Specifications for

Reflect-O-Ray® E.D.S. 3.5 GAS FIRED 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 Infrared Heaters" conforming to the ANSI Z83.6 - (Current Standard).
b) Canadian Gas Association Certified "Gas Infrared Heaters" conforming to CAN 1-2.16-M81, CAN 1-2.17-M91CSA, C22.2 No. 0-M1991 Standards.

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.

1.2.4 System shall be furnished complete with Burner(s), Vacuum Exhauster(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 - BURNERS

2.1.1 Burners shall be capable of firing at 75,000 BTU/hr (21.97 kW/hr), 105,000 BTU/hr (30.76 kW/hr), or 130,000 BTU/hr (38.09 kW/hr) inputs, with natural gas and at 75,000 BTU/hr (21.97 kW/hr), 105,000 BTU/hr (30.76 kW/hr) or 120,000 BTU/hr (35.16 kW/hr) inputs, with LP gas.

2.1.2 Burner power requirements 24 Volt, 60 Hz AC 40VA.

2.1.3 Burners shall include the following features:

a) Fitted with a 4" (101.6 mm)-diameter combustion air inlet with a fixed combustion air-metering orifice.
b) Burners shall be fitted a differential air pressure switch so as to prove adequate combustion air is present before burner fires.
c) Burners shall be fitted with solid state electronic controls with spark ignition & 100% lockout in event of low fire or main flame failure - Hot surface ignition shall not be allowed.
d) 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.
e) Burner(s) flame sensing shall be by flame rectification with a separate probe.
f) Burner(s) shall have a minimum 15-second pre-purge before ignition.
g) Burner(s) casing(s) to be constructed of 16 Ga. (1.587mm) stainless steel.
h) Burner(s) shall be fitted with inspection window for visual inspection of spark and flame.
i) Burner(s) shall be fitted with 3 indicator lights - "Power On", "Air Flow On", & "Burner On".
j) Burner controls, differential pressure switch, gas valve, electrical wiring, etc. shall be segregated form the combustion air supply.
k) Burner cover and other metal to metal connections shall be fitted with gaskets.

2.1.4 Burner(s) and vacuum exhauster electrically interlocked.

2.2 - VACUUM EXHAUSTER

2.2.1 Dynamically balanced forward inclined fan wheel constructed of stainless steel with a cast iron hub.

2.2.3 Direct Drive.

2.2.4 Inlet cone and venturi plate constructed of stainless steel and engineered for maximum efficiency.

2.2.5 16-gauge (1.587-mm) stainless steel housing.

2.2.6 Motor to be one sixth (1/6) HP (115V, 3.0 amp), one quarter (1/4) HP (115V, 3.5 amp - 402.5 watts), one half (1/2) HP dual voltage (115/230V 6.2/3.1 Amps - 713 watts) or one (1) HP dual voltage (115/230 V 12/6 Amps - 1,380 watts) - 3450 RPM, 60 Hz capacitor start internally protected, class B insulation. Sealed ball bearings front and rear, totally enclosed design. No sub fractional motors allowed.

2.2.7 Vibration isolating rubber mounts.

2.2.8 Stainless steel bird screen on side wall venting.

2.2.9 Three and one half-inch (3.5" / 89 mm) Stainless steel, insulated flexible vibration isolation connector.

2.3 - SYSTEM CONTROLS

2.3.1 Thermostat provided by equipment manufacturer, 115V, 16 amp (1,840 watt) rating.

2.4 - RADIANT TUBE HEAT EXCHANGING NETWORK

2.4.1 Combustion tube shall be 10' long 16 gauge (1.587mm) aluminized steel 3.5" (89 mm) OD swaged one end.

2.4.2 Balance of radiant tubing shall be constructed of patented, spiral wound 22 gauge (0.76 mm) aluminized steel, 3.5" (89 mm) OD.

2.4.3 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.

2.4.4 Reflectors to be made of minimum 0.025" (0.635 mm) bright aluminum.

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

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

2.4.7 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 (1"/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 (10' / 3.048m).

2.4.8 Minimum lineal length of radiant tubing per 100,000 Btu/hr (29.3 kW/hr) of input shall be 60 feet (18.29m).

2.4.9 The maximum firing rate shall be 2000 Btu/hr (0.586 kW/hr) per square foot (0.0929 square meter) of radiant tubing surface area. The total radiant tubing surface area is the radiant tubing which is covered by reflectors and associated with one vacuum exhauster.

2.5 - COMBUSTION AIR

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

2.5.2 Outside combustion air ducting to be minimum of 4" (101.6 mm) OD (S&D PVC or galvanized stovepipe).

2.6 - SYSTEM PERFORMANCE

2.6.1 System shall attain a net exhaust temperature of not less than 200°F (93.3°C) in a 15 min. run cycle and shall not exceed a maximum net temperature of 325°F (162.8°C).

2.6.2 System STEADY STATE EFFICIENCY shall be a minimum of 82%, maximum 87%. The system cyclic efficiency shall be a minimum of 85%, maximum 91% (this is based on a 15 min. run time).

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

2.6.4 Maximum temperature of radiant tube shall not exceed a NET temperature of 1000°F (537.8°C).

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.

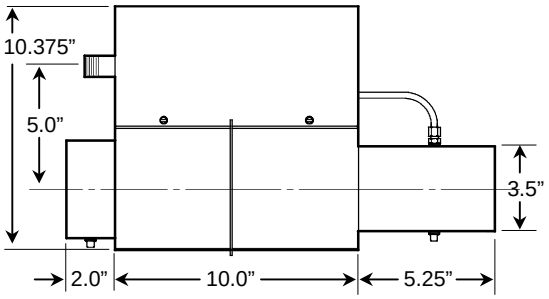
3.1.4 Cleaning: Clean reflectors as may be required and touch up painted surfaces as may be needed.

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.

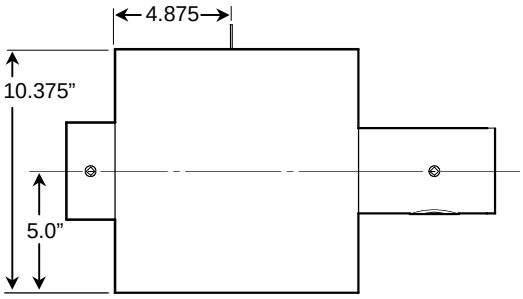
END OF SECTION

BURNER DIMENSIONS

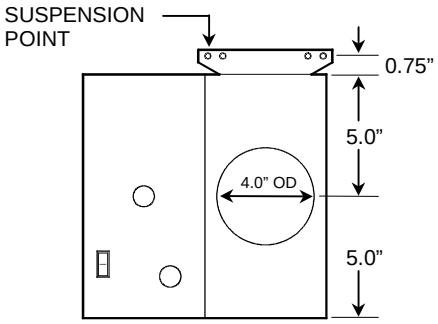
TOP VIEW



SIDE VIEW



END (AIR INLET) VIEW

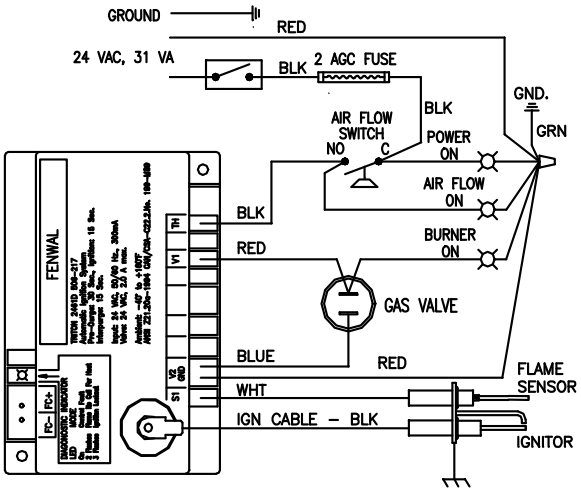


Stainless Steel Burner Housing

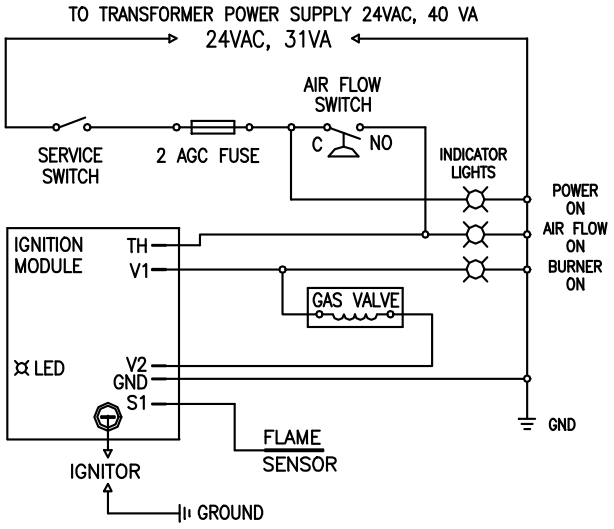
BURNER INTERNAL WIRING DIAGRAM

Internal Wiring Diagram for Reflect-O-Ray® EDS 3.5® Systems Fenwall Triton Ignition Control

Point To Point Diagram



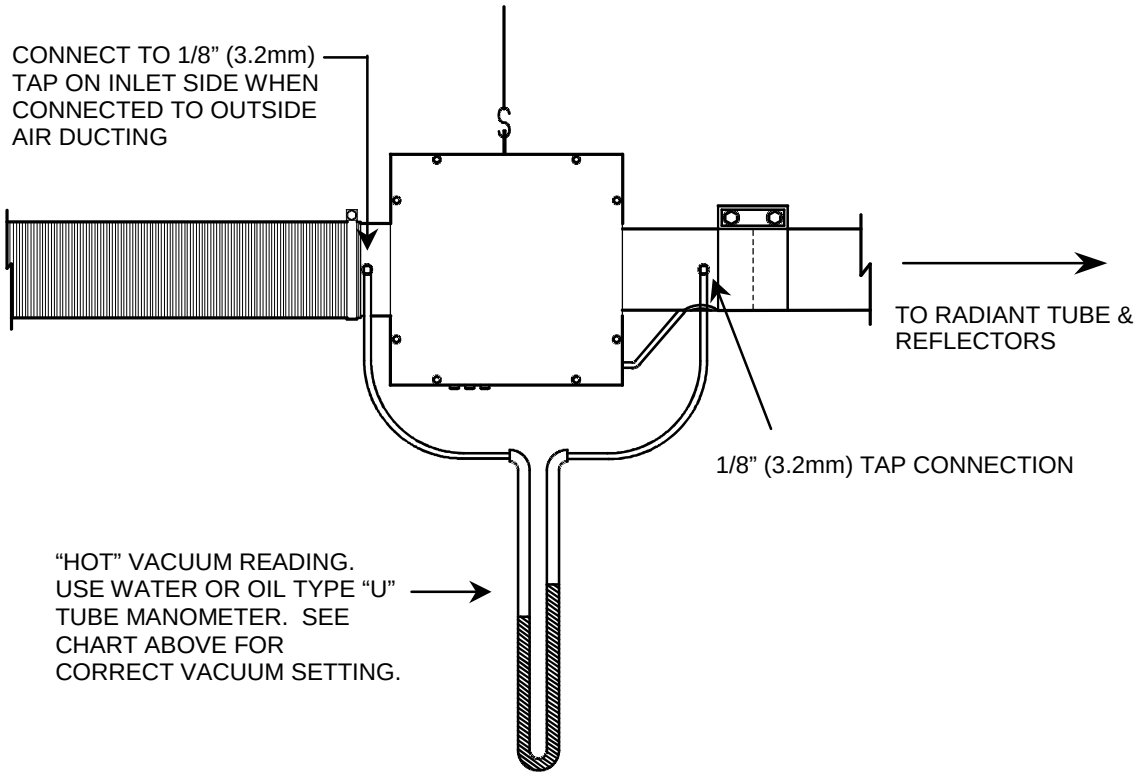
Ladder Diagram



BURNER PART NO.	BTU/Hr INPUT	ELECTRICAL RATING	SUGGESTED ORIFICE SIZE	MANIFOLD PRESSURE*	VACUUM READING HOT*
0800.NG	130,000	24 V, 31 VA	13/64"	3.5" W.C.	1.25” W.C.
0800.LP	120,000	24 V, 31 VA	#30	10.0" W.C.	1.25” W.C.
0801.NG	130,000	24 V, 31 VA	13/64"	3.5" W.C.	0.6 to 0.7” W.C.
0801.LP	120,000	24 V, 31 VA	#30	10.0" W.C.	0.6 to 0.7” W.C.
0900.NG	105,000	24 V, 31 VA	4.6 mm	3.5" W.C.	0.5 to 0.6” W.C.
0900.LP	105,000	24 V, 31 VA	#32	10.0" W.C.	0.5 to 0.6” W.C.
0875.NG	75,000	24 V, 31 VA	#18	3.5" W.C.	0.3 to 0.4” W.C.
0875.LP	75,000	24 V, 31 VA	#40	10.0" W.C.	0.3 to 0.4” W.C.

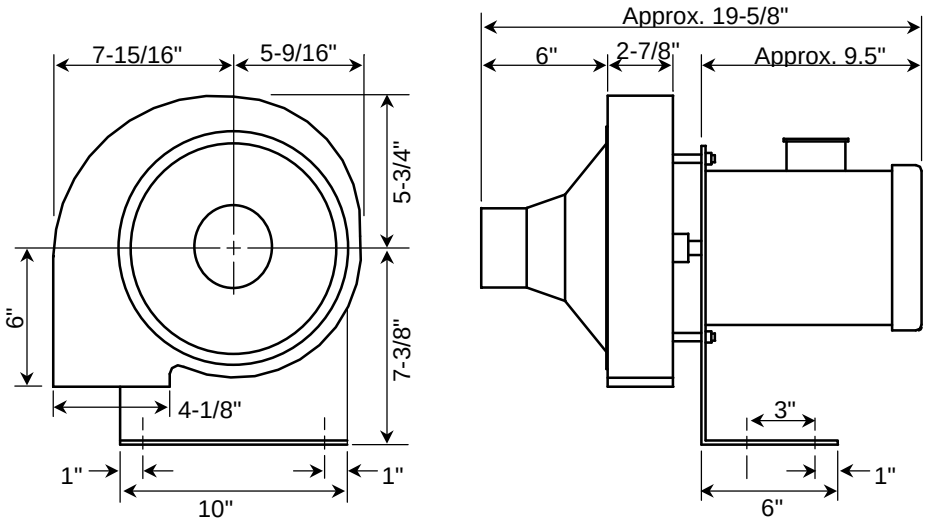
***NOTE** - The system must be operating for a minimum of 15 minutes prior to taking any readings. Turn off burner momentarily for this reading. The vacuum settings are for systems equipped with both inside and outside combustion air. Final gas manifold pressure readings must be taken with the regulator cap securely in place.

VACUUM TEST CONNECTIONS



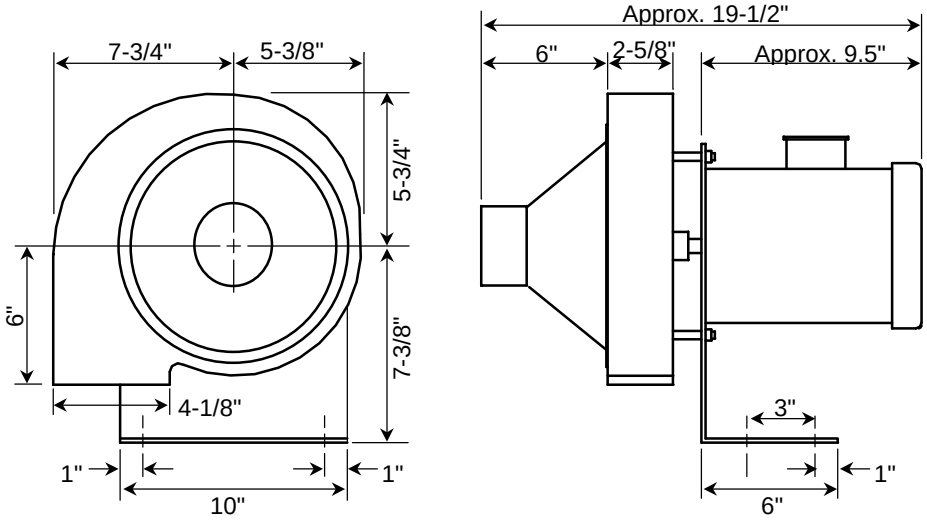
0401.WO/DI & 0402.WO/DI - VACUUM EXHAUSTERS

0401.WO/DI - 115 / 208-230V, 6.2 / 3.1-3.0 FLA, 60 Hz, 1 Ph., 3450 RPM, totally enclosed motor (TENV or TEFC), thermally protected. Stainless steel housing, ventrui inlet and inlet cone.
0402.WO/DI - 115 / 208-230V, 12.4 / 3.0-2.7 FLA, 60 Hz, 1 Ph., 3450 RPM, totally enclosed motor (TENV or TEFC), thermally protected. Stainless steel housing, ventrui inlet and inlet cone.



0201.WO VACUUM EXHAUSTER DATA

0201.WO - 115 / 208-230V, 3.6 / 3.0-3.0 FLA, 60 Hz, 1 Ph., 3450 RPM, totally enclosed motor (TENV or TEFC), thermally protected. Stainless steel housing, ventrui inlet and inlet cone.



NOTE - Motor substitutions can occur, always refer to the motor manufacturer nameplate for electrical information and wiring instructions

Note: One 40 VA, 24-volt transformer is shipped with each burner assembly. This transformer(s) are typically mounted near the vacuum exhauster. The wiring to each burner assembly must be a minimum of 18-ga. wire with a maximum length of 120 feet

GAS PRESSURE AT MANIFOLD

Natural Gas: 3.5" W.C.
LP Gas: 10.0" W.C.
1/2" NPT Gas Connector Size

BURNER ASSEMBLY ELECTRICAL RATING

24 VAC, 50/60 Hz., 31 VA

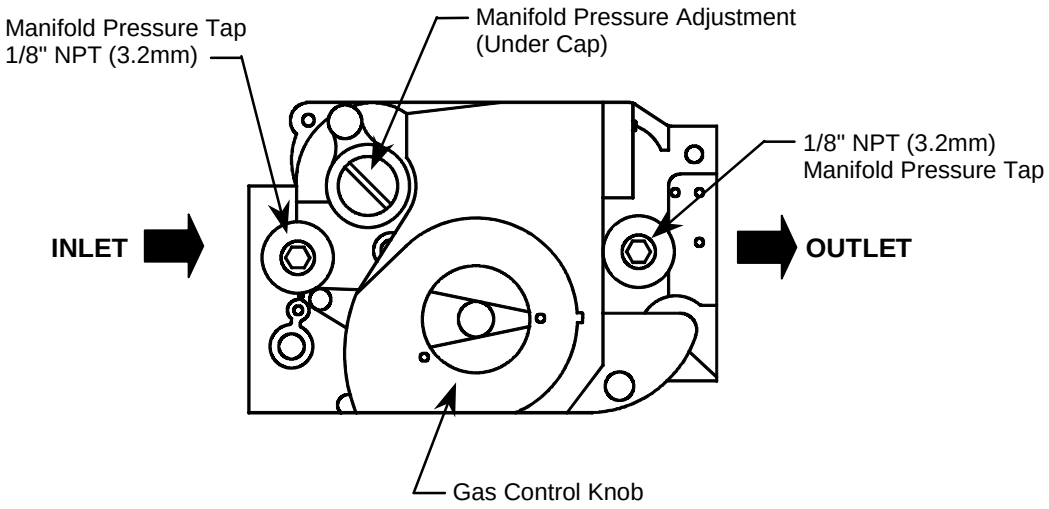
GAS INLET PRESSURE

Natural Gas:	5.0" Minimum	14.0" Maximum
LP Gas:	11.0" Minimum	14.0" Maximum

ALTITUDE

All systems are rated and certified for elevations of 0 - 4500 **(0 - 1,370 m)** No de-rating required.

HONEYWELL GAS VALVE
PN 5285.06 (NG) & 5285.06LP (LP)

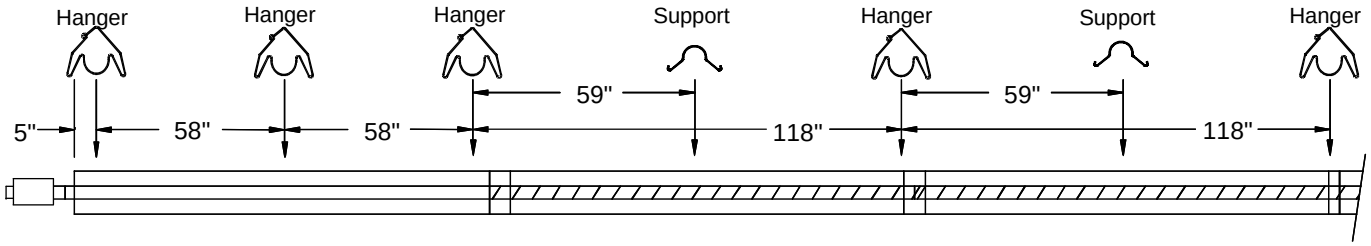


NOTE: Gas pressures must be measured with a water or red oil manometer - NOT A DIAL GAUGE. All measurements must be made when this heater and all other gas burning equipment connected to the gas supply system are operating at maximum capacity. It should be assured by test that the gas pressure at the burner inlet is not greater than the figures given above.

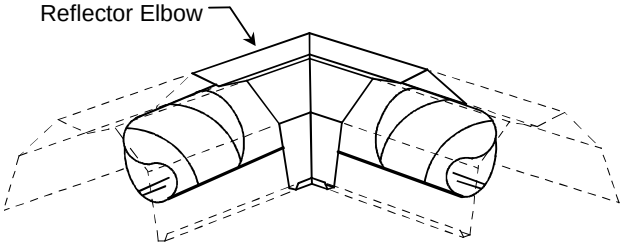
Maximum inlet pressure is 1/2 lb. or 14.0" W.C.

The installer must provide a 1/8" N.P.T. (**3.2mm**) plugged tapping, accessible for test gauge connection, immediately upstream of the gas supply.

HANGER & SUPPORT LOCATIONS - STANDARD INSTALLATION

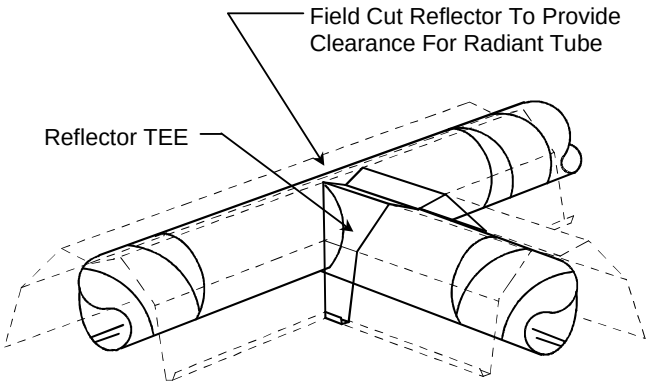


REFLECTOR ELBOW CONNECTION



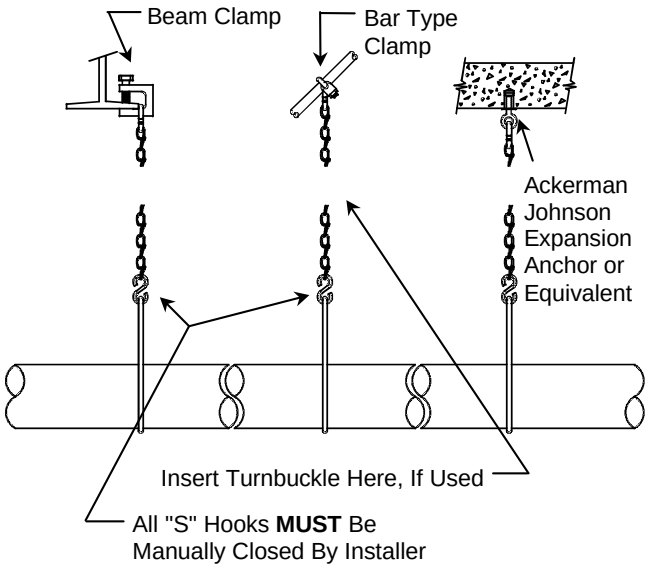
Secure To Connecting Reflector
With Sheet Metal Screws

REFLECTOR TEE CONNECTION



Use Sheet Metal Screws To Secure
"Tee" In Place

SUSPENSION METHODS



System shall be suspended by chain (trade size #3 or larger), wire rope, etc., minimum workload of 90 Lbs. All suspension hardware must be corrosion resistant. For fine adjustment turnbuckles may be used.

NOTES:

- DO NOT HANG VACUUM EXHAUSTER WITH CHAIN.
- SECURE TURNBUCKLES SO THAT THEY WILL NOT UNWIND OR UN-SCREW.
- CRIMP "S" HOOKS CLOSED BEFORE LEAVING JOB.
- LISTED MATERIALS ARE MINIMUM REQUIRED, USE EQUIVALENT OR BETTER MATERIALS

CLEARANCE TO COMBUSTIBLES

WARNING

FIRE OR EXPLOSION HAZARD. CAN CAUSE PROPERTY DAMAGE, SEVERE INJURY, OR DEATH

Refer to the following instructions as well as the engineering drawing for proper installation of the radiant tubing and reflectors. Consideration must be given to partitions, storage racks, hoists, building structures, etc.

Caution must be used when running system near combustible materials such as wood, paper, rubber, etc.

Minimum clearances to combustibles must be maintained for wall, floor, ceiling temperatures. The maximum allowable temperature of combustible materials adjacent to the heater during normal operation shall be not be more than 90°F in excess of room temperature. See the following chart for clearance to combustible information.

Consideration must be given when running the radiant tube next to wood, paper, storage racks, hoists, building construction, etc. In storage areas where stacking of materials may occur, the installer must provide signs, which specify the maximum stacking height so as to maintain the required clearance to combustibles.

The following clearance to combustibles must be maintained from vehicles parked below heater. For building personnel safety, it is recommended that the system not be mounted lower than 9' from the floor unless fitted with protective guards.

CLEARANCE TO COMBUSTIBLES

CLEARANCES FOR 0800.NG/LP & 0801.NG/LP BURNER ASSEMBLIES

REFLECTORS	MNT'G. ANGLE	SIDES		TOP	BELOW		END	
		FRONT	BACK		AT BURNER	25 FT FROM BURNER	BURNER	"U" BEND
0360.00/01 STANDARD REFLECTOR	0 - 30°	36"	36"	7"	60"	15"	18"	--
0360.00/01 STANDARD REFLECTOR WITH 0340.INSUL.25 TUBE	0 - 30°	15"	15"	5"	30"	15"	18"	--
0812.00/01 PANEL REFLECTOR	0°	30"	30"	7"	72"	72"	18"	18"
0812.00/01 PANEL REFLECTOR	30°	56"	30"	7"	72"	72"	18"	18"
0812.00/01 PANEL REFLECTOR WITH 0304.INSUL.25 TUBE	0 - 30°	15"	15"	5"	25"	25"	18"	18"

CLEARANCES FOR 0900.NG/LP & 0875.NG/LP BURNER ASSEMBLIES

REFLECTORS	MNT'G. ANGLE	SIDES		TOP	BELOW		END	
		FRONT	BACK		AT BURNER	25 FT FROM BURNER	BURNER	"U" BEND
0360.00/01 STANDARD REFLECTOR	0 - 30°	36"	36"	6"	60"	15"	18"	--
0360.00/01 STANDARD REFLECTOR WITH 0340.INSUL.25 TUBE	0 - 30°	15"	15"	5"	30"	15"	18"	--
0812.00/01 PANEL REFLECTOR	0°	30"	30"	6"	72"	72"	18"	18"
0812.00/01 PANEL REFLECTOR	30°	56"	30"	6"	72"	72"	18"	18"
0812.00/01 PANEL REFLECTOR WITH 0304.INSUL.25 TUBE	0 - 30°	15"	15"	5"	25"	25"	18"	18"

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.

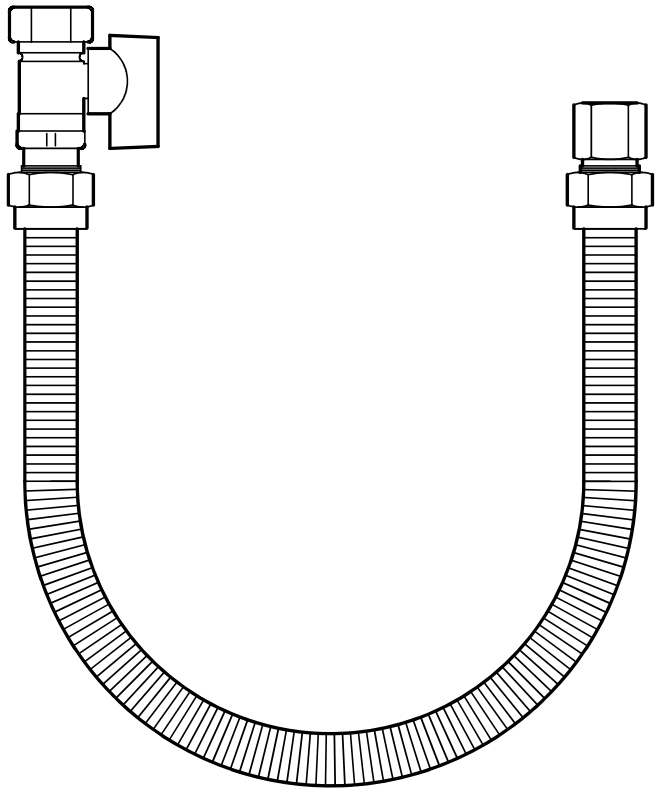
INSTALLATION & CHECKOUT

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

Part No. 0304.AS.16, Burner Combustion Tube

16 Ga. Aluminized Steel burner Combustion Tube

ALUMINIZED STEEL TUBE

- Aluminized Steel Construction
- Used With Reflect-O-Ray® EDS 3.5® Radiant Tube System
- Corrosion Resistant

SPECIFICATIONS

CRC Part No.:
0304.AS.16

Dimensions:
Minimum 16 Ga. aluminized steel, 3.5" Tubing

Temperature Rating:
1050°F (565°C)

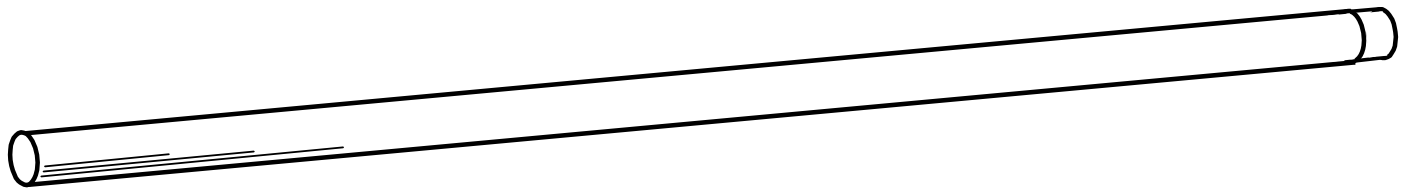
INSTALLATION & CHECKOUT

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 to each other or to other fittings with 0507.00 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

Part No. 0304.AS, Spiral Radiant Tube

Aluminized Steel Radiant Tube

ALUMINIZED STEEL RADIANT TUBE

- Aluminized Steel Spiral Construction
- 9'-9" or 19'-6" Long Sections
- Used With Reflect-O-Ray® EDS 3.5® Radiant Tube System
- Patented, Strong, Low Mass Tube (Min. 22 Ga.)
- Corrosion Resistant

SPECIFICATIONS

CRC Part No.:

0304.AS – 9'-9" Long
0304.AS.20 – 19'-6" Long

Dimensions:

Minimum 22 Ga. aluminized steel, 3.5" Spiral Tubing

Temperature Rating:

1050°F (565°C)

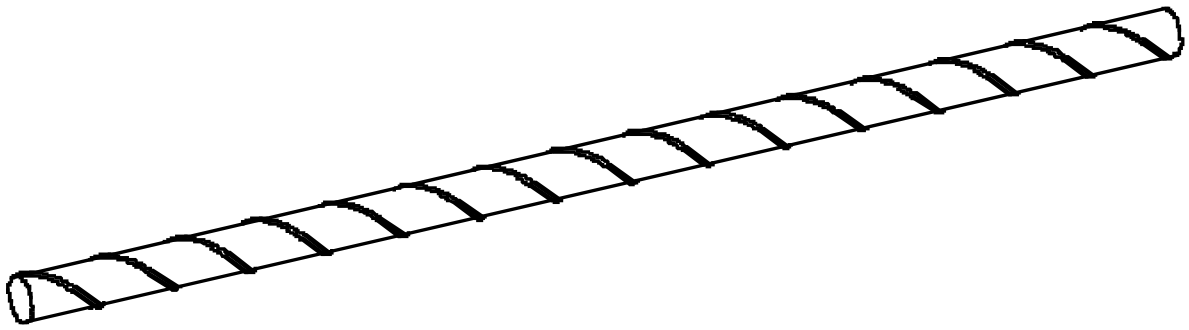
INSTALLATION & CHECKOUT

Installation

Install radiant tube as shown on shop drawing. Note, radiant tubes are connected by swaged couplers (PN 0311.AS) 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. 0360.00, Reflector
Aluminum Reflector

ALUMINUM REFLECTOR

- Bright Finish Aluminum Reflector
- High Reflectivity
- Used With Reflect-O-Ray® EDS 3.5® Radiant Tube System
- Corrosion Resistant

SPECIFICATIONS

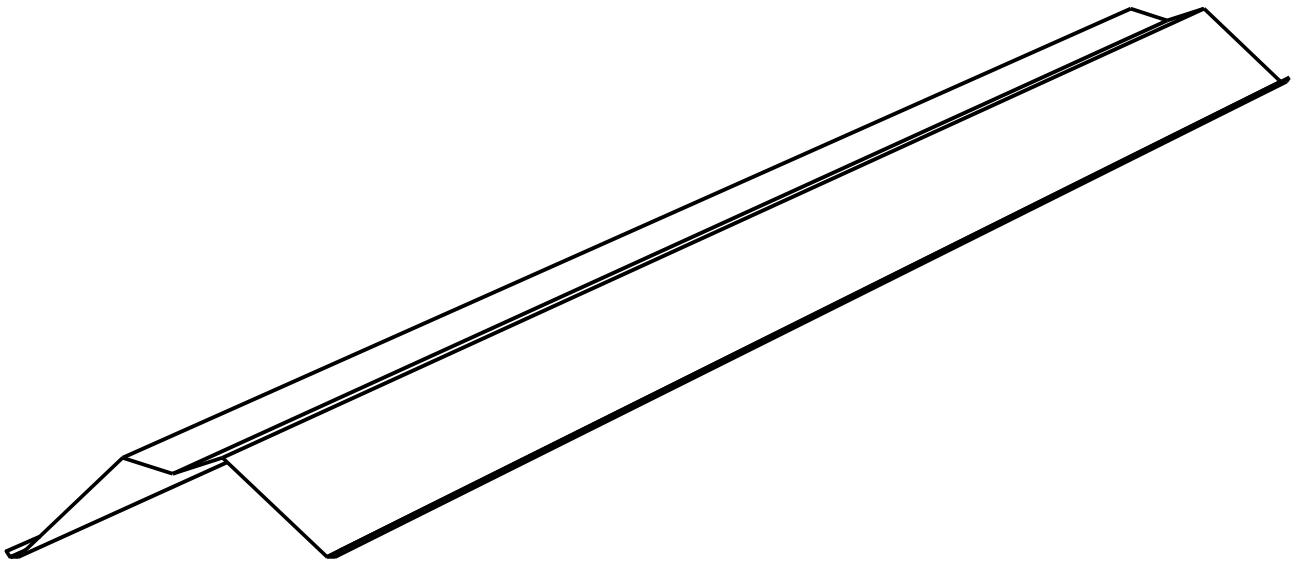
CRC Part No.:
0360.00 – 10'-0" Long

Dimensions:
Minimum 0.025" Thick Bright Aluminum, 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. 0311.AS, Radiant Tube Coupler

Aluminized Steel Radiant Tube Coupler

ALUMINIZED STEEL TUBE COUPLER

- Aluminized Steel Construction
- Swaged For Internal Connection To 0304.AS Radiant tubes.
- Used With Reflect-O-Ray® EDS 3.5® Radiant Tube System
- Aluminized Steel, Min. 18 Ga.
- Corrosion Resistant

SPECIFICATIONS

CRC Part No.:
0311.AS

Dimensions:
Minimum 18 Ga. aluminized steel, 3.5" Tubing Swaged on Both Ends

Temperature Rating:
1050°F (565°C)

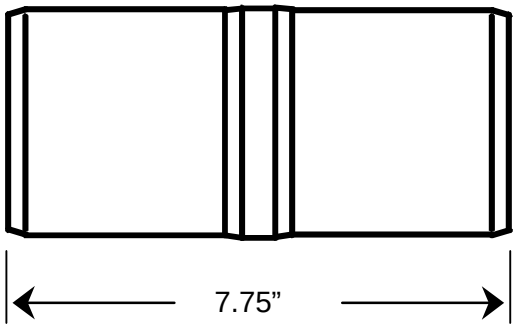
INSTALLATION & CHECKOUT

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. 0306.AS, Radiant Tube Elbow

Aluminized Steel Radiant Tube Elbow

ALUMINIZED STEEL TUBE ELBOW

- Aluminized Steel Construction
- Swaged Ends For Internal Connection To 0304.AS Radiant tubes.
- Used With Reflect-O-Ray® EDS 3.5® Radiant Tube System
- Aluminized Steel, Min. 18 Ga.
- Corrosion Resistant

SPECIFICATIONS

CRC Part No.:
0306.AS

Dimensions:
Minimum 18 Ga. Aluminized Steel, 3.5" - 90° Elbow, Swaged on Both Ends

Temperature Rating:
1050°F (565°C)

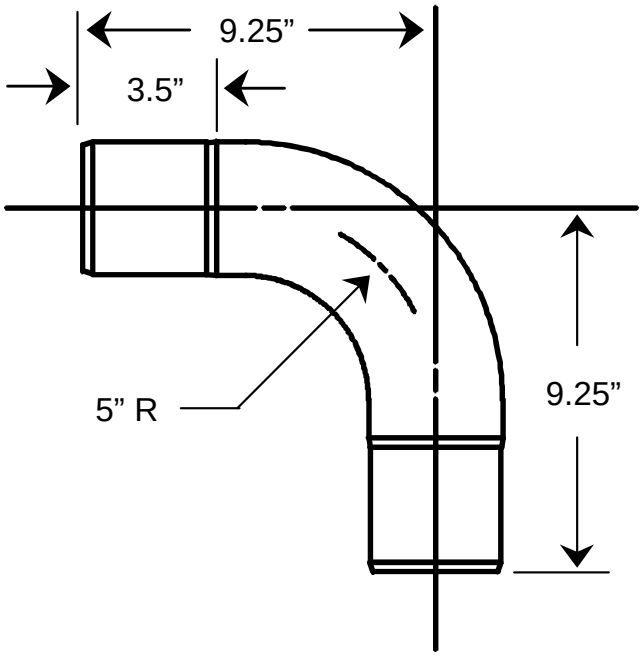
INSTALLATION & CHECKOUT

Installation

Install elbow as shown on shop drawing. Note elbows 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. 0307.AS, Radiant Tube Tee

Aluminized Steel Radiant Tube Tee

ALUMINIZED STEEL TEE

- Aluminized Steel Construction
- Swaged Ends For Internal Connection To 0304.AS Radiant tubes.
- Used With Reflect-O-Ray® EDS 3.5® Radiant Tube System
- Aluminized Steel, Min. 18 Ga.
- Corrosion Resistant

SPECIFICATIONS

CRC Part No.:
0307.AS

Dimensions:
Minimum 18 Ga. Aluminized Steel, 3.5" x 3.5" x 3.5" Tee, Swaged Ends

Temperature Rating:
1050°F (565°C)

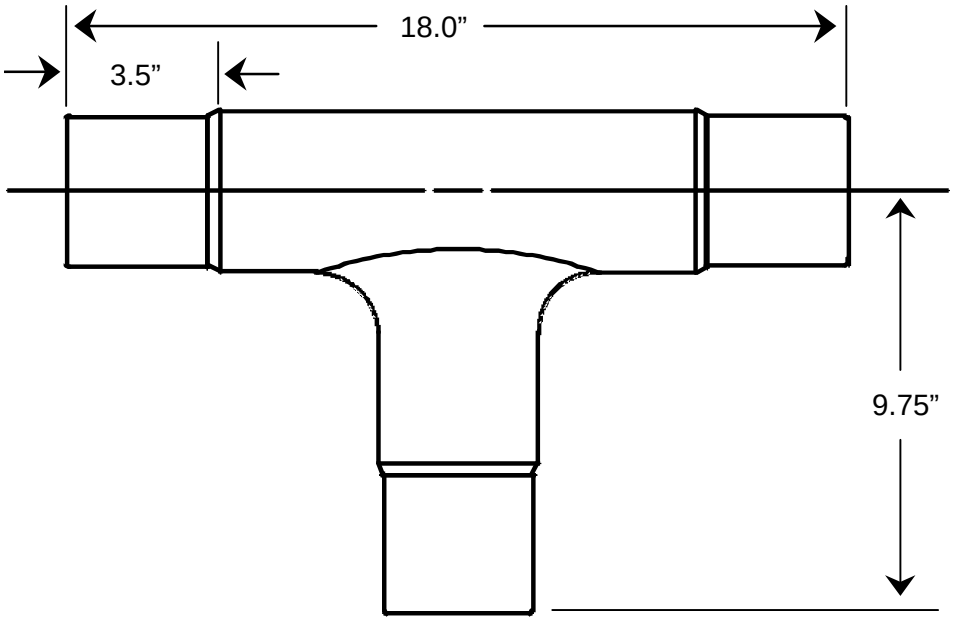
INSTALLATION & CHECKOUT

Installation

Install tee as shown on shop drawing. Note tee is 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 tee's 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. 0307.AS.B, Tee With Dampers Inline

Aluminized Steel Radiant Tube Tee With Dampers

ALUMINIZED STEEL TEE WITH DAMPERS INLINE

- Aluminized Steel Construction
- Swaged Ends For Internal Connection To 0304.AS Radiant tubes.
- Dampers Installed Inline
- Used With Reflect-O-Ray® EDS 3.5® Radiant Tube System
- Aluminized Steel, Min. 18 Ga.
- Corrosion Resistant

SPECIFICATIONS

CRC Part No.:
0307.AS.B

Dimensions:
Minimum 18 Ga. Aluminized Steel, 3.5" – Tee With Dampers, Swaged Ends

Temperature Rating:
850°F (454°C)

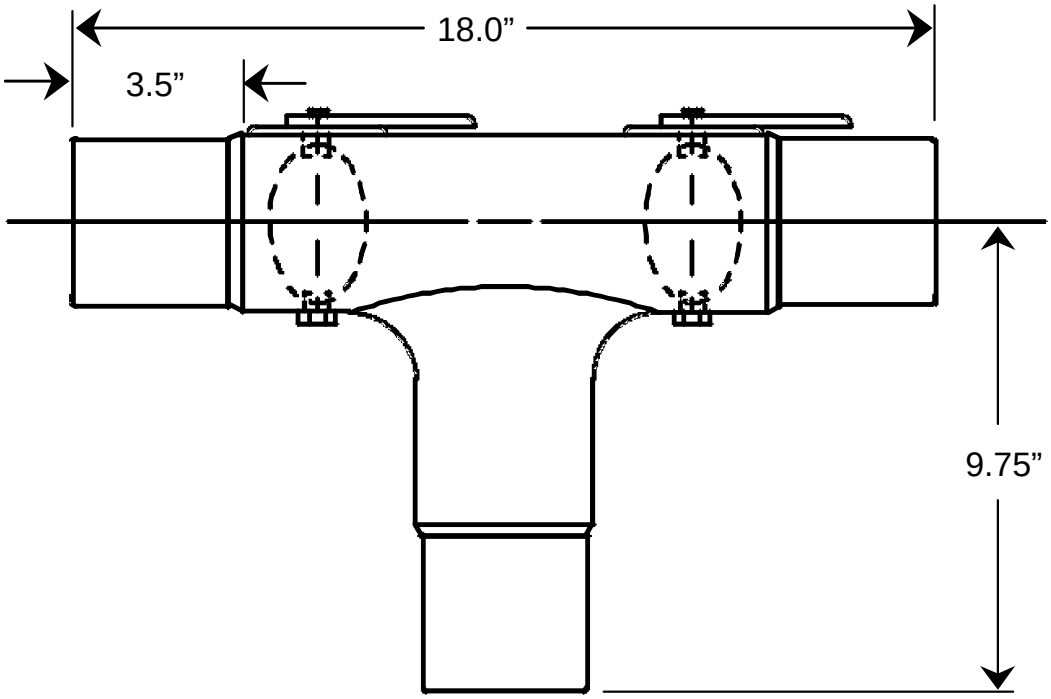
INSTALLATION & CHECKOUT

Installation

Install damper tee as shown on shop drawing. Note tee is 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 and method for setting the system vacuum.

Checkout

Make sure that the radiant tubes and tee's 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. 0307.AS.C, Tee With Dampers At 90°

Aluminized Steel Radiant Tube Tee With Dampers

ALUMINIZED STEEL TEE WITH DAMPERS AT 90°

- Aluminized Steel Construction
- Swaged Ends For Internal Connection To 0304.AS Radiant tubes.
- Dampers Installed At 90° To Each Other
- Used With Reflect-O-Ray® EDS 3.5® Radiant Tube System
- Aluminized Steel, Min. 18 Ga.
- Corrosion Resistant

SPECIFICATIONS

CRC Part No.:
0307.AS.C

Dimensions:
Minimum 18 Ga. Aluminized Steel, 3.5" – Tee With Dampers, Swaged Ends

Temperature Rating:
850°F (454°C)

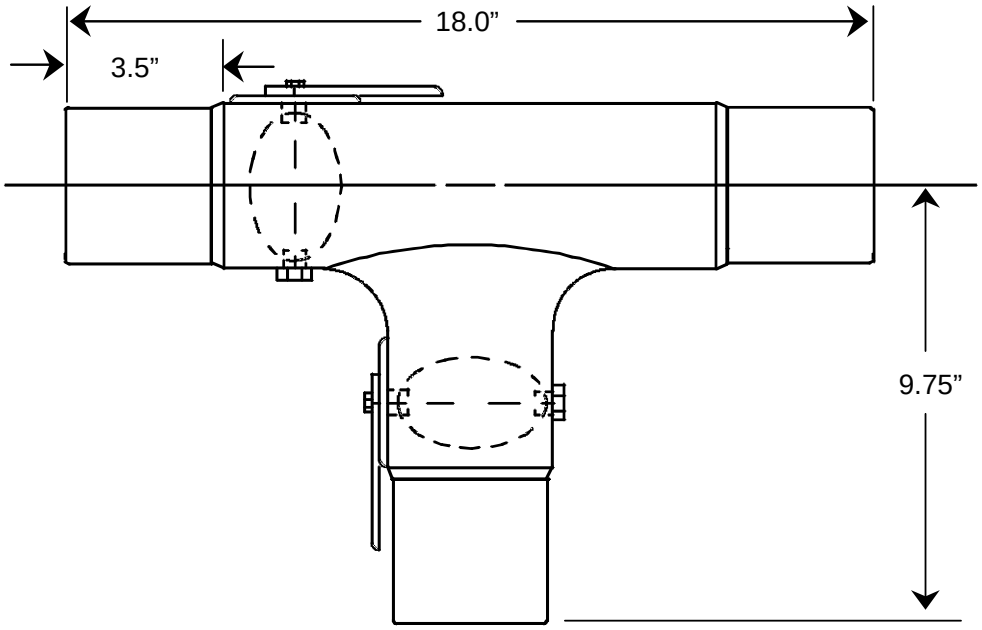
INSTALLATION & CHECKOUT

Installation

Install damper tee as shown on shop drawing. Note tee is 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 and method for setting the system vacuum.

Checkout

Make sure that the radiant tubes and tee's 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. 0341.00, Damper
Aluminized Steel Damper

ALUMINIZED STEEL DAMPER

- Aluminized Steel Construction
- Swaged End For Internal Connection To 0304.AS Radiant tubes.
- Single Flow Damper Application
- Used With Reflect-O-Ray® EDS 3.5® Radiant Tube System.
- Corrosion Resistant

SPECIFICATIONS

CRC Part No.:
0341.00 - Damper

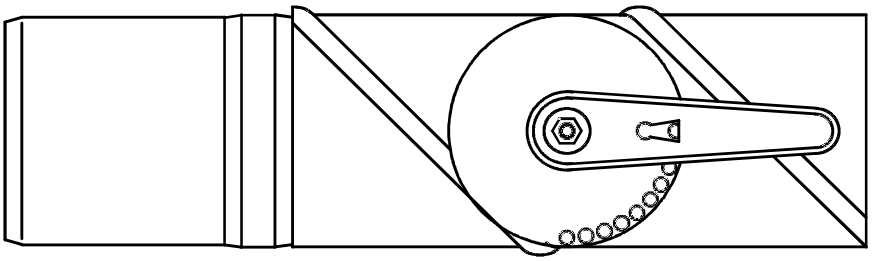
Dimensions:
7" section of spiral tube with damper in the center. 0311.AS coupler inserted in one end.

Temperature Rating:
850°F (454°C)

INSTALLATION & CHECKOUT

Installation
Install damper as shown on shop drawing. Note coupler in damper assembly is 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 and method for setting the system vacuum.

Checkout
Make sure that the radiant tubes and couplers and fittings 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. 0334.SS, Stainless Steel Exhaust Flex

Stainless Steel Exhaust Flex & Clamps

STAINLESS STEEL EXHAUST FLEX

- Stainless steel inner liner with black fiberglass outer liner.
- 3.56” (90 mm) ID, 30” (762mm) Long
- High temperature rating
- Two stainless steel hose clamps included
- Corrosion Resistant

SPECIFICATIONS

CRC Part No.:
0334.SS – Stainless Steel Exhaust Flex & Clamps

Dimensions:
3.56” (90mm) ID, 30” (762mm) Long

Temperature Rating:
Max. 850°F (454°C)

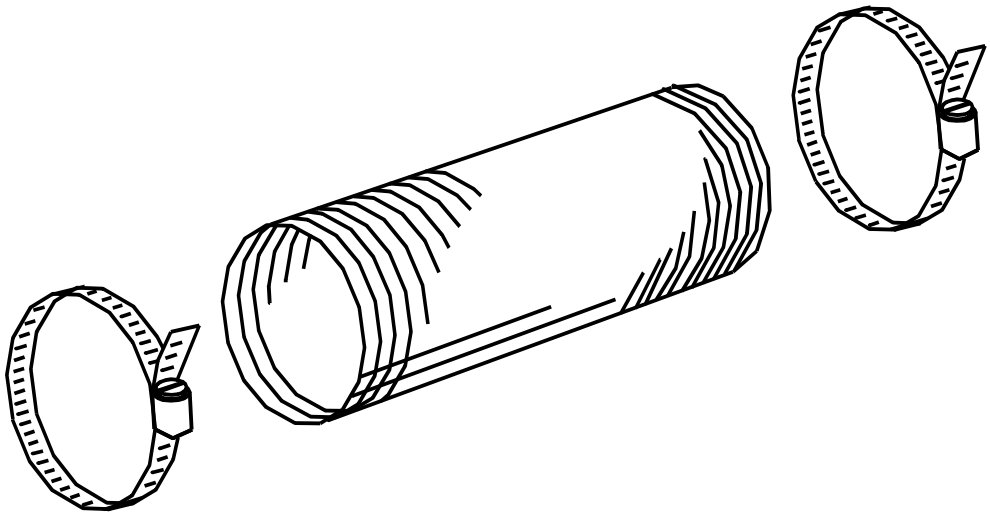
INSTALLATION & CHECKOUT

Installation

Install the flex assembly as shown on shop drawing. Refer to the owner's manual for installation guidance and method for setting the system vacuum.

Checkout

Make sure that the exhaust flex is 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. 0314.00, Fresh Air Inlet Assembly

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

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)

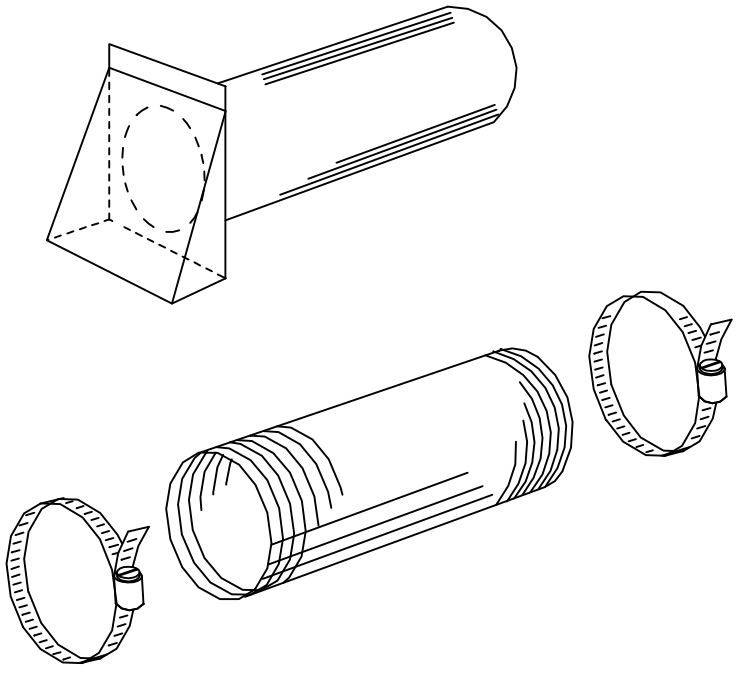
INSTALLATION & CHECKOUT

Installation

Install the 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. 0614.00, Fresh Air Inlet Assembly

Fresh Air Inlet, Flex & Clamps

FRESH AIR INLET ASSEMBLY

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

SPECIFICATIONS

CRC Part No.:
0614.00 – Fresh Air Inlet, Flex & Clamps

Dimensions:
6.0” (152mm) OD on Inlet Hood
24” (609mm) Long PVC Coated Aluminum Flex & Clamps

Temperature Rating:
Min. –40°F (-40°C)
Max. 200°F (93°C)

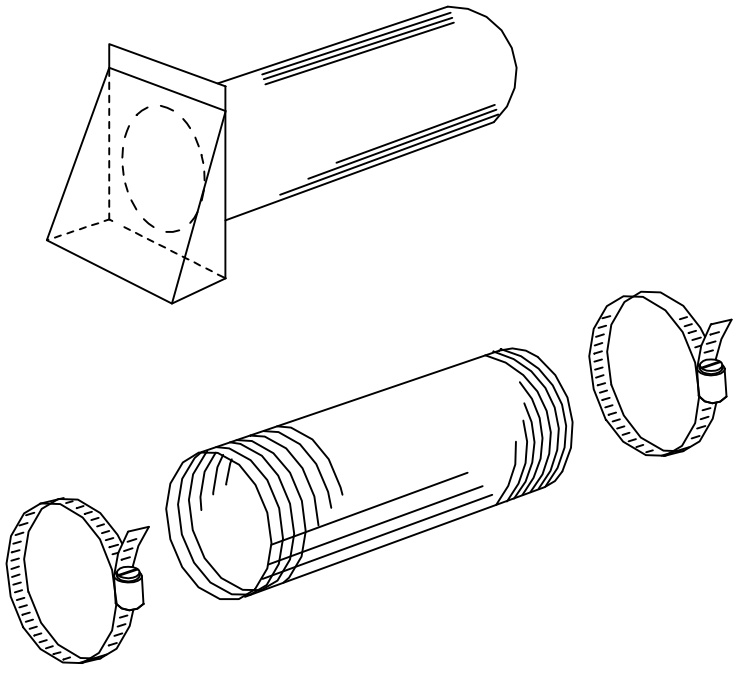
INSTALLATION & CHECKOUT

Installation

Install the 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. 5487.00, Thermostat

Raintight, weather resistant, N.E.M.A 4X

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.

Control Range:

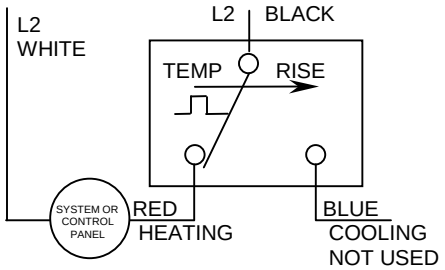
40°F (5°C) to 110°F (113°C)

Electrical Ratings:

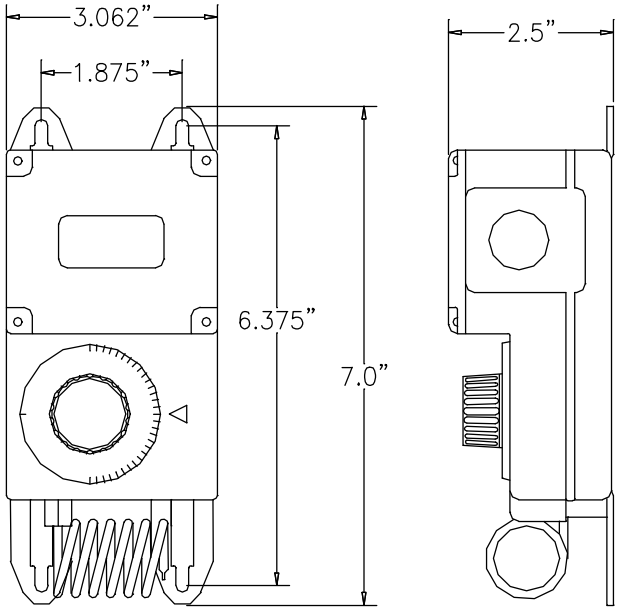
50-60Hz	120 V	240 V	277 V	480V
Full Load Amp	16	12	10	- -
LRA	80	60	50	- -
Resistive Amp	25	25	22	5
Pilot Duty	125 VA	125 VA	125 VA	125 VA

Note: This thermostat is suitable for 24 VAC operation

Wiring:



Dimensions:



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. 0219.00 & 0419.00, Vent Terminal

Side Wall Vent Terminal

POWDER COATED ALUMINIZED STEEL

- Aluminized Steel Construction
- Stainless Steel Bird Screen
- Powder Coated
- Corrosion Resistant

SPECIFICATIONS

CRC Part No.:

0219.00 – Used with 0201.WO Vacuum Exhauster
0419.00 – Used with 0401 & 0402 series Vacuum Exhausters

Dimensions:

0219.00 – 2.656” x 5.312” (ID Dimensions), 24“ Long
0419.00 – 2.906” x 5.312” (ID Dimensions), 24“ Long

Temperature Rating:

450°F (232°C)

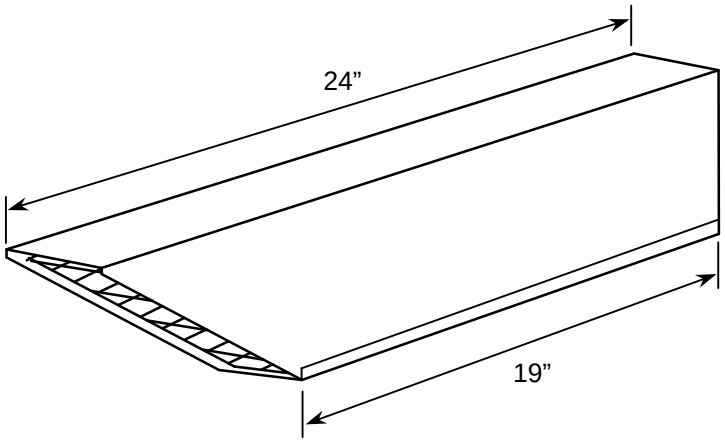
INSTALLATION & CHECKOUT

Installation

The side wall vent terminal is designed to fit over the outlet of the vacuum exhauster. Install vent terminal as outlined on shop drawing. Refer to the owner's manual for installation guidance.

Checkout

Make sure that the vent terminal is installed in accordance with the owner’s manual as well as the shop drawing. Inspect to make sure that vent terminal is secured to vacuum exhauster and wall penetration is properly sealed.



COMBUSTION RESEARCH CORPORATION

Part No. 1810.VT.600, Vent Cap

6” Round Vent Cap

SIDE WALL VENT TERMINAL

- High Wind Vent Cap
- 6” Diameter Inlet
- Aluminum Construction
- Corrosion resistant

SPECIFICATIONS

CRC Part No.:

1810.VT.600

Dimensions:

6" (152mm) Inlet Connection

Maximum Temperature:

Maximum 600°F (315°C)

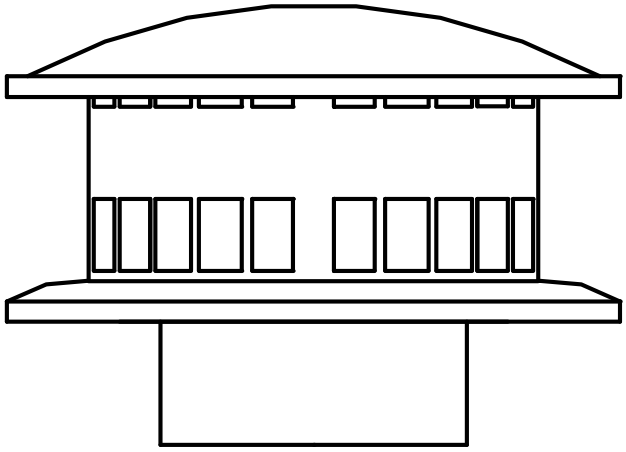
INSTALLATION & CHECKOUT

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.CH.000
100’ of Hanging Chain

HANGING CHAIN

- Double Loop Hanging Chain – 100’ Long
- Galvanized steel construction

SPECIFICATIONS

CRC Part No.:

1800.CH.000

Dimensions:

100’ (30,481mm) Hanging Chain – Workload rating of 90 pounds – Galvanized steel construction.

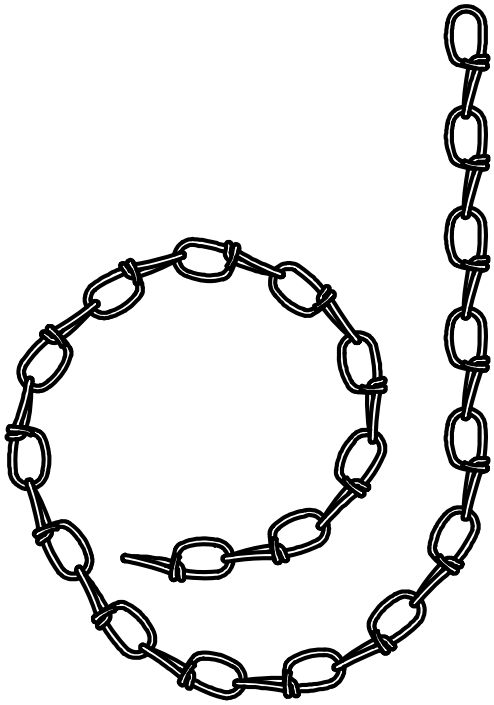
Maximum Temperature:

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.



COMBUSTION RESEARCH CORPORATION

Part No. 1800.SH.000
100 Pieces of “S” Hook

“S” HOOK

- Double Loop Hanging Chain – 100’ Long
- Galvanized steel construction

SPECIFICATIONS

CRC Part No.:

1800.SH.000

Dimensions:

100’ Pieces or “S” Hook – Workload rating of 90 pounds – Galvanized steel construction.

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.