# Universal Temperature/Process Controllers ⅛ and ¼ DIN Sizes

**Also Available in 1/16 DIN Size!**

All models shown smaller than actual size.

**CN8500**

CN8541TC-R1

CN8561TC-R1

CN8551TC-R1

## CN8500 Series

**3 YEAR WARRANTY** | **UL**

✔ **NEMA 4X (IP65) Front Panel Standard**
✔ **Universal Power Supply**
✔ **User-Selectable Ramp to Setpoint**
✔ **Smooth Auto/Manual Operation**
✔ **Optional RS232 or RS485 Communications**
✔ **Autotuning Heat or Cool**
✔ **Thermocouple, RTD, Voltage, or Current Input**

✔ **Plug-In Outputs Modules (Field Installable)**
✔ **Dual Outputs and Alarms**
✔ **Optional Heater Break Alarm, Remote Setpoint, Transducer Power Supply, and Recorder Output**

The CN8500 Series temperature controller is versatile and user-friendly. The operator needs to review only those parameters relevant to the particular application. A dual digital display offers optimal process information at a glance. The dedicated upper display shows the process temperature, while the lower display displays setpoint and setup parameters. Individual

LEDs identify the status outputs, alarms, digital communications, and special options. The CN8500 Series features a NEMA 4X front panel and a universal power supply that accepts 103 to 253 Vac and 103 to 330 Vdc.

Control algorithms available are P, PI, PD, PID, and on/off. The autotune feature automatically sets proportional band, rate, and reset before the process reaches setpoint. These parameters provide quick stabilization of both the heating and cooling process without overshoot, hunting, or cycling. The standard dual control outputs can be configured in a variety of control and alarm applications such as heat, heat/cool, heat/alarm, cool, or cool/alarm. The ramp-to-setpoint feature allows the user to define the rate of rise to reach the setpoint, thus minimizing thermal shock to the load during start-up.

## Specifications
### Performance
**Accuracy:** ±0.2% FS, ±1 digit

**Setpoint Resolution:**
1 count/0.1 count

**Repeatability:** ±1.0 count

**Temperature Stability:** 5 µV/°C maximum; 3 µV/°C typical

**Thermocouple Cold-Junction Tracking:** 0.05°C/°C ambient

**Common Mode Rejection:** >100 dBA

**Series Mode Rejection:** >70 dBA

**Process Sampling:** 10 Hz (100 ms)

### Inputs
**Thermocouple Lead Resistance:** 100 Ω maximum for rated accuracy

**Response Time:** 0.1, 1.0 or 10 s

**Decimal Position:** Selectable

### Outputs
**Output #1:** Reverse acting (heating)

**Output #2:** Direct acting (cooling)

**Mechanical Relay:**
Rated 5 A @ 120 Vac,
3 A @ 240 Vac

**Current:** 4 to 20 mA, 500 Ω maximum

**Voltage:** 20 Vdc pulse, 1 kΩ minimum load

**Triac:** Solid state relay, 120/240 Vac, zero voltage switched rated 1 A continuous, 10 A surge @ 25°C (77°F)

**Alarms:** Optically isolated triac rated 1 A, 120/240 Vac @ 25°C (77°F)

## Control Characteristics
**Setpoint Limits:** Limited to configured range for thermocouple and RTD; limited to scaled range

**Alarms:** Adjustable for high/low, process or deviation

**Rate:** 0 to 900 s

**Reset:** 0 to 3600 s

**Cycle Time:** 0.2 to 120 s

**Gain:** 0 to 400

**Gain Ratio:**
0 to 2.0 (in 0.1 increments)

**On/Off Deadband:** 1 to 100 counts

**Spread (Output 2):**
0 to 100 counts (above setpoint)

**Damping:** Adjustable (low, normal or high)

**Ramp to Setpoint:** 1 to 100 minutes

**Autotune:** Operator-initiated from front panel

**Manual Control:** Operator-initiated from front panel

### General
**Power:** 115 to 230 Vac ±10%, 50/60 Hz; 115 to 300 Vdc ±10% (auto-polarity)

**Display:** Dual LED, 4-digit process display, green menu/parameter display; 9.2 mm (0.37") high for ⅛ DIN models; 14 mm (0.55") process display for ¼ DIN units

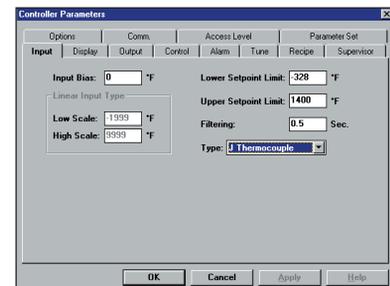**Power Consumption:** Less than 6 VA (instrument) @ 120 Vac

## For CN8200, CN8240 and CN8260 Series Controllers

FREE Software

✔ **Software Can Support Up to 254 CN8200, CN8240 or CN8260 Controllers**
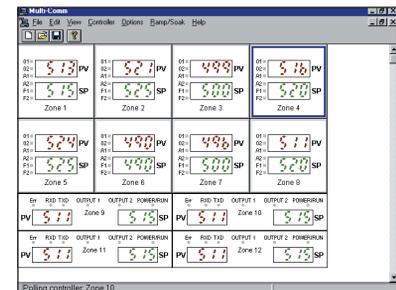


**Sample of screen displaying status of multiple controllers.**



**Sample of screen displaying controller parameters.**

The CN8-SW software is designed to interface with the CN8200, CN8240 and CN8260 Series controllers with optional communication hardware. Designed for use on laptops or PC's, this development provides the user with:

• Time saving benefit and convenience of remotely configuring and adjusting units.

• Saving and retrieving settings to and from files.

• Cloning settings to other instruments.

• Highly flexible logging and "real time" charting capability for providing hard copy QA records for ISO-9000 and other management purposes.

The CN8-SW software is a powerful process development tool for the OEM customer or process engineer. With compatible modems and PC computers, remote site supervisory control and data acquisition can take place to facilitate periodic or continuous monitoring and troubleshooting.

Data is stored to file in a tamper resistant format to ensure the integrity of reports for quality monitoring requirements.

## Input Types and Ranges

| Input Code | Type | Range | Resolution |
|---|---|---|---|
| TC | J<br>Iron-constantan | -18 to 760°C<br>0 to 1400°F | 1°C<br>1°F |
| | K<br>CHROMEGA®-ALOMEGA® | -18 to 1349°C<br>0 to 2460°F | 1°C<br>1°F |
| | T<br>Copper-constantan | -129 to 316°C<br>-200 to 600°F | 1°C<br>1°F |
| | N<br>OMEGALLOY® | -18 to 1299°C<br>0 to 2370°F | 1°C<br>1°F |
| | R<br>Pt/13% Rh-Pt | -18 to 1299°C<br>0 to 3200°F | 1°C<br>1°F |
| | S<br>Pt/10% Rh-Pt | -18 to 1299°C<br>0 to 3200°F | 1°C<br>1°F |
| RTD | RTD<br>3-wire, 100 Ω Pt | -200 to 850°C<br>-328 to 1562°F | 1°C<br>1°F |
| | RTD<br>3-wire, 100 Ω Pt | -128.8 to 232.2°C<br>-199.0 to 450.0°F | 0.1°C<br>0.1°F |
| V5 | 1 to 5 V<br>0 to 5 V | Scalable (-1999 to 9999)<br>Scalable (-1999 to 9999) | Selectable<br>Selectable |
| V10 | 2 to 10 V<br>0 to 10 V | Scalable (-1999 to 9999)<br>Scalable (-1999 to 9999) | Selectable<br>Selectable |
| MV | 10 to 50 mV<br>0 to 50 mV | Scalable (-1999 to 9999)<br>Scalable (-1999 to 9999) | Selectable<br>Selectable |
| MA | 4 to 20 mA<br>0 to 20 mA | Scalable (-1999 to 9999)<br>Scalable (-1999 to 9999) | Selectable<br>Selectable |

**P**

**CN8551RTD-R1**



*Panel Punches Available, Visit omega.com/panelpunches*

**CN8541RTD-R1**

**CN8500**

**All models shown smaller than actual size.**



**CN8561RTD-R1**

**Weight (⅛ DIN):** 0.34 kg (12 oz)

**Weight (¼ DIN):** 0.425 kg (15 oz)

**Panel Cutout (⅛ DIN):** 45 x 92 mm (1.772 x 3.622")

**Panel Cutout (¼ DIN):** 92 mm (3.622") square

**Dimensions (⅛ DIN Horizontal):** 53 x 100 mm (2.1 x 3.95"); 18.3 mm (0.72") depth

**Dimensions (¼ DIN):** 100 W x 100 H x 18.3 minimum bezel (3.95 x 3.95 x 0.72")

**Panel Depth:** 100 mm (3.937")

**Front-Panel Rating:** NEMA 4X (IP65)

**Operating Ambient Range:** 0 to 55°C (32 to 131°F) @ 90% RH maximum, non-condensing

**Memory Protection:** Solid state non-volatile memory

**Connections:** Rear barrier strip with locking terminals

**Contacts:** Twin bifurcated

## To Order

| Model No. | Cutout | Description |
|---|---|---|
| CN8541(*)-(**) | ⅛ DIN vertical | Single output |
| CN8542(*)-(**)-(**) | ⅛ DIN vertical | Dual output |
| CN8551(*)-(**) | ⅛ DIN horizontal | Single output |
| CN8552(*)-(**)-(**) | ⅛ DIN horizontal | Dual output |
| CN8561(*)-(**) | ¼ DIN | Single output |
| CN8562(*)-(**)-(**) | ¼ DIN | Dual output |

Comes complete with operator's manual.

**\*** Specify input code: *"-TC"* (thermocouple), *"-RTD"*, *"-MV"* (voltage to 50 mV) or *"-MA"* (current to 20 mA). See input table on previous page for details.

**\*\*** Specify output code(s) from output types table below. Single output units can be ordered for either heat (reverse) or cool (direct) action.

### Output Types (No Additional Cost)

| Output Type | 1st Output–Heat Only (Reverse) Order Suffix | 2nd Output–Cool Only (Direct)* Order Suffix |
|---|---|---|
| 5 A Relay | **-R1** | **-R2** |
| 1 A SSR | **-T1** | **-T2** |
| 4 to 20 mA | **-F1** | **-F2** |
| 20 Vdc Pulse | **-DC1** | **-DC2** |

**\*** Single output controllers can be ordered for either heat (reverse) or cool (direct) acting.

***Ordering Examples: CN8561TC-R2,*** ¼ DIN controller, thermocouple input, 5 A relay, 2nd output configured for cooling operation.

***CN8561TC-DC1-AL1-C2-PV4,*** single-output controller for thermocouple input, 1st output DC pluse with 1 alarm output, RS232C communications and recorder output.

***OCW-2,*** 2-year warranty extension.

### Options*

| Ordering Suffix | Description |
|---|---|
| **-AL1** | Single alarm |
| **-AL2** | Dual alarms |
| **-C2** | RS232 communications† |
| **-C4** | RS485 communications† |
| **-XP1** | Transducer power supply, 15 Vdc |

**\*** 1 alarm option, 1 communications option and the XP1 option can be installed in a unit.

**†** Free CN8-SW software download available at *omega.com/cn8500*

### Other Options (Only 1 Option Available Per Unit)

| Ordering Suffix | Description |
|---|---|
| **-PV3** | Recorder output, 4 to 20 mA |
| **-PV4** | Recorder output, 0 to 5 Vdc |
| **-HB1** | Heater break alarm, 0 to 20 A |
| **-HB2** | Heater break alarm, 0 to 60 A |
| **-RSP4** | Remoter setpoint, 0 to 5 Vdc |
| **-RSP5** | Remote setpoint, 1 to 5 Vdc |
| **-RSP6** | Remote setpoint, 0 to 20 mA |
| **-RSP7** | Remote setpoint, 4 to 20 mA |

### Accessories

| Model No. | Description |
|---|---|
| **CNQUENCHARC** | Noise suppression RC snubber (2 leads), 110 to 230 Vac |
| **CN8500-ALI** | Alarm relay module |
| **CN8500-DC** | DC pulse output module |
| **CN8500-F** | 4 to 20 mA output module |
| **CN8500-R** | Relay output module |
| **CN8500-T** | 1 A SSR output module |



**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.