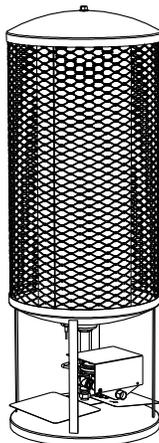


INSTALLATION AND OPERATION INSTRUCTIONS RFPA21A CONSTRUCTION HEATER FLOOR MODEL



WARNING

IMPROPER INSTALLATION

Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.

WHAT TO DO IF YOU SMELL GAS

- * **DO NOT** try to light any appliance.
- * **DO NOT** touch any electrical switch; **DO NOT** use any phone in your building.
- * **Immediately** call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- * If you cannot reach your gas supplier, **CALL** the fire department.

SAVE FOR FUTURE REFERENCE

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1. GENERAL INFORMATION

INSTALLER: This manual is the property of the owner. Please present this manual to the owner when you leave the job site. This heater is a self-contained infrared floor model heater for use in the temporary heating of buildings under construction, repair or alteration.

⚠ WARNING

GENERAL HAZARD

FAILURE TO COMPLY WITH THE PRECAUTIONS AND INSTRUCTIONS PROVIDE WITH THIS HEATER, CAN RESULT IN DEATH, SERIOUS BODILY INJURY AND PROPERTY LOSS OR DAMAGE FROM THE HAZARDS OF FIRE, EXPLOSION, BURN, ASPHYXIATION, CARBON MONOXIDE POISONING, AND/OR ELECTRICAL SHOCK.

ONLY PERSONS WHO CAN UNDERSTAND AND FOLLOW THE INSTRUCTIONS SHOULD SERVICE THIS HEATER.

IF YOU NEED ASSISTANCE WITH THIS HEATER OR INFORMATION SUCH AS AN INSTRUCTIONS MANUAL, LABEL, ETC., CONTACT THE MANUFACTURER.

⚠ WARNING

FIRE, BURN, INHALATION, AND EXPLOSION HAZARD

KEEP SOLID COMBUSTIBLES, SUCH AS BUILDING MATERIALS, PAPER OR CARDBOARD, A SAFE DISTANCE AWAY FROM THE HEATER AS RECOMMENDED BY THE INSTRUCTIONS. NEVER USE THE HEATER IN SPACES WHICH DO OR MAY CONTAIN VOLATILE OR AIRBORNE COMBUSTIBLES, OR PRODUCTS SUCH AS GASOLINE, SOLVENTS, PAINT THINNER, DUST PARTICLES OR UNKNOWN CHEMICALS.

⚠ WARNING

NOT FOR HOME OR RECREATIONAL USE.

INSTALLATION REQUIREMENTS

The heater is designed and approved for use as a construction heater in accordance with Standard ANSI.Z83.7 - CGA 2.14. **CHECK WITH YOUR LOCAL FIRE SAFETY AUTHORITY IF YOU HAVE ANY QUESTIONS ABOUT APPLICATIONS.** Other standards govern the use of fuel gases and heat producing products in specific applications. Your local authority can advise you about these.

This heater is intended for use in the temporary heating of buildings or structures under construction, alteration or repair.

Installation of this heater must be in accordance with all applicable codes shown in the instructions and/or the local codes and authorities having jurisdiction. Heaters shall be installed by a licensed contractor or licensed installer. Clearances to combustibles as outlined in this manual should always be observed.

Every heater shall be located with respect to building construction and other equipment so as to permit access to the heater. Each installer shall use good installation practices when locating the heater and must give consideration to service accessibility. The heater should be inspected before each use, and at least annually by a qualified service person.

This heater is for **INDOOR INSTALLATION ONLY**. While the products of combustion are expelled into the building, national codes require ventilation in the building to dilute these products of combustion. The ventilation may be provided by gravity or mechanical means. Refer to Section 8 "VENTILATION AND COMBUSTION AIR" of this manual for minimum requirements for ventilation and combustion air.

The heater must not be installed where it is directly exposed to water spray, rain and/or dripping water.

Copies of the National Fuel Gas Code (ANSI Z22.3.1 – latest edition) are available from the American Gas Association Laboratories, 8501 E. Pleasant Valley Road, OH 44131. All NFPA codes are available from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

	<p>WARNING:</p> <p>This product can expose you to chemicals including ceramic fibers, which are known to the State of California to cause cancer, and carbon monoxide, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.p65warnings.ca.gov.</p>
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	<p style="text-align: center;">WARNING</p> <p style="text-align: center;">BURN HAZARD</p> <p>Hot surfaces! Do NOT move, handle or service heater while operating.</p> <p>Allow at least 10 minutes before touching any surfaces.</p> <p>Failure to do so may result in serious injury.</p>
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	<p style="text-align: center;">WARNING</p> <p style="text-align: center;">FIRE HAZARD</p> <p>Heater must be on a stable and level surface.</p> <p>Failure to do so may result in death, serious injury or property damage.</p>
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2. SPECIFICATIONS

MODEL NO.	GAS TYPE	INPUT BTU/HR	ORIFICE SIZE
RFP21A-N6	NATURAL	212,000	"H" (.2660)
RFP21A-L6	PROPANE	200,000	#20 (.1610)

Gas Pipe connection: ½" NPT Female

MODEL SUFFIXES:

- N - Natural Gas
- L - Propane Gas
- 6 - Standing Pilot Ignition
- 100% Safety Shutoff, Manual Valve (Baso)

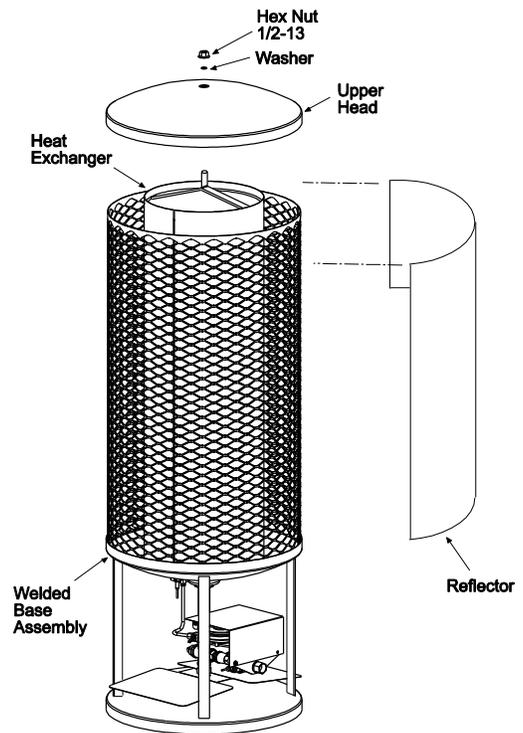
DIMENSIONS	RFP21A
HEATER PACKAGED	18-1/2" x 18-1/2" x 51-1/2"
SHIPPING WEIGHTS	62 LBS.

3. ADDING OPTIONAL REFLECTOR

A 180° reflector can be used where it is desirable to direct the heat into a specific work area. This is ordered as an accessory item, Part No. 04310010 for Model RFPA21A .

INSTALLATION INSTRUCTIONS

1. Loosen and remove the 1/2-13 hex nut and washer from the heater assembly.
2. Lift the head from the heater.
3. Place reflector on outside of expanded metal guard with bottom edge inside lip of the base head assembly.
4. Replace upper head with lip over the expanded guard and reflector.
5. Re-secure with the nut and washer.



4. MINIMUM CLEARANCES TO COMBUSTIBLES

The heater shall be operated only on a **NON-COMBUSTIBLE**, level floor. Minimum clearances to combustible walls and ceilings are listed below:

MODEL RFPA21A	FRONT	SIDES	REAR	TOP	CLEARANCE FROM PROPANE CYLINDER
WITH REFLECTOR	240"	84"	48"	54"	20 FEET
WITHOUT REFLECTOR	----	144"	----	54"	20 FEET

REFER TO BULLETIN NFPA 58 AND LOCAL CODES

WARNING: KEEP PERSONNEL AND COMBUSTIBLE MATERIAL AT LEAST 12 FT. FROM HEATER MODEL RFPA21A WHEN IN OPERATION.

5. GAS CONNECTIONS AND REGULATION

1. Connect to the supply tank or manifold in accordance with the latest edition of National Fuel Gas Code (ANSI Z223.1) and local building codes. Authorities having jurisdiction should be consulted before the installation is made.
2. Pipe joint compounds must be resistant to the action of liquefied petroleum gases.
3. Where local codes do not prohibit, an A.G.A. or U.L. approved flexible connection is recommended between the rigid piping and the heater. A union and an approved shut-off valve should be installed before the control valve inlet. The shut-off valve should be installed within 6 feet of the union.
4. This appliance is equipped with a manual gas valve and an appliance regulator. The maximum supply pressure to the appliance is 14" W.C. or ½ P.S.I. If the line pressure is more than the maximum supply pressure, then use a line regulator which corresponds to the supply pressure.
5. After gas connections have been made, make sure the heater and all gas outlets are turned off before the main gas supply is turned on. Turn the gas pressure on and check for leaks. To check for leaks, apply a solution of soap suds to all connections and joints or check by one of the methods listed in Appendix D of ANSI Z223.1 (latest edition) Natural Fuel Gas Code. DO NOT USE AN OPEN FLAME OF ANY KIND TO TEST FOR LEAKS.

6. INSTRUCTIONS FOR PRESSURE TEST GAUGE CONNECTION

Supply Pressure: Installer to provide a 1/8" N.P.T. plugged tapping, accessible for test gauge connection immediately upstream of the gas supply connection to the heater.

Manifold Pressure: Turn gas valve to "OFF" position. Remove 1/8" plug from manifold downstream from the valve and connect 1/8" nipple to the tapped hole. Connect gauge to nipple. Turn on the gas supply.

With the main burner operating, check burner manifold pressure using a water manometer. If adjustment is required, remove cover screw of the appliance regulator. Using a small screwdriver, turn adjustment screw clockwise to increase or counter-clockwise to decrease gas pressure to burner. Replace cover screw.

Gauges which measure in pounds per square inch or ounces per square inch are not accurate enough to measure or set the manifold pressure. Use a water manometer.

GAS TYPE	MANIFOLD PRESSURE	MINIMUM*	MAXIMUM
Natural	3.5" W.C.	5" W.C.	14" W.C.
Propane	10" W.C.	11" W.C.	14" W.C.

*Minimum permissible gas supply pressure for purpose of input adjustment.

7. INFORMATION FOR LP GAS FLOOR MODEL HEATERS ONLY

Heaters used with LP gas must be installed in accordance with the latest edition of the National Fuel Gas Code -NFPA54, Standard for the Storage and Handling of LP Gas - NFPA 58, all state and local codes or the authority having jurisdiction.

This heater is intended for industrial or construction heating and it must never be used for residential/domestic heating.

WARNING:A single stage regulator must be installed on the tank or cylinder to reduce the tank or cylinder pressure to the heater. Operation of this heater without this regulator can cause damage to the heater and personal injury.

The heater must be connected to the tank or cylinder by a UL Listed hose assembly or hard piping. A 15 foot assembly of UL Listed hose is available from Space-Ray under Part No. 42035000. A single stage LP gas regulator (operation range: 10-150 PSIG inlet and 11.0" W.C. outlet) having a POL fitting with an excess flow valve is available as Part No. 03456000 (LP Cylinder Kit).

The volume of a given quantity of liquid LP gas in a container is directly related to its temperature. As a result, the vaporization rate of a tank or cylinder will decrease as the temperature drops and as the percentage of liquid in the container becomes smaller. Table 1 shows the approximate vaporization rate of a 100 lb. cylinder. **CAUTION: Space-Ray DOES NOT recommend the use of a 100 lb. cylinder with the RFPA21A heater because of the large BTU input.**

TABLE 1
Maximum Continuous Draw in BTU/Hr
At Various Temperatures (°F)

Lbs. of Propane in Cylinder	20°F	40°F	60°F	70°F
100	167,000	214,000	277,000	300,000
80	137,000	180,000	214,000	236,000
60	109,000	140,000	176,000	197,000
40	**	105,000	131,000	141,000
30	**	**	107,000	118,000

** Rate of vaporization drops below the heater input rate.

WARNING: Due to the continuous length of time the heater might be in operation, a 100 lb. LP gas cylinder may not be sufficient in size. Manifolding several cylinders together is a practical way of increasing the time of operation of these heaters. Operation of the heater with insufficient sized cylinders or when the liquid level becomes too low will result in poor heater performance and can cause sooting. Consult your LP gas dealer for proper sizing of container. Always turn the gas off at the tank or cylinder when the heater is not in use. When in operation, keep the heater a safe distance from the LP gas container and combustible materials as indicated on the heater and in the instructions. Fasten LP cylinders securely so they cannot be knocked over.

8. VENTILATION AND COMBUSTION AIR

This heater requires ventilation in the building to dilute the products of combustion and provide fresh air for efficient combustion. The minimum recommended vent flow required is as follows:

RFP21A: 880 cfm

The combustion air enters through the heater base and must not be restricted. **DO NOT block or enclose any part of the heater base.** All ventilation in the building must be at a level above the height of the heater.

9. LIGHTING AND SHUTDOWN INSTRUCTIONS

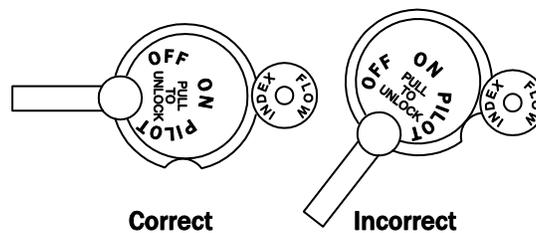
MODELS WITH IGNITION SUFFIX "-6"

1. Pull lock button and turn valve handle to "Pilot" position; DO NOT pull out valve handle - Push down button and light pilot. Hold button in firmly for approximately 30 seconds or until pilot remains lighted without holding button down. If air is in the line, it will take a few minutes for gas to reach the pilot.

2. Turn handle to "ON" position.

3. If heater does not light, shut off gas completely for five minutes before attempting to relight.

4. To turn off main burner and pilot gas, pull lock button and turn handle to "OFF".



CAUTION: DO NOT PULL OUTWARD ON VALVE HANDLE

CAUTION: DO NOT OPERATE MAIN BURNER AT ANY SETTING LESS THAN FULL "ON" POSITION. SOOTING WILL OCCUR!

10. CLEANING AND ANNUAL MAINTENANCE

This heater must be cleaned and serviced at least once before the start of each heating season or at any time the infrared emitter show signs of collecting any foreign material on its surface. Maximum heating efficiency and clean combustion will be maintained by keeping the emitter and burner clean. To clean the heater, follow these instructions:

1. Turn off the gas supply to the heater.
2. Remove and clean the burner.
 - a. Remove the three (3) piece burner alignment brackets.
 - b. Unscrew the burner from burner fitting on which it is mounted.
 - c. Remove three (3) fillister head screws holding burner cap in place.
 - d. Burner ports are formed by grooves on underside of burner cap; burner ports may be cleaned with a wire brush.
 - e. Removal of burner cap also makes mixing tube of burner accessible for cleaning with a round wire brush.
 - f. After cleaning, re-assemble burner cap on burner base with the three (3) 8 - 32 fillister head screws.
 - g. Screw burner all the way down on burner fitting and install burner alignment brackets.
3. If the emitter shows any accumulation of material in the ports, remove the heater top and the expanded metal guard to expose the emitter and use a high pressure air hose to blow the ports clean. If this does not clean the holes, remove the four (4) screws holding the emitter to its mounting ring and remove the emitter so that it can be cleaned both inside and out with a wire brush and then blown out with a high pressure air hose.
4. Inspect the pilot burner and remove any foreign material with a brush or an air hose.
5. Reassemble the heater, test all connections for leaks and test the heater to be sure it is now operating properly.

11. REPLACING PARTS

At all times when parts are being replaced, ensure that both gas and electrical supplies are disconnected.

Various parts are available from the factory for replacement by a licensed service person. Refer to exploded parts guide in Section 12 for all replacement parts.

Date of Installation _____

Heater Model Number RFPA 21A _____ - _____

N6 = Natural Gas

Heater Serial Number _____

L6 = Propane Gas

12. REPLACEMENT PARTS LIST - RFPA21A-(N,L) 6

ITEM NO.	PART NO.	DESCRIPTION
1	02004010	Round Head Machine Screw #10-32 x 1/4 (3 each)
2	02123030	Round Head Machine Screw #8-32 x 3/16"
3	02240010	Hex Washer Head Sheet Metal Screw #12 x 3/4" (4 each)
4	02129050	Washer - Flat #10 (4 each)
5	02104060	Nut - Speed #10 (4 each)
6	02152010	Hex Head Thread Cut Screw #10-24 x 3/8" (2 each)
7	04114000	Upper Head
8	04593030	Expanded Metal Guard
9	04485000	Heat Exchanger Assembly
10	04380000	Main Burner Assembly (less alignment bracket)
11	41858000	Burner Base
12	41859000	Burner Cap
13	02215040	Hex Washer Head Machine Screw #8-32 x 1" (4 each)
14	02186040	Hex - Nut #8-32 (4 each)
15	04094010	Shutter Plate - Fixed
16	02166010	Pan Head Machine Screw #8-32 x 3/8" (2 each)
17	40584000	Burner Alignment Bracket Assembly
18	02004040	Round Head Machine Screw #10-32 x 3/4" (3 each)
19	02126060	Nut - Square #10-32 (3 each)
20	04783010	Base Assembly
21	41806020	Label Holder Plate
22	41874990	Radiation Shield (nameplate holder)
23	30335010	Pilot Burner & Orifice Fitting - Nat. #J181EKA3223
24	30335020	Pilot Burner & Orifice Fitting - LP #J181EKA4214
25	03345010	Pilot Orifice - Nat (.023") #Y90AA - 3223
26	03345060	Pilot Orifice - LP (.014") #Y90AA - 4214
27	30335000	Pilot Burner less Orifice #J181EKA
28	03401030	Thermocouple #K16BA-18+C31
29	04659000	Pilot Tubing - Baso valve
30	03527000	Break Away Fitting (included with valve and pilot orifice)
31	03339020	Plug - 1/8" (pressure tap)
32	41834000	Burner Fitting Assembly
33	03258980	Main Burner Orifice (Nat.) "H"
34	03258200	Main Burner Orifice (LP) #20
35	03695000	Gas Valve - Baso #H43BA-5D
36	03307230	Regulator - RV48 (Nat.) @ 5" W.C.
37	03307210	Regulator - RV48 (LP) @ 10" W.C.
38	03333040	Nipple 1/2 x 1-1/2
39	43136000	Manifold Support & Nameplate Bracket
40	41357080	Instruction Manual (not shown)

41	41874030	Nameplate Label - State Gas Type (not shown)
42	42918010	Pilot Shield - Inner
43	42918020	Pilot Shield - Outer
44	02127150	Nut - Hex 1/2-13
45	02129160	Washer - Flat 1/2
46	41847000	Washer - Burner Fitting
47	02247010	Hex Head Machine Screw 1/2-13 x 1
48	41848030	Control Arm Assembly (complete) - Nat.
49	41848040	Control Arm Assembly (complete) - LP

MODEL NUMBER SUFFIXES

N - Natural Gas

L - LP Gas

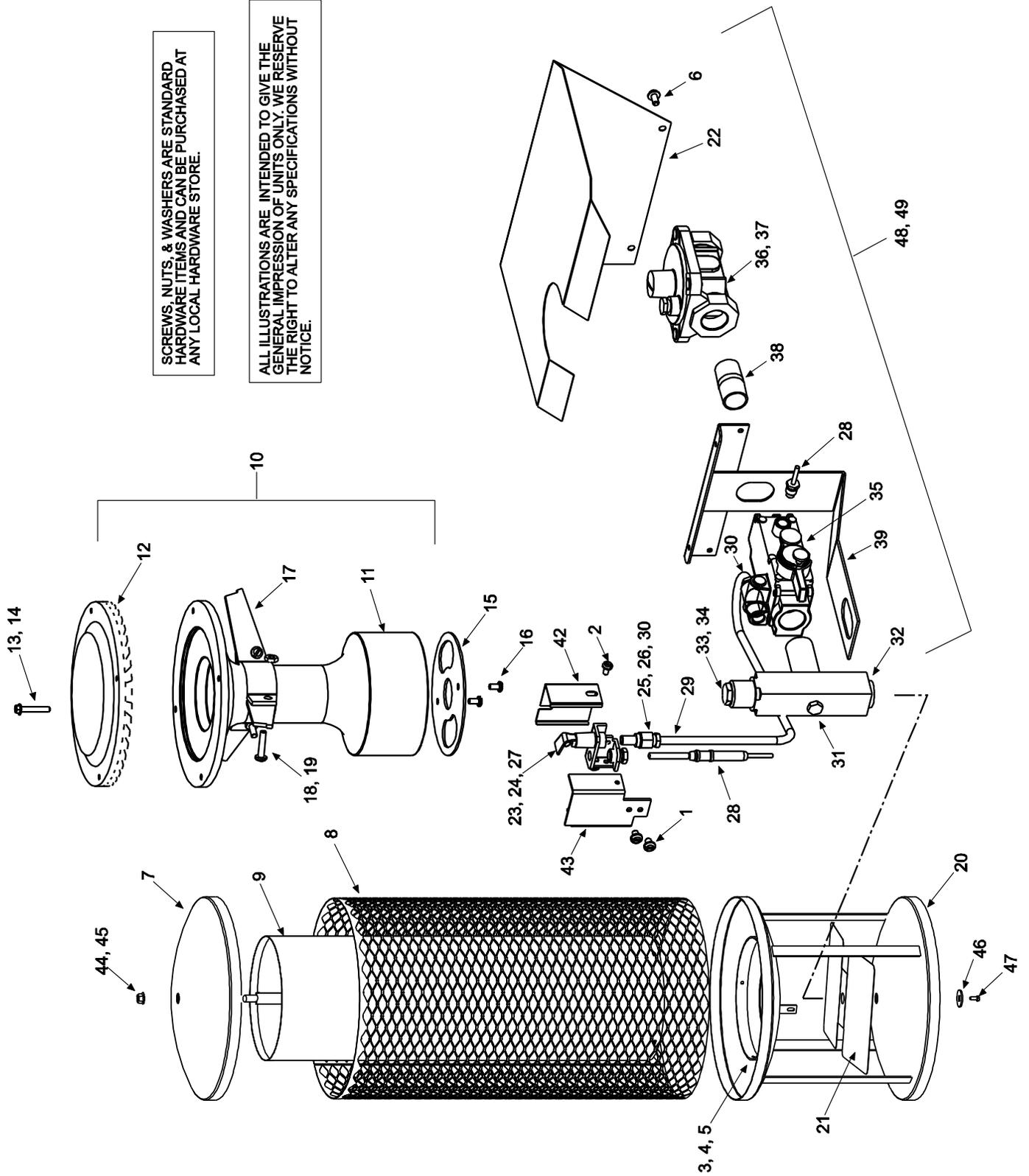
6 - 100% Gas Shutoff Control - Manually Operated (Baso valve)

IMPORTANT

PLEASE ORDER BY PART NUMBER - NOT BY ITEM NUMBER.

ALSO REFER TO COMPLETE MODEL NUMBER WHEN ORDERING.

ALL REPLACEMENT PART PRICES AVAILABLE WHEN ORDERING.



SCREWS, NUTS, & WASHERS ARE STANDARD
HARDWARE ITEMS AND CAN BE PURCHASED AT
ANY LOCAL HARDWARE STORE.

ALL ILLUSTRATIONS ARE INTENDED TO GIVE THE
GENERAL IMPRESSION OF UNITS ONLY. WE RESERVE
THE RIGHT TO ALTER ANY SPECIFICATIONS WITHOUT
NOTICE.



LIMITED WARRANTY: Gas-Fired Products, Inc., the manufacturer, warrants to the original owner of any Space-Ray infrared gas heater that said heater will be free from defects in material or workmanship under normal use and service. The heater(s) shall be installed, used and maintained strictly in accordance with the manufacturer's instructions. The manufacturer's sole obligation under this warranty shall be limited to furnishing replacement parts, F.O.B. Charlotte, NC, for 12 months from the date of installation, or 18 months from the date of shipment by the manufacturer, whichever period shall expire first. Labor charges for removal of defective parts and the installation of the replacement parts are not included. This warranty applies only within the USA and Canada.

WARNING: Manufacturer's warranty shall not apply: (a) to damage to the heater when used in an atmosphere containing halogenated hydrocarbons or other corrosive chemicals. Some compounds in the air can be ingested into the equipment and can cause an accelerated rate of corrosion of some of the parts of the heating components. The use of such chemical compounds in or near the operating environment of the heater should be avoided where a longer heater life is desirable; (b) to any heater or components which have been repaired or replaced with other than factory parts, modified in any way, misused or damaged, or which have been used contrary to the manufacturer's written instructions. Replacement parts are available through Space-Ray representatives or their distributors.

LIMITATION OF WARRANTY: THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. WITHOUT LIMITING THE FOREGOING, THE MANUFACTURER EXPRESSLY EXCLUDES ANY AND ALL IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE AND ANY IMPLIED WARRANTY OF MERCHANTABILITY FOR ITS PRODUCTS.

If any provision of this warranty is found to be void, unenforceable or unconscionable, then the same is hereby severed and the remainder of this warranty is hereby saved and shall remain in force.

EXCLUSIVE REMEDY: The sole and exclusive remedy under this warranty is the replacement of the defective parts or heaters as hereinabove specified. THE MANUFACTURER DOES HEREBY EXPRESSLY EXCLUDE ANY AND ALL LIABILITY FOR INCIDENTAL AND CONSEQUENTIAL DAMAGES UNDER THIS OR ANY OTHER WARRANTY. Without intending to limit the aforesaid exclusion, THE MANUFACTURER DOES HEREBY EXCLUDE ANY LIABILITY UNDER THIS OR ANY OTHER WARRANTY FOR INJURIES AND COMMERCIAL LOSSES TO PROPERTY THAT RESULT FROM THE OPERATION, PROPER OR IMPROPER, OF ITS PRODUCTS.

ADDITIONAL WARRANTY ON HEAT EMITTING SURFACE AND BURNER: Manufacturer warrants to the original owner of any CSA design certified heater that, if installed, used and maintained strictly in accordance with the printed instructions received with the heater, the manufacturer will at any time during the below listed time periods, furnish at no cost to the original owner, replacement emitters or burners which have become inoperative by reason of any defect in our workmanship, materials or construction. The manufacturer's obligation under this warranty shall be limited to furnishing replacements under the following time periods from the date of installation:

	<u>EMITTER</u>	<u>BURNER</u>
RFPA SERIES	1 Year	10 Years

The manufacturer will not be responsible for labor charges incurred for removal or installation of emitters. Any transportation charges involved in the return or repair are excluded.

ADDITIONAL TERMS: Manufacturer assumes no liability for delay in performing its obligations under the aforesaid warranty. Manufacturer assumes no liability for failure in performing its obligations thereunder if failure results directly or indirectly from any cause beyond its control, including but not limited to acts of God, acts of Government, floods, fires, shortages of materials, strikes and other labor difficulties or delays or failures of transportation facilities.

THIS IS A NON-RESIDENTIAL PRODUCT. Installation and service shall be by a Licensed Contractor and in accordance with National and Local Codes.

When presenting warranty claims, proof of date of purchase must be submitted.

No Representative is authorized to assume for the manufacturer any liability except as set forth above.

In case of claim under this warranty, contact:

Space-Ray
P.O. Box 36485
305 Doggett Street (28203)
Charlotte, NC 28236
(704) 372-3485

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