

Construction Characteristics

The ideal solution for applications that require high watt densities (Watt/in²) and/or high operating temperatures.

Band heaters are capable of temperatures up to 760°C (1400°F) and watt densities up to 23.25 Watt/cm² (150 Watt/in²). The recommended maximum watt density for a specific application will depend on the heater size and its operating temperature.

Specially formulated mineral insulated tape providing excellent thermal conductivity and dielectric strength is used to insulate the nickel chrome resistance wire from the stainless steel sheath. The heater assembly is formed under pressure to a precise diameter with a thin low-mass cross section, assuring fast heat-up rates and reduced cycle times.



Unbreakable Power Screw Terminals

Only these band heaters offer this unique screw terminal design. The stainless steel power screw terminals are resistant to over-torquing.



Superior Clamping Mechanism

The clamping brackets are formed from the outer sheath of the heater, providing a unique one-piece built-in construction strap. The clamping power is generated through barrel nuts and socket head screws, which as an integral part of the built-in strap, provide superior clamping force for maximum performance and optimal heater life.



Innovative Lead Terminations

Smaller size band heaters are powered-up by means of lead wire terminations. To insure a resilient connection that will withstand abrasion, mechanical abuse and keep contaminants out of the transition area, a specially designed stainless steel transition cap with a built-in strain relief was developed. The cap is welded to the sheath and the cavity is filled with insulating cement, sealing the band heater from contaminants.



Unique Igloo Ceramic Covers

To eliminate exposed wiring/screw terminals on band heater installations, a 90° double port ceramic cap was designed. This unique and exclusive Igloo ceramic terminal insulator fits over the entire terminal and lug, leaving no exposed wiring.



Specifications & Tolerances

If non-standard widths or tighter tolerances are required, contact OMEGA.

Performance Ratings

Maximum Temperature: 760°C (1400°F)

Nominal Watt Density:

Nozzle Bands, Under 3" Diameter: 4.7 to 15.5 Watt/cm²
(30 to 100 Watt/in²)

Barrel Bands, 3" and Greater in Diameter:
3.1 to 10.9 Watt/cm² (20 to 70 Watt/in²)

Maximum Watt Density: 23 Watt/cm² (150 Watt/in²)
dependent on heater size, operating temperature and termination

Electrical Ratings

Maximum Voltage: 480 Vac per termination

Dual Voltage: Available depending on heater configuration

Maximum Amperage:

Lead Wire Termination: 10A

Screw Terminations: 8-32UNF—20A, 10-32UNF—25A

Resistance Tolerance: +10%, -5%

Wattage Tolerance: +5%, -10%

Physical Size Construction Limitations

Nominal Gap—Built-In Bracket:

Less than 44 mm (1¾") Diameter: 6 mm (¼")

44 to 51 mm (1¾ to 2") Diameter: 8 mm (5/16")

51 to 127 mm (2 to 5") Diameter: 10 mm (3/8")

127 mm to 0.46 m (5 to 18") Diameter: 13 mm (½")

Greater than 0.46 m (18") Diameter: 19 mm (¾")

If a larger gap is required for probes or thermocouples, specify when ordering.

Maximum Inside Diameters:

One-Piece: 355.6 mm (14")*

Expandable: 355.6 mm (14")*

Two-Piece: 635.0 mm (25")

Over 635.0 mm (25") will require multiple segments.
Contact OMEGA.

* Note: OMEGA recommends two-piece construction for heaters 10" ID and greater.

Standard Widths: 25.4 to 203.2 mm (1 to 8")

Width Tolerance: 2.4 mm (±3/32")

Exposed electrical wiring on band heater installations is a violation of Electrical Safety Codes including O.S.H.A.

Diameter/Width Limitations

Width		One-Piece Construction Inside Diameter		Expandable Construction Inside Diameter		Two-Piece Construction Inside Diameter	
in	mm	in	mm	in	mm	in	mm
1	25.4	1 to 10	25.4 to 254.0	N/A	N/A	3 to 25	76.2 to 635.0
1½	38.1	1 to 14	25.4 to 355.6	2½ to 14	63.5 to 355.6	3 to 25	76.2 to 635.0
2	50.8	1½ to 14	38.1 to 355.6	2½ to 14	63.5 to 355.6	3 to 25	76.2 to 635.0
2½	63.5	1½ to 14	38.1 to 355.6	2½ to 14	63.5 to 355.6	3 to 25	76.2 to 635.0
3	76.2	1½ to 14	38.1 to 355.6	2½ to 14	63.5 to 355.6	3 to 25	76.2 to 635.0
3½	88.9	1¾ to 14	44.5 to 355.6	2½ to 14	63.5 to 355.6	3 to 25	76.2 to 635.0
4	101.6	2 to 14	50.8 to 355.6	2½ to 14	63.5 to 355.6	3 to 25	76.2 to 635.0
4½	114.3	2¼ to 14	57.2 to 355.6	2½ to 14	63.5 to 355.6	3 to 25	76.2 to 635.0
5	127.0	2½ to 14	63.5 to 355.6	2½ to 14	63.5 to 355.6	3 to 25	76.2 to 635.0
5½	139.7	2¾ to 14	69.9 to 355.6	3 to 14	63.5 to 355.6	3 to 25	76.2 to 635.0
6	152.4	3 to 14	76.2 to 355.6	3 to 14	76.2 to 355.6	3 to 25	76.2 to 635.0
6½	165.1	3¼ to 14	82.6 to 355.6	3¼ to 14	82.6 to 355.6	3¼ to 25	82.6 to 635.0
7	177.8	3½ to 14	88.9 to 355.6	3½ to 14	88.9 to 355.6	3½ to 25	88.9 to 635.0
7½	190.5	3¾ to 14	95.3 to 355.6	3¾ to 14	95.3 to 355.6	3¾ to 25	95.3 to 635.0
8	203.2	4 to 14	101.6 to 355.6	4 to 14	101.6 to 355.6	4 to 25	101.6 to 635.0

Additional Limitations

- For heaters less than 102 mm (4") in diameter, the maximum width is twice the diameter.
- Heaters with standard brackets are available from 25 to 203 mm (1 to 8" wide, while heaters with low profile brackets are available from 25 to 152 mm (1 to 6") wide.
- 25 mm (1") diameter heaters are only available in 25 to 38 mm (1 and 1½") widths.
- For heaters from 254 mm (10") diameter up to 0.6 m (25") diameter, OMEGA recommends using 2-piece construction for superior clamping. Over 0.6 m (25") diameter, 3 or 4 segments are recommended.
- Combinations of some minimum and maximum variations may not be available. Contact OMEGA with your special requirements.
- Post terminals are only available on heaters greater than 64 mm (2½") in diameter and 38 mm (1½") in width.

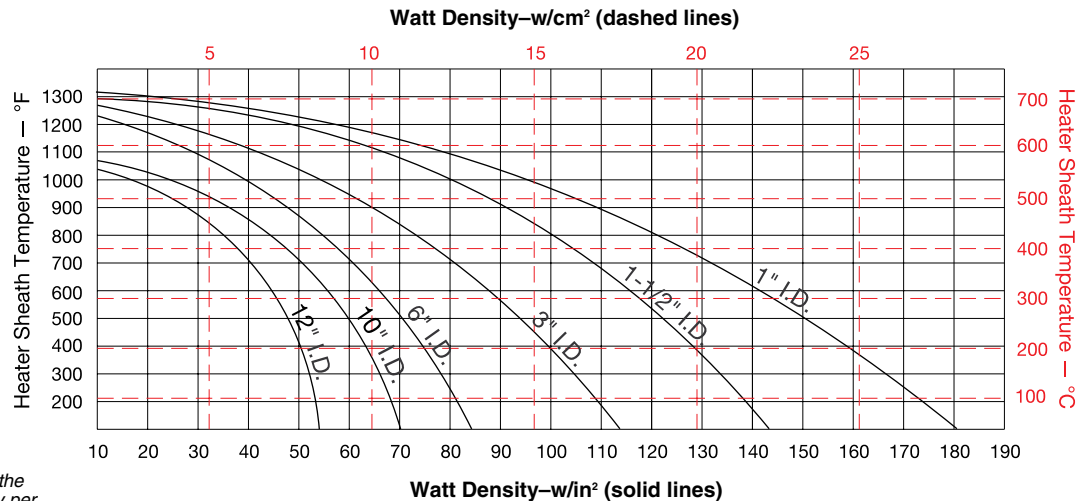
Maximum Watt Densities

Maximum Allowable Watt Density

The chart displays the maximum Watt Density curves for various diameter heaters. Use this chart when determining the appropriate wattage value for your chosen heater.

Be aware that certain factors will require you to derate the watt density (Watt/in²) of your heater selection.

CAUTION: Failure to adhere to the maximum allowable watt density per heater size will result in poor operating life.



Calculating Maximum Watt Density

Factors to be taken into consideration:

- Type of controls
- Voltage variations
- Machine cycling rate
- Type of resin being processed
- Coefficient of thermal expansion and conductivity of the cylinder
- Designing a heater that closely matches the wattage requirement will decrease the frequency of cycling and temperature overshoot, thereby increasing the life of the heater

Once these factors have been established, proceed with the following steps:

- Determine the maximum operating temperature.
- Calculate the total wattage required to obtain the maximum operating temperature.
- Determine the quantity and size of the heater bands to be used. Due to clamping concerns, 51 through 76 mm (2" through 3") wide band heaters have long proven to be the most efficient and reliable in most cylindrical heating applications.
- Determine individual band heater wattage by dividing the total required wattage by the quantity of band heaters selected.

- Determine the band heater's heated area by subtracting unheated (cold) areas created by screw terminals, gaps, holes, and cutouts.

Nominal Unheated Areas

Construction Style	Cold Area to Subtract
One-piece band	1" x width
One-piece expandable band	1 1/2" x width
Two-piece band	2" x width

For each hole or cutout add to the cold area from the Table the (Hole size + 1/2") x heater width. This is total cold area to use in the following formula to calculate the heater watt density.

Watt Density Formula

$$\text{Watt Density} = \frac{\text{Wattage}}{(3.14 \times \text{Band ID} \times \text{Band Width}) - (\text{Cold Area})}$$

(Watt/in²)

- Check in the above graph that the calculated watt density does not exceed the maximum recommended watt density. Locate the maximum cylinder temperature required on the left-hand side of the graph, follow the horizontal line until it intersects with the line of the band heater being used, and read directly down to obtain the maximum recommended watt density (watt/in²).
- If the calculated watt density is higher than the recommended value, it must be corrected or it will cause poor heater life. This can be accomplished by using more band heaters or lowering the heater wattage.
- Should you have a problem in selecting the proper band heater or establishing watt density for your application, contact OMEGA.

Correction Factors

For heaters wider than 76.2 mm (3"), reduce maximum allowable watt density from chart by 20%.

For applications using insulating shroud, reduce maximum allowable watt density from chart by 25%.

Do not use insulating blankets if heater temperatures are above 649°C (1200°F). Failure to adhere will result in premature heater failure.

Nozzle Band Heaters Available Through the Terminator Program

Model Numbers listed are for heaters with Type W2 termination—right-angle wire braid leads [305 mm (12") leads, 254 mm (10") stainless steel braid]. Other terminator program terminations and options can also be applied to stock heaters (see To Order chart below).

To Order									
Model No.		Inner Dimension		Width		Watt	Watt Density		Clamping/ Construction
120V	240V	mm	inch	mm	inch		Watt/cm ²	Watt/in ²	
MPP50101	—	25.4	1	25.4	1	150	10.9	70	WB
—	MPP50206	25.4	1	25.4	1	225	16.3	105	WB
MPP50301	MPP50401	25.4	1	38.1	1½	200	9.7	62	WB
—	MPP50601	25.4	1	38.1	1½	250	12.1	78	WB
MPP50701	MPP50801	25.4	1	38.1	1½	300	14.5	93	WB
MPP51101	MPP51202	31.8	1¼	25.4	1	250	13.2	85	WB
—	MPP51401	31.8	1¼	25.4	1	275	14.6	94	WB
MPP51701	—	31.8	1¼	38.1	1½	350	12.4	80	LB
—	MPP51801	31.8	1¼	38.1	1½	350	12.4	80	WB
MPP51901	MPP52001	38.1	1½	25.4	1	200	8.4	54	OB
MPP52301	MPP52402	38.1	1½	25.4	1	300	12.5	81	OB
MPP52501	MPP52602	38.1	1½	38.1	1½	300	8.4	54	LB
—	MPP52903	38.1	1½	38.1	1½	450	12.5	81	LB
—	MPP53001	38.1	1½	50.8	2	300	6.3	40	LB
—	MPP53202	38.1	1½	50.8	2	450	9.4	61	LB
—	MPP53401	38.1	1½	76.2	3	350	4.9	31	LB
—	MPP53501	38.1	1½	76.2	3	500	7.0	45	LB
MPP53801	MPP53901	44.5	1¾	38.1	1½	300	6.9	44	LB
—	MPP54301	44.5	1¾	50.8	2	750	12.9	83	LB
—	MPP54401	44.5	1¾	63.5	2½	550	7.6	49	LB
—	MPP54601	44.5	1¾	76.2	3	1000	11.5	74	LB
MPP54701	MPP54801	50.8	2	25.4	1	350	10.3	66	OB
—	MPP54901	50.8	2	38.1	1½	400	7.8	50	LB
MPP55051	MPP55101	50.8	2	50.8	2	750	11	71	LB
—	MPP55401	57.2	2¼	25.4	1	350	8.9	58	OB
—	MPP55801	57.2	2¼	63.5	2½	1000	10.2	66	LB
MPP55901	MPP56001	63.5	2½	25.4	1	400	9.0	58	OB
—	MPP56101	63.5	2½	38.1	1½	500	7.5	49	LB

Ordering Example: MPP55051, nozzle band heater, 120V, 750 watt, 305 mm (12") leads.

Ordering Information

Order by model number for heaters with Type W2 termination. Call OMEGA for model numbers for heaters with other Terminator Program terminations and options.

Custom Engineered/Manufactured

Heaters can be application specific; therefore for sizes, electrical ratings, terminations and any other design features not listed OMEGA will custom manufacture to your specifications. Consult us with your requirements.



Nozzle Band Heaters

Model numbers listed are for heaters with screw terminal terminations—Type T2 or T3X.
Model numbers for heaters with other terminations will be assigned at time of order.

To Order											
Model No.	Inner Dimension		Width		Watt	Voltage	Watt Density		Style	Clamping/ Construction	Terminal
	mm	inch	mm	inch			Watt/cm ²	Watt/in ²			
MPP00230	76.2	3	38.1	1½	500	240	6.3	41	1 pc	NB	T2
MPP00231	76.2	3	38.1	1½	525	240	6.6	43	1 pc	NB	T2
MPP00232	82.6	3¼	63.5	2½	1100	120	7.4	48	1 pc	NB	T3X
MPP00233	82.6	3¼	63.5	2½	1400	240	9.4	61	1 pc	NB	T3X
MPP00234	88.9	3½	50.8	2	800	240	6.2	40	1 pc	NB	T3X
MPP00235	92.1	3⅝	38.1	1½	650	240/480	8	52	Exp	NE	T2
MPP00236	101.6	4	38.1	1½	625	240/480	6.8	44	Exp	NE	T2
MPP00237	101.6	4	38.1	1½	725	240/480	7.8	51	Exp	NE	T2
MPP00238	101.6	4	38.1	1½	800	240	7.3	47	1 pc	NB	T2
MPP00186	114.3	4½	63.5	2½	1250	240	5.9	38	1 pc	NB	T3X
MPP00239	127	5	38.1	1½	1000	240/480	8.1	52	Exp	NE	T2
MPP00240	133.4	5¼	38.1	1½	600	240/480	4.6	30	Exp	NE	T2
MPP00241	133.4	5¼	38.1	1½	1000	240/480	7.7	49	Exp	NE	T2
MPP00187	133.4	5¼	76.2	3	1700	240/480	6.1	39	Exp	NE	T3X
MPP00242	133.4	5¼	114.3	4½	2400	240/480	5.7	37	Exp	NE	T3X
MPP00243	133.4	5¼	114.3	4½	2700	240/480	6.4	41	Exp	NE	T3X
MPP00244	139.7	5½	38.1	1½	1000	240/480	7.2	47	Exp	NE	T2
MPP00245	139.7	5½	38.1	1½	1300	240/480	9.4	61	Exp	NE	T2
MPP00246	152.4	6	38.1	1½	1000	240/480	6.5	42	Exp	NE	T2
MPP00247	152.4	6	38.1	1½	1400	240/480	9.1	59	Exp	NE	T2
MPP00248	165.1	6½	38.1	1½	1250	240/480	7.4	48	Exp	NE	T2
MPP00249	171.5	6¾	38.1	1½	815	240/480	4.6	30	Exp	NE	T2
MPP00250	171.5	6¾	38.1	1½	1000	240/480	5.7	37	Exp	NE	T2
MPP00188	171.5	6¾	101.6	4	2600	240/480	5.2	34	Exp	NE	T3X
MPP00251	171.5	6¾	127	5	3700	240/480	6	39	Exp	NE	T3X
MPP00189	171.5	6¾	152.4	6	3750	240/480	5	33	Exp	NE	T3X
MPP00252	177.8	7	38.1	1½	1250	240/480	6.8	44	Exp	NE	T2
MPP00253	177.8	7	38.1	1½	1500	240/480	8.2	53	Exp	NE	T2
MPP00254	190.5	7½	38.1	1½	1500	240/480	7.5	49	Exp	NE	T2
MPP00255	193.7	7⅞	76.2	3	1800	240/480	4.2	27	Exp	NE	T3X
MPP00190	193.7	7⅞	114.3	4½	3150	240/480	4.9	32	Exp	NE	T3X
MPP00256	203.2	8	38.1	1½	1250	240/480	5.8	38	Exp	NE	T2
MPP00257	203.2	8	38.1	1½	1600	240/480	7.5	48	Exp	NE	T2
MPP00258	228.6	9	38.1	1½	1500	240/480	6.1	40	Exp	NE	T2
MPP00259	228.6	9	38.1	1½	1750	240/480	7.2	46	Exp	NE	T2
MPP00191	241.3	9½	76.2	3	3000	240/480	5.6	36	Exp	NE	T3X
MPP00260	285.8	11¼	76.2	3	2400	240/480	3.7	24	Exp	NE	T3X
MPP00261	285.8	11¼	127	5	5100	240/480	4.7	31	Exp	NE	T3X

Ordering Example: MPP00232, nozzle band heater, 120V, 1100 watt, screw terminals.