

Ceramic Fiber Products

Ceramic Fiber Heaters

Mounting Methods

Continued

7. MODULE-MOUNT System

The Watlow MODULE-MOUNT system is more than a mounting method. It's a design solution that integrates ceramic fiber heaters with a shell for mounting on an optional steel "space-frame" structure.

Combining the heaters and mounting assembly in one unique package provides ease of installation—and makes the heater more accessible for maintenance—minimizing downtime.



Performance Capabilities

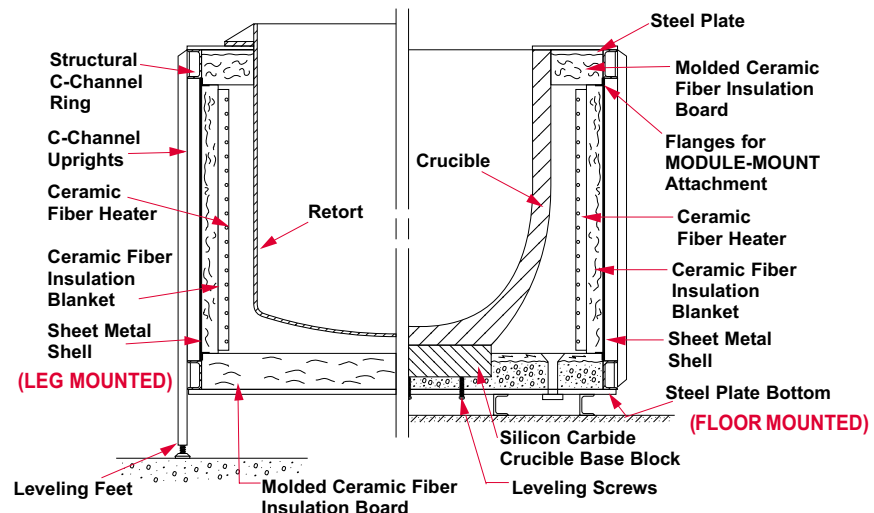
- Holds ceramic fiber heaters capable of operating up to 2200°F (1205°C)
- Watt densities up to 25 W/in² (4 W/cm²)

Features and Benefits

- **"Hot change" feature** allows individual heater replacement without total system shutdown or disassembly.
- **"Spaceframe" structure** can be designed to hold from four to more than 18 heaters. Also accommodates heater sizes from as small as four to 12 inches (102-305 mm) wide and up to 48 inches (1220 mm) tall.
- **Design flexibility** is ideal for **flat and curved** wall heaters. The Spaceframe could be customized to hold any heaters that conform with size, shape and electrical rating limitations.
- **Operates off power line sources** from 120 to 600V~(ac), single or three phase. NEMA1 terminal boxes are provided as standard.

System Designs

The MODULE-MOUNT system examples presented here are for crucible and retort furnaces. Also represented here are floor and leg mounted configurations. Together this represents an overview of how the MODULE-MOUNT system can be used in several typical applications, such as aluminum crucible furnaces, retorts, vacuum tanks, fluidized beds, lead pots and more. The cross-sectional illustration is to help visualize the MODULE-MOUNT system concept.



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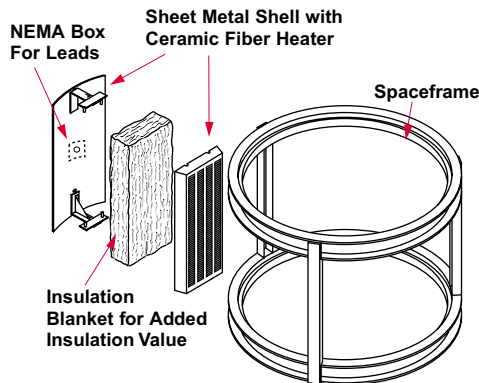
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MODULE-MOUNT System

Construction Details



Flat and arc-section panels, used in one-by-multiple unit arrays. This is the MODULE-MOUNT system.

The MODULE-MOUNT system consists of four basic components: the ceramic fiber heater, additional insulation blanket and a sheet metal shell to hold the heater and insulation blanket. The Spaceframe would be made by the furnace builder to meet custom application design.

The back side of the ceramic fiber heater is slotted to accept cemented-in tubes for connecting the heater to the shell. The reusable shell can be made of the most appropriate sheet metal (aluminized steel is used as the standard) to meet operating environment conditions. Several layers of reusable ceramic fiber blanket are placed between the shell and heater, adding insulation value [typically the heater is two inches (51 mm) thick, with three inches (76 mm) of blanket].

Sizes and Specifications of Representative MODULE-MOUNT System Designs

The specification chart is to help understand the range of systems possible. Basic considerations include: total size, load to be heated, heater configuration and power requirements. The MODULE-MOUNT system is very flexible in terms of both range of sizes and the types of loads that can be heated. Since the number of heaters around an object could range from four to any number, MODULE-MOUNT heaters can be assembled to meet virtually any application. Typically, MODULE-MOUNT assemblies are divisible by three to accommodate three-phase power and, if necessary for vertical

zoning, can be arranged in stacked vertical rings. The MODULE-MOUNT system concept can be applied to virtually any size object for which a suitable Spaceframe can be constructed. Since almost any size object can be accommodated, there are no available standard or stock sizes in the MODULE-MOUNT system. Instead, stock and standard ceramic fiber heaters are available to adapt for use in a MODULE-MOUNT system. Watlow can also provide made-to-order ceramic fiber heaters to meet exact application requirements.

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Typical MODULE-MOUNT System Designs

The chart below lists the different specifications for typical applications of the MODULE-MOUNT heating system.

Load Type	Lead Pot	Fluidized Bed	Retort	Aluminum Crucible*	Aluminum Crucible*
Load Weight lbs (kg)	1000 (455)	400 (180)	1100 (500)	620 (280)	2400 (1090)
Load Size Top O.D. in (mm)	14 (355)	22 (560)	28 (710)	28.25 (715)	40 (1015)
Load Size Height in (mm)	20 (510)	28 (710)	48 (1220)	22.75 (580)	27.5 (700)
Total System Power kW	16.0	38.7	60.0	46.8	84.0
Number of Heaters	6	9	9	12	12
Heater Array I.D. in (mm)	17 (430)	28 (710)	34 (865)	34 (865)	48 (1220)
Chamber Height in (mm)	20 (510)	26 (660)	46 (1170)	26 (660)	30 (760)
Heater Size Width in (mm)	9.75 (250)	10 (255)	12.5 (315)	8.9 (225)	12.6 (320)
Heater Size Height in (mm)	18 (455)	24 (610)	44 (1115)	23 (585)	27 (685)
Heater Rating Volts	139	240	277	139	277
Heater Rating Watts	2667	4300	6675	3900	7000

* Watlow also offers from stock non-MODULE-MOUNT flat sinuated element replacement heaters for aluminum crucible furnaces used in the non-ferrous foundry and die-casting market.