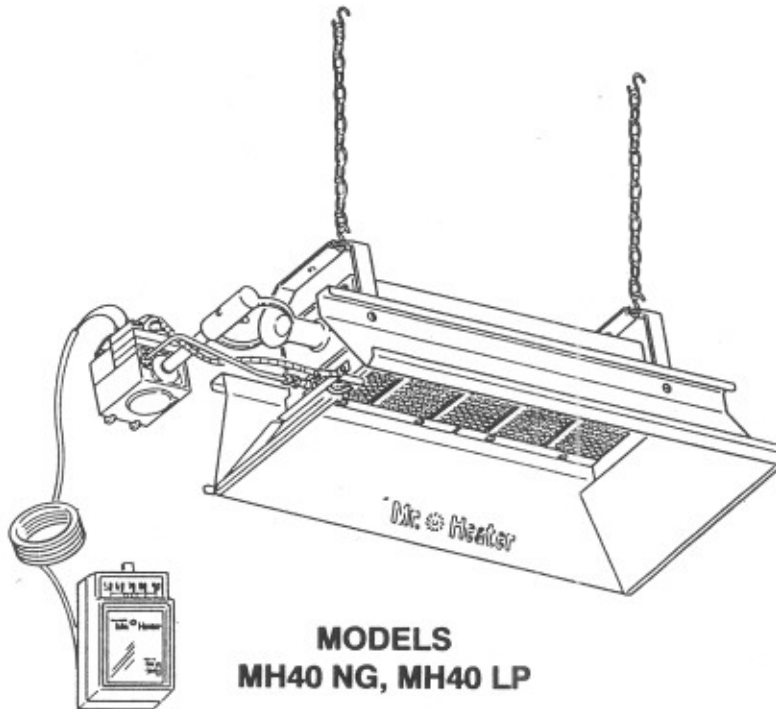


INSTALLATION AND OPERATING INSTRUCTIONS



GAS-FIRED INFRA-RED SPACE HEATERS



MODELS
MH40 NG, MH40 LP

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.



ANSI Z83.6b - 1993 [AGA]
CAN 1-2. 16-M81 [CGA]



Stock #18682

9/97

1. WARNINGS

MAINTAIN CLEARANCES AS SHOWN IN TABLE 3 OR ON HEATER NAMEPLATE IN GARAGE INSTALLATIONS WHERE PARKED VEHICLES ARE DIRECTLY BELOW THE HEATER.

DO NOT USE MATCH OR OTHER FLAME FOR LEAK TESTING.

DO NOT USE PLASTIC OR COPPER PIPE.

DO NOT EXCEED 1/2 P.S.I. INLET PRESSURE TO HEATERS SHOWN IN TABLE 1.

IF NOT INSTALLED, OPERATED AND MAINTAINED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS, THIS PRODUCT COULD EXPOSE YOU TO SUBSTANCES IN FUEL OR FROM FUEL COMBUSTION WHICH ARE KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

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2. GENERAL INFORMATION

- a. Your heater comes fully assembled and is tested at the factory for proper gas and input as stated on the name plate.
- b. Before proceeding with the installation, be sure to inspect for damages. Freight company must be notified of any damages and request that the inspection be made. MR. HEATER will send replacement parts for damaged parts only after receiving a signed inspection report to prove the liability of the freight company.
- c. Do not attempt to operate heater with any other gas than that indicated on the heater name plate.
- d. The installation of heater must conform with local building codes, or in absence of local codes, with the National Fuel Gas Code, ANSI Z223.1a/NFPA54, and Standard for Storage and Handling of Liquefied Petroleum Gases, ANSI/NFPA 58.
- e. Plugged 1/8" N.P.T. Test Gage Connection is located on the Heater Gas Valve or a 1/4" N.P.T. Connection is located on the outside of the Cast Venturi.

Table 1. BTU Ratings and Supply Pressures

MODEL NO.	BTU/HR. RATING		GAS SUPPLY PRESSURE (W.C.)						ORIFICE SIZE	
	GAS		MIN.		MAX.		MANIFOLD			
	NATURAL	PROPANE	NAT.	L.P.	NAT.	L.P.	NAT.	L.P.	NAT.	L.P.
MH40NG	40,000	--	6.8"	--	7"	--	5.8"	--	37	--
MH40LP	--	40,000	--	11"	--	14"	--	10"	--	50

Table 2. Heater Dimensions and Orifice Sizes

MODEL NO.	OPERATING PRESSURE	ORIFICE SIZE		INPUT BTU/HR	SIZE			
		BURNER	PILOT		WIDTH	LENGTH	HEIGHT	WEIGHT
MH40NG	6.8" w.c.	37	.023	40,000	19-1/4"	30-1/4"	12"	25 LBS.
MH40LP	10" w.c.	50	.015	40,000	19-1/4"	30 1/4"	12"	25 LBS.

* For additional information, contact:

MR. HEATER CORPORATION
 CUSTOMER SERVICE DEPT.
 CLEVELAND, OHIO
 1-800-251-0001

* The following extra NFPA manuals are helpful when installing MR. HEATER in a location not anticipated in this manual:

<u>Number</u>	<u>Related Subject</u>
NFPA 88	Clearances to Combustible Surfaces
NFPA 409	Clearances to Combustible Surfaces

DO NOT EXCEED 1/2 PSI INLET PRESSURE TO HEATER.

3. CLEARANCES Minimum clearances to combustibles (Refer to Table 3). Provide adequate clearance to combustibles, see Table 3. Also, between control end of heater for servicing and minimum on top and sides for ventilation and combustion air supply.

A minimum clearance of 8' above floor for public garages in accordance with ANSI/NFPA No. 88 most recent edition, or Table 3; whichever is larger.

A minimum clearance of 10' from the bottom of heater to top of wing, or engine enclosure, where aircraft are housed, and 8' above floor in other areas of the hangar in accordance with ANSI/NFPA No. 409 most recent edition, or Table 3; the larger dimension of ANSI/NFPA No. 409 or Table 3 is to be used.

TABLE 3. INSTALLATION, VENTILATION AND MOUNTING INFORMATION

MODEL NO.	BTU/HR. RATING GAS		NORMAL MOUNTING POSITION	CLEARANCES TO COMBUSTIBLE SURFACES			
	NATURAL	PROPANE		TOP	SIDES	BACK	BELOW
MH40NG	40,000	--	HORIZ-30°	34"	30"	30"	68"
MH40LP	--	40,000	HORIZ-30°	34"	30"	30"	68"

* When selecting installation locations for MR. HEATER ensure that the opening of any exterior or interior doors or windows will not violate clearances or contact any heater components.

4. SUSPENSION

Heater has four mounting holes, two on each end, for attaching rod, chain, or angle iron brackets and shall be safely and adequately fixed in position independent of gas and electric supply lines. Refer to Figures 11 & 12 for recommended suspensions.

5. GAS SUPPLY

Provide adequate gas supply for rated input of each heater using American Standard Installation of gas piping and gas appliances in building. ANSI Z223.1a/NFPA 54 pamphlet, Table C-3 shows capacity of pipe of different diameters and lengths in cubic feet per hour for natural gas with pressure drop of 0.3 inches, specific gravity of 0.60. For liquified Petroleum Gas (LP) capacity refer to Table C-3 and C-15 of the same pamphlet. For recommended heater gas connection refer to Figures 3 & 10. On threaded pipes use a pipe compound which is resistant to the action of all gases.

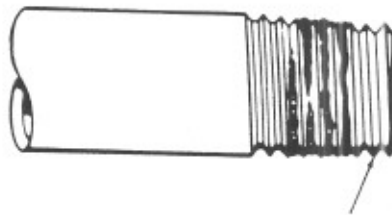
If gas lines are to be pressure tested with compressed air, disconnect each heater to prevent control damage and cap outlets. After reconnecting all heaters, purge gas lines of air and check all connections for leaks using soap solution. Liquid dishwashing detergent is an excellent leak detector.

6. PIPING REQUIREMENTS

All piping installed must comply with local codes and ordinances or with the National Fuel Gas Code, ANSI Z223.1 (NFPA 54), whichever takes precedence. When installing piping, the following requirements must be taken into consideration:

- * Use new properly reamed black pipe free from chips.
- * Apply a good quality pipe compound to all male threads prior to assembly. **If L.P. gas is the fuel, ensure that pipe compound is resistant to L.P. gas. DO NOT USE TEFLON (tm) tape.**
- * Prior to installation, apply pipe compound to all male threads as shown in Figure 1.

USE MODERATE AMOUNT OF PIPE DOPE



LEAVE 2 THREADS BARE

Figure 1. Pipe Compound Application

* Male threads on pipe to be installed into gas valve shall meet the requirements of Figure 2. Threads longer than those shown in the figure may cause gas valve distortion and malfunction.

* A sediment trap meeting the typical requirements of Figure 10 shall be installed in the line to the gas valve.

* A dedicated shutoff valve for the heater must be installed in the gas supply line.

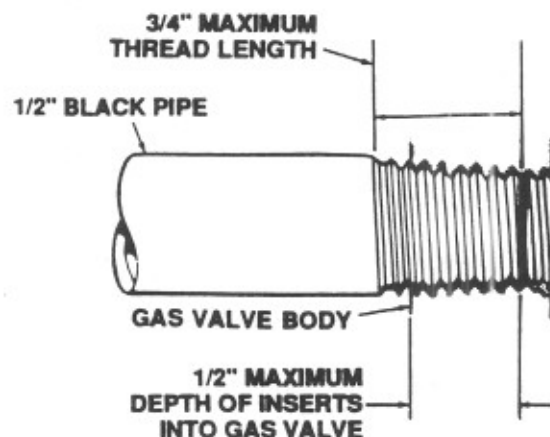
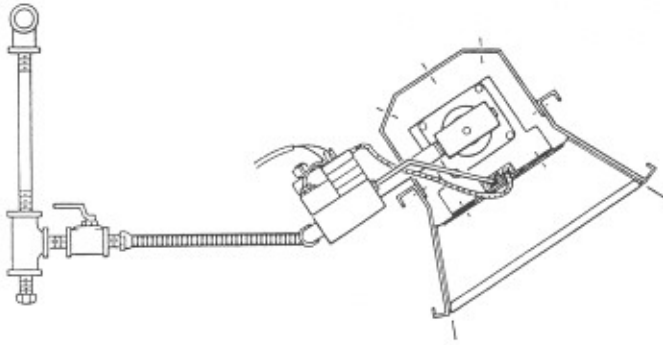


FIGURE 2. GAS VALVE CONNECTION REQUIREMENTS



NOTE:

1. **ONLY USE A PIPE COMPOUND WHICH IS RESISTANT TO LIQUIFIED GASES ON L.P. INSTALLATIONS.**
2. **FITTINGS SHOWN ARE NOT INCLUDED WITH HEATER.**

FIGURE 3. TYPICAL PIPING INSTALLATION

7. GAS PRESSURE

When a higher than the maximum recommended gas pressure is being maintained at the main gas line, a separate regulator must be installed ahead of the heater. Refer to Table 1 for maximum allowable pressure for stated heater model and gas.

See heater rating plate for minimum gas supply pressure "For the Purpose of Input Adjustment."

On a multiple heater installation it may be possible to use one large capacity regulator or an individual regulator for each heater. Nevertheless, it is recommended practice to make the entire pipe system a loop.

Contact your local representative or the factory for proper gas pressure reducing design stage.

8. ELECTRICAL

NEVER CONNECT POWERPILE GAS VALVE OR THERMOSTAT TO LINE VOLTAGE OR A TRANSFORMER.

9. THERMOSTAT & LOCATION

Make sure that the electrical characteristics of the thermostat match those of the heater controls. For best results thermostat should be positioned 5 ft. above floor where air can circulate freely around it. **DO NOT MOUNT directly to cold-side wall, in direct drafts, or directly beneath the infra-red heater.**

Ensure that the selected thermostat location meets all of the above requirements. Refer to the instructions that come with the thermostat for additional general information and mounting instructions.

If the wall is of stud and wallboard construction, then use the #6 by 1 inch sheet metal screws, included with the thermostat, and mount the thermostat in the selected location.

If wall is brick or masonry, the appropriate anchors must be obtained to accommodate the thermostat mounting screws. Use the back plate of the thermostat as a template to mark the hole location, drill appropriate size anchor holes, install the anchors and securely attach the thermostat using the mounting screws.

Connect thermostat wires to gas valve as shown in Figure 4.

THERMOSTAT

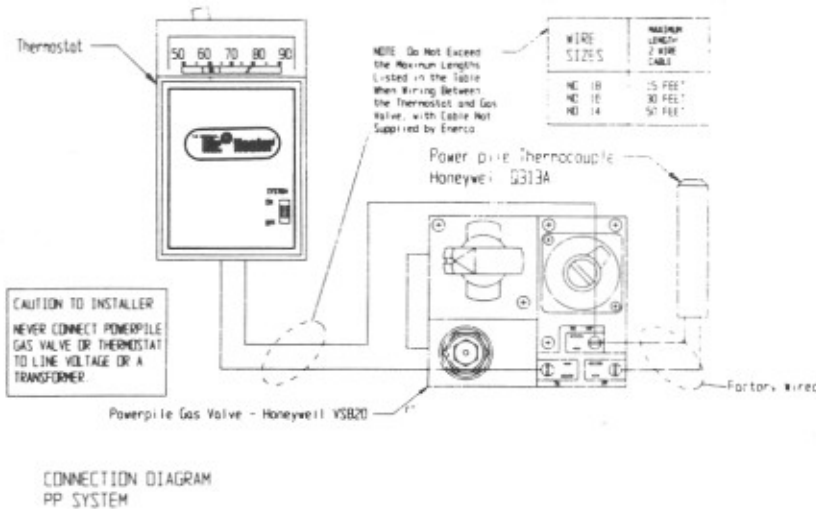


FIGURE 4 CONNECTION DIAGRAM

10. VENTILATION

- The minimum intake and exhaust air openings shall provide for not less than 400 CFM for every 100,000 BTU input except that the infiltration area may be included in the intake area.
- Where natural (gravity) ventilation is provided for exhaust, the openings must be distributed above the heaters (preferably at the peak of the roof) and the areas of openings shall not be less than 300 square inches for every 100,000 BTU input.

11. START-UP PROCEDURE

OPEN THE GAS SUPPLY VALVE OR VALVES.

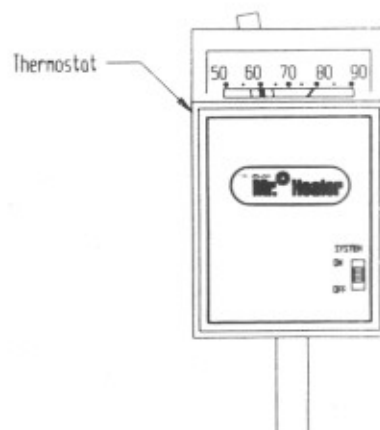


FIGURE 5. THERMOSTAT CONTROLS

Set the thermostat to the OFF position. See Figure 5. If the manual gas control knob on the gas valve is not in the OFF position, partially depress the knob and rotate to the OFF position. See Figure 6.

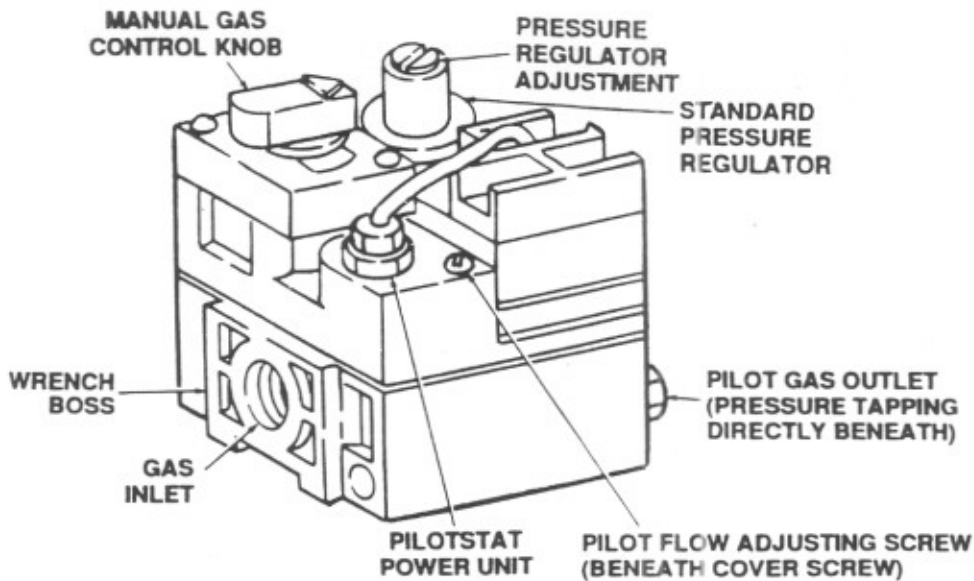


FIGURE 6. GAS VALVE COMPONENTS

Wait 5 minutes to allow gas that may have accumulated in the main burner to escape (especially important after installation).

Turn the manual gas control knob to the PILOT position.

Depress the manual gas control knob. Using a match, light the pilot light. See Figure 6. Hold the knob down for approximately 30 seconds to allow any air in gas lines to pass through pilot and, once the pilot is lit, allow the thermocouple to heat up enough to activate the safety valve in an open position.

Release manual gas control knob and turn to ON. Reset thermostat to desired temperature.

NOTE

During the initial startup of MR. HEATER an odor and, perhaps, some vapor will come from the heater. This is the gasket binding material emitting this odor and/or vapor. After approximately 20 minutes this odor will disappear and not occur again.

12. MR. HEATER SHUTDOWN

Turn thermostat to OFF.

Turn manual gas control knob on gas valve to PILOT position.

Partially depress knob and rotate to the OFF position.

Close gas supply valves.

13. OPERATOR MAINTENANCE INSTRUCTIONS

1. TROUBLESHOOTING

- Table 4 lists the common malfunctions which you may find during the operation or maintenance of your heater.
- For additional information refer to Honeywell Field Bulletin enclosed in the heater carton.
- In the event results cannot be obtained after performing all listed solutions, call your Mr. Heater dealer, or the factory customer service department at 1-800-251-0001.

2. ADJUSTING THE PILOT FLAME

The pilot flame should envelope $3/8$ to $1/2$ in. (10 to 13 mm) of the tip of the thermocouple or generator. To adjust the pilot flame, refer to Figure 7.

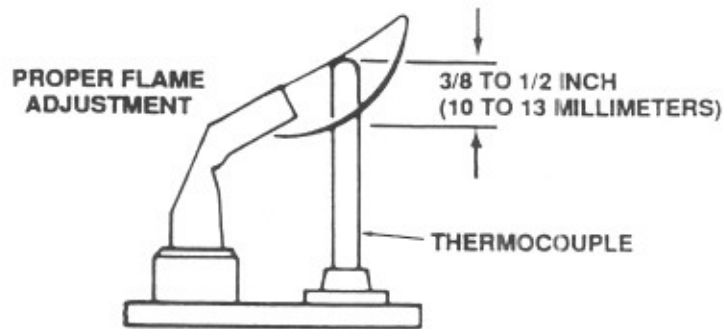


FIGURE 7. PROPER FLAME ADJUSTMENT

- Remove pilot adjustment cover screw. Refer to Figure 8.
- Turn inner adjustment screw clockwise \rightarrow to decrease or counterclockwise \leftarrow to increase pilot flame.
- Always replace cover screw after adjustment and tighten firmly to ensure proper operation.

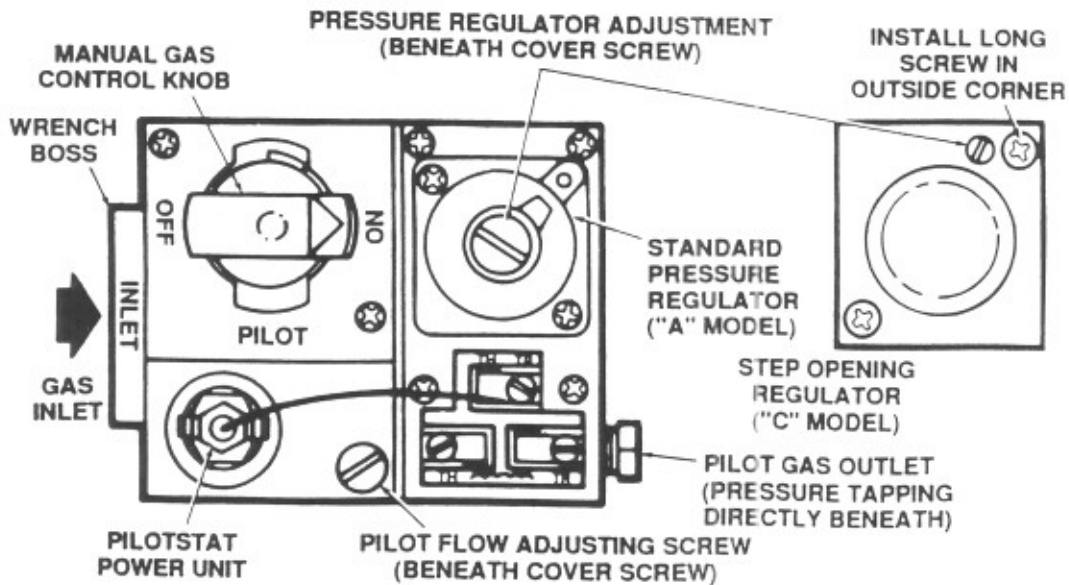


FIGURE 8. TOP VIEW OF STANDARD CAPACITY GAS CONTROL.

TABLE 4 TROUBLESHOOTING CHART

Below in chart form are various symptoms of a malfunctioning system, possible defects that will cause these symptoms and suggested corrective measure. The chart assumes that the proper gas pressure is available to the heater and that the lighting procedure is as stated on the plate attached to the heater.

SYMPTOMS	CAUSES	SOLUTIONS
Burner light off very slow	Partially blocked pilot orifice Pilot out of adjustment	Re-adjust pilot Replace
Burner light off very slow infra-red Color stays dull	Partially blocked burner orifice	Replace
Burner flashback (roaring noise during operation and ceramic grid surface will be dark)	Low gas pressure Damaged burner	Correct line pressure or call your gas supplier Replace
Ceramic grid or burner sooting up (when new or after cleaning)	First check for damaged burner orifice If burner orifice is not damaged then check for damaged manifold.	Replace if damaged Replace
Pilot cannot be ignited	Blocked pilot orifice Gas cock not in position Pilot gas flow adjustment Screw may be closed	Replace Gas cock knob must be turned to pilot and held depressed Open and adjust (see Figure 12)
Pilot lights but goes out	Defective thermocouple Defective control	Replace Replace
Pilot stays lit but main burner will not light	Loose wire or improperly wired Defective control Blocked burner orifice	Tighten connections, check wiring diagram Replace Clean orifice or replace
Failure to ignite	Main gas off Air in gas line Loose wire connections Dirty wire connections	Open manual valves Bleed gas line Tighten wire connections Clean terminals and secure terminals

3. REPLACING THE GAS VALVE UNIT

- a. Remove the two gas valve unit wires at the gas control valve labeled "PP."
- b. Unscrew gas valve from gas piping.
- c. Reconnect gas valve and unit wires to terminals "PP." Be sure to leave thermostat wire on one terminal.

14. FREQUENCY OF OPERATOR CHECKS

Intermittent Use - Appliances that are used seasonally should be checked before shutdown and again before the next use.

Dusty, wet or corrosive environment. Since these environments can cause the gas control to deteriorate more rapidly, the system should be checked more often.

The gas control should be replaced if:

- a. It does not perform properly on checkout or troubleshooting.
- b. The gas control knob is hard to turn or push down, or it fails to pop back up when released.

15. WARRANTY

MR. HEATER warrants that infra-red heaters manufactured and sold will be free from defects in material and workmanship.

MR. HEATER pro-rated grid warranty shall continue in effect until the expiration of five (5) years from the date of shipment of original grid by MR. HEATER.

Parts, assemblies, controls, etc. furnished by Mr. Heater suppliers will carry a one year (1) warranty or the applicable warranties of the suppliers.

The sole responsibility of Mr. Heater under this warranty shall be to replace or repair any part for which a written claim is made to Mr. Heater within the time limit of this warranty, which is returned upon request to Mr. Heater - F.O.B. Cleveland, Ohio - or F.O.B. a Mr. Heater authorized service facility and which is proved to be defective upon inspection by Mr. Heater.

This warranty shall not apply to any part or product which has been subjected to misuse or neglect, damaged by accident, or rendered defective by reason of improper installation. THIS WARRANTY IS IN LIEU OF ANY AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, and in any other responsibility of Mr. Heater for parts or products sold by Mr. Heater, including consequential or special damages.

16. IF SERVICE IS REQUIRED

PLEASE DO NOT RETURN THIS APPLIANCE TO YOUR STORE.

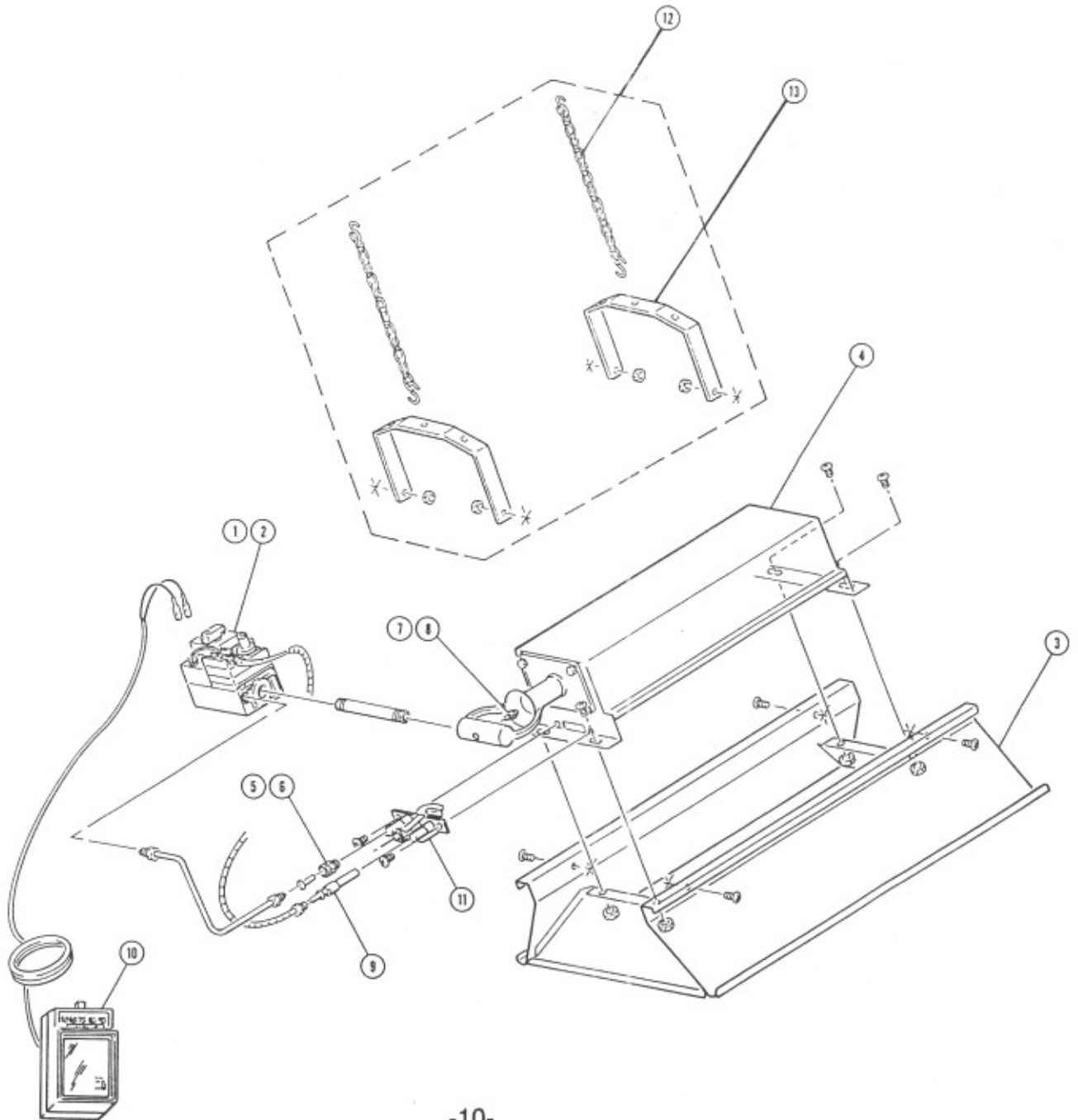
For information regarding service, please call our toll-free number: 1-800-251-0001

Our office hours are 8:30 AM - 5:00 PM, Eastern Time Zone, Monday thru Friday.

Please include the model number, date of purchase, and description of problem in all communication.

17. MH40 REPLACEMENT PARTS LIST

ITEM NO	STOCK NO	DESCRIPTION	ITEM NO.	STOCK NO.	DESCRIPTION
1	00024	GAS-VALVE-NATURAL GAS	9	09360	THERMOCOUPLE-GENERATOR
2	00025	GAS VALVE-PROPANE GAS	10	10357	THERMOSTAT
3	00434A	REFLECTOR ASSY.	11	11406	PILOT BURNER N.G.
4	02523A	BURNER ASSY.	12	17374	CHAIN KIT
5	05574	ORIFICE - PILOT NAT. GAS	13	F114561	HEATER HANGER KIT
6	05573	ORIFICE - PILOT PROPANE GAS	14	11405	PILOT BURNER L/P
7	05450	ORIFICE BURNER-PROPANE GAS			
8	05437	ORIFICE - BURNER NAT. GAS			



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