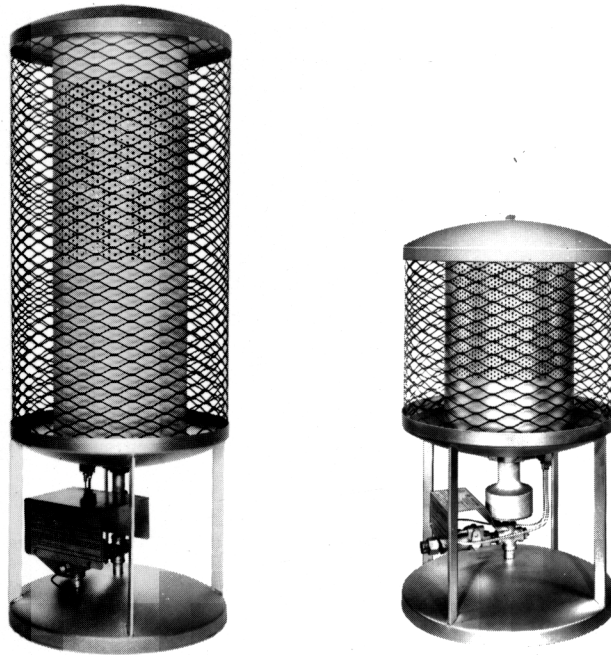




## INSTALLATION AND OPERATING INSTRUCTIONS

FLOOR MODELS  
RFPA10B and RFPA21A



### 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 neighbors phone. Follow the gas supplier's instructions.
- \* If you cannot reach your gas supplier, call the fire department.

**WARNING:** 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.

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 jobsite.

This heater is a self-contained infrared radiant floor model heater for use in locations where flammable gases or vapors are not generally present and is intended for the heating of non-residential spaces.

### INSTALLATION REQUIREMENTS

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.

This heater is certified by the American Gas Association Laboratories as a space heater only and should not be used for any other applications.

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. This ventilation may be provided by gravity or mechanical means. Refer to Section 8 of this manual for minimum requirements for ventilation and combustion air.

Copies of the National Fuel Gas Code (ANSI Z223.1 - latest edition) are available from the American Gas Association Laboratories, 8501 E. Pleasant Valley Road, Cleveland, OH 44131. All NFPA codes are available from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

**NOTE:** This heater does not comply with Section 2.10 Radiant Coefficient of ANSI Z83.6a - 1992.

**WARNING:** DO NOT move, handle or service a hot or operating heater.

**WARNING:** Heaters must only be used on stable and level surfaces for safe operation.

## 2. SPECIFICATIONS

| MODEL NO. | GAS TYPE | INPUT BTU/HR | ORIFICE SIZE |
|-----------|----------|--------------|--------------|
| RFA10B    | NATURAL  | 100,000      | #12 (.1890)  |
| RFA10B    | PROPANE  | 95,000       | 7/64 (.1094) |
| RFA21A    | NATURAL  | 212,000      | "H" (.2660)  |
| RFA21A    | 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)
- 6C - Standing Pilot Ignition  
100% Safety Shutoff, Manual Valve (White-Rodgers)

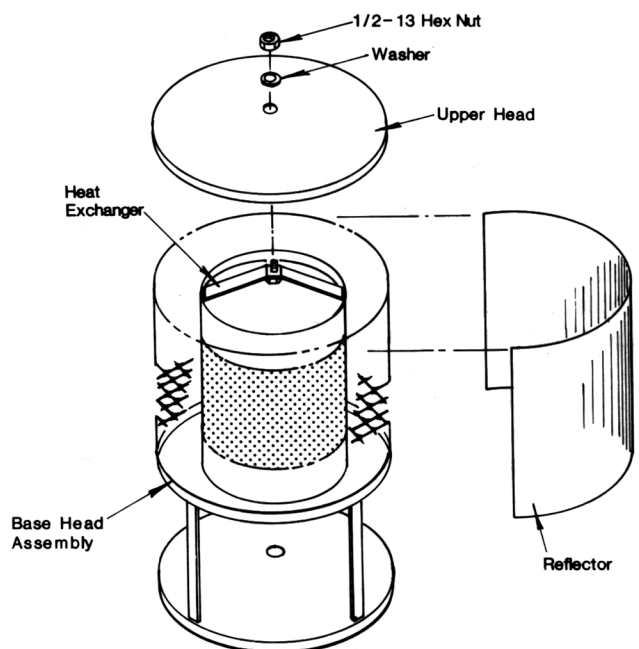
| DIMENSIONS       | RFA10B                  | RFA21A                      |
|------------------|-------------------------|-----------------------------|
| HEATER           | 18" Dia. x 32-3/4"      | 18" Dia. x 48-9/16"         |
| PACKAGED         | 18-1/2" x 18-1/2" x 34" | 18-1/2" x 18-1/2" x 51-1/2" |
| SHIPPING WEIGHTS | 55 LBS.                 | 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. 0431003 for Model RFA10B or Part No. 0431001 for Model RFA21A.

### 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. Resecure 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 RFPA10B     | FRONT | SIDES | REAR | TOP | CLEARANCE FROM PROPANE CYLINDER |
|-------------------|-------|-------|------|-----|---------------------------------|
| WITH REFLECTOR    | 120"  | 60"   | 48"  | 54" | 20 FEET                         |
| WITHOUT REFLECTOR | ----  | 60"   | ---- | 54" | 20 FEET                         |

| 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 5 FT. FROM HEATER MODEL RFPA10B AND 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 | SUPPLY 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. 4203500. 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. 0345600 (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 RFP21A 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:

|         |         |
|---------|---------|
| RFP10B: | 418 cfm |
| 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".

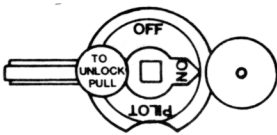
**CAUTION: DO NOT PULL OUTWARD ON VALVE HANDLE**

### MODELS WITH IGNITION SUFFIX "-6C"

1. Turn gas control knob to "OFF" position. Allow 5 minutes for any gas to escape before lighting.
2. Turn gas control knob to "PILOT" position. Push down on gas control knob and light the pilot with a match. Hold this knob down for approx. 60 seconds after lighting the pilot.
3. When the gas control knob is released, the pilot should continue to burn. If the pilot goes out, repeat Steps 1 and 2 again.
4. Push the knob down slightly and rotate the gas control knob from "PILOT" to "ON". The main burner will ignite.
5. If the main or pilot burners extinguish, depress and turn the gas control knob to the "OFF" position, wait 5 minutes and repeat the above lighting procedure.

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

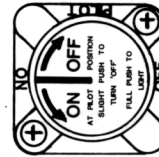
**"WHITE-RODGERS" VALVE**



**CORRECT**



**INCORRECT**



**CORRECT**



**INCORRECT**

**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 \_\_\_\_\_ - \_\_\_\_\_

Heater Serial Number \_\_\_\_\_

N = Natural Gas

L = Propane Gas

## 12. REPLACEMENT PARTS LIST - RFPA10B & RFPA21A

| ITEM NO. | PART NO. | DESCRIPTION  | MODEL USED ON         |
|----------|----------|--|-----------------------|
| 1        | 0411400  | Upper Head   |                       |
| 2        | 0459302  | Expanded Metal Guard (Short)                         | RFPA10B               |
| 3        | 0459303  | Expanded Metal Guard (Tall)                          | RFPA21A               |
| 4        | 0436202  | Heat Exchanger Assembly (Short)                      | RFPA10B               |
| 5        | 0448500  | Heat Exchanger Assembly (Tall)                       | RFPA21A               |
| 6        | 0438000  | Main Burner Assembly (Complete)                      |                       |
| 7        | 4185800  | Burner Base  |                       |
| 8        | 4185900  | Burner Cap   |                       |
| 9        | 0409401  | Shutter Plate - Fixed                                |                       |
| 10       | 4058400  | Burner Alignment Bracket Assembly                    |                       |
| 11       | 0478301  | Base Assembly  |                       |
| 13       | 4180600  | Warning Plate  |                       |
| 14       | 4179502  | Pilot Shield - Outer                                 | RFPA10B               |
| 15       | 4179501  | Pilot Shield - Inner                                 | RFPA10B               |
| 16       | 0339902  | Pilot Burner & Orifice Fitting - Nat. #J129DDA3223   | RFPA10B-N6,N6C        |
| 17       | 0339903  | Pilot Burner & Orifice Fitting - LP #J129DDA4212     | RFPA10B-L6,L6C        |
| 18       | 0334501  | Pilot Orifice - Nat (.023") #Y90AA - 3223            | RFPA10B-N6,N6C        |
| 19       | 0334502  | Pilot Orifice - LP (.012") #Y90AA - 4212             | RFPA10B-L6,;6C        |
| 20       | 0343700  | Pilot Burner less Orifice #J129DDA                   | RFPA10B               |
| 21       | 3033501  | Pilot Burner & Orifice Fitting - Nat. #J181EKA3223   | RFPA21A-N6            |
| 22       | 3033502  | Pilot Burner & Orifice Fitting - LP #J181EKA4214     | RFPA21A-L6            |
| 23       | 0334501  | Pilot Orifice - Nat (.021") #Y90AA - 3223            | RFPA21A-N6            |
| 24       | 0334506  | Pilot Orifice - LP (.014") #Y90AA - 4214             | RFPA21A-L6            |
| 25       | 3033500  | Pilot Burner less Orifice #J181EKA                   | RFPA21A               |
| 26       | 0340103  | Thermocouple   | RFPA10B,RFPA21A       |
| 27       | 0465900  | Pilot Tubing - Baso valve                            |                       |
| 28       | 4179900  | Pilot Tubing - White-Rodgers valve                   |                       |
| 29       | 0352700  | Break Away Fitting - Comes w/Valve and Pilot Orifice |                       |
| 32       | 0333902  | Plug - 1/8" (Pressure Tap)                           |                       |
| 33       | 4183400  | Burner Fitting Assembly                              |                       |
| 34       | 0325812  | Main Burner Orifice (Nat.) #12                       | RFPA10B-N6,N6C        |
| 35       | 0325891  | Main Burner Orifice (LP) 7/64"                       | RFPA10B-L6,L6C        |
| 36       | 0325898  | Main Burner Orifice (Nat.) "H"                       | RFPA21A-N6            |
| 37       | 0325820  | Main Burner Orifice (LP) #20                         | RFPA21A-L6            |
| 38       | 0369500  | Gas Valve - Baso #H43BA-5D                           |                       |
| 39       | 3009101  | Gas Valve - White-Rodgers #764-2                     | RFPA10B Only          |
| 40       | 0330710  | Regulator - RV48 (Nat.)                              |                       |
| 41       | 0330721  | Regulator - RV48 (LP)                                |                       |
| 41a      | 0330723  | Regulator - RV48 (Nat.) @ 6" W.C.                    | RFPA21A-N6 Only       |
| 42       | 0333304  | Nipple 1/2 x 1-1/2                                   |                       |
| 43       | 0333310  | Nipple 1/2 x 3                                       | RFPA10B-N6C, L6C Only |
| 44       | 0306800  | Union (Complete)                                     | Accessory Only        |
| 45       | 0306803  | Nut (Union)  | Accessory Only        |
| 46       | 0306801  | Union Half - Female                                  | Accessory Only        |
| 47       | 0306802  | Union Half - Male                                    | Accessory Only        |
| 48       | 4313600  | Manifold Support & Nameplate Bracket                 |                       |
| 49       | 4135701  | Instruction Manual (Not Shown)                       |                       |
| 50       | 4198800  | Nameplate (State Gas Type)                           | RFPA10B-6             |
| 51       | 4198801  | Nameplate (State Gas Type)                           | RFPA10B-6C            |
| 52       | 4187402  | Nameplate (State Gas Type)                           | RFPA21A-6             |
| 53       | 4291801  | Pilot Shield - Inner                                 | RFPA21A               |
| 54       | 4291802  | Pilot Shield - Outer                                 | RFPA21A               |
| 57       | 0212715  | Nut - Hex 1/2-13                                     |                       |
| 58       | 0212916  | Washer - Flat 1/2                                    |                       |
| 59       | 4184700  | Washer - Burner Fitting                              |                       |
| 60       | 0224701  | Machine Screw 1/2-13 x 1                             |                       |
| 61       | 4187701  | Control Arm Kit - Nat.                               | RFPA10B-N6            |
| 62       | 4187702  | Control Arm Kit - LP                                 | RFPA10B-L6            |
| 63       | 4187704  | Control Arm Kit - Nat.                               | RFPA21A-N6            |
| 64       | 4187705  | Control Arm Kit - LP                                 | RFPA21A-L6            |
| 65       | 4187723  | Control Arm Kit - Nat.                               | RFPA10B-N6C           |
| 66       | 4187724  | Control Arm Kit - LP                                 | RFPA10B-L6C           |

**MODEL NUMBER SUFFIXES**

- N - Natural Gas
- L - LP Gas
- 6 - 100% Gas Shutoff Control - Manually Operated (Baso valve)
- 6C - 100% Gas Shutoff Control - Manually Operated (White-Rodgers 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.**

