

Flexible Heaters



Line Heating

STRETCH-TO-LENGTH® Heaters

During semiconductor processes, condensation of many critical gases occurs due to a phase shift at low temperatures. Burning of gases occurs if the delivery line is too hot. High or low temperature conditions may result in undesirable particulates, costly device defects and tool maintenance.

The Watlow STRETCH-TO-LENGTH® (S-T-L) gas line heater system is an easy-to-assemble temperature solution that delivers superior performance compared to heat tape. The heater's preformed construction allows an engineer to easily wrap it around the delivery line. It provides consistent heater/gas line contact to improve temperature uniformity. Due to its flexibility, the S-T-L gas line heater can compensate for variable component sizes to reduce the potential for hot and cold spots.

The S-T-L system includes a 2 W/in² S-T-L heater and silicone foam rubber insulation.

Features and Benefits

Easy to install two-part system

- Conveniently fits most gas line configurations

Flexible heater design

- 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

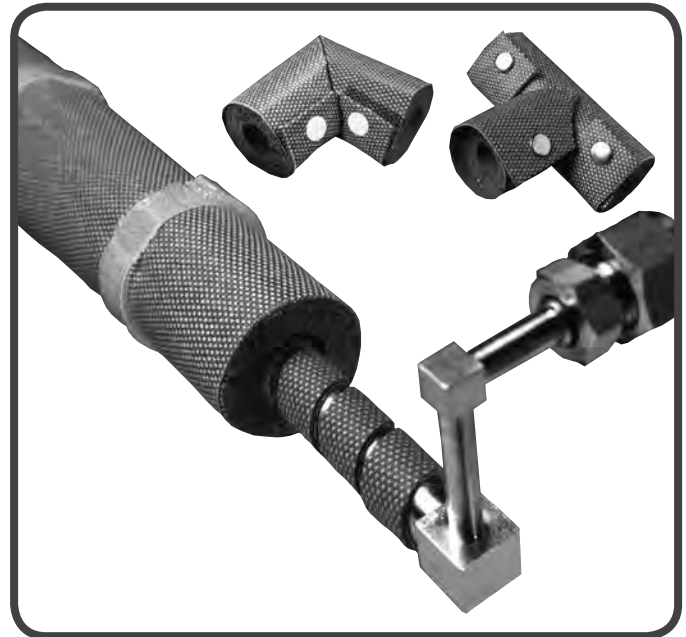
Agency Certification, Recognition Compliance and Approvals

- Semi S2-93 compatible with a high-limit thermocouple and controller
- UL® recognized for U.S. safety standards

Typical Applications

Gas delivery lines

- Boron trichloride, BCl₃
- Chlorine trifluoride, ClF₃
- Dichlorosilane, (DCS), SiH₂Cl₂
- Tetra ethyl orthosilicate, TEOS
- Tungsten hexafluoride, WF₆
- Process gas line qualification



Specifications

- Heater material is reinforced silicone rubber fabric
 - Color:
 - Insulation and outer jacket – orange
 - Heater – orange
- Cleanroom strap fasteners
- Voltage: 120 and 240VAC
- Max. operating temperature: 392°F (200°C)
- Heater watt density: 2 W/in² (0.31 W/cm²) – 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)
- Insulation:
 - 3/8 in. (9.5 mm) wall, silicone rubber, closed cell sponge
 - Jacket material is reinforced silicone rubber fabric

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STRETCH-TO-LENGTH Heaters (Continued)

S-T-L heaters are specified by their straight length. For actual applications, an engineer can wrap the heaters to achieve an optimum temperature profile. Coverage lengths of approximately 60 and 80 percent on ¼ in. (6 mm) and ½ in. (13 mm) diameter tubes are provided

as a guide to select heater lengths for actual gas line dimensions. A gas line with 100 percent coverage is approximately 2 W/in², 80 percent coverage 1.6 W/in² or 60 percent coverage 1.2 W/in².

S-T-L Heater Ranges - ¼ in. (6 mm) O.D. Tubing

0.25 60% Coverage	0.25 80% Coverage	120V Version Part Number	Amperes	240V Version Part 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

S-T-L Heater Ranges - ½ in. (13 mm) O.D. Tubing

0.50 60% Coverage	0.50 80% Coverage	120V Version Part Number	Amperes	240V Version Part 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

¼ in. (6 mm) O.D. Tubing Insulators

¼ in. (6 mm) Heater I.D. x Length	Description	Part 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	VCR fitting	015030500

½ in. (13 mm) O.D. Tubing Insulators

½ in. (13 mm) Heater I.D. x Length	Description	Part 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	VCR fitting	015042500

¾ in. (9.5 mm) O.D. Tubing Insulators

¾ in. (9.5 mm) Heater I.D. x Length	Description	Part 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	VCR fitting	015042500

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Power Extensions

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

Accessories

Description	Part 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 J T/C w/mini plug	Z5786
12 in. 24 Ga. Type K T/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™