

# 1/16 DIN Autotune Temperature and Process Controllers

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CN63200 and  
CN63400 Series  
Starts at  
**\$125**



- ✓ PID Control With Reduced Overshoot
- ✓ CN63200 Accepts Thermocouples and RTDs
- ✓ CN63400 Accepts 0 to 10 Vdc and 0/4 to 20 mA Signals
- ✓ On-Demand Auto-Tuning of PID Settings
- ✓ DC Analog Output (Optional)
- ✓ User Programmable Function Button
- ✓ Front Panel Programming

The CN63200 controllers accepts signals from a variety of temperature sensors (thermocouple or RTD), while the CN63400 controllers accepts either a 0 to 10 Vdc or 0/4 to 20 mA dc input signal. Both controllers can provide an accurate output control signal (time proportional or DC analog output) to maintain a process at a setpoint value. Dual 4-digit displays allow viewing of the process/temperature and setpoint simultaneously. Front panel indicators inform the operator of the controller and output status. The comprehensive programming allows these controllers to meet a wide variety of application requirements.

## Specifications

**Display:** 2-line by 4-digit, LCD negative image transmissive with backlighting  
**Top (Process) Display:** 7.6 mm H (0.3") digits with red backlighting  
**Bottom (Parameter) Display:** 5.1 mm H (0.2") digits with green backlighting



CN63200-R1, \$125, shown larger than actual size.

## Power:

**Line Voltage Models:** 85 to 250 Vac, 50/60 Hz, 8 VA

## Low Voltage Models:

**DC Power:** 18 to 36 Vdc, 4 W

**AC Power:** 24 Vac, ±10%, 50/60 Hz, 7 VA

**Controls:** 3 rubber push buttons for modification and setup of controller parameters, 1 additional button (F1) for user programmable function, 1 external user input (models with alarms) for parameter lockout or other user programmable functions

**Memory:** Non-volatile E<sup>2</sup>PROM retains all programmable parameters.  
**Isolation Level:** AC power with respect to all other I/O; 250V working (2300V for 1 min)

**Sensor Input to Analog Output:** 50V working (500V for 1 minute)  
**Relay Contacts to All Other I/O:** 300V working (2300V for 1 minute)

**DC Power with Respect to Sensor Input and Analog Output:** 50V working (500V for 1 minute)

## Environmental Conditions:

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

**Storage Temperature Range:** -40 to 80°C (-40 to 176°F)

**Operating and Storage Humidity:** 85% max relative humidity (non-condensing) from 0 to 50°C (32 to 122°F)

**Altitude:** Up to 2000 meters

**Connection:** Wire-clamping screw terminals

**Construction:** Black plastic alloy case and collar style panel latch; panel latch can be installed for vertical or horizontal instrument stacking; black plastic textured bezel with transparent display window; controller meets NEMA 4X (IP65) requirements for indoor use when properly installed; Installation Category II, Pollution Degree 2

**Weight:** 179 g (6.3 oz)



## Input Specifications

### Sensor Input:

**Sample Period:** 100 ms (10 Hz rate)

**Step Response Time:** 300 ms typical, 400 msec max to within 99% of final value with step input

### Failed Sensor Response:

**Main Control Output(s):** Programmable preset output

**Display:** "OPEN"

**Alarms:** Upscale drive

**Analog Output:** Upscale drive when assigned to retransmitted input

**Normal Mode Rejection:** >40 dB @ 50/60 Hz

**Common Mode Rejection:** >120 dB, DC to 60 Hz

**Overvoltage Protection:** 120 Vac @ 15 s max

### RTD Inputs (CN63200 Only)

**Type:** 2- or 3-wire

**Excitation:** 150  $\mu$ A typical

**Lead Resistance:** 15  $\Omega$  max per input lead

**Resolution:** 1 or 0.1° for all typesable, enable or disable

**Hysteresis:** Programmable

Type	Input Type	Range	Standard
385	100 $\Omega$ platinum, Alpha = 0.00385	-200 to 600°C (-328 to 1112°F)	IEC 751
392	100 $\Omega$ platinum, Alpha = 0.00385	-200 to 600°C (-328 to 1112°F)	No official standard
672	120 $\Omega$ nickel, Alpha = 0.00672	-80 to 215°C -112 to 419°F	No official standard
$\Omega$	Linear resistance	0.0 to 320.0 $\Omega$	N/A

### Temperature Indication Accuracy (CN63200 Only):

$\pm$ (0.3% of span, +1°C) at 23°C (73°F) ambient after 20 minute warm up; includes NIST conformity, cold junction effect, A/D conversion errors and linearization conformity

**Span Drift (Maximum):** 130 PPM/°C

**User Input (Only Controllers with Alarms Have a User**

**Input Terminal):** Internally pulled up to 7 Vdc (100 K $\Omega$ ,

$V_{IN}$  Max: 35V

$V_{IL}$ : 0.6V max

$V_{IH}$ : 1.5V min

$I_{OFF}$ : 40  $\mu$ A max

**Response Time:** 120 ms max

**Functions:** Programmable

## Output Specifications

### Control and Alarm Outputs:

#### Relay Output:

**Type:** Form "A"

**Contact Rating:** 3 A @ 250 Vac or 30 Vdc;

$\frac{1}{10}$  HP @ 120 Vac (inductive load)

**Life Expectancy:** 100,000 cycles at max load rating (decreasing load and/or increasing cycle time, increases life expectancy)

#### Logic/SSR Output (Main Control Output Only):

**Rating:** 45 mA max @ 4V min, 7V nominal

### Main Control:

**Control:** PID or on/off

**Output:** Time proportioning or DC analog

**Cycle Time:** Programmable

**Auto-Tune:** When selected, sets proportional band, integral time, derivative time, and output dampening time; also sets input filter and (if applicable) cooling gain

**Probe Break Action:** Programmable

**Alarms (Optional):** 2 relay alarm outputs

**Reset Action:** Programmable; automatic or latched

**Standby Mode:** Programmable; enable or disable

**Hysteresis:** Programmable

**Sensor Fail Response:** Upscale

## Thermocouple Inputs (CN63200 Only)

**Types:** T, E, J, K, R, S, B, N, C, and linear mV

**Input Impedance:** 20 M $\Omega$  for all types

**Lead Resistance Effect:** 0.25  $\mu$ V/ $\Omega$

### Cold Junction Compensation

$\pm$ 1°C typical (1.5°C max) error over ambient temperature range

**Resolution:** 1° for types R, S, B and 1 or 0.1° for all other types

TC Type	Display Range	Wire Color		Standard
		ANSI	BS1843	
T	-200 to 400°C -328 to 752°F	(+) Blue (-) Red	(+) White (-) Blue	ITS-90
E	-200 to 750°C -328 to 1382°F	(+) Violet (-) Red	(+) Brown (-) Blue	ITS-90
J	-200 to 760°C -328 to 1400°F	(+) White (-) Red	(+) Yellow (-) Blue	ITS-90
K	-200 to 1250°C -328 to +2282°F	(+) Yellow (-) Red	(+) Brown (-) Blue	ITS-90
R	0 to 1768°C 32 to 3214°F	No standard	(+) White (-) Blue	ITS-90
S	0 to 1768°C 32 to 3214°F	No standard	(+) White (-) Blue	ITS-90
B	149 to 1820°C 300 to 3308°F	No standard	No standard	ITS-90
N	-200 to 1300°C -328 to 2372°F	(+) Orange (-) Red	(+) Orange (-) Blue	ITS-90
C (W5/W6)	0 to 2315°C 32 to 4199°F	No standard	No standard	ASTM E988-96
mV	-5.00 mV to 56.00 mV	N/A	N/A	N/A

### Signal Input (CN63400 Only)

Input Range	Accuracy*	Impedance	Max Continuous Overload	Res
10 Vdc (-1 to 11)	0.30 % of rdg + 0.03V	1 M $\Omega$	50V	10 mV
20 mAdc (-2 to 22)	0.30 % of rdg + 0.04 mA	10 $\Omega$	100 mA	10 $\mu$ A

\* Accuracies are expressed as percentages over 0 to 50°C (32 to 122°F) ambient range after 20 minute warm-up.

**Annunciator:** "A1" and "A2" programmable for normal or reverse acting

**Cooling:** Software selectable (overrides alarm 2)

**Control:** PID or on/off

**Output:** Time proportioning

**Cycle Time:** Programmable

**Proportional Gain Adjust:** Programmable

**Heat/Cool Deadband Overlap:** Programmable

**Analog DC Output (Optional):**

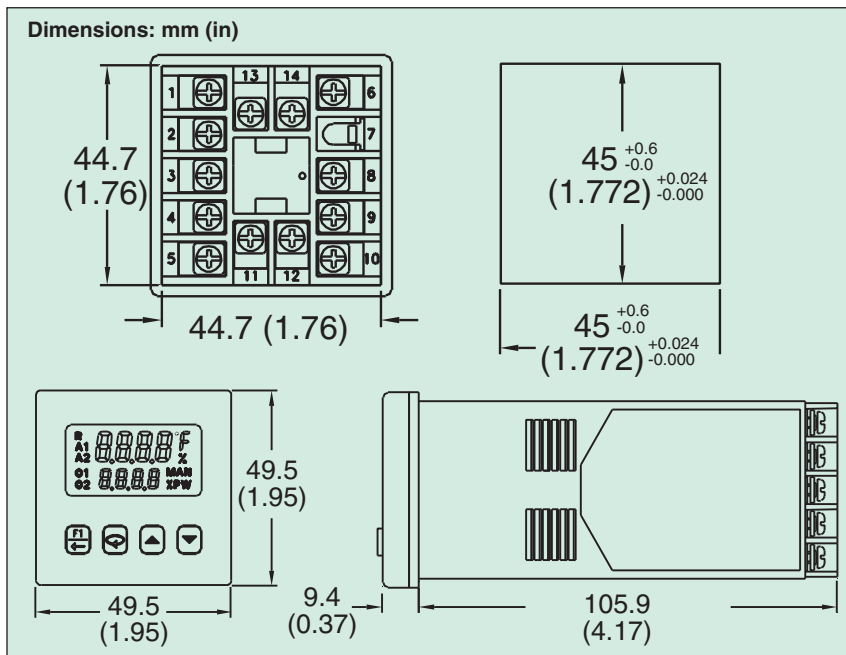
**Action:** Control or retransmission

**Update Rate:** 0.1 to 250 s

Output Range**	Accuracy*	Compliance	Resolution
0 to 10V	0.3% of FS + $\frac{1}{2}$ LSD	10 k $\Omega$ min	$\frac{1}{8000}$
0 to 20 mA	0.3% of FS + $\frac{1}{2}$ LSD	500 $\Omega$ max	$\frac{1}{8000}$
4 to 20 mA	0.3% of FS + $\frac{1}{2}$ LSD	500 $\Omega$ max	$\frac{1}{6400}$

\* Accuracies are expressed as percentages over 0 to 50°C (32 to 122°F) ambient range after 20 minute warm-up.

\*\* Outputs are independently jumper selectable for either 10V or 20 mA. The output range may be field calibrated to yield approximately 5% overrange and a small underrange (negative) signal.



CN63200-R1, \$125, shown actual size.

**MOST POPULAR MODELS HIGHLIGHTED!**

<b>To Order (Specify Model Number)</b>		
Model No.	Price	Description
<b>Temperature Inputs: Standard Power Models (85 to 250 Vac, 50 to 60 Hz, 8 VA max)</b>		
CN63200-R1	\$125	Single output, relay
CN63200-R1-AL	145	Single output, relay, 2 alarms
CN63200-DC1	125	Single output, DC pulse
CN63200-DC1-AL	145	Single output, DC pulse, 2 alarms
CN63200-F1-AL	175	Single output, analog control or re-transmission, 2 alarms
<b>Temperature Inputs: Low Voltage Models(18 to 36 Vdc; 7 W)</b>		
CN63200-R1-LV	\$125	Single output, relay
CN63200-R1-AL-LV	145	Single output, relay, 2 alarms
CN63200-DC1-LV	125	Single output, DC pulse
CN63200-DC1-AL-LV	145	Single output, DC pulse, 2 alarms
CN63200-F1-AL-LV	175	Single output, analog control or re-transmission, 2 alarms
<b>Process Inputs: Standard Power Models (85 to 250 Vac, 50 to 60 Hz, 8 VA max)</b>		
CN63400-R1	\$125	Single output, relay
CN63400-R1-AL	145	Single output, relay, 2 alarms
CN63400-DC1	125	Single output, DC pulse
CN63400-DC1-AL	145	Single output, DC pulse, 2 alarms
CN63400-F1-AL	175	Single output, analog control or re-transmission, 2 alarms
<b>Process Inputs: Low-Voltage Models (18 to 36 Vdc; 7 W)</b>		
CN63400-R1-LV	\$125	Single output, relay
CN63400-R1-AL-LV	145	Single output, relay, 2 alarms
CN63400-DC1-LV	125	Single output, DC pulse
CN63400-DC1-AL-LV	145	Single output, DC pulse, 2 alarms
CN63400-F1-AL-LV	175	Single output, analog control or re-transmission, 2 alarms

Comes complete with operator's manual.

\* Analog out may be used for retransmitted signals. When using analog output for retransmitted signals, AL1 becomes main control O1, if selected for heating in the analog out models.

**Ordering Examples:** CN63400-DC1-AL, 18 to 36 Vdc power, process inputs, single DC pulse output with 2 alarms, \$145.  
 CN63200-R1-AL, 85 to 250 Vac power, temperature inputs, single relay output with 2 alarms, \$145.

**Accessories (Field-Installable)**

Model No.	Price	Description
CNQUENCHARC	\$8	Noise suppression RC snubber (2 leads), 110 to 230 Vac

Recommended Reference Book: Controller Tuning/PID, GE-2117, \$25.  
 See Section Y For Additional Books





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