



# Infrared Heaters For Controlled Concentrated Heating

## Model 6040



### Infrared Heat. Instantaneous Results.

The Model 6040 DryIR infrared heater is designed for drying applications that require a clean, responsive, non-contact heat source on target areas up to four inches (102 mm) wide. The Model 6040 DryIR makes it simple to add extra capability enabling increased line speeds. Designed for easy installation, low operation cost, and minimal maintenance, the system is an economical solution. Typical applications for the Model 6040 include:

- Water-based drying
- Solvent-based drying
- Adhesive curing

### FAST. FOCUSED. CONTROLLED.

#### Features and Benefits

- The fast responding, medium-wave quartz lamps heat up and cool down instantly in response to power control signals.

- The lamps provide infrared heat directly to the desired area, resulting in immediate evaporation.
- The aluminum construction of the Model 6040 combined with the air-cooling, allows the heater to withstand continuous high-temperature operation.
- The modular design of the heater allows units to be installed in a variety of configurations suitable for many applications.
- Electric heat source is clean and efficient and does not come in contact with product being heated.
- An integrated fan blows air past the lighted lamps resulting in heated air impingement on the target product surface, combined with quartz lamps for extremely fast drying rates.
- Localized energy generated by unit heats desired target area without heating surrounding areas.
- Digital display power controller comes integrated in the Model 6040.





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## Description

### Heater Module

The heater module uses medium-wave quartz halogen lamps backed by an aluminum reflector to provide heat. It is available in the heated width of 4.0 inches (102 mm).



Figure 1:  
The reflectors are used to concentrate radiation down onto a 4.0-inch width.

### Air Cooling

An integrated fan blows air past the lighted lamps resulting in a heated air impingement on the target product surface. When combined with quartz lamps, the result is immediate evaporation and fast drying rates.

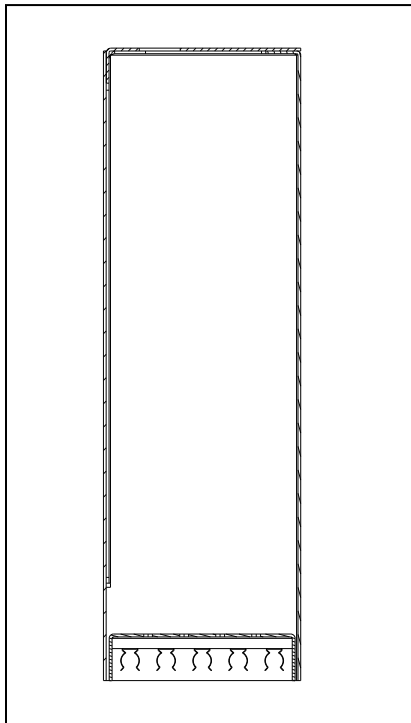
### Power Cord

Each unit is supplied with an 8-foot (2.4 m) electrical cord. The cord is supplied with a connector plug.

### Product Sizes

The Model 6040 generates radiant energy and directs it into a band approximately 16 inches (406 mm) long and 4.0 inches (102 mm) wide. Two units can be mounted side-by-side to increase effective drying width to 8-inches (203 mm). See figure 2.

Figure 2: Heated Surface



### Heat Flux Density

Heat flux densities up to approximately 140 watts per square-inch (903 watts per square-cm) can be achieved with the Model 6040 operating at the lamp's rated voltage. Heat flux density is a product of the lamp type, applied voltage, and distance between the lamp and the target surface. See heat flux plot in figure 4.

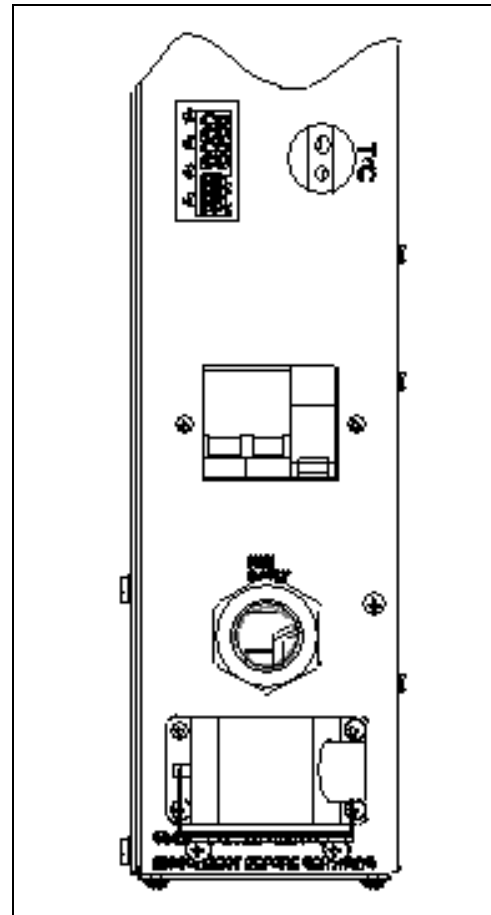
### Lamps

Each unit is supplied with five 240-volt lamps. Additional lamps can be ordered separately for the heater.

### Power Controller

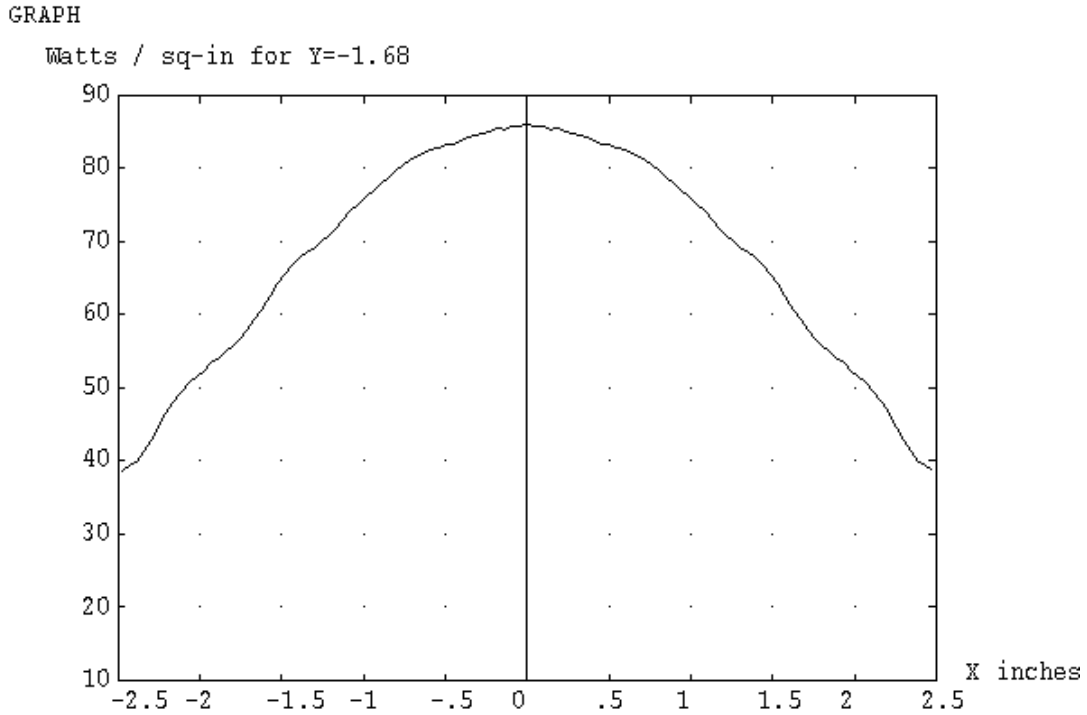
A digital display power controller comes integrated with the DryIR Model 6040. It displays process and set point variable and has a thermal couple input and a 0-10-volt input. See figure 3.

Figure 3: Model 6040 Top View with Digital Power Controller



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Figure 4: Model 6040 Heat Flux Plot



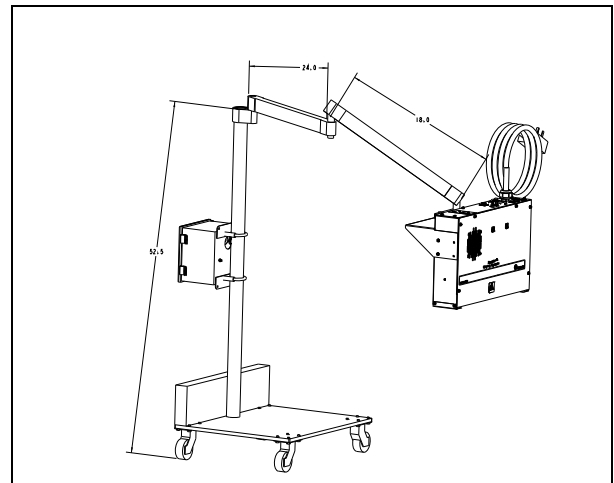
**Optional Mounting Kit**

The Model 6040 can be ordered with an optional mounting kit. The 6040 comes with tapped 5 mm holes for easy mounting.

**Optional Mounting Base**

The mounting base is designed for heater module height and position adjustments. The mounting base will come fully assembled and attached to the DryIR. See figure 5.

Figure 5: Optional Mounting Base





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Specifications – DryIR Model 6040

Model 6040 DryIR Specifications		
	Medium-Wave	Short-Wave
Maximum Drying Width	4 inches (102 mm)	4 inches (102 mm)
Overall Length	21.1 inches (536 mm)	21.1 inches (536 mm)
Heated Length	16 inches (406 mm)	16 inches (406 mm)
Lamps (5 Total)	1875 Watt each	1600 W each
Lamp Orientation	Horizontal Only	Horizontal or Vertical
Lamp Rated Voltage	240 Vac	240 Vac
Amps at Rated Voltage	39.0 Amps	33.3 Amps
Power at Rated Voltage	9.4 kW	8.0 kW
Blower Air Volume	75 CFM (2.1m <sup>3</sup> /min)	
Interlock Relays	120 VAC, 24 VAC, 24 VDC (customer-specified)	
Mounting Hardware	5 mm threaded mounting screw (Mounting Kit available)	
Control Signal Connection	6 Pin Industrial Connector (screw termination, removable)	
Operation Controls	On/Off switch	
	Manual Heat Adjustment via power controller	
	Automatic Heat Adjustment via Tachometer Input Circuitry and External Tachometer Kit <i>(Tachometer Kit Option – ordered separately from Drying System)</i>	
Operation Interrupts	When the interlock connections are made, the heater module will not function unless the Run signal is present	
Site Requirements	208-240V/50 amp service	
	Plug NEMA 6-50P	

Ordering Information – Model 6040

Model	Product Description
6040	DryIR Infrared Drying Module (Includes all electrical cords)
Code	Lamp Type
MW	9.4 kW Medium-Wave
SW	8.0 kW Watt Short-Wave
Code	Interlock Relay Type
1	24-Volts, AC
2	24-Volts, DC
3	120-Volts, AC
Code	Additional Options
MB	Mobile Base (with 30 ft. power cord)
00	None
Code	Custom Options
00	None



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Ordering Example – Model 6040

	Model	Lamp Type	Interlock Relay Type	Additional Options	Custom Options
Typical Model Number	<b>6040</b>	<b>MW</b>	<b>1</b>	<b>00</b>	<b>00</b>

Accessories, Spare & Replacement Parts – Model 6040

Model	Description
085131-002	Tachometer Kit
106918-001	Mounting Kit
099172-002	Replacement Electrical Power Cord (10-foot (3 m) length)
106764-002	Field Replacement Unit (FRU), 240V, Medium-wave (includes 5 lamps and reflectors)
106764-004	Field Replacement Unit (FRU), 240V, Short-wave (includes 5 lamps and reflectors)
106656-003	Medium-Wave Infrared Lamp (1875 watts, 240 volts)
103390-005	Short Wave Infrared Lamp (1600 watts, 240 volts)
085143-002	Interlock Relay, 24 VAC
080821-001	Interlock Relay, 24 VDC
085143-001	Interlock Relay, 120 VAC
080821-002	Interlock Relay, 12 ADC
096521-006	Interlock Relay, 240 VDC
106823-001	Circuit Breaker, 50 AMP
106813-001	Reflector Assembly
107131-001	Control Module
M6040	Additional Model 6040 Operation Manual (one supplied with each heating module)
106806-001	FAB – End Air Deflector



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### Other Heaters 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:



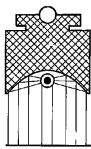
A single lamp and reflector heating system that focuses energy on a small (.25") target. Instant on/instant off capability makes it ideal for applications such as soldering, localized heat treating, and stress relieving.



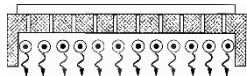
A lamp and formed reflector that concentrates heat precisely on a .25" wide line. Excellent for forming plastic, local heat treating and drying ink.



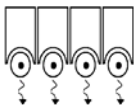
A lamp and formed reflector that provides even heat distribution across a 1.7" wide strip. Can be used for curing, drying and precise heating.



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



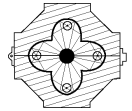
Offers the capability to create a custom area heater design to match the application's area heating needs. Multiple modules are housed



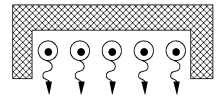
together in a sheet metal enclosure to provide the desired heating effect.



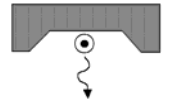
A cylindrical chamber with controlled, concentrated infrared energy for curing extrusions, drying ink in a moving line or heating a stationary test specimen.



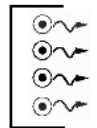
Designed to provide high-intensity infrared heat onto localized areas with a high concentration of infrared heat. Excellent for annealing, heat treating, or providing controlled heat for high temperature controlled testing.



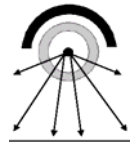
Designed with aluminum reflectors, the heater provides a low, uniform heat flux. Ideal for drying or curing adhesives, curing rubber/silicone and plastics processing.



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.



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.



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# Application Chart

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



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