

## Flexible Gas Line Heater Improves Temperature Uniformity for Gas Applications

The STRETCH-TO-LENGTH® heater is the perfect solution for semiconductor gas line applications requiring precise temperatures to prevent condensation or over-temperature breakdown of critical process chemistries. As a superior alternative to heat tape, its preformed construction allows it to be wrapped around the delivery line enabling consistent heater/gas line contact and improved temperature uniformity.

The STRETCH-TO-LENGTH gas line heater is the perfect solution for semiconductor processes where condensation of critical gases occurs due to a phase shift at low temperatures. High or low temperature conditions could result in undesirable particulates and result in costly device defects and tool maintenance.

The STRETCH-TO-LENGTH heater's preformed wrapping capability provides engineers with the flexibility needed to compensate for different sized components, thereby reducing the potential for hot and cold spots.

The system includes a 2 W/in<sup>2</sup> STRETCH-TO-LENGTH heater and silicone rubber foam insulation.

### Features and Benefits

#### Two-part system design

- Easy to install
- Conveniently fits most gas line configurations

#### Flexible heater design

- Gives engineers flexibility to easily customize the thermal profile for each gas line application
- Allows quick prototyping to determine energy distribution requirements for process improvements

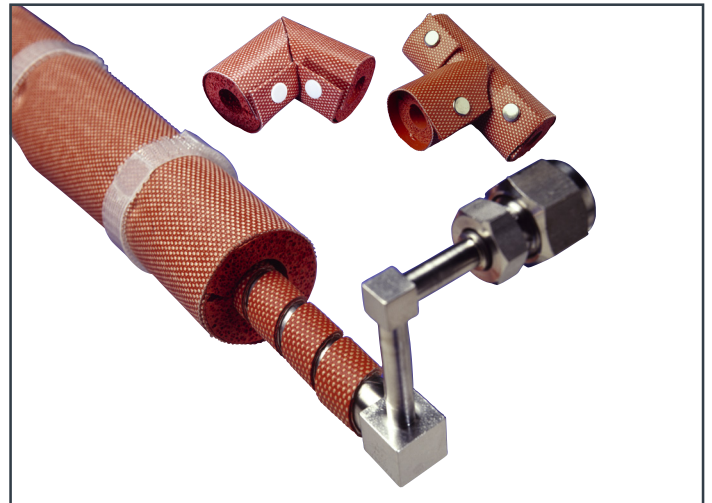
#### Flexible standard system components

- Eliminates unnecessary lead times for custom designs

### Typical Applications

#### Gas deliver lines

- Boron trichloride, BCl<sub>3</sub>
- Chlorine trifluoride, ClF<sub>3</sub>
- Dichlorosilane, (DCS), SiH<sub>2</sub>Cl<sub>2</sub>
- Tetra ethyl orthosilicate, TEOS
- Tungsten hexafluoride, WF<sub>6</sub>
- Process gas line qualification



### Specifications

- Heater and insulation jacket material:
  - Reinforced silicone rubber fabric
- Insulation material:
  - Silicone sponge
- Insulation and outer jacket color:
  - Orange
- Clean room strap fasteners
- Voltage: 120 and 240VAC
- Max. operating temperature: 392°F (200°C)
- Heater watt density: 2 W/in<sup>2</sup> (0.31W/cm<sup>2</sup>) – Watlow recommends 80% line wrap for optimum performance
- Power lead wires: 12 in. (305 mm); #18 AWG UL® 1180 CSA, rated 10A, lead wire pair encapsulated in reinforced silicone rubber sleeving
- Heater interconnectable up to a 10A circuit
- Material rated UL® 94-HB
- Heater materials are UL® rated to 392°F (200°C)
- Semi S2-93 compatible with a high-limit thermocouple and controller
- Agency certification and UL® recognized for U.S. safety standards. Contact the factory for specific applications and approvals
- Available with the EGH integrated thermal solution

STRETCH-TO-LENGTH heaters are specified by their straight length. Engineers can wrap heaters to achieve optimum temperature profile for actual applications. Coverage lengths of approximately 60 and 80 percent on 1/4 in. (6 mm) and 1/2 in. (13 mm) diameter tubes are offered as a guide in selecting heater lengths for actual gas line dimensions.

A gas line with 100 percent coverage provides approximately 2 W/in<sup>2</sup>, 80 percent coverage 1.6 W/in<sup>2</sup> or 60 percent coverage 1.2 W/in<sup>2</sup>.

### STRETCH-TO-LENGTH Heater Ranges - 1/4 in. (6 mm) Outside Diameter Tubing

0.25 60% Coverage	0.25 80% Coverage	120V Version Code Number	Amperes	240V Version Code Number	Amperes
10.20	8.04	005120500	0.10	N/A	N/A
14.45	11.39	005170500	0.14	N/A	N/A
18.70	14.74	005220500	0.18	005220501	0.09
23.80	18.76	005280500	0.23	005280501	0.12
30.60	24.12	005360500	0.30	005360501	0.15
39.95	31.49	005470500	0.39	005470501	0.20
51.00	40.20	005600502	0.50	005600503	0.25
63.75	50.25	005750500	0.63	005750501	0.31
76.50	60.30	005900500	0.75	005900501	0.38

### STRETCH-TO-LENGTH Heater Ranges - 1/2 in. (13 mm) Outside Diameter Tubing

0.50 60% Coverage	0.50 80% Coverage	120V Version Code Number	Amperes	240V Version Code Number	Amperes
10.20	6.63	005170501	0.14	N/A	N/A
15.00	9.75	005250501	0.21	N/A	N/A
21.00	13.65	005350502	0.29	005350503	0.15
29.40	19.11	005490502	0.41	005490503	0.20
38.40	24.96	005640502	0.53	005640503	0.27
47.40	30.81	005790502	0.66	005790503	0.33
59.40	38.61	005990502	0.82	005990503	0.41
73.80	49.97	005F103502	1.02	005F103503	0.51
92.40	60.06	005F128502	1.28	005F128503	0.64

### 1/4 in. (6 mm) Outside Diameter Tubing Insulators

1/4 in. (6.4 mm) Heater I.D. x Length	Description	Code Number
18 in. (457 mm)	Straight insulator	012180500
36 in. (914 mm)	Straight insulator	012360500
Elbow	90° union elbow insulator	012020500
Tee	Union tee insulator	012030500
	VCR fitting	015030500

### 1/2 in. (13 mm) Outside Diameter Tubing Insulators

1/2 in. (13 mm) Heater I.D. x Length	Description	Code Number
18 in. (457 mm)	Straight insulator	024180500
36 in. (914 mm)	Straight insulator	024360500
Elbow	90° union elbow insulator	020024500
Tee	Union tee insulator	024030500
	VCR fitting	015042500

### 3/8 in. (9.5 mm) Outside Diameter Tubing Insulators

3/8 in. (9.5 mm) Heater I.D. x Length	Description	Code Number
18 in. (457 mm)	Straight insulator	016180500
36 in. (914 mm)	Straight insulator	016360500
Elbow	90° union elbow insulator	016020500
Tee	Union tee insulator	016030501
	VCR fitting	015042500

### Extensions

Description	Code Number
3 ft (914 mm)	A000136
6 ft (1829 mm)	A000137
10 ft (3048 mm)	A000138

### Accessories

Description	Code Number
Power cord 6 ft 18-2 SJ	Z5302-2
Wiring Y connector - 1F-2M	Z5303-2
Wiring Y connector - 1M-2F	Z6333
Female termination plug	Z5309-2
Male termination plug	Z6332
12 in. 24 ga. Type JT/C w/mini plug	Z5786
12 in. 24 ga. Type KT/C w/mini plug	Z5639
Gender changer - M-F	Z6334
Gender changer - F-M	Z6335
6 in. power extension	Z6374
10 ft Type J T/C extension	Z6271

**Note:** All power connectors use AMP Mate-N-Lok®

Watlow® and STRETCH-TO-LENGTH® are registered trademarks of Watlow Electric Manufacturing Company.  
UL® is a registered trademark of Underwriter's Laboratories, Inc.  
Mate-N-Lok® is a registered trademark of TYCO ELECTRONICS AMP Corporation.

*Powered by Possibility*

To be automatically connected to the nearest  
North American Technical Sales Office:  
**1-800-WATLOW2 • www.watlow.com**  
**inquiry@watlow.com**

#### International Technical Sales Offices:

<b>Austria</b>	+43 6244 20129 0	<b>India</b>	+91 40 6661 2700
<b>China</b>	+86 21 3532 8532	<b>Italy</b>	+39 02 458 8841
<b>France</b>	+33 1 41 32 79 70	<b>Japan</b>	+81 3 3518 6630
<b>Germany</b>	+49 7253 9400 0	<b>Korea</b>	+82 2 2169 2600

<b>Mexico</b>	+52 442 256 2200
<b>Singapore</b>	+65 6773 9488
<b>Spain</b>	+34 91 675 1292
<b>Taiwan</b>	+886 7 288 5168
<b>UK</b>	+44 115 964 0777