

Model 5236



- **High Intensity, short wave, quartz lamp heat source**
- **Fast Response Lamps** -- yield 90 percent output within three seconds
- **Non-contact Heat source** -- does not come in contact with the product being heated
- **Localized heat** -- only on the desired area without heating the rest of the product
- **Controllable energy output** -- can be adjusted to match process requirements
- **Repeatable results** -- can be achieved for consistent process outputs
- **Electric heat source** -- is clean and efficient
- **Temperatures** -- up to 375°F (191°C) can be achieved
- **Three different sizes** -- available in 5, 10 and 16 inch (127, 254 and 406 mm) heated lengths
- **Heat flux densities** -- to 450 watts per square foot (4.8 kw per square meter)



FAST. FOCUSED. CONTROLLED.

Application

The Model 5236 **SimulateIR** space thermal simulation module can be used for efficient irradiating of test vehicle surfaces to simulate the heat generated by the sun, planet reflection, and planet radiation inside a space chamber. It is used where the combined or singular heating effects of solar, albedo, and planet radiation must be simulated. This heating method is especially practical where full spectrum solar simulation is not necessary or may not be economically feasible.

Heater Description

The Model 5236 is a small, lightweight, low blockage-area, modular, radiant heating unit. The basic module includes the following major components:

Reflector. The module uses 'T3-style', halogen lamps backed by a CERAGOLDTM semi-circular reflector on a stainless steel substrate to provide heat. It is available in a variety of heated lengths to accommodate different heating requirements.

Mounting. Threaded holes are provided to mount the module. It can also be mounted with combination mounting clamp/power bus clips.

Electrical Connection. Electrical connection can be made to the module via combination mounting clamp/power bus clips or via holes provided on the electrical bus bar.

Features and Benefits

Rapid Response. The lamps heat up and cool down instantly in response to power control signals. They reach 90 percent of full operating temperature within three seconds of a cold start. The radiant energy dissipates to ten percent five seconds after the power supply is disconnected.

Modular Design. The modular design of the module allows units to be mounted in a wide variety of configurations.

Controllable Energy Output. The infrared energy emitted from the module can be adjusted to match the heating requirements of a variety of applications. If a surrounding array of modules is divided into separately-controlled zones, simulated vehicle rotation can be realized by programming each zone independently. Research, Inc. manufactures a complete line of SCR power control instrumentation to control the operation of the module.

Technical Information

Product Temperatures. The maximum target surface temperature depends upon the ability of the target surface to absorb radiant energy, the amount of heat loss, and the voltage applied to the heater emitter. The maximum target surface temperature should be less than 375°F (191°C), depending upon its geometry. The maximum allowable temperature on the center of the reflector body is 800°F (427°C).

Product Sizes. Products up to 16 inches (406 mm) can be heated with a single module. Larger heated areas can be created by mounting multiple units in a heating array.

Heat Flux Densities. The Model 5236 can be arrayed to produce from near zero to approximately 450 watts per square foot (4.8 kilowatts per square meter) on a target surface.

The directional response of the Model 5236 is relatively uniform over a wide angle (approximately 150 degrees). The curves in Figure 1 show the magnitude of the directional response for distances greater than three times the source lighted length.

Reflector. The reflector and other components of the module are composed of low outgassing materials such as Gold, Stainless Steel, Steatite, Quartz, and Ceramic coating (BaO, B2O3, ZnO, SiO2, CrO3). The module is rated for continuous duty for approximately 3500 hours.

The duty cycle can be extended when the heat cycle program modulates periodically.

The reflector is available in heated lengths of 5, 10 and 16 inches (127, 254 and 406 mm). Heated length is specified at the time Model 5236 is ordered.

Lamps· High intensity, short wave, tubular quartz, 'T3-style', halogen infrared lamps are available for the different heated lengths of the module. The tungsten emitter in the lamps has an operating temperature of 4000°F (2205°C) at rated voltage with a spectral energy peak wavelength of 1.15 microns. At lower than rated voltages, the emitter temperature decreases to reduce the net energy output as shown in Figure 2. Each module uses one lamp centered in the reflector by locating supports on the reflector body in contact with the quartz envelope of the lamp. The lamp is sold separately from the module.

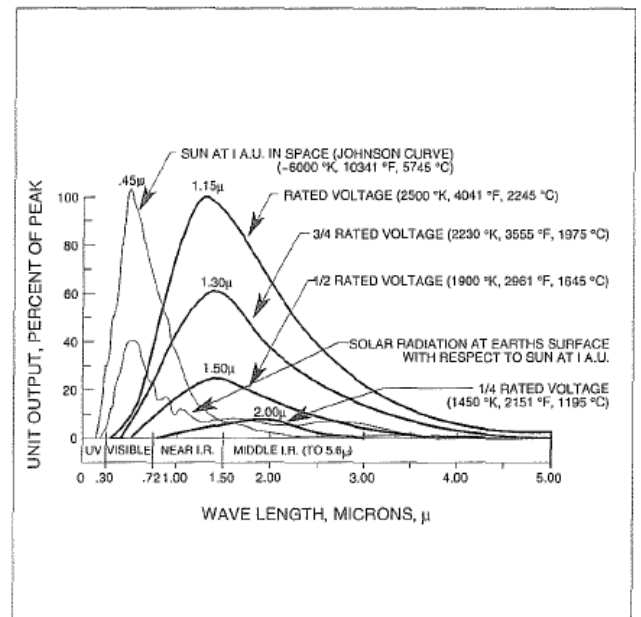
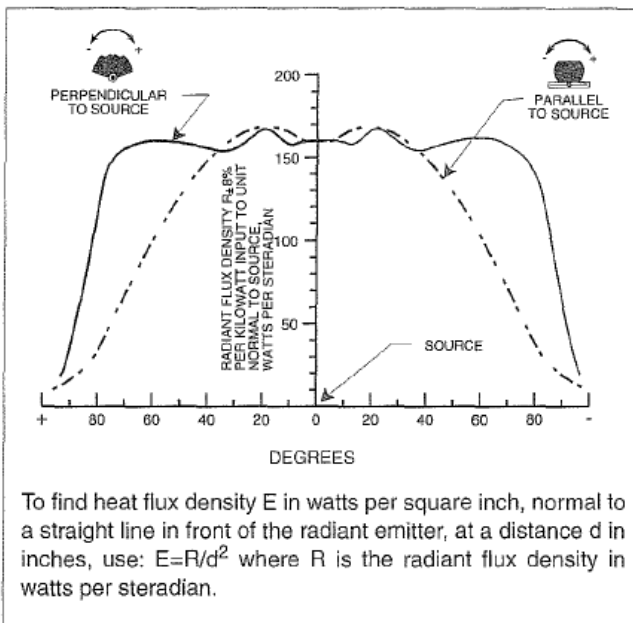
Mounting· Several modules can be attached to a light and open mounting frame to produce a low radiation blockage array. The back of the module has a mounting plate that contains four 8-32 NC threaded holes for mounting purposes. The unit can also be mounted with two combination mounting clamp/power bus clips on the back of the unit. The mounting clamp/power bus clips will

mount to a pair of power bus rods with diameters of 0.25 to 0.44 inch (6 to 11 mm).

The module can be mounted to operate in air at atmospheric pressure or in cryo-paneled vacuum space chambers at any vacuum level except those that may produce corona and arc over (see Specifications). The unit has a high emissivity coating on the rear side of the reflector body for radiation cooling to cold (-100°F [-74°C] or cooler). Absorptive (0.8 or more emissivity) cryopanel should cover the inside walls of an environmental chamber housing the Model 5236.

Best results are attained when the lamp axis is horizontal to provide uniform filament support. However, units with 5 and 10 inch (127 and 254 mm) heated lengths can be operated in any position required. The axis of units with 16 inch (406 mm) heated length should not exceed 30 degrees from horizontal.

Electrical Connection· If used for mounting, the combination mounting clamp/power bus clips are also used to provide electrical connection to the module. By removing the combination mounting clamp/power bus clips, two holes with a 0.2 inch (5 mm) diameter on the bus bar can be used for electrical connection.



Specifications – Model 5236

Specification	MODEL NUMBER		
	5236-05-A	5236-10-A	5236-16-A
Lamp Type	500T3/CL 500T3/CL/HT	1000T3/2CL/HT	1600T3/CL
Rated Voltage	120	240	240
Current at Rated Voltage, Amps	4.17	4.17	6.66
Total Power Dissipated at Rated Voltage, Watts	500	1000	1600
Weight with Lamp, Pounds (kg)	0.437 (0.197)	0.625 (0.281)	0.812 (0.366)
Frontal Area Blockage, Inches ² (mm ²)	5.66 (3650)	8.92 (5750)	12.51 (8070)
Possible Corona Region in Dry Air, Chamber Pressure, Torr*	None	1.1 to 7.6 x 10 ⁻⁴	1.1 to 7.6 x 10 ⁻⁴

* Space Chamber can be pumped to a hard vacuum before applying voltage to lamps or lamp voltage can be reduced when operating in this region.

Ordering Information – Model 5236

Model	Product Description
5236	Space Thermal Simulation Module
Code	Length
05-A 10-A 16-A	5 Inches (127 mm) 10 Inches (254 mm) 16 Inches (406 mm)

Ordering Example – Model 5236

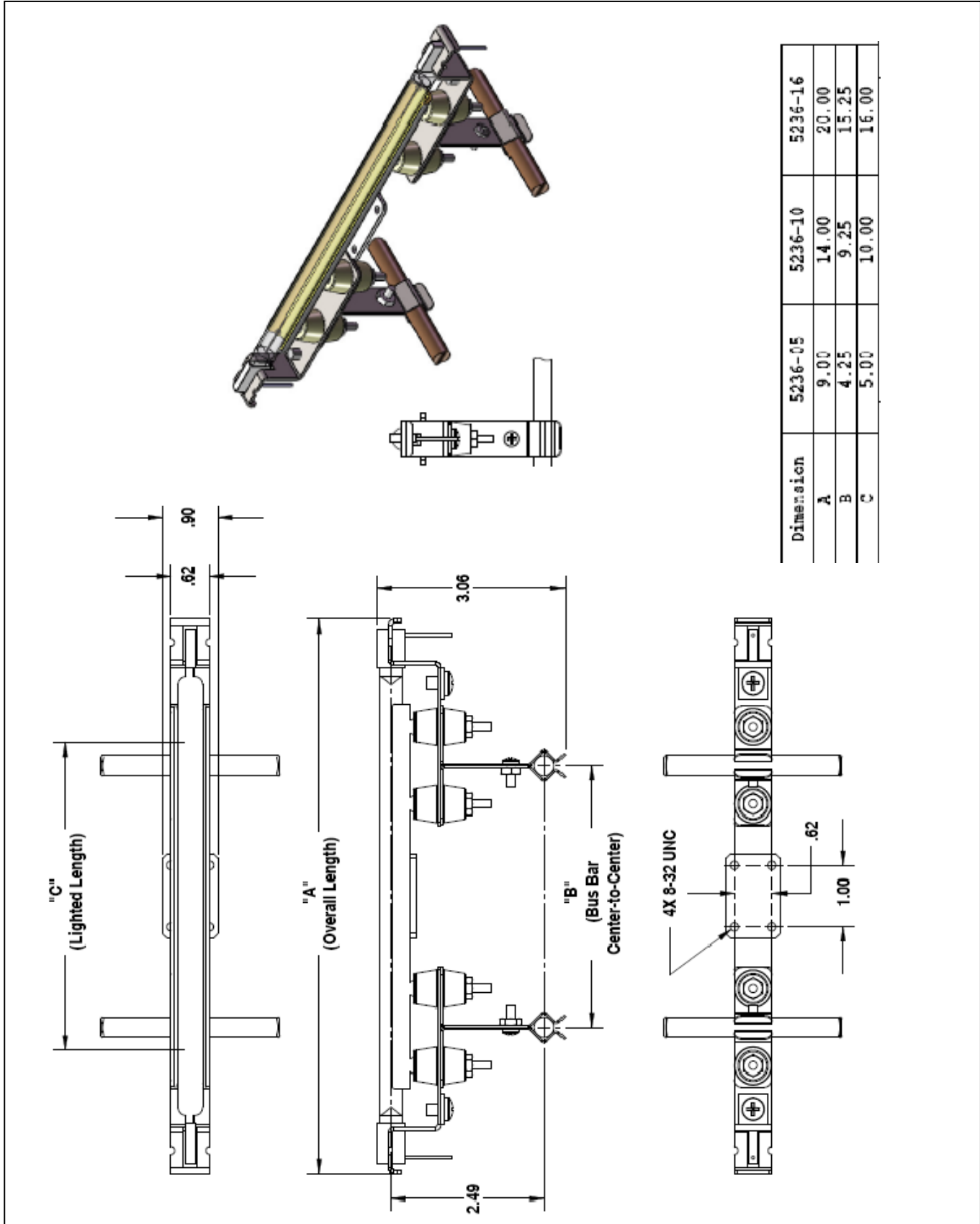
	Model	Length
Typical Model Number	5236	10-A

Lamps for Model 5236

Model	Heater Length	Watts	Lamp Description
057541-001	5 Inches (127 mm)	500	500T3/CL
057544-002	10 Inches (254 mm)	1000	1000T3/2CL/HT
057541-004	16 Inches (406 mm)	1600	1600T3/CL ⁽¹⁾

(1) Horizontal operation recommended for this lamp.

Infrared Heaters



Heater's Available From Research, Inc.

Research, Inc. is the industry leader in the design, development and manufacture of electric infrared heating components and integrated heating systems. Our products are designed to meet a wide variety of process requirements including the drying, heating, curing, soldering, bonding and annealing of many different materials.

Whether it's one of our standard products or a custom heating system, we are committed to providing solutions to meet our customer's most demanding heating needs. The following types of heaters are available:

Spot IR

INFRARED HEATERS

A single lamp and reflector heating system that focuses energy on a small (.25") target. Instant on/instant off capability makes it ideal for applications such as soldering, localized heat treating, and stress relieving.



Line IR

INFRARED HEATERS

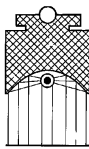
A lamp and formed reflector that concentrates heat precisely on a .25" wide line. Excellent for forming plastic, local heat treating and drying ink.



Strip IR

INFRARED HEATERS

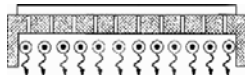
A lamp and formed reflector that provides even heat distribution across a 1.7" wide strip. Can be used for curing, drying and precise heating.



Panel IR

INFRARED HEATERS

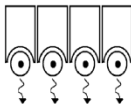
Designed with either ceramic or aluminum reflectors, the heater can provide consistent heat over a large area. Used for most drying and curing applications.



Module IR

INFRARED HEATERS

Offers the capability to create a custom area heater design to match the application's area heating needs. Multiple modules are housed

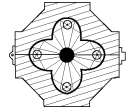


together in a sheet metal enclosure to provide the desired heating effect.

Chamber IR

INFRARED HEATERS

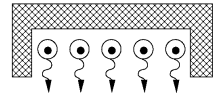
A cylindrical chamber with controlled, concentrated infrared energy for curing extrusions, drying ink in a moving line or heating a stationary test specimen.



Hi-Temp IR

INFRARED HEATERS

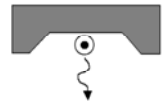
Designed to provide high-intensity infrared heat onto localized areas with a high concentration of infrared heat. Excellent for annealing, heat treating, or providing controlled heat for high temperature controlled testing.



Lo-Temp IR

INFRARED HEATERS

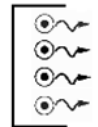
Designed with aluminum reflectors, the heater provides a low, uniform heat flux. Ideal for drying or curing adhesives, curing rubber/silicone and plastics processing.



Dry IR

INFRARED HEATERS

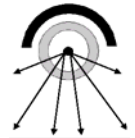
An aluminum reflector and either medium or short-wave lamps provide a band of heat from .5" - 4" wide. Can be used for water-based drying, solvent-based drying and adhesive curing.

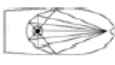
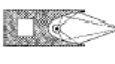
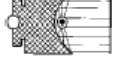









Simulate IR

INFRARED HEATERS

Used for efficient irradiation of test vehicle surfaces to simulate the infrared energy generated by the sun, planet reflection, and planet radiation inside a space chamber.



Application Chart		Spot IR	Line IR	Strip IR	Panel IR	Chamber IR	Hi-Temp IR	Module IR	Lo-Temp IR	Dry IR	Simulate IR
		INFRARED HEATERS	INFRARED HEATERS	INFRARED HEATERS	INFRARED HEATERS	INFRARED HEATERS	INFRARED HEATERS	INFRARED HEATERS	INFRARED HEATERS	INFRARED HEATERS	INFRARED HEATERS
Family	Heat Profile										
Coatings	Cure and Melt Powders				✓					✓	
	Dry and Cure Paints		✓	✓	✓				✓	✓	
	Dry Inks		✓	✓	✓				✓	✓	
Composites	Dry Adhesives		✓	✓	✓				✓	✓	
	Preheating	✓	✓	✓	✓				✓	✓	
	Resin Curing			✓	✓				✓	✓	
Electronics	Curing		✓		✓						
	Filament Winding	✓	✓		✓						
	Laminating			✓	✓				✓		
Material Testing	Ceramic Processing			✓	✓						
	Shrink Insulation			✓	✓						
	Soldering/Desoldering	✓	✓		✓						
Metal Processing	Thick Film Drying				✓						
	Wafer Processing						✓				
	Aerodynamic Heating Simulation						✓				✓
Metal Processing	Coupon Tests				✓						
	Structural Tests				✓						
	Thermal Stress Test				✓						
Plastics	Annealing	✓	✓								
	Brazing		✓								
	Preheating	✓	✓	✓	✓				✓		
Plastics	Soldering	✓	✓		✓						
	Spring Stress Relief						✓				
	Weld Stress Relief			✓	✓						
Plastics	Activating Thermo Transfer	✓	✓	✓	✓				✓	✓	
	Bending		✓								
	Bonding	✓	✓		✓						
Plastics	Preheating	✓	✓	✓	✓				✓	✓	
	Thermoforming	✓	✓	✓	✓				✓	✓	
	Welding	✓	✓		✓						
Reglossing	Chocolates			✓							
	Cosmetics			✓							
	Plastic Tubing										
Rubber/Silicone	Soap		✓								
	Curing			✓	✓						
	Pre-Cure			✓	✓						
Rubber/Silicone	Preheating	✓	✓	✓	✓						
	Vulcanizing			✓	✓						