Dual Channel Autotune Temperature Controllers

CYC325-T1 shown smaller than actual size.

CYC325 Series

1 YEAR WARRANTY · MADE IN USA · CE

- **Operates Down to 1.2 K with Appropriate Sensors**
- **2 Sensor Inputs**
- **Supports Diode, RTD, and Thermocouple Sensors**
- **Sensor Excitation (Current Reversal Eliminates Thermal EMF Errors for Resistance Sensors)**
- **2 Autotuning Control Loops: 25 and 2 W Max**
- **Control Loop 2: Variable Vdc source from 0 to 10 V Max**
- **IEEE-488 and RS232C Interfaces**

The CY325 Series dual-channel temperature controller is capable of supporting nearly any diode, RTD, or thermocouple temperature sensor. Two independent PID control loops with heater outputs of 25 and 2 W are configured to drive either a 50 or 25 Ω load for optimal control flexibility. Designed with ease of use, functionality, and value in mind, the CYC325 Series is ideal for general-purpose laboratory and industrial temperature measurement and control applications.

Specifications

Thermometry

Number of Inputs: 2

Input Configuration: Each input is factory configured for either diode/RTD or thermocouple

Isolation: Sensor inputs optically isolated from other circuits but not each other

A/D Resolution: 24-bit

Input Accuracy: Sensor dependent, refer to input specifications table

Measurement Resolution: Sensor dependent, refer to input specifications table

Max Update Rate: 10 rdg/s on each input (except 5 rdg/s on input A when configured as thermocouple)

Filter: Averages 2 to 64 input readings

Sensor Input Configuration Diode/RTD:
Measurement Type: 4-lead differential
Excitation: Constant current with current reversal for RTDs
Supported Sensors: Diodes, silicon, GaAlAs; RTDs, 100 Ω Platinum, 1000 Ω Platinum, germanium, carbon-glass, Cernox™, and Rox™
Standard Curves: CY7 and CY670, PT-100, PT-1000, RX-102A, RX-202A
Input Connector: 6-pin DIN

Thermocouple:
Measurement: 2-lead, room temperature, compensated
Excitation: N/A
Supported Sensors: Most thermocouple types
Standard Curves: Type E, Type K, Type T, AuFe 0.07% vs Cr, AuFe 0.03% vs Cr
Input Connector: Ceramic isothermal block

Control

Control Loops: 2

Control Type: Closed loop digital PID with manual heater output or open loop

Tuning: Autotune (1 loop at a time), PID, PID zones

Control Stability: Sensor dependent, see input specification table

PID Control Settings:

Proportional (Gain): 0 to 1000 with 0.1 setting resolution
Integral (Reset): 1 to 1000 (1000/s) with 0.1 setting resolution
Derivative (Rate): 1 to 200% with 1% resolution

Manual Output: 0 to 100% with 0.01% setting resolution

Zone Control: 10 temperature zones with P, I, D, manual heater out, and heater range

Setpoint Ramping: 0.1 K/min to 100 K/min

Safety Limits: Curve temperature, power up heater off, short circuit protection

Front Panel:

Display: 2-line, 20-character, liquid crystal display with 5.5 mm (0.216") character height
Number of Reading Displays: 1 to 4
Display Units: K, °C, V, mV,

Reading Source: Temperature, sensor units

Display Update Rate: 2 rdg/s
Temp Display Resolution: 0.001° from 0 to 99.999°, 0.01° from 100 to 999.99°, 0.1° above 1000°
Sensor Units Display Resolution: Sensor dependent; to 5 digits
Other Displays: Setpoint, heater range, and heater output; user selected

Setpoint Setting Resolution: Same as display resolution (actual resolution is sensor dependent)

Heater Output Display: Numeric display in percent of full scale for power or current

Heater Output Resolution: 1%

Display Annunciators: Control input, remote, autotune

Keypad: 20-key membrane, numeric and specific functions

Front Panel Features: Front panel curve entry, keypad lock-out

Interface

IEEE-488 Interface Features: SH1, AH1, T5, L4, SR1, RL1, PP0, DC1, DT0, C0, E1

Reading Rate: To 10 rdg/s on each input

Software Support: LabVIEW™ driver; consult factory for availability

Serial Interface:

Electrical Format: RS232C
Baud Rates: 9600, 19200, 38400, 57600

Connector: 9-pin D-style, DTE configuration

Reading Rate: To 10 rdg/s, each input

General

Ambient Temperature: 15 to 35°C (59 to 95°F) at rated accuracy, 5 to 40°C (41 to 104°F) at reduced accuracy

Power Requirement: Standard 120 Vac, optional 240 Vac, 6%, -10%, 50 or 60 Hz, 85 VA

Dimensions: 89 H x 216 W x 368 mm D (3.5 x 8.5 x 14.5"), half rack

Weight: 4.00 kg (8.82 lb)

Approval: CE mark

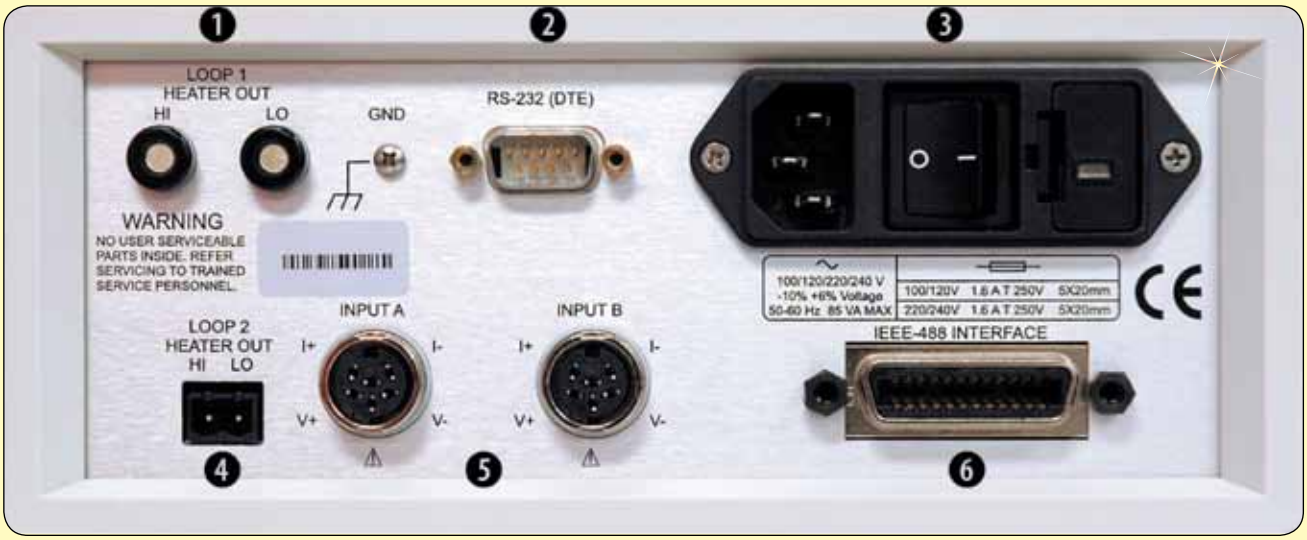
Input Specifications

	Sensor Temp Coefficient	Input Range	Excitation Current	Display Resolution	Measurement Resolution	Electronic Accuracy (at 25°C)	Electronic Control Stability[1]
Diode	Negative	0 to 2.5 V	10 µA ±0.05%[2,3]	100 µV	0.4 µV	±80 µV ±0.005% of rdg	±20 µV
Diode	Negative	0 to 7.5 V	10 µA ±0.05%[2,3]	100 µV	10 µV	±80 µV ±0.001% of rdg	±40 µV
PTC RTD	Positive	0 to 500ø	1 mA[4]	10 mø	2 mø	±0.004ø ±0.01% of rdg	±4 mø
PTC RTD	Positive	0 to 5000ø	1 mA[4]	100 mø	20 mø	±0.004ø ±0.02% of rdg	±40 mø
NTC RTD	Negative	0 to 7500ø	10 µA ±0.05%	100 mø	40 mø	±0.1ø ±0.04% of rdg	±80 mø
Thermocouple	Positive	±25 mV	N/A	1 µV	0.4 µV	±1 µV ±0.05% of rdg[5]	±0.8 µV
Thermocouple	Positive	±50 mV	NA	1 µV	20 µV	±1 µV ±0.05% of rdg[5]	±0.8 µV

ø = diameter

1 *Control stability of the electronics only, in ideal thermal system*
2 *Current source error has negligible effect on measurement accuracy*
3 *Diode input excitation can be set to 1 mA*
4 *Current source error is removed during calibration*
5 *Accuracy specification does not include errors from room temperature compensation*

CYC325-T1 rear view shown smaller than actual size.



1 Loop 1 heater output
2 Serial (RS232C) I/O (DTE)
3 Line input assembly
4 Loop 2 heater output
5 Sensor input connectors
6 IEEE-488 interface

To Order

Model No.	Description
CYC325	2 diode/RTD inputs
CYC325-T1	1 diode/RTD, 1 thermocouple input
CYC325-T2	2 thermocouple inputs

Accessories

Model No.	Description
CYC-6201	1 m (3.3' long) IEEE-488 (GPIB) computer interface cable assembly
CYC-CAL-325-CERT	Instrument recalibration with certificate, no points
CYC-CAL-325-DATA	Instrument recalibration with certificate and data
CYC-RM-1/2	Rack mount kit for mounting one ½ rack temperature controller in 482.60 mm (19") rack, 90 mm (3.5") high
CYC-RM-2	Rack mount kit for mounting two ½ rack temperature controllers in 482.60 mm (19") rack, 135 mm (5.25") high
CYC-106-009	Heater output connector, dual banana jack
CYC-106-233	6-pin male input connector
CYC-106-735	Terminal block, 2-pin
MA-2001	Reference Book: Semiconductor-Laser Physics

Comes complete with heater output connector (dual banana jack), sensor input mating connector (6-pin DIN plugs), terminal block (2-pin), power cord and operator's manual.

*Add suffix **"-240"** for 240 Vac power supply, no additional cost.*

***Ordering Example: CYC325,** 2 inputs silicon diode/RTD controller.*