

## Small • Easy to Use • Reliable Temperature Control with a Timer

Watlow's popular Series 935 panel-mounted, digital indicating, temperature controller with timer is now available with a separate input for remote timer start. It also includes a single temperature sensor input from a thermocouple or RTD sensor, and dual control outputs. The outputs may operate in a variety of modes including: heat, cool, alarm and timer. The timer function operates in a choice of delay-on, delay-off, signal-on or signal-off modes.

The Series 935A offers even more flexibility with a unique remote set point input; this feature makes the 935 the building block for multi-loop control. The new Series 935B option provides a separate input to initiate timer start from a remote switch. Front panel lock capability rounds out the feature set on both versions. With both hardware and software lockouts, the Series 935 will match your security requirements without compromising usability.

### Features and Benefits

#### ½ DIN package

- Small panel footprint

#### NEMA 4X

- Water/corrosion-proof front panel

#### Easy, push-to-set key action

- Simple operation

#### Countdown timer

- Control simple event

#### Remote set point input

- Low cost temperature control for multiple zones

#### Remote timer input

- Flexibility for timing applications

#### Universal power supply

- Worldwide flexibility

#### UL®/CSA/CE approval

- Assured safety

#### ±0.25% accuracy

- Accuracy with economy

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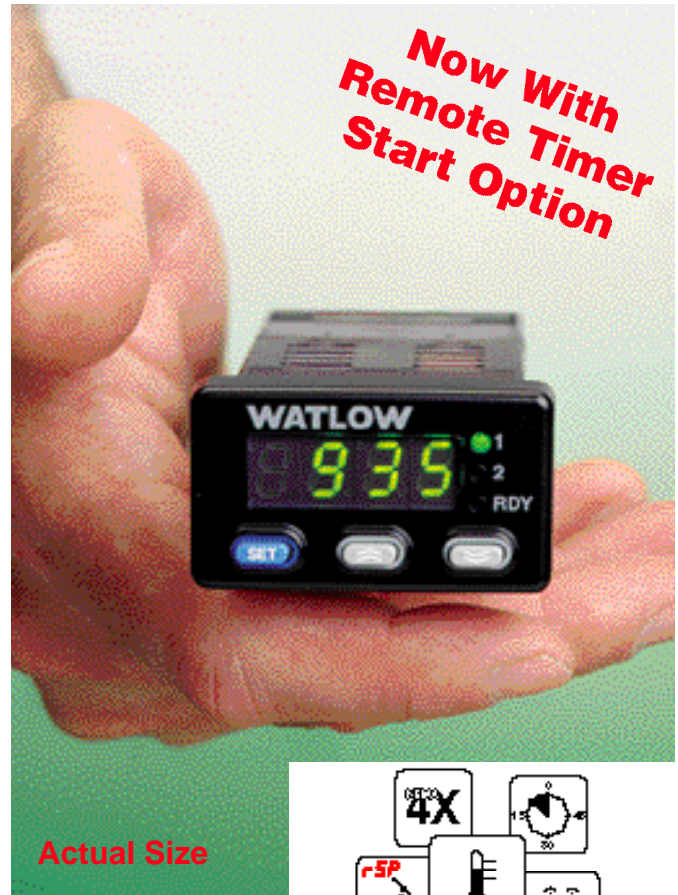
### Your Authorized Watlow Distributor Is:

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Actual Size



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WIN-935A-0702

ISO 9001



## Specifications-W935-XSPN Rev E03

### Control Mode

- Auto-tune PID, PID, PD, PI, on-off
- Countdown timer; hours:minutes, minutes:seconds
- Timer output modes; Delay-off, Delay-on, Signal-off, Signal-on

### Agency Approvals

- UL®/C-UL® 508, File #E102269
- NEMA4X<sup>®</sup> (IP65) rated front panel
- CE approved
- 89/336/EEC Electromagnetic Compatibility Directive:
  - EN 50081-2: 1994 Emissions
  - EN 50082-2: 1995 Immunity
- 73/23/EEC Low-voltage Directive:
  - EN 61010-1: 1993 Safety

### Operator Interface

- Single, seven-segment digital display, factory selectable red or green
- Outputs/operation annunciators, three discrete LEDs
- Three tactile feedback momentary switches
- Front panel lock dry contact closure disables front panel operation

### Accuracy

- $\pm 0.25\%$  of span, or
- Types S and T thermocouple @  $< 200^\circ\text{C}$ ,  $\pm 0.32\%$  of span typical

### Ambient Rejection

- $< 0.15^\circ\text{C}/^\circ\text{C}$  rise in ambient, or
- Types S and T thermocouple @  $< 0.47^\circ\text{C}/^\circ\text{C}$  rise in ambient typical

### Sensors/Inputs

- Type E, J, K, N, S and T thermocouple, grounded or ungrounded junction
- RTD, two wire 100 base (DIN) resistance
- Remote set point input, field-selectable, 0-5V $\approx$ (dc), scaleable, 10k  $\Omega$  input impedance (Remote Input Option A only)
- Remote timer start dry contact closure initiates timer start (Remote Timer Start Option B only)

### Input Range

#### Thermocouple

Type E	-200 to 799°C	(-328 to 1470°F)
Type J	0 to 750°C	(32 to 1382°F)
Type K	-200 to 1250°C	(-328 to 2282°F)
Type N	0 to 1250°C	(32 to 2282°F)
Type S	0 to 1450°C	(32 to 2642°F)
Type T	-200 to 350°C	(-328 to 662°F)

#### RTD Resolution (DIN)

1°	-200 to 700°C	(-328 to 1292°F)
0.1°	-128.8 to 537.7°C	(-199.9 to 999.9°F)

### Control Output

- Output update rate: 1/sec (1Hz)

#### #1 Output/Remote Input

- Switched $\approx$ (dc) logic signal, 5V $\approx$ (dc) @ 25mA nominal, short circuit protected, non-isolated (Remote Input Option A only)
- Switched $\approx$ (dc) logic signal, 6V $\approx$ (dc) @ 60mA nominal, short circuit protected, non-isolated (Watlow DIN-A-MITE<sup>®</sup> power controller compatible) (Remote Timer Start Option B only)

#### #2 Output

- Switched $\approx$  (dc) logic signal, 6V $\approx$ (dc) @ 60mA nominal, short circuit protected, non-isolated (Watlow DIN-A-MITE<sup>®</sup> power controller compatible)
- Electromechanical<sup>①</sup> relay, Form A, 2A, 240V $\sim$ (ac) without contact suppression<sup>③</sup> (Remote Input Option A only)
- Solid state relay, Form A, 0.5A, 24 to 264V $\sim$ (ac), without contact suppression<sup>③</sup>. Off state output impedance 31M  $\Omega$ . (Remote Input Option A only)

### Output Cycle Time

- Switched $\approx$ (dc) and solid state relay; 5.0 sec default, 0.1 sec minimum
- Electromechanical relay; 30.0 sec default, 5.0 sec minimum

### Line Voltage/Power

- 100-240V $\sim$ (ac) +10%, -15%; (85-264V $\sim$ (ac), 50/60Hz,  $\pm 5\%$ )
- 24-28V $\approx$ (ac/dc) +10%, -15%; (20-31V $\approx$ (ac/dc), 50/60Hz,  $\pm 5\%$ ) (Remote Input Option A only)

### Operating Environment

- 0 to 65°C (32 to 149°F)
- 0 to 90% RH, non-condensing

### Terminals

- Touch-safe set screw type, accepts 22-12 gauge wire

## Ordering Information-W935-XMNN Rev E04

To order, complete the code number on the right with the information below:

**9 3 5 - 1 C - 0**

**Series 935**—Single thermocouple or RTD (DIN) input, dual output, single display temperature controller with time function and four digit display

**Remote Inputs**

A = Remote set point input or front panel lock input in place of output #1

B = Separate input for remote timer start or front panel lock

**#1 Output/Remote Input**

C = Switched $\approx$ (dc), logic signal, non-isolated, (Optionally used for remote set point input or front panel lock input for Remote Input A option only)

**#2 Output**

C = Switched $\approx$ (dc), logic signal non-isolated

D = Electromechanical<sup>①</sup> relay, Form A, 2A, 240V $\sim$ (ac), without contact suppression<sup>③</sup> (Only available with Remote Input Option A)

K = Solid state relay, Form A, 0.5A, 24-264V $\sim$ (ac) without contact suppression<sup>③</sup> (Only available with Remote Input Option A)

**Power Supply**

0 = 100-240V $\sim$ (ac) nominal (high voltage)

1 = 24-28V $\approx$ (ac/dc) nominal (low voltage) (Only available with Remote Input Option A)

**Custom Options**

00 = None

AA = No Watlow logo

XX = Custom label or parameters, Consult factory for options.

**Display**

R = Red displays

G = Green displays

① Electromechanical relays warranted for 100,000 closures only. Solid state switching devices recommended for applications requiring fast cycle times or extended service life.

② To effect NEMA4X (IP65) rating requires a minimum mounting panel thickness of 1.5 mm (0.06 in.) and a surface finish not rougher than 0.000812 mm (0.000032 in.).

③ When using this output to drive a solenoid, MDR or electromechanical relay (contactor), protect output with a Quencharc<sup>®</sup>. Order code number 0804-0147-0000. Refer to owner's manual for wiring information.

Quencharc<sup>®</sup> is a registered trademark of ITW Paktron.

## Dimensions

