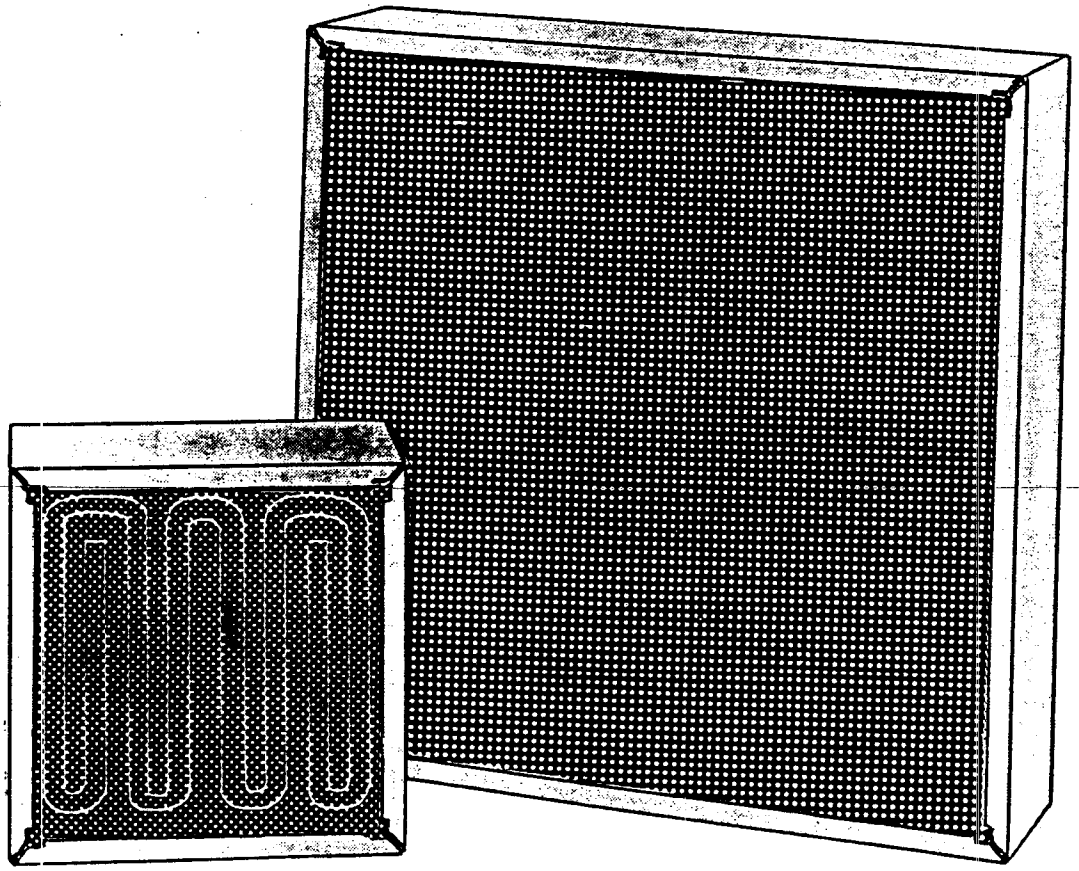
QF, QG, QC and QH SERIES

Infrared Radiant Panel Heaters



OMEGALUX®

An OMEGA Technologies Company

Operator's Manual

M1254/0791

TABLE OF CONTENTS
QF, QG, QC, QH SERIES

SECTION 1 INTRODUCTION

1.1 GENERAL DESCRIPTION

The OMEGALUX® QF, QG, QC and QH Series of Infrared Radiant Panel Heaters are designed to provide uniform infrared coverage from the emitter face. This eliminates uneven heating of the working surface. The modular design of the panel heaters allows additional units to be easily added to the heating system. This flexibility allows the user to place the panels in different configurations to meet specific heating needs. Installing the panels two to four inches from the working surface allows the working surface to absorb up to 80% of the heater's output. The radiant panels do not require external reflectors which must be periodically cleaned or replaced. There is no reduction in radiant output over the life of each heater panel.

The QG Series heaters use a solid black Ceran™ glass as the emitter face. The QF Series emitter face is constructed using bonded high temperature cloth quartz. All of the QG and QF Series are rated to 1600°F (870°C) maximum continuous emitter face temperature. The QH and QC Series use a fused quartz glass emitter face and ideal for higher power applications. They are rated for a maximum temperature of 1800°F (981°C). DO NOT OPERATE ABOVE THESE TEMPERATURES FOR MAXIMUM HEATER LIFE.

SECTION 2 UNPACKING

Remove the packing list and verify that all equipment has been received. If there are any questions about the shipment, please call the OMEGALUX Customer Service Department at 1-800-622-2378.

Upon receipt of shipment, inspect the container and equipment for any sign of damage. Take particular note of any evidence of rough handling in transit. Immediately report any damage to the shipping agent.

NOTE

The carrier will not honor any claims unless all shipping material is saved for their examination. After examining and removing contents, save packing material and carton in the event reshipment is necessary.

SECTION 3 INSTALLATION

CAUTION AND WARNING

CAUTION: Hazard of fire. These radiant heater panels must not be operated in the presence of flammable vapors, gases or combustible materials without proper ventilation and/or other safety precautions, either in compliance with the National Fire Protection Bulletin 86A entitled "Oven and Furnace" or the authority having jurisdiction. Fire and electrical shock may result if products are used improperly or installed by non-qualified personnel. The QF, QG, QC and QH Series Panel Heaters are intended for radiant heat only. NEVER LET MATERIAL COME INTO CONTACT WITH THE FACE OF THE HEATER.

3.1 GENERAL MOUNTING PROCEDURES

Heaters may be mounted in either a horizontal or vertical position. The recommended distance between the working surface and the emitter face of the heater panel is 2 inches minimum and 4 inches maximum. Distances greater than 4 inches will decrease the efficiency of the heat absorption of the working surface.

3.2 MULTIPLE HEATING PANELS

When multiple heating panels are used, a minimum of 1/32 of an inch spacing should be left between each panel for heater expansion. Provide suitable supporting framework using angle irons, strap iron or continuous slot framing. Provide 3/8 inch diameter mounting holes corresponding to bolt hole locations. See Sections 5.2 through 5.4 for QF, QG, QC and QH Series specifications, dimensional references and mounting diagrams for bolt hole locations.

3.3 THERMOCOUPLE INSTALLATION

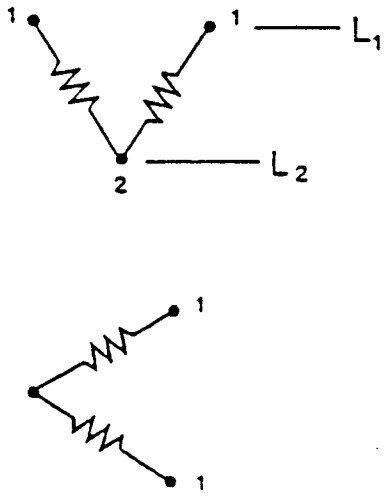
3.3.1 Direct Temperature Control of Panel Heaters

The temperature of the Infrared Radiant Panel Heaters can be directly controlled when the heaters are ordered with an optional 1/8 inch diameter quartz tube thermowell (option "T"). The placement of the thermowell is different for each series of the panel heaters. See Sections 5.2 to 5.4 for the specific location of each thermowell for the particular heaters series. For the QF Series, two thermowells are provided: one parallel to the heating elements for primary temperature control and one perpendicular to the heating elements, providing overtemperature control. For the QC and QH Series heaters, one thermowell is provided, and it is located parallel to the heating elements. The recommended thermocouple for use with the QF, QC and QH Series is Type K (OMEGA Part Number TJ36-CAIN-18U-9-CC-XCIB). The entire probe is rated to 1500°F (815°C).

For QG Series heaters, one thermowell is provided and it is located perpendicular to the glass emitter face for primary temperature control. The recommended thermocouple for use with the QG Series is Type K (OMEGA Part No. QSK#1036/BT-090-K-4-1/2-60-1).

3.3.2 Direct Process Temperature Control

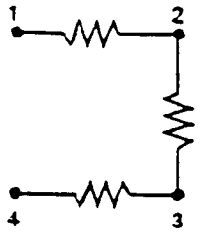
To control the process temperature directly, the thermocouple may be placed in the air directly above the process, on the outer surface of the emitter face, or close to the product being heated. There is no one answer for all processes. Depending upon the design and construction of the oven or dryer, the thermocouple location may change. Factors to be considered are product loading (continuous or batch), response time needed of the heater, and the environment (high volume of air purging).



120, 240 V
Jumper 1 to 1, to L_1, 2 to L_2

480 V
L_1 to 1, L_2 to 1, Leave 2 open

Figure 4-1. Combinations for Dual Voltage Heaters



For 1 Phase
Jumper 1 and 3, 2 and 4

For 3 Phase
Jumper 1 and 4

Figure 4-2. Combinations for Dual Phase Heaters

SECTION 5 SPECIFICATIONS

5.1 GENERAL SPECIFICATIONS

VOLTAGE:

QF SERIES:	120 VAC, 480 VAC, 1 and 3 phase 120/240, 240/480 VAC dual voltage, 1 phase
QG SERIES:	120, 240 and 480 VAC, 1 phase 120/240, 240/480 VAC dual voltage, 1 phase
QC, QH SERIES:	240 VAC, 1 phase 240/480 VAC dual voltage, 1 phase

WATTAGE:

QF SERIES:	720 - 21,600 watts
QG SERIES:	720 - 8640 watts
QC, QH SERIES:	1660 - 8640 watts

MAXIMUM OPERATING TEMPERATURE:

QF, QG SERIES:	1600°F
QC, QH SERIES:	1800°F

DIMENSIONS: See specific Series specifications in Sections 5.2 through 5.4.

5.2 QF SERIES

The warm up curve (Figure 5-1) shows the response time of the QF Series heaters measured by a thermocouple, from a cold start to maximum operating temperature, for a 25 W/in^2 heater. Changes in temperature or partial warm up, will be approximately this curve.

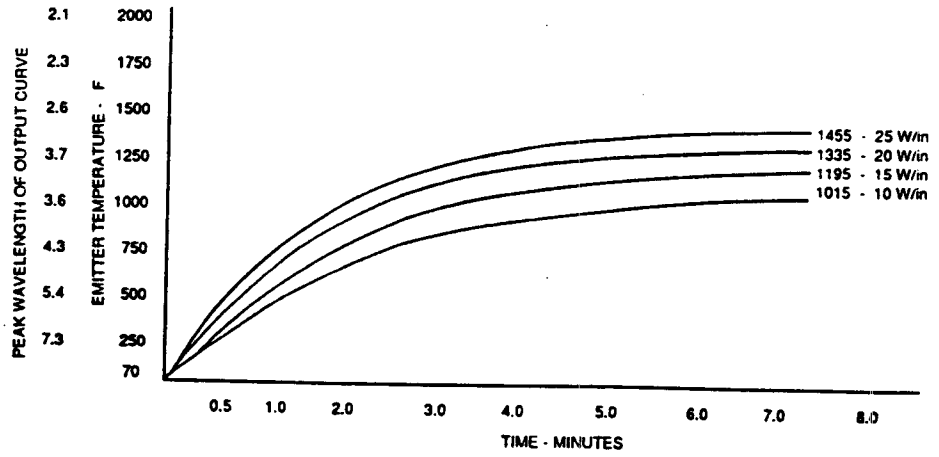


Figure 5-1. Warm Up Curve

The emission output curve (Figure 5-2) compares emitter surface temperature versus watt density and the corresponding wavelength emitted for a specific emitter surface temperature. The key to efficiency is to select an emitter wavelength that best matches the peak absorption of the process product.

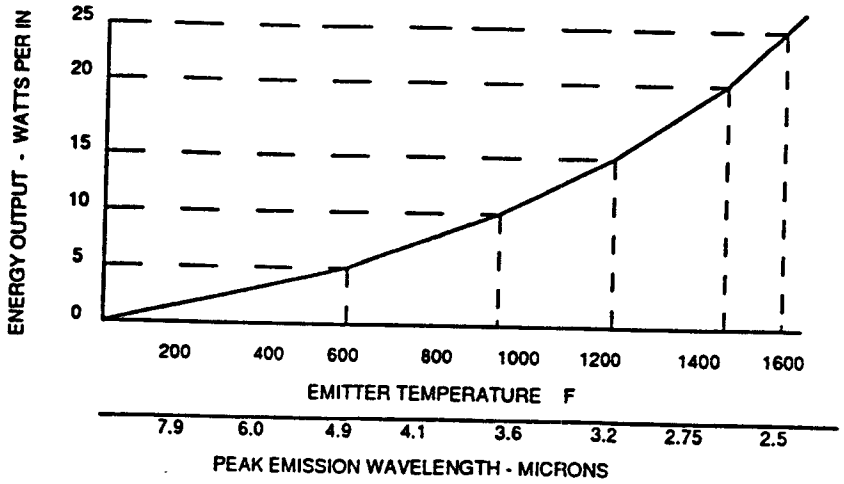


Figure 5-2. Emission Output Curve

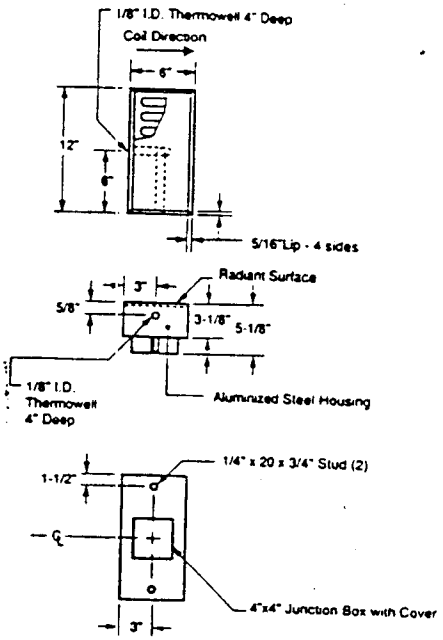


Figure A
6" W x 12"L

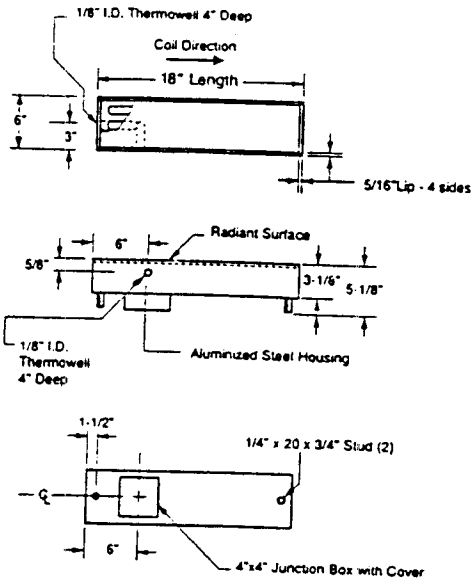
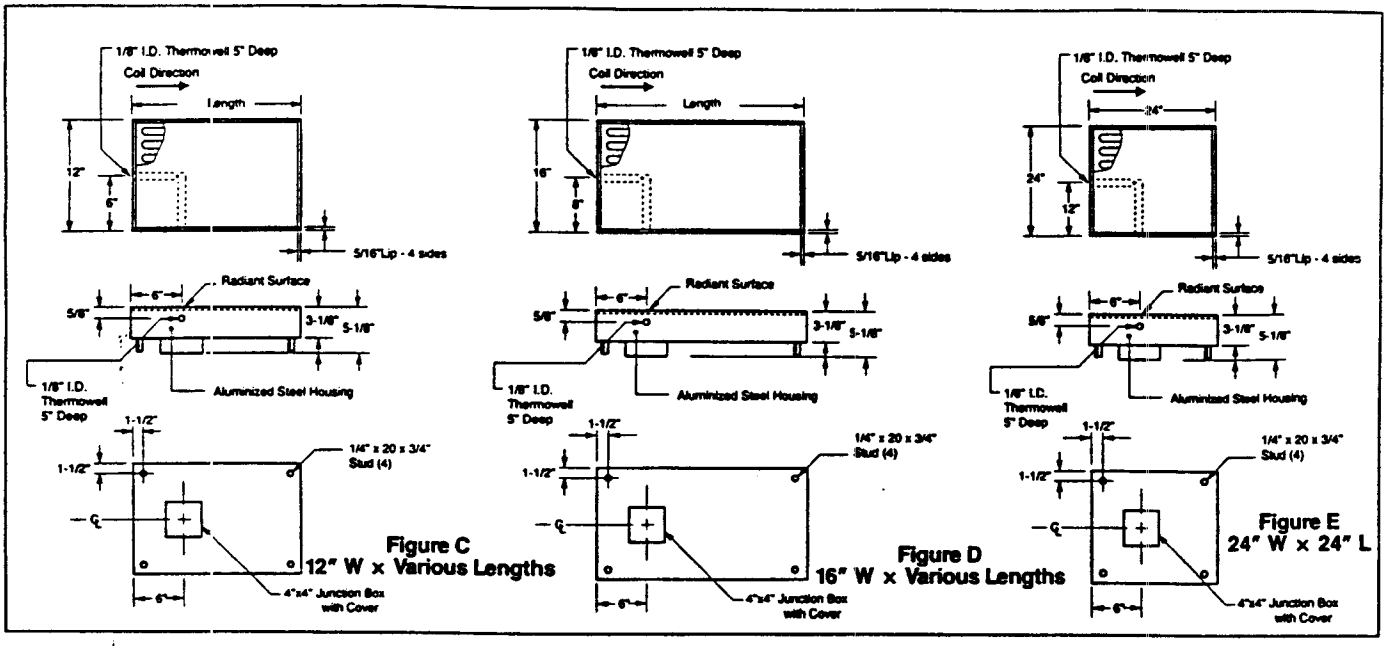


Figure B
6" W x Various Lengths

Width (in.)	Length (in.)	Wattage	Voltage	Phase	Without Thermowell Model No.	With Thermowell Model No.	Dim. Reference
10 W/in²							
6	12	720	120	1	QF-061210	QF-061210-T	Fig. A
6	18	1080	120/240	1	QF-061810	QF-061810-T	Fig. B
6	24	1440	120/240	1	QF-062410	QF-062410-T	Fig. B
6	30	1800	120/240	1	QF-063010	QF-063010-T	Fig. B
6	36	2160	240/480	1	QF-063610	QF-063610-T	Fig. B
6	48	2880	240/480	1	QF-064810	QF-064810-T	Fig. B
12	12	1440	240	1	QF-121210	QF-121210-T	Fig. C
12	18	2160	240/480	1	QF-121810	QF-121810-T	Fig. C
12	24	2880	240/480	1	QF-122410	QF-122410-T	Fig. C
12	30	3600	240/480	1	QF-123010	QF-123010-T	Fig. C
12	36	4320	240/480	1	QF-123610	QF-123610-T	Fig. C
12	48	5760	240/480	1	QF-124810	QF-124810-T	Fig. C
12	60	7200	240 or 480	3	QF-126010/*	QF-126010/*-T	Fig. C
12	72	8640	240/480	3	QF-127210/*	QF-127210/*-T	Fig. C
16	16	2560	240/480	1	QF-161610	QF-161610-T	Fig. D
24	24	5760	240 or 480	Dual	QF-242410/*	QF-242410/*-T	Fig. E
15 W/in²							
6	12	1080	120/240	1	QF-061215	QF-061215-T	Fig. A
6	18	1620	240	1	QF-061815	QF-061815-T	Fig. B
6	24	2160	240/480	1	QF-062415	QF-062415-T	Fig. B
6	30	2700	240/480	1	QF-063015	QF-063015-T	Fig. B
6	36	3240	240/480	1	QF-063615	QF-063615-T	Fig. B
6	48	4320	240/480	1	QF-064815	QF-064815-T	Fig. B
12	12	2160	240/480	1	QF-121215	QF-121215-T	Fig. C
12	18	3240	240/480	1	QF-121815	QF-121815-T	Fig. C
12	24	4320	240/480	1	QF-122415	QF-122415-T	Fig. C
12	30	5400	240/480	1	QF-123015	QF-123015-T	Fig. C
12	36	6480	240 or 480	3	QF-123615/*	QF-123615/*-T	Fig. C
12	48	8640	240 or 480	3	QF-124815/*	QF-124815/*-T	Fig. C
12	60	10800	240 or 480	3	QF-126015/*	QF-126015/*-T	Fig. C
12	72	12960	240 or 480	3	QF-127215/*	QF-127215/*-T	Fig. C
16	16	3840	240/480	1	QF-161615	QF-161615-T	Fig. D
16	24	5760	240 or 480	Dual	QF-162415/*	QF-162415/*-T	Fig. D
24	24	8640	480	Dual	QF-242415/480	QF-242415/480-T	Fig. E

*Designate voltage, i.e. insert 240 V or 480 for 480 V.



Width (in.)	Length (in.)	Wattage	Voltage	Phase	Without Thermowell Model No.	With Thermowell Model No.	Dim. Reference
20 W/in²							
6	12	1440	240	1	QF-061220	QF-061220-T	Fig. A
6	18	2160	240/480	1	QF-061820	QF-061820-T	Fig. B
6	24	2880	240/480	1	QF-062420	QF-062420-T	Fig. B
6	30	3600	240/480	1	QF-063020	QF-063020-T	Fig. B
6	36	4320	240/480	1	QF-063620	QF-063620-T	Fig. B
6	48	5760	240/480	1	QF-064820	QF-064820-T	Fig. B
12	12	2880	240/480	1	QF-121220	QF-121220-T	Fig. C
12	18	4320	240/480	1	QF-121820	QF-121820-T	Fig. C
12	24	5760	240/480	1	QF-122420	QF-122420-T	Fig. C
12	30	7200	240 or 480	3	QF-123020/*	QF-123020/*-T	Fig. C
12	36	8640	240/480	3	QF-123620/*	QF-123620/*-T	Fig. C
12	48	11520	240 or 480	3	QF-124820/*	QF-124820/*-T	Fig. C
12	60	14400	240 or 480	3	QF-126020/*	QF-126020/*-T	Fig. C
12	72	17280	240 or 480	3	QF-127220/*	QF-127220/*-T	Fig. C
16	16	5120	240 or 480	Dual	QF-161620/*	QF-161620/*-T	Fig. D
16	24	7680	480	Dual	QF-162420/480	QF-162420/480-T	Fig. D
24	24	11520	480	Dual	QF-242420/480	QF-242420/480-T	Fig. E
25 W/in²							
6	12	1800	240/480	1	QF-061225	QF-061225-T	Fig. A
6	18	2700	240/480	1	QF-061825	QF-061825-T	Fig. B
6	24	3600	240/480	1	QF-062425	QF-062425-T	Fig. B
6	30	4500	240/480	1	QF-063025	QF-063025-T	Fig. B
6	36	5400	240/480	1	QF-063625	QF-063625-T	Fig. B
6	48	7200	240 or 480	1	QF-064825	QF-064825-T	Fig. B
12	12	3600	240 or 480	1	QF-121225	QF-121225-T	Fig. C
12	18	5400	240 or 480	1	QF-121825	QF-121825-T	Fig. C
12	24	7200	240 or 480	3	QF-122425/*	QF-122425/*-T	Fig. C
12	30	9000	240 or 480	3	QF-123025/*	QF-123025/*-T	Fig. C
12	36	10800	240 or 480	3	QF-123625/*	QF-123625/*-T	Fig. C
12	48	14400	240 or 480	3	QF-124825/*	QF-124825/*-T	Fig. C
12	60	18000	240 or 480	3	QF-126025/*	QF-126025/*-T	Fig. C
12	72	21600	240 or 480	3	QF-127225/*	QF-127225/*-T	Fig. C
16	16	6400	240 or 480	Dual	QF-161625/*	QF-161625/*-T	Fig. D
16	24	9600	480	Dual	QF-162425/480	QF-162425/480-T	Fig. D
24	24	14400	480	Dual	QF-242425/480	QF-242425/480-T	Fig. E

**Designate voltage, i.e. insert 240 for 240 V or 480 for 480 V.*

5.3 QG SERIES

The warm up/cool down curve (Figure 5-3) shows the response time of the QG Series infrared heaters in free air from a cold start to full output and from full output to cool down cond tion. The curve will be affected by the ambient operating conditions.

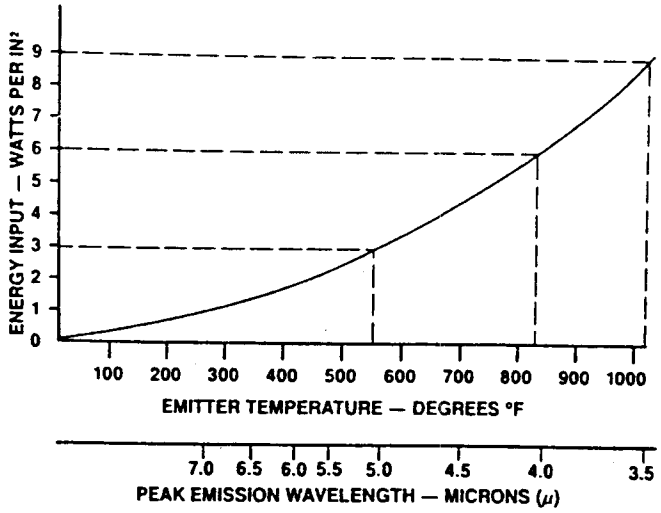


Figure 5-3. Warm Up/Cool Down Curve

The emission output curve (Figure 5-4) compares emitter surface temperature versus watt density and the corresponding wavelength emitted. The key to efficiency is to select an emitter wavelength that best matches the peak absorption of the process product.

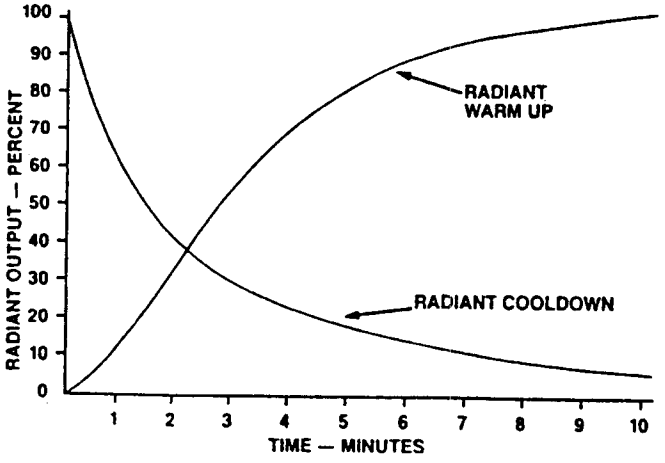
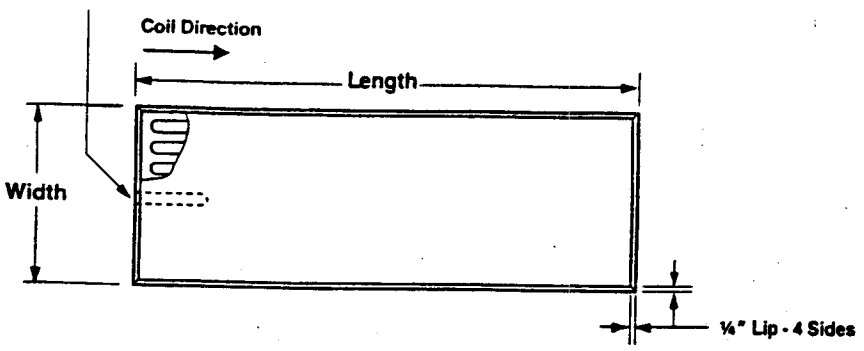
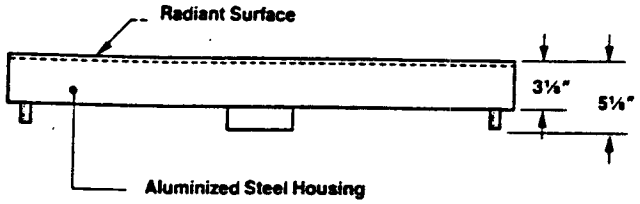
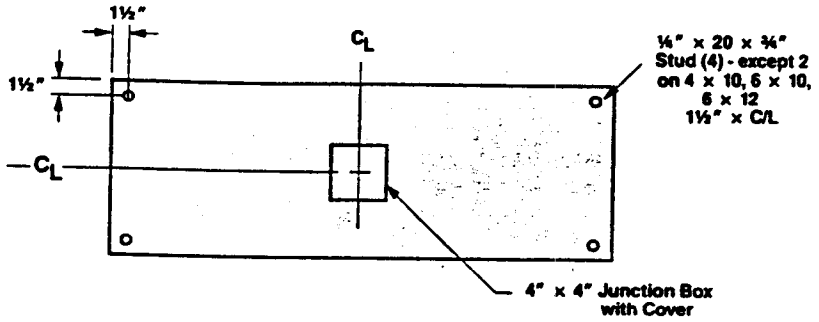


Figure 5-4. Emission Output Curve







Width (in.)	Length (in)	Wattage	Voltage	Phase	Without Thermowell Model No.	With Thermowell Model No.
10 W/in²						
6	12	720	120	1	QG-061210	QG-061210-T
6	18	1080	120/240	1	QG-061810	QG-061810-T
6	24	1440	120/240	1	QG-062410	QG-062410-T
12	12	1440	120/240	1	QG-121210	QG-121210-T
12	18	2160	240/480	1	QG-121810	QG-121810-T
12	24	2880	240/480	1	QG-122410	QG-122410-T
24	24	5760	240	1	QG-242410/240	QG-242410/240-T
24	24	5760	480	1	QG-242410/480	QG-242410/480-T
15 W/in²						
6	12	1080	240/480	1	QG-061215	QG-061215-T
6	18	1620	240	1	QG-061815	QG-061815-T
6	24	2160	240/480	1	QG-062415	QG-062415-T
12	12	2160	240/480	1	QG-121215	QG-121215-T
12	18	3240	240/480	1	QG-121815	QG-121815-T
12	24	4320	240/480	1	QG-122415	QG-122415-T
16	24	5760	240/480	1	QG-162415	QG-162415-T
24	24	8640	240	1	QG-242415/240	QG-242415/240-T
24	24	8640	480	1	QG-242415/480	QG-242415/480-T
20 W/in²						
6	18	2160	240/480	1	QG-061820	QG-061820-T
6	12	1440	240/480	1	QG-061220	QG-061220-T
6	24	2880	240/480	1	QG-062420	QG-062420-T
12	12	2880	240/480	1	QG-121220	QG-121220-T
12	18	4320	240/480	1	QG-121820	QG-121820-T
12	24	5760	240/480	1	QG-122420	QG-122420-T
16	24	7680	240/480	1	QG-162420	QG-162420-T

5.4 QC AND QH SERIES

The warm up curve (Figure 5-5) shows the response time of the QC and QH Series infrared heaters, measured by a thermocouple from a cold start to a maximum temperature. Changes in temperature, or partial warm up will be approximately this curve.

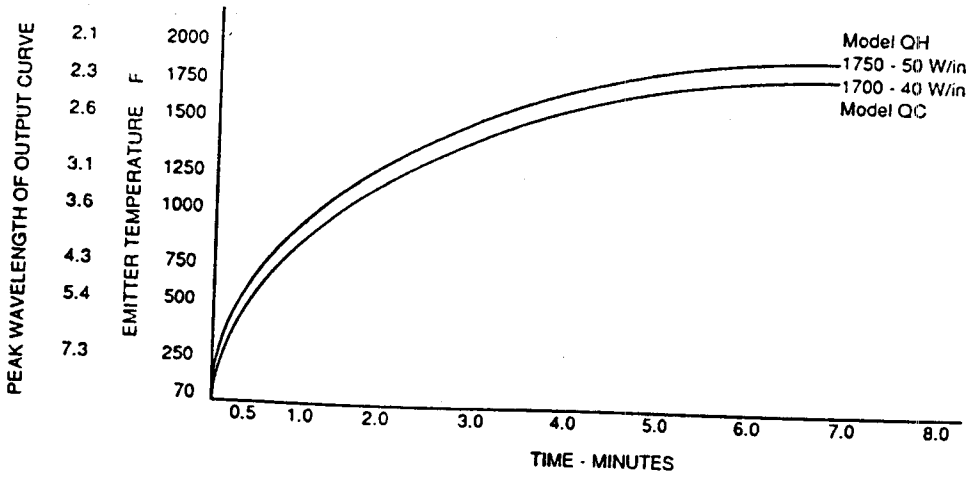


Figure 5-5. Warm Up Curve

The emission output curve (Figure 5-6) compares the emitter face temperature versus the corresponding wavelength emitted for a specific temperature. The key to efficiency is to select an emitter wavelength that best matches the peak absorption of the process product.

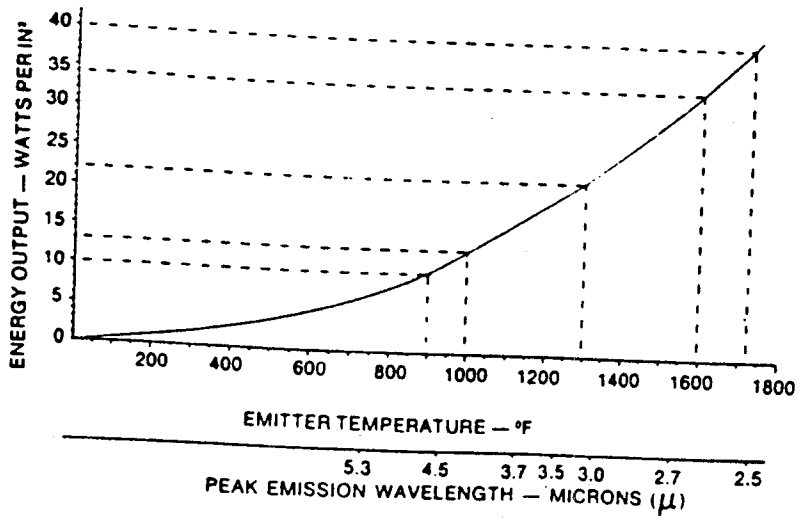
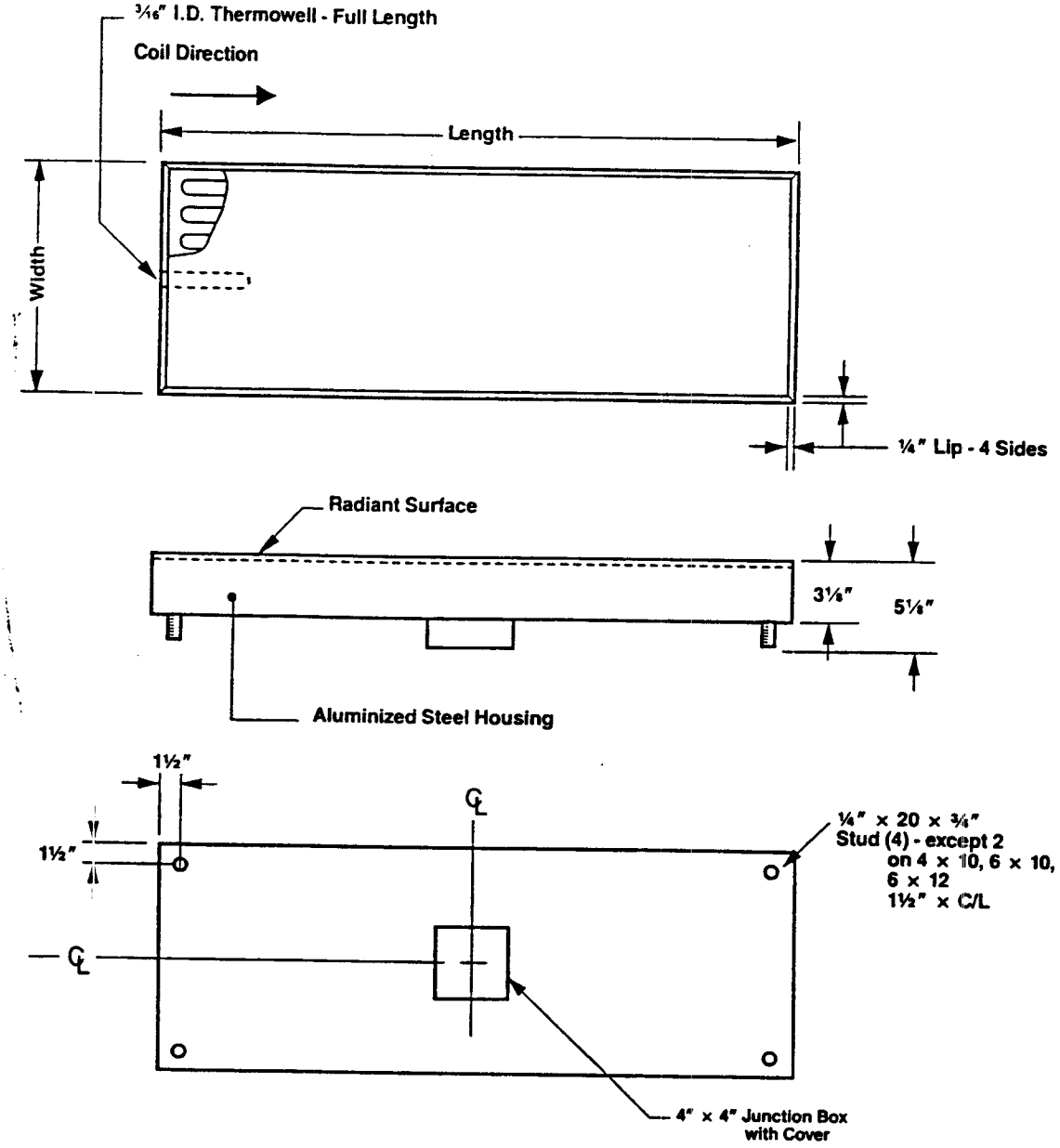


Figure 5-6. Emission Output Curve



Width (in.)	Length (in.)	Wattage	Voltage	Phase	Without Thermowell Model No.	With Thermowell Model No.
40 W/in² QC Series						
4	10	1600	240	1	QC-041040	QC-041040-T
6	10	2400	240/480	1	QC-061040	QC-061040-T
8	10	3200	240/480	1	QC-081040	QC-081040-T
10	10	4000	240/480	1	QC-101040	QC-101040-T
12	10	4800	240/480	1	QC-121040	QC-121040-T
6	12	2880	240/480	1	QC-061240	QC-061240-T
12	12	5760	240/480	1	QC-121240	QC-121240-T
60 W/in² QH Series						
4	10	2400	240/480	1	QH-041060	QH-041060-T
6	10	3600	240/480	1	QH-061060	QH-061060-T
8	10	4800	240/480	1	QH-081060	QH-081060-T
10	10	6000	240/480	1	QH-101060	QH-101060-T
12	10	7200	240/480	1	QH-121060	QH-121060-T
6	12	4320	240/480	1	QH-061260	QH-061260-T
12	12	8640	240/480	1	QH-121260	QH-121260-T

WARRANTY

OMEGALUX warrants this unit to be free of defects in materials and workmanship and to give satisfactory service for a period of 13 months from date of purchase. OMEGALUX Warranty adds an additional one (1) month grace period to the normal one (1) year product warranty to cover handling and shipping time. This ensures that our customers receive maximum coverage on each product. If the unit should malfunction, it must be returned to the factory for evaluation. Our Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGALUX, if the unit is found to be defective it will be repaired or replaced at no charge. However, this WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGALUX's control. Components which wear or which are damaged by misuse are not warranted. These include contact points, fuses, and triacs.

UNITS THAT ARE INHERENTLY DANGEROUS ARE INTENDED TO BE INSTALLED AND USED ONLY BY QUALIFIED PERSONNEL. NO WARRANTY EXTENDED HEREIN WILL APPLY IF SUCH UNIT IS INSTALLED OR USED BY UNQUALIFIED PERSONNEL. There are no warranties except as stated herein. There are no other warranties, expressed or implied, including but not limited to the implied warranties of merchantability and of fitness for a particular purpose. OMEGALUX is not responsible for any damages or losses caused to other equipment, whether direct, indirect, incidental, special or consequential, which the purchaser may experience as a result of the installation or use of the product. The buyer's sole remedy for any breach of this agreement by OMEGALUX or any breach of any Warranty by OMEGALUX shall not exceed the purchase price paid by the purchaser to OMEGALUX for the unit or units or equipment directly affected by such breach.

Every precaution for accuracy has been taken in the preparation of this manual, however, OMEGALUX neither assumes responsibility for any omissions or errors that may appear nor assumes liability for any damages that result from the use of the products in accordance with the information contained in the manual.

Return Requests/Inquiries

Direct all warranty and repair requests/inquiries to the OMEGA ENGINEERING Customer Service Department. Call toll free in the USA: 1-800-622-2378, FAX: 203-359-7811; International: 203-359-1660, FAX: 203-359-7807.

BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, YOU MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OUR CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

FOR WARRANTY RETURNS, please have the following information available BEFORE contacting OMEGA:

1. P.O. number under which the product was PURCHASED.
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems you are having with the product.

FOR NON-WARRANTY REPAIRS OR CALIBRATION, consult OMEGA for current repair/calibration charges. Have the following information available BEFORE contacting OMEGA:

1. Your P.O. number to cover the COST of the repair/calibration,
2. Model and serial number of product, and
3. Repair instructions and/or specific problems you are having with the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. That way our customers get the latest in technology and engineering.

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