

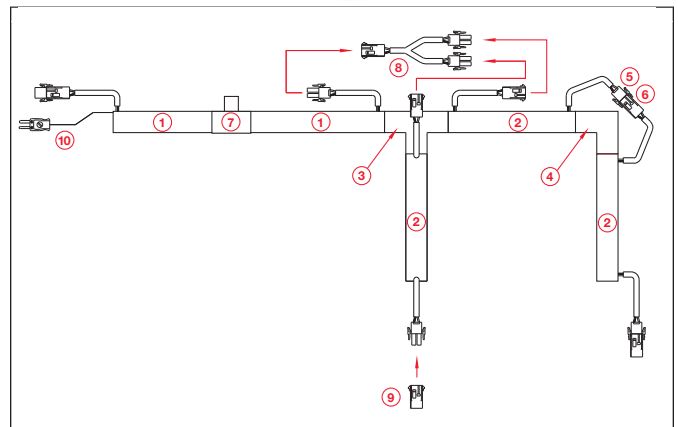
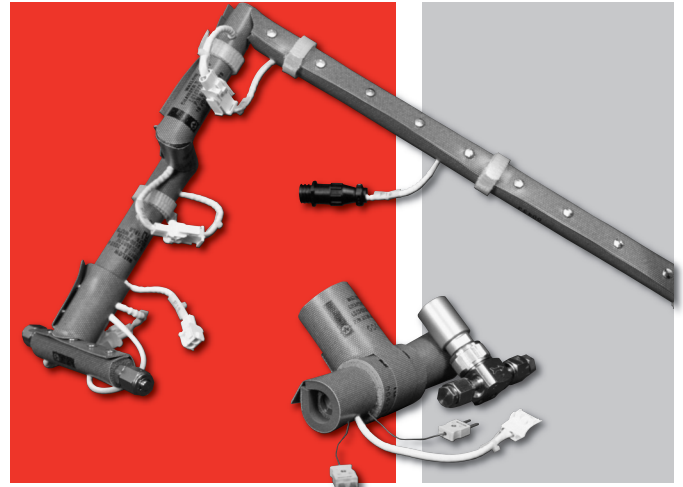
Modular Gas Line Heaters

High Uniformity Gas Delivery Line Heaters

Watlow's high uniformity gas delivery line heaters prevent condensation of specific gases that condense or liquefy due to a phase shift at low temperatures. These gases include Tetraethyl orthosilicate (TEOS), Boron trichloride (BCl_3), Aluminum Chloride (AlCl_3), Chlorine trifluoride (ClF_3) and Dichlorosilane (DCS). In semiconductor processes, condensation occurs in the gas line and puddles in the shower head before being injected into the vacuum chamber. A substantial number of wafer defects will occur if liquefied gases are injected into the vacuum chamber. Uniform heating of the lines prevents condensation. TEOS lines are typically heated above 194°F (90°C) and BCl_3 above 86°F (30°C), depending on pressure and flow rate. The optimum line temperature will vary based on the process parameters.

Specifications

- Watt density of 2.5 W/in² (0.4 W/cm²) on gas line outside diameter
- UL[®] recognized for U.S. and Canadian safety standards
- Heaters and insulators meet UL94-HB flammability requirements
- Insulated straight fillers for 100 percent line coverage; elbows and tees are trim-to-fit to proper length
- Inside diameter available: ¼, ⅜, ½, ¾ in. (6, 9.5, 13, 19 mm)
- 120V standard, other voltages available
- Small metal snaps
- ⅝ in. (9.5 mm) wall, silicone rubber, closed cell sponge



Upstream Gas Line Heater Assembly

- ① 9 in. (229 mm) heater with thermocouple. Heater leads have a male plug on one end and a female cap on the other end. Heater materials are UL[®] rated to 392°F (200°C)
- ② 6 in. (152 mm) heater, heater leads, see ① above on drawing
- ③ Union tee insulator
- ④ 90° union elbow insulator
- ⑤ Male plug, AMP Mate-N-Lok[™] connector part number 1-480698-0; with sockets AMP Mate-N-Lok[®] connector part number 350689-1
- ⑥ Female cap, AMP MATE-N-LOK[™] connector part number 1-480699-0; with pins AMP Mate-N-Lok[®] connector part number 350690-1
- ⑦ Valve or regulator
- ⑧ Y connector: one female cap on one end, two male plugs on the other end
- ⑨ Dead plug (sealed)
- ⑩ Type J thermocouple w/ male mini-plug (optional)

 **WATLOW**[®]
Better Thermal Solutions...*Faster*

COL-MGL-0311

Gas Line Diameter

¼ in. (6 mm) O.D. Tubing

¼ in. (6 mm) Heater I.D. x Length in. (mm)		Description	Volts	Watts	Amperes	Code Number		
						Without T/C RAPID SHIP	With Type J T/C RAPID SHIP	With Type K T/C Standard
6	(152)	Heated straight	120	12	0.10	008060C1	008060C1A	008060C1K
9	(229)	Heated straight	120	18	0.15	008090C1	008090C1A	008090C1K
12	(305)	Heated straight	120	24	0.20	008120C1	008120C1A	008120C1K
18	(457)	Heated straight	120	36	0.30	008180C1	008180C1A	008180C1K
24	(610)	Heated straight	120	48	0.40	008240C1	008240C1A	008240C1K
36	(914)	Heated straight	120	72	0.60	008360C1	008360C1A	008360C1K
18	(457)	Straight insulator	N/A	Trim-to-fit	Insulator	008180C0		
* Elbow		90° union elbow insulator	N/A	Trim-to-fit	Insulator	008020C0		
* Tee		Union tee insulator	N/A	Trim-to-fit	Insulator	008030C0		

⅜ in. (9.53 mm) O.D. Tubing

¼ in. (6 mm) Heater I.D. x Length in. (mm)		Description	Volts	Watts	Amperes	Code Number		
						Without T/C Standard	With Type J T/C Standard	With Type K T/C Standard
6	(152)	Heated straight	120	18	0.15	012060C1	012060C1A	012060C1K
9	(229)	Heated straight	120	27	0.23	012090C1	012090C1A	012090C1K
12	(305)	Heated straight	120	36	0.30	012120C1	012120C1A	012120C1K
18	(457)	Heated straight	120	54	0.45	012180C1	012180C1A	012180C1K
24	(610)	Heated straight	120	71	0.60	012240C1	012240C1A	012240C1K
36	(914)	Heated straight	120	107	0.90	012360C1	012360C1A	012360C1K
18	(457)	Straight insulator	N/A	Trim-to-fit	Insulator	012180C0		
* Elbow		90° union elbow insulator	N/A	Trim-to-fit	Insulator	012020C0		
* Tee		Union tee insulator	N/A	Trim-to-fit	Insulator	012030C0		

½ in. (13 mm) O.D. Tubing

¼ in. (6 mm) Heater I.D. x Length in. (mm)		Description	Volts	Watts	Amperes	Code Number		
						Without T/C RAPID SHIP	With Type J T/C RAPID SHIP	With Type K T/C Standard
6	(152)	Heated straight	120	24	0.20	016060C1	016060C1A	016060C1K
9	(229)	Heated straight	120	36	0.30	016090C1	016090C1A	016090C1K
12	(305)	Heated straight	120	48	0.40	016120C1	016120C1A	016120C1K
18	(457)	Heated straight	120	72	0.60	016180C1	016180C1A	016180C1K
24	(610)	Heated straight	120	96	0.80	016240C1	016240C1A	016240C1K
36	(914)	Heated straight	120	144	1.20	016360C1	016360C1A	016360C1K
18	(457)	Straight insulator	N/A	Trim-to-fit	Insulator	016180C0		
* Elbow		90° union elbow insulator	N/A	Trim-to-fit	Insulator	016020C0		
* Tee		Union tee insulator	N/A	Trim-to-fit	Insulator	016030C0		

* For use on Micro-Fit® weld fittings.

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