Omega II®

Pre **E**ngineered **P**ackages

Products by: COMBUSTION RESEARCH CORPORATION

SUBMITTAL DATA

PROJECT:

Specifications for

Omega II® UNITARY P.E.P. SYSTEMS

PART 1 - GENERAL

It is the intent of this specification to identify design requirements and minimum standards for the quality, construction, delivery, installation, and operation of the low intensity, vacuum vented, gas fired infrared heating equipment. Minor variations, in accordance with standard practice, shall be indicated on the shop drawings and submitted for approval.

1.1 - CODES AND STANDARDS

1.1.1 The entire heating system shall be designed certified to:

a) American Gas Association "Gas-Fired Low-Intensity Infrared Heaters" conforming to the ANSI Z83.20- (Current Standard).
b) Canadian Gas Association Certified "Gas-Fired Low-Intensity Infrared Heaters" conforming to CSA 2.34 – (Current Standard).

1.1.2 Installation shall conform to local codes and local gas authorities including the National Electrical Code, National Fuel Gas Code, and applicable ANSI, NFPA & CAN/CGA & CSA codes.

1.2 - QUALITY ASSURANCE

1.2.1 The material construction and operation of the infrared heating equipment shall conform to the performance specifications contained herein. Approved manufacturer is: Combustion Research Corporation, 2516 Leach Rd., Rochester Hills, MI, 48309; Tel. No. 248.852.3611, Fax. No. 248.852.9165.

1.2.2 Manufacturer shall warrant mechanical and electrical components for a period of one year from original invoice date.

1.2.3 Manufacturer shall warrant radiant tube for a period of ten (10) years (against internally created corrosion) from the original invoice date provided system is installed and maintained in accordance with the owner's manual - see warranty statement for details.

1.2.4 System shall be furnished complete with Burner(s), Tubular infrared emitters, Fittings, Reflector Shields, Hangers, and System Controls.

1.3 - MANUFACTURER AND INSTALLER QUALIFICATIONS

1.3.1 The low intensity, gas fired infrared heating system shall be a product of a manufacturer who has had at least ten years experience in design and fabrication and who is regularly engaged in the manufacture of the type of gas fired low intensity infrared heating equipment specified herein. Only manufactures who can submit evidence of actual installations of comparable designed construction, and that the products have proven practical, durable, and require a minimum of maintenance, will be qualified under this specification.

1.3.2 Installation of the gas fired low intensity infrared heating equipment shall be by supervised by an authorized representative of the heater manufacturer and shall be in accordance with approved installation drawings. Mechanics shall be skilled and experienced in the erection of the low intensity infrared heating equipment of the type specified herein.

1.4 - DELIVERY AND STORAGE

1.4.1 Materials shall be shipped in the manufacturers standard protective packaging to the designated site.

1.4.2 The installing contractor is responsible for receiving, unloading and storage of materials. Storage shall be in dry locations free from dust and water and available for inspection and handling. Handle equipment carefully to prevent damage. Remove damaged items that cannot be restored to like new condition and replace with new items.

PART 2 - PRODUCT

2.1 - BURNER

2.1.1 Burner shall be capable of firing at 40,000 BTU/hr (11.72 kW/hr) up to and including 100,000 BTU/hr (29.3 kW/hr) at 5,000 BTU/hr (1.46 kW/hr) increments with natural gas or LP gas.

2.1.2 Burner power requirements 115 Volt, 60 Hz AC, 1.8 A.

2.1.3 Burner shall include the following features:

a) Fitted with a 4" (102 mm) diameter combustion air inlet with a fixed combustion air-metering orifice.
b) Burner shall be fitted a differential air pressure switch so as to prove adequate combustion air is present before burner fires.
a) Burner shall be fitted with solid state electronic controls with spark ignition & 100% lockout in event of flame failure.
b) Regulator to be factory set at 3.5" W.C. (6.54 mm/Hg) for natural gas and 10.0" W.C. (18.68 mm/Hg) for propane gas.
c) Gas valve, ignition controls, and differential pressure switch shall be enclosed within the burner compartment and SEGREGATED from the combustion air supply.
d) Heavy-duty nozzle pre-mix combustion system - minimum 0.125" (3.17 mm) metal thickness.
e) Electrode and flame rod to be made of NiChrome.
f) Burner shall have a minimum 15-second pre-purge before ignition.
g) Burner shall casing to be constructed of 16 Ga. (1.587mm) aluminized steel, powder coated.
h) Burner shall be fitted with inspection window for visual inspection of spark and flame.
i) ½" NPT gas inlet on the back, side, bottom or top of burner assembly - GAS INLET IS NOT TO BE ON THE COMBUSTION TUBE SIDE OF BURNER.

2.1.4 Burners venting into common stack shall be operated with one thermostat.

2.2 - SYSTEM CONTROLS

2.2.1 Shall be supplied with:

a) Supplied with pre-wired controls. 115V, 16 amp, 60 Hz.
b) Solid state spark ignition and flame rectification (separate probe) with 100% flame lockout and 30 second pre-purge (24 VAC, 22 VA).
c) Thermostat provided by equipment manufacturer, 115V, 8 amp minimum rating.

2.3 - RADIANT TUBE HEAT EXCHANGING NETWORK

2.3.1 All radiant tubing (including combustion tube) shall be stainless steel construction.

2.3.2 Combustion tube shall be 10' (3048mm) long 16 gauge stainless steel 3.5" (89 mm) OD swaged one end.

2.3.3 Balance of radiant tubing shall be heat-treated, spiral wound 22 gauge **aluminized 409 stainless steel**, 3.5" (89 mm) OD.

2.3.4 Assembly: Assemble and install the heating system in accordance with the installation manual and shop drawings.

a) Combustion tube to be supported with tube and reflector hangers on maximum centers of:
- Straight tube systems - 54" (1372 mm)
- "U" tube systems - 66" (1376 mm)
b) Remainder of radiant tube to be supported with tube and reflector hangers on maximum centers of:
- Straight tube systems - 118" (2,997 mm) with intermediate reflector supports between each 118" (2,997 mm) distance.
- "U" tube systems - 66" (1676 mm).
c) Burner head is to be supported by approved hanging method and not allowed to "free hang" off of the combustion tube.

2.3.5 Elbows and tube coupler to be made of min. 18 gauge (1.32 mm) aluminized steel, swaged at both ends so as to fit into 3.5" (89 mm) spiral tube.

2.3.6 Reflectors to be made of minimum 0.025" (0.635 mm) bright stainless steel.

2.3.7 Tubing and reflector hangers to be made of 0.25" (6.35 mm) Dia. Zinc plated CRS.

2.3.8 All joints to be sealed and mechanically fastened with self drilling and tapping screws.

2.3.9 All radiant tubing to be continuously covered by the reflector, i.e. radiant tube elbows, "U' bends and fittings to be covered by reflectors -- NO GAPS BETWEEN REFLECTORS. Reflectors are to be overlapped a minimum of one-inch (25.4 mm) and secured together with sheet metal screws allowing for one unsecured overlap joint for expansion on each straight run exceeding ten feet (3,048 mm).

2.4 - COMBUSTION AIR

2.4.1 Outside combustion air (if used) is to be provided without the use of supplementary supply blowers or fans.

2.4.2 Outside combustion air ducting to be minimum of 4" (102 mm) OD (S&D PVC or galvanized stovepipe).

2.5 - SYSTEM PERFORMANCE

2.5.1 System shall attain a net exhaust temperature of not less than 200° F (92.5° C) in a 15 min. run cycle and shall not exceed a maximum net temperature of 400° F (204.2° C).

2.5.2 System STEADY STATE EFFICIENCY shall be a minimum of 77%, maximum 87%.

2.5.3 System shall be a non-condensing dry tube system i.e. - After a minimum run time of 8 minutes all condensation will cease and moisture will exit the system in a vapor state.

PART 3 - EXECUTION

3.1 - INSTALLATION

3.1.1 Power Requirements: It is the installers' responsibility to verify the correct power requirements for the project.

3.1.2 Fuel Supply and Distribution:

a) A suitably designed gas distribution system shall be installed per shop drawings.
b) Each burner assembly shall be furnished with a stainless steel gas connector with manual shut off valve.

3.1.3 Assembly: Assemble and install the heating system in accordance with the installation manual and shop drawings.

3.1.4 Cleaning: Clean reflectors as may be required and touch up painted surfaces as may be needed.

3.1.5 Testing: Upon completion of installation, including work by other trades, adjust and test the heating system in accordance to the manufacturer's owners manual. Adjust and re-test heating system until entire installation is fully operable and acceptable.

END OF SECTION

TECHNICAL DATA

MANIFOLD GAS PRESSURE

Natural Gas: 3.5" W.C.
LP Gas: 10.0" W.C.
½" NPT Gas Connector

ELECTRICAL RATING

115 VAC, 60 Hz, 1.8 Amp

GAS INLET PRESSURE

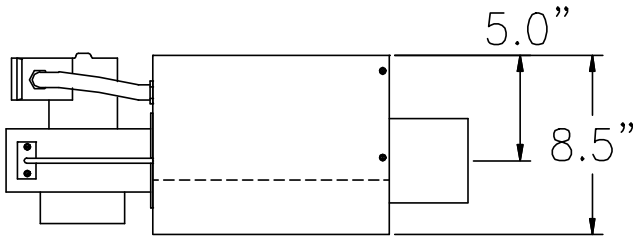
Natural Gas:	6.0" W.C. Min.	14.0" W.C. Max.
LP Gas	11.0" W.C. Min.	14.0" W.C. Max.

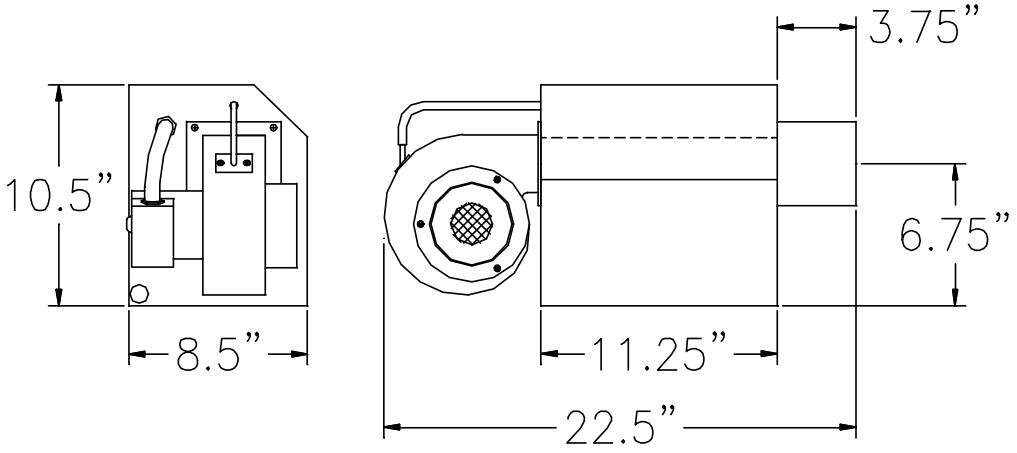
ALTITUDE

Systems 0S922 thru 0S910 (40k thru 100k Btu/hr input) 0- 4,500 ft. (0 – 1370 m) No derating required.

Systems 0S926 thru 0S945 (105k through 200k input)
0 - 2,000 Ft. (0 - 610m) No derating required.
2,000 - 4,500 Ft. (610 - 1,370m) Derating required.

BURNER DIMENSIONS

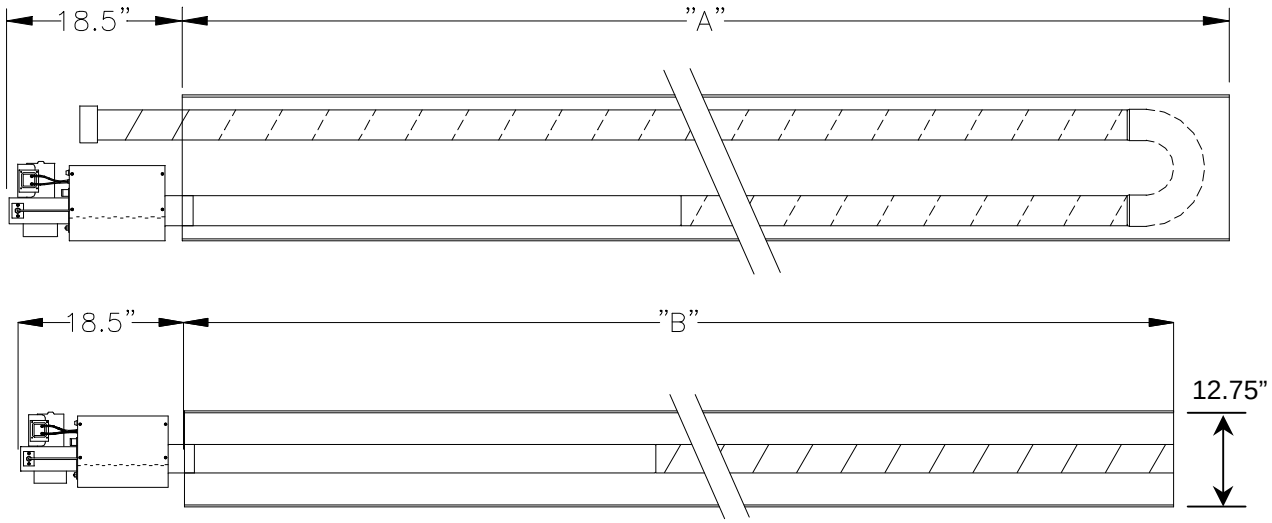




SYSTEM DIMENSIONS

3.5" Omega II®

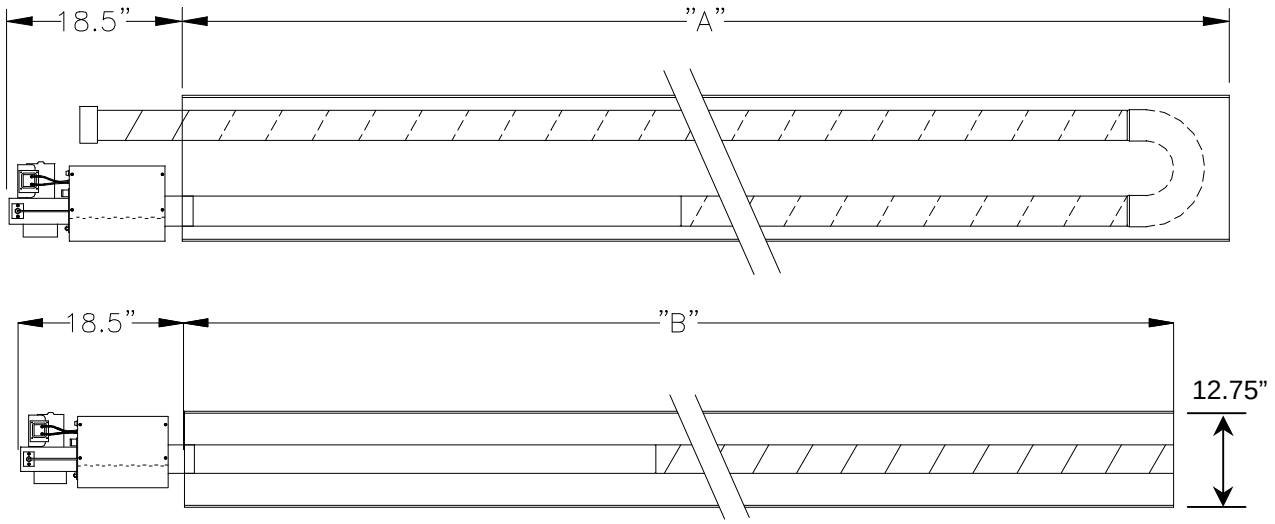
BURNER P.N.	BTU/Hr INPUT	A ("U" TUBE SYSTEM)	B (STRAIGHT TUBE SYSTEM)
0S922.NG/LP	40,000	5'-0" (1524mm)/10'-0" (3048mm)	10'-0" (3048mm)/19'-8" (6020mm)
0S921.NG/LP	45,000	5'-0" (1524mm)/10'-0" (3048mm)	10'-0" (3048mm)/19'-8" (6020mm)
0S920.NG/LP	50,000	10'-0" (3048mm) / 14'-8" (4496mm)	19'-8" (6020mm) / 29'-10" (9093mm)
0S919.NG/LP	55,000	10'-0" (3048mm) / 14'-8" (4496mm)	19'-8" (6020mm) / 29'-10" (9093mm)
0S918.NG/LP	60,000	10'-0" (3048mm) / 14'-8" (4496mm)	19'-8" (6020mm) / 29'-10" (9093mm)
0S917.NG/LP	65,000	10'-0" (3048mm) / 14'-8" (4496mm) / 19'-11" (6071mm)	19'-8" (6020mm) / 29'-10" (9093mm) / 39'-4" (11989mm)
0S916.NG/LP	70,000	10'-0" (3048mm) / 14'-8" (4496mm) / 19'-11" (6071mm)	19'-8" (6020mm) / 29'-10" (9093mm) / 39'-4" (11989mm)
0S915.NG/LP	75,000	10'-0" (3048mm) / 14'-8" (4496mm) / 19'-11" (6071mm)	19'-8" (6020mm) / 29'-10" (9093mm) / 39'-4" (11989mm)
0S914.NG/LP	80,000	10'-0" (3048mm) / 14'-8" (4496mm) / 19'-11" (6071mm)	19'-8" (6020mm) / 29'-10" (9093mm) / 39'-4" (11989mm)
0S913.NG/LP	85,000	10'-0" (3048mm) / 14'-8" (4496mm) / 19'-11" (6071mm)	19'-8" (6020mm) / 29'-10" (9093mm) / 39'-4" (11989mm)
0S912\.NG/LP	90,000	10'-0" (3048mm) / 14'-8" (4496mm) / 19'-11" (6071mm)	19'-8" (6020mm) / 29'-10" (9093mm) / 39'-4" (11989mm)
0S911.NG/LP	95,000	14'-8" (4496mm) / 19'-8" (6020mm) / 24'-10" (7569mm)	29'-10" (9093mm) / 39'-4" (11989mm) / 49'-1" (14961mm)
0S910.NG/LP	100,000	14'-8" (4496mm) / 19'-8" (6020mm) / 24'-10" (7569mm)	29'-10" (9093mm) / 39'-4" (11989mm) / 49'-1" (14961mm)



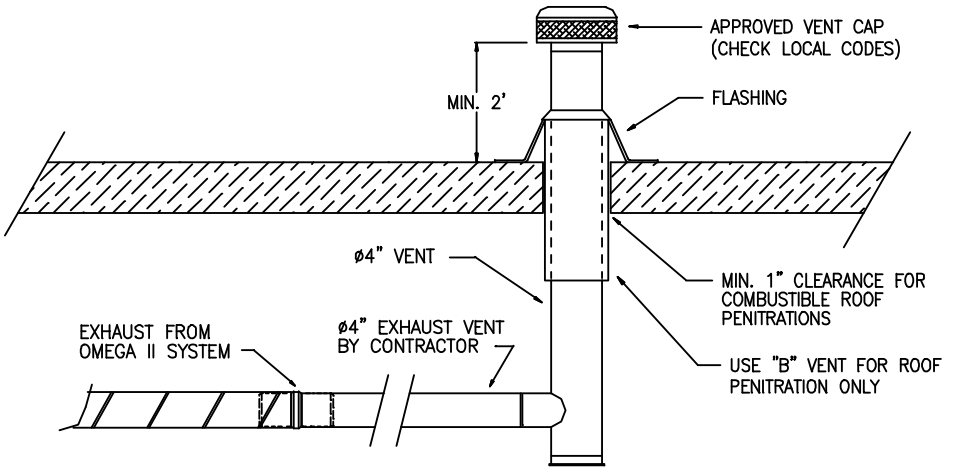
SYSTEM DIMENSIONS

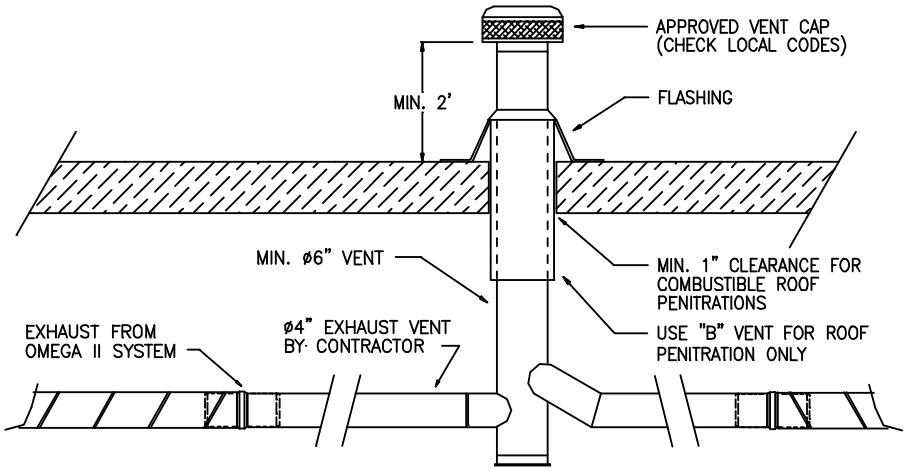
4" Omega II®

BURNER P.N.	BTU/Hr INPUT	A ("U" TUBE SYSTEM)	B (STRAIGHT TUBE SYSTEM)
0S926.NG/LP	105,000	14'-8" (4496mm) / 19'-11" (6071mm) / 24'-9" (7544mm)	29'-10" (9093mm) / 39'-4" (11989mm) / 49'-1" (14961mm)
0S927.NG/LP	110,000	14'-8" (4496mm) / 19'-11" (6071mm) / 24'-9" (7544mm)	29'-10" (9093mm) / 39'-4" (11989mm) / 49'-1" (14961mm)
0S928.NG/LP	115,000	14'-8" (4496mm) / 19'-11" (6071mm) / 24'-9" (7544mm)	29'-10" (9093mm) / 39'-4" (11989mm) / 49'-1" (14961mm)
0S929.NG/LP	120,000	19'-11" (6071mm) / 24'-9" (7544mm) / 29'-9" (9068mm)	39'-4" (11989mm) / 49'-1" (14961mm) / 58'-11" (17958mm)
0S930.NG/LP	125,000	19'-11" (6071mm) / 24'-9" (7544mm) / 29'-9" (9068mm)	39'-4" (11989mm) / 49'-1" (14961mm) / 58'-11" (17958mm)
0S931.NG/LP	130,000	19'-11" (6071mm) / 24'-9" (7544mm) / 29'-9" (9068mm)	39'-4" (11989mm) / 49'-1" (14961mm) / 58'-11" (17958mm)
0S932.NG/LP	135,000	19'-11" (6071mm) / 24'-9" (7544mm) / 29'-9" (9068mm)	39'-4" (11989mm) / 49'-1" (14961mm) / 58'-11" (17958mm)
0S933.NG/LP	140,000	19'-11" (6071mm) / 24'-9" (7544mm) / 29'-9" (9068mm)	39'-4" (11989mm) / 49'-1" (14961mm) / 58'-11" (17958mm)
0S934.NG/LP	145,000	19'-11" (6071mm) / 24'-9" (7544mm) / 29'-9" (9068mm)	39'-4" (11989mm) / 49'-1" (14961mm) / 58'-11" (17958mm)
0S935.NG/LP	150,000	19'-11" (6071mm) / 24'-9" (7544mm) / 29'-9" (9068mm)	39'-4" (11989mm) / 49'-1" (14961mm) / 58'-11" (17958mm)
0S936.NG/LP	155,000	19'-11" (6071mm) / 24'-9" (7544mm) 29'-9" (9068mm) / 34'-9" (10592mm)	39'-4" (11989mm) / 49'-1" (14961mm) 58'-11" (17958mm) / 68'-8" (20930mm)
0S937.NG/LP	160,000	19'-11" (6071mm) / 24'-9" (7544mm) 29'-9" (9068mm) / 34'-9" (10592mm)	39'-4" (11989mm) / 49'-1" (14961mm) 58'-11" (17958mm) / 68'-8" (20930mm)
0S938.NG/LP	165,000	19'-11" (6071mm) / 24'-9" (7544mm) 29'-9" (9068mm) / 34'-9" (10592mm)	39'-4" (11989mm) / 49'-1" (14961mm) 58'-11" (17958mm) / 68'-8" (20930mm)
0S939.NG/LP	170,000	19'-11" (6071mm) / 24'-9" (7544mm) 29'-9" (9068mm) / 34'-9" (10592mm)	39'-4" (11989mm) / 49'-1" (14961mm) 58'-11" (17958mm) / 68'-8" (20930mm)
0S940.NG/LP	175,000	19'-11" (6071mm) / 24'-9" (7544mm) 29'-9" (9068mm) / 34'-9" (10592mm)	39'-4" (11989mm) / 49'-1" (14961mm) 58'-11" (17958mm) / 68'-8" (20930mm)
0S941.NG/LP	180,000	24'-9" (7544mm) / 29'-9" (9068mm) 34'-9" (10592mm)	49'-1" (14961mm) / 58'-11" (17958mm) 68'-8" (20930mm)
0S942.NG/LP	185,000	24'-9" (7544mm) / 29'-9" (9068mm) 34'-9" (10592mm)	49'-1" (14961mm) / 58'-11" (17958mm) 68'-8" (20930mm)
0S943.NG/LP	190,000	24'-9" (7544mm) / 29'-9" (9068mm) 34'-9" (10592mm)	49'-1" (14961mm) / 58'-11" (17958mm) 68'-8" (20930mm)
0S944.NG/LP	195,000	24'-9" (7544mm) / 29'-9" (9068mm) 34'-9" (10592mm) / 39'-9" (12116mm)	49'-1" (14961mm) / 58'-11" (17958mm) 68'-8" (20930mm) / 78'-5" (23901mm)
0S945.NG/LP	200,000	24'-9" (7544mm) / 29'-9" (9068mm) 34'-9" (10592mm) / 39'-9" (12116mm)	49'-1" (14961mm) / 58'-11" (17958mm) 68'-8" (20930mm) / 78'-5" (23901mm)



EXHAUST METHODS





COMMON VENTING

1. The total stack length from the OMEGA II exhaust to the point where it terminates should be a minimum of three feet (3') and a maximum of twenty feet (20'). It is recommended that any portion of flue pipe that passes through the roof or wall be a double wall vent, 'B' vent is recommended (check local codes) .
2. Horizontal runs to vertical vent should never exceed 75% of the vertical height of the vent stack. Refer to ANSI Z223.1 (current standard) (same as bulletin NFPA-54) for proper vent sizes and installation. When exhausting more than one OMEGA II heater into a common stack the open area of vent must equal or exceed the sum of the open area of each flue vent connected to it.
3. When exhausting more than one OMEGA II heater into a common stack the same thermostat should control both heaters.
4. Connections to a common stack must be staggered so as to avoid direct opposition between streams of combustion gasses.
5. A 1" minimum clearance must be maintained around vent when passing through the roof.
6. An approved Vent Cap should be used on all through the roof applications. The National Fire Protection Standards, NFPA Numbers 54 and 211, require that unless an approved Vent Cap is used the vent must extend at least two feet above the highest portion of a building within ten feet.
7. All Joints in the flue should be sealed. Use General Electric RTV 106 Red, high temperature adhesive sealant or equivalent should be sealed. Use General Electric RTV 106 Red, high temperature adhesive.

COMBUSTION RESEARCH CORPORATION

Part No. 0317.00, Gas Connector

Stainless Steel Gas Connector with Manual Valve

STAINLESS STEEL GAS CONNECTOR

- Stainless steel flex construction - Corrosion resistance.
- No-Neck™ Design - Added safety.
- Manual connector valve included.

SPECIFICATIONS

CRC Part No.:

0317.00

Dimensions:

½" F.I.P x ½" F.I.P Connections

7/8" O.D x ½" I.D. Stainless Steel Flex, 24" Long.

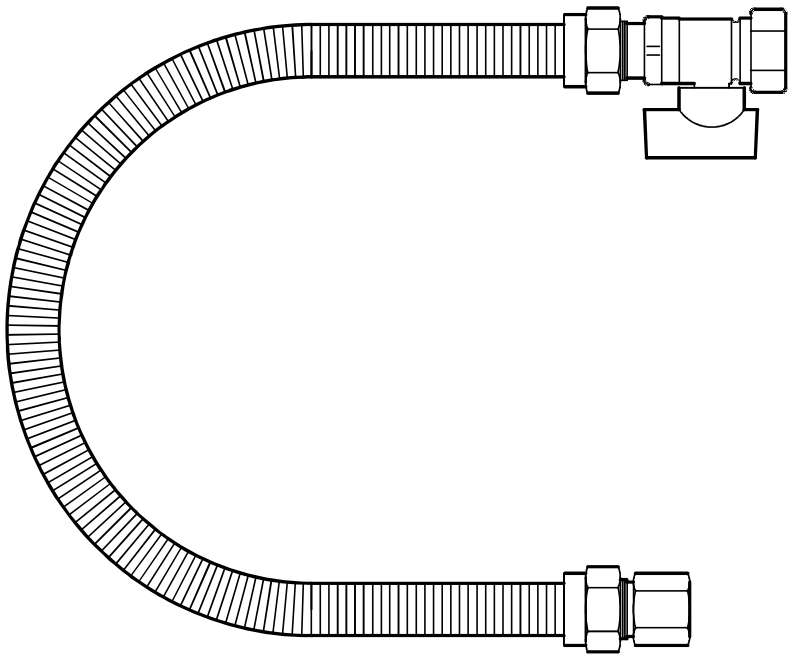
INSTALLATION & CHECKOUT

INSTALLATION

Install the stainless gas connector as outlined in the owner's manual. The stainless steel gas connector is to be installed with the manual gas valve on the up-stream side.

CHECKOUT

Make sure that the gas connector is installed in accordance with the owner's manual. Check connections for leaks with a soap solution. If bubbling occurs tighten flare connections or reapply pipe joint compound to pipe thread connections. Recheck for gas leaks.



COMBUSTION RESEARCH CORPORATION

Burner Combustion Tube

16 Ga. Heat Treated Aluminized 409 StainlessSteel

HEAT TREATED ALUMINIZED 409 STAINLESS STEEL COMBUSTION TUBE

- Aluminized 409 StainlessSteel Construction – Heat treated
- Used With Omega II® Radiant Tube System
- Corrosion Resistant

SPECIFICATIONS

CRC Part No.:

0404.SS.16.HT - 4” diameter radiant tube
Wt. – 26.0 lbs. (11.8 kg)
0304.SS.16.HT - 3.5” diameter radiant tube
Wt. – 23.5 lbs. (10.6 kg)

Dimensions:

Minimum 16 Ga. heat treated aluminized 409 stainless steel, 3.5” or 4.0" Tubing

Temperature Rating:

1050°F (565°C)

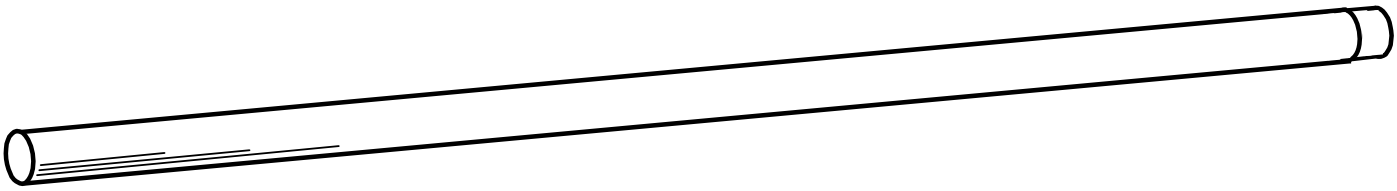
INSTALLATION & CHECKOUT

Installation

Install 16 Ga. burner combustion tube immediately down stream of burner. Note one end is swaged to fit inside the next radiant tube. Position weld seam so that it is on the bottom. Secure radiant tubes burner assembly with 0507.00 (3.5”) or 0403.00 (4.0”) stainless steel drawband couplers. Refer to the owner's manual for installation guidance.

Checkout

Make sure that the weld seam is positioned on the bottom of the tube. Inspect to make sure that all radiant tubes are connected square and straight.



COMBUSTION RESEARCH CORPORATION

Spiral Radiant Tube
Heat Treated Aluminized 409 Stainless Steel

HEAT TREATED ALUMINIZED 409 STAINLESS STEEL RADIANT TUBE

- Heat treated Aluminized 409 Stainless Steel Spiral Construction
- 9'-9" Long Sections
- Used With Omega II® Radiant Tube System
- Patented, Strong, Low Mass Tube (Min. 22 Ga.)
- Corrosion Resistant

SPECIFICATIONS

CRC Part No.:

0404.SS.HT - 4" diameter radiant tube
Wt. – 13.0 lbs. (5.9 kg)
0304.SS.HT - 3.5" diameter radiant tube
Wt. – 13.0 lbs. (5.9 kg)

Dimensions:

Minimum 22 Ga. heat-treated 409 aluminized stainless steel

Temperature Rating:

1050°F (565°C)

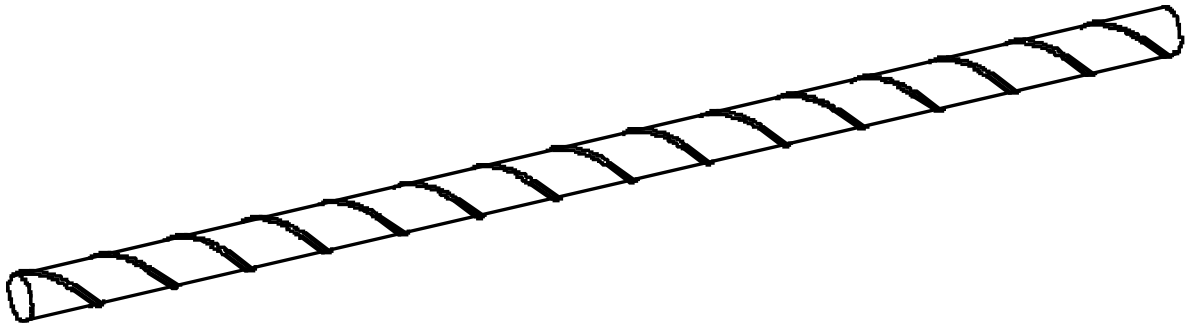
INSTALLATION & CHECKOUT

INSTALLATION

Install radiant tube as shown on shop drawing. Note, radiant tubes are connected by swaged couplers (0311.AS - 3.5" or 0411.AS – 4.0") designed to fit inside the spiral radiant tube. Refer to the owner's manual for installation guidance.

Checkout

Make sure that radiant tubes are installed in accordance with the owner's manual as well as the shop drawing. Inspect to make sure that all radiant tubes are connected square and straight.



COMBUSTION RESEARCH CORPORATION

Part No. 0360.02, Reflector
Stainless Steel Reflector

ALUMINUM REFLECTOR

- Bright Finish 304 Stainless Steel Reflector
- High Reflectivity
- Used With Omega II® Radiant Tube System
- Corrosion Resistant

SPECIFICATIONS

CRC Part No.:

0360.02 - 10'-0" Long
Wt. – 5.0 Lbs. (2.27 kg)

Dimensions:

Minimum 0.025" Thick Bright Stainless Steel, 10'-0" Long.

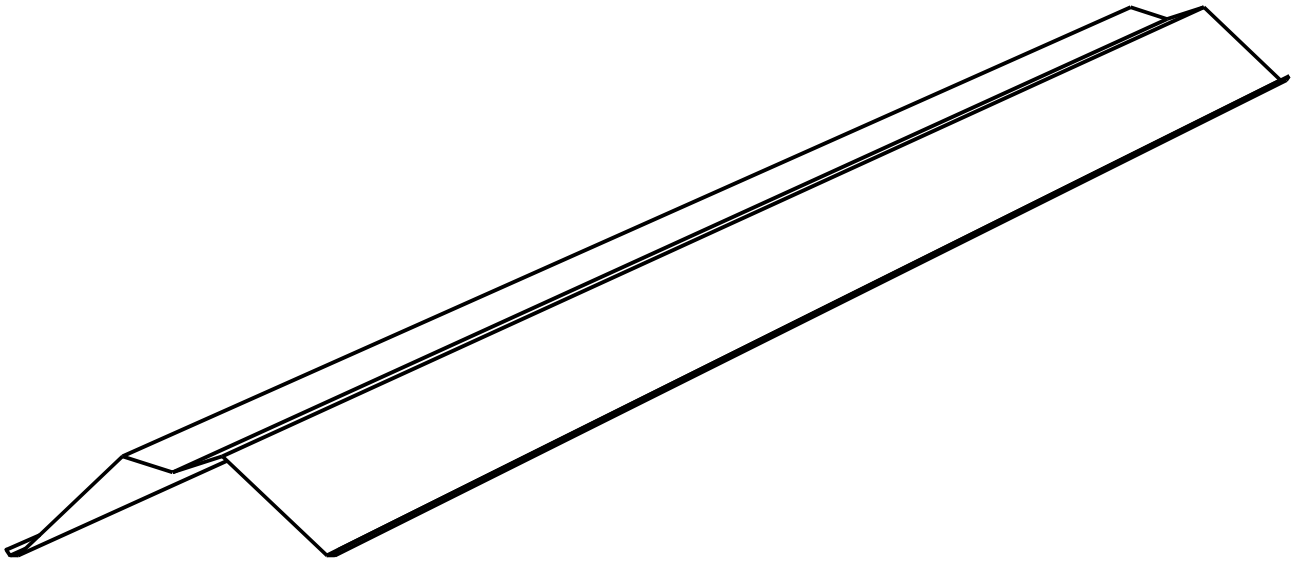
INSTALLATION & CHECKOUT

INSTALLATION

Install reflectors over radiant tubes as shown on shop drawing. Note, secure reflectors together at each straight run allowing for one unsecured joint for expansion - Refer to the owner's manual for installation guidance.

Checkout

Make sure that the radiant tubes and reflectors are installed in accordance with the owner's manual as well as the shop drawing. Inspect to make sure that all radiant tubes are connected square and straight. Make sure that one expansion joint for each straight run is installed



COMBUSTION RESEARCH CORPORATION

Part No. 0306.P1.SS, Elbow Package

SS Reflector Elbow & 3.5”, 90° Tube Elbow

ELBOW PACKAGE

- Bright Finish Stainless Steel Reflector Material
- 0306.AS Aluminized Steel Radiant Tube Elbow
- Horizontal Reflector Mounting Configuration
- Used With Omega II® Radiant Tube System
- Corrosion Resistant

SPECIFICATIONS

CRC Part No.:

0306.P1.SS - 3.5” diameter
Wt. 4.0 lbs. (1.81 kg)

Dimensions:

Minimum 0.025” Thick Bright 304 Stainless Steel, Minimum 18 Ga. aluminized steel radiant tube elbow.

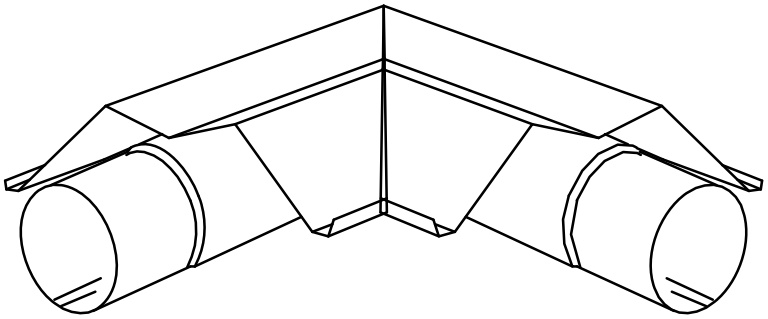
INSTALLATION & CHECKOUT

INSTALLATION

Install radiant tube elbow and reflector elbow as shown on shop drawing. Note, secure tube elbow to radiant tubes with self drilling and taping screws and secure reflector elbow to the adjacent reflectors with the self drilling and tapping sheet metal screws - Refer to the owner's manual for installation guidance.

Checkout

Make sure that the radiant tube elbows and reflector elbows are installed in accordance with the owner’s manual as well as the shop drawing. Inspect to make sure that all radiant tubes are connected square and straight.



COMBUSTION RESEARCH CORPORATION

Part No. 0406.P1.SS, Elbow Package

SS Reflector Elbow & 4.0”, 90° Tube Elbow

ELBOW PACKAGE

- Bright Finish 304 Stainless Steel Reflector Material
- 0406.AS Aluminized Steel Radiant Tube Elbow
- Horizontal Reflector Mounting Configuration
- Used With Omega II® Radiant Tube System
- Corrosion Resistant

SPECIFICATIONS

CRC Part No.:

0406.P1.SS - 4.0” diameter
Wt. 4.0 lbs. (1.81 kg)

Dimensions:

Minimum 0.025” Thick Bright 304 Stainless Steel, Minimum 18 Ga. aluminized steel radiant tube elbow.

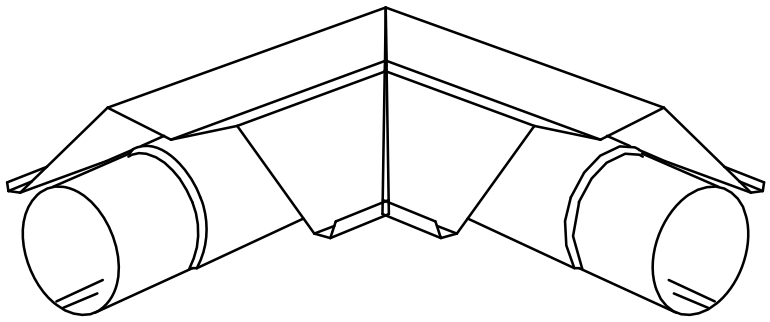
INSTALLATION & CHECKOUT

INSTALLATION

Install radiant tube elbow and reflector elbow as shown on shop drawing. Note, secure tube elbow to radiant tubes with self drilling and taping screws and secure reflector elbow to the adjacent reflectors with the self drilling and tapping sheet metal screws - Refer to the owner's manual for installation guidance.

Checkout

Make sure that the radiant tube elbows and reflector elbows are installed in accordance with the owner’s manual as well as the shop drawing. Inspect to make sure that all radiant tubes are connected square and straight.



COMBUSTION RESEARCH CORPORATION

Radiant Tube Coupler

Aluminized Steel Radiant Tube Coupler

ALUMINIZED STEEL TUBE COUPLER

- **INSTALLATION** Aluminized Steel Construction
- Swaged For Internal Connection To 0304.AS or 0404.AS Radiant tubes.
- Used With Omega II® Radiant Tube System
- Aluminized Steel, Min. 18 Ga.
- Corrosion Resistant

SPECIFICATIONS

CRC Part No.:

0311.AS - 3.5" Diameter
Wt. 1.25 Lbs. (0.57 kg)
0411.AS - 4.0" Diameter
Wt. 2.0 Lbs. (0.9 kg)

Dimensions:

Minimum 18 Ga. aluminized steel, Swaged on Both ends

Temperature Rating:

1050°F (565°C)

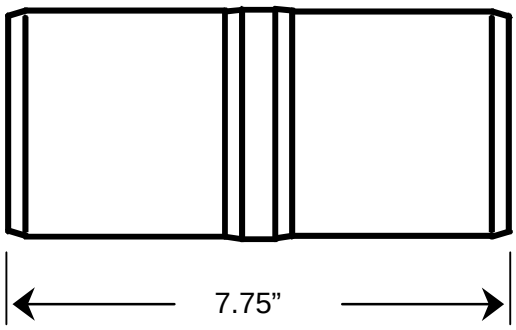
INSTALLATION & CHECKOUT

INSTALLATION

Install coupler as shown on shop drawing. Note couplers are designed to fit inside the spiral radiant tube. Apply sealer to internal surface of radiant tube before inserting coupler. Secure with three self drilling and taping screws on each swaged end. Refer to the owner's manual for installation guidance.

Checkout

Make sure that the radiant tubes and couplers are installed in accordance with the owner's manual as well as the shop drawing. Inspect to make sure that all radiant tubes are securely connected, and are square and straight.



COMBUSTION RESEARCH CORPORATION

Part No. 5484.00 Thermostat
Line Voltage Wall Thermostat

THERMOSTAT FEATURES

- Thermostat connects to standard 2" x 4" electrical single gang box.
- Single pole.
- Underwriter's Laboratories (UL) listed for the U.S. & Canada.
- Vertical mounting on 2" x 4" single gang outlet box.
- Color-coded lead wire connections.
- Dial with temperature in Fahrenheit, 50° F to 90° F temperature range.
- Multiple burners can be controlled by one thermostat.

SPECIFICATIONS

CRC Part No.:

5484.00 - Heating only (Wt. – 0.5 Lbs., 0.23 kg)

Dimensions:

4-1/2" (114 mm) x 2-3/4" (70mm)

Mounting:

NEMA single gang box (2-9/32" (83 mm) screw centers.

Control Range:

50°F (10°C) to 90°F (32°C)

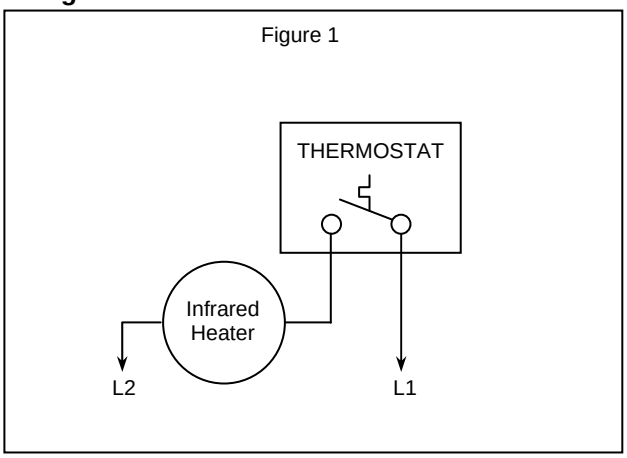
Electrical Ratings:

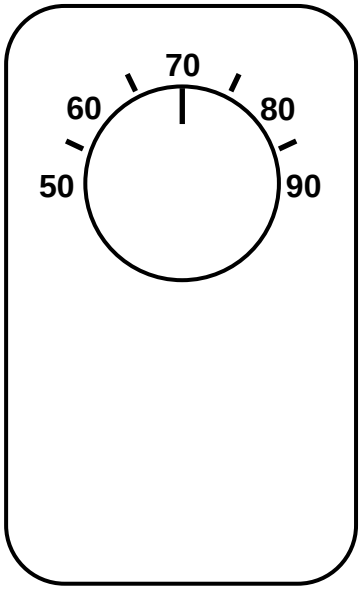
50-60Hz	120 VAC
Full Load	9.0 AMP
Resistive	22 AMP

Note: This thermostat is also suitable for 24 VAC operation.

Wiring:

Figure 1





INSTALLATION & CHECKOUT

MOUNTING

Position thermostat on inside wall about 5" (1.5m) above floor, mounted on 2" x 4" vertical electrical outlet box. A 4" square junction box requires a mud ring adapter (not provided). Do not mount thermostat where it can be affected by drafts, direct radiant heat from the heater as well as the sun or other sources of heating or cooling.

Wire as shown in figure 1.

Remove cover by pulling out at the bottom. Install thermostat by screwing base to electrical box. DO NOT press on the bimetal sensor or set point knob to seat the thermostat to the electrical box - thermostat will be damaged.

SETTING AND CHECKOUT

Turn on power. Raise the temperature setting to energize the heating load. The heater will turn on. The heater will turn off when the temperature rises to the set point.

Lower the temperature setting to lowest setting to de-energize the heating load. The heater will turn off

COMBUSTION RESEARCH CORPORATION

Part No. 5487.00 Thermostat

NEMA 4X, Line Voltage Wall Thermostat

THERMOSTAT FEATURES

- N.E.M./A. 4X enclosure complies with N.E.C Article 547 when used with appropriate watertight connections
- Rugged weather resistant enclosure made of corrosion resistant materials.
- Low mass, high surface area of stainless steel coiled sensor provides rapid response to temperature change.
- Underwriters Laboratories (UL) listed and CSA Certified
- Multi-positional mounting meets new or existing wiring.
- Insulated enclosure
- Easily removable knockouts in sides, ends and back of enclosure
- Large wiring compartment with water tight cover separated from thermostat compartment.
- Large dial with temperature in Fahrenheit (40° F to 110° F) & Celsius (5° C to 113° C).

SPECIFICATIONS

CRC Part No.:

5487.00 - Heating only (Wt. – 0.75 Lbs., 0.34 kg)

Control Range:

40°F (5°C) to 110°F (113°C)

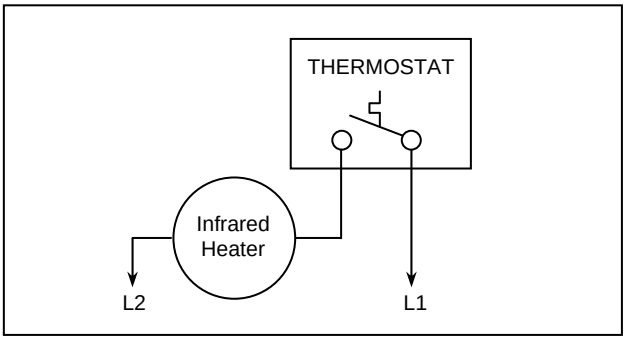
Electrical Ratings:

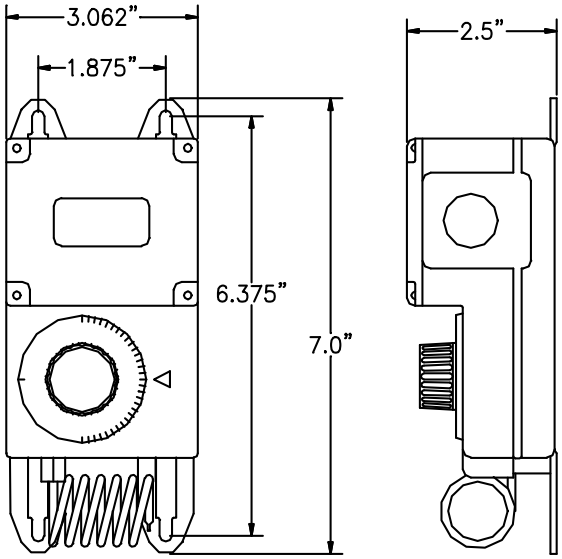
50-60Hz	120 V	240 V	277 V	480V
Full Load Amp	16	12	10	- -
LRA	80	60	50	- -
Resistive Amp	25	25	22	5
Pilot Duty	125 VA	125 VA	125 VA	125 VA

Note: This thermostat is also suitable for 24 VAC operation.

Wiring:

Figure 1





INSTALLATION & CHECKOUT

MOUNTING:
Position thermostat on inside wall about 5' (1.5m) above floor, mount on wall with 4 screws (not provided) through 4 slotted feet on thermostat. Remove the desired knock-out and install electrical conduit. In wet applications use of appropriate watertight conduit (4X Listed) is required. Install conduit with a drip loop so that water or other liquids cannot enter the thermostat.

CAUTION: Failure to use suitable watertight connections and suitable drip loop could result in water or other liquids entering the enclosure which can cause control failure, personal injury and/or property damage.

Do not mount thermostat where it can be affected by drafts, direct radiant heat from the heater as well as the sun or other sources of heating or cooling. Do not bend, crimp or damage the sensor - the calibration and operation may be affected.

Wire as shown in figure 1.

SETTING AND CHECKOUT:
Turn on power. Raise the temperature setting to energize the heating load. The heater will turn on. The heater will turn off when the temperature rises to the set point.

Lower the temperature setting to lowest setting to de-energize the heating load. The heater will turn off.

COMBUSTION RESEARCH CORPORATION

Part No. 5490.02 Thermostat

120 Volt Programmable Wall Thermostat

THERMOSTAT FEATURES

Thermostat t

- Thermostat connects to standard 2" x 4" electrical single gang box.
- Weekday/Weekend Programmable thermostat
- Four periods per day
- Temporary temperature override
- Vacation Hold
- Vertical mounting on 2" x 4" single gang outlet box.
- Fahrenheit or Celsius readings
- With temperature in Fahrenheit, 45° F to 90° F temperature range.
- Energy Star® compliant

SPECIFICATIONS

CRC Part No.:

5490.02 – 120 Volt Programmable Thermostat (Wt. – 2.0 Lbs., 0.90 kg)

Dimensions:

4.7" (119.4 mm) x 2.7" (68.5mm) x 2.4” (61mm) D

Mounting:

NEMA single gang box (2-9/32" (83 mm) screw centers.

Control Range:

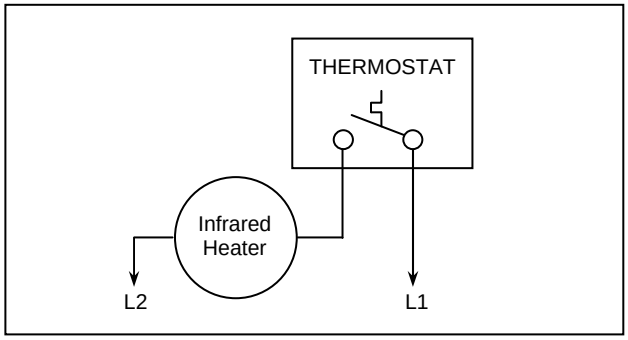
45°F (7°C) to 90°F (32°C)

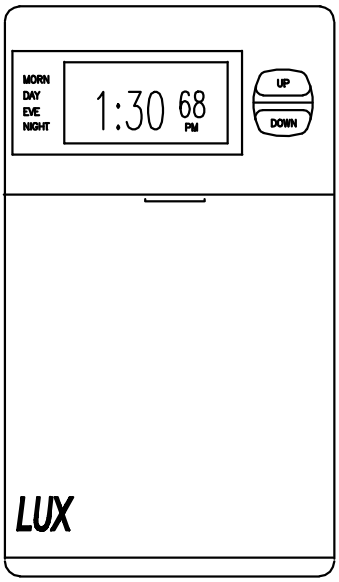
Electrical Ratings:

15 Amps (120/240 VAC)
120V, ¼ HP (1,800 Watts Resistive) Not Both
240V, ½ HP (3,600 Watts Resistive) Not Both

Wiring:

Figure 1





INSTALLATION & CHECKOUT

MOUNTING

Position thermostat on inside wall about 5’ (1.5m) above floor, mounted on 2" x 4" vertical electrical outlet box. A 4" square junction box requires a mud ring adapter (not provided). Do not mount thermostat where it can be affected by drafts, direct radiant heat from the heater as well as the sun or other sources of heating or cooling.

Wire as shown in figure 1.

SETTING AND CHECKOUT

Turn on power. Raise the temperature setting to energize the heating load. The heater will turn on. The heater will turn off when the temperature rises to the set point.

Lower the temperature setting to lowest setting to de-energize the heating load. The heater will turn off.

Set and program thermostat as required.

COMBUSTION RESEARCH CORPORATION

Part No. 5490.01 Thermostat

24 Volt Programmable Wall Thermostat

THERMOSTAT FEATURES

- Thermostat connects to standard 2" x 4" electrical single gang box.
- Weekday/Weekend Programmable thermostat
- Four periods per day
- Horizontal mounting on 2" x 4" single gang outlet box.
- Fahrenheit or Celsius readings
- With temperature in Fahrenheit, 45° F to 90° F temperature range.
- Energy Star® compliant

SPECIFICATIONS

CRC Part No.:

5490.01 – 24 Volt Programmable Thermostat (Wt. – 2.0 Lbs., 0.90 kg)

Dimensions:

4-3/4" (121 mm) x 3-3/4" (95mm)

Mounting:

NEMA single gang box (2-9/32" (83 mm) screw centers.

Control Range:

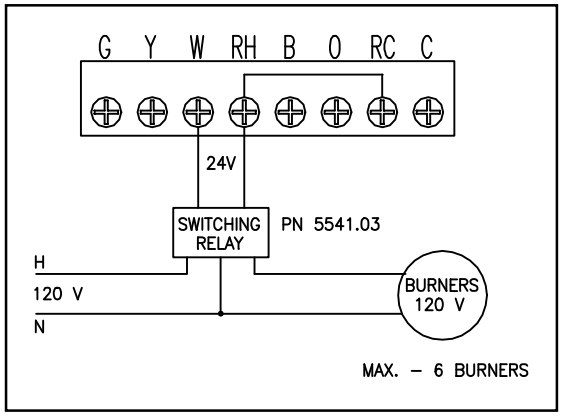
45°F (7°C) to 90°F (32°C)

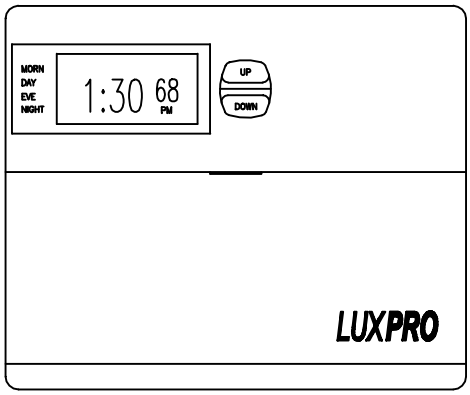
Electrical Ratings:

24VAC

Wiring:

Fig. 1





INSTALLATION & CHECKOUT

MOUNTING

Position thermostat on inside wall about 5' (1.5m) above floor, mounted on 2" x 4" horizontal electrical outlet box. A 4" square junction box requires a mud ring adapter (not provided). Do not mount thermostat where it can be affected by drafts, direct radiant heat from the heater as well as the sun or other sources of heating or cooling.

Wire as shown in figure 1.

SETTING AND CHECKOUT

Turn on power. Raise the temperature setting to energize the heating load. The heater will turn on. The heater will turn off when the temperature rises to the set point.

Lower the temperature setting to lowest setting to de-energize the heating load. The heater will turn off.

Set and program thermostat as required.

COMBUSTION RESEARCH CORPORATION

Part No. 5541.03 Switching Relay

Switching Relay, Control Center

SWITCHING REALY

- Control center for operating 120V burner assemblies with a 24V thermostat.
- Standard mounting on 4 x 4 junction box.

SPECIFICATIONS

CRC Part No.:

5541.03 – Switching Relay
(Wt. – 2.75 Lbs., 1.25 kg)

Dimensions:

4" (102 mm) x 4" (102mm) x 3.5” (89mm) High

Mounting:

Standard 4” x 4” junction box

Electrical Ratings:

Control Circuit – 24v, 60 Hz
Switching – SPDT

Contact Ratings at 120Vac

Full Load: 13.8 amp
Locked Rotor: 82.8 amp
Horsepower: ¾

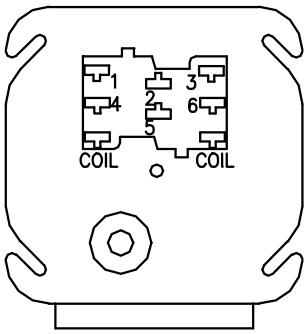
Transformer Ratings:

Primary Voltage: 120 VAC
Secondary Voltage: 24V
Power rating: 40 VA

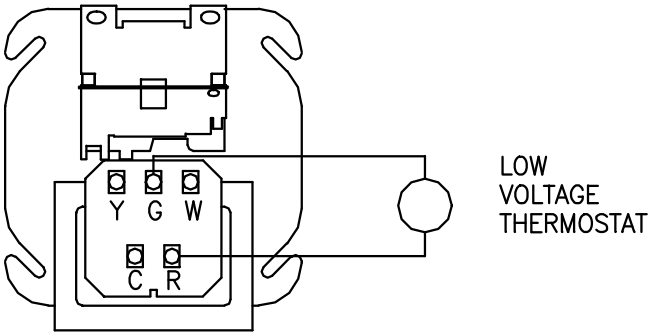
INSTALLATION & CHECKOUT

MOUNTING

The location should be centrally located to the heaters. Mount on a standard 4" x 4" electrical outlet box. Wire in accordance to installation drawings.



BOTTOM VIEW



TOP VIEW

COMBUSTION RESEARCH CORPORATION

Part No. 0314.00, Fresh Air Inlet Assembly

4” Fresh Air Inlet, Flex & Clamps

FRESH AIR INLET ASSEMBLY

- PVC and Aluminum Construction
- Weather Proof
- Inlet Flex & Clamps Included
- Corrosion Resistant

SPECIFICATIONS

CRC Part No.:

0314.00 – Fresh Air Inlet, Flex & Clamps
(Wt. – 1.5 Lbs., 0.68 kg)

Dimensions:

4.0” (101mm) OD on Inlet Hood
24” (609mm) Long PVC Coated Aluminum Flex & Clamps

Temperature Rating:

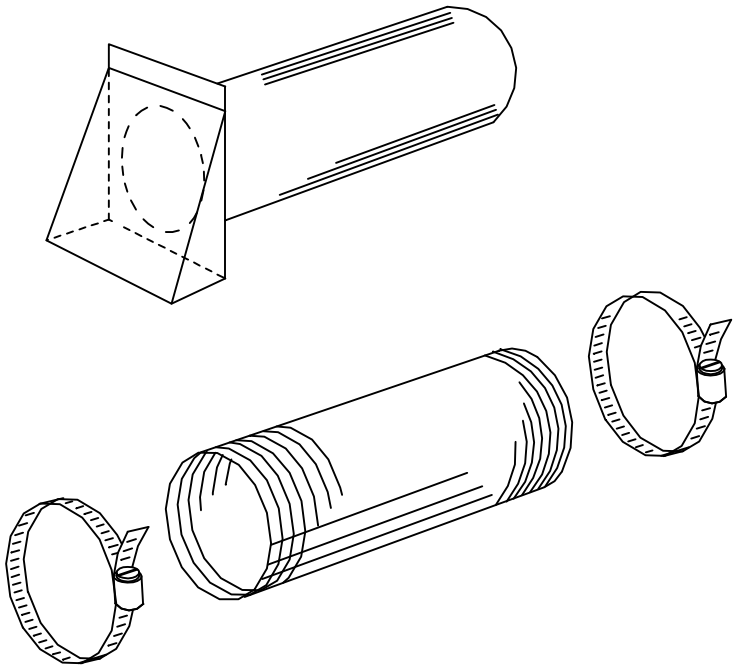
Min. –40°F (-40°C)
Max. 200°F (93°C)

INSTALLATION & CHECKOUT

INSTALLATION:
Install fresh air assembly as shown on shop drawing. Apply silicone sealer to external surface that mounts against wall. Secure to wall with three screws. Refer to the owner's manual for installation guidance.

Checkout

Make sure that the fresh air assembly and flex is installed in accordance with the owner’s manual as well as the shop drawing. Inspect to make sure flex is securely fastened with clamps provided.



COMBUSTION RESEARCH CORPORATION

Part No. 1811.VT.400
4” Round Vent Cap

SIDE WALL VENT TERMINAL

- High Wind Vent Cap
- 4” Diameter (“B” Vent) Inlet
- Aluminum Construction
- Corrosion resistant

SPECIFICATIONS

CRC Part No.:

1811.VT.400
(Wt. – 1.5 Lbs., 0.68 kg)

Dimensions:

4" – “B” Vent Inlet Connection

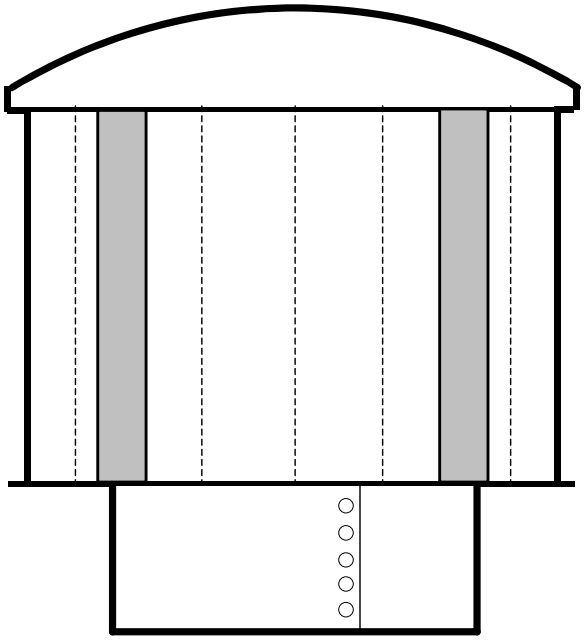
Maximum Temperature:

Maximum 600°F (315°C)

INSTALLATION & CHECKOUT

INSTALLATION
Install the vent cap as shown in the Owners' Manual and shop drawings. Observe any clearance to combustibles and applicable installation codes.

CHECKOUT
Make sure that vent terminal is securely fastened to venting pipe (supplied by installer). Install as outlined in the Owners' Manual and in accordance with applicable codes.



COMBUSTION RESEARCH CORPORATION

Part No. 1811.VT.600
6” Round Vent Cap

SIDE WALL VENT TERMINAL

- High Wind Vent Cap
- 6” Diameter (“B” Vent) Inlet
- Aluminum Construction
- Corrosion resistant

SPECIFICATIONS

CRC Part No.:

1811.VT.600
(Wt. – 2.0 Lbs., 0.91 kg)

Dimensions:

6" - “B” Vent Inlet Connection

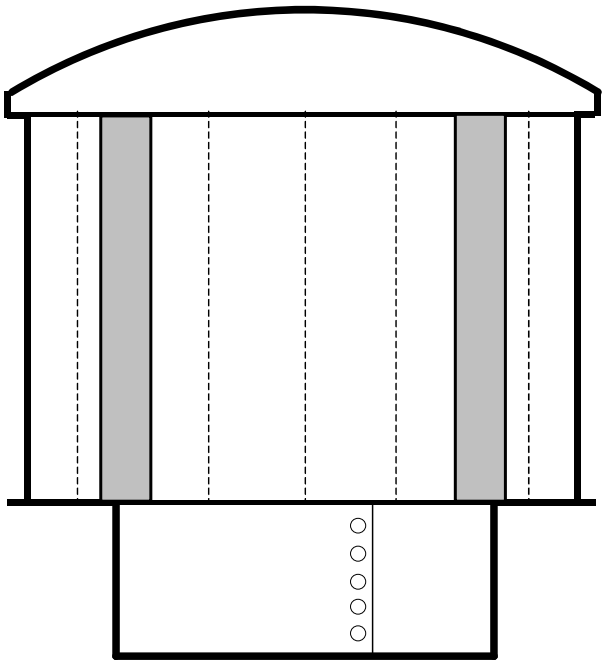
Maximum Temperature:

Maximum 600°F (315°C)

INSTALLATION & CHECKOUT

INSTALLATION
Install the vent cap as shown in the Owners' Manual and shop drawings. Observe any clearance to combustibles and applicable installation codes.

CHECKOUT
Make sure that vent terminal is securely fastened to venting pipe (supplied by installer). Install as outlined in the Owners' Manual and in accordance with applicable codes.



COMBUSTION RESEARCH CORPORATION

Part No. 1800.CS
5’ of Hanging Chain & “S” Hooks

HANGING CHAIN & “S’ HOOKS

- Double Loop Hanging Chain – 5’ Long
- “S” hooks – Qty. two

SPECIFICATIONS

CRC Part No.:

1800.CS
(Wt. – 0.25 Lbs., 0.11 kg)

Dimensions:

5’ (1524mm) Hanging Chain – Work load rating of 90 pounds

Maximum Temperature:

Maximum 600°F (315°C)

INSTALLATION & CHECKOUT

INSTALLATION
Install chain and “S” hooks as shown in the Owners' Manual and shop drawings.

CHECKOUT
Make sure that all “S” are crimped closed Install as outlined in the Owners' Manual and in accordance with applicable codes.