ChamberIR
INFRARED HEATERS

Infrared Heaters For Controlled Concentrated Curing

Model 4069

Infrared Heat. Instantaneous Results.

The Model 4069 ChamberIR infrared heater is designed to provide heat for products in continuous processes or test specimens. The Model 4069 heater focuses high-density infrared energy, generated by T-3 halogen lamps, inward toward a cylindrically shaped target area. The clamshell-style' heater design allows for easy access to the heating chamber. The Model 4069 is offered in heated lengths of 10, 16, 25, and 38 inches (254, 406, 635, and 965 mm).

Applications

The Model 4069 ChamberIR infrared heaters are designed for use in any application that requires a clean, responsive, non-contact heat source.

Some typical applications for the heater are listed below:

- Coupon tests
- Curing rubber/silicone
- Drying and curing paint
- Drying and curing adhesive
- Preheating
- Pre-curing rubber/silicone
- Reglossing
- Shrink insulation
- Spring stress test
- Reglossing plastic tubing
- Vulcanizing

RESEARCH INC.
PROVIDING CONTROLLED ENERGY
DRYING ▲ CURING ▲ HEATING

FAST. FOCUSED. CONTROLLED.

Features and Benefits

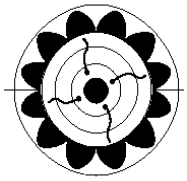
- They reach 90 percent of full operating temperature within five seconds of a cold start.
- The radiant energy dissipates to ten percent five seconds after the power supply is disconnected.
- The clamshell-style hinged opening and split-quartz liner design allow easy access and accurate positioning, for easy startup.
- The construction of these heaters, combined with water-cooling and air-cooling, allows the chamber to withstand continuous high temperature operation.
- Non-contact heat source does not come in contact with product being heated.
- The infrared energy emitted from these heaters can be adjusted to match the heating requirements of a variety of applications.
- Repeatable results can be achieved for consistent process outputs.
- Research, Inc. manufactures a complete line of process control instruments and SCR power controllers designed with a number of features for optimum operation, and plug-and-play capability.

Description

The ChamberIR Model 4069 included the following major components:

Heater Module

The clamshell-style' heater design allows for easy access to the heating chamber. The Model 4069 is offered in heated lengths of 10, 16, 25, and 38 inches (254, 406, 635, and 965 mm). Heated length is specified at the time the Model 4069 is ordered. Each unit is supplied with factory-installed lamps. Additional lamps can be ordered separately from the heater.



12 or 18 parabolic reflectors focus the infrared energy supplied by T-3 lamps toward the center axis.

Water Cooling

Adequate cooling water is required during operation. Each reflector is designed with an internal coolant passageway to allow coolant to flow through its entire length during operation. Flexible tubing and plumbing fittings are supplied with each heater for easy installation.

Air Cooling

A cooling fan is designed into the Model 4069 housing and provides ambient airflow through the heater body. This airflow helps to prevent air-borne contamination from depositing on the reflector surfaces. It also provides cooling to the quartz halogen lamp end seals.

Reflectors

A circular array of individual parabolic polished-aluminum reflectors direct the infrared energy generated by the quartz halogen lamps toward the center axis of the heater. Each heater houses either 12- or 18- reflectors, depending on the model. The 12-reflector model accepts product sizes up to 2 inches in diameter while the 18-reflector model accepts products up to 4 inches in diameter. The heater design allows individual reflectors to be easily removed for routine maintenance and periodic cleaning.

Figure 1: Model 4069 ChamberIR Heater

Lamps

The factory-installed ceramic end-seal T3 style quartz halogen lamps have ceramic end seals to protect the joint of each lamp lead to the lamp-emitter filament.

Quartz Liner

A split quartz liner is included with the Model 4069 and provides contamination protection for the aluminum reflectors. When installed into the heater, the quartz liner protects the aluminum reflectors and lamps from contaminants released in the heating process, resulting in maximum efficiency of the heater.

Heater Safety

An integrated flow switch is housed within the heater and is electrically connected to the power supply system. The flow switch will not allow power to be supplied to the heater unless there is sufficient coolant flow.

A thermostat is attached to the back of the reflector containing the coolant outlet fixture. This thermostat is also wired to the power control system and will cause power to be disconnected from the heater in the event the preset trip temperature is exceeded

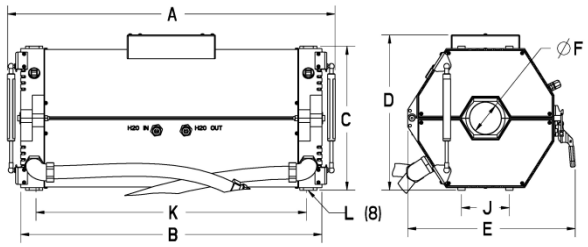
Optional Power Control System

The Model 4069 can be ordered with a Model 935 SCR-based power control system. Specified as the 'PC' option, this power control system is a complete controlled heating solution designed with a number of features including heater on/off control switching, potentiometer local control, and mechanically interlocked doors with main power disconnect switch. Heater over-temperature indicators and system cooling on/off control switches with indicator lamps are also included. Lamp out indication circuitry is also available along with the user's choice of either a digital voltmeter or digital temperature indicator. Please see Model 935 ControlIR® product data sheet for further detail.

An electrical junction box is included and wired directly to the power control box with 15 feet (4.6m) of electrical cable. The heater is supplied with two 12-foot (3.7 m) electrical cables terminated with connectors that plug into the junction box.

Figure 2. Model 4069 ChambIR® with PC Option

In addition, each Model 4069 heater is wired with zoning capability. Please contact Research, Inc. for more details regarding the Model 935 ControlIR® power control cabinet with zoning options.



Dimensions – Model 4069

Model Number	Overall Dimensions, Inches (mm)						Mounting Dimension, Inches (mm)		
	A	B	C	D	E	ØF**	J	K	L
4069-12R-10L-XX-XX	18.82 (478)	16.13 (410)	14.5 (368)	15.63 (397)	17.11 (435)	3.22 (82)	4.88 (124)	13.00 (330)	M10
4069-12R-16L-XX-XX	24.44 (621)	21.75 (552)	14.5 (368)	15.63 (397)	17.11 (435)	3.22 (82)	4.88 (124)	18.62 (473)	
4069-12R-25L-XX-XX	33.44 (849)	30.75 (781)	14.5 (368)	15.63 (397)	17.11 (435)	3.22 (82)	4.88 (124)	27.62 (702)	
4069-12R-38L-XX-XX	46.44 (1180)	43.75 (1111)	14.5 (368)	15.63 (397)	17.11 (435)	3.22 (82)	4.88 (124)	40.62 (1032)	
4069-18R-10L-XX-XX	18.82 (478)	16.13 (410)	17.0 (432)	18.55 (471)	20.61 (523)	5.90 (150)	6.06 (154)	13.00 (330)	
4069-18R-16L-XX-XX	24.44 (621)	21.75 (552)	17.0 (432)	18.55 (471)	20.61 (523)	5.90 (150)	6.06 (154)	18.62 (473)	
4069-18R-25L-XX-XX	33.44 (849)	30.75 (781)	17.0 (432)	18.55 (471)	20.61 (523)	5.90 (150)	6.06 (154)	27.62 (702)	
4069-18R-38L-XX-XX	46.44 (1180)	43.75 (1111)	17.0 (432)	18.55 (471)	20.61 (523)	5.90 (150)	6.06 (154)	40.62 (1032)	

Specifications – Model 4069 and lamp replacement part numbers

Model Number	Lamp Lighted Length, inches (mm)	Lamp Wattage	Lamp Type	Lamp Part Number	Lamp Rated Voltage	Wattage Heater, kW	**Water Flow GPM (LPM)	Total Weight, Pounds (kg)
4069-12R-10L-12kW-240V	10 (254)	1000	QIH240-1000RI2	103390-003	240	12.0	1.2 (4.5)	85 (39)
4069-12R-10L-12kW-480V	10 (254)	1000	QIH240-1000RI2	103390-003	240	12.0	1.2 (4.5)	85 (39)
4069-12R-10L-24kW-240V	10 (254)	2000	QIH240-2000RI2	103390-004	240	24.0	2.3 (8.6)	85 (39)
4069-12R-10L-24kW-480V	10 (254)	2000	QIH240-2000RI2	103390-004	240	24.0	2.3 (8.6)	85 (39)
4069-12R-16L-19kW-240V	16 (406)	1600	QIH240-1600RI2	103390-005	240	19.2	1.8 (6.9)	95 (43)
4069-12R-16L-19kW-480V	16 (406)	1600	QIH240-1600RI2	103390-005	240	19.2	1.8 (6.9)	95 (43)
4069-12R-16L-36kW-480V	16 (406)	3000	QIH240-3000RI2	103390-012	240	38.4	3.6 (13.5)	95 (43)
	***	3200	QIH3843200R12	103390-006	384	38.4	3.6 (13.5)	95 (43)
4069-12R-25L-30kW-480V	25 (635)	2500	QIH480-2500RI2	103390-007	480	30.0	2.8 (10.6)	124 (56)
4069-12R-38L-46kW-480V	38 (965)	3800	QIH480-3800RI2	103390-010	480	45.6	4.2 (15.9)	155 (62)
4069-18R-10L-18kW-240V	10 (254)	1000	QIH240-1000RI2	103390-003	240	18.0	1.7 (6.5)	112 (51)
4069-18R-10L-18kW-480V	10 (254)	1000	QIH240-1000RI2	103390-003	240	18.0	1.7 (6.5)	112 (51)
4069-18R-10L-36kW-480V	10 (254)	2000	QIH240-2000RI2	103390-004	240	36.0	3.3 (12.7)	112 (51)
4069-18R-16L-29kW-240V	16 (406)	1600	QIH240-1600RI2	103390-005	240	28.8	2.7 (10.2)	140 (64)
4069-18R-16L-29kW-480V	16 (406)	1600	QIH240-1600RI2	103390-005	240	28.8	2.7 (10.2)	140 (64)
4069-18R-25L-45kW-480V	25 (635)	2500	QIH480-2500RI2	103390-007	480	45.0	4.2 (15.7)	177 (80)
4069-18R-38L-68kW-480V	38 (965)	3800	QIH480-3800RI2	103390-010	480	68.4	3.1 (11.9)*	228 (104)

** Stated flow rates are for each of two flow paths*
*** Maximum inlet-water temperature not to exceed 100 ℉ (37 ℃)*
**** Lamp replacement for older 406-12R-16L-38kW-480V heaters*

Ordering Information

Model	Product Description
4069	Parabolic Clamshell Heating System (Includes lamps and split-quartz liner)
Code	**Reflector Number**
12R	12 Reflectors (Maximum product diameter up to 2 inches)
18R	18 Reflectors (Maximum product diameter up to 4 inches)
Code	**Length, Heater Power Rating, Voltage**
	12 Reflector Size Availability:
10L-12KW-240V	10-inch length, 12 Kilowatts, 240 Volts
10L-12KW-480V	10-inch length, 12 Kilowatts, 480 Volts
10L-24KW-240V*	10-inch length, 24 Kilowatts, 240 Volts
10L-24KW-480V	10-inch length, 24 Kilowatts, 480 Volts
16L-19KW-240V	16-inch length, 19 Kilowatts, 240 Volts
16L-19KW-480V	16-inch length, 19 Kilowatts, 480 Volts
16L-36KW-480V	16-inch length, 36 Kilowatts, 480 Volts
25L-30KW-480V	25-inch length, 30 Kilowatts, 480 Volts
38L-46KW-480V*	38-inch length, 46 Kilowatts, 480 Volts
	18 Reflector Size Availability:
10L-18KW-240V	10-inch length, 18 Kilowatts, 240 Volts
10L-18KW-480V	10-inch length, 18 Kilowatts, 480 Volts
10L-36KW-480V	10-inch length, 36 Kilowatts, 480 Volts
16L-29KW-240V*	16-inch length, 29 Kilowatts, 240 Volts
16L-29kW-480V	16-inch length, 29 Kilowatts, 480 Volts
25L-45KW-480V*	25-inch length, 45 Kilowatts, 480 Volts
38L-68KW-480V*	38-inch length, 68 Kilowatts, 480 Volts

Code	Optional Power Control System
PC-VM PC-TI	Model 4069 heater supplied with Model 935 power control system. Includes: electrical junction box, interface wiring, lamp-out detection, and a choice of digital voltmeter or digital temperature indicator. Power Control System with Digital Volt Meter – 50 Amp Rating Power Control System with Digital Volt Meter – 80 Amp Rating (*) Power Control System with Digital Temperature Indicator – 50 Amp Rating Power Control System with Digital Temperature Indicator – 80 Amp Rating (*)

** These models exceed a 50-amp rating, requiring an 80-amp rated power controller*

Ordering Example

	Model	Reflector Number	Length, Heater Power Rating, Voltage	Optional Power Control System
Typical Model Number	**4069**	**18R**	**25L-45KW-480V**	**PC-TI**

Example above includes:
Model: 4069 heater with18 reflectors and 2500 watt lamps at 480 volts. Optional equipments includes a Power Control System with Digital Temperature Indicator – 50 Amp Rating.

Infrared Heaters For Controlled Concentrated Curing.

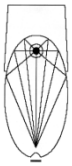
Heater's Available from Research, Inc.

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:

SpotIR 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.

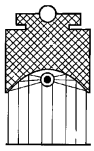


LineIR Infrared Heaters

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

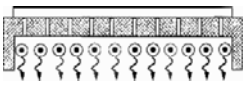
StripIR Infrared Heaters

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.



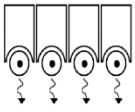
PanelIR Infrared Heaters

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



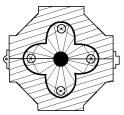
ModuleIR Infrared Heaters

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.



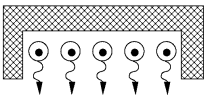
ChamberIR Infrared Heaters

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



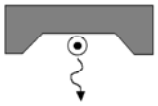
Hi-TempIR Infrared Heaters

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-TempIR 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.

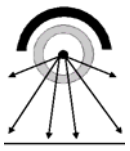


DryIR Infrared Heaters

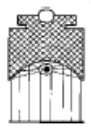
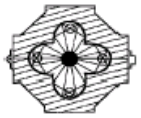
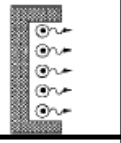
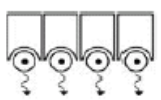
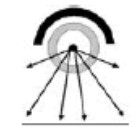
An aluminum reflector and either medium or short-wave lamps provide a band of heat from .5" - 4" wide. Can be used for water-based drying, solvent-based drying and adhesive curing.

SimulateIR 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

Family / Heat Profile		SpotIR Infrared Heaters	LineIR Infrared Heaters	StripIR Infrared Heaters	PanelIR Infrared Heaters	ChamberIR Infrared Heaters	Hi-TempIR Infrared Heaters	ModuleIR Infrared Heaters	Lo-TempIR Infrared Heaters	DryIR Infrared Heaters	SimulateIR Infrared Heaters
											
Coatings	Cure and Melt Powders				√					√	
	Dry and Cure Paints			√	√				√	√	
	Dry Inks		√	√	√					√	
	Dry Adhesives			√	√				√	√	
	Preheating	√	√	√	√	√	√	√	√	√	
	Resin Curing			√	√				√	√	
Composites	Curing		√		√	√					
	Filament Winding	√	√								
	Laminating			√	√				√		
Electronics	Ceramic Processing				√						
	Shrink Insulation			√		√					
	Soldering/ Desoldering	√	√		√						
	Thick Film Drying				√						
	Wafer Processing						√				
Material Testing	Aerodynamic Heating Simulation						√				√
	Coupon Tests					√	√				
	Structural Tests				√		√				
	Thermal Stress Test						√				
Metal Processing	Annealing	√	√				√				
	Brazing		√				√				
	Preheating	√	√	√	√	√	√	√	√		
	Soldering	√	√		√						
	Spring Stress Relief					√	√				
	Weld Stress Relief			√	√		√				
Plastics	Activating Thermo Transfer	√	√	√	√				√	√	
	Bending		√						√		
	Bonding	√	√								
	Preheating	√	√	√	√	√	√	√	√		
	Thermoforming	√	√	√	√				√		
	Welding	√	√								
Reglossing	Chocolates			√				√			
	Cosmetics			√				√			
	Plastic Tubing					√					
	Soap		√								
Rubber/ Silicone	Curing			√	√	√			√		
	Pre-Cure			√	√	√			√		
	Preheating	√	√	√	√	√	√	√	√		
	Vulcanizing			√	√	√			√		