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Protection For Over-temperature Hazards



The Series 94 is a microprocessor-based control with single input, dual output. This controller is added to thermal applications to limit over-temperature conditions. The limit controller provides safety assurance against instances where a high temperature runaway condition could occur from a shorted input sensor or an output device that could fail in a closed position. A limit controller is recommended for any application where thermal runaway could affect operator safety, cause damage to capital equipment, produce large product scrap costs or create a fire hazard.

Watlow's Series 94 is a 1/16 DIN temperature controller with a NEMA 4X (IP65) front panel (optional). This high performance controller is ideal for applications such as furnace and ovens, environmental chambers, semiconductor, food processing or anywhere an over-temperature condition could cause damage to equipment, product, create a fire hazard or pose a risk to personnel. Since the NEMA 4X front panel can be hosed or wiped down without damage to the controller it is also excellent for use where equipment needs to be cleaned frequently. The compact size of the controller allows more flexibility in applications where space is a problem.

The Series 94 also has many of the standard Watlow features, such as dual digital display, accuracy at ±0.1 percent of span, a wide operating environment from 0 to 65˚C, at 115V~ line voltage power/0-60˚C for 230V~ power, easy setup with operator friendly prompts.

The Series 94 is manufactured by ISO 9001 registered Watlow Controls and reliably backed by a three-year warranty.

Features and Benefits

Dual display
- Displays limit set point and actual

Dual outputs
- Provides limit/alarm capacity

NEMA 4X (IP65) certified (BSEN) (optional)
- Offers water and dust resistance

Universal inputs
- Offers wide range of sensor inputs

Lock-out facility
- Offers high security

Output limit
- Safety shut down in over-temperature condition

Flexible hi/low alarm output
- Notifies of trouble

Programmable display default
- Shows actual, limit or alarm default display information

±0.1 percent accuracy
- Offers excellent range accuracy

Your Authorized Watlow Distributor is:

WATLOW

WIN-94-109

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Specifications

Control Mode
- Microprocessor-based
- Single input, dual output
- Limit and alarm

Agency Approval
- FM approved, Class 3545, File J.I. 0D5A1.AF

Operator Interface
- Sealed membrane front panel
- Dual, 4-digit red or green displays
- Advance, Increment, Decrement, and Reset keys

Accuracy
- Calibration accuracy and sensor conformity: ±0.1% of span, ±1°C @ 77°F ± 5°F/25°C ± 3°C ambient and rated line voltage
- Accuracy span: 1000°F/540°C minimum
- Temperature stability: ±0.2°F/°F or ±0.1°C/°C rise in ambient maximum
- Voltage stability: ±0.01% of span per percent of rated line voltage

Sensors/Inputs
- Thermocouple, grounded or ungrounded sensors
- RTD 2- or 3-wire, platinum, 100Ω @ 0°C calibration to DIN curve (0.00385Ω/Ω/°C) or JIS curve (0.003916Ω/Ω/°C); user selectable
- Sensor break protection de-energizes limit output to protect system
- °F or °C display, user selectable

Input Range

Specified temperature ranges represent the controller's operational span.

• Thermocouple

Type B	32	to	3308°F	or	0	to	1820°C
Type J	32	to	1382°F	or	0	to	750°C
Type K	-328	to	2282°F	or	-200	to	1250°C
Type N	32	to	2282°F	or	0	to	1250°C
Type S	32	to	2642°F	or	0	to	1450°C
Type T	-328	to	662°F	or	-200	to	350°C

• RTD Resolution (DIN or JIS)

1°	-328	to	1292°F	or	-200	to	700°C
0.1°	-199.9	to	999.9°F	or	-199.9	to	700.0°C

Output 1 Limit
- Electromechanical relay

Output 2 Alarm
- Electromechanical relay
- Switched dc
- Solid state relay

Output Specifications
- Electromechanical relay③, Form C, 5A @ 120/240V~ or 30V⎓(dc) maximum, rated resistive load, without contact suppression.
- Switched dc signal provides a non-isolated minimum turn on voltage of 3V⎓(dc) into a minimum 500Ω load, maximum on voltage not greater than 12V⎓(dc) into an infinite load.
- Solid state relay③, Form A, 0.5A @ 24V~ min. to 265V~ max. Opto-isolated, without contact suppression. Off state output impedance is 31MΩ.

Output Configurations

Output 1 selections: Limit Control
- Limit output

Output 2 selections:
- Process with flashing alarm message
- Process without alarm message
- Alarm with separate high and low set points
- Hysteresis: 1 to 9999°C/°F

Line Voltage/Power
- 100-240V~ (85-264V~); 50/60Hz ±5%
- 12-24V≂(ac/dc) (10-26≂[ac/dc]); 50/60Hz ±5%
- Power consumption 7VA (12 to 24V≂[ac/dc]) 12VA (100-240V~)
- Data retention upon power failure via non-volatile memory

Operating Environment
- 32 to 149°F/0 to 65°C at 115V~ line voltage power
- 32 to 140°F/0 to 60°C at 230V~ line voltage power
- 0 to 90% RH, non-condensing
- Storage temperature: -40° to 185°F/-40° to 70°C

Terminals
- Size 6 universal head screw terminals accepts 20-14 gauge wire

Dimensions

Height	2.1"	53 mm
Width	2.1"	53 mm
Overall Depth	4.7"	119 mm
Behind panel depth	4.1"	104 mm
Weight	0.5 lb	0.2 kg

Ordering Information

9 4 _ _ - 1 _ _ - 0 0 _ _

Series 94
Microprocessor-based
1/16 DIN, single input, dual output
4-digit displays

NEMA 4X (IP65)② Option
A = Without NEMA 4X (IP65) Rating
B = With NEMA 4X (IP65) Rating

CE Option
A = Non CE Compliant
B = CE Compliant

Output 1 (Limit)
D = Electromechanical relay, Form C, 5A, without contact suppression①③

Output 2 (Alarm)
A = None
C = Switched dc output, non-isolated
D = Electromechanical relay, Form C, 5A, without contact suppression①③
K = Solid state relay, Form A, 0.5A, without contact suppression③

Line Voltage/Power
0 = 100-240V~ (high voltage)
1 = 12-24V≂(ac/dc) (low voltage)

Display
Upper/Lower
RR = Red/Red
RG = Red/Green
GR = Green/Red
GG = Green/Green

① Electromechanical relays are not recommended for PID control. They are warranted only for 100,000 contact closures.

② To effect NEMA 4X (IP65) rating requires a minimum mounting panel thickness of 0.06 inch (1.5 mm) and surface finish not rougher than 0.000032 inch (0.000812 mm).

③ Switching inductive loads (relay coils, etc.) requires using an RC suppressor.

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