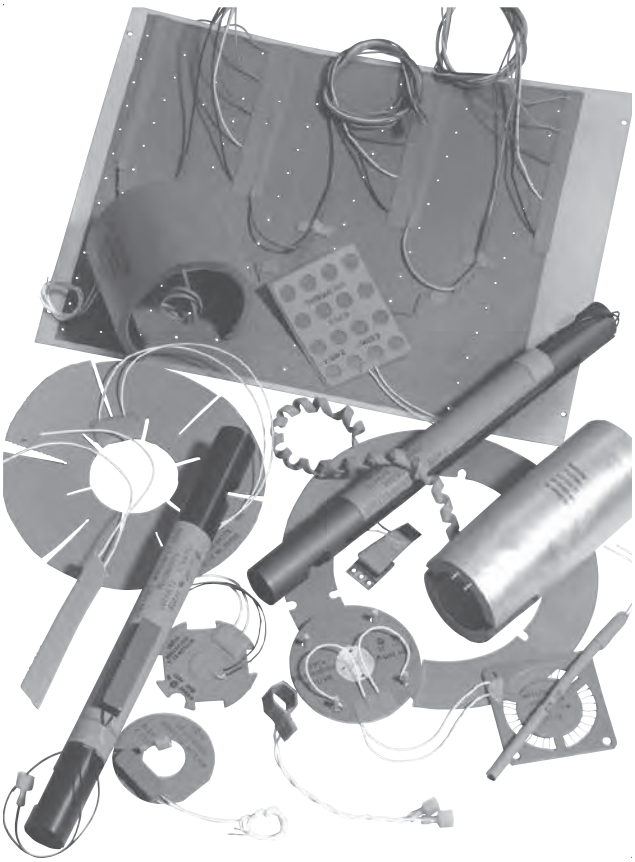
Flexible Heaters

Silicone Rubber Heaters

Rugged, yet thin, lightweight and flexible—use of Watlow® silicone rubber heaters is limited only by the imagination. Heat can be put exactly where it is needed to improve heat transfer, speed warm ups and decrease wattage requirements in an application process.

Fiberglass-reinforced silicone rubber provides dimensional stability without sacrificing flexibility. Because very little material separates the element from the part, heat transfe is rapid and efficient.



Performance Capabilities

- Operating temperatures up to 500°F (260°C)
- Watt densities up to 80 W/in^2 (12.5 W/cm^2), dependent upon application temperature
- Wire-wound element thickness — 0.055 in. (1.4 mm)
- UR®, cUR®, VDE and CE recognitions are available on many designs up to 428°F (220°C)

Features and Benefits

Designed to the exact shape and size needed
- Conforms to component and/or equipment

More than 80 designs available immediately from stock
- Reduces downtime

Constructed with wire-wound or etched foil elements
- Enables a thin, lightweight heater
- Provides the desired flexibility for many dynamic applications
- Delivers low mass and easily repeatable distributed watt densities

Moisture and chemical-resistant silicone rubber material
- Provides longer heater life

Vulcanizing adhesives or fasteners
- Allows heaters to be easily bonded to parts

Typical Applications

- Semiconductor processing equipment
- Freeze protection and condensation prevention for many types of instrumentation and equipment
- Medical equipment such as blood analyzers and test tube heaters
- Computer peripherals such as laser printers
- Curing of plastic laminates
- Photo processing equipment

Silicone Rubber Heaters

Wire-Wound Elements

Width in.	Width (mm)	Length in.	Length (mm)	Watts	120VAC Part Number	120/240VAC Part Number
1	(25)	2	(51)	10	**010020C1***	
		3	(76)	15	**010030C1***	
		4	(102)	20	**010040C1***	
		5	(127)	25	**010050C1***	
		5	(127)	6.25/25		**010050C2***
		10	(254)	50	**010100C1**	
		10	(254)	12.50/50		**010100C2***
		15	(381)	75	**010150C1**	
		15	(381)	18.75/75		**010150C2**
		20	(508)	100	**010200C1**	
		20	(508)	25/100		**010200C2**
		25	(635)	125	**010250C1**	
		30	(762)	150	**010300C1**	
		35	(889)	175	**010350C1**	
		40	(1016)	200	**010400C1**	
		80	(2032)	400	**010800C1**	
		120	(3048)	600	**010F10C1**	
2	(51)	2	(51)	20	**020020C1***	
		5	(127)	50	**020050C1**	
		5	(127)	12.50/50		**020050C2***
		10	(254)	100	**020100C1**	
		10	(254)	25/100		**020100C2**
		15	(381)	150	**020150C1**	
		15	(381)	37.50/150		**020150C2**
		20	(508)	200	**020200C1**	
		20	(508)	50/200		**020200C2**
		25	(635)	250	**020250C1**	
		30	(762)	300	**020300C1**	
		35	(889)	350	**020350C1**	
		40	(1016)	400	**020400C1**	
3	(76)	3	(76)	45	**030030C1**	
		5	(127)	75	**030050C1**	
		5	(127)	18.75/75		**030050C2**
		10	(254)	150	**030100C1**	
		10	(254)	37.50/150		**030100C2**
		15	(381)	225	**030150C1**	
		15	(381)	56.25/225		**030150C2**
		20	(508)	300	**030200C1**	
		20	(508)	75/300		**030200C2**
		25	(635)	375	**030250C1**	
		30	(762)	450	**030300C1**	
		35	(889)	525	**030350C1**	
		40	(1016)	600	**030400C1**	

CONTINUED

*** Due to their high resistance, these heaters are not recommended for curved or flexing applications.**

Notes:

- Thickness 0.055 in. (1.4 mm)
- UL® component recognition available
- Silicone rubber wire-wound elements rated at 5 W/in^2 (0.78 W/cm^2)

Silicone Rubber Heaters

Wire-Wound Elements *(Continued)*

Width in.	Width (mm)	Length in.	Length (mm)	Watts	120VAC Part Number	120/240VAC Part Number
4	(102)	4	(102)	80	**040040C1**	
		5	(127)	100	**040050C1**	
		5	(127)	25/100		**040050C2**
		10	(254)	200	**040100C1**	
		10	(254)	50/200		**040100C2**
		15	(381)	300	**040150C1**	
		15	(381)	75/300		**040150C2**
		20	(508)	400	**040200C1**	
		20	(508)	100/400		**040200C2**
		25	(635)	500	**040250C1**	
		30	(762)	600	**040300C1**	
		35	(889)	700	**040350C1**	
		40	(1016)	800	**040400C1**	
5	(127)	5	(127)	125	**050050C1**	
		5	(127)	31.25/125		**050050C2**
		10	(254)	250	**050100C1**	
		10	(254)	62.50/250		**050100C2**
		15	(381)	375	**050150C1**	
		15	(381)	9.38/375		**050150C2**
		20	(508)	500	**050200C1**	
		20	(508)	125/500		**050200C2**
		25	(635)	625	**050250C1**	
		30	(762)	750	**050300C1**	
		35	(889)	875	**050350C1**	
		40	(1016)	1000	**050400C1**	
6	(152)	5	(127)	150	**060050C1**	
		5	(127)	37.50/150		**060050C2**
		10	(254)	300	**060100C1**	
		10	(254)	75/300		**060100C2**
		15	(381)	450	**060150C1**	
		15	(381)	112.50/450		**060150C2**
		20	(508)	600	**060200C1**	
		20	(508)	150/600		**060200C2**
		25	(635)	750	**060250C1**	
		30	(762)	900	**060300C1**	
		35	(889)	1050	**060350C1**	
		40	(1016)	1200	**060400C1**	

Silicone Rubber Heaters

Wire-Wound Elements Configured Options

To order, complete the part number with the information below:

Wire Wound

0_____-____

Modification Options
0 = None
A = PSAS bottom
B = PSAS top
E = With plate, heater on side opposite flange
F = With plate, heater on flange side
G = Flaps + grommets
H = Flaps + boot hooks
J = Flaps + latch fasteners
K = PSAS and low loss
L = Low loss
M = Low loss + flaps + grommets
N = Low loss + flaps + boot hooks
P = Low loss + flaps + latch fasteners
R = 1/16 in. sponge
S = 1/8 in. sponge
T = 1/4 in. sponge
U = 3/8 in. sponge
V = 1/2 in. sponge
W = PSAS + 1/16 in. sponge
Y = PSAS + 1/8 in. sponge
1 = PSAS + 1/4 in. sponge
2 = PSAS + 3/8 in. sponge
3 = PSAS + 1/2 in. sponge

Sensors

Type	LOC	WIR
0 = None		
L = T10	STD	STD
M = T10	STD	ALT
N = T10	ALT	STD
P = T10	ALT	ALT
R = T207	STD	STD
S = T207	STD	ALT
T = T207	ALT	STD
U = T207	ALT	ALT
V = T207E	On heater	STD
W = T207E	Remote	STD
4 = JSTD	STD	STD
6 = JALT	STD	STD
7 = KSTD	STD	STD

- For thermostats, standard location is as shown in catalog; standard wiring is integral or in series with the heater, alternate location is rotated parallel with heater width, alternate wiring is separate leads for pilot control.
- For thermocouples, Type J standard is PFA insulation, Type J alternate is fiberglass insulation, Type K standard is fiberglass insulation.

T10 Set °F*
0 = None
A = 125
B = 150
E = 175
F = 200
G = 225
H = 250
J = 275
K = 300

T207 Set °F*
0 = None
1 = 40/55
2 = 60/75
3 = 95/110
4 = 145/160

T/C Length
0 = None
A = 8 in.
B = 12 in.
E = 18 in.
F = 24 in.
G = 30 in.
H = 36 in.
J = 40 in.
K = 4 ft
L = 5 ft
M = 6 ft
N = 7 ft
P = 8 ft
R = 9 ft
S = 10 ft
T = 12 ft
U = 15 ft
V = 18 ft
W = 20 ft
Y = 22 ft
1 = 25 ft
2 = 30 ft

* For all thermostats the heater must be a 2 in. (51 mm) min. width and 5 in. (127 mm) min. length.

Lead Insulation
0 = None
1 = 1180 UL® R/C
2 = 1180 C-UL® R/C
3 = 3133 22 Ga.
6 = 1199 CSA
7 = HPN
8 = 6 ft HPN set
9 = Type E PTFE
A = 1180VDE*
B = 1199VDE*
C = Silicone leads w/waterproof cap
E = SJO cord
F = 6 ft SJO set

* 1180VDE denotes a C-UL® heater plus a VDE stamp.

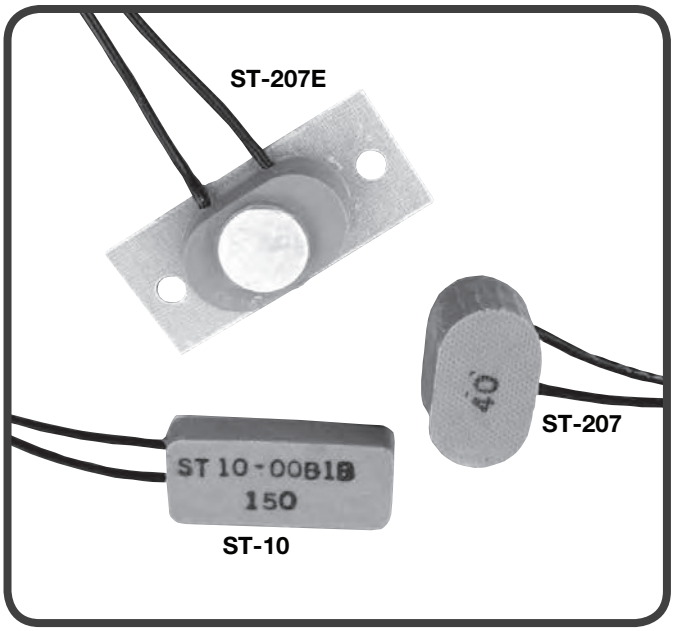
Lead Length*
A = 8 in.
B = 12 in.
E = 18 in.
F = 24 in.
G = 30 in.
H = 36 in.
J = 40 in.
K = 4 ft
L = 5 ft
M = 6 ft
N = 7 ft
P = 8 ft
R = 9 ft
S = 10 ft
T = 12 ft
U = 15 ft
V = 18 ft
W = 20 ft
Y = 22 ft
1 = 25 ft
2 = 30 ft

* Customer specified length must be noted in inches when ordering.

Thermostats and Accessories

ST10 and ST207

Watlow® offers several styles of sensors for use with flexible heaters. These sensors are available as preset or adjustable thermostats, thermocouples, thermistors, RTDs or thermal fuses. They can be integrally mounted (encapsulated in silicone rubber) to sense the temperature of either the part or the heater sheath. The thermostats can also be ordered separate from the heater, allowing direct control of your process temperature, if desired.

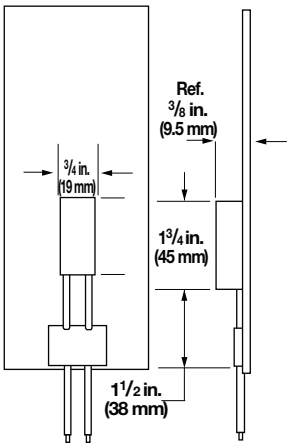


Pre-Set Thermostats

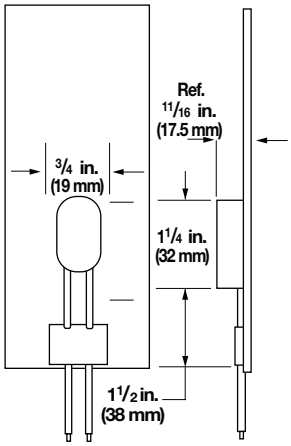
Several styles of non-adjustable, pre-set thermostats are available from Watlow. Thermostats separate from the heater are encapsulated in silicone rubber, and are available with standard 12 in. (305 mm) leads unless otherwise specified.

Thermocouples, thermistors, RTDs and thermal fuses are usually mounted to the heater under a vulcanized protective cap of silicone rubber sheath material. This drawing shows a typical mounting style for a thermocouple.

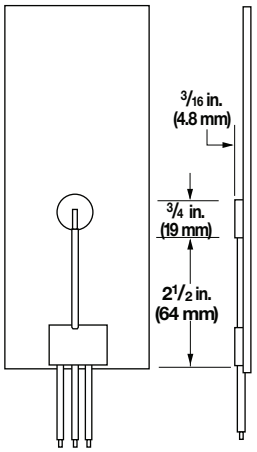
Note: Precise part temperature control with preset thermostats requires prototyping and field testing.



T-10



T-207



Thermocouple

Pre-Set Thermostats (Non-Adjustable)

Thermostat Model	Maximum Watts	Volts AC	Temperature Settings Available °F (°C)	Agency Approvals		
				UR	cUR	VDE
T-10	600/960	120/240	125-300±10 (50-149±5)	yes	yes	yes
T-207	1500	120/240	40/55±8 (4/13±4.4)	yes	yes	yes
	1500	120/240	60/75±8 (16/24±4.4)	yes	yes	yes
	1500	120/240	95/110±8 (35/43±4.4)	yes	yes	yes
	1500	120/240	145/160±8 (63/71±4.4)	yes	yes	yes

Notes:

- When ordering a pre-set thermostat separate from the heater, simply add the prefix **S** to the model number. (Example: ST-10) See next page.
- Snap action preset temperatures on the T-207 are close/open settings.
- T-10 thermostats are manufactured for specific preset temperatures. Available in 25°F increments.
- Other temperature ranges and voltages are available on special order. Minimum quantities apply, contact your Watlow representative before ordering.