

# Autotune Process Controller Displays Line Graph of Process Variable vs Time, ¼ DIN Size

2 YEAR  
WARRANTY

OMEGA  
CARE  
Extended Warranty  
Program



Shown smaller  
than actual size.

KMTSS-125G-6, 24\$  
thermocouple probe  
sold separately in  
Section A

The OMEGA® CN3800 series process controllers are autotune PID controllers that offer direct or reverse acting control that can be based on many different process parameters, including temperature, pressure, flow, pH, and relative humidity. Up to 9 ramp and soak profiles of up to 9 steps each can be stored by the controller. The 9 profiles can be linked together for a maximum of 81 steps. Individual profiles can be repeated up to 9999 times. Linked profiles can be repeated up to 999 times. These controllers can display a line graph of the process variable vs time for added visual indication. The two standard alarms can be programmed as high limit/low limit alarms or absolute/deviation alarms.

## Applications

- ✓ Furnace/Oven Control
- ✓ Food Processing
- ✓ Constant Temperature Baths

Optional RS-232C or RS-422A digital communications are available for remote operation of the controller from a supervisory computer. The optional analog output provides the capability to re-transmit the process variable or setpoint value to a recorder or datalogger.

## Specifications

**Digital Display:** 4 digit, 7-segment LED; PV (process value), red LED 14.3 mm (0.56") high; SV (set value), green LED 10.0 mm (0.39") high; PTN and STP, green LED 10.0 mm (0.39") high  
**LCD Display:** 16 alpha-numerical x 2 lines (with backlight)

CN3800 Series

**\$839**

Basic Unit

- ✓ High Accuracy,  $\pm 0.1\%$
- ✓ Ramp and Soak Capability
- ✓ Universal Power Supply (90 to 264 Vac)
- ✓ User-Selectable Inputs and Ranges
- ✓ Programmable Scaling for Process Inputs
- ✓ Alarms Hi and Low can be Programmed as Absolute or Deviation
- ✓ Optional RS-232/RS-422A Communications

**Display Accuracy:**  $\pm(0.1\% + 1 \text{ digit})$ /standard accuracy at  $23^{\circ}\text{C}/73^{\circ}\text{F} \pm 5^{\circ}\text{C}/9^{\circ}\text{F}$ ; resolution, 0.1 or 1 depending on range

### Input (see Input Range Table):

Thermocouple, up-scale break protection, input impedance 500  $\Omega$  min; RTD ( $\infty = 0.00385$  or 0.00392), lead wire tolerance 5  $\Omega$  max/wire; mV, up to 100 mV; V up to 10 V; input impedance 500  $\Omega$  min; and current up to 20 mA, receiving impedance 250 ohms

### Sampling Cycle:

0.25 sec maximum

**PV Bias:** 0 to  $\pm 999$  units

**Digital Filter:** 0 to 200 times (input sampling setting)

**For Additional Controllers  
and Indicators, See Section M**

**Control Mode:** Auto-tuning PID; proportional band, 0.1 to 999.9% FS; integral time, 1 to 6000 sec; derivative time, 0 to 3600 sec (PI mode at 0 setting)

**Auto/Manual Selection:**

Balanceless, bumpless transfer

**Control Outputs:** Relay contact, 240 Vac 2.5 A resistive load, 1 A inductive load; current, 4-20 mA dc, load resistance 600 ohm max; voltage, 0 to 10 Vdc, load current 2 mA max; dc pulse 15 Vdc 20 mA/output rating

**Proportional Cycle:**

1 to 120 sec variable

**Alarm:** 2 alarms, can be set independently hi/lo limit, absolute or deviation; rating 240 Vac 2.5 A resistive load, 1 A inductive load

**Program Profile Control:**

9 profiles max, 9 steps per profile, 81 steps max

**Profile Repeat:** 9999 times max

**Profile Link:** 9 patterns max

**Profile Link Repeat:**

999 times max

**Time 1:** 0 to 99 hrs and 59 minutes/step

**Time 2:** 0 to 99 minutes and 59 seconds/step

**Analog Output Option:** 2 outputs, one each for PV and SV; output signal: 0 to 10 Vdc, max load current 2 mA; 0 to 10 mV dc, output resistance 10 ohms; 4-20 mA dc, load resistance 500 ohm max; accuracy:  $\pm 0.01\%$  FS vs display; resolution: 0.01% FS max

**Digital Communications Option:** RS-232C and/or RS-422A; interface speed, 1200, 2400 or 4800 bps selectable; data bit, 7-bit; stop bit, 1-bit

**Memory Protection:** Non-volatile

**Operating Ambient Temperature Range:** -10 to 50°C (14 to 122°F), humidity 90% RH max

**Power Supply:**

90 to 264 Vac, 50/60 Hz

**Power Consumption:**

Approx 17 VA

**Insulation Resistance:** 500 Vdc 20 M $\Omega$  between input terminal and power supply terminal; 500 Vdc 20 M $\Omega$  between power supply terminal and ground terminal.

**Dimensions:** 96 x 96 x 140 mm (3.78 H x 3.78 W x 5.53" D); panel depth 125 mm (4.92")

CN3800 Series



Input Range Table

| Input Code          | Type                    | Range             |                   |
|---------------------|-------------------------|-------------------|-------------------|
| TC                  | T Copper-Constantan     | -199.9 to 200.0°C | -300 to 400°F     |
|                     | J Iron-Constantan       | 0 to 600.0°C      | 0 to 1100°F       |
|                     | E CHROMEGLA®-Constantan | 0 to 700.0°C      | 0 to 1300°F       |
|                     | K CHROMEGLA®-ALOMEGA®   | -100.0 to 400.0°C | -150 to 750°F     |
|                     |                         | 0 to 800.0°C      | 0 to 1500°F       |
|                     |                         | 0 to 1200°C       | 0 to 2200°F       |
|                     | N OMEG-P®-OMEG-N®       | 0 to 1300°C       | 0 to 2300°F       |
|                     | PLII Platinel II        | 0 to 1300°C       | 0 to 2300°F       |
|                     | R Pt-13%Rh/Pt           | 0 to 1700°C       | 0 to 3100°F       |
|                     | S Pt-10%Rh/Pt           | 0 to 1700°C       | 0 to 3100°F       |
| B Pt-6%Rh/Pt-30%Rh* | 0 to 1800°C             | 0 to 3300°F       |                   |
| C W-5%Re/W-26%Re    | 0 to 2300°C             | 0 to 4200°F       |                   |
| RTD                 | 100 ohm Pt, 3-wire      | -199.9 to 600.0°C | -300.0 to 1100°F  |
|                     |                         | -100.0 to 100.0°C | -150.0 to 200.0°F |
|                     |                         | -100.0 to 300.0°C | -150.0 to 600.0°F |
|                     |                         | -40.0 to 60.0°C   | -40.0 to 140.0°F  |
|                     |                         | 0 to 50.00°C      | 0 to 120.0°F      |
|                     |                         | 0 to 100.0°C      | 0 to 200.0°F      |
|                     |                         | 0 to 200.0°C      | 0 to 400.0°F      |
| MV†                 | Millivolt               | 0 to 500.0°C      | 0 to 1000°F       |
|                     |                         | -10 to 10 mV      |                   |
|                     |                         | 0 to 10 mV        |                   |
|                     |                         | 0 to 20 mV        |                   |
|                     |                         | 0 to 50 mV        |                   |
|                     |                         | 0 to 100 mV       |                   |
| V†                  | Volt                    | -1 to 1 V         |                   |
|                     |                         | 0 to 1 V          |                   |
|                     |                         | 0 to 2 V          |                   |
|                     |                         | 0 to 5 V          |                   |
|                     |                         | 1 to 5 V          |                   |
| MA†                 | Current                 | 0 to 10 V         |                   |
|                     |                         | 4 to 20 mA        |                   |
|                     |                         | 0 to 20 mA        |                   |

\* Effective range + 750 to 3300°F (400 to 800°C)

† User-programmable scaling is available with scaling range of -1999 to 9999 digits.

**Panel Cutout:**

92 x 92 mm (+0.8/-0 mm)  
3.622" x 3.622" (+0.03/-0)

**Panel Thickness:**

1.0 to 3.5 mm (0.04 to 0.14")

**Installation:** Push-in panel, no mounting hardware necessary

**Weight:** 750 g (1.65 lb)

# CN3800 Features

## Monitor LED's

- FIX LED (Constant Value Control)
- MAN LED (Manual Control)
- AT LED (Autotuning)
- PTN Display (Pattern No.)
- STP Display (Step No.)



Legend Display °C/°F Selectable

PV Display (Process Value)

SV Display (Set Value)

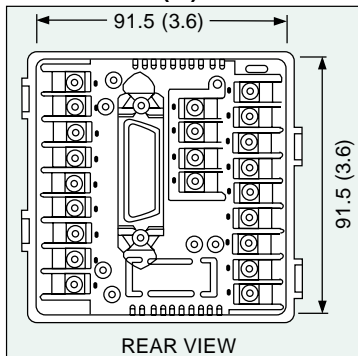
LCD Functional Displays

OMEGACARE<sup>SM</sup> extended warranty program is available for models shown on this page. Ask your sales representative for full details when placing an order.

Setting Key Buttons: Each Parameter can be Set with Assistance of the Menu Driven LCD Display

GEQSS-14G-12, \$30 Low Noise Thermocouple Probes, see Section A.

Dimensions are shown in mm (in)



### To Order (Specify Model Number)

| Model No. | Price | Description                                    |
|-----------|-------|--|
| CN3801(*) | \$839 | Controller with single mechanical relay output |
| CN3802(*) | 839   | Controller with single dc pulse                |
| CN3803(*) | 839   | Controller with single 4 to 20 mA dc output    |
| CN3804(*) | 839   | Controller with single 0 to 10 Vdc output      |

\*Specify input code TC, RTD, mV, V or mA. Refer to Input Types and Range table.

Ordering Example: CN3801TC-AO2MV-RS2 is a controller with thermocouple input, single mechanical relay output, optional analog voltage output and optional RS-232C digital communications, \$839 + 200 + 200 = \$1239. OCW-1 OMEGACARE<sup>SM</sup> extends standard 2-year warranty to a total of 3 years (\$123), \$1239 + 123 = \$1362.

### Options - Analog and Communications Options are Not Field Installable

| Ordering Suffix | Price | Description  |
|-----------------|-------|--|
| -AO1MV          | \$100 | Analog output, 0 to 10 mV dc/output resistance: 10 Ω                 |
| -AO1MA          | 100   | Analog output, 4 to 20 mA dc/load resistance: 500 Ω max              |
| -AO1V           | 100   | Analog output, 0 to 10 Vdc/load current: 2 mA max                    |
| -AO2MV*         | 200   | Dual analog output, 0 to 10 mV dc/output resistance: 10 Ω            |
| -AO2MA*         | 200   | Dual analog output, dual 4 to 20 mA dc/load resistance: 500 ohms max |
| -AO2V*          | 200   | Dual analog output, dual 0 to 10 Vdc/ load current: 2 mA max         |
| -RS2            | 200   | RS-232 digital communications  |
| -RS4            | 200   | RS-422 digital communications  |
| -PC**           | 80    | 24-pin I/O connector and cable (1 meter)                             |

\*These options provide dual analog outputs, one for process variable (PV) and one for setpoint value (SV).

\*\*The external I/O connector allows you to select but not change the values of run/reset, hold, advance, autotune, and profiles 1 thru 9. This I/O also provides a status signal for guaranteed soak, advance, hold run/reset, fix, manual, and output.







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