1/16 DIN Autotune Controller

CN76000 Series

1 YEAR WARRANTY

- Dual 4-Digit Display
- Autotune PID, PID, or On/Off Control
- Thermocouple Input with 1° or 0.1° Resolution
- RTD Input with 1° or 0.1° Resolution
- Scalable Voltage and Current Inputs
- Displays in °F, °C, or Engineering Units
- Password Protection
- Front-Panel Programming
- Relay, DC Pulse, AC SSR, Voltage, or Current Output(s)

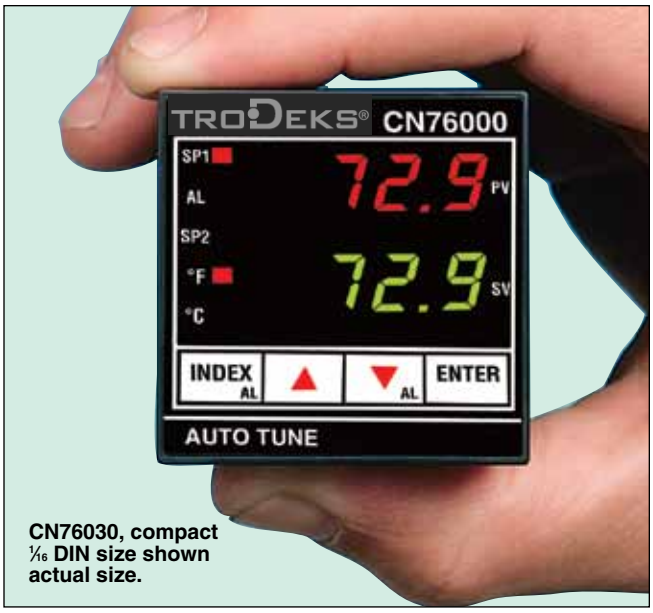
Optional Features

- Analog Process or RS485 Digital Output
- Tracking/Non-Tracking Alarms

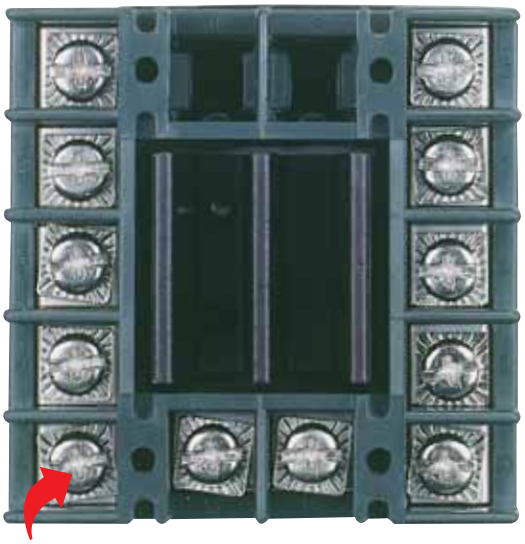
Additional Features

- Loop Break Protection
- Min/Max Indication
- Auto/Manual Operation
- Percent Output Indication
- Single-Segment Ramp and Soak

Compact, 1/16 DIN Size, with NEMA 2, 3R, and 12 Rated Front Panel.



CN76030, compact 1/16 DIN size shown actual size.



Convenient screw terminal connections.

The CN76000 1/16 DIN controllers provide economical control for a wide variety of processes, including heating, cooling, and heat/cool. When used with the proper transmitters, these devices can also control pressure, flow, humidity, motion, or pH. The front panel is NEMA 2, 3R, and 12 rated for waterproof protection and is corrosion resistant.

The sophisticated design of the CN76000 incorporates the latest microprocessor and surface mount technology, compressing an unprecedented number of standard features into a compact 1/16 DIN package. The user can program control functions from the front panel; input types are DIP switch selectable. Multiple tuning modes allow the user to select from 3 standard tuning presets, manual tuning, or autotuning.

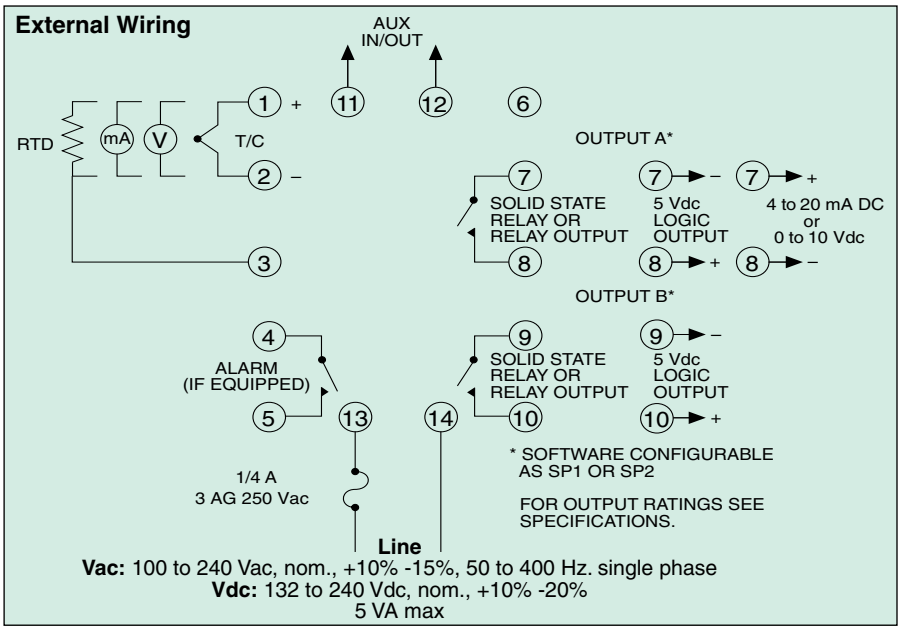
Standard features include self-diagnosis with fault indication. Non-volatile memory retains all process parameters when power is off, without battery backup. Settings for the optional alarm are configurable. The alarm action may be defeated on startup, or until the process value exceeds the alarm setpoint. The power interrupt feature will reset on power-up if the alarm condition no longer exists.

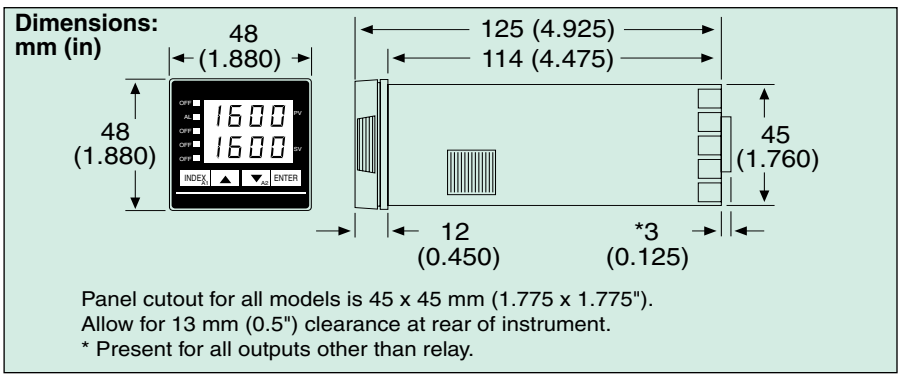
Other standard features include min/max storage and display, auto/manual control, percent output indication, ramp and soak operation, 4 user-selectable security levels with password protection, and jumper-selected 5 Vdc pulse output to drive external solid state relays. Optional features include RS485 communications, process recorder output, and 4-stage setpoint.

Specifications

Inputs: Thermocouple, RTD, voltage or current; see input chart for ranges
Resolution: See range chart; voltage and current input models are fully field scalable to engineering units with up to 2 decimal places
Accuracy: ±0.25% span ±1 digit
Input Impedance: 3 MΩ min, thermocouple; 200 µA, RTD current; 249 Ω, current; 5 kΩ, voltage
Sensor Break Protection: De-energizes control outputs to protect system
Loop Break Protection: Error message is initiated on shorted sensor or open heater circuit; break time adjustable from off to 99 minutes
Loop Break Alarm: On alarm relay equipped units, unit can be programmed to alarm on loop break
Setpoint Range: Selectable
Displays: Dual 4-digit, 7-segment LED, 7.6 mm (0.3") high; process variable in red, setpoint in green
Control Action: Reverse (heat) or direct (cool) action; selectable for single or dual setpoint models
Control Modes: Time-proportioning and proportional control modes; selectable preset tune, autotune or manual PID, P, PI or PD with reset anti-windup
Proportional Band: 6 to 5000°F or equivalent °C units; 6 to 9990 for voltage/current inputs
Integral Time: 0.1 to 99.9 minutes, or off
Derivative Time: 0.01 to 99.99 minutes, or off
Cycle Time: 2 to 80 s
Approach Rate: Off to 99.99 min
On-Off Control: Adjustable on-off differential 2° to full scale in 1° steps, 2 counts to full scale in 1-count steps (voltage/current inputs)
Ramp and Soak: One ramp time and soak time each adjustable from 0 to 100 hours; end procedure can be set for HOLD or OFF
Power:
- **Vac:** 100 to 240 Vac, nom., +10% -15%, 50 to 400 Hz. single phase
- **Vdc:** 132 to 240 Vdc, nom., +10% -20%

Power Consumption: 5 VA maximum
Line Voltage Stability: ±0.05% over supply voltage range
Temperature Stability: 4 µV/°C (2.3 µV/°F) typical, 8 µV/°C (4.5 µV/°F) maximum





Common-Mode Rejection: 140 dB minimum at 60 Hz
Normal-Mode Rejection: 65 dB typical, 60 dB at 60 Hz
Isolation: Relay and SSR outputs are isolated; current, voltage and logic outputs must not share common grounds with the input
Memory: Non-volatile; no batteries required
Mechanical Relay Output: SPST (form A), 3 A @ 250 Vac, resistive; 1.5 A @ 250 Vac, inductive; 250 VA pilot duty rating, 2 A @ 125 Vac or 1 A @ 250 Vac, ⅛ hp @ 125 Vac or 250 Vac
Solid State Relay Output: 3.5 A up to 240 Vac at 25°C (77°F); derates to 1.25 A @ 55°C (131°F)
Voltage Output: Non-isolated; 0 to 10 Vdc, 500 Ω minimum
Current Output: Non-isolated; 0 to 20 mA, 600 Ω maximum; zero and span adjustable
DC Pulse Output: Non-isolated; 5 Vdc @ 25 mA
Operating Ambient: -10 to 55°C (-4 to 131°F); 0 to 90% RH up to 40°C (104°F), non-condensing; 10 to 50% at 55°C (131°F), non-condensing
Storage Ambient: -40 to 80°C (-40 to 175°F)
Alarms: 2 alarms operate the same relay; 3.0 A resistive 250 Vac; form A contact (SPST); field programmable for absolute (non-tracking) or deviation (tracking); can be set anywhere within the scaling of the controller; selectable inhibit and power interrupt; automatic/manual reset
Process Signal Output (Optional): Linearized, non-isolated 0 to 10 Vdc @ 5 mA; user-selectable scale positioning of zero and full scale; scaling span is 50 to 11,998 counts
RS485 Communications (Optional): Unit with RS485 compatible communications (no CE rating for RS485 option)
Dimensions: 48 H x 48 W x 125 mm D (1.88 x 1.88 x 4.925"); 115.3 mm (4.54") depth behind panel
Panel Cutout: 45 mm (1.775") square; 1/16 DIN
Weight: 227 g (8 oz)
Front-Panel Ratings: NEMA 2, 3R and 12; dust and splash resistant

Input Types and Ranges

Input Type		Range	Resolution	Range	Resolution
J DIN	Iron-constantan	-100 to 1600°F -100 to 990°F	1°F 0.1°F	-73 to 87°C -73 to 871°C	1°C 0.1°C
J	Iron-constantan DIN	-100 to 1600°F -100 to 990°F	1°F 0.1°F	-73 to 87°C -73 to 871°C	1°C 0.1°C
K	CHRTRODEKS ®-ALTRODEKS®	-200 to 2500°F -190 to 990°F	1°F 0.1°F	-129 to 137°C -129 to 990°C	1°C 0.1°C
E	CHRTRODEKS ®-constantan	-100 to 1800°F -100 to 990°F	1°F 0.1°F	-73 to 982°C -73 to 990°C	1°C 0.1°C
T	Copper-constantan	-350 to 750°F -190 to 750°F	1°F 0.1°F	-212 to 398°C -212 to 398°C	1°C 0.1°C
R	TRODEKSLLOY ® nicrosil-nisil	-100 to 2372°F -100 to 990°F	1°F 0.1°F	-73 to 1300°C -73 to 990°C	1°C 0.1°C
N*	Pt/13%Rh-Pt	0 to 3200°F	1°F	-17 to 1760°C	1°C
C*	Pt/10%Rh-Pt	0 to 3200°F	1°F	-17 to 1760°C	1°C
S	Pt/6%Rh-Pt/30%Rh	75 to 3308°F	1°F	24 to 1820°C	1°C
B	W/5%Re-W/26%Re	0 to 4208°F	1°F	-17 to 2320°C	1°C
RTD	100 Ω Pt 0 0385 curve	-328 to 1607°F -190 to 990°F	1°F 0.1°F	-200 to 875°C -190 to 875°C	1°C 0.1°C
RTD	100 Ω Pt 0 0392 curve	-328 to 1607°F -190 to 990°F	1°F 0.1°F	-200 to 875°C -190 to 875°C	1°C 0.1°C
RTD	120 Ω Ni	-112 to 608°F -112 to 608°F	1°F 0.1°F	-80 to 320°C -80 to 320°C	1°C 0.1°C
Process Current		0 to 20 mA, 4 to 20 mA†			
Process Voltage		0 to 5 Vdc, 1 to 5 Vdc†			

† Voltage and current inputs are fully scalable for zero and span.
Maximum setting range is -1999 to 9999 counts.

Options

Ordering Suffix	Description
-PV	Scalable recorder; output 0 to 10 Vdc
-485A**	RS485 communications

***Note:** Only 1 option may be installed in a unit.*
*** No CE rating for -485A option.*

To Order

Single Output Models

Model No.	Output
CN76(*)30	Relay/DC Pulse††
CN76(*)20	DC pulse/AC SSR††
CN76(*)50	0 to 20 mA
CN76(*)60	0 to 10 Vdc

Comes complete with mounting bracket and operator's manual.
** Specify 0 for standard unit, 1 for alarm unit; for alarms, for an additional cost.*
†† These outputs are logic jumper selectable between relay and DC pulse, or between DC pulse and AC SSR.
***Ordering Example: CN76030-485A,** CN76000 controller with single relay/DC pulse output and optional RS485 communications.*

Dual Output Models

Model No.	Output 1	Output 2
CN76(*)33	Relay/DC pulse††	Relay/DC pulse††
CN76(*)22	DC pulse/AC SSR††	DC pulse/AC SSR††
CN76(*)53	0 to 20 mA	Relay/pulse††
CN76(*)63	0 to 10 Vdc	Relay/DC pulse††

** Specify 0 for standard unit, 1 for alarm unit; for alarms, for an additional cost.*
†† These outputs are logic jumper selectable between relay and DC pulse, or between DC pulse and AC SSR.
***Ordering Example: CN76133-485,** CN76000 controller with dual relay/DC pulse outputs, alarms and optional RS485 communications.*

Accessories

Model No.	Description
DPP-4	1/16 DIN panel punch
CNQUENCHARC	Noise suppression kit for mechanical relay models driving AC contactors or solenoids