

Cryogenic Autotune Temperature Controllers



CYC324-03 shown smaller than actual size.

CYC320 Series



- ✓ Autotune PID
- ✓ For Temperature Control from 1.4 to 800 K
- ✓ Electronic Accuracy and Control Stability to $\pm 0.1^{\circ}\text{C}$
- ✓ Autotuning PID Parameters Automatically Determined
- ✓ Manual Tuning of PID Parameters via Front Panel
- ✓ Silicon Diode, 100 Ω Pt RTD, or Thermocouple Input
- ✓ Ability to Store One User Defined Calibration Curve
- ✓ RS232C Communications Standard
- ✓ 25 Watt DC Heater Output
- ✓ Small Rack Mount Package
- ✓ Isolated Current Source Allows True 4-Wire Sensor Readings For High Instrument Accuracy

The CYC320 Series cryogenic temperature controllers offer a simple, low cost answer to basic low temperature control needs. They incorporate a scroll type entry so that setup can easily be accomplished from the front keypad. Three models are available to accommodate either silicone diode, RTD or thermocouple input. The operator can also enter a user-defined curve, for a custom sensor. This curve can have up to 97 points plus two end points. The curve values are entered over the standard RS232 interface.

A cryogenic system is a complex arrangement of thermal resistances and heat capacities which are represented by thermal mass and time constants.

The CYC320 Series analyzes this system's operating parameters on-line. The autotune feature increases the user's efficiency by automatically calculating the correct proportional (gain), integral (reset) and derivative (rate) control parameters within minutes. Once set, the PID values are only modified when the system characteristics change. Time spent adjusting or fine-tuning the controller is eliminated, leaving the user with more time to experiment with something other than controller settings! Heater output of the CYC230 Series is a variable dc current for quiet, stable control.



CYC321-01 rear panel.

CYC320-HTR cartridge heater.

Specifications

CYC321: Silicon diode, 1.4 K to 475 K

CYC322: 100 Ω platinum RTD, 30 K to 800 K

CYC324: Ch-AuFe (0.07%) thermocouple, 4 K to 325 K

Type E: 40 K to 425 K

Type K: 90 K to 325 K

Type T: 90 K to 485 K

Curve Storage: Memory space for one 99 point user defined curve

Display: 8 digit alphanumeric LED display

Resolution: 0.1 (K or °C)

Instrument Accuracy

(When Used With):

Silicon Diode: ±0.2 mV
±0.02% rdg

100 Ω RTD: ±20 mV ±0.05% rdg

Thermocouple: ±2 μV
±0.05% rdg

System Accuracy: Instrument accuracy plus sensor accuracy; ranges from 0.1 K at 4.2 K to 0.6 K at 800 K

Repeatability: ±0.1 (K or °C) or better (dependent on sensor sensitivity)

TEMPERATURE CONTROL CHARACTERISTICS

Setpoint Resolution: 0.1 (K or °C)

Control Stability:

Better than ±0.1 K in a properly designed system

Automatic Control Modes:

P, PI, or PID control user selectable

Manual Control Modes:

Proportional (Gain) 0 to 999;
Integral (Reset) 1 to 999 second;
Derivative (Rate) 0 to 50% of Integral Time

Heater Output: 25 Watts/1 A at 25 V compliance

Heater Load: 25 Ω or greater, automatic shutoff if load <20 Ω

GENERAL

Communications: RS232C

3-wire, half-duplex, asynchronous transmission at 300 or 1200 baud; RJ-11 modular socket; user may input setpoint, heater on/off, curve data; output data includes temperature, setpoint, heater %, external curve

Response Time: 1 second electronic data update rate (typical)

Power: 110 or 220 Vac selectable, 65 VA

Dimensions:

217 L x 90 W x 317 mm D (8.5 x 3.5 x 12.5")

Weight: 2.7 kg (6 lb)

CYC320-HTR

Cartridge Heater: Nickel-Chromium resistance wire with MgO insulation, 2 solid pins



OMEGACARESM extended warranty program is available for models shown on this page. Ask your sales representative for full details when placing an order. OMEGACARESM covers parts, labor and equivalent loaners.

AVAILABLE FOR FAST DELIVERY!

To Order

Model No.	Input Type
CYC324-03	Thermocouple controller

Comes complete with sensor input connector power cord, double banana plug for heater output and operator's manual.

Note: Units are calibrated at no additional cost.

Ordering Example: CYC324-03, silicone diode controller, CYC320-SHC, heater cable assembly, CY7-SD7, silicon sensor.

OCW-3, OMEGACARESM extends the standard 1-year warranty to a total of 4 years.

Accessories

Model No.	Description
CYC320-SHC	Cable assembly for CYC321 and CYC322
CYC320-HTR	Cartridge heater, 25 W
CYD200-C	RJ11 jack and 3 m (10') of cable, RS232 adaptor
CYD200-D	RJ11 to DB25 adaptor, connects RJ11 to 25-pin RS232 serial port
CYD200-DB9	RJ11 to DB9 adaptor, connects RJ11 to 9-pin RS232 serial port

For information on precision calibration option yielding highest readout accuracy, please contact our Cryogenic Applications Engineers.