Temperature Controller

FEATURES
Sub-panel mounted
Direct digital temperature set
Set in 0.1°C increments
Output to drive external triacs or contactors
Proportional control
Linearized output to drive external meters

GENERAL DESCRIPTION
The Model 28-03-02 temperature controller is a sub-panel mounted unit that operates with thermistor sensors. The unit features a remote 3-digit switch assembly that allows the operator to directly dial the desired temperature in 0.1°C increments throughout the calibrated range of -20.0 to +69.9°C or 0 to 69.9°C. The proportional controller provides a fixed proportional band, fixed cycle time and a linearized 100 mv per degree output signal to drive external digital meters. The unit also has a zero switching output to fire external triacs or solid state contactors such as the Model 53-00-12.

SPECIFICATIONS:

OUTPUT:
Opto-coupled zero switch module output to fire external triac.

LINE VOLTAGE: 120 VAC ± 10%, 50/60 Hz.

POWER CONSUMPTION: 5 VA (controller only).

OPERATING AMBIENT: 30 to 130°F.

CONTROL ACCURACY:
Typically ± 0.5°C, depending on design of thermal system.

INDICATION OUTPUT:
Linearized -2.00 to +6.00 V, corresponding to -20.0 to +60.0°C.
100 mv/°C linear to ± 50 mv (± 0.5°C).

SET POINT ADJUSTMENT:
3-digit set in 0.1°C increments (10K total resistance).

TEMPERATURE RANGE: -20 to +69.9°C, 0 to 69.9°C.

PROPORTIONAL BAND: Fixed, 1°C maximum.

CYCLE TIME: Fixed, 2.5 seconds, nominal.

SET POINT SHIFT W/AMBIENT:
± 0.005°C drift/°C change in ambient temperature.

SET POINT SHIFT W/LINE VOLTAGE
± 0.005°C maximum set point shift for ± 10% change in line voltage.

ISOLATION:
Sensor and control circuitry are isolated from line and load.

SENSOR: Thermistor.
TEMPERATURE RANGE
0 to 69.9°C
-20 to +69.9°C

SET POINT ASSEMBLY NUMBER
A006-196
A006-185

ORDERING INFORMATION
Specify model number, temperature range, set point assembly number and sensor.
Model 28-03-02

THERMISTOR 800-011
THERMISTOR TEMPERATURE CONTROL

7-13-81

See Page 2 for Specifications.

See Page 3 for External Wiring Diagram.
SPECIFICATIONS:

LINE VOLTAGE: 115 VAC ± 10%, 50/60 Hz.

POWER REQUIREMENT: 5 VA.

CONTROL: Time Proportioning.

PROP. BAND: 1°C Maximum.

OUTPUT: Zero crossing opto-isolator to fire external triac.

CYCLE TIME: 2.5 Sec. Nominal.

SENSOR: 1K thermistor.

TEMPERATURE RANGE: -20.0°C to 69.9°C.

SET POINT: 3 digit digital set in .1°C increments.

ACCURACY: ± .5°C from -20.0 to +60.0°C. ± 1°C from -20.0 to +69.9°C.
At 50% Duty Cycle.

AMBIENT TEMPERATURE RANGE: +50°F to +125°F.

AMBIENT TEMPERATURE EFFECTS: ± .005°C drift/°C change in ambient.

LINE VOLTAGE EFFECTS: ± .005°C maximum set point shift for ± 10% change in line voltage.

INDICATION OUTPUT: -2.00V to +6.00V corresponding to -20°C to +60°C.
100MV/°C linear to ± .5°C (+ 50MV)
EXTERNAL WIRING DIAGRAM

DATA SHEET
MODEL 28-03-03

7-13-81
BI-POLAR

DIGITAL SWITCH ASSEMBLY

LOAD

KAX FUSE (Sized for Triac)

WHT

BLK

RED

OPTIONAL METER

Thermistor Sensor

L1
120V A.C.

L2
COM.

100 Ω

Triac (Sized for Load)

28-03-03
TEMPERATURE CONTROL

WATLOW WINONA, INC.
EXTERNAL WIRING DIAGRAM

DATA SHEET
MODEL 28-03-03

7-13-81
UNI-POLAR
DIGITAL
SWITCH
ASSEMBLY

LOAD
KAX
FUSE
(Sized
for
Triac)

BLK.

L1
120V A.C.

L2
COM.

100 Ω

TRIAC
(Sized
for
Load)

BLK.

RED

A
B

THERMISTOR
SENSOR

28-03-03
TEMPERATURE CONTROL

WATLOW WINONA, INC.
WINONA, MINNESOTA 55987 • 1265 EAST SANBORN STREET • PHONE 507-454-5300
SPECIFICATIONS:

OUTPUT:
(1) Optically coupled zero switching module output to drive Model 53-00-12 solid state contactor.
(2) 0 to 1 milliamp signal to drive external meter, Model 70-07-01.

LINE VOLTAGE: 120/240 VAC ± 10%, 50/60 Hz.

POWER CONSUMPTION: 4 VA (controller only).

OPERATING AMBIENT: 30 to 130°F.

CONTROL MODE:
Time proportioning with fixed cycle rate of 15 seconds.
Fixed automatic reset.
Fixed rate action.
Fixed proportional band of 15°F.

SENSOR PROTECTION:
In the event of an open sensor, load power will de-energize.

COLD JUNCTION COMPENSATION:
Automatic, thermocouple is connected directly to unit.

THERMOCOUPLE LEAD LENGTH:
An approximate error of 1°F is introduced for 60 ohms in thermocouple lead resistance.

SETPOINT POTENTIOMETER: Remote, 24" leads standard.

ISOLATION: T.C. input to load and line.
D. C. Resistance: $10^{11}$ ohms. Capacitance: 50 pf
TEMPERATURE RANGES

<table>
<thead>
<tr>
<th>RANGE</th>
<th>THERMOCOUPLE TYPE</th>
<th>SET POINT ASSEMBLY #</th>
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<tbody>
<tr>
<td>0 to 400°F</td>
<td>J</td>
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</tr>
<tr>
<td>200 to 600°F</td>
<td>J</td>
<td>A006-255</td>
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<tr>
<td>0 to 750°F</td>
<td>J</td>
<td>A006-256</td>
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<tr>
<td>300 to 900°F</td>
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<td>A006-257</td>
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<tr>
<td>0 to 2000°F</td>
<td>K</td>
<td>A006-258</td>
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</tbody>
</table>

ORDERING INFORMATION

Specify model number, temperature range, thermocouple type and set point assembly number.

Model 28-06-14