circular chart paper, 10 reuseable set-up charts, 2 ferrite cores, 9V battery, 2 ink-style pens and operator's manual.

CT7300 SERIES
2 Pen Circle Chart Recorder

Dimensions:
356 H x 356 W x 97 mm D
(14 x 14 x 4")
Panel Cutout: Industry standard
323 x 323 mm (13 x 13")
Weight: 3 kg (7 lb)

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

☐ *MOST POPULAR MODELS HIGHLIGHTED!*

To Order *(Specify Model Number)*

Model No.	Price	Description
CT7310	$845	Recorder, circular process, 2-pens
CT7311	856	Recorder, circular process, 2-pens, 1 relay
CT7312	910	Recorder, circular process, 2-pens, 2 relays

Comes complete with operator's manual, 10 reuseable set-up charts, 2 ferrite cores, 2 ink-style pens, 9V battery and 100 charts.

Accessories

Model No.	Price	Description
CT7300-GREEN	$25	Pens, green, package of 6
CT7300-RED	25	Pens, red, package of 6
CT7000C-0-100/24	18	Paper, circular, 100 qty
CT7000C-(range/time*)	18	Paper, circular, 100 qty
CT7000C-CUSTOM	630	Paper, specify range, 10 x 100 qty
CT7300-SUP	19	Spare setup charts, 10 to a box

* Other standard ranges: 0 to 600/24, 0 to 400/24, 0 to 200/24, 30 to 230F/24, 0 to 100/7, 0 to 1000/24, 0 to 300/24, 0 to 300/7, 0 to 800/24, 0 to 2000/24, -50 to 50/7, 0 to 200/7, 0 to 2500/24, 0 to 1200/24, 60 to 180F/24, 0 to 14PH/24, -50 to 50/24.
For NEMA 4 (IP65) rated case, add "-NEMA" to model number and add $50 to price.
For LED display indication, add "-D" to model number and add $95 to price.
Ordering Examples: CT7310,** 2-pen circular process recorder, **CT7300-RED** and **CT7300-GREEN,** spare pens, **CT7000C-0-100/24,** spare paper, $845 + 25 + 25 + 18 = **$913.
CT7310-NEMA,** chart recorder with NEMA 4 (IP65) rated case, $845 + 50 = **$895.
OCW-2,** OMEGACARE^{SM} extends standard 3-year warranty to a total of 5 years ($152), $845 + 152 = **$997.

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Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters,Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves,Variable Area Flowmeters, Vortex Shedding Flowmeters

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• click here to go to the omega.com home page •

Circular Chart Recorder

CT87 Series

1 YEAR WARRANTY CE

- ✔ **Easy-to-Read 152 mm (6")
  Circular Chart**
- ✔ **Type J Thermocouple Input**
- ✔ **Economical**
- ✔ **LED Digital Display
  of Temperature**
- ✔ **Front Panel Controls
  for Fast, Easy Setup**
- ✔ **Select From
  3 Temperature Ranges**
- ✔ **6-Hour, 24-Hour, or
  7 Day Chart Rotation**
- ✔ **Select for Single
  or Continuous
  Chart Rotation**
- ✔ **Free Standing or
  Wall Mounted**
- ✔ **Fold Down Carrying Handle**
- ✔ **Durable Polycarbonate Case**
- ✔ **Plug-In SMP Connection
  for J Thermocouple**
- ✔ **Adaptor for 120 Vac
  Operation (220 Vac
  Optional)**
- ✔ **Battery Back-Up for
  Power Interruptions**

CT87LF or CT87LC

- ✔ **Low Temperature
  Recorders**
- ✔ **Typical Temperature
  Measurement
  Applications**
- ✔ **Freezers**
- ✔ **Refrigerators**
- ✔ **Environmental**
- ✔ **Chambers**
- ✔ **Room Temperatures**

CT87LC Ranges

- ✔ **-40 to 0°C, -30 to 10°C,
  and 10 to 50°C**

CT87LF Ranges

- ✔ **-40 to 30°F,
  -20 to 50°F,
  and 50 to 120°F**
- ✔ **Comes with 4" L,
  ⅛" Dia., 304 SS Needle
  Tip Probe with 4.6 m (15')
  Leads**

CT87HF or CT87HC

- ✔ **High Temperature
  Recorders for Higher
  Temperature
  Measurement
  Applications**
- ✔ **Ovens**
- ✔ **Process Chambers**

CT87HC Ranges

- ✔ **0 to 120°C, 0 to 250°C,
  and 250 to 500°C**

CT87HF Ranges

- ✔ **0 to 250°F, 0 to 500°F,
  and 500 to 1000°F**
- ✔ **Comes with 6' L
  24 Gage Glass Insulated
  Thermocouple**

**CT87LF low temperature
recorder, with CT87-J-NP
probe (included with the
CT87L models).**

The CT87 Series temperature recorder is a precision instrument used to monitor and record temperature on a 152 mm (6") circular chart. The CT87 may be carried as as portable instrument or mounted in a fixed location. The CT87 offers a variety of features to meet any temperature recording requirement. A combination of 3 temperature ranges and 3 chart speeds provides 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.

Specifications

Low Temp°F: -40 to 30, -20 to 50, 50 to 120
Low Temp °C: -40 to 0, -30 to 10, 10 to 50
High Temp °F: 0 to 250, 0 to 500, 500 to 1000
High Temp °C: 0 to 120, 0 to 250, 250 to 500
Ambient Operating Temp: 0 to 49°C (32 to 120°F)
Relative Humidity: 0 to 96%
Accuracy: ±1°C (±2°F)
Chart Diameter: 152 mm (6")
Chart Speed Selectable: 6-hr, 24-hr, 7 days
Chart Rotation Selectable: Single turn, continuous
Chart Speed Accuracy: ±1%
Display: 3 digit LED 13 mm (0.5")
Recording Pen: Ink type
Case Size: 235 H x 184 W x 70 mm L (9¼ x 7¼ x 2¾")
Weight: 2.2 kg (4 lb, 7 oz)
Battery Back-Up Life: 48-hr, 8 "AA" alkaline batteries (included)
Primary Power: 115 Vac, 50/60 Hz or 220 Vac, 50/60 Hz
Temperature Probe:
  Low Temp Recorder:
  CT87-J-NP (needle probe)
  High Temp Recorder:
  TC-GG-J-24-72-SMP-M-PP

CT87LF low temperature model, with CT87-J-NP probe (included with the CT87L models), shown smaller than actual size.

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

To Order *Visit omega.com/ct87 for Pricing and Details*

Model No.	Voltage	Ranges
CT87LF	110	-40 to 30°F, -20 to 50°F and 50 to 120°F
CT87LF-220	220	
CT87LC	110	-40 to 0°C, -30 to 10°C and 10 to 50°C
CT87LC-220	220	
CT87HF	110	0 to 250°F, 0 to 500°F and 500 to 1000°F
CT87HF-220	220	
CT87HC	110	0 to 120°C, 0 to 250°C and 250 to 500°C
CT87HC-220	220	

Accessories

Model No.	Description
CT87-PEN-BLACK	Replacement pen
CT87-J-NP	Low temp replacement probe, 4" L, ⅛" Dia, 304 SS needle probe, 4.6 m (15') leads
TC-GG-J-24-72-SMP-M-PP	High temp replacement sensor, 6' L, 24 gage glass insulated "J" thermocouple

Note: *Many other "J" type probes are available, visit omega.com. Comes complete with 1 package assorted charts, 2 pens, AC adaptor, Type J thermocouple, 8 "AA" batteries and operator's manual. CT87L also comes with CT87-J-NP probe. CT87H also comes with TC-GG-J-24-72-SMP-M beaded wire thermocouple probe.*

Ordering Examples: CT87HC, *110V circular chart recorder with beaded wire probe included.*

OCW-3, *OMEGACARE℠ extends standard 1-year warranty to a total of 4 years.*

Replacement Charts

Charts	Temperature
CT87C--40-30F/(*)	-40 to 30°F
CT87C--40-0C/(*)	-40 to 0°C
CT87C--20-50F/(*)	-20 to 50°F
CT87C--30-10C/(*)	-30 to 10°C
CT87C-50-120F/(*)	50 to 120°F
CT87C-10-50C/(*)	10 to 50°C
CT87C-L(**)-MIX	60 assorted charts
CT87C-0-250F/(*)	0 to 250°F
CT87C-0-120C/(*)	0 to 120°C
CT87C-0-500F/(*)	0 to 500°F
CT87C-0-250C/(*)	0 to 250°C
CT87C-500-1000F/(*)	500 to 1000°F
CT87C-250-500C/(*)	250 to 500°C
CT87C-H(**)-MIX	—

* Insert "24H" for 24-hour chart, "6H" for 6-hour, or "7D" for 7 days.

** Insert either F or C for an assortment of 60 charts.

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PRESSURE
RECORDERS

CT87P Series

≥1 YEAR WARRANTY CE

- ✔ **13 mm (0.5") LED Display**
- ✔ **152 mm (6") Chart**
- ✔ **3 Pressure Ranges**
- ✔ **4 Recording Speeds**
- ✔ **Front-Panel Selectable Controls**
- ✔ **Single or Continuous Chart Rotation**
- ✔ **Free Standing or Wall Mount**

The CT87P pressure recorder is a versatile instrument that accurately measures and records pressures. The remote sensor has a 1.8 m (6') long cord and a 17-4 stainless steel pressure port with ¼ NPT threads. The burst pressure is 2500 psi, rated for any gas or fluid compatible with 17-4 stainless steel. Battery backup ensures normal operation during power interruptions. The unit can also be run from any 12 Vdc source (auto or marine).

SPECIFICATIONS
Pressure Ranges psi Model:
0 to 500 psi, 0 to 150 psi, 0 to 50 psi
Pressure Ranges bar Model:
0 to 35 bar, 0 to 10 bar, 0 to 3.5 bar
Pressure Accuracy: ±1% full scale
Ambient Operating Temp Range:
0 to 60°C (32 to 140°F)
Remote Pressure Sensor: 1.8 m (6') long 17-4 stainless steel ¼ NPT pressure port, 2500 psi burst pressure, rated for any gas or fluid compatible with 17-4 stainless steel
Ambient Operating Relative Humidity: 96% maximum
Selectable Chart Speeds: 6 hours, 24 hours, 7 days, 31 days
Chart Rotation Mode (Selectable):
Single turn or continuous
Chart Speed Accuracy: ±1%

CT87P, shown smaller than actual size.

Chart Diameter: 152 mm (6")
Display: 3-digit, 13 mm (0.5") LED
Primary Power Supply: 120 Vac, 50/60 Hz, or 220 to 240 Vac, 50/60 Hz (AC adaptor included)
Battery Life: 48 hours continuous use
Battery Backup: 8 "AA" alkaline batteries (included)

Recording Pen: Ink
Case Size:
235 H x 184 W x 70 mm D
(9¼ x 7¼ x 2¾")
Weight:
2.13 kg (4.7 lb)
Case Material: Polycarbonate

Remote sensors included

To Order

MODEL NO.	DESCRIPTION
CT87P	Circular pressure recorder, psi ranges
CT87PB	Circular pressure recorder, bar ranges
CT87P-230	Circular pressure recorder, psi, 230 Vac
CT87PB-230	Circular pressure recorder, bar, 230 Vac
CT87P-RP	Replacement pressure sensor
CT87-PEN-BLACK	Replacement pen
CT87P-C-(*)	60 pressure charts
MN1500	"AA" batteries (pack of two)

OMEGACARE℠ Extended Warranty Program

(*) Insert pressure range code from chart below.

PRESSURE RANGE	PRESSURE CHART CODES			
	6 HOURS	**24 HOURS**	**7 DAYS**	**31 DAYS**
0 to 500 psi	**6H500PSI**	**24H500PSI**	**7D500PSI**	**31D500PSI**
0 to 150 psi	**6H150PSI**	**24H150PSI**	**7D150PSI**	**31D150PSI**
0 to 50 psi	**6H50PSI**	**24H50PSI**	**7D50PSI**	**31D50PSI**
0 to 35 bar	**6H35BAR**	**24H35BAR**	**7D35BAR**	**31D35BAR**
0 to 10 bar	**6H10BAR**	**24H10BAR**	**7D10BAR**	**31D10BAR**
0 to 3.5 bar	**6H3.5BAR**	**24H3.5BAR**	**7D3.5BAR**	**31D3.5BAR**

Comes complete with AC adaptor, 60 assorted charts, 2 pens, 8 "AA" batteries and operator's manual.
***Ordering Example: CT87P,** 152 mm (6") circular pressure recorder with psi ranges,*
***OCW-3,** OMEGACARE℠ extends standard 1-year warranty to a total of 4 years.*
***CT87PB,** 152 mm (6") pressure recorder with bar ranges.*
OMEGACARE℠ extended warranty program is available for models shown on this page. Ask your sales representative for full details when placing an order. OMEGACARE℠ covers parts, labor and equivalent loaners.

Temperature Chart Recorder

NEW

CT89 Series

1 YEAR WARRANTY CE

- ✔ **Advanced Microcontroller Design**
- ✔ **Large LED Digital Temperature Display**
- ✔ **3 Temperature Ranges and 4 Chart Speeds**
- ✔ **Front Panel Selectable Single Turn or Continuous Chart Rotation**
- ✔ **Front Panel Controls for Fast and Easy Setup**
- ✔ **Standard 120V Operation**
- ✔ **Battery Back-Up Assures Normal Operation During Power Interruptions**
- ✔ **12V Vehicular or Marine Use Operations**
- ✔ **Stainless Steel Remote Reading 102 mm (4") Probe with 4.6 m (15') Cable**
- ✔ **Fold-Down Handle**
- ✔ **Freestanding or Wall Mounted**
- ✔ **Durable Polycarbonate Case, Cover, and Handle**

Applications
- ✔ **Food Storage**
- ✔ **Environment, Energy Management**
- ✔ **HVAC, Refrigeration Maintenance**
- ✔ **General Laboratory Monitoring**
- ✔ **Computer Room Monitoring**
- ✔ **Ovens, Dryers, Paint Booths**

CT89F with probe included.

The newly designed CT89 temperature recorder with remote sensor employs advanced microcontroller design that enables this versatile instrument to accurately measure and record temperatures in air, gas, liquids, powders, solids, and semi-solids.

The CT89 is a precision instrument used to monitor and record temperature on 6" circular chart paper. It may be carried as a portable instrument or mounted in a fixed location. A combination of 3 temperature ranges and 4 chart speeds provide a high degree of flexibility. In addition, the chart rotation may be set for single or continuous turn operation. To protect the data being recorded the CT89 uses an automatic battery backup to maintain operation during a power outage.

S

NEW

CT89F.

OMEGACARE℠
Extended Warranty Program

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

Specifications

Temperature Scale: -40 to 30°F, -20 to 50°F, 50 to 120°F, -40 to 0°C, -30 to 10°C, and 10 to 50°C

Chart Speed Selectable: 6 hours, 24 hours, 7 days, 31 days

Chart Speed Accuracy: ±1%

Chart Diameter: 152 mm (6")

Temperature Display: 3 digit LED; 13 mm (0.5") H

Temperature Accuracy: ±1°C (±2°F)

Temperature Sensor: Stainless steel tip submersible with 4.6 m (15') of cable

Recording Pen: Ink type

Power Supply: 120 Vac, 50/60 Hz or 220/240 Vac, 50 Hz

Battery Backup: 8 alkaline "AA" cells (included)

Battery Life: 48 hours

Operating Temperature: 0 to 49°C (32 to 120°F)

Operating Humidity: 0 to 96% max

Dimensions: 235 L x 184 W x 70 mm D (9.25 x 7.25 x 2.75")

Weight: 7 oz (4 lb)

To Order *Visit omega.com/ct89 for Pricing and Details*

Model No.	Description
CT89F	Temperature chart recorder, 110 Vac, °F
CT89F-220	Temperature chart recorder, 220 Vac, °F
CT89C	Temperature chart recorder, 110 Vac, °C
CT89C-220	Temperature chart recorder, 220 Vac, °C
CT87-PEN-BLACK	Replacement pen
CT89-PROBE	Replacement stainless steel temperature probe, 120 mm (4") L, with 4.6 m (15') wire

Charts	Temperature
CT87C- -40-30F/(*)	-40 to 30°F
CT87C- -40-0C/(*)	-40 to 0°C
CT87C- -20-50F/(*)	-20 to 50°F
CT87C- -30-10C/(*)	-30 to 10°C
CT87C-50-120F/(*)	50 to 120°F
CT87C-10-50C/(*)	10 to 50°C
CT87C-L(**)-MIX	60 assorted charts

Comes complete with 60 assorted 152 mm (6") diameter charts, 102 mm (4") probe, 2 black cartridge pens, and operator's manual.

* Insert "6H" for 6-hour, "24H" for 24-hour chart, "7D" for 7 days, or "31D" for 31 days.
** Insert either "F" or "C" for an assortment of 60 charts.
Ordering Example: CT89F, temperature chart recorder 110 Vac.
OCW-3, OMEGACARE extends standard 1-year warranty to a total of 4 years.

Microprocessor Based
Circular Chart Recorders

CT9000 Series

Remember to Order Extra Paper 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.

CT9144 shown smaller than actual size.

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

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
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)
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

mA DC: 0 to 20 mA or 4 to 20 mA with internal 50 Ω shunt
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:
±0.25°C (1.45°F) typical, ±0.5°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: 650 Ω 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, °C to °F, °F to °C, linear mass flow, DP mass flow, BTU, RH, F_O, ZrO_2
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
Type: Process high or low, rate rising or falling
Hysteresis: Fully adjustable

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

CT9173 shown smaller than actual size.

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.*
* For additional universal inputs, change last digit of base number to **2, 3, 4, 6, or **8,** representing the total number of inputs for an additional cost per input beyond standard number offered (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.*

S

Portable Universal
Circular Chart Recorder
5 Models Available

OE OMEGA™

CTXL Series

2 YEAR WARRANTY **NIST**

Optional†

Choice of White or Gray to Meet Your Needs!

PATENTS PENDING

Large 200 mm (8") 2-Sided Chart

CTXL-TRH recorder shown smaller than actual size.

---

5 Models Available!

1. **Temperature/Humidity with Wired Probe**
2. **Temperature/Humidity with Remote Wireless Probe**
3. **Dual Process-Voltage or Current**
4. **Dual Thermocouple**
5. **pH/Temperature**

✔ **Large, 200 mm (8") Scale**
✔ **1, 7 or 32 Day Recording**
✔ **Easy to Read Dual Channel Backlit LCD Readout**
✔ **Convenient Front Panel Programming/Operation**
✔ **Monitors Min/Max/Avg Values**
✔ **High/Low Audible/Visual Alarms**
✔ **Dual High Alarm Relays, Dual Low Alarm Voltage Outputs**
✔ **Double Sided Charts with Magnetic Mount Hub**
✔ **Benchtop or Wall Mount with Built-In Chart Lights**
✔ **Powered by 4 D Batteries or Universal AC Adaptor**
✔ **Data Logging PC Software Available Online**
✔ **RoHS 2 Compliant**

The CTXL Series circular chart recorders from OMEGA combine form and function in an easy to use two-channel circular chart recorder with a large, 200 mm (8") diameter chart, and dual channel LCD readout. Depending on your application, the CTXL is available to measure ambient temperature and humidity (with an available wireless option capable of up to 90 m (300') (line of sight), dual thermocouple, dual process (1 V, 5 V, 10 V, or 0/4 to 20 mA), or pH/temperature.

The CTXL has a custom LCD readout that displays the current values of both channels, and can indicate the min, max or average input values as well. The display also indicates the chart speed (1, 7 or 32 day), battery status, high and low alarm indication, keypad lockout status, and battery life.

Additional features of the CTXL include dual relays with contact closures for high alarms, and dual voltage outputs for low alarms to drive external relays. A built-in audible buzzer also informs the user of an alarm condition. A hidden key (White Box) can lockout unauthorized access to the front keypad, preventing changes to the recorder settings.

The CTXL features a rugged, ABS enclosure, suitable for industrial environments, but it's also intended to fit right in to other environments, such as museums, art galleries, computer rooms, labs, clean rooms, even hospitals. The CTXL is designed for both benchtop and wall mount operation; a convenient base rotates out of the way, and is hidden by a decorative foot cover for wall mount use.

Each unit comes complete with 120 assorted double-sided charts, 2 pen sets, extra chart light, universal ac adaptor, 4 "D" cell alkaline batteries, RS232 cable and adaptor, wall mounting kit, and quick start manual. CTXL-TRH models are also supplied with sensor probe and clip, and 1.8 m (6') probe extension cable.

† Refer to accessories chart for NIST calibration ordering information.

Temperature/Relative Humidity Recorder

Large 200 mm (8") 2-Sided Chart

MODEL #1
CTXL-TRH

2 YEAR WARRANTY

NIST

Optional†

- ✔ **-17 to 49°C (2 to 120°F) and 2 to 98% RH Ranges**
- ✔ **Detachable Sensor Probe for Direct Attachment or Remote Mounting**
- ✔ **Available Wireless Sensor Model**
- ✔ **Windows-Based PC Data Logging Software Available Online**
- ✔ **Specialty Chart Papers Available for Custom Applications**
- ✔ **Benchtop or Wall Mount with Built-In Chart Lights**
- ✔ **RoHS 2 Compliant**

The CTXL–TRH recorder is designed for both local and remote monitoring of temperature and relative humidity. The standard sensor probe clips to the side of the unit, or may be detached and mounted up to 12 m (40') away, using available extension cables. For even longer distances, the recorder is available with a wireless probe, which can be placed up to 90 m (300') line of sight, or 33 m (110') indoors away from the recorder. Simply plug-in the wireless receiver in place of the probe into the recorder, and you're ready to go.

The CTXL-TRH is available with specialty paper charts, with optimal ranges marked right on the chart, so you can easily see from a distance that the temperature and humidity readings are within range.

A Windows-based application program allows the user to monitor

PATENTS PENDING

the temperature and relative humidity using their PC (software is available online). You can log the data to a file, as well as display the information on a custom on-screen chart; set the alarms on the recorder, and display their status on-screen. You can also re-scale the recorder chart paper, setting temperature and %RH limits anywhere within the range of the unit. This allows you to use the 8" chart to display narrow temperature and humidity bands, for greater resolution.

Specifications
(See Common Specifications on Page 8)
Temperature:
Range: -17.7 to 49°C (0 to 120°F)
Display Accuracy: ±1°C (2°F)
Chart Accuracy: ±1.5°C (3°F)
Display Resolution: 0.1° (F or C)

CTXL-TRH recorder, shown smaller than actual size.

Relative Humidity:
Range: 0 to 98% RH
Display Accuracy: ±3% RH, 15 to 90% RH @ room temperature; ±5% RH, <15 or > 90% RH @ room temperature
Chart Accuracy: ±4% RH, 15 to 90% RH, ±6% RH, <15 or >90% RH
Display Resolution: 1% RH
Remote Probe:
12.2 m (40') max distance
Temperature/Humidity Sensor:
Digital sensor
Probe Disconnect: Pens will go to the Home position; Display will show "Prb Err". Chart motor will continue to run
Alarm Set Point Resolution:
    Temperature: 0.5°C or °F
    Humidity: 1%RH
Alarm Deadband:
    Temperature: 0.5°C or °F
    Humidity: 3% RH

† Refer to accessories chart for NIST calibration ordering information.

MODEL #2

2 YEAR WARRANTY **NIST**

Optional†

PATENTS PENDING

Large 2-Sided Chart

Choice of White or Gray to Meet Your Needs!

Wireless Transmitter—Up to 90 m (300') from Recorder

✔ **Record Temperature/ Humidity with Remote Wireless Probe**
✔ **RF Range 90 m (300') Line of Sight and 33 m (108') Indoors**
✔ **1, 7 or 32 Day Recording**
✔ **Easy to Read Dual Channel Backlit LCD Readout**
✔ **Convenient Front Panel Programming/Operation**
✔ **Monitor Min/Max/Avg Values**
✔ **High/Low Audible/ Visual Alarms**
✔ **Dual High Alarm Relays, Dual Low Alarm Voltage Outputs**
✔ **Double Sided Charts with Magnetic Mount Hub**
✔ **Benchtop or Wall Mount with Built-In Chart Lights**
✔ **Powered by 4 "D" Batteries or Universal AC Adaptor**
✔ **RoHS 2 Compliant**

Specifications
(See Common Specifications on Page 8)

Transmitter
Transmit Sample Rate: 2 sec up to 2 min

Radio Frequency: ISM 915 MHz or ISM 868 MHz

Approvals:
   CTXL-TRH-(*)-W9: FCC, Class A

RF Link Range:

Outdoor Line of Sight: Up to 90 m (300')

Indoor/Urban: Up to 33.5 m (110')

Computer Interface: USB, to change transmit interval, frequency and channel ID

Operating Ambient: -18 to 49°C (0 to 120°F), 2 to 98% RH

LED Indicators: Red LED for Low Battery and other communication error indications; Green LED for transmit indication

Power: One 3.6 Vdc "AA" Lithium Battery, 2400 mAH capacity, or optional ac adaptor, UNI-AC-100/240-5V

Battery Life: 1 year typical, at 1 minute transmission rate

Remote wireless temperature/humidity transmitter, included, shown smaller than actual size.

OMEGA CTXL-PT SERIES WIRELESS TEMPERATURE/HUMIDITY TRANSMITTER

CTXL-TRH-W-W9 temperature/ humidity recorder with remote wireless transmitter, shown smaller than actual size.
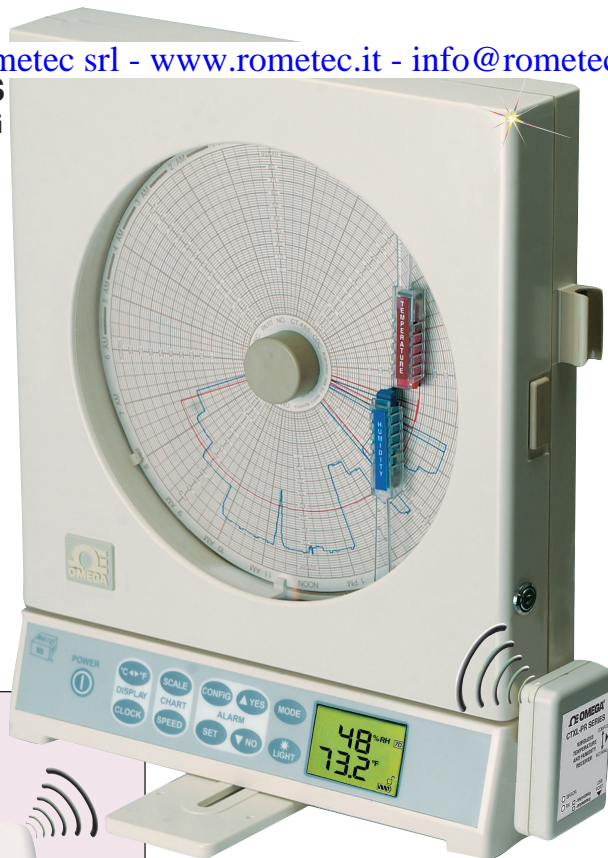
Receiver
Computer Interface: USB, to change receive interval, frequency and channel ID

**Operating Ambient:** -18 to 49°C (0 to 120°F), 2 to 98% RH

LED indicators: Red LED for comm. error indications, Green LED for receive indication

**Power:** From the CTXL recorder through the round DIN connector

† Refer to accessories chart for NIST calibration ordering information.

Application Software Available Online!
- **Monitors Temperature and Humidity**
- **Line Graph and Store of Readings in Real Time and Download of Recorded Data**
- **Set the Line Graph Scales to Auto, Logarithmic, or Manual**
- **Re-Scale the Recorder Chart Paper**
- **Print Line Graphs to a Printer**
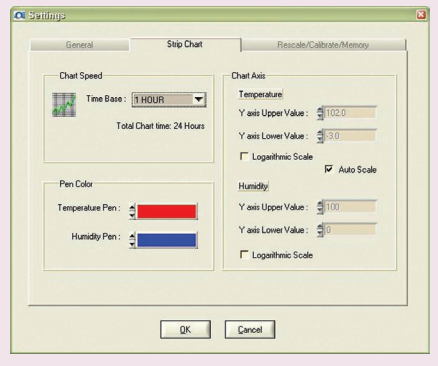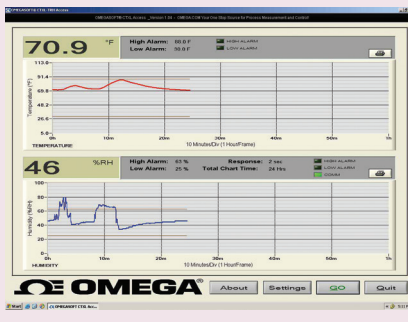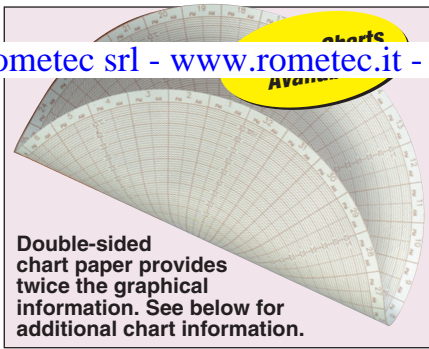
Double-sided chart paper provides twice the graphical information. See below for additional chart information.

CTXL-TRH Units Include
120 Double-Sided Charts FREE!
(20 each of 1-day, °F; 1-day, °C; 7-day, °F; 7-day, °C; 32-day, °F; 32-day °C).
Additional charts can be ordered as 1 pack of 100 or 6 packs of 100 (see "Charts" table below left).

To Order

CTXL-TRH-W	Temperature/RH recorder	White	—
CTXL-TRH-G	Temperature/RH recorder	Gray	—
CTXL-TRH-W-(*)	Temperature/RH recorder	White	Y
CTXL-TRH-G-(*)	Temperature/RH recorder	Gray	Y

* Specify wireless type: "W9" for USA/Canada (915 MHz) or "W8" for Europe (868 MHz)

Double-Sided Charts†

Model No.	Description
CT485-CDF	100 charts, 1 day (am/pm), °F
CT485-CDC	100 charts, 1 day (am/pm), °C
CT485-C24F	100 charts, 1 day (24 hr), °F
CT485-C24C	100 charts, 1 day (24 hr), °C
CT485-CWF	100 charts, 7 day, °F
CT485-CWC	100 charts, 7 day, °C
CT485-CMF	100 charts, 32 day, °F
CT485-CMC	100 charts, 32 day, °C
CT485-CSP	120 charts, 20 each, 1 day (am/pm), 7 day, 32 day, °F and °C (one included with unit)

†† To order a package of 600 double sided charts, add suffix "-6" to model number for additional cost.

Double-Sided Specialty Charts (pkg of 20)

To Order

Model No.	Description	Optimal Band Range
CT485-MW(*)	Museum/art gallery, 7 day	18.3 to 22.2°C (65 to 72°F), 40 to 50% RH
CT485-MM(*)	Museum/art gallery, 32 day	18.3 to 22.2°C (65 to 72°F), 40 to 50% RH
CT485-HW(*)	Hospital, 7 day	20 to 23.3°C (68 to 74°F), 40 to 50% RH
CT485-HM(*)	Hospital, 32 day	20 to 23.3°C (68 to 74°F), 40 to 50% RH
CT485-LW(*)	Lab/clean room, 7 day	20 to 23.9°C (68 to 75°F), 40 to 55% RH
CT485-LM(*)	Lab/clean room, 32 day	20 to 23.9°C (68 to 75°F), 40 to 55% RH
CT485-PW(*)	Computer room/office, 7 day	18.3 to 23.9°C (65 to 75°F), 45 to 60% RH
CT485-PM(*)	Computer room/office, 32 day	18.3 to 23.9°C (65 to 75°F), 45 to 60% RH

* Specify temperature units, "C" for °C or "F" for °F.

Accessories

Model No.	Description
CTXL-PT-(*)	Wireless Temperature/Humidity probe transmitter, to retrofit a CTXL-TRH unit
CTXL-PR-(*)	Wireless Temperature/Humidity receiver, to retrofit a CTXL-TRH unit
UNI-AC-100/240-5V	Universal (110/240 Vac, 50/60 Hz) 5 Vdc adaptor, to power CTXL-PT externally
UNIV-AC-100/240	Universal (110/240 Vac, 50/60 Hz) 9 Vdc adaptor
CTXL-CABLE-6	1.8 m (6') sensor extension cable (replacement)
CTXL-CABLE-10	3 m (10') sensor extension cable
CTXL-CABLE-25	7.6 m (25') sensor extension cable
CTXL-CABLE-6-S	3 m (10') sensor extension cable
CT485B-CAL-KIT	RH calibration kit, 33 and 75% RH salt solutions
CAL-3-CTXL†	NIST-traceable calibration
CT485B-MAG	Chart magnetic hub
CT485-PS	Pen set, one each red and blue pens
CT485-PS-6	Six pen sets, six each red and blue pens
CTXL-RP-W-CAL-3	Temperature/humidity sensor probe (white) with CAL-3 certificate
CTXL-RP-G-CAL-3	Temperature/humidity sensor probe (gray) with CAL-3 certificate
CTXL-RP-W	Temperature/Humidity sensor probe (white)
CTXL-RP-G	Temperature/Humidity sensor probe (gray)
CT485B-CLIP-KIT	Sensor clip kit
OM-NOMAD-BATT	3.6V "AA" lithium replacement battery for CTXL-PT wireless transmitter

* Specify wireless type: "W9" for USA/Canada (915 MHz) or "W8" for Europe (868 MHz). To retrofit a CTXL-TRH recorder with wireless capability, one transmitter (CTXL-PT) and one receiver (CTXL-PR) are required.

Each unit comes complete with sensor probe and clip, 120 assorted double-sided charts, 2 pen sets, 1.8 m (6') remote sensor cable, wall mount kit, 4 "D" cell batteries, RS232 cable and adaptor, universal (110/240 Vac, 50/60 Hz) 9 Vdc adaptor, and quick start manual.

Ordering Example: CTXL-TRH-W-W9, white temperature/relative humidity recorder with remote/wireless probe, **CT485-CWF,** chart paper

Dual Input Process Recorder
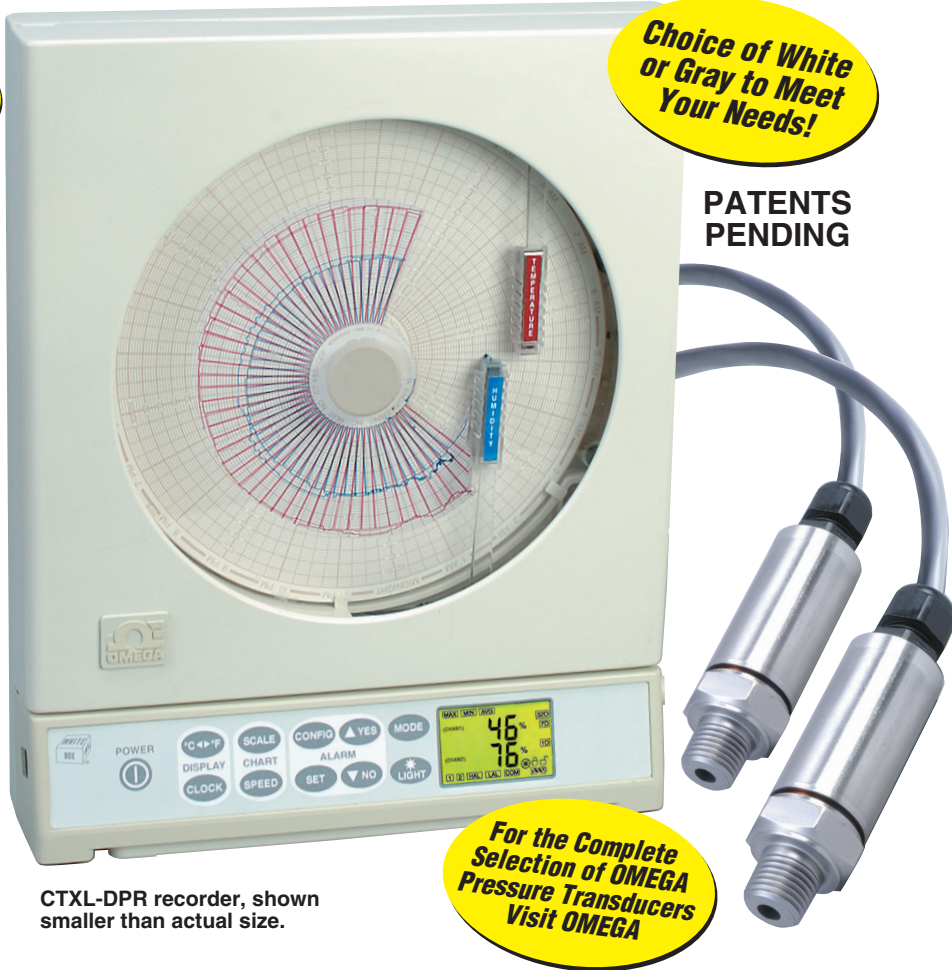
Large 200 mm (8") 2-Sided Chart

Choice of White or Gray to Meet Your Needs!

MODEL #3
CTXL-DPR

.2 YEAR WARRANTY **NIST**

Optional†

- ✔ **Models Available for Voltage or Current Input**
- ✔ **Voltage Models Selectable for 1, 5 or 10V Inputs**
- ✔ **Current Models Selectable for 0 to 20 or 4 to 20 mA Inputs**
- ✔ **±1% FS Display Accuracy**
- ✔ **Windows® Based PC Data Logging Software Available Online**
- ✔ **Benchtop or Wall Mount with Built-In Chart Lights**
- ✔ **RoHS 2 Compliant**

The CTXL-DPR is a dual input process recorder, available with either voltage or current inputs. Both input channels are set to the same input range; the voltage input model has selectable ranges of 0 to 1, 0 to 5 and 0 to 10V, while the current model is selectable between 0 to 20 and 4 to 20 mA ranges. Standard charts are scaled for 0 to 100%; the user can also scale the chart paper to show a portion of the full range.

PATENTS PENDING

CTXL-DPR recorder, shown smaller than actual size.

For the Complete Selection of OMEGA Pressure Transducers Visit OMEGA

Specifications

(See Common Specifications on Page 8)

Input Types: Process voltage (DPR-V) or current (DPR-I)

Input Connection: mini DIN connector

Input Ranges: Both input channels configured to same input range

   CTXL-DPR-V: 0 to 1V, 0 to 5V or 0 to 10V

   CTXL-DPR-I: 4 to 20 mA or 0 to 20 mA

Display Accuracy: ±1.0%FS

Standard Chart Scale: 0 to 100%

Out of Range Input: Display will flash. Chart motor will continue to run

Alarm set point Resolution: 1%

Alarm Deadband: 3%

Excitation Voltage: 15Vdc @ 50 mA

To Order

Model No.	Description	Color	Input
CTXL-DPR-W-V	Dual input process recorder	White	Voltage
CTXL-DPR-G-V	Dual input process recorder	Gray	Voltage
CTXL-DPR-W-I	Dual input process recorder	White	Current
CTXL-DPR-G-I	Dual input process recorder	Gray	Current

Double-Sided Charts

Model No.	Description
CTXL-DPR-CD	100 charts, 1 day (am/pm), 0 to 100%
CTXL-DPR-CW	100 charts, 7 day, 0 to 100%
CTXL-DPR-CM	100 charts, 32 day, 0 to 100%
CTXL-CSP-P	120 charts, sample pack (one included with unit)

Accessories

Model No.	Description
CAL-3-CTXL†	NIST-traceable calibration
UNIV-AC-100/240	Universal 9 Vdc adaptor
CTXL-CABLE-6-S	1.8 m (6') analog input extension cable, stripped leads termination
CT485-PS	Pen set, one each red and blue pens
CT485-PS-6	Six pen sets, six each red and blue pens

Each unit comes complete with 120 assorted double-sided charts, 2 pen sets, 1.8 m (6') input cable, wall mount kit, 4 "D" cell batteries, RS232 cable and adaptor, universal ac adaptor, and quick start manual.

Ordering Example: CTXL-DPR-W-V, white dual voltage input recorder, **CTXL-DPR-CW**, chart paper (100 double-sided sheets, 7 day, 0 to 100%).

Dual Input Thermocouple Recorder

MODEL #4
CTXL-DTC

2 YEAR WARRANTY **NIST**
Optional†

- ✔ **User Selectable for J, K or T Type Thermocouple Input**
- ✔ **Universal Thermocouple Connector Compatible with Standard and Miniature Connectors**
- ✔ **Up to ±1.5°C (2.7°F) Display Accuracy**
- ✔ **Benchtop or Wall Mount with Built-In Chart Lights**
- ✔ **Data Logging PC Software Available Online**
- ✔ **RoHS 2 Compliant**

The CTXL-DTC is a dual input thermocouple recorder, both input channels are set to the same calibration; the user can select either J, K or T type thermocouple calibration. Input connections are via UST type universal thermocouple connector that is compatible with both standard (type OST) and miniature (type SMP) thermocouple connectors.

The recorder comes with standard chart papers for J, K, and T Type thermocouple inputs. The blank chart paper can be used to re-scale the chart paper within the operating chart scale.

Specifications
(See Common Specifications on Page 8)

Input Types: Dual J, K, or T thermocouple; user programmable from PC

Input Connection: Universal connector, compatible with both standard (type OST) and miniature size (type SMP) thermocouple connectors

Display Range:
  Type J: -100 to 700°C (-148 to 1292°F)
  Type K: -100 to 1000°C (-148 to1832°F)
  Type T: -100 to 300°C (-148 to 572°F)

PATENTS PENDING

Choice of White or Gray to Meet Your Needs!

CTXL-DTC recorder, shown smaller than actual size.

Large 200 mm (8") 2-Sided Chart

Display Accuracy:
  Type K: ±2°C (4°F)
  Types J and T: ±1.5°C (3°F)

Standard Chart Scales:
  Type J: -40 to 260°C (-40 to 500°F)
  Type K: -40 to 560°C (-40 to 1040°F)
  Type T: -40 to 160°C (-40 to 320°F)

Open Thermocouple Input: Pens will go to the Home position; display will show "Prb Err". Chart motor will continue to run

Out of Range Input: Display flashes

Alarm Set Point Resolution: 1°C or °F

Alarm Deadband: 3°C or °F

To Order

Model No.	Description	Color
CTXL-DTC-W	Dual input thermocouple recorder	White
CTXL-DTC-G	Dual input thermocouple recorder	Gray

Double-Sided Charts

Model No.	Description
CTXL-DTC-(*)-CD	100 charts, 1 day (am/pm)
CTXL- DTC-(*)-CW	100 charts, 7 day
CTXL- DTC-(*)-CM	100 charts, 32 day
CTXL-CSP-T	120 charts, sample pack (one included with unit)

Accessories

Model No.	Description
CAL-3-CTXL†	NIST-traceable calibration
UNIV-AC-100/240	Universal 9 Vdc adaptor
CT485-PS	Pen set, one each red and blue pens
CT485-PS-6	Six pen sets, six each red and blue pens

* Specify chart range: "R1" for -40 to 560°C (-40 to 1040°F), "R2" for -40 to 260°C (-40 to 500°F), or "R3" for -40 to 160°C (-40 to 320°F)
Each unit comes complete with two SC-GG-K-30-36-PP thermocouples, 120 assorted double-sided charts, 2 pen sets, wall mount kit, 4 "D" cell batteries, RS232 cable and adaptor, universal ac adaptor, and quick start manual.
Ordering Example: CTXL-DTC-G, gray dual thermocouple input recorder, **CTXL-DTC-R1-CW,** chart paper [100 double-sided sheets, 7 day, -40 to 560°F (-40 to 1040°F) range].

pH/Temperature Recorder

MODEL #5
CTXL-PH

2 YEAR WARRANTY **NIST**
Optional†

✔ **Record pH with Automatic Temperature Compensation**
✔ **Standard BNC pH Electrode Connector**
✔ **Pt100 RTD Temperature Sensor ATC**
✔ **Benchtop or Wall Mount with Built-In Chart Lights**
✔ **Data Logging PC Software Available Online**
✔ **RoHS 2 Compliant**

The CTXL-PH is a high accuracy pH and temperature recorder, compatible with any standard pH electrode. The CTXL-PH also measures temperature from a pH electrode with built-in Pt100 RTD sensor for automatic temperature compensation for pH measurement. Standard charts feature 0 to 12 pH and 0 to 120°C ranges, while the recorder can display 0 to 14 pH and 0 to 100°C on the digital readout. The user can also scale the chart paper to show a portion of the full ranges, ie, from 6 to 8 pH and from 50 to 75°C, for greater resolution.

Specifications
(See Common Specifications on Page 8)
pH Input:
  Connection: BNC connector
  Display Range: 0 to 14 pH
  Chart Scale: 0 to 12 pH
  Accuracy: 0.1 pH, chart and display
Resolution:
  Chart Paper: 0.1 pH
  Display: 0.01 pH
  Input Impedance: 10^{12} Ω, typical
  Automatic Temperature:
  Compensation: 0 to 100°C
  (32 to 212°F)

Temperature Input
  Input: Pt100 RTD, 0.00385 curve
  Connection: Terminal block
  Display Range: 0 to 100°C
  (32 to 212°F), chart and display
  Chart Scale: 0 to 120°C
  Accuracy: 1°C, chart and display
  Resolution:
    Chart Paper: 1°
    Display: 0.1

CTXL-PH, pH/ temperature recorder, shown smaller than actual size.

pH electrode and buffer solution sold separately.

PATENTS PENDING

To Order

Model No.	Description	Color
CTXL-PH-W	pH/temperature recorder	White
CTXL-PH-G	pH/temperature recorder	Gray

*** To form a complete system, add pH electrode (listed in accessories).*

Double-Sided Chart

Model No.	Description
CTPH-CDC	100 charts, 1 day (am/pm), 0 to 12 pH/0 to 120°C
CTPH-CWC	100 charts, 7 day, 0 to 12 pH/0 to 120°C
CTPH-CMC	100 charts, 32 day, 0 to 12 pH/0 to 120°C
CTPH-CSP	120 charts, sample pack (one included with unit)

Accessories

Model No.	Description
PHE-7352-15-PT100	Heavy-duty pH electrode with Pt100 RTD temperature sensor
PHE-6510	Submersion pH electrode, CPVC (mounting assembly required), visit omega.com/phe-6510
PHE-6511	Submersion pH electrode, PVDF (mounting assembly required), visit omega.com/phe-6510
PHE-1311	General purpose pH electrode
PHA-4	4 pH buffer solution, 475 ml bottle
PHA-7	7 pH buffer solution, 475 ml bottle
PHA-10	10 pH buffer solution, 475 ml bottle
UNIV-AC-100/240	Universal 9 Vdc adaptor
CAL-3-CTXL†	NIST-traceable calibration
CT485-PS	Pen set, one each red and blue pens
CT485-PS-6	Six pen sets, six each red and blue pens

Each unit comes complete with 120 assorted double-sided charts, 2 pen sets, wall mount kit, 4 "D" cell batteries, RS232 cable and adaptor, universal ac adaptor, temperature compensation resistor and quick start manual.

pH Electrode sold separately.

***Ordering Examples: CTXL-PH-W,** white pH/temperature recorder, **PHE-6510,** submersible pH electrode (CPVC) and **PHEH-65-10-PT100,** mounting assembly with 100 Ω Pt RTD automatic temperature compensation.*

Keypad Buttons

Clock – Display Time & Date for 3 seconds

°C ◄ ► °F – Toggle Temperature Units (Temp units)

Scale – Sets the Chart Scale for °C or °F (Temp units)

Speed – Sets Chart Speed for 1, 7 or 32 Day Operation

Config – Enter Configuration Menu

Set – Enable/Disable Alarms

▲ Yes – Increase Set Value

▼ No – Decrease Set Value

Mode – Display Min, Max, Average; also T1-T2 (thermocouple model)

Light – Chart Light and Display Backlight Switch

White Box – User Lockout

Common Specifications

Display: Custom, 4-digit, dual LCD with backlight

Display Sampling Rate: 2 sec

Display Modes: Max, min, avg, T1 – T2 Chart Response Time: 0.5, 3.5, 16 min for 1, 7, and 32 days, respectively

Keypad Response: 350 ms

Chart Paper: 203 mm (8") circular, linear radial divisions, double sided

Chart Drive:
  Type: Stepper motor
  Accuracy: 1% rotation

Chart Hold-Down: Magnetic hub

Pen Drive:
  Type: Stepper motor, linear screw drive
  Deadband: 0.5°C or °F and 3% RH
  Pen Lift: Automatic on door opening— pens are door mounted and swing clear of the chart when door opens

Clock: Time (24 hr clock) and date

Clock Battery Backup: Holds clock information for 14 days when main power is removed

Audible Alarm: Piezoelectric beeper

Alarm Outputs:
  Relay Contacts: Two, rated 2 A @ 30 Vdc (high alarm)
  Voltage Output: Two, rated 100 mA to drive an external relay (low alarm)

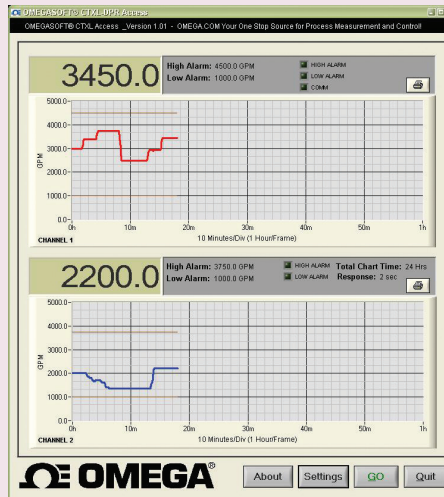**Operating Ambient:** 0 to 49°C (32 to 120°F); 2 to 98% RH

Power: 4 "D" alkaline batteries and ac adaptor (included)
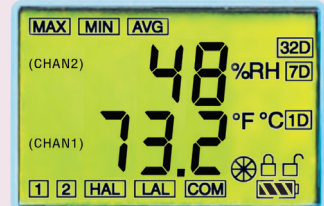
Battery Life: 3 months under normal conditions

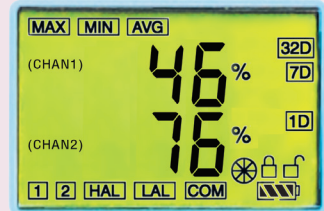**AC Adaptor:** 100 to 240 Vac input, 9 Vdc @ 1.7 A output

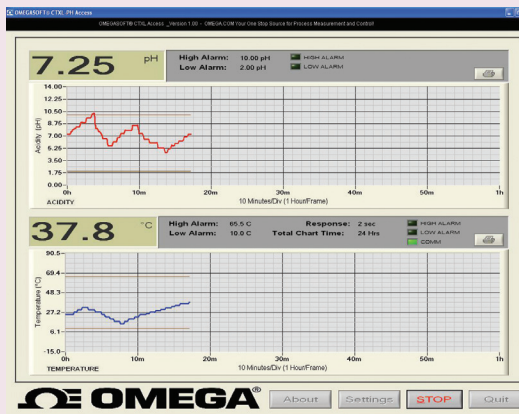**Battery Status:** Indicator on LCD; shows 100, 75%
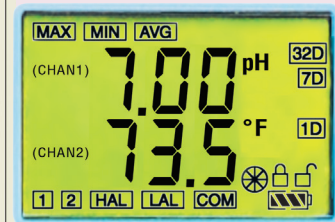

CTXL-DPR PC Application

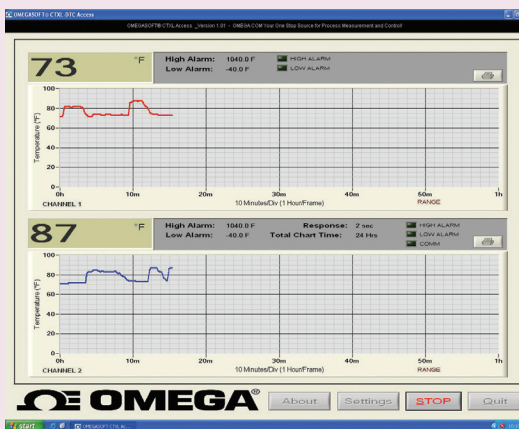**CTXL-TRH–Temperature/Humidity Local Display**

CTXL-DPR–Dual Process Local Display
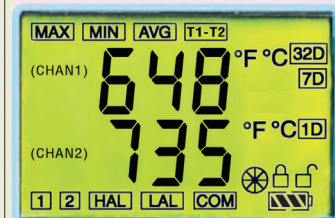

CTXL-PH PC Application

CTXL-PH–pH & RTD Local Display

CTXL-DTC PC Application

CTXL-DTC–Dual Thermocouple Local Display

Serial PC Communications: RS232, 2-way, 9600 baud

Memory: 256K EEPROM (2.8 chart revolutions worth of data)

Lock/Unlock (White Box) Key: Press and hold for 3 seconds to enable/ disable; when in lock mode, all keys are inactive except for the power, light, mode, clock and lock/unlock keys

Mounting: Keyhole slots for wall mounting; foot cover for bench top use

Case: ABS plastic

Dimensions: 33.5 H x 27.1 W x 6.7 cm D (13³⁄₁₆ x 10¹¹⁄₁₆ x 2⁵⁄₈")

Weight: Approx. 3.2 kg (7 lb) with batteries

Programmable Chart Recorders
100 and 180 mm

RD101B Series

2 YEAR WARRANTY · CSA · CE

- ✔ **Digital and Bar Graph Display**
- ✔ **1, 2, 3, 4 Continuous Pens or 6-Point Dot Printing Models (RD1800B Also Has 12-, 18-, 24-Dot Printing)**
- ✔ **Universal Inputs: Thermocouple, RTD, Voltage**
- ✔ **Programmable Input Types, Full Scale Ranges, Alarms, Chart Speed**
- ✔ **Powerful but Easy to Use**
- ✔ **Interactive Displays Make Setup Easy**
- ✔ **Large, Bright Dot-Matrix Display for Data and Units**
- ✔ **Compact—Only 220 mm (8.6") Deep**
- ✔ **Splashproof Front Door**
- ✔ **Fast Dot Printing— 6 Channels in as Little as 10 Seconds**
- ✔ **Removable Terminal Blocks for Easy Wiring**
- ✔ **Optional Alarms with Remote Control**
- ✔ **Optional RS422A/RS485 or Ethernet Communications**
- ✔ **Pen Offset Compensation**

RD106B with KTSS-18G-12 thermocouple, sold separately, shown smaller than actual size. See omega.com

The RD100B 100 mm (4") and RD1800B 180 mm (7") Series programmable chart recorders are easy to use. They feature universal thermocouple, RTD, and DC voltage (mV or V) inputs, as well as an analog bar graph and a digital display.

Each recorder can print out— at programmed intervals or on demand—the date and time, channel number, scale marking, tag number, proper engineering units, chart speed, alarm value, and complete program list.

The non-contact, ultrasonic pen-position transducer is more accurate than standard pen mechanisms. The wear-free, brushless DC servo-motor eliminates the need for motor brushes, lead wire, and connectors, and is directly mounted to the printed circuit board. These 2 features contribute to the long, trouble-free life of these recorders.

Optional Communication Output
The optional RS422A/RS485 or Ethernet interface lets the user connect up to 32 units on a multidrop line to a single host computer for data logging or input/ output of any setup parameter.

Versatile Alarm and Remote Control Functions (Optional)
The user can select up to 4 of the following 6 alarm types: high/low limit, deviation high/low limit, rate of change high/low. Optional alarm relay contact outputs are front-panel selectable. Also included is a remote control feature, which lets the user select any 5 of the following functions through the front keypad: recording start/stop; chart speed change; manual printout start; message printout start (up to 5 user-defined messages).

RD1824B shown smaller than actual size.
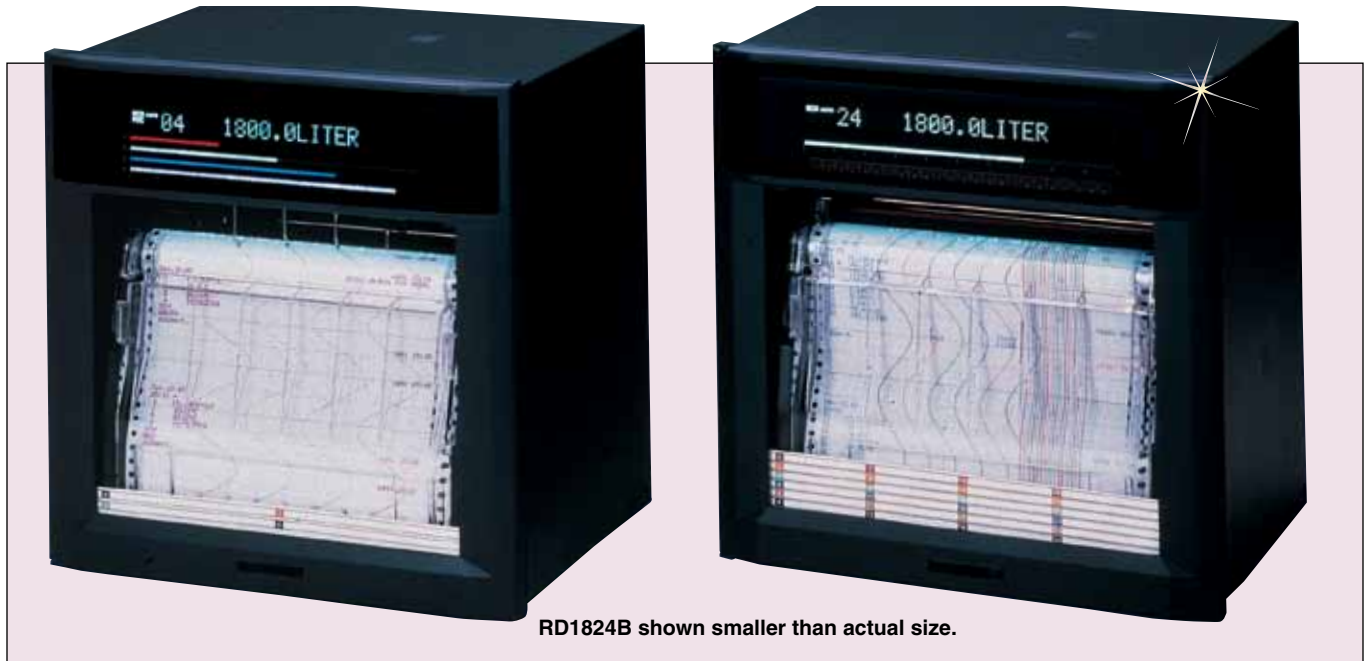
Specifications

Input	Type*	Measurement Range	Measurement Accuracy	Resolution
T/C	J	-200 to 1100°C (-328 to 2012°F)	±0.15% rdg + 0.5°C (0.9°F); -200 to -100°C (-328 to -148°F): ±0.15% rdg +0.7°C (1.3°F)	0.1°C
	T	-200 to 400°C (-328 to 752°F)	±0.15% rdg + 0.5°C (0.9°F)	0.1°C
	K	-200 to 1370°C (-328 to 2498°F)	±0.15% rdg + 0.7°C (1.3°F); -200 to -100°C (-328 to -148°F): ±0.15% rdg +1.0°C (1.8°F)	0.1°C
	E	-200 to 800°C (-328 to 1472°F)	±0.15% rdg + 0.5°C (0.9°F)	0.1°C
	N	0 to 1300°C (32 to 2372°F)	±0.15% rdg + 0.7°C (1.3°F)	0.1°C
	R/S	0 to 1760°C (32 to 3200°F)	±0.15% rdg + 0.1°C (0.2°F); 0 to 100°C (32 to 212°F) ±3.7°C (6.7°F) and 100 to 300°C (212 to 572°F) ±1.5°C (2.7°F)	0.1°C
	B	0 to 1820°C (32 to 3308°F)	±0.15% rdg + 0.1°C above 600°C (0.18°F above 1112°F) 400 to 600°C (752 to 1112°F): ±2.0°C (3.6°F), not specified below 400°C (752°F)	0.1°C
	C(W)	0 to 2315°C (32 to 4199°F)	±0.15% of rdg + 1.0°C (1.8°F)	0.1°C
	J DIN(L)	-200 to 900°C (-328 to 1652°F)	±0.15% rdg + 0.5°C (0.9°F); -200 to -100°C (-328 to -148°F): ±0.15% rdg +0.7°C (1.3°F)	0.1°C
	T DIN(U)	-200 to 400°C (-328 to 752°F)	±0.15% rdg + 0.5°C (0.9°F)	0.1°C
Vdc	20 mV	-20 to 20 mV	±0.1% rdg + 3-digits	10 µV
	60 mV	-60 to 60 mV	±0.1% rdg + 2-digits	10 µV
	200 mV	-200 to 200 mV	±0.1% rdg + 2-digits	100 µV
	2V	-20 to 20V	±0.1% rdg + 3-digits	1 mV
	6V	-60 to 60V	±0.1% rdg + 3-digits	1 mV
	20V	-20 to 20V	±0.1% rdg + 2-digits	10 mV
	50V	-50 to 50V	±0.1% rdg + 3-digits	10 mV
	1 to 5V	1 to 5V	±0.1% rdg + 2-digits	1 mV
RTD	Pt100	-200 to 600°C (-328 to 1112°F)	±0.15% rdg + 0.3°C (0.5°F)	0.1°C
	JPt100	-200 to 550°C (-328 to 1022°F)	±0.15% rdg + 0.3°C (0.5°F)	0.1°C

Input	Range	Measurement	Limit
Digital input (operation recording)	Input only	Less than 2.4V: off; 2.4 or more: on (TTL)	Contact inputs; contact on/off

*** Note:** *Thermocouple Type J, K, T, E R, S, B: ANSI, IEC 584, DIN IEC 584, JIS C 1602-1981; Type N: nicrosil-nisil, IEC 584, DIN IEC 584; Type C W5%-R/W-26%; J DIN, T DIN: DIN 43760.*
Pt100: JIS C 1604-1989, JIS C 1606-1989, IEC 751, DIN IEC 751.
JPt100 JIS C 1604-1981, JIS C 1606-1989.

S

General Specifications

RD1800B: 288 W x 288 H x 220 mm D
(11.4 x 11.4 x 8.66")
RD100B: 144 W x 144 H x 220 mm D
(5.67 x 5.67 x 8.66")

Weight:
RD1800B: 6 dot, 8.4 kg (20 lb);
24 dot, 9.0 kg (20 lb) approx
RD100B: 1 pen, 2.1 kg (4.5 lb);
2 pen, 3.4 kg (7.5 lb); 3 pen, 3.6 kg
(7.9 lb); 4 pen, 2.4 kg (6.9 lb);
6 dot, 2.5 kg (5.5 lb) approx

Case: Drawn steel

Front Door: Aluminum die casting

Panel Thickness:
2 x 26 mm (0.078 x 1.02")

Power: 90 to 132, 180 to 250 Vac,
50/60 Hz standard

Maximum Power Consumption:
Approximately 40 VA

**Ambient Temperature
and Humidity:** 0 to 50°C (32 to 122°F),
20 to 80% RH @ 5 to 40°C (41 to 104°F)

Memory Backup: Lithium battery

Input

Reference Junction Accuracy:
Type J, K, T, E, N, J DIN, T DIN: ±0.5°C;
Type R, S, B, C: ±1°C

Temperature Coefficients:
Effect of ambient temperature
of 10°C (50°F)

Digital Display:
Within ±0.1% rdg + 1 digit

Recording: Within digital
display ±0.2% of recording span
(excluding reference junction)

**Performance Under Reference
Operating Conditions:**
Temperature:
23 ±2°C (73 ±3.6°F)

Humidity: 55 ±10%

Usable Power Voltage: 90 to 132 or
180 to 264 Vac, 50/60 Hz

Warm-Up Time: 30 minutes

Measurement Intervals:
Pen Models: 125 ms/channel
Dot Models: RD100B: 1 s/6 channels;
RD1800B: 2.5 s/6 channels

Input Resistance: DC voltage 200 mV
and lower ranges; T/C ranges: 10 MΩ
min; DC voltage 2V and higher ranges:
approx 1 MΩ

Input Bias Current: 10 nA max
(approximately 100 nA on a
thermocouple input if burnout detection
selected)

Thermocouple Burnout Detection:
On/off programmable for each channel or
more detected as open circuit

1 to 5 V Burnout: Less than 0.2V

Maximum Input Voltage: 200 mV or
lower and TC, RTS, DI ranges: ±10 Vdc
continuous; 2 Vdc or greater:
±6 Vdc continuous

Recording System

Recording Span:
RD100B: 100 mm
RD1800B: 180 mm

Pen-Writing: Disposable felt pens
(analog recording), plotter pens
(digital recording)

Dot Printing:
Recording Paper:
RD1800: 20 m Z-fold chart
RD100B: 16 m Z-fold chart

Step Response Time:
RD1800: 1.5 s
RD100B: 1 s max

Deadband: Pen models
0.2% of recording span max

**Maximum Recording
Resolution:** Dot-printing models 0.1 mm

Recording Format:
Normal, zone and partial recording

Chart Speed:
Pen Models: 5 to 12,000 mm/h
(82 increments)
Dot-Printing Models: 1 to 1500 mm/h
(1 mm steps)

Analog Recording Cycles:
Pen Models: Continuous
Dot Printing Models: 6 dots/10 s;
12 dots/15 s; 18 dots/20 s,
24 dots/30 s max

**Print Cycle Time—Dot Printing
Models:** Auto mode chart speed
determines analog recording cycle rate;
fix mode recording is done at fastest
analog recording interval

Chart Speed Accuracy: Less than
±0.1% (chart running more than
1000 mm continuously and related
to grid of the paper)

Message Printout:
5 messages, date/time and message
up to 16 characters

Periodic Printout: Engineering units
(up to 6 alphanumeric), tag marker
(up to 7 alphanumeric), scale marker
(0/100%), the measured data print

List Printout:
Prints listing of range settings, alarm
settings and other parameters

Manual Printout: Provides a digital
printout of measured results

Display System

Display:
RD100B: VFD 254 x 406 mm
(10 x 16") dot matrix
RD1800B: 457 x 406 mm
(18 x 16") dot matrix

Display: Selectable display screen

Bar Graph Display: Measured value is
1% resolution, left-reference or
center-zero bar graph display (individually
programmable for each channel)

Alarms:
Display: Alarm setting level indicator;
channel number (dot-matrix
models only)
Levels: 4 levels/channel
Types: High, low, high rate of
change, low rate of change, delta
high, delta low (rate of change
alarm time interval: measurement
interval x 1 to 15)
Indications: Shared alarm indicator
flashes; in dot-printing models, alarm
status of alarm channel is
also displayed
Recording: Prints channel number,
alarm type and time on or off on right
side of chart

**RD1804B shown smaller
than actual size.**

Optional Alarm Relay Contact Output and Remote Control

Alarm Relays: 2, 4, 6 (all units),
12 and 24 points (RD1800 only);
outputs programmable; energize or
de-energize (all relays); hold or non-hold

Remote Control: Enables any mix of
the following to be assigned to 5 contact
inputs: output programmable; recording
start/stop; chart speed change; manual
printout start; alarm acknowledge,
time adjust; computation start/stop,
computation restate; message printout
start (up to 5)

Input Signal: TTL, open collector,
contact

Input Signal Width: 1 second minimum

Contact Capacity: 3 A @ 250 Vac;
0.1 A @ 250 Vdc resistive load

Optional Communication Output

RS422A/RS485: Conforms to EIA
RS422A; can be used to output
measured values, input and output setup
parameters

Addresses: 1 to 32

Asynchronous:
Start-stop synchronization

Communication System: Half duplex

Wiring: 5-wire

Data Length: 7 or 8-bit

Parity: odd, even or none

Communication Rate: 1200, 2400,
4800, 9600, 19,200, 38,400 baud

Communication Mode:
ASCII or binary (measured data only)

Communication Distance: 1.2 km

Ethernet Interface: Electrical and
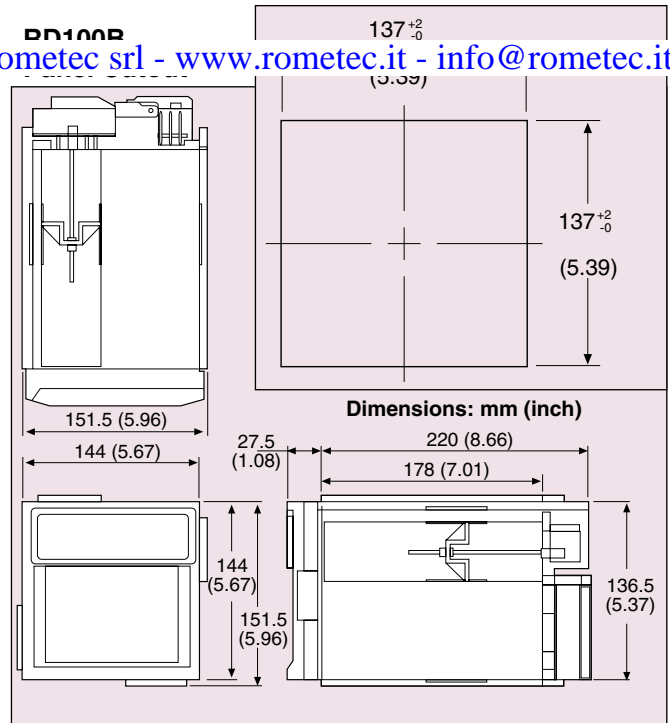mechanical conformance to IEE8023

Transmission Media: 10 Base-T

Protocol: TCP, IP, UDP, ICMP, ARP

CE Option: Meets European
standards for EMI interference

To Order *Visit omega.com/rd100b_rd1800b for Pricing and Details*

Model No.	Input Channels	Recording Type
RD101B	1	100 mm (4") continuous
RD102B	2	100 mm (4") continuous
RD103B	3	100 mm (4") continuous
RD104B	4	100 mm (4") continuous
RD106B	6	100 mm (4") dot
RD1801B	1	180 mm (7") continuous
RD1802B	2	180 mm (7") continuous
RD1803B	3	180 mm (7") continuous
RD1804B	4	180 mm (7") continuous
RD1806B	6	180 mm (7") dot
RD1812B	12	180 mm (7") dot
RD1818B	18	180 mm (7") dot
RD1824B	24	180 mm (7") dot

Comes complete with 1 pen per channel, 1 pack of paper, mounting brackets and operator's manual.

Ordering Examples: RD104B, *4-pen recorder with 4-alarm relays.*
**OCW-3,** *OMEGACARE^{SM} extends standard 2-year warranty to a total of 5 years.*

RD100B Panel Cutout

Dimensions: mm (inch)

137 +2 -0 (5.39)
137 +2 -0 (5.39)
151.5 (5.96)
144 (5.67)
27.5 (1.08)
220 (8.66)
178 (7.01)
144 (5.67)
151.5 (5.96)
136.5 (5.37)

Options *(Not Field Installable)*

Suffix No.	Description
/A1/R1	2-alarm outputs, remote control
/A2/R1	4-alarm outputs, remote control (RD100A Series only)
/A3/R1	6-alarm outputs, remote control (RD106A and RD1800 Series)
/A4/R1	12-alarm outputs, remote control (RD1806, RD1812, RD1818, RD1824 only)
/A5/R1	24-alarm outputs, remote control (RD1824 only)
/C3	RS422A communications
24V	24 Vdc power (not available on portable unit)
/C7	Ethernet interface, 10 Base-T

OMEGACARE^{SM}
Extended Warranty Program

OMEGACARE^{SM} extended warranty program is available for models shown on this page.
OMEGACARE^{SM} covers parts, labor and equivalent loaners. Ask your sales representative for full details when placing an order.
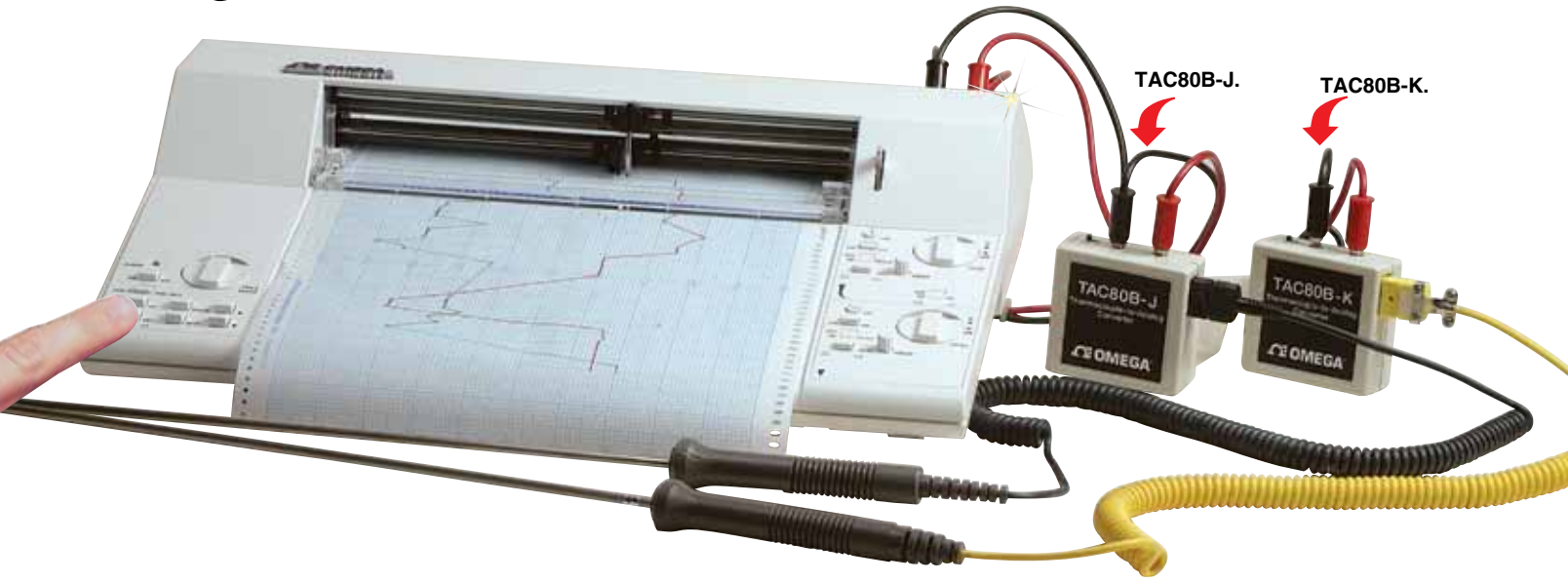
RD1800B Panel Cutout

360 (14.17)
281 +2 0 (11.06)
80 (3.15)
281 +2 0 (11.06)
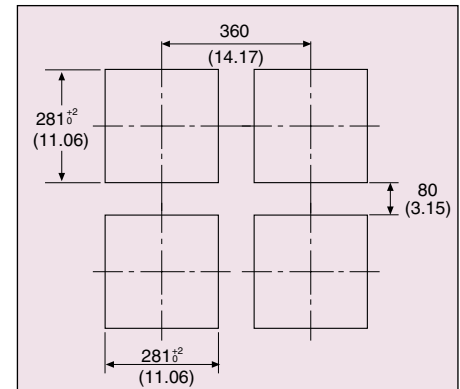
Accessories

Model No.	Description
RD100A-01	Disposable red felt pen channel-1
RD100A-02	Disposable green felt pen channel-2
RD100A-03	Disposable blue felt pen channel-3
RD100A-04	Disposable violet felt pen channel-4
RD100A-11	Plotter pen
RD100B-SW1	Configuration software for models with communication interface
RD100B-SW2	Configuration software for models without communication interface
RD100-RC	6-color print ribbon purple, red, green, blue, brown, black (RD106 only)
RD110-RC	6-color print ribbon for RD1806, RD1812, RD1818 and RD1824
RD100-ZFP-1	Z-fold chart paper (pkg of 1) 100 mm x 16 m (4" x 52') RD100A Series
RD110-ZFP	Z-fold chart paper (pkg of 1) 180 mm x 20 m (7" x 65') RD1800 Series

Dimensions: mm (inch)

DOOR
228 (11.34)
228 (11.34)
25 (0.98)
245 (9.65)
220 (8.66)
182.3 (7.18)

S
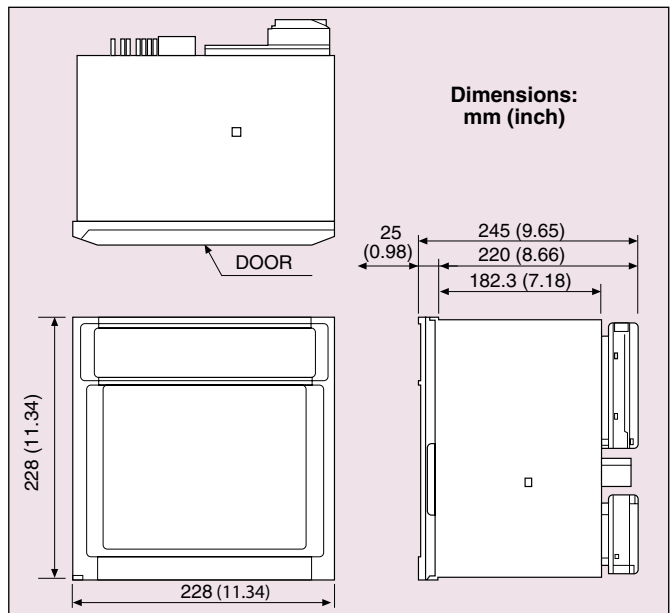
200 mm (8") Flatbed Recorders
Single and Dual Channel

TAC80B-J.   TAC80B-K.

RD45A-EPL with optional TAC-80B thermocouple-to-analog converters, and JHIN-18G-RSC-12 and KHIN-18G-RSC-12 thermocouple probes. Shown smaller than actual size.

RD45A-EPL

1 YEAR WARRANTY CE

Remember to Order Extra Pens and Paper!

- ✔ **14 Input Ranges from 1 mV to 20 Vdc**
- ✔ **Selectable Left or Right Side Zero Position**
- ✔ **Differential Inputs**
- ✔ **Electric Pen Lift and Remote Control Options**
- ✔ **Pen Offset Compensation Optional**

The RD45A single-channel and RD46A dual-channel flatbed recorders are ideal instruments for use in research, development and production, as well as in service and education applications. Designed for ease of use, these recorders have an ergonomic shape which allows the user to easily write comments on the chart, even next to the pen.

The wide, 200 mm (8") chart is capable of recording measurements from 1 mV full scale to 20 V. Chart speeds from 0.1 mm/min to 20 mm/

sec (1 mm = 0.03937") are available. As an option, pen offset compensation is available. This eliminates the recording offset caused by the distance between the 2 pens.

Specifications
Input Ranges: 1, 2, 5, 10, 20, 50, 100, 200, 500 mV; 1, 2, 5, 10, 20 Vdc
Variable Range:
From 40 to 100% FS
Span Accuracy: 0.3% FS
Non-Linearity: 0.3% FS
Deadband: 0.2% FS
Response Time:
0.2 sec for 5 to 95% FS
Input Impedance: 1 MΩ dc; 10 kΩ in series with 1.5 µF for ac
Input: Floating, non-symmetric
Input Terminals: 2 safety terminals
Max Input Voltage: 42 Vdc/30 Vac max at input terminals; (personal safety limits)
CMRR: 130 dB
Zero Adjustment: -50 to 150% FS
Zero Position: User-selectable, left or right side

Zero Drift: 1 µV/°C max
Chart Speeds: 0.1, 0.2, 0.5, 1, 2, 5, 10, 20 mm/min or mm/sec (1 mm = 0.03937")
Chart Paper: 200 mm W x 25 m L (7.87" x 82')
Chart Step Size: 0.05 mm (0.002")
Chart Timebase Accuracy: ±50 ppm
Pen Lift Option: Electronic; automatic pen lift after 30 sec if chart is not advanced
Operating Ambient Range:
-10 to 40°C (14 to 104°F); 35 to 85% RH, non-condensing
Storage Temperature Range:
-40 to 75°C (-40 to 167°F)
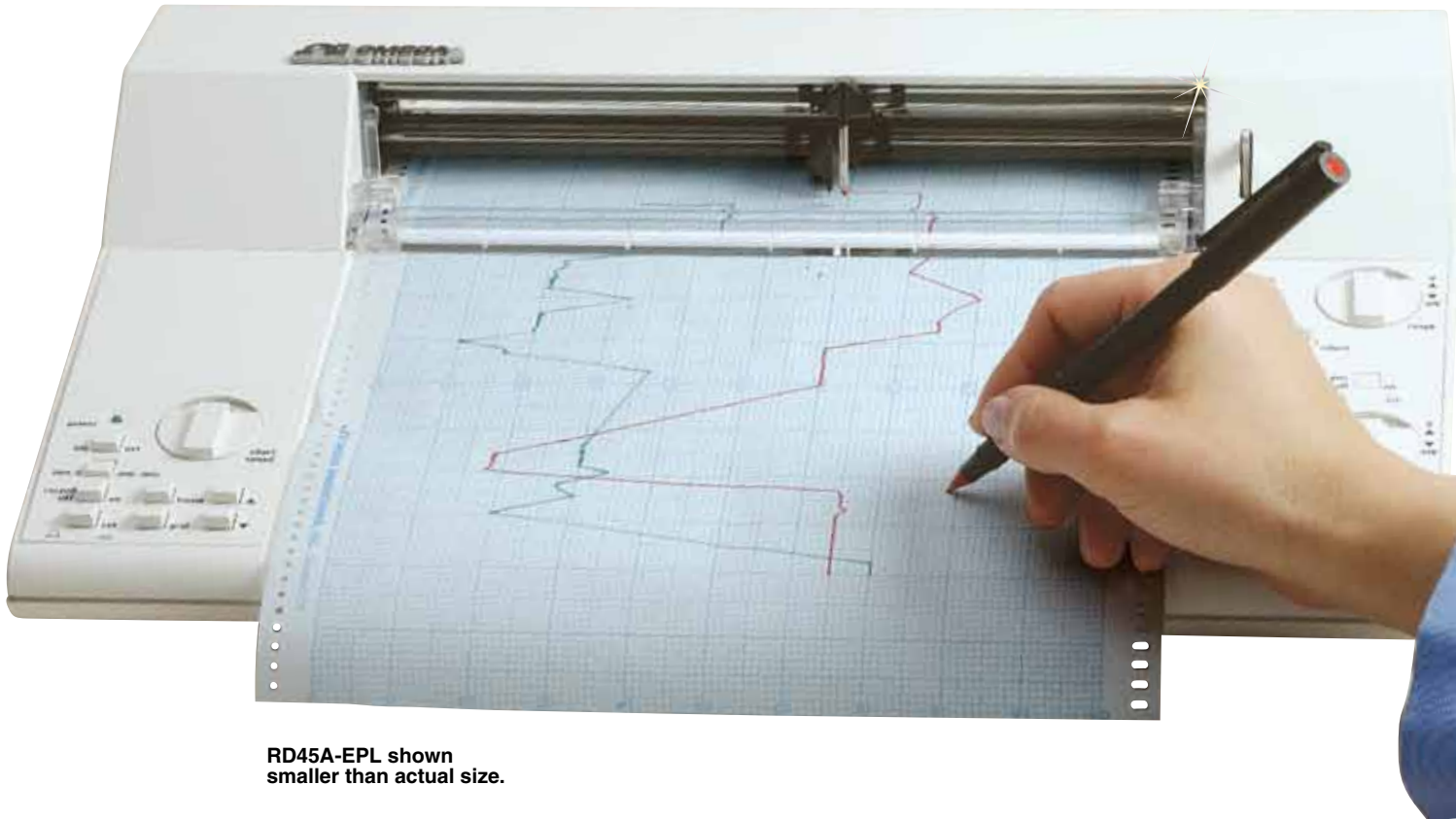**Power:** 110/220 Vac, switchable; -15/+20%; 50/60 Hz
Power Consumption:
30 VA single-channel; 40 VA dual-channel
Dimensions:
90 H x 380 W x 290 mm D (3.6 x 15 x 11.5")
Weight: 3.5 kg (7.7 lb)

**RD45A-EPL shown
smaller than actual size.**

To Order

Model No.	Description
RD45A-EPL	Single-channel recorder with pen lift and remote control, 200 mm (8")
RD46A-EPL	Dual-channel recorder with pen lift and remote control, 200 mm (8")

*Each recorder comes with 1 pen for each channel, one 25 m (82') roll of paper, power cord, fuse, input adaptor connectors
and complete operator's manual.*
***Ordering Example: RD46A-EPL,** dual-channel recorder, **RDX40-RP,** extra chart paper [ten 25 m (82') rolls)].*
***OCW-3,** OMEGACARE℠ extends standard 1-year warranty to a total of 4 years.*

*Ergonomic Shape
Lets User Write
Comments Right on the
Chart, Even Next
to the Pen!*

**OMEGA
CARE**℠
**Extended Warranty
Program**

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

Accessories and Options

Model No.	Description
RDX40-RP	10 rolls of chart paper, 25 m (82') each
RDX40-RD1	6 red pens, channel-1; also event marker
RDX40-BL	6 blue pens, channel-1
RDX40-GR	6 green pens, channel-1
RDX40-BK	6 black pens, channel-1
RDX40-RD2	6 red pens, channel-2
RDX40-BK2	6 black pens, channel-2

S

Hybrid Chart Recorder 250 mm (10")

RD5100 Series

2 YEAR WARRANTY

✔ **High Speed Scanning at 36 Points/Sec and High-Speed Recording**
✔ **High Accuracy of 0.05%**
✔ **Various Industrial Values Can be Measured at the Same Time with Selectable Ranges**
✔ **Superior Ease of Operation**
✔ **Engineering Port is Provided (USB)**
✔ **Anti-Noise Countermeasures**
✔ **Communication Interfaces are Available**
✔ **Recording and Calculation of Data Communication Input**

RD5100 series chart recorders are 250 mm (10") hybrid recorders with multi-range input. Innovative design high performance recorder provides high accuracy, ±0.05%; high speed scanning, 0.1 second for 36 points and high speed recording, 1 line in 3 seconds. Simple operational keys and PC setting functions drastically improved usability of recording system.

RD5110

Specifications
Input
Number of Measuring Points: 12, 24 and 36 points
Input Types: Universal (refer to the table of inputs)
Range Setting: Input type and range are set with front keys
Scale Setting: The minimum and maximum values and unit are set for each point with front keys
   Setting Range: -30,000 to 30,000
   Decimal Points: Optional setting

Indication Accuracy: Refer to the table of inputs on page S-35d
Temperature Drift: 0.1% FS/ 10°C
Measuring Period: 0.1 sec/channel
Reference Junction Compensation Accuracy:
   K, E, J, T, N, Platinel II: ±0.5°C (33°F) or less [0°C (32°F) or more when measuring]
   R, S, WRe5-WRe26, NiMo-Ni, U, L: ±1.0°C (34°F) or less [only when the ambient temperature is 23°C (73°F) ±5°C (41°F)]
Input Resolution: Approx. 1/40,000 (standard range conversion)
Burnout: Select with/without burnout for each input
Allowable Signal Source Resistance:
   Thermocouple Inputs, DC Voltage Input (10 mV): 500Ω or less (without burnout)
   DC Voltage Input (Except 10 mV): 100Ω or less
   Resistance Thermometer Inputs: 10Ω or less/ line, three lines are common, Pt100, JPt100
Input Resistance:
   Thermocouple Input, DC Voltage Input: Approx. 1MΩ
Maximum Input Applied Voltage: ±20 Vdc
Input Correction: Zero/span correction and shift correction for each channel
Maximum Common Mode Coltage: 30 Vac (support LVD)
Common Mode Rejection Ratio: 130dB

Series Mode Rejection Ratio: 50dB (only when the peak value of noise is below standard range)
Terminal Board: Detachable type, removable for wire connection

Recording Specifications
Recording System: Raster scan system, 10-color wire dot printing
Recording and Recording Color:
   Analog Recording: Color can be specified for each channel as required 10 colors (red, purple-red, orange, brown, green, yellow-green, blue-green, purple, purple-blue, black)
   Digital Recording and Logging Recording: Black
   Message Printing: Black
   List Printing: Black
Chart Paper: Fan-fold type; overall width 318 mm (12.5"), total length 20 m (65.6'); effective recording width 250 mm (10") (analog recording)
Chart Speed: 1 to 1500 mm/H [in 1 mm/H steps]
Skip Function: Analog recording, digital recording and digital display can be set independently from recording slip
Recording Compensation: Independent setting of zero spans are available

Display Specifications
Digital Display: Color LCD panel RGB (640 x 240 dot)
Display Size: 149.8 W x 57.4 mm H (5.8 W x 2.25" H)

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Setting Display: Common to digital display*

Display Contents: Digital display

Channel Display: One-point/multiple points continuous/sequential indication change

Display Measuring Value of Each Channel: One-point/multiple points continuous/sequential indication change

Clock Display: Hour/Minute/ Second/Tag/Unit

Chart Speed Display

Status Display:

Record On: Lights during recording; LED

Key Lock: Lights during key lock

Alarm: Lights during alarm activated; LED

Chart End: Lights just before record ending

Fail: Lights during unit abnormal time

* Sharing LED and setting display

Alarm Specifications

Alarm Display: Occurrence CH No, data is displayed in red when alarm occurs

Alarm Types: High limit, low limit

Alarm Setting Method: Individual setting for each point four levels/ channels

Alarm Output: See option specification

Setting and Operational Specifications

Key Types, Operation:

Func1: Switching each function

Func2: Switching each function

Enter: Setting a change of parameter for each mode

Menu: Specifying each setting function

Esc: Used to escape in the middle of setting

▲: Used to switch channels when specifying the parameter on cursor

▼: Used to switch channels when specifying the parameter on cursor

▶: Used to move cursor to the right

◀: Used to move cursor to the left

Rec: Analog recording, digital recording, printing, switching chart ON/OFF

DataP: Digital recording of latest data

Feed: Fast-forwarding chart paper

Shift: Specifying key

. _ =: Setting characters of ". _ ="

@ + -: Setting characters of "@ + -"

0 * /: Setting parameter value 0 and character of "* / "

1ABC: Setting parameter value

2DEF: Setting parameter value 2 and character of "DEF"

3GHI: Setting parameter value 3 and character of "GHI"

4JKL: Setting parameter value 4 and character of "JKL"

5MNO: Setting parameter value 5 and character of "MNO"

6PQR: Setting parameter value 6 and character of "PQR"

7STU: Setting parameter value 7 and character of "STU"

8VWX: Setting parameter value 8 and character of "VWX"

9YZ: Setting parameter value 9 and character of "YZ"

Recording Operation:

Record On/Off: Recording operation ON/OFF*

Data Print: Printing measuring data*

Feed: Fast-forwarding chart paper

* Two actions are taken to operate

General Specifications

Rated Power Voltage: 100 to 240 Vac (universal power supply) 50/60Hz

Maximum Power Consumption: 100V A

Reference Operating Condition:

Ambient Temperature/Humidity Range: 21 to 25°C (70 to 77°F), 45 to 65% RH

Power Voltage: 90 to 264V

Power Frequency: 50/60Hz ±2%

Attitude: Forward/Backward/left/right within 3°

Warm-Up Time: 1 hour or longer

Normal Operating Condition:

Ambient Temperature/Humidity Range: 0 to 40°C (32 to 104°F), 20 to 80% RH

Power Voltage: 90 to 264V

Power Frequency: 50/60Hz ±2%

Attitude: Forward/backward/left/right within 3°

Transportation Condition: At the packed condition on shipment from our factory

Ambient Temperature/Humidity Range: -20 to 60°C (-4 to 140°F), 5 to 90%RH (no dew condensation)

Vibration: 10 to 60 Hz, 4.9 m (16')/ S2 (0.5G or less)

Impact: 392 m (1.3')/S2 (approx. 40G or less)

Storage Condition:

Ambient Temperature: -20 to 60°C (-4 to 140°F), 5 to 90% RH (no dew condensation)

Working Condition:

Working Temperature Range: 0 to 40°C (32 to 104°F)

Working Humidity Range: 20 to 80% RH

Power Failure Protection: Programmed parameters stored into EEPROM memory clock circuit sustained for 5 years or longer by a lithium battery (at the operation of 8 hours or longer per day)

Insulation Resistance:

Between Primary Terminals and Protective Conductor Terminals: 20MΩ or more at 500 Vdc

Between Secondary Terminals and Protective Conductor Terminals: 20MΩ or more at 500 Vdc

Between Primary Terminals and Secondary Terminals: 20MΩ or more at 500 Vdc

Dielectric Strength:

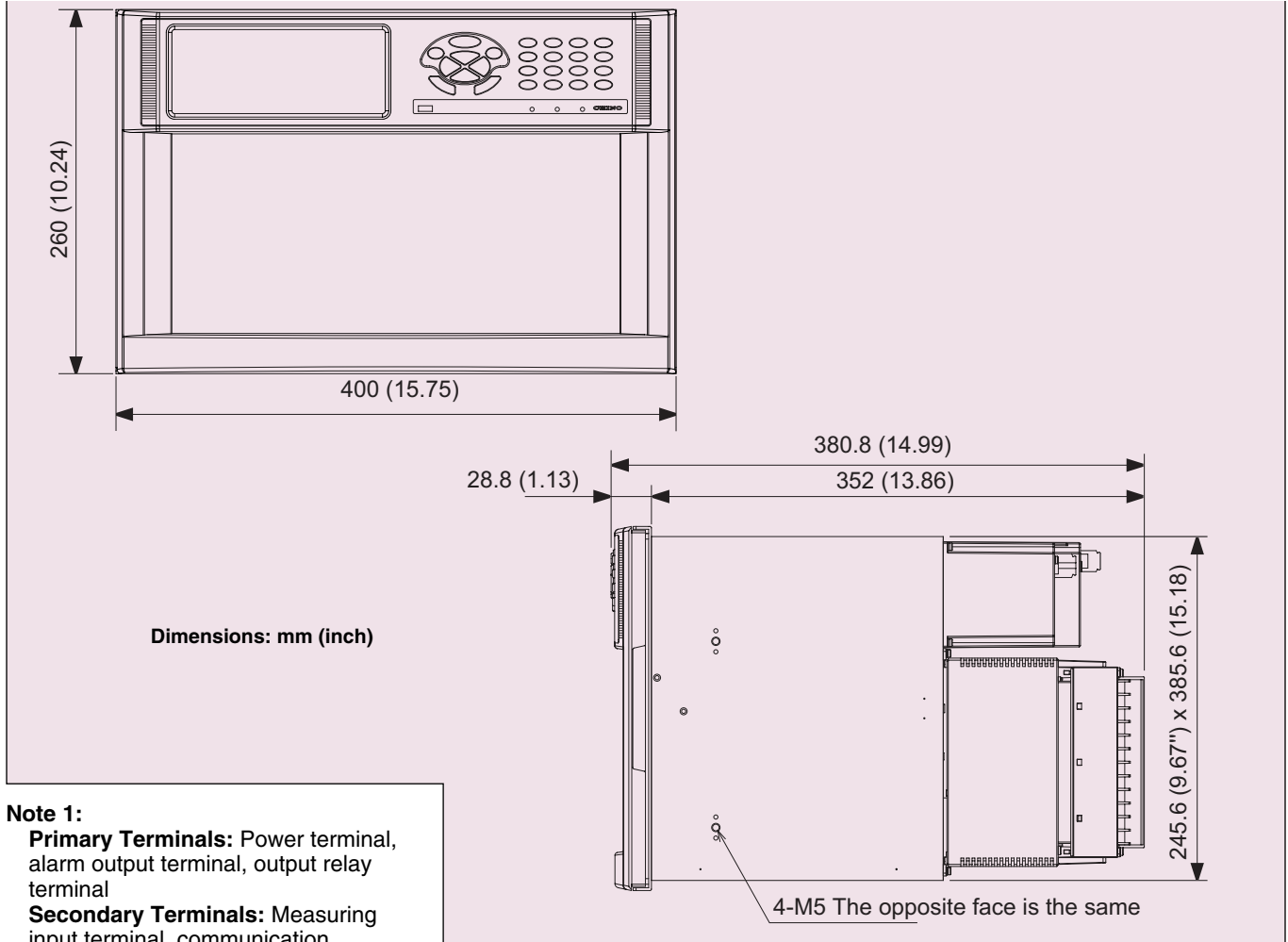**Between Primary Terminals and Protective Conductor Terminals:** 1 minute at 1500 Vac

Between Secondary Terminals and Protective Conductor Terminals: 1 minute at 500 Vac

Between Primary Terminals and Secondary Terminals: 1 minute at 1500 Vac

Option Specifications

Options	Comments
External Drive	Chart 3-speed, chart stop, data printing, list printing, message printing 5 types, operation recording
Alarm Output	Mechanical relay: 12, 24, 36 points output, max contact capacity of 100 to 240 Vac, 3 A resistance load
External Drive	Chart 3-speed, chart stop, data printing, list printing, message printing 5 types, operation recording
Comm Interface	RS422A or RS485 + Ethernet + 1a contact output (1a contact output is contact output of mecha relay)
Chart End Output	Chart End relay output when chart paper ended (communication interface is required)
Fail Output	Fail relay output when abnormality (communication interface is required)
Receiving Resistance for Current Input	250Ω (for 20 mA) or 100Ω (for 50 mA) are externally mounted to measure current

260 (10.24)

400 (15.75)

Dimensions: mm (inch)

28.8 (1.13)

352 (13.86)

380.8 (14.99)

245.6 (9.67") x 385.6 (15.18)

4-M5 The opposite face is the same

Note 1:
   Primary Terminals: Power terminal, alarm output terminal, output relay terminal
   Secondary Terminals: Measuring input terminal, communication terminal, external drive terminal

Note 2: When testing insulation resistance and dielectric strength, please short-circuit every terminals of primary and secondary terminals before the test; test without short-circuiting terminals can damage instruments

Case Assembly Material:
   Door (Frame): ABS resin
   Front Panel: Soda glass
   Back Case: Normal steel

Color:
   Door (Frame): White (equivalent to DIC546 ½)
   Front Panel: Transparent
   Back Case: White (equivalent to DIC546 ½)

Mounting: Panel mounting

Weight: About 15 kg (33 lb) (full option)

Dimensions: 400 W x 260 H x 300 mm D (15.7 W x 10.2 H x 11.8" D)

Panel Cut Dimensions: 388 x 248 mm (15.2 x 9.7")

Terminal Screws:
   Measuring Input, Alarm Terminals: M3.5
   Power, Protective Conductor Terminal, External Drive Terminal, Communication Terminal: M4

Chart Paper Illumination: White LED

Communication Interface Specifications

|		With Communication Interface	Without Communication Interface
Ethernet	**Specification**	Ethernet10BASE-T/ 100BASE-T, automated recognition, TCP, IP, HTTP, exclusive protocol	―
	Function	Data display, parameter setting, with browser data display, parameter setting on exclusive application	―
RS422A RS485	**Specification**	RS422A, RS485, Communication protocol: MODBUS communication specification: 9600 bps to 19200 bps 7E1 to 8N2	―
	Function	Data display and parameter setting using exclusive application	―
USB	**Specification**	Inside of front door, USB1.1, full speed 12 mbps, bulk transfer, Control transfer	
	Function	Parameter setting for exclusive application	

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Communication Interface Specifications

Input Signals		Measuring Ranges	Reference Ranges	Accuracy Ratings	Display Resolutions
DC Voltage		-10.0 to 10.0 mV	±10 mV	±0.05% ±1 digit	1 µV
		-20.0 to 20.0 mV	±20 mV		
		-40.0 to 40.0 mV	±40 mV		10 µV
		-80 0 to 80.0 mV	±80 mV		
		-1.25 to 1.25V	±1.25V		100 µV
		-2.5 to 2.5V	±2.5V		
		-5.0 to 5.0V	±5V		1 mV
		-10.0 to 10.0V	±10V		
Thermocouples	K	-200 to 500°C (-328 to 932°F)	±20 mV	±0.05% ±0.5°C (±33°F)	0.1°C (32°F)
		-200 to 900°C (-328 to 1652°F)	±40 mV		
		-200 to 1370°C (-328 to 2498°F)	±80 mV	±0.05% ±1°C (±34°F)	
	E	-200 to 250°C (-328 to 482°F)	±20 mV	±0.05% ±0.7°C (±33.2°F)	
		-200 to 500°C (-328 to 932°F)	±40 mV		
		-200 to 900°C (-328 to 1652°F)	±80 mV	±0.05% ±1°C (±34°F)	
	J	-200 to 350°C (-328 to 662°F)	±20 mV	±0.05% ±0.7°C (±33.2°F)	
		-200 to 700°C (-328 to 1292°F)	±40 mV		
		-200 to 1200°C (-328 to 2192°F)	±80 mV	±0.05% ±1°C (±34°F)	
	T	-200 to 400°C (-328 to 752°F)	±20 mV	±0.05% ±0.7°C (±33.2°F)	
	R	0 to 1760°C (32 to 3200°F)	±20 mV	±0.05% ±1°C (±34°F)	
	B	0 to 1300°C (32 to 2372°F)	±20 mV		
	N	0 to 600°C (32 to 1112°F)	±20 mV	±0.1% ±0.1°C (±32°F)	
		0 to 1000°C (32 to 1832°F)	±40 mV		
		0 to 1300°C (32 to 2372°F)	±80 mV	±0.1% ±1°C (±34°F)	
	W-WRe26	0 to 2315°C (32 to 4199°F)	±80 mV		
	PrRh40-PtRh20	0 to 1888°C (32 to 3430°F)	±20 mV		
	NiMo-Ni	-50 to 1310°C (-58 to 2390°F)	±80 mV		
	Platinel II	0 to 500°C (32 to 932°F)	±20 mV	±0.1% ±0.1°C (±32°F)	
		0 to 950°C (32 to 1742°F)	±80 mV	±0.1% ±1°C (±34°F)	
		0 to 1395°C (32 to 2543°F)	±80 mV		
	U	-200 to 350°C (-328 to 662°F)	±20 mV	±0.05% ±1°C (±34°F)	
		-200 to 600°C (-328 to 1112°F)	±40 mV		
	L	-200 to 350°C (-328 to 662°F)	±20 mV		
		-200 to 700°C (-328 to 1292°F)	±40 mV		
		-200 to 900°C (-328 to 1652°F)	±80 mV		
RTDs	**Pt100**	-50 to 50°C (-58 to 122°F)	50Ω	±0.05% ±0.3°C (±32.5°F)	0.1°C (32°F)
		-100 to 130°C (-148 to 266°F)	100Ω		
		-200 to 250°C (-328 to 482°F)	200Ω		
		-200 to 550°C (-328 to 1022°F)	300Ω		
	JPt100	-50 to 50°C (-58 to 122°F)	50Ω		
		-100 to 130°C (-148 to 266°F)	100Ω		
		-200 to 250°C (-328 to 482°F)	200Ω		
		-200 to 550°C (-328 to 1022°F)	300Ω		

Note 1: *Ambient temperature/humidity range: 23°C ±2°C*
Note 2: *For thermocouple input, the accuracy of reference junction compensation is not included with the accuracy ratings.*
Note 3: *Accuracy rating is the percentage of measuring range K, E, J, T, R, S, B, N: IEC584, JIS C 1602-1995; W-Wre26, Wre5-WRs26,*
PtRh40-PtRh20, NiMo-Ni, Platinel?: ASTM Vol.14.03; U(Cu-CuNi), L(Fe-CuNi): DIN43710; Pt100: IEC751, JIS C 1604-1997;

Terminal Board
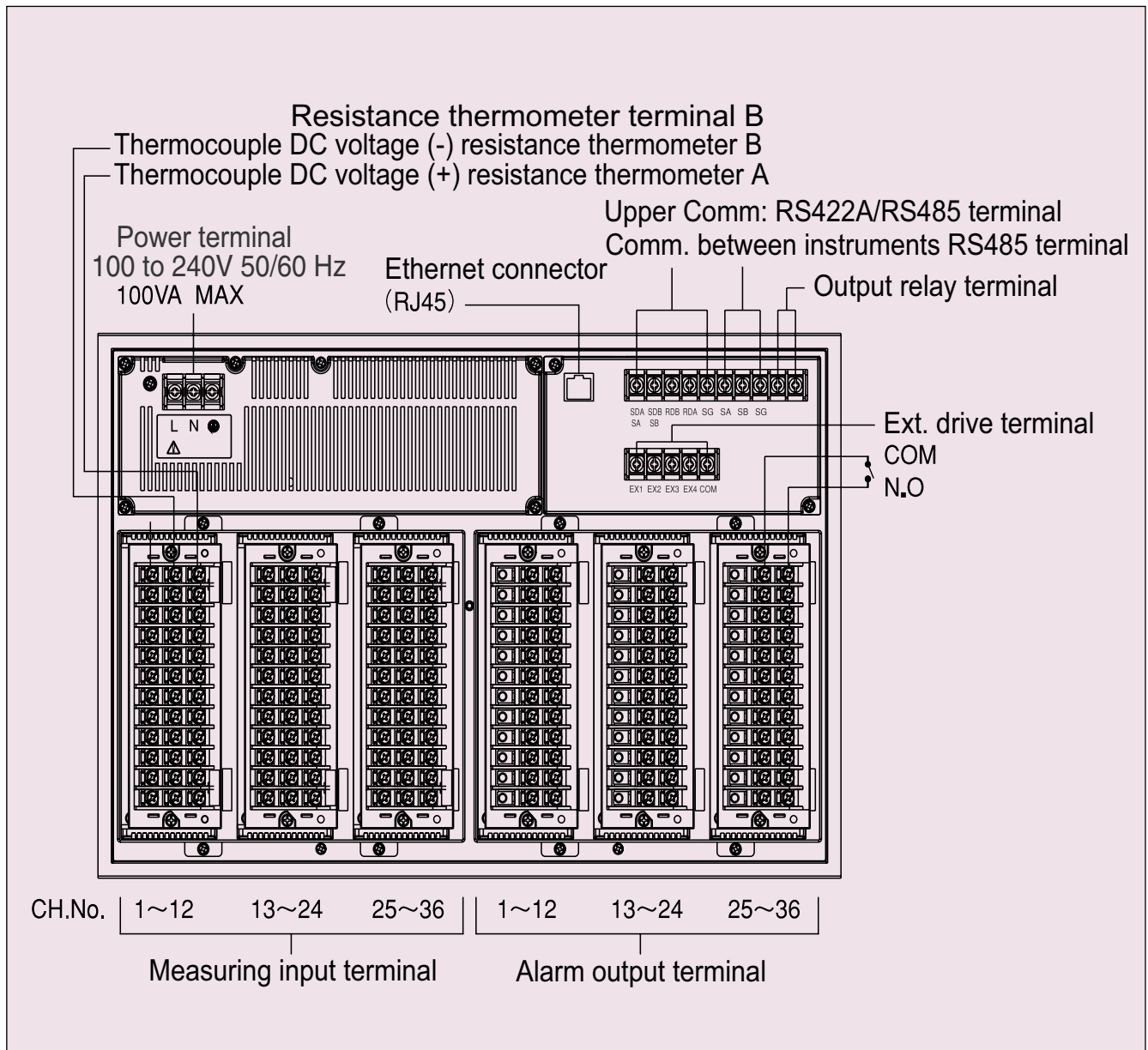
Exceptions of Accuracy Ratings

Input Signals	Measuring Ranges	Accuracy Ratings
K, E, J, T, L	-200 to 0°C (-328 to 32°F)	±0.2% ±1 digit
R, S	0 to 400°C (32 to 752°F)	
B	0 to 400°C (32 to 752°F)	None
	400 to 800°C (752 to 1472°F)	±0.15% ±1 digit
U	-200 to 0°C (-328 to 32°F)	±0.3% ±1 digit
W-WRe26	0 to 300°C (32 to 572°F)	
PrRh40-PtRh20	0 to 300°C (32 to 572°F)	±1.5% ±1 digit
	300 to 800°C (572 to 1472°F)	±0.8% ±1 digit
NiMo-Ni	-50 to 100°C (-58 to 212°F)	±0.2% ±1 digit

Note: Refer to thermocouple input accuracy is calculated based on standard range, see previous page.

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1 channel display

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

12 channels simultaneous display

Engineering and USB port

36 channels simultaneous display

Operation key pad

To Order

Model No.	Description
RD5110	250 mm (10") 12-points hybrid chart recorder
RD5120	250 mm (10") 24-points hybrid chart recorder
RD5130	250 mm (10") 36-points hybrid chart recorder
RD5111	250 mm (10") 12-points with 12 alarms hybrid chart recorder
RD5112	250 mm (10") 12-points with 24 alarms hybrid chart recorder
RD5121	250 mm (10") 24-points with 12 alarms hybrid chart recorder
RD5122	250 mm (10") 24-points with 24 alarms hybrid chart recorder
RD5131	250 mm (10") 36-points with 12 alarms hybrid chart recorder
RD5132	250 mm (10") 36-points with 24 alarms hybrid chart recorder
RD5133	250 mm (10") 36-points with 36 alarms hybrid chart recorder
RD5110-COMM	250 mm (10") 12-points hybrid chart recorder with communications
RD5120-COMM	250 mm (10") 24-points hybrid chart recorder with communications
RD5130-COMM	250 mm (10") 36-points hybrid chart recorder with communications

Comes complete with operator's manual.
***Ordering Example: RD5110,** 250 mm (10") hybrid chart recorder.*
***OCW-3,** OMEGACARE[SM] extends standard 2-year warranty to a total of 5 years.*

Accessories

Model No.	Description
RD5100-RC	10-color ribbon cassette, package of 5
RD5100-CP-0/100	Z-fold chart paper 250 mm x 20 m (9.8" x 65.6'), case of 15
RD9900-ZAILA	ZAILA data analysis software
RD2800-PASS	Parameter programming software
RD2800-KIDS	Data acquisition software