



**TOTAL  
CUSTOMER  
SATISFACTION**  
3 Year Warranty

## A Step Ahead Watlow's 24-Step Ramping Control

Watlow's Series 942 is a 1/4 DIN ramping control providing 24-step program capability, or easy to use non-ramping set point operation. The control is designed with a variety of features including a unique data output that sends information directly to a serial printer for permanent records.

The Series 942 is a microprocessor-based, single input, dual control output, ramping control or programmer. Two optional auxiliary outputs can be user defined as alarms or time-based events. Optional retransmit output allows retransmit of set point or process variable.

Sensor input includes nine types of thermocouples, RTD and scalable process input. Range limiting of the set point variable matches the control to the application.

Ramping operations include 24-step program capability, ramp-rate or time-based programming, guaranteed soak deviation, program looping, and program status selection after power outages.

The Series 942 is designed to operate in the most demanding industrial environments. Watlow's three-year warranty is an additional guarantee of Control Confidence®.

### Your Authorized Watlow Distributor Is:

### Features and Benefits

#### 24 step program capability

- Ideal for most applications requiring a ramping profile

#### Time based or ramp rate programming

- Flexible programming

#### Easy non-ramping set point operation

- Static set point can be set without programming

#### Auto-tuning

- Quick and easy tuning

#### Hardware lockout of Setup parameters

- Provides an extra level of process security

#### Optional dual auxiliary outputs

- Flexible time-based event alarm outputs

#### Optional retransmit of set point or process variable

- Can be used as a master programmer or connected to a chart recorder



WIN-942-70

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# Specifications

## Control Mode

- 24-step time/temperature profile control
- Easy to use single or fixed set point
- Optional dual auxiliary outputs, selectable as alarms or time-based events
- Optional retransmit of set point or process variable
- EIA/TIA-422A, EIA/TIA-423A, or EIA/TIA-485 data communications available
- Control outputs, user selectable: Heat, Heat/Cool, Cool, Cool/Heat, outputs independent, or related via dead band for Heat/Cool applications
- PID parameters:  
Proportional band: 0 (off) or 1 to 999°F (0 to 555°C), or 999 units, or 0 to 999.9% of span  
Reset: 0 (off) or 0.01 to 9.99 repeats per minute  
Integral: 0 (off) or 0.1 to 99.9 minutes per repeat  
Rate/derivative: 0 (off) or 0.01 to 9.99 minutes  
Cycle time: 1 to 60 seconds  
Dead band: ±99°F (±9.9), ±55°C (±5.5), ± 99 units (±9.9)

## Operator Interface

- Membrane front panel
- Dual, four digit 0.56 inch (14 mm) LED displays
- MODE, RUN/HOLD, UP and DOWN keys

## Input Range

### Thermocouple

Type B	1598 to 3092°F	(870 to 1700°C)
Type C <sup>2</sup>	797 to 4200°F	(425 to 2315°C)
Type J	32 to 1382°F	(0 to 750°C)
Type K	-328 to 2282°F	(-200 to 1250°C)
Type N	32 to 2282°F	(0 to 1250°C)
Type R	32 to 2642°F	(0 to 1450°C)
Type S	32 to 2642°F	(0 to 1450°C)
Type T	-328 to 662°F	(-200 to 350°C)
Pt 2 <sup>2</sup>	32 to 2543°F	(0 to 1395°C)

### RTD Resolution (DIN or JIS)

1°	-328 to 1112°F	(-200 to 600°C)
0.1°	-99.9 to 392.0°F	(-73.3 to 200.0°C)

## Process

0-5V=(dc) or 4-20mA=(dc) -500 to 3500 units

## Output 1 (Heating or Cooling)

- Solid state relay, Form A, 0.5A @ 24V~ min., 264V~ max., opto-isolated, burst fire switching, with or without contact suppression. Off state output impedance with RC suppression is 20kΩ. 31MΩ without contact suppression.
- Electromechanical relay<sup>1</sup>, Form C, 6A @ 120/240V~, 6A @ 28V=(dc), 1/2 hp @ 120V~, 125VA @ 120V~. Off state output impedance with RC suppression is 20kΩ.
- Switched dc signal provides a minimum turn on voltage of 3V=(dc) into a minimum 500Ω load; maximum on voltage not greater than 32V=(dc) into an infinite load, non-isolated.
- Process, 0-20mA=(dc) or 4-20mA=(dc) reverse or direct acting into a 600Ω maximum load impedance, non-isolated.
- Process, 0-5V=(dc) or 0-10V=(dc) reverse or direct acting into a 1kΩ minimum load impedance, non-isolated.

## Output 2 (Heat, Cool or None)

- Solid state relay, Form A, 0.5A @ 24V~ min., 264V~ max., opto-isolated, burst fire switching, with or without contact suppression. Off state output impedance with RC suppression is 20kΩ. 31MΩ without contact suppression.
- Electromechanical relay<sup>1</sup>, Form A, 6A @ 120/240V~, 6A @ 28V=(dc), 1/2 hp. @ 120V~(ac), 125VA @ 120V~. Off state output impedance with RC suppression is 20kΩ.
- Switched dc signal provides a minimum turn on voltage of 3V=(dc) into a minimum 500Ω load; maximum on voltage not greater than 32V=(dc) into an infinite load, non-isolated.

## Retransmit Outputs

- 4-20mA=(dc) into a 600Ω maximum load, non-isolated.
- Retransmit of process or set point. User selectable range.
- 0-5V=(dc), 1kΩ minimum load impedance, non-isolated.

## Auxiliary Outputs

- Electromechanical relay<sup>1</sup>, Form A or B, 6A, with RC suppression. Off state output impedance is 20kΩ with RC suppression.
- Selectable "Normally Open" or "Normally Closed" action
- Selectable as alarms or events
- Latching or non-latching, process or deviation alarms
- Separate high or low alarm values
- Alarm silencing (inhibit) on power up for Alarm 1 (deviation only)

## Accuracy

- Calibration accuracy: ±0.1% of span or 1000°F (540°C), whichever is greater, or ±1 LSD whichever is greater. Specified at 77°F ±5°F (25°C ±3°C) ambient and rated line voltage ±10%
- Temperature stability: ±0.1°F/°F (0.1°C/°C) change in ambient
- Voltage stability: ±0.01 percent of span per percent of rated line voltage

## Agency Approvals

- UL® 873, File #E43684
- CSA C22.2 #24-1981, File #LR30586

## Ordering Information

### Series 942

Quad output, microprocessor-based, 1/4 DIN time/temperature profile controller

### Input Type

- 1 = Type C<sup>2</sup>, J, K, T, N, Pt 2<sup>2</sup> thermocouple
- 2 = Type C<sup>2</sup>, J, K, T, N, Pt 2<sup>2</sup> thermocouple  
1° RTD, 4-20mA=(dc), 0-5=(dc)
- 3 = Type C<sup>2</sup>, J, K, T, N, Pt 2<sup>2</sup> thermocouple  
0.1° RTD, 4-20mA=(dc), 0-5=(dc)
- 4 = Type B, R, S thermocouple

### #1 Output

- B = Solid state relay, Form A, 0.5A, with RC suppression
- C = Switched dc, non-isolated
- D = Electromechanical relay<sup>1</sup>, Form C, 6A with RC suppression
- E = Process, 0-10V=(dc), non-isolated
- F = Process, 4-20mA=(dc), non-isolated
- G = Process, 0-20mA=(dc), non-isolated
- H = Process, 0-5V=(dc), non-isolated
- K = Solid state relay without contact suppression, Form A, 0.5A

### #2 Output

- A = None
- B = Solid state relay, Form A, 0.5A, with RC suppression
- C = Switched dc, non-isolated
- D = Electromechanical relay<sup>1</sup>, Form A, 6A with RC suppression
- K = Solid state relay without contact suppression, Form A, 0.5A

### Alarm/Retransmit Outputs

- 0 = None
- 1 = Single, electromechanical relay, Form A or B, 6A, with RC suppression, no retransmit
- 2 = Dual, electromechanical relay, Form A or B, 6A, with RC suppression, no retransmit
- 3 = Single, electromechanical relay, Form A or B, 6A, with RC suppression, 0-5V=(dc) retransmit
- 4 = Single, electromechanical relay, Form A or B, 6A, with RC suppression, 4-20mA=(dc) retransmit
- 5 = No alarm output, 0-5V=(dc) retransmit
- 6 = No alarm output, 4-20mA=(dc) retransmit

### Communications

- A = None
- B = Isolated EIA/TIA-423/EIA/TIA-422
- D = Isolated EIA/TIA-485

### Front Panel

- 00 = Standard
- XX = Special label; artwork private label charge, or custom software, consult a Watlow representative

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

<sup>2</sup> Not an ANSI symbol.

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