

Ramp/Soak Profile Controller $\frac{1}{16}$ DIN Size



CN1166 Series
\$240
 Basic Unit

- ✓ **Universal Input:** Thermocouple, RTD, Current and Voltage
- ✓ **PID with Fuzzy Logic** Minimizes Overshoot and Improves Control
- ✓ **Four Programs of Sixteen Segments** with an Event Output
- ✓ **Universal Power Supply** and Optional Low Voltage
- ✓ **Dedicated Configuration Port** Allows Configuration Directly from a PC, Plus the Development, Transfer, and Storage of Programs
- ✓ **Optional RS-485 Communications**
- ✓ **NEMA-4X (IP65) Front Panel Standard**

The CN1166 $\frac{1}{16}$ DIN profile controller is capable of holding up to 4 programs of 16 segments each and includes an event output. The controller can be configured from the front of the instrument or by a PC through a configuration port. The configuration port has a dual purpose; first, it can be used to modify the controller setups, and secondly, it can be used to transfer programs or profiles. This controller has a fuzzy logic algorithm plus a pre-tune algorithm, that when combined provide shorter start-up time and reduced overshoot. The CN1166 contains many of the features of larger, more expensive profilers such as guaranteed soak, delayed start, profile active output, profile recovery features, profile cycling, plus an optional digital input for remote run/hold. RS-485 communications is also available with convenient, full access to all profile data. Modular I/O options allow for field upgrades by adding or replacing plug-in boards.



GKQSS-316G-12, \$29
 Thermocouple Probe Sold Separately. See Section A

Shown larger than actual size

Specifications General

Display: Red/Green LED, 7-segment LED's; 0.39" (9.9 mm) high process value, 0.28" (7.1 mm) high setpoint value

Input Impedance: Greater than 100 M Ω resistive (except for dc mA and V inputs)

Inputs: Thermocouples J, J DIN, K, T, R, S, B; RTD Pt100, 3-Wire alpha=0.00385; Process: 0 to 50 mV, 0 to 10 V, 4 to 20 mA, 0 to 20 mA, 10 to 50 mV, 1 to 10 V, 2 to 10 V

Input Sample Rate: Four samples/second

Digital Input Filter: Time constant selectable from front panel - 0.0 (i.e., OFF), 0.5 to 100.0 seconds in 0.5-second increments

Input Resolution: 14 bits approximately; always four times better than display resolution

Isolation: Universal Input isolated from all outputs except dc pulse at 240 Vac

Process Variable Offset: Adjustable \pm input span

RTD Sensor Current: 150 μ A (approximately)

Accuracy: \pm 0.25% of span \pm 1 LSD

Process Inputs

Scale Range Maximum: -1999 to 9999. Decimal point as required

Scale Range Minimum: -1999 to 9999. Decimal point as for Scale Range Maximum

Minimum Span: 1 display LSD

Sensor Break Protection:

Applicable to 4 to 20 mA, 1 to 5 V and 2 to 10 V ranges only. Break detected within two seconds. Control outputs set to OFF (0% power); alarms operate as if the process variable has gone under-range

Remote Run/Hold Input (Option)

Type: Voltage-free or TTL-compatible; edge-sensitive OFF-ON transition - currently selected program will run or (if currently held) resume running ON-OFF transition - currently running program will be held

Voltage-Free Operation:

Connection to contacts of

ALSO AVAILABLE...

external switch or relay; contacts open = OFF (minimum contact resistance = 5000 Ω), contacts closed = ON (maximum contact resistance = 50 Ω)

TTL Levels: ON:-0.6 to 0.8 V, OFF: 2.0 to 24 V

Maximum Input Delay (OFF-ON): 1 second

Minimum Input Delay (ON-OFF): 1 second

Outputs

Types Available: Relay, dc pulse, ac SSR, and analog

Relay

Contact Type: Single pole double throw (SPDT) mechanical relay

Rating:

2 A resistive at 120/240 Vac

Lifetime: >500,000 operations at rated voltage/current

Isolation: Inherent

dc Pulse

Drive Capability: >4.2 dc into 1 kΩ minimum

Isolation: Not isolated from input or other dc pulse outputs

ac SSR

Operating Voltage Range: 20-280 Vrms (47-63 Hz)

Current Rating: 0.01-1 A (full cycle rms on-state @ 25°C); derates linearly above 40°C to 0.5 A @ 80°C

Max. Non-Repetitive Surge

Current: (16.6 ms): 25 A peak

Min OFF-State @ Rated Voltage: 500 V/μs

Max. OFF-State Leakage @ Rated Voltage: 1 mA rms

Max. OFF-State Voltage Drop @

Rated Current: 1.5 V peak

Repetitive Peak OFF-State Voltage, Vdrm: 600 V minimum

Analog

Resolution: Eight bits in 250 ms (10 bits in 1 second typical, > 10 bits in >1 second typical)

Update Rate: Every contact algorithm execution.

Ranges: 0 to 20 mA, 4 to 20 mA, 0 to 10 V, 0 to 5 V

Load Impedance: 0 to 20 mA: 500 Ω maximum; 4 to 20 mA: 500 Ω maximum; 0 to 10 V: 500 Ω minimum; 0 to 5 V: 500 Ω minimum

Isolation: Isolated from all other inputs and outputs

Range Selection Method: Link jumper or DIP switch and front panel code

Control Characteristics Loop Control

Automatic Tuning Types:

Pre-tune

Proportional Bands: 0 (OFF), 0.5%-999.9% of input span

at 0.1% increments

Reset (Integral

Time Constant): 1 s-99 min 59 s and OFF

Rate (Derivative

Time Constant): 0 (OFF)-99 min 59 s

Manual Reset (Bias):

Added each control algorithm execution. Adjustable in the range 0-100% of output power (single output) or -100% to 100% of output power (dual output)

Deadband/Overlap:

-20 to +20% of Proportional Band 1 + Proportional Band 2.

ON/OFF Differential:

0.1 to 10% of input span

Auto/Manual Control:

User-selectable with "bumpless" transfer into and out of Manual Control

Cycle Times: Selectable from ½ to 512 secs in binary steps

Setpoint Range: Limited by range maximum and range minimum

Performance

Reference Conditions Generally as EN60546-1

Ambient Temperature: 20°C ±2°C (68°F ±3.6°F)

Relative Humidity: 60-70%

Input Types and Ranges

Input Type	Range	
J Iron-Constantan	32 to 842°F	0 to 450°C
	32 to 1402°F	0 to 761°C
	32.0 to 401.7°F	0.0 to 205.4°C
K CHROMEGA®-ALOMEGA®	-328 to 1400°F	-200 to 760°C
	-328 to 2503°F	-200 to 1373°C
T Copper Constantan	-328 to 504°F	-200 to 262°C
	32.0 to 501.1°F	0.0 to 260.6°C
L Iron-Constantan (J DIN)	32 to 842°F	0 to 450°C
	32 to 1404°F	0 to 762°C
	32.0 to 402.3°F	0.0 to 205.7°C
R Pt-13%Rh/Pt	32 to 3002°F	0 to 1650°C
S Pt-10%Rh/Pt	32 to 3000°F	0 to 1649°C
B Pt-30%Rh/Pt-6%Rh	212 to 3315°F	100 to 1824°C
RTD Pt, 385 100 Ω	-149.8 to 999.1°F	-101.0 to 537.3°C
Process Voltage	0 to 50 mV, 10 to 50 mV, 0 to 5 V, 1 to 5 V, 0 to 10 V, 1 to 10 V, 2 to 10 V	
Process Current	0 to 20 mA, 4 to 20 mA	



Companion Profile Controller, CN1462 Series ¼ DIN available in this section.

Supply Voltage: 90-264 Vac 50/60 Hz (1%)

Source Resistance: <10 Ω for thermocouple input

Lead Resistance: <0.1 Ω/lead balanced (PT100)

Operating Conditions

Ambient Temperature (Operating): 0 to 55°C (32 to 131°F)

Ambient Temperature (Storage): -20 to 80°C (-4 to 176°F)

Relative Humidity:

20 to 95% non-condensing

Supply Voltage: 90-264 Vac 50/60 Hz (standard) 20-50 Vac 50/60 Hz or 22-65 Vdc (option)

Source Resistance: 1000 Ω maximum (thermocouple)

ALSO AVAILABLE...



Companion Limit Controller:
Model CN1602, 1/6 DIN Universal
 Temp/Process Limit Controller,
 available in this section.

Lead Resistance: 50 Ω per lead
 maximum balanced
 (Pt100)**Performance Under
 Operating Conditions**

Temperature Stability: 0.01% of
 span/°C change in ambient
 temperature

**Cold Junction Compensation
 (Thermocouple Only):**

Better than ±1°C

Supply Voltage Influence:
 Negligible

Sensor Resistance Influence:
 Thermocouple 100 Ω: <0.1% of
 span error; Thermocouple 1000 Ω:
 <0.5% of span error; RTD Pt100,
 50 Ω/lead: <0.5% of span error

Environmental

EMI Susceptibility: Certified
 to EN50082-1:1992 and
 EN50082-2:1995. **Note:** For line-
 conducted disturbances induced by
 RF fields (10 V 80% AM 1 kHz), the
 product is self-recoverable in the
 frequency bands 17 to 47 MHz and
 68 to 80 MHz

EMI Emissions: Certified to
 EN50081-1:1992 and
 EN50081-2:1994

Safety Considerations:
 Complies with EN61010-1:1993

Power Consumption:
 4 watts approx.

Front Panel Sealing:
 To IP66 (NEMA-4)

Physical

Dimensions: 48 mm (1.89")
 square, 110 mm (4.33") depth

Front Panel:

48 x 48 mm H (1.9 x 1.9")

Panel Cutout:

1/6 DIN, 45 mm (1.77") square

Mounting: Plug-in with panel
 mounting fixing strap, Panel cut-out
 45 x 45 mm (1.9 x 1.9")

Terminals:

Screw type (combination head)

Weight: 0.21 kg maximum (0.46 lb)

IN STOCK FOR FAST DELIVERY!

To Order (Specify Model No.)

Model Number	Price	Description
CN1166-R1	\$240	Single relay output
CN1166-DC1	240	Single dc pulse output
CN1166-T1	240	Single ac SSR output
CN1166-F1	270	Single analog output

OMEGACARESM extended warranty program is available for models shown on this page. Ask your sales representative for full details when placing an order.

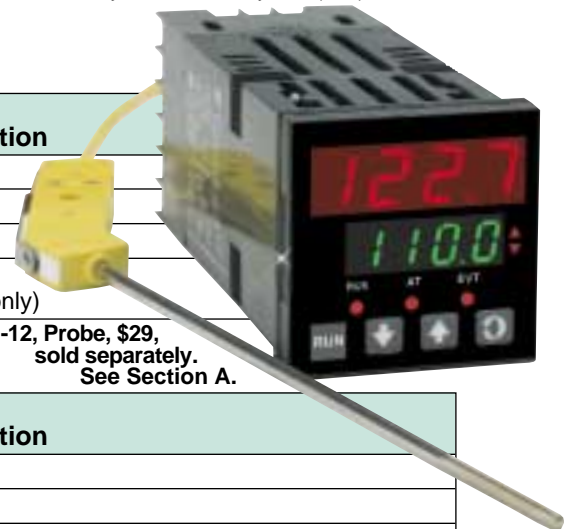
Ordering Example: CN1166-R1-F3, 1/6 DIN profile controller with single relay output and analog retransmission output, \$240 + 47 = \$287

OCW-1 OMEGACARESM extends standard 3-year warranty to a total of 4-years (\$28), \$287 + 28 = \$315

Second Output Options

Output No. 2 Suffix	Price	Description
-R2	\$26	Relay
-DC2	26	dc pulse
-T2	26	ac SSR
-F2	47	analog (control only)

GKQSS-316G-12, Probe, \$29,
 sold separately.
 See Section A.



Third Output Options

Output No. 3 Suffix	Price	Description
-R3	\$26	Relay
-DC3	26	dc pulse
-T3	26	ac SSR
-F3	47	Analog retransmission

Optional Power Supply

Ordering Suffix	Price	Description
-LV	\$15	20 to 50 Vac/22 to 65 Vdc

Additional Options (Only 1 option available per unit)

Ordering Suffix	Price	Description
-C4	\$62	RS-485 communications
-RRH	26	Remote run/hold

Optional Plug-In Boards and Accessories (Field Installable)

Model Number	Price	Description
BD1600-R*	\$26	2 A relay output
BD1600-DC*	26	dc pulse output
BD1600-T*	26	ac SSR output
BD1600-F*	47	Analog output
BD1600-TPS*	60	Transmitter power supply (24 Vdc)
BD1600-C4	62	RS-485 communications
BD1600-SOFT**	105	Software & cable for the configuration port

*BD1600 modules are for Outputs 2 and 3 only. Output one is built-in.

** For configuration only, not used with RS-485 communications





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