## SERIES EHG®

Many applications requiring a fixed temperature set point have relied on mechanical thermostat devices (thermostats) for thermal control. But, thermostats are inadequate for many applications because of the long-term reliability issues such as 100,000 cycle rating and poor temperature control.

The SERIES EHG® thermal solution includes a compact temperature control, thermocouple sensor and power switching device integrated into the heater's power cord. The SERIES EHG reduces system costs and substantially extends the life over conventional thermostat solutions.

The evolution of miniature microprocessor technology and Watlow switching technology allowed the development of a small versatile temperature control and thermocouple sensor that can be integrated with Watlow silicone rubber heater products. This device senses the temperature via input from a thermocouple strategically placed on the heater mat. The microprocessor is programmed prior to shipment with the customer's application specific set point. This results in quick delivery of a custom integrated system.

The small mass of the thermocouple provides superior response to changes in process temperature and allows for higher watt density silicone rubber heater designs. Depending on the specific application, Watlow's power switching design can extend life up to 40 times greater than thermostats. These features result in an integrated custom set point temperature control product with superior life span, faster heat-up rates and improved accuracy. The SERIES EHG system has been tested to over four million cycles at rated amperage.

## Features and Benefits

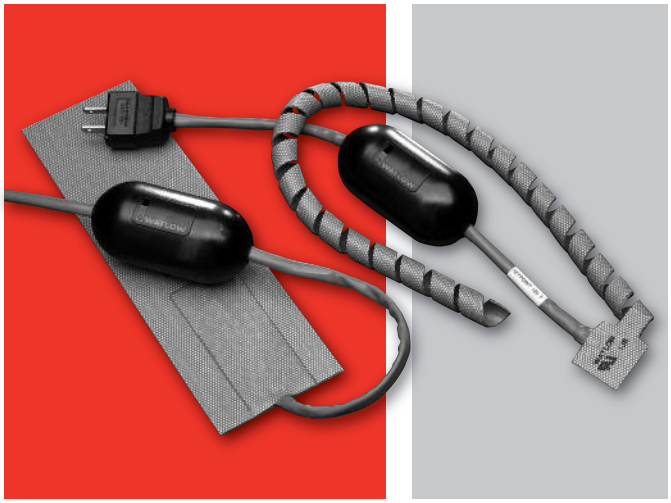
**Long operational life**
- Improves system reliability

**Tight temperature control**
- Assures process accuracy

**Small sensor footprint**
- Fits with almost any heater
- Responds quickly to temperature changes
- Controls high watt densities in low mass applications

**Reduced system cost**
- A single SERIES EHG controller can be configured with multiple heaters to reduce system cost

**Pre-wired, in line control**
- Simplifies installation
- Provides two-wire power connection



**Durable housing with built-in strain relief**
- Protects electronics
- Assures low risk of mechanical damage

**Manufactured with proven Watlow components**
- Assures reliable system performance

## Typical Applications

- Semiconductor processing
- Aerospace composite repair
- Foodservice equipment
- Freeze protection
- Life sciences
- Telecommunications

# SERIES EHG

*Technical Information*

## Specifications

### Operational

- SERIES EHG silicone rubber heater UL® recognized to 428°F (220°C) operating temperature
- Factory programmed fixed set point
- On-off controller with 6°F (3°C) switching hysteresis
- Temperature band LED indicator ON between -68 and +68°F (–20 and +20°C) of set point

### Electrical

- Voltage rating: 120 or 240VAC – 30/+10%, 50/60Hz
- Silicone rubber heater watt densities up to 80 W/in$^2$ (12.5 W/cm$^2$) dependent on application temperature
- SERIES EHG system UL® recognized to 10A max.

### Sensor

- Type K thermocouple

### Mechanical

- Controller dimensions 3.75 in. (95 mm) long by 1.75 in. (45 mm) diameter
- Heater per silicone rubber heater specifications

### Agencies

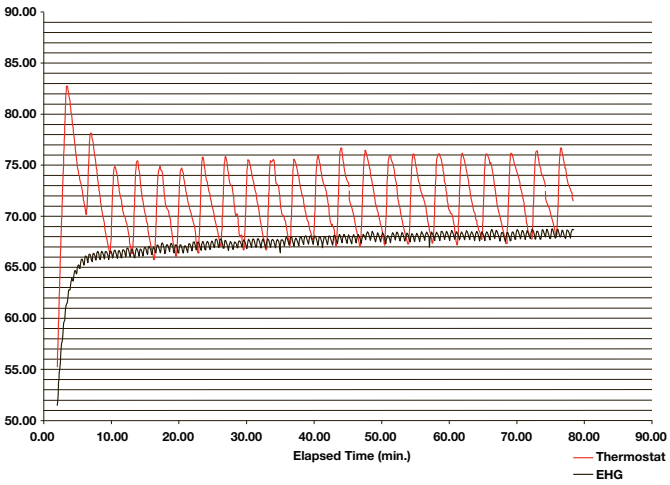
- Silicone rubber heater: UL® recognized File #E52951
- SERIES EHG controller: TUV File DE 3-3068 to EN 61010-1:2001, UL® File E43684 to UL® 873 temperature indicating and regulating equipment

### Environmental

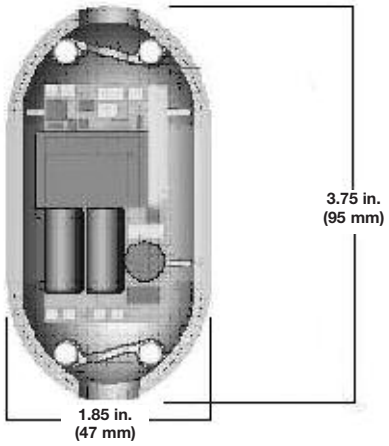
- Controller operating temperature range 32 to 128°F (0 to 70°C)
- Controller storage temperature range -40 to 158°F (–40 to 70°C)

Contact your Watlow representative for custom configurations.

## SERIES EHG Versus Thermostat (typical application)




## Dimensions




## Integrated SERIES EHG System Versus Integrated Thermostat System

| | Integrated EHG System | Integrated Thermostat System | SERIES EHG Benefit |
|---|---|---|---|
| Life comparison at rated amperage 10A load | Tested to greater than 4,000,000 cycles with | Rated 100,000 cycles | Longer product life of SERIES EHG system and high reliability in application |
| Switch hysteresis | 6°F (3°C) | 15°F (8°C) | SERIES EHG system will provide superior process control |
| Improved response time reduces overshoot on start-up | 6°F (3°C) typical | 25°F (14°C) typical | SERIES EHG system will respond to changes in temperature faster than thermostat |
| Warranty | 2 years on material and workmanship | 1 year on material and workmanship | Warranty can be extended because of superior SERIES EHG life |
| Zero cross switching | SERIES EHG has zero cross switching | Random switching during sign wave cycle | Reduces possibility of electrical mechanical interference (EMI) |

## SERIES EHG® SL10

The EHG® SL10 is a key component in a powerful system that integrates a heater, an adjustable set point temperature controller, high/low temperature alert, power switching device and a high temperature safety limit. This agency recognized controller/safety limit meets UL® 1998 and CE 60730 requirements. The optional display/communications module can be easily upgraded and added in the field to provide digital display indication, adjustment of set point, RS485 Modbus® communications and other human machine interface (HMI) features. This system allows you to purchase only what is needed for your application.

The easy to install, compact design, inherent reliability and integrated limit functions make this controller a tremendous value. The controller is designed for easy integration with Watlow® heaters simplifying engineering, reducing component count on new equipment and decreasing cost of ownership. For original equipment manufacturers (OEMs), CE, Semi-S2 compliance and UL® recognition will reduce time and costs necessary for global agency testing and validation.


## Features and Benefits

**Process controller and safety limit in one package**
- Meets UL® 1998 and CE 60730 requirements
- Eliminates the need for a thermal fuse on a heater
- Eliminates replacement of heater when fuse fails

**Optional display/communications module**
- Allows easy upgrade onto base device
- Offers low cost field upgrade
- Provides easy, snap-on installation

**Accurate and flexible temperature process controller**
- Replaces problematic bi-metal thermostats with accurate electronic temperature process controller
- Allows easy change of process parameters

**Ambient operating temperature range 32 to 158°F (0 to 70°C)**
- Increases reliability when mounting in harsh temperature environments or in close proximity to heaters

**Integrated high/low temperature alert signal relay**
- Provides dry contact output to activate external alarm or process function
- Signals control status with three integrated LEDs
- Allows a signal of up to two amperes 30VAC/VDC, Form A to alert if process temperature is out of range limits

**Health check diagnostics**
- Monitors maximum heater process temperature, maximum ambient temperature and thermocouple operation
- Provides health check signal to inform operator that the process is working correctly

**Universal power supply**
- Allows an input of 85 to 264VAC, 50/60Hz
- Provides safe control of up to 2400 watts with 10 amperes switching in both controller and safety limit

**Can be switched from on-off and PID algorithm**
- Increases product life (on-off control is default)
- Offers selectable PID control algorithm for tighter temperature uniformity

**Universal ⅛ turn mounting bracket**
- Allows mounting to most surfaces
- Provides flexible mounting—either horizontally or vertically

## Typical Applications

**Foodservice equipment**
- Warming and serving equipment
- Food holding cabinets

**Life sciences**
- Laboratory equipment
- Medical equipment

**Packaging**
- Heat sealing bars
- Hot glue application equipment

**Semiconductor processing**
- Gas delivery lines

# SERIES EHG SL10

*Technical Information*

## Specifications

### Operational

- Two, Type K thermocouple inputs - process temperature control and safety limit
- Process temperature output - 10A NO-ARC relay
- Safety limit alarm - 10A relay
- High/low temperature alert - 2A 30VAC/VDC, Form A (single pole, normally open contact)
- On-off temperature controller algorithm, upgraded via communications to PID algorithm (min. cycle time 30 seconds)

### Standard Molex connectors

- Controllers are integrated to the heater and are supplied by Watlow

### Power

- Isolated universal power supply 85 to 264VAC, 50/60Hz
- Up to 2400 W with 10A switching capability

### NO-ARC Relay

- 10A switching
- 4.5 million cycles

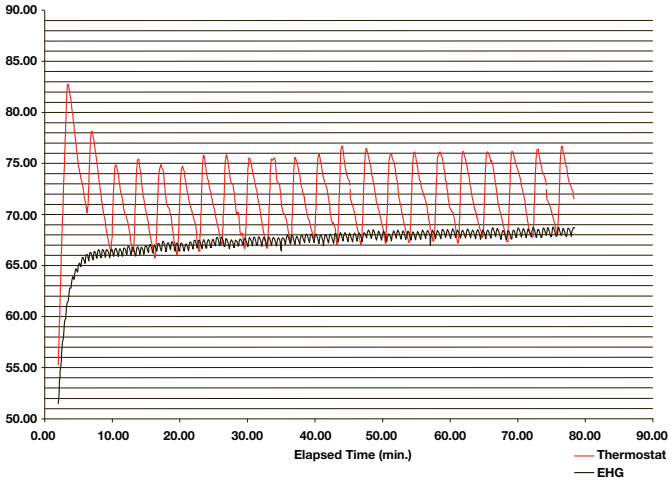
### Environmental

- Ambient operating temperature range 32 to 158°F (0 to 70°C)

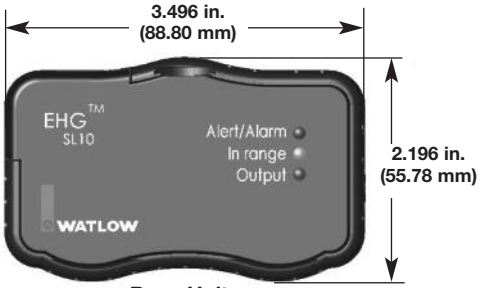
### Agency Approvals

- UL® 1998/ C-UL®
- CE 60730
- Semi-S2

## SERIES EHG Versus Thermostat (typical application)




## Dimensions




Base Unit


Without Optional Module


With Optional Module

## Switching Device Comparison Chart

| | T-Stat | Solid State Relay | Watlow NO-ARC Relay |
|---|---|---|---|
| Amperage at 77°F (25°C) | 10A | 10A | 10A |
| Amperage at 158°F (70°C) | 10A | De-rate significantly and add heat sink and air cooling | 10A |
| Output device life at 10A | Rated 100,000 at 158°F (70°C) | Greater than 10 million cycles at 77°F (25°C) | Greater than 4.5 million cycles at 158°F (70°C) |

# SERIES EHG SL10

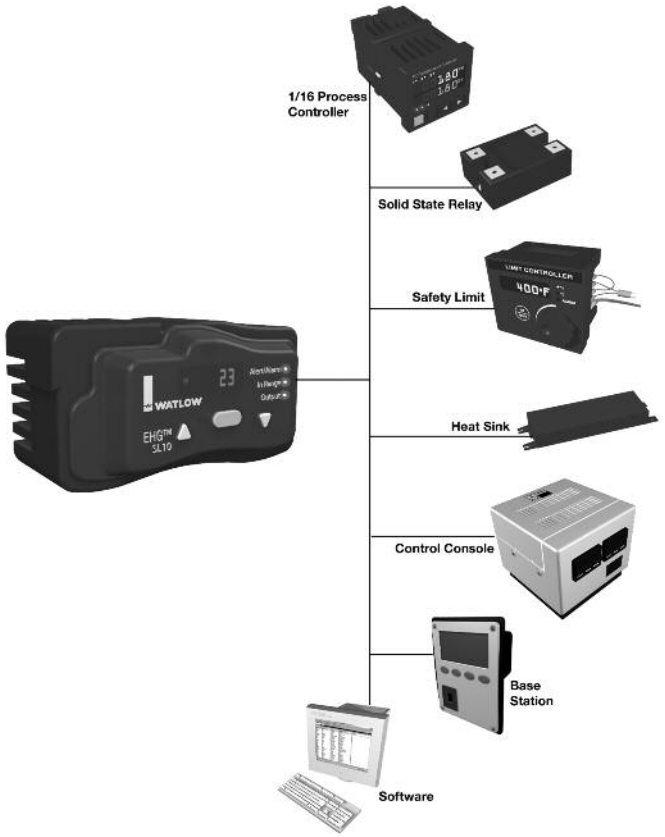
***Technical Information*** *(Continued)*

## EHG SL10 Software

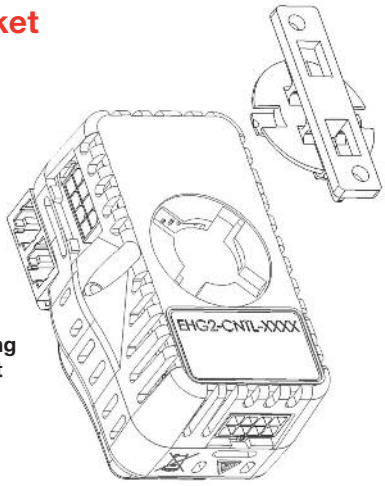
With the addition of an optional communication module, the EHG SL10 can be managed, monitored and manipulated via software. Change set points, label devices, change tuning parameters, check health status and much more all with the click of a key.



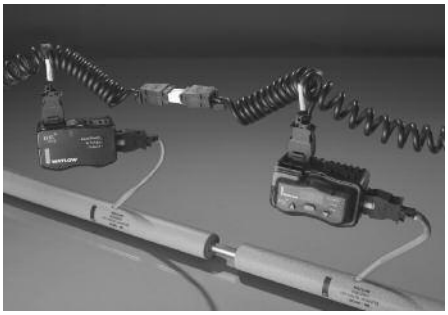
## Reduces System Complexity and Cost




## Mounting Bracket




**The EHG SL10 mounting bracket lets you mount the controller in any of four angles.**



**The EHG SL10 can be "daisy-chained" for gas line and other assemblies.**

# SERIES EHG SL10

## *Technical Information* *(Continued)*

## Optional Upgrade Modules

These upgrade modules are easy to install because there is no need to reconfigure, rewire or reorder the base unit. No technician is needed for the installation, which creates a seamless, cost-efficient system that can be upgraded.

| | Diagnostics Memory Control Parameters | Ability to Change Temperature Parameters | Field Adjustable Set Point | 3-Digit 7-Segment LED Display Illuminated | Diagnostic LED's | User Interface Software | Modbus® RTU Communication | RS 485 |
|---|---|---|---|---|---|---|---|---|
| Base Unit  | ✓ | ✓ | | | ✓ | | | |
| Optional Display Module  | ✓ | ✓ | ✓ | ✓ | ✓ | | | |
| Optional Communication Module  | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ |
| Optional Display and Communication Module  | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |