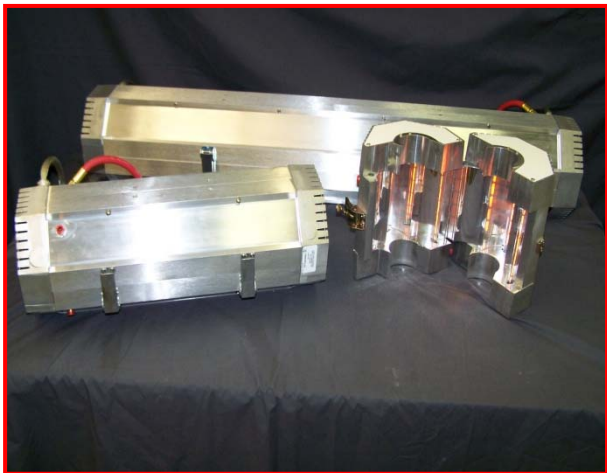


ChambIR[®]

Model E4 Infrared Heating System

Product Data Sheet



Infrared Radiant Heating Chamber

The Model E4 elliptical chamber is designed for rapid heating of small size continuous materials such as tube, cable, and wire with an outer diameter less than 0.25 inch (6 mm). It may also be used as a high temperature furnace in test applications. The E4 is available in seven different lengths. Typical applications for these heaters include:

- Curing small-diameter silicone tubing
- Re-glossing small-diameter plastic tubing
- Burning lubricant off extruded wire
- Curing coatings or adhesives on wire or cable
- Drying water from wire or cable

Heating Rates

Up to 10 times faster than competitive convection or hot wall radiant systems

Fast Response Quartz Lamps

Yield 90 percent output within three seconds – dissipates 90 percent energy within five seconds

Electric Heat Source

Clean and efficient

Non-Contact Heat Source

Does not come in contact with the product being heated

Controllable Energy Output

Can be adjusted to match process requirements

Repeatable Results

Can be achieved for consistent process

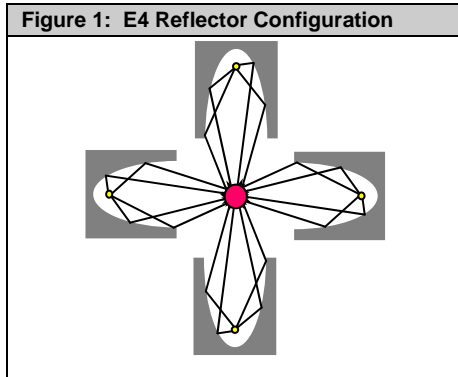
Fast. Focused. Controlled.



ChambIR-E4-D-01-A

Description

The Model E4 focuses high-density infrared energy, generated by 'T3-style', halogen lamps, onto a cylindrically shaped target area. The heater is hinged so it can open and close in a clamshell style, for easy access.



Reflectors

Four elliptical reflectors (see Figure 1) focus the infrared energy supplied by T3 lamps toward the heater center axis. The reflectors are constructed from aluminum polished to a specular finish and are available in heated lengths of 2, 5, 6, 10, 16, 25, and 38 inches (51,127, 152, 254, 406, 635, and 965 mm).

Lamps

A variety of high intensity, short wave, 'T3-style', infrared lamps are available for the different heated lengths of the Model E4. The tungsten emitter in the lamps has an operating temperature of 2500 °K with a spectral energy peak wavelength of 1.15 microns. Each Model E4 requires four lamps to operate. The lamps are sold separately from the Model E4.

Water Cooling

The Model E4 requires an external water-cooling supply to cool the reflectors. Refer to the options section for more details on cooling.

Benefits

Fast

T3 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 within five seconds after power is removed. The instant on/off feature offers a great number of benefits to the user including reduced warm up and cool down times.

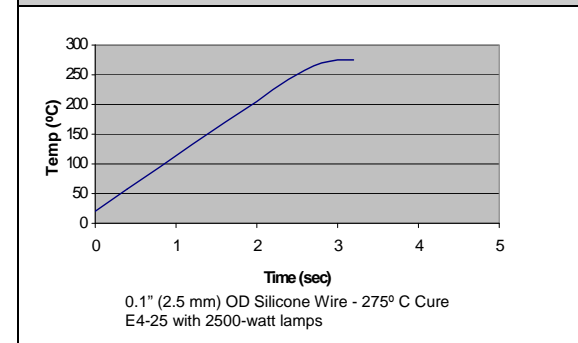
Focused

T3 lamps have a small filament, which allows the energy to be focused towards a target. By focusing the IR, the concentration of heat is greatly increased, which allows small targets to see more thermal energy and allows higher process line speeds.

Controlled

The ability to control the direction of the infrared heat, along with rapid response, allows higher heat transfer rates than with other infrared and convection systems. Figure 2 shows the heating of a silicone-jacketed wire. Using an E4, the wire is heated to curing temperature in several seconds, as compared to 2 to 5 times longer with other systems.

Figure 2 – Silicone Jacketed Wire Heating



Low Temperature Applications

Most pre- and post- plastics and rubber extrusion applications are low temperature (under 400 °C). Under these conditions, it is only necessary to provide water-cooling to the reflectors to allow the heaters to run continuously. The recommended maximum product diameter in these applications is 0.25 inch (6 mm). The heater will accommodate product size up to 2.5 inches in OD, however the heating will not be uniform around the circumference if the OD is greater than 0.25 inch (6 mm). Refer to the Model 4069 product data sheet for uniform heating of larger materials.

High Temperature Applications

The Model E4 may also be operated as a high temperature furnace. Transient product temperatures to 2000°F (1100°C) and continuous product temperatures to 1500°F (815°C) can be achieved with the Model E4. Air-cooling options (A/AA) are recommended if operated in this mode.

Options and Accessories

Lamps

Lamps for the Model E4 are purchased separately. Table 1 displays available lamps.

Model	Heated Length	Volts	Watts	Lamp Description
057550-002	2 Inches	120	500	Q500T3/CL
057550-003	2 Inches	120	1000	Q1000T3/4CL
057541-001	5 Inches	120	500	500T3/CL
094312-002	5 Inches	120	500	500T3/CL(2)
057550-004	6 Inches	120	1500	Q1500T3/CL
057544-002	10 Inches	240	1000	1000/T3/2CL/HT
057544-005	10 Inches	240	2000	2000/T3/CL/HT
057541-004	16 Inches	240	1600	1600T3/CL
057541-008	16 Inches	240	3000	3000T3/CL
094312-001	16 Inches	240	3000	3000T3/CL(2)
057541-005	25 Inches	480	2500	2500T3/CL(1)
057549-001	25 Inches	480	2500	2500T3/VB/CL
057544-008	25 Inches	600	5000	5MT3/1CL/HT(1)
057541-006	38 Inches	570	3800	3800T3/CL(1)
057549-002	38 Inches	570	3800	3800T3/VB/CL

(1) These lamps are for horizontal operation only.
 (2) Pigtail lead, HeLeN-Coated, glare reduction lamp

Controls



The Model 915 cabinet is designed specifically to control the E4. It contains the power control and alarm handling to properly and safely control your process. Refer to Table 2 for selection data. Refer to the Model 910/915 data sheet for specifications.

Refer to the Model 910/915 data sheet for specifications.

Custom Systems



We provide complete system solutions for the E4 heater including power controls, water-cooling, and custom frames. The figure at the left shows a packaged solution using the E4, the 915 Power Control Solution, customer

framework, and a special water-cooling system. Other configurations are available – consult factory.

Water Cooling System/Water Cooling



A self-contained air-to-water heat exchanger (Model C100) can be used to provide water-cooling for the reflectors. The kit comes with fittings, hose, and the chiller unit and is

ordered separately. Table 3 shows the cooling

requirements of the E4 with the Model C100 cooling system, and with customer-supplied water-cooling. Refer to the Model C100 data sheet for specifications. A protection kit is also available. It includes a water flow switch, a thermostat and the fittings to add it into the cooling system.

For customer supplied cooling, de-ionized water, or an ethylene glycol mixture is preferred. Inlet water temperature should not exceed 100°F (38°C) and inlet water pressure should be at least 65 psi (7.0 kg/cm³) and less than 100 psi (7.0 kg/cm³)

E4 / Lamp	Vr	Wr	Va	Wa	Amps	915 Model
E4-02/500W	240	2000	240	2000	8.3	915-240-20
E4-02/1000W	240	4000	240	4000	16.7	915-240-20
E4-05/500W	240	2000	240	2000	8.3	915-240-20
E4-06/1500W	240	6000	240	6000	25.0	915-240-40
E4-10/1000W	240	4000	240	4000	16.7	915-240-20
E4-10/2000W	240	8000	240	8000	33.3	915-240-40
E4-16/1600W	240	6400	240	6400	26.7	915-240-40
E4-16/3000W	240	12000	240	12000	50.0	915-240-70
E4-25/2500W	480	10000	480	10000	20.8	915-480-40
E4-25/5000W	600	20000	480	14184	29.5	915-480-40
E4-38/3800W	570	15200	480	11666	24.3	915-480-40
E4-38/3800W	420	15200	420	15200	36.2	915-480-40

E4 / Lamps	Cooling	
	CoolIR # of C100 Units	Water Cooling GPM LPM
E4-02/500W	1	0.25 0.93
E4-02/1000W	2	0.49 1.87
E4-05/500W	1	0.25 0.93
E4-06/1500W	N/A	0.74 2.80
E4-10/1000W	2	0.49 1.87
E4-10/2000W	N/A	0.98 3.73
E4-16/1600W	2	0.79 2.98
E4-16/3000W	N/A	1.47 5.60
E4-25/2500W	N/A	1.23 4.66
E4-25/5000W	N/A	1.74 6.62
E4-38/3800W	N/A	1.43 5.44

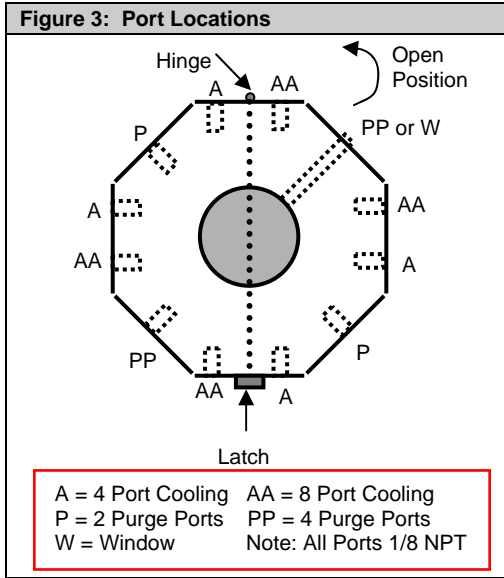
Quartz Liner

A quartz liner can be provided to protect the reflectors in the heater from contaminants, to maintain the reflectors at their maximum efficiency. It has a 2.24 inch (57 mm) outer diameter and a 2.09 inch (53 mm) inner diameter. There is a flare at one end of the quartz liner to allow vertical installation

Observation Window

A 0.5 inch diameter window (W) with a quartz cover can be provided in the center of the chamber side wall, to permit product viewing. With the quartz cover removed, product

temperature can be measured with a suitable optical pyrometer. The observation window is not available on models ordered with four purging ports. See Figure 3.



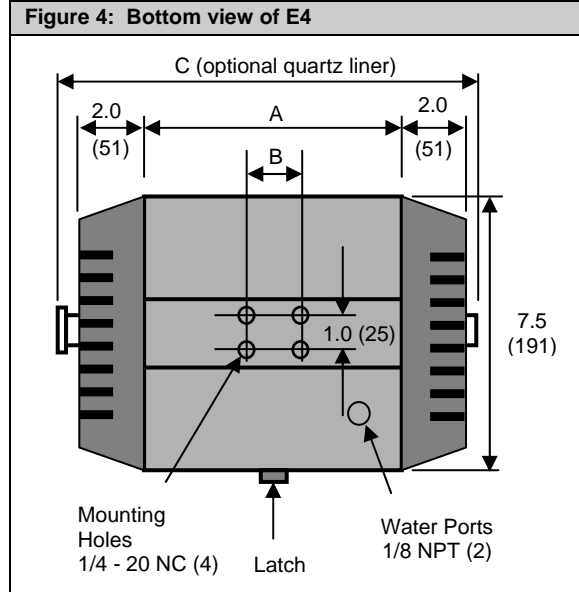
Purging Ports

Purging ports (P/PP) can be provided on two or four opposing sides of the chamber wall. This feature allows the heating environment to be force-cooled or inert gas-purged. Purging ports will not function with a quartz liner installed.

Air Cooling

Cooling ports provide added cooling to enhance lamp life. Four or eight air-cooling ports (A/AA) can be provided along the lamps. Clean, dry shop air should be used with the air-cooling ports.

Model	A in(mm)	B in(mm)	C in(mm)	Weight lbs(kg)
E4-02	2.50 (64)	N/A	9.0 (228)	13 (5.9)
E4-05	5.50 (140)	3.0 (76)	12.0 (304.8)	18 (8.16)
E4-06	7.40 (188)	3.0 (76)	14.0 (356)	22 (8.97)
E4-10	10.50 (268)	5.0 (127)	17.0 (432)	27 (12.25)
E4-16	16.50 (421)	5.0 (127)	23.0 (584)	38 (17.24)
E4-25	25.50 (648)	5.0 (127)	32.0 (813)	54 (24.5)
E4-38	38.50 (978)	5.0 (127)	45.0 (1143)	77 (34.93)



Installation and Specifications

Mounting dimensions are shown in Figure 4 and Table 4.

Model	Product Description
E4	Radiant Heating Chamber
Code	Length
02	2 Inches (51 mm)
05	5 Inches (127 mm)
06	6 Inches (152 mm)
10	10 Inches (254 mm)
16	16 Inches (406 mm)
25	25 Inches (635 mm)
38	38 Inches (965 mm)
Code	Additional Options
W	Observation Window
P	Two Port Purging
PP ⁽¹⁾	Four Port Purging
A	Four Port Air Cooling
AA	Eight Port Air Cooling
<i>(1) Not available with Observation Window</i>	

Model	Quartz Liner Kit for Model:
KQL-E4-02	2 Inch (51 mm) length
KQL-E4-05	5 Inch (127 mm) length
KQL-E4-06	6 Inch (152 mm) length
KQL-E4-10	10 Inch (254 mm) length
KQL-E4-16	16 Inch (406 mm) length
KQL-E4-25	25 Inch (635 mm) length
KQL-E4-38	38 Inch (965 mm) length

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