

# Paloma

**Multi-Outlet Instantaneous  
AUTOMATIC GAS WATER HEATER**

with

**Piezo Electric Ignition  
Capacity Transfer Device  
Pilot Safety Device**

**INSTRUCTION MANUAL**



**MODEL PH-5-3F**

**Paloma** Industries, Limited  
6-23, MOMOZONO-CHO, MIZUHO-KU, NAGOYA, JAPAN

Thank you for purchasing PALOMA gas water heater.  
 Reading this manual will give you many hints on using it to best advantage.

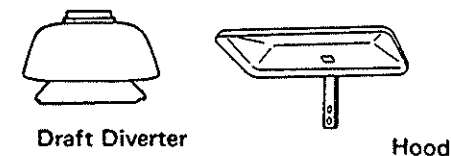
## FEATURES

- Piezo-electric ignition  
 Piezo-electric type requires no matches or dry cell batteries. Electric spark ignites pilot burner.
- Pilot safety device  
 Equipped with pilot burner safety shut off device. When pilot is out, no gas will flow to burner. Safe operation is assured.
- Lateral air supply type  
 With lateral air supply, oils, vapors, etc. are kept out of interior. Steady combustion is maintained and interior parts remain cleaner.
- Water volume regulator  
 Gives continuous, even flow of hot water and stabilizes variation in local water pressure.
- Easy temperature adjuster  
 Desired water temperature can be obtained instantly thanks to easy-handle temperature adjusting knob.
- Durable finish  
 Front jacket finished with white porcelain enamel, heat resistant and color fast. Easily cleaned.
- Multipoint outlet type  
 From one heater, hot water distributed to any place, for instance, shower, kitchen, bathroom etc., and used whenever needed.
- Minimum operating water pressure  
 Water heater has been designed for satisfactory service at inlet water pressure as low as 0.3 kg/cm<sup>2</sup> (4.3 lbs/sq.in.) and may be suitably installed where this minimum pressure is available.
- Easy installation  
 Easily installed on wall with screws securing bracket.
- Capacity Transfer Device  
 Two stages of combustion are selectable, full or half. It is economical when inlet water temperature is rather high in summer.

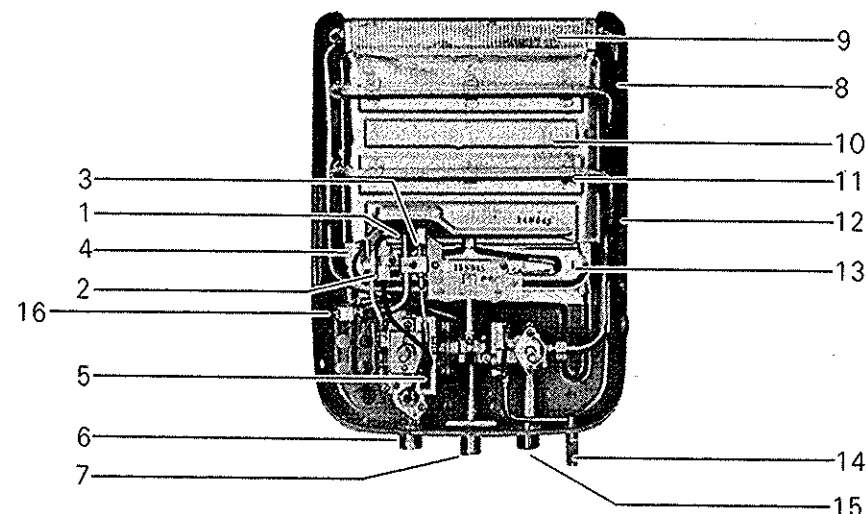
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## NAME OF PARTS



- OPTIONAL PARTS -  
 (Above parts shall be purchased separately when you order.)



- |                             |                                |
|-----------------------------|--------------------------------|
| (1) Pilot burner            | (9) Heat exchanger             |
| (2) Electrode               | (10) Inner hull                |
| (3) Thermocouple            | (11) Inner hull coil           |
| (4) Subsidiary burner       | (12) Lateral air supply inlet  |
| (5) Piezo-electric ignition | (13) Main burner               |
| (6) Gas inlet               | (14) Drain plug w/relief valve |
| (7) Hot water outlet        | (15) Water inlet               |
| (8) Back jacket             | (16) Pilot jet cleaner         |

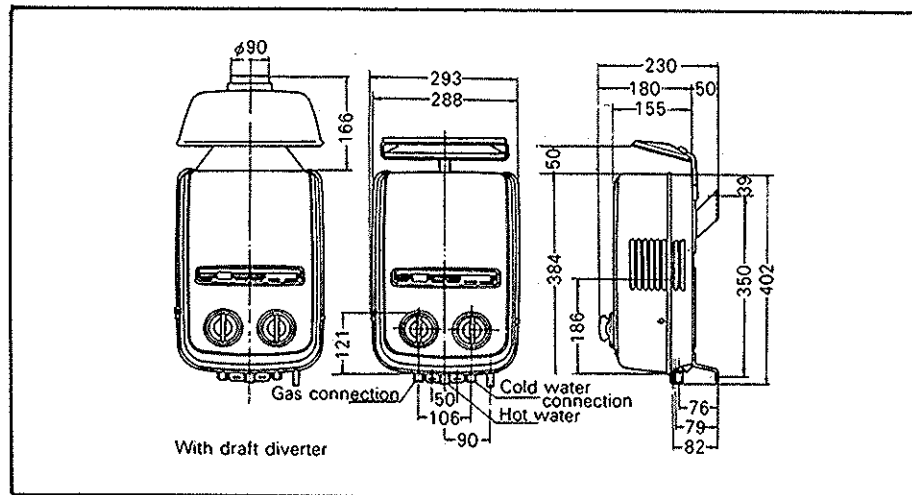
## SPECIFICATIONS (PH-5-3F)

Type	Dimensions			Net Weight	Connections		
	Height	Width	Depth		Hot water	Water	Gas
PH-5-3F	15 $\frac{1}{8}$ in 402mm	11 $\frac{1}{2}$ in 293mm	9 in 230mm	13.7lbs 6.2kg	$\frac{1}{2}$ "	$\frac{1}{2}$ "	$\frac{1}{2}$ "

Rated output	Rated input	Gas consumption L.P. Gas	Min. operating water pressure	Hot water output per temperature rise		
				$^{\circ}$ C	30	60
506(369) BTU/min.	635(476) BTU/min.	1.76(1.32) lb/hr.	4.3 lbs/sq. in.	liters/min.	4.3(3.1)	2.1
127.5(93) kcal/min.	160(120) kcal/min	0.8(0.6) kg/hr.	0.3 kg/cm $^2$	$^{\circ}$ F	50	100
				Imp.gal/min.	1.01(0.74)	0.5
				U.S.gal/min.	1.21(0.88)	0.61

( ) : HALF POSITION

## Configuration and Dimensions (Approx.)



"SINCE WE ARE CONSTANTLY IMPROVING OUR PRODUCTS, ALL SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE."

## HOW TO USE

### NOTE :

After installation, be sure to do trial ignition in accordance with following procedure.

Make sure type of gas you have matches Paloma specifications.

1. Fully open hot water tap and water inlet valve. Make sure water passes through heater. When water flows from hot water tap, turn off tap.

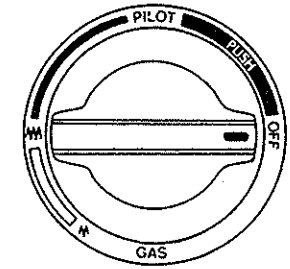
2. Push gas adjusting knob and turn to the left till a clicking sound is heard. — Pilot is lit instantaneously by a spark.

**Note:** With LP gas, the quantity of gas which issues from pilot burner is so small that burner does not ignite until air in the pipe has been completely discharged. Do not hastily conclude that pilot nozzle is clogged.

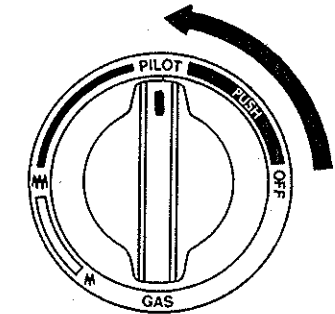
3. Once sure pilot is lit, keep pushing' knob for about 20 seconds. Then release after pushing more firmly.

Subsidiary burner goes out. Recheck the pilot.

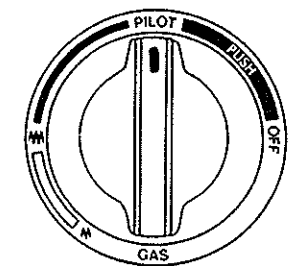
Safety device begins to operate and safety valve is opened. If pilot burner fails to ignite, repeat ignition procedure from the beginning.



Starting position



Lighting pilot



Hold here

4. Turn gas adjusting knob to "M" position completing process.

Now water heater is ready for use.

**Note:** If necessary, pilot can be lit with match. Just remove observation window as seen in illustration (Right).

Replace window after lighting, keeping it in place during use.

**For hot water —**

Turn on hot water tap. Main burner will ignite automatically from pilot. Hot water will flow.

**To shut off hot water —**

Turning off hot water tap will automatically shut off main burner, leaving only pilot lit. With pilot on, main burner will re-ignite whenever hot water tap is turned on.

**How to turn off pilot flame —**

Turn gas adjusting knob to OFF position. Pilot will go out automatically.

**Temperature adjustment —**

This is regulated by amount of water flowing through heater.

(a) For hotter water —

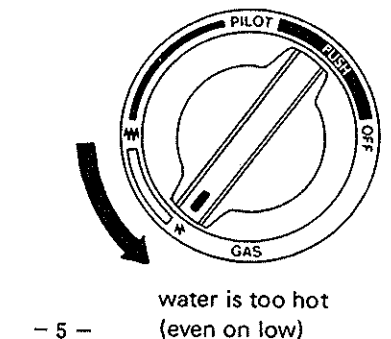
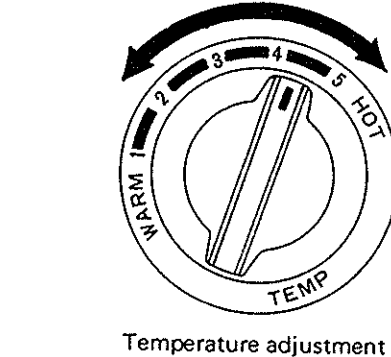
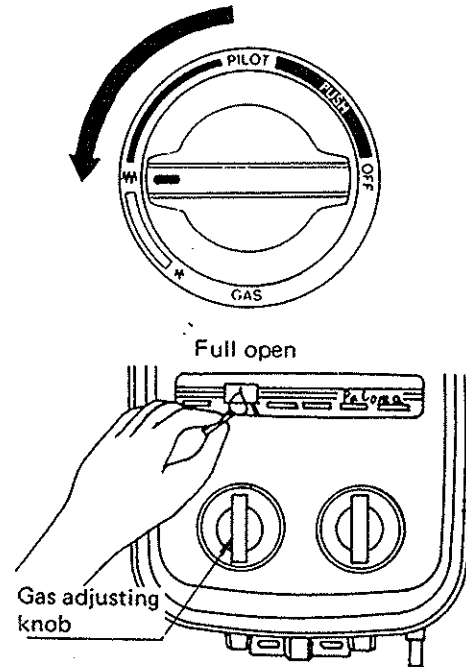
Turn temperature adjusting knob to the right. Water flow decreases and becomes hot.

(b) To decrease temperature —

Turn knob to the left. Hot water flow increases.

(c) Capacity Transfer —

When inlet water is warm — Reduce gas volume in half by turning gas adjusting knob to "M" position — cutting down amount of gas. Showers in summer, for example, require less tem-



**Note:** Make sure gas adjusting knob is set at specified positions, "M" or "M". Knob in intermediate position will cause damage to burners.

Do not choose half position "M" when inlet water temperature is rather low, because water drain grows and damages combustion chamber.

**Hot-water temperature and hot-water output —**

The difference between temperature of water before heating and that of heated water is referred to as "temperature rise". When 15°C (59°F) water is heated to 45°C (113°F) temperature rise is 30°C (54°F). This temperature rise varies slightly with geographical location. In Japan, temperature of city water is 2°C (36°F) to 5°C (41°F) in winter and about 25°C (77°F) in summer.

Performance of water heater cannot be determined merely from temperature of the hot water it supplies. Find temperature rise by measuring temperatures of unheated and heated water. At the same time, measure quantity of hot water supplied in one minute and compare this and temperature rise values with relevant figures listed in specification table.

**When heater is not in use —**

Turn gas adjusting knob back to OFF position.

Close off gas at main intake valve so as to insure absolute safety.

**Note:** If there is any strong gas odor or smell of burning, turn gas off immediately at the source and consult dealer.

**If pilot goes out —**

If pilot burner goes out when heater is in operation, do not re-ignite pilot burner immediately; interior of heater may be filled with gas.

First, cut off water supply and turn gas knob to starting position. Before re-igniting heater in accordance with the ignition procedure described above, make sure that there is no odor of gas in and around heater.

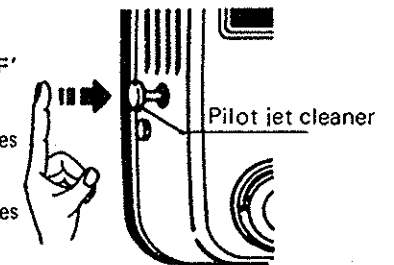
**How to operate the pilot jet cleaner**

1. Ensure that the gas control knob is in the 'OFF' position before using.

2. The cleaner should be used if the pilot flame becomes reduced in size as a result of clogging on the jet.

3. Depress the button to its full extent several times until the pilot flame becomes larger.

4. Do not use the cleaner when the pilot flame is of normal size and do not operate when the heater is alight as this will extinguish the flame.



## EXPOSURE OF HEATER TO COLD WEATHER

Where heater is exposed to freezing conditions, be sure to drain. See "Proper Draining"

Turn off gas at intake valve the night before.

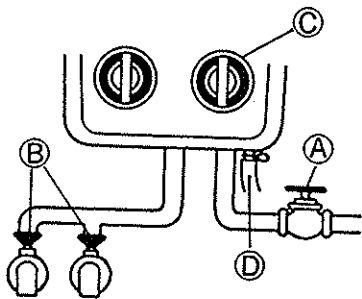
Freezing will damage heater. So, replace drain plug before using heater.

Supply water to heater by turning on water intake valve.

Turn off hot water tap after making certain water flows, then ignite pilot burner in accordance with procedure described.

## PROPER DRAINING

1. Turn off main water intake valve (A).  
If a non-freezing valve is utilized, turn off and leave valve (A) open.
2. Open all hot water taps (B).
3. Turn temperature adjusting knob (C) to WARM position.
4. Remove drain plug (D) to drain all water from heater.



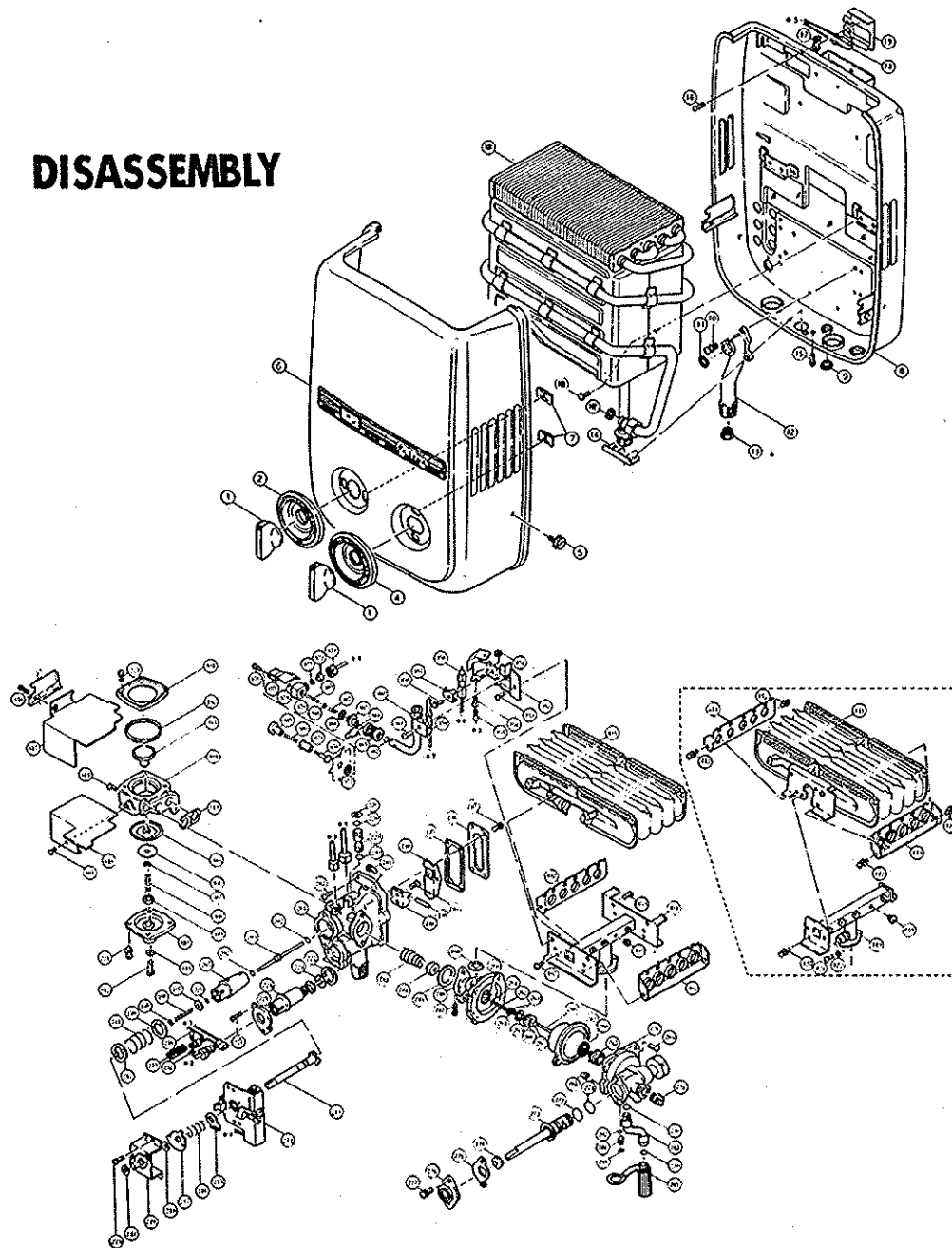
**Note:** In extremely cold weather, be sure to drain water from heater immediately after use.

If considerable time has lapsed since last use, be sure to light main burner and operate heater at highest temperature before draining to insure that there is no icing in heater and piping.

After steps 1 through 4 are completed, be sure to ignite subsidiary burner for 2-3 minutes to complete draining.

**Warning:** Drain plug should be removed completely and replaced when the heater is next used.

## DISASSEMBLY



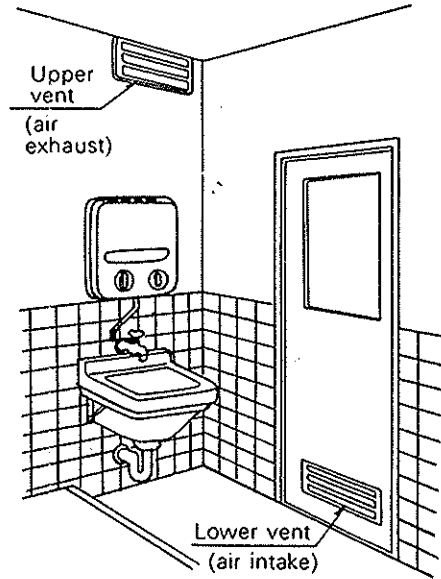
## SPARE AND REPLACEMENT PARTS

Model for Town gas or Nat. gas is equipped with gas pressure regulator. For repairs and replacement, only genuine Paloma components should be used. Such parts may be ordered by these instruction, and description of the respective parts, its consecutive No. as well as Model for which it is to be used should be quoted.

# INSTALLATION

Choose place with good ventilation —

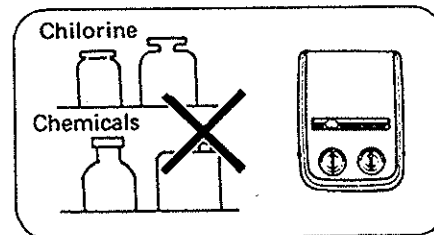
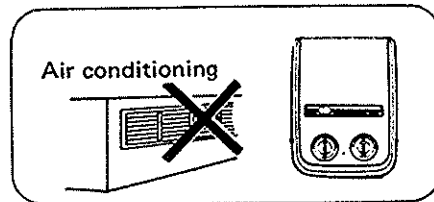
For perfect combustion, gas requires a considerable amount of air. Be especially careful in installing heater in very small room. Poor ventilation, lack of fresh air, will mean imperfect combustion. And this is neither healthy nor safe. In place such as the one seen here on the right, be sure to provide a pair of vents above and below heater, as shown in Fig. A. Each vent should be at least  $100\text{cm}^2$  (16 sq. in.) . . . . e.g. 10 by 10cm (4 by 4 in) . . . . effective area.



Do not install heater in a location where incomplete combustion is foreseeable, i.e.

- (a) In small, poorly ventilated rooms.
- (b) In air-tight rooms with air-conditioning.
- (c) Near vents for heating or cooling.
- (d) In places where special chemicals are used.
- (e) In bath room.

Fig. A



Do not install out of doors —

Pilot will not stay lit in wind and there is always danger of cold-weather freeze.

**NOTE:** Any local by-law and regulations pertaining to installation should be strictly observed. Check your area.

# PLUMBING

All dimensions necessary for plumbing are shown on page 3.

The models are designed as MULTI-OUTLET TYPE WATER HEATER, to serve more than one outlet.

## WATER SUPPLY

- (1) Minimum working water pressure is 4.3 lbs/sq. inch at inlet to provide proper operation of automatic pressure control valve.  
However, additional water pressure is required above minimum pressure to cover any pressure head loss or drop in hot water supply lines.  
Make sure that total water pressure at inlet is sufficient to operate heater at full capacity.
- (2) Install a shutoff valve near water inlet of heater for servicing and draining.
- (3) Connection between heater and taps should be as short and direct as possible, and have uniform pipe size of sufficient diameter to carry full capacity of hot water.
- (4) Be sure to connect water inlet and hot water outlet as shown on heater. If reversed, heater will not function.
- (5) When hot water flows through supply pipes there is an inevitable heat loss, regardless of type of heater. Thus, insulation or protection of hot water piping is encouraged.

**Note:** Heater is equipped with many delicate mechanisms. Therefore, before connecting to water supply, pass water through heater to wash out dust, sand or other particles to avoid damage.  
Make sure that water inlet pipes are cleaned.

## PLUMBING FOR GAS

### (1) Town gas —

Use pipe large enough in diameter ( $\frac{1}{2}$  in. or larger) to let adequate quantity of gas pass through.

Coal gas  $4500 \text{ kcal/m}^3$  (500 BTU/cu. ft.) require a gas pressure of 100mm (4inches) water column and Coal gas  $5000 \text{ kcal/m}^3$  (560 BTU/cu. ft.) that of 100mm (4 in.) water column to get the specified quantity of gas.

### (2) LPG —

Use steel pipe ( $\frac{1}{4}$  in. or larger in diameter) or, copper pipe (8mm ( $\frac{1}{4}$  in.) or larger in diameter) large enough in diameter to let adequate quantity of gas pass through. When using rubber hose, make it as short as possible.

It should not exceed 2m (6.6 ft.) in length.

Standard gas pressure is 280mm (11 in.) water column.

(3) After heater is connected to gas supply, all connections including water heater must be completely checked with soapy water, bubble solution or other acceptable means. Do not use matches, candles or other sources of ignition for leakage test.

**Note:** Do not use industrial gas pressure regulators as they are used for medium and high pressure gas.

If gas pressure exceeds the relevant value mentioned above, imperfect combustion may result. Moreover, life of heater may be shortened. If pressure is low, gas may be insufficient to heat water.

## INSTALLATION OF EXHAUST PIPE

### 1. Be sure to discharge waste gas outdoors.

Except in a well ventilated room, be sure to install an exhaust pipe to discharge waste gas.

### 2. Diameter and length of the exhaust pipe

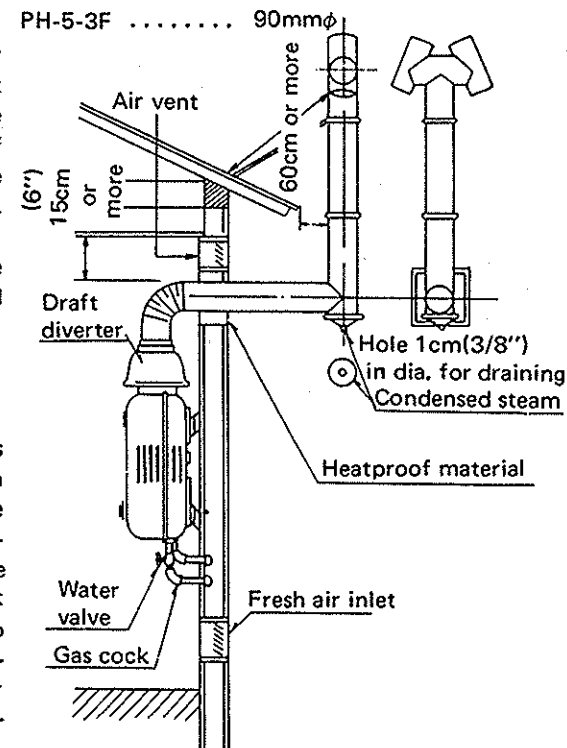
The internal diameter of the exhaust pipe should be specified below. The horizontal part of the pipe should be as short as possible.

### 3. Material of the exhaust pipe

The steam in the exhaust gas may form water drops inside the exhaust pipe. Therefore, the pipe should be made of a heat and corrosion-proof material. Available chimneys are made of galvanized iron sheets, copper sheets, slate pipes or enameled material. We recommend the use of a slate pipe or enameled chimney.

### 4. Installing the exhaust pipe

The vertical part of the exhaust pipe should be about 1.5 times as long as the horizontal part. The section between these two parts should be shaped in such a way as not to prevent the flow of exhaust gas. The temperature of the gas is about  $150^{\circ}\text{C}$  ( $300^{\circ}\text{F}$ ) but take care to keep the exhaust pipe apart from any inflammable structure. Provide an air gap between the pipe and the structure or support the pipe with a refractories.



## TROUBLE SHOOTING

PROBLEM	PROBABLE CAUSE	MEASURES
1. Pilot fails to light (No spark.)	(1) Spark gap is too wide  (2) Spark leaks  (3) Electrode is dirty.	Adjust gap to 9/64— 3/16 inch. (3.5—5.0mm) Pull lead line away from place of spark leaks  Clean electrode.
2. Pilot fails to light (With spark.)	(1) Air in line  (2) Short circuit of lead line  (3) Pilot orifice is clogged	Push in gas knob at the igniting position long enough to exhaust air.  Pull the lead line away from place of short.  Call your dealer. Use the pilot jet cleaner
3. Pilot lights, then goes out.	Gas knob is not being pushed in long enough.	Keep pushing gas knob for about 20 seconds at pilot position.
4. Pilot flame goes out easily.	(1) Wrong installation.  (2) Pilot orifice is clogged.	Check flue outlet. Do not install the heater where wind is blowing to pilot flame.  Call your dealer. Use the pilot jet cleaner
5. Pilot keeps lit but main burner is not ignited.	Insufficient water pressure.	With city water, use larger pipes or eliminate resistances in piping. If using pump increase pump pressure.
6. Main burner stays on, even when hot water is off.	Defective automatic gas valve	Stop use immediately and call your dealer.

PROBLEM	PROBABLE CAUSE	MEASURES
7. Soot from the main burner.	(1) Dust or soot has deposited on the heat exchanger, causing poor exhaust.  (2) Improper com- bustion, result of over gas input.	Call your serviceman   Reduce gas input to proper rate
8. Water is not hot, even when heater is set at high temperature.	(1) Insufficient gas input.  (2) Gas cylinder is almost empty. (L.P. Gas).  (3) Excessive water flow rate.	Increase gas input to proper rate.  Replenish.  Dirt deposit in water control device.
9. Water is too hot, even if set at low temperature.	(1) Inlet water is warmer and/or water volume is low.  (2) gas input excessive	Use capacity transfer device.   Reduce gas input to proper rate.

### HOW TO REMOVE FRONT COVER

- (1) Pull off gas and temperature adjusting knobs.
- (2) Remove the 2 knurled screws located at bottom on both sides of cover.
- (3) Hold lower part of the cover in both hands, pull slightly away from heater at the bottom and lift clear of beaded top edge of rear cover.