

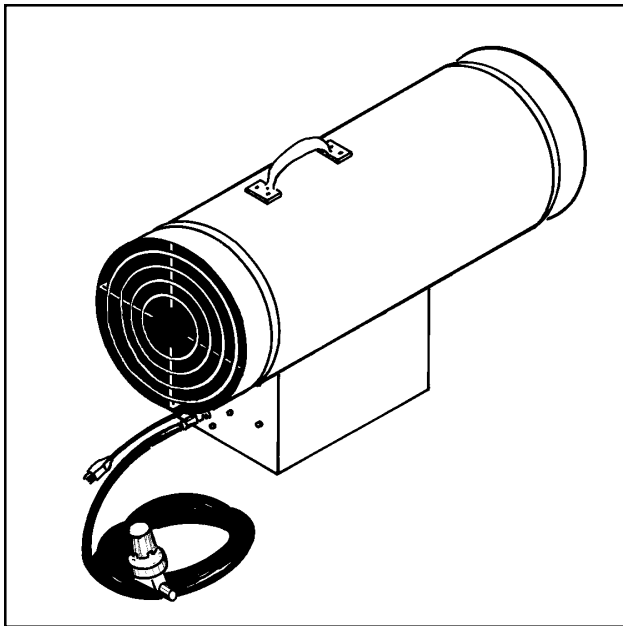
# OPERATING INSTRUCTIONS

**National-Riverside  
Universal  
MODEL  
3500-FACV**

**PROPANE  
CONSTRUCTION  
HEATER**

**SPC  
ALL-PRO  
MODEL  
SPC-350**

**FORCED AIR  
VARIABLE 175,000 TO 350,000 BTU/HR**



## HEATER SPECIFICATIONS

|                                  |  |
|----------------------------------|--|
| Type of Gas                      | For Use with Propane Only                          |
| Input Rating Variable            | Maximum: 350,000 BTU/hr<br>Minimum: 175,000 BTU/hr |
| Fuel Consumption                 | 8.8-16.2 lbs/hr                                    |
| Gas Supply Pressure to Regulator | Maximum: bottle pressure<br>Minimum: 20 psig       |
| Regulator out                    | 20 psig  |
| Fuel Orifice Size                | #45 Drill  |
| Electrical Input                 | 115V, 60 Hz, 1 $\phi$ , 7a                         |
| Minimum Operating Voltage        | 100V   |
| Fan                              | 1725 rpm, 1400 cfm                                 |
| Ignition                         | Direct Spark, Interrupted Type                     |
| Spark Generator                  | Solid State, 15,000V, Across 1/8" Gap              |
| Primary Flame Control            | Solid State, 10-15 Second Timing                   |
| High Temperature Control         | 240°F  |
| Min. Ambient Temperature Rating  | 0°F  |
| Thermostat Control               | 35°F-85°F  |
| Size (Length x Width x Height)   | 31" x 13" x 20"                                    |
| Net Weight                       | 54 lbs.  |
| Shipping Weight                  | 56 lbs.  |



**YOUR SAFETY IS IMPORTANT TO YOU AND TO OTHERS,  
SO PLEASE READ THESE INSTRUCTIONS BEFORE YOU  
OPERATE THIS HEATER.**



## GENERAL HAZARD WARNING:

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

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

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

**RETAIN THESE INSTRUCTIONS FOR FUTURE REFERENCE.**

## OPERATING PRECAUTIONS

This is a propane, direct-fired, forced air heater. It's intended use is primarily temporary heating of buildings under construction, alteration or repair.



### WARNING

**NOT FOR HOME OR RECREATIONAL VEHICLE USE**

Propane is heavier than air. If propane leaks from a connection or fitting, it sinks to the floor, collecting there with the surrounding air, forming a potentially explosive mixture. Obviously, propane leaks should be avoided, so set up the propane supply with utmost care. Leak check new connections or reconnections with a soap and water solution and follow all connection instructions herein. Also, ask your propane dealer for advice on the propane supply installation and ask him to check it if there are any questions.

Direct-Fired means that all of the combustion products enter the heated space. Even though this heater operates very close to 100 percent combustion efficiency, it still produces small amounts of carbon monoxide. Carbon monoxide (called CO) is toxic. We can tolerate small amounts but not a lot. CO can build up in a heated space and failure to provide adequate ventilation could result in death. The symptoms of inadequate ventilation are:

- headache
- dizziness
- burning eyes and nose
- nausea
- dry mouth or sore throat

So, be sure to follow advice about ventilation in these operating instructions.

Forced Air means that a blower or fan pushes the air through the heater. Proper combustion depends upon this air flow; therefore, the heater must not be revised, modified or operated with parts removed or missing. Likewise, safety systems must not be circumvented or modified in order to operate the heater.

**When the heater is to be operated in the presence of other people the user is responsible for properly acquainting those present with the safety precautions and instructions, and of the hazards involved.**

## SAFETY PRECAUTIONS

1. Check the heater thoroughly for damage. DO NOT operate a damaged heater.
2. DO NOT modify the heater or operate a heater which has been modified from its original condition.
3. Use only propane gas.
4. Use only VAPOR WITHDRAWAL propane supply. If there is any question about vapor withdrawal, ask your propane dealer.
5. Mount the propane cylinders vertically (shutoff valve up). Secure them from falling or being knocked over and protect them from damage.
6. Locate propane containers at least 7 ft. from the heater and **do not** direct exhaust toward containers.
7. Use only the hose and regulator assembly provided with the heater. Inspect hose assembly before each use of the heater. If there is excessive abrasion or wear, or hose is cut, replace with hose assembly listed on parts list before using heater.
8. For indoor use only. Area must be well ventilated. Provide minimum openings of 3 sq. ft. near the floor and 3 sq. ft. near the ceiling (also see "Operating Precautions").
9. If at any time gas odor is detected, IMMEDIATELY DISCONTINUE operation until the source of gas has been located and corrected.
10. Install the heater such that it is not directly exposed to water spray, rain and/or dripping water.
11. Maintain minimum clearance from normal combustible material (like paper) as follows:  
floor-0 ft.;outlet-8 ft.; sides-2 ft.; top-3 ft. Locate 10 ft. from canvas or plastic tarpaulins or similar coverings and secure them to prevent flapping or movement due to wind action.
12. Operate only on a stable, level surface.
13. Do not use with ductwork. Do not restrict inlet or exit.
14. Use only the electrical power specified. The electrical connection and grounding must comply with National Electrical Code - ANSI/NFPA 70.
15. Use only a properly grounded 3-prong receptacle or extension cord.
16. Do not move, handle or service while hot or burning.
17. Use only in accordance with local codes or, in the absence of local codes, with the Standard for the Storage and Handling of Liquefied Petroleum Gases ANSI/NFPA 58-1998.

**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.**

## PROPANE FUEL PRECAUTIONS

### WARNING:

Local codes for installation of propane systems may vary considerably. Therefore, ask your local propane supplier for advice on propane system installation in your particular area. In the absence of local codes, install in accordance with American National Standards Institute (ANSI)/National Fire Protection Association (NFPA) publication Standard for the Storage and Handling of Liquefied Petroleum Gases ANSI/NFPA 58-1998. Your supplier, fire marshal or library should have a copy.

The propane supply system must be arranged for vapor withdrawal. Propane cylinders must be secured in the upright position to keep them from falling or being knocked over.

During use, liquid propane in a container vaporizes. As it vaporizes, the propane cools itself. If this cooling process continues long enough and proceeds fast enough, the propane temperature and pressure will fall so low that heater operation may be improper or even impossible even though plenty of propane remains in the container. Often frost forms on the outside of the propane container as a warning of excessive refrigeration.

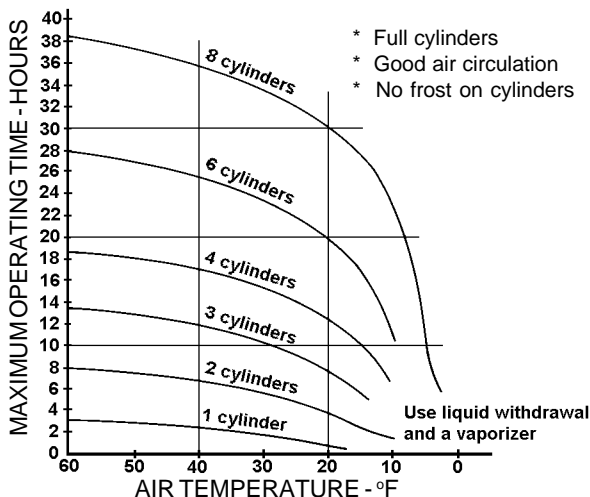
Recommendations to reduce the ill effects of refrigeration are:

- \* Provide considerably more propane than you plan to consume. As a rule of thumb, provide twice as much.
- \* Fill containers frequently, especially in cold weather. Never allow propane to fall below one-third of container capacity.
- \* If possible, keep containers in a warm area. Under no circumstances should the heater exhaust be directed toward the propane container.
- \* Watch for frost formation on the container. If it occurs, discontinue use of the heater and refill the container.

## SIZE AND CAPACITY OF PROPANE CYLINDERS

The chart below shows the approximate size of the cylinder required for this heater. To use the chart:

1. Select the lowest air temperature expected (at the bottom of the chart).
2. Move straight up to time of operation desired (left side of chart).
3. Read the number of cylinders required. Rather than using several 100-lb. cylinders, it may be preferable to use a larger container installed outside (consult your propane supplier).



## OPERATING INSTRUCTIONS

### PREPARING FOR OPERATION

1. Check the heater for possible shipping damage. If any is found, *immediately* notify your dealer.
2. Follow all of the "Precautions" on pages 2 & 3.
3. Connect the POL fitting of hose and regulator assembly to the propane cylinder by rotating the POL nut counterclockwise into the propane cylinder's valve outlet and securely tighten with a wrench.
4. Connect the hose to the heater by rotating the hose fitting clockwise.
5. Securely tighten all gas connections.
6. Open the cylinder's gas valve and check all gas connections with a soap and water solution. **DO NOT USE A FLAME.**
7. Connect power cord to well-grounded 115V, 60 Hz, 1Ø source of power.
8. When using an extension cord, make certain that it is a 3-wire (grounded) cord of proper wire size. See chart on page 4.

### START

1. Slowly open the main valve at propane cylinder to prevent excess flow check valve from closing.
2. Set thermostat to full on (turn knob clockwise to pin stop). Heater will ignite automatically.
3. Adjust ball valve on control panel to desired burn rate.

| Valve Handle Position | Burn Rate      |
|-----------------------|----------------|
| Full counterclockwise | 350,000 BTU/hr |
| Full clockwise        | 175,000 BTU/hr |

4. Set thermostat to desired temperature. Heater will turn off and on automatically as the temperature varies in the heated area.

### STOP

1. Securely close valve on the propane cylinder.
2. Continue to operate heater until all fuel in the hose has burned.
3. Turn thermostat off.

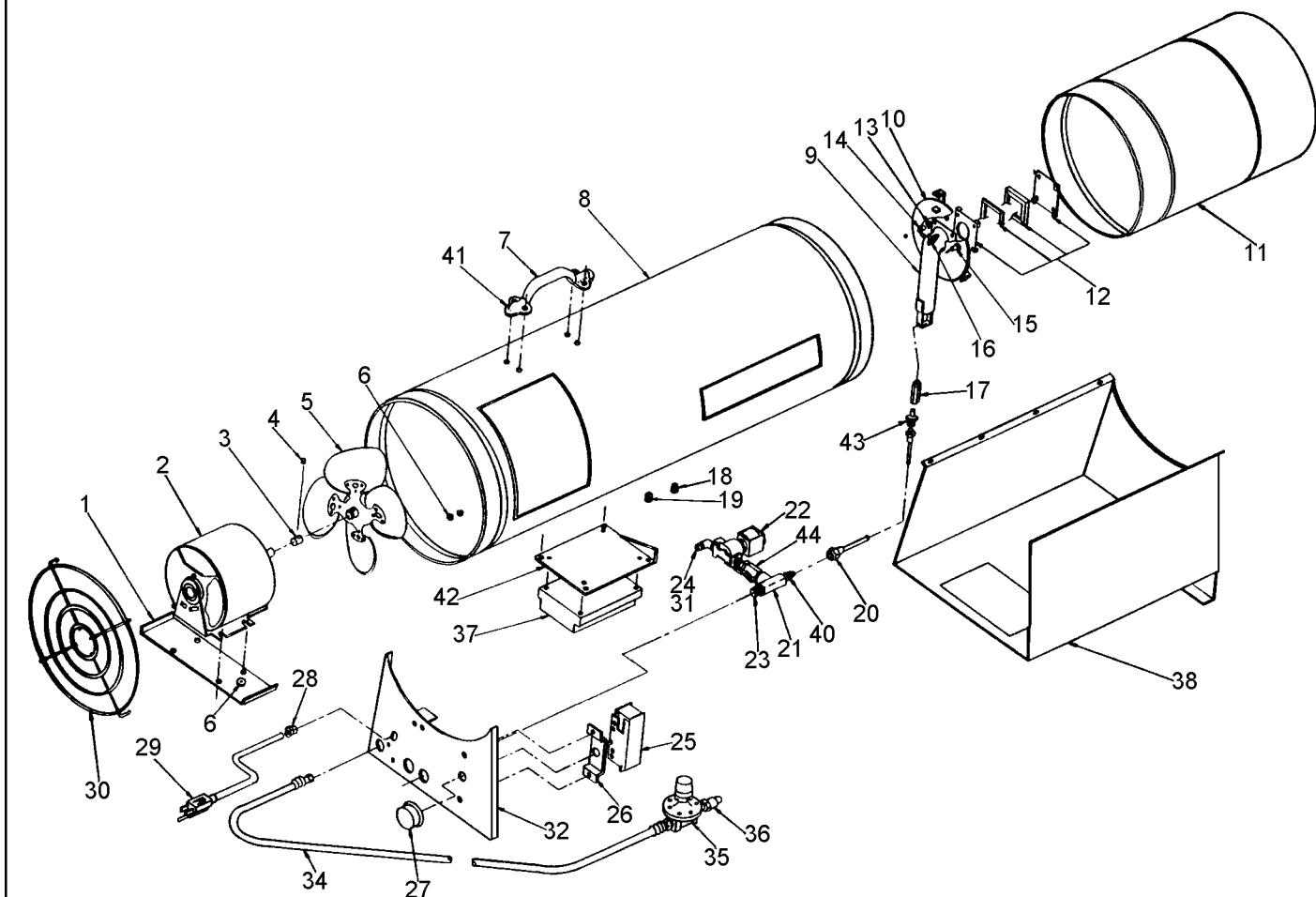
### RESTART AFTER SAFETY SHUTDOWN

1. Securely close valve at propane cylinder. Turn heater off.
2. Wait 5 minutes.
3. Restart following "Start" procedure.

### MAINTENANCE AND STORAGE

1. The heater should be inspected before each use, and at least annually by a qualified person.
2. Before each use, check the soft "O" ring seat at the bullnose of the POL fitting. If the "O" ring is cut, scuffed, or otherwise damaged, replace it with part number 6681.
3. Turn off the gas at the LP-gas supply cylinder(s) when the heater is not in use.
4. When the heater is to be stored indoors, the connection between the LP-gas supply cylinder(s) and the heater must be disconnected and the cylinder(s) removed from the heater and stored out of doors and in accordance with Chapter 5 of the standard for Storage and Handling of Liquefied Petroleum Gases ANSI/NFPA 58-1998.

## 3500FAC-V



| ITEM NO. | PART NO. | DESCRIPTION                            | QTY. | ITEM NO. | PART NO. | DESCRIPTION                             | QTY. |
|----------|----------|--|------|----------|----------|---|------|
| 1        | 3178     | Motor Support                          | 1    | 31       | 6118     | Filter 1/4 Pipe Insert                  | 1    |
| 2        | 1174     | Motor Assembly                         | 1    | 32       | 1614     | Panel, Control Assembly Ram             | 1    |
| 3        | 6229     | Spacer, Fan                            | 1    | 33       | 7431     | Ball Valve                              | 1    |
| 4        | 6010     | Set Screw                              | 2    | 34       | 6151     | Hose Assy LP                            | 1    |
| 5        | 6073     | Fan 12" CCW 1/2 ID HUB                 | 1    | 35       | 7406     | Regulator 20 psi                        | 1    |
| 6        | 6225     | Snap Bushing                           | 3    | 36       | 6252     | POL Excess Flow                         | 1    |
| 7        | 7095     | Handle                                 | 1    | 37       | 10739    | Control Flame Assembly **               | 1    |
| 8        | 1486     | Burner Shell Assembly Cylinder         | 1    | 38       | 1731     | Control Box Assembly                    | 1    |
| 9        | 1546     | Burner Tube Assembly                   | 1    | 40       | 6144     | Ftg., Male Connector 5/16 FLR x 1/4 MPT | 1    |
| 10       | 1491     | Flame Holder Assembly                  | 1    | 41       | 7094     | Clip Handle Mounting                    | 2    |
| 11       | 1487     | Middle Cylinder                        | 1    | 42       | 3653     | Bracket, Flame Control                  | 1    |
| 12       | 1663     | Grid Assembly                          | 1    | 43       | 7372     | Ftg., Male Connector 5/16 FLR x 1/8 MPT | 1    |
| 13       | 3017     | Keeper                                 | 4    | 44       | 7431     | Ball Valve                              | 1    |
| 14       | 7121     | Spacer                                 | 4    | *        | 6070     | Loop Clamp, 5/16"                       | 2    |
| 15       | 7118     | Electrode                              | 1    | *        | 6312     | Manual, Operating Instructions          | 1    |
| 16       | 6168     | High Limit Control Assembly            | 1    | *        | 6369     | Label, Warning, Fuel                    | 1    |
| 17       | 3652     | Fuel Nozzle                            | 1    | *        | 6373     | Label, Fan Rotation                     | 1    |
| 18       | 6224     | Snap Bushing                           | 1    | *        | 6374     | Label, Electrical Ground                | 1    |
| 19       | 6226     | Universal Bushing                      | 1    | *        | 6383     | Label, Universal Logo                   | 1    |
| 20       | 1616     | Fuel Tube Assembly                     | 1    | *        | 7341     | Label, Model, Operating Instruction     | 1    |
| 21       | 7343     | Fitting, Female Tee, 1/4"              | 1    | *        | 7403     | Label, Wiring                           | 1    |
| 22       | 1125     | Valve Assembly                         | 1    | *        | 6712     | Label, Hangtag LP Hose                  | 1    |
| 23       | 7355     | Fitting, Male Plug, 1/4 MPT            | 1    | *        | 7339     | Parts List/Wiring Diagram               | 1    |
| 24       | 6121     | Fitting, Male Elbow, 1/4 FLR x 1/4 MPT | 1    | ++       | 10739    | Alternate Flame Control Assembly        | 1    |
| 25       | 1735     | Thermostat Mounting Assembly           | 1    | ++       | 7801     | Flame Control CP Mark 10 DN             | 1    |
| 26       | 3441     | Bracket, Thermostat Mounting           | 1    | ++       | 7808     | Flame Control Potted CP Mark 10 DN      | 1    |
| 27       | 1507     | Thermostat Knob Assembly               | 1    | ++       | 6641     | Terminal Board                          | 1    |
| 28       | 6223     | Strain Relief Bushing                  | 1    |          |          |   |      |
| 29       | 1036     | Power Cord Assembly                    | 1    |          |          |   |      |
| 30       | 3180     | Inlet Grill Assembly                   | 1    |          |          |   |      |

\*Item not shown on exploded view

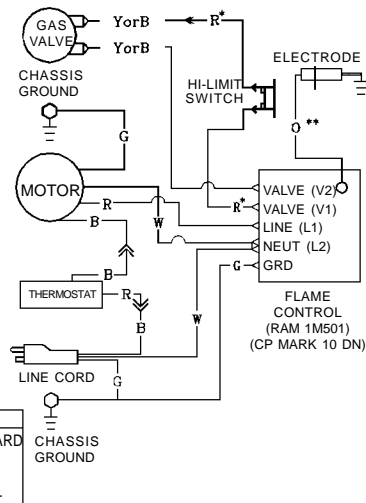
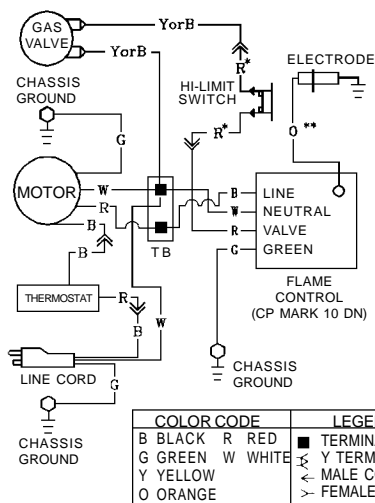
++Alternate Control not shown

7339F

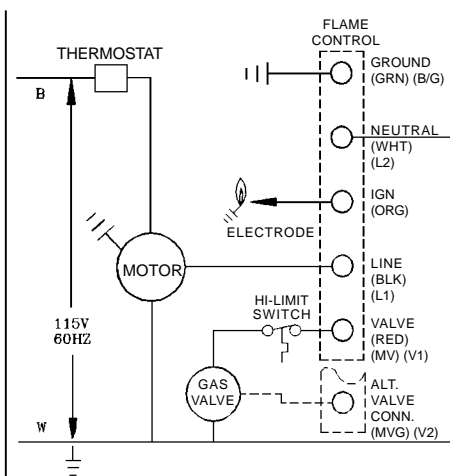
SEPTEMBER 1999

## WIRING DIAGRAM

### CONNECTION DIAGRAM



### SCHEMATIC DIAGRAM



If any original wiring as supplied with the heater must be replaced, it must be replaced with type AWG 105° C wire or its equivalent except as indicated (\*type SF 2-200, \*\*SGI 250° C)

7403C

## WIRING CHART

| PART NO. | COLOR         | LENGTH | FROM                     | TO                      |
|----------|---------------|--------|--------------------------|-------------------------|
| 1110     | GREEN         | 4 1/2" | Flame Control (Ground)   | Ground                  |
| 1721     | Red (Hi-Temp) | 13"    | High Limit Switch        | Valve (Yellow or Black) |
| 1721     | Red (Hi-temp) | 13"    | High Limit Switch        | Harness (Red)           |
| 1722     | Red (Hi-Temp) | 23"    | High Limit Switch        | Flame Control (Valve)   |
| 1617     | Orange        | 19"    | Flame Control (Ignition) | Electrode               |
| 1807     | Black         | 12"    | Gas Valve                | High Limit Switch       |
| 1807     | Black         | 12"    | Gas Valve                | Flame Control           |
| 1959     | Green         | 7"     | Flame Control (Harness)  | Ground                  |
| 1959     | Red           | 7"     | Flame Control (Harness)  | High Limit Switch       |
| 1959     | White         | 6"     | Flame Control (Harness)  | Terminal Block          |
| 1959     | Black         | 6"     | Flame Control (Harness)  | Terminal Block          |

### INSTRUCTIONS FOR ORDERING PARTS

All parts orders must show heater Model No., Item No., Part No., and Description. We recommend that only parts supplied by the manufacturer be used on this unit. A locally purchased part may appear to be identical, although in reality it might endanger the heater or the persons operating the heater.

The heater should be serviced only by a trained, experienced service person.

Read the section on "Servicing" before ordering parts.

For parts order, call (909) 981-5343.

## SERVICING

A hazardous condition may result if a heater is used that has been modified or is not functioning properly. When the heater is working properly:

- \* The flame is contained within the heater.
- \* The flame is essentially blue with perhaps some yellow tipping.
- \* There is no strong disagreeable odor, eye burning or other physical discomfort.
- \* There is no smoke or soot internal or external to the heater.
- \* There are no unplanned or unexplained shutdowns of the heater.

The parts lists and wiring diagram show the heater as it was constructed. Do not use a heater which is different from that shown. In this regard, use only the hose, regulator and cylinder connection fitting (called a POL fitting) supplied with the heater. Do not use alternates. For this heater, the regulator must be set to supply 20 psig outlet pressure. If there is any uncertainty about the regulator setting, have it checked.

A heater which is *not* working right must be repaired, but *only* by a trained, experienced service person. Contact the factory for the service center closest to you, phone number (909) 981-5343 or visit our website at [www.scheuco.com](http://www.scheuco.com).

You may also obtain in-warranty or out-of-warranty service by returning the product freight prepaid to:

**Scheu Products Company**  
8855 Baker Avenue  
Rancho Cucamonga, CA 91730

In-warranty products returned to the Service Department will be repaired with no charge for either parts or labor and will be returned to you freight prepaid. Please include a brief statement indicating date, place of purchase, the nature of the problem and proof of purchase.

Out-of-warranty products returned to the Service Department will be repaired with a charge for parts and labor and will be returned to you freight collect.

## TECHNICAL INFORMATION

### HOW MUCH HEAT DO I REQUIRE?

For economy, it is important to match input to that required. But heat requirements often vary. For example, it usually takes a lot more heat to get things warm than it does to keep them that way. Likewise, outside air temperature usually changes during the day so you may need more heat at night than you do in the daytime. An approximation of the heat required can be found by using the chart below.

| BTU'S PER HOUR REQUIRED          |                                 |         |         |         |
|----------------------------------|---------------------------------|---------|---------|---------|
| Cubic feet of space to be heated | Temperature Rise Required (°F)* |         |         |         |
|                                  | 20°                             | 30°     | 40°     | 50°     |
| 5,000                            | 14,000                          | 20,000  | 27,999  | 34,000  |
| 7,000                            | 19,000                          | 28,000  | 38,000  | 47,000  |
| 10,000                           | 27,000                          | 40,000  | 54,000  | 67,000  |
| 15,000                           | 40,000                          | 60,000  | 80,000  | 100,000 |
| 20,000                           | 54,000                          | 80,000  | 107,000 | 133,000 |
| 30,000                           | 80,000                          | 120,000 | 160,000 | 200,000 |
| 50,000                           | 133,000                         | 200,000 | 266,000 | 333,000 |

**WARNING:** When using a thermostat the heater exit area should be protected from personnel and warnings posted of sudden startup.

### Recommended Minimum Gauge for Cord Extensions

| Wire Gauge Chart A.W.G. |                     |    |     |     |
|-------------------------|---------------------|----|-----|-----|
| Name Plate 120V Amps.   | Cord Length in Feet |    |     |     |
|                         | 25                  | 50 | 100 | 150 |
| 5-6                     | 18                  | 16 | 14  | 12  |
| 6-8                     | 18                  | 16 | 12  | 10  |
| 8-12                    | 18                  | 14 | 12  | 10  |
| 10-12                   | 16                  | 14 | 10  | 8   |
| 12-14                   | 16                  | 12 | 10  | 8   |



ANSI Z83.7b-1993/CGA 2.14-1972  
Construction Heater

**SCHEU PRODUCTS COMPANY, INCORPORATED**  
MAIL: P.O. BOX 250, UPLAND, CA 91785  
PLANT: 8855 BAKER AVE., RANCHO CUCAMONGA, CA 91730  
TELEPHONE: 909-981-5343

P/N 6312S  
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