

# Circular Recorders

## CT7000 Series



- ✓ 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.

### Specifications

#### Input Ranges

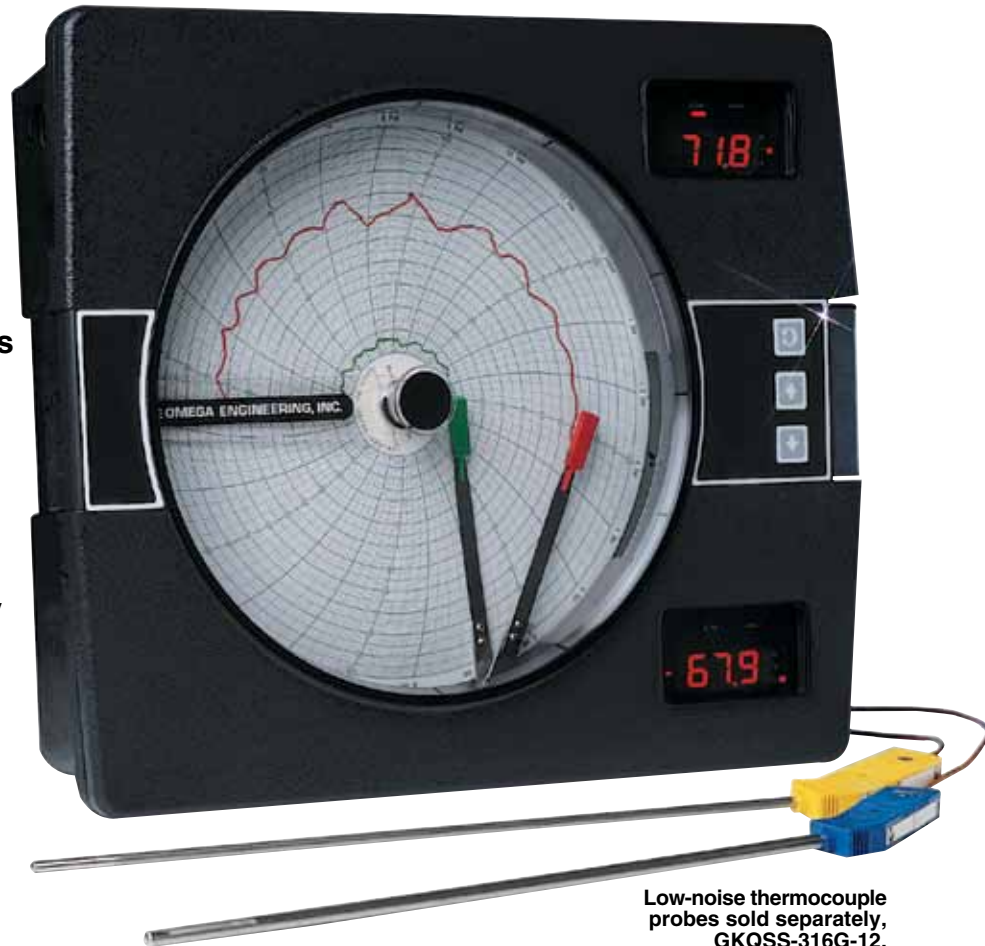
##### Thermocouple:

- 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  $\Omega$  (0.00385  $\Omega/\Omega/^\circ\text{C}$ ),  
-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



Low-noise thermocouple probes sold separately, GKQSS-316G-12, GTQSS-316G-12

**Milliamps:** 4 to 20 mA DC (via appropriate external shunt resistor)

#### Performance

##### Measurement Error Limit

**Thermocouple Types J, K, T, E, N and RTD:**  $\pm 0.25\%$  of reading +  $1^\circ$  @  $25^\circ\text{C}$  ( $77^\circ\text{F}$ )

**Type R, S, B, C Thermocouples:**  $\pm 0.25\%$  of span @  $25^\circ\text{C}$  ( $77^\circ\text{F}$ )

**mVdc and Vdc:**  $\pm 0.25\%$  of scaled span plus 1 least-significant digit

##### Ambient Temperature Error

**Limit:** 0.01% of span per  $^\circ\text{C}$  ( $1.8^\circ\text{F}$ ) deviation from  $25^\circ\text{C}$  ( $77^\circ\text{F}$ )

**Process Value Output Error Limit:**  $\pm 0.5\%$  of span

**Record Error Limit:**  $\pm 0.5\%$  of chart span or better, typically;  $\pm 1.0\%$  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  $1^\circ$

**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

**Chart Rotation:**

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  $\Omega$   
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  $\pm 10\%$ , 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

**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

**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.