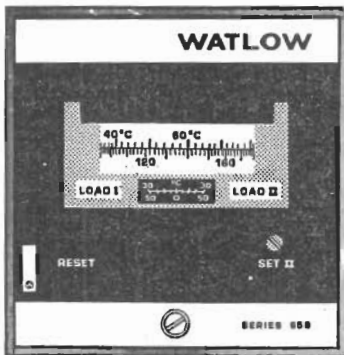


Temperature Controller



FEATURES

Plug-in Din Design
Thermocouple Sensor
Analog Indication
115/230 VAC Operation
(Field Selectable)
Dual Output
Relay or Solid State Outputs
Time Proportioning, Auto Re-
set, Rate on Primary Output
On-off Secondary Control
Load Power Indication
Control or Latched Alarm
on Secondary Output

GENERAL

Series 659 is a plug-in Din size, dual output, thermocouple, analog indicating temperature controller. The control mode for the primary output is time proportioning, auto reset, and rate; while the secondary output is on-off. Proportional band, auto reset, cycle time, and rate are internal adjustments. The plug-in design allows for easy access to the internal adjustments.

The unit is available in three standard versions including heat/heat, heat/cool, and heat with alarm output. When the secondary output is an alarm application, a front panel reset switch is present.

Outputs are dual relay or triacs. The primary set point is controlled by the drum type set pot. The secondary set point is controlled by a front panel adjustable potentiometer. Indication is a choice of two analog meters. There is a meter that is superimposed over the dial scale and reads temperature directly, or a meter which indicates a deviation from the primary set point.

L.E.D. load indicators are front panel mounted. Load 1 L.E.D. will energize when power is applied to Load 1. Load 2 L.E.D. operation is dependent upon the application.

DATA SHEET 659 SERIES



SPECIFICATIONS:

PRIMARY CONTROL MODE: 3-Mode:

- 1) Proportional Band: Internal adjustment, 10 to 100°F.
- 2) Auto Reset: Internal adjust., 0.05 to 0.5 repeats per minute.
- 3) Rate: Internal adjustment, 0 to 5 minutes.

CYCLE TIME: Internal adjust., 2 to 20 seconds.

SECONDARY CONTROL MODE: Standard control is on-off.

SENSOR: Thermocouple types "J" and "K".

OUTPUTS:

- 1) Dual relays rated 10A/120V, 5A/240V resistive, 50 V.A. inductive. Plug-in for easy replacement.
- 2) Dual solid state zero switching isolated triacs rated 1 ampere at 120/240V. Note: Load current must be 0.05 amperes minimum to insure proper triac switching.
- 3) Primary Output: Solid state zero switching isolated triac rated 15 amperes at 120/240V. Note: Load current must be 0.1 amperes minimum to insure proper triac switching.
Secondary Output: Solid state zero switching isolated triac rated 1 ampere at 120/240V. Note: Load current must be 0.05 amperes minimum to insure proper triac switching.

NO. 2 OUTPUT OPTIONS: Deviation or direct reading meter.

- 1) Control Applications. In a control application, output 2 can operate above or below the primary setpoint.
- 2) Alarm Applications. The standard model utilizes a high latched alarm with a front panel alarm reset.

INDICATION:

- 1) Direct Reading: An analog meter superimposed over the dial scale that indicates temperature directly.
- 2) Deviation: A calibrated analog meter integral to the controller that uses the set point temperature $\pm 30^{\circ}\text{C}$ or $\pm 50^{\circ}\text{F}$ to indicate process temperature.

INDICATOR LIGHTS: Load 1 L.E.D. indicates power to the load. Load 2 L.E.D. operation depends upon the application.

LINE VOLTAGE: 115/230 VAC $\pm 10\%$, 50/60 Hz.

POWER CONSUMPTION: Less than 5 V.A.

OPERATING AMBIENT: 30 to 130°F.

SET POINT SHIFT W/AMBIENT:

Typically ± 5 microvolts/°F referred to the input.

SET POINT SHIFT W/LINE VOLTAGE: A change of $\pm 10\%$ will produce a shift of less than $\pm .25\%$ of span.

CONTROL ACCURACY: Typically $\pm 1\%$ of span, depending on design of the thermal system.

T.C. BREAK PROTECTION:

Normal protection is to turn off the primary output.

ISOLATION: T.C. input to load and line.

D.C. resistance: 10^{11} ohms. Capacitance: 50 pf.

REMOTE CONTROL OR SLAVING:

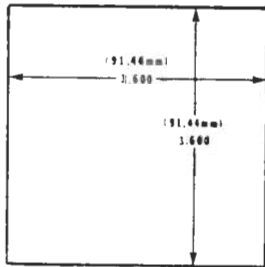
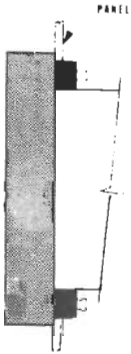
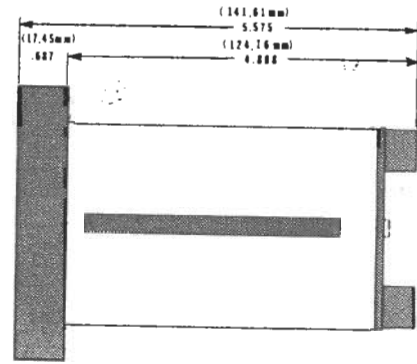
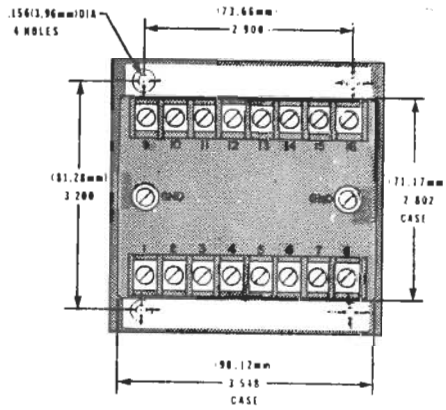
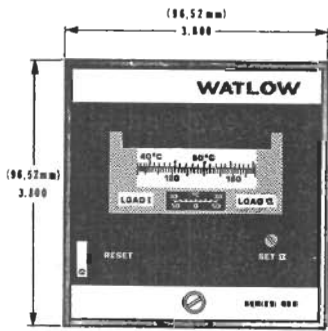
The unit has the capability of being controlled by an external source. Consult the factory for further information.

WATLOW WINONA, INC.

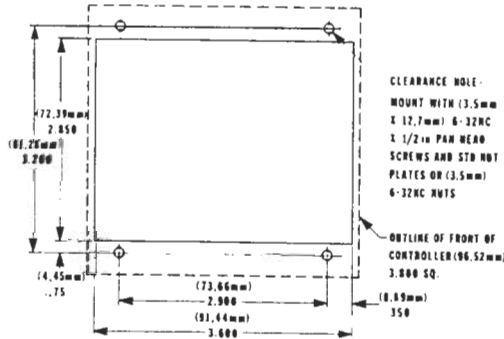
WINONA, MINNESOTA 55987

1265 EAST SANBORN STREET

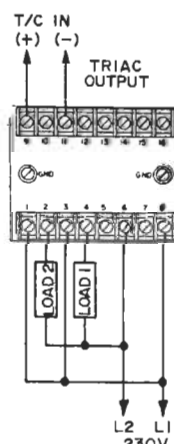
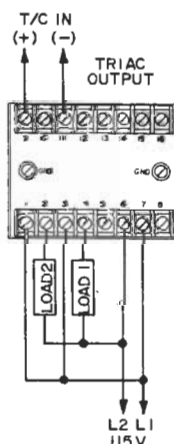
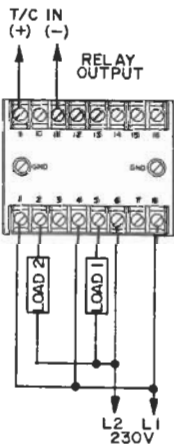
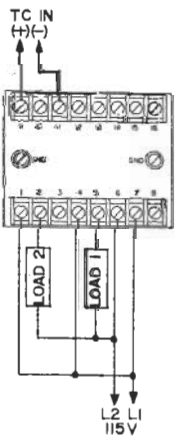
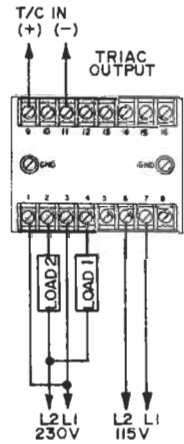
PHONE 507 454-5300



PANEL CUTOUT



ALTERNATE PANEL CUTOUT



SERIES 659
TEMPERATURE CONTROL

TERMINAL DESIGNATIONS

- T₂ N.O. SOLID STATE
- T₁ OUTPUT - LOAD #2
- T₁ N.O. SOLID STATE
- T₂ OUTPUT - LOAD #1
- DATE (EXT. TRIAC-LOAD #1)
- A.C. LINE COMMON, L2
- 120V LINE, L1
- 240V LINE, L1
- T.C. +
- NOT USED
- NOT USED
- T.C. -, RED
- NOT USED
- SET POINT + (OUT)
- PROGRAMMER + (IN)
- SIGNAL COND. + (OUT)
- CIRCUIT COMMON

MODEL: _____

RANGE: _____

T.C. TYPE: _____

WATLOW WINONA
WINONA, MINN.

SERIES 659
TEMPERATURE CONTROL

TERMINAL DESIGNATIONS

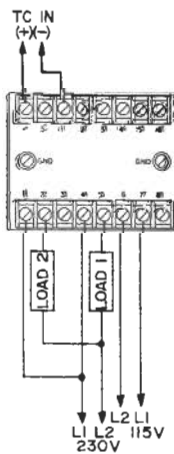
- N.O. LOAD #2-CONTACT RATED
- C. 240W MAX., SAMP. RMISE.
- N.O. LOAD #1-CONTACT RATED
- N.O. 240W MAX., SAMP. RMISE.
- C. 240W MAX., SAMP. RMISE.
- A.C. LINE COMMON, L2
- 120V LINE, L1
- 240V LINE, L1
- T.C. +
- NOT USED
- NOT USED
- T.C. -, RED
- NOT USED
- SET POINT + (OUT)
- PROGRAMMER + (IN)
- SIGNAL COND. + (OUT)
- CIRCUIT COMMON

MODEL: _____

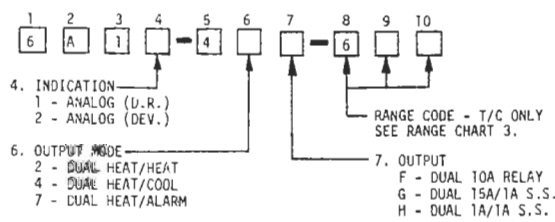
RANGE: _____

T.C. TYPE: _____

WATLOW WINONA
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ORDERING INFORMATION



NOTE: Consult factory on availability of 15A output