

Universal Temperature/Process Controllers 1/8 and 1/4 DIN Sizes



CN8500 Series



- ✓ 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: $\pm 0.2\%$ FS, ± 1 digit

Setpoint Resolution:
1 count/0.1 count

Repeatability: ± 1.0 count

Temperature Stability: $5 \mu\text{V}/^\circ\text{C}$ maximum; $3 \mu\text{V}/^\circ\text{C}$ typical

Thermocouple Cold-Junction Tracking: $0.05^\circ\text{C}/^\circ\text{C}$ 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 k Ω 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 $\pm 10\%$, 50/60 Hz; 115 to 300 Vdc $\pm 10\%$ (auto-polarity)

Display: Dual LED, 4-digit process display, green menu/parameter display; 9.2 mm (0.37") high for $\frac{1}{8}$ DIN models; 14 mm (0.55") process display for $\frac{1}{4}$ 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.

Input Types and Ranges

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

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.

Weight (½ DIN): 0.34 kg (12 oz)
Weight (¾ DIN): 0.425 kg (15 oz)
Panel Cutout (½ DIN): 45 x 92 mm (1.772 x 3.622")
Panel Cutout (¾ DIN): 92 mm (3.622") square
Dimensions (½ DIN Horizontal): 53 x 100 mm (2.1 x 3.95"); 18.3 mm (0.72") depth
Dimensions (¾ 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(*)-(**)	½ DIN vertical	Single output
CN8542(*)-(**)-(**)	½ DIN vertical	Dual output
CN8551(*)-(**)	½ DIN horizontal	Single output
CN8552(*)-(**)-(**)	½ 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 pulse 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

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