

Ramping Controls

Series 920

Watlow's Series 920 is a ¼ DIN microprocessor-based ramping control. Plain English prompts simplify operator training and operations. This controller reduces difficult process control requirements to very simple tasks with no cryptic numeric characters or complex translations table to check when programming.

The Series 920 is a single input, quad output programmable ramping controller. Dual PID outputs allow precise tuning in ON/OFF, P, PI, PD or PID modes. Dual auxiliary outputs are user-definable as either events or alarms.

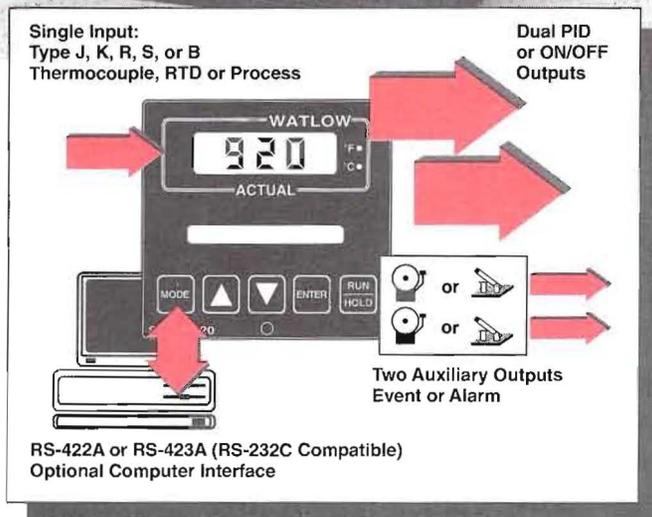
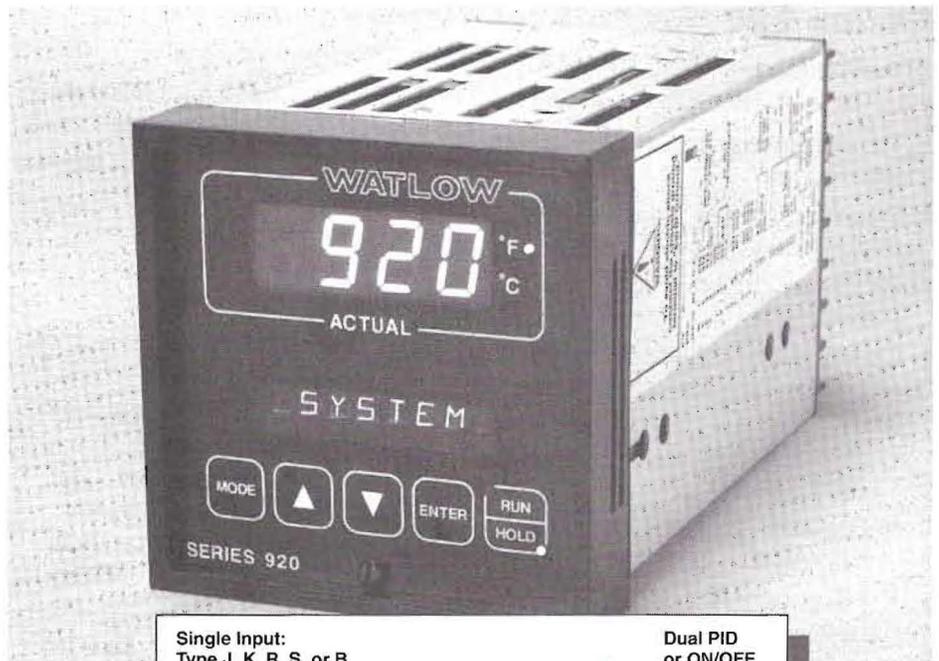
It offers 99 steps of programming in up to 10 resident profiles. The process actual display keeps operators continually informed on the current status of the process variable. The Series 920 has a wide range of sensor input types as well as a scalable process input with a range limiting feature. A data communications port enables the Series 920 to talk to a host computer.

Performance Capabilities

- Accuracy to 0.15 percent
- Operating environment 30 to 130°F (0 to 55°C)

Features

- **English language prompts** allow faster programming and training.
- **Single channel ramping controller** for time-based or ramp-rate programmable control.
- **Up to 99 steps of program capacity** to accommodate the most demanding profiles.
- **Ten resident profiles in non-volatile RAM** makes profiles ready to run instantly.



- **Two auxiliary outputs** are events or alarms providing flexible configuration of control/process.
- **Serial data communications** for computer networking of machines and systems.
- **Three year warranty*** provides Control Confidence®.

Applications

- Environmental chambers
- Complex process furnaces
- Any process that changes variables over time

*Electromechanical relay output warranted to 100,000 cycles.

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Specifications

Control Mode

- Microprocessor-based, user selectable modes
- Single input, dual control outputs, dual auxiliary outputs
- 99 step programmer with up to 10 profiles
- Control outputs: User selectable as: Heat, Heat/Cool, Cool/Heat or Cool
 - Outputs independent, or related via deadband
 - ON/OFF: 3°F (1.7°C) switching hysteresis
 - PID parameters

Proportional band: 0 to 900°F (0 to 500°C), or 0 to 500 units, 0.0 to 90.0°F (0.0 to 50.0°C) for 0.1° RTD inputs

Reset: 0.00 to 5.00 repeats per minute

Rate: 0.00 to 5.00 minutes

Rate band: 0 to 7 times proportional band

Cycle time: 1 to 60 seconds

- Deadband: $\pm 36^\circ\text{F}$ ($\pm 20^\circ\text{C}$), ± 20 units
- Auxiliary outputs: User selectable as:
 - Event per step
 - Alarm

Process or deviation value per output

Latching or non-latching

Separate high and low values per output

Operator Interface

- Membrane front panel
- Four digit $\frac{1}{2}$ in (13 mm) LEDs displaying actual process input value
- LED indication of °F, °C, or process variable units

- MODE, ENTER, UP, DOWN, and RUN/HOLD keys
- Eight character alphanumeric display of operating data

Input

- Thermocouple, RTD and electrical process input
- Automatic cold junction compensation for thermocouple
- RTD input 2 or 3 wire, platinum, 100 Ω @ 0°C, calibrated to JIS curve #3916 (0.003916 $\Omega/\Omega/^\circ\text{C}$) or to DIN curve #3850 (0.003850 $\Omega/\Omega/^\circ\text{C}$)
- Sensor break protection de-energizes control outputs to protect system
- Isolated or grounded sensor
- Operating ranges user selectable
- Offset of input signal, $\pm 90^\circ\text{F}$ ($\pm 50^\circ\text{C}$), ± 50 units, front panel adjustable $\pm 9.0^\circ\text{F}$ ($\pm 5.0^\circ\text{C}$) for RTD input

- °F, °C, or process variable units are user selectable

Range Information

Thermocouple		
J t/c	32 to 1382°F	(0 to 750°C)
K t/c	-328 to 2282°F	(-200 to 1250°C)
T t/c	-328 to 662°F	(-200 to 350°C)
R t/c	392 to 2642°F	(200 to 1450°C)
S t/c	392 to 2642°F	(200 to 1450°C)
B t/c	1472 to 3092°F	(800 to 1700°C)

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

Process	
0-5VDC	-99 to 1800 units
4-20mA	-99 to 1800 units

Output—Control (Single or Dual)

- Solid state relay, Form A, 0.5A @ 24VAC minimum, 264VAC maximum, 10mA minimum load, opto-isolated, zero cross switching. OFF state impedance is 20k Ω minimum.
- Open collector, switched DC signal provides a minimum turn ON voltage of 3VDC into a minimum 500 Ω load; maximum ON voltage not greater than 32VDC into an infinite load.

- Electromechanical relay, Form C, SPDT: 6A @ 115/230VAC, 6A @ 28VDC, $\frac{1}{8}$ hp @ 115VAC, 125VA Pilot Duty @ 115VAC. OFF state impedance is 20k Ω minimum.
- Triac 15A, resistive @ 230VAC, 100mA minimum load, mounted external on rear of case.
- Process, 4-20mA, non-isolated, load impedance 600 Ω maximum.

Output—Auxiliary

- Electromechanical relay, 2 ea; #1, Form C; #2, Form A, 6A. SPDT: 6A

@ 115/230VAC, 6A @ 28VDC, $\frac{1}{8}$ hp @ 115VAC, 125VA pilot duty @ 115VAC. OFF state impedance is 20k Ω minimum.

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Accuracy

- Calibration Accuracy: $\pm 0.15\%$ of span, ± 1 digit at $77^\circ\text{F} \pm 5^\circ\text{F}$ ($25^\circ\text{C} \pm 3^\circ$) ambient & rated line voltage $\pm 10\%$
- Accuracy Span: 1000°F (540°C) minimum
- Temperature Stability: $\pm 2\mu\text{V}/^\circ\text{F}$ ($3.6\mu\text{V}/^\circ\text{C}$) ambient referred to the input
- Voltage Stability: $\pm 0.01\%$ of span /% of rated line voltage

Agency Approvals

- UL recognized, UL873, File #E43684

Terminals

- #6 compression type, universal head screw terminals

Communications

- Serial data communications
- RS-422A or RS-423A (RS-232C compatible)
- All operator indication and controls
- ANSI X3.28 protocol, or XON/XOFF protocol
- Isolated
- DB-15 female receptacle

Power

- $120/240\text{VAC} \pm 10\%$, $50/60\text{Hz} \pm 5\%$
- 18VA power consumption
- Data retention upon power failure via nonvolatile memory

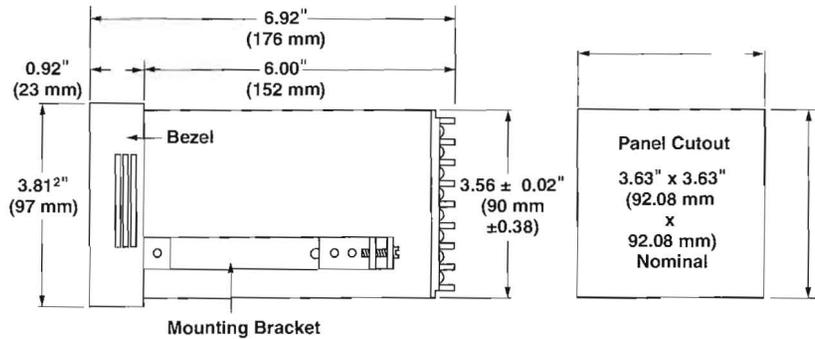
Operating Environment

- 30 to 130°F (0 to 55°C)
- 0 to 90% RH, non-condensing

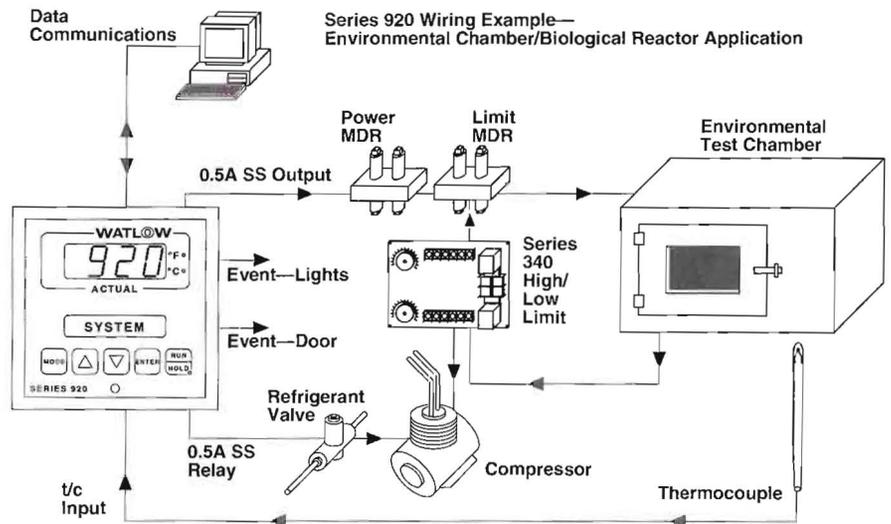
Weight

- 2.8 lb (1.27 kg)

Dimensions

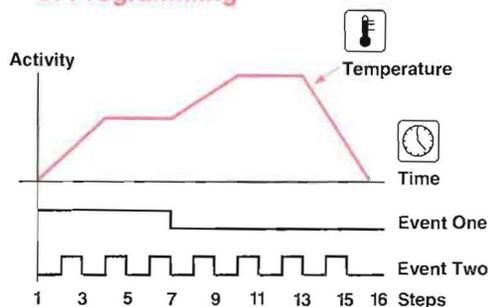


Wiring Example



Feature Highlights

Single Channel Ramping, 99 Steps of Programming



99 Steps in 10 Profiles

The Series 920 offers fully programmable, temperature over time control with dual heat/cool outputs. Two events contribute useful, versatile action in a variety of applications. Loop commands allow continuous repeating steps, or to a fixed count.

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F.O.B.: Winona, Minnesota

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Ordering Information



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RTD		
1° RTD	-328 to 1112°F	(-200 to 600°C)
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Process	
0-5VDC	-99 to 1800 units
4-20mA	-99 to 1800 units

To order, complete the model number to the right with the information below: **9 2 0 A -** **0 - 0**

Category and Details

Control

Series 920 = Single channel, microprocessor based, dual output, ramping controller, 99 steps, ¼ DIN

Input

- 2 = Type J, K, T thermocouple, 0-5VDC, 1° RTD
- 3 = Type J, K, T thermocouple, 4-20mA, 0.1° RTD
- 4 = Type R, S, B thermocouple

#1 Output

- B = Solid state relay, Form A, 0.5A, RC suppression
- C = Switched DC, open collector, non-isolated
- D = Electromechanical relay, Form C, 6A
(Warranted to 100,000 cycles only)
- E = Triac, 15A, resistive, external
- F = Process, 4-20mA, non-isolated

#2 Output

- A = None
- B = Solid state relay, Form A, 0.5A, RC suppression
- C = Switched DC, open collector, non-isolated
- D = Electromechanical relay, Form C, 6A
(Warranted to 100,000 cycles only)

Communications

- A = None
- B = Isolated RS-422/RS-423

Front Panel

- 00 = Standard
- XX = Special label; artwork private label charge. Consult Watlow representative.

Availability

Stock: Same day shipment

All other combinations: 10 working days or less