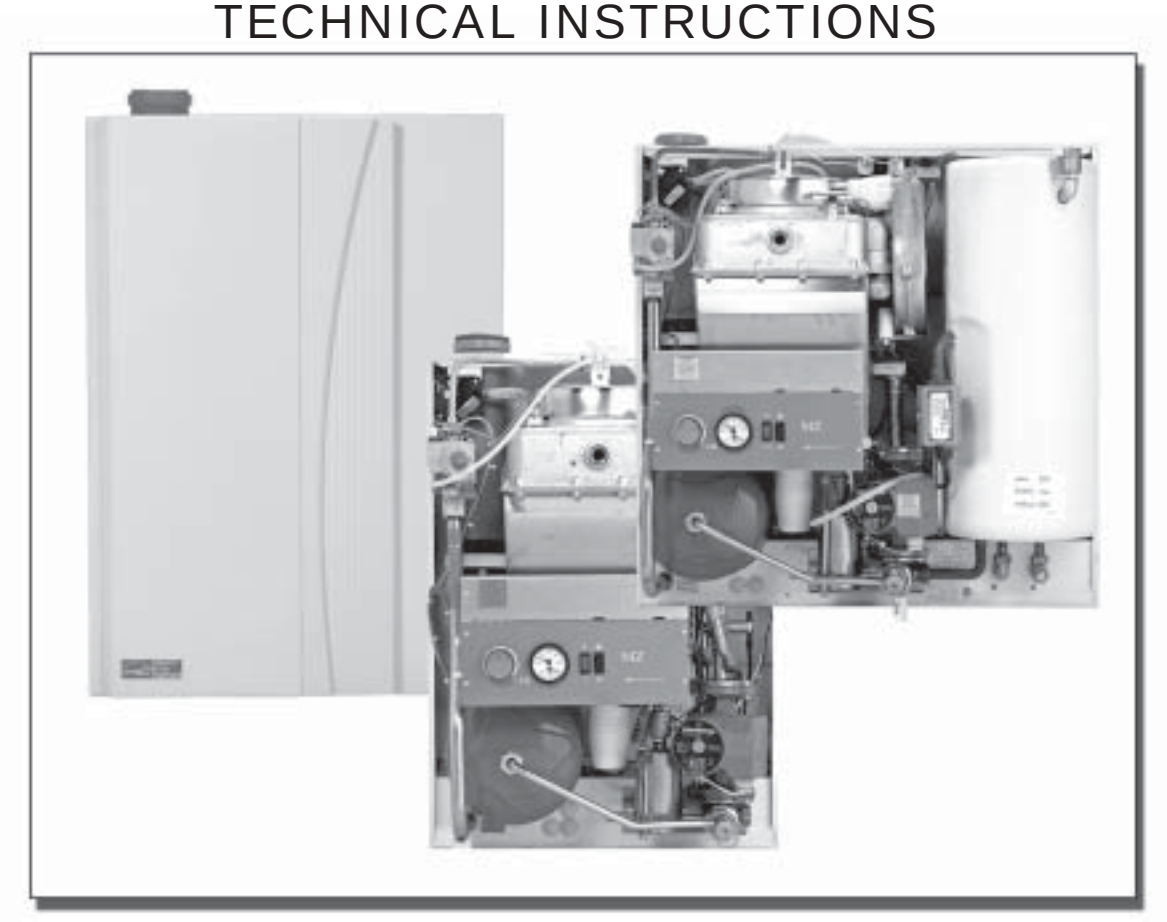
MONITOR MZ 25C/MZ 25 S

TECHNICAL INSTRUCTIONS



Wall Mounted, Fully Condensing Application Efficiency, 95%

MZ25C 94,500 Btu • MZ25S 94,500 Btu

ANCI Z21.10.3b - 2004• CSA 4.3b-2004 Gas Water Heaters Volume III Storage Water Heaters, With Input Ratings Above 75,000 BTU Per Hour, Circulation and Instantaneous

MONITOR PRODUCTS, INC.

www.monitorproducts.com

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Revised 7/07

MZ 25C/MZ 25S TECHNICAL INSTRUCTIONS

WARNING: If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or death.

FOR YOUR SAFETY

- Do not store or use gasoline or other flammable, vapors and liquids in the vicinity of this or any other appliance.

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.

INSTALLATION AND SERVICE MUST BE PERFORMED BY A QUALIFIED INSTALLER, SERVICE AGENCY OR THE GAS SUPPLIER.

TABLE OF CONTENTS

I. PRESENTATION

1 - DESCRIPTION

Wall-mounted, condensing, gas-fired instantaneous water heater for use with natural or LP gases in accordance with ANSI Z 223.1 or CGA B149

The following parts come fitted in a plain and stylish cover:

- a high performance, condensing finned tube heat exchanger.
- a premixing burner with a heat-resistant steel grate.
- a gas valve.
- control panel and electrical fittings which regulate the water heater and ensure smooth operation
- a heating circuit safety valve (43.5 psi / 3 bars).
- a combined temperature/pressure gauge.
- a condensate drain with built in condensate trap.
- a circulating pump.
- air eliminator.
- an 2.1 gal (8 litres) expansion tank.
- a by-pass (to be adjusted if the installation flow rate is too low).
- a 3-way selector valve. (S model only)

2 - RANGE

FEATURES :

- Compact (14.2 inches deep / 361 mm)
- Sturdiness ensured by using an oversized exchanger
- Very high operating efficiency

3 - TECHNICAL SPECIFICATIONS

GAS PROPERTIES. rated heat input MZ 25: 94 500 Btu/h (27.7 kW)*

* Heat input calculated on the higher heating value: H

	Natural gas	LP gas
Heating value H 60 °F / 15.5 °C BTU/foot³ / Mj/m³	1075 / 40.1	2500 / 93.1
Inlet pressure IWG / mmCE	7.0 / 177.8	11.0 / 279.4
Gas flow 60°F / 101.3 Kpa foot³/h / m³/h	87.9 / 2.49	37.8 / 1.07
Gas orifice inch / mm	0.213 / 5.4	0.138 / 3.5
P2 (outlet pressure) IWG / mmCE	2.8 / 71	5.50 / 140
Air burner pressure IWG / mmCE	1.57 / 40	1.57 / 40
ΔP Air pressostat IWG / mmCE	1.57 / 40	1.57 / 40
Heat input L H BTU/h.kW	85040 / 24.9 94500 / 27.7	88455 / 25.9 94500 / 27.7
Air orifice Inch / mm	1.14 / 29	1.22 / 31

DOMESTIC WATER FLOW RATE

ΔT 54°F (30°C) MZ 25: 2.91 gal/min (11 l/min)

MINIMUM SYSTEM WATER FLOW RATE

3.52 gal/min - 800 l/h

WATER PRESSURE

Heating pressure: maxi 43.5 PSI (3 bars) - mini 14.5 PSI (1 bar)

Hot water pressure: maxi 87 PSI (6 bars)

MAXI OPERATING FLOW TEMPERATURE

176°F (80°C)

ELECTRICAL SUPPLY

120V - 60 Hz

COMBUSTION PRODUCTS

Max temperature: 176°F (80°C)

Flow rate 32°F (0°C) 14.7 PSI (1013 mbar): 1201 foot³/h - 34 m³/h

Balanced flue 3" (75 mm) diameter: Max temperature: 266°F (130°C).

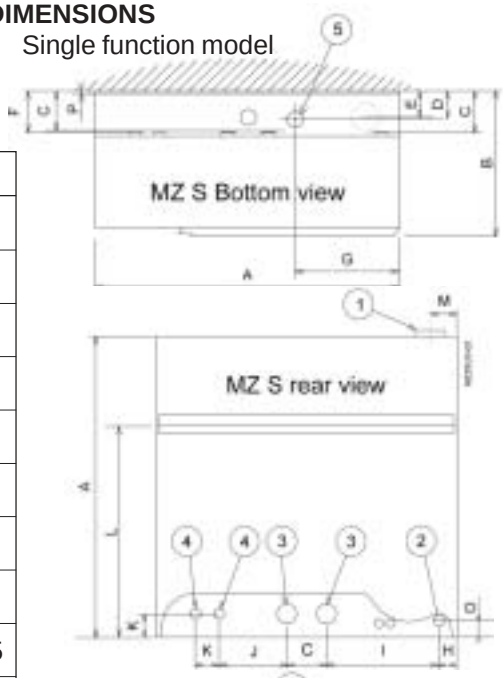
3.1 - CONNECTION DIAMETER

Models	MZ 25
Combustion Products	2.55 inches (75 mm) diameter PP MZ balanced flue - (1, fig. 1)
Gas connection	3/4" (0.79/1.06 inches) - (20/27 mm) diameter - (2, fig. 1)
Water heater connections	1" (1.02/1.34") - (26/34 mm) diameter - (3, fig. 1)
Domestic hot water connections	3/4" (0.79/1.06") - (20/27 mm) diameter - (4, fig. 1)
Condensate connections	1.26" (32 mm) diameter PVC - (5, fig. 1)

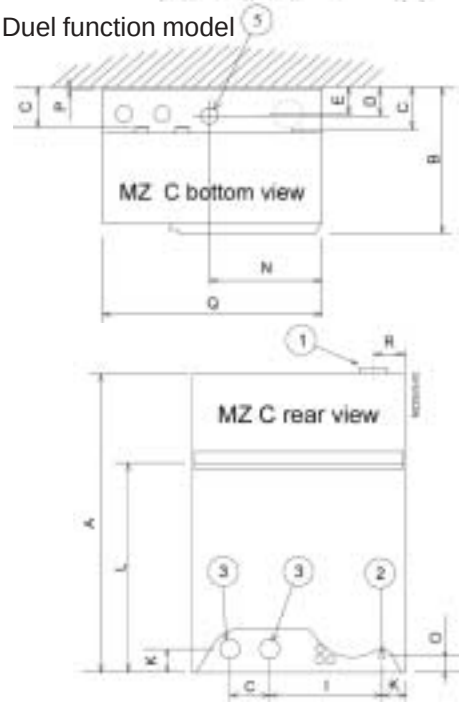
3.2 - OVERALL DIMENSIONS

	Inches	mm
A	29.9	760
B	14.2	361
C	3.9	100
D	3.1	78
E	2.6	66
F	4.1	104
G	10.3	262
H	1.8	45
I	11.2	283,5
J	6.7	170,5
K	2.4	60
L	20.9	530
M	2.7	67,5
N	1.6	42
O	10.9	277
P	0.24	6
Q	21.3	540
R	3.2	82,5

Single function model



Duel function model



II. OPERATION

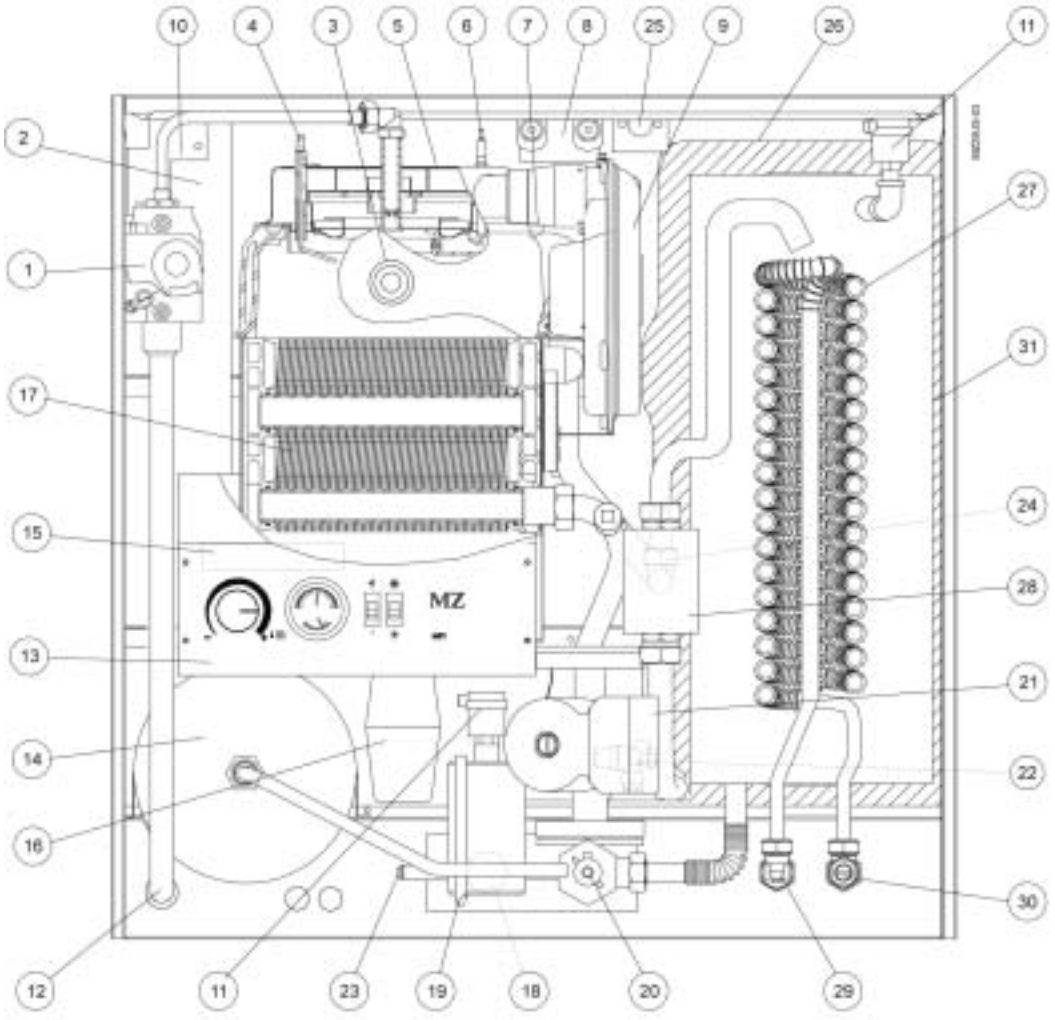
1 - PRINCIPLE OF OPERATION

The wall-mounted condensing gas-fired water heater makes maximum use of the energy yielded by the gas combustion process. Using its “super-exchanger”, the MZ recovers the sensible heat from the combustion products, with an efficiency of about 12% greater than that of a traditional water heater even without condensing. If the flue gases are evacuated at this stage of combustion, they are at temperatures of 392°F to 572°F (200°C to 300°C).

These flue gases still contain some of the sensible heat and in particular appreciable amounts of latent heat in the form of water vapor. By routing the heating return through the bottom of the exchanger/condenser at a temperature of less than 127.4°F (53°C), the flue gases will condense. This condensation allied to the high performance of the exchanger results in an energy saving of up to 30% compared to conventional equipment. As the phenomenon of condensation only occurs for heating return temperatures of below 127.4°F (53°C), the operating efficiency of the heating installation will increase as the average annual heating return temperature decreases.

1.1 - OPERATING SCHEMATIC (MZ 25S)

Fig. 2



1) Gas valve
2) Flue
3) Sight glass
4) Ignition electrode
5) Gas burner
6) Ionization probe
7) High limit stat 195°F (90°C)
8) Ignition transformer
9) Air Fan
10) Differential air pressure switch
11) Air eliminator
12) Gas supply
13) Control panel
14) Expansion vessel
15) Connection box
16) Condensate drainage siphon trap
17) Exchanger with finned tubes
18) Heating flow
19) Thermostat sensors
20) Heating return
21) Circulating pump
22) Safety valve
23) By-pass
24) Flow switch
25) DHW thermostat
26) DHW cylinder
27) Heating coil HW production
28) 3 Way valve
29) Hot water outlet
30) Cold water inlet
31) Insulation

1.2 - OPERATING SCHEMATIC (MZ 25)

1) Gas valve
2) Flue
3) Sight glass
4) Ignition electrode
5) Gas burner
6) Ionization probe
7) High limit stat 195 °F (90 °C)
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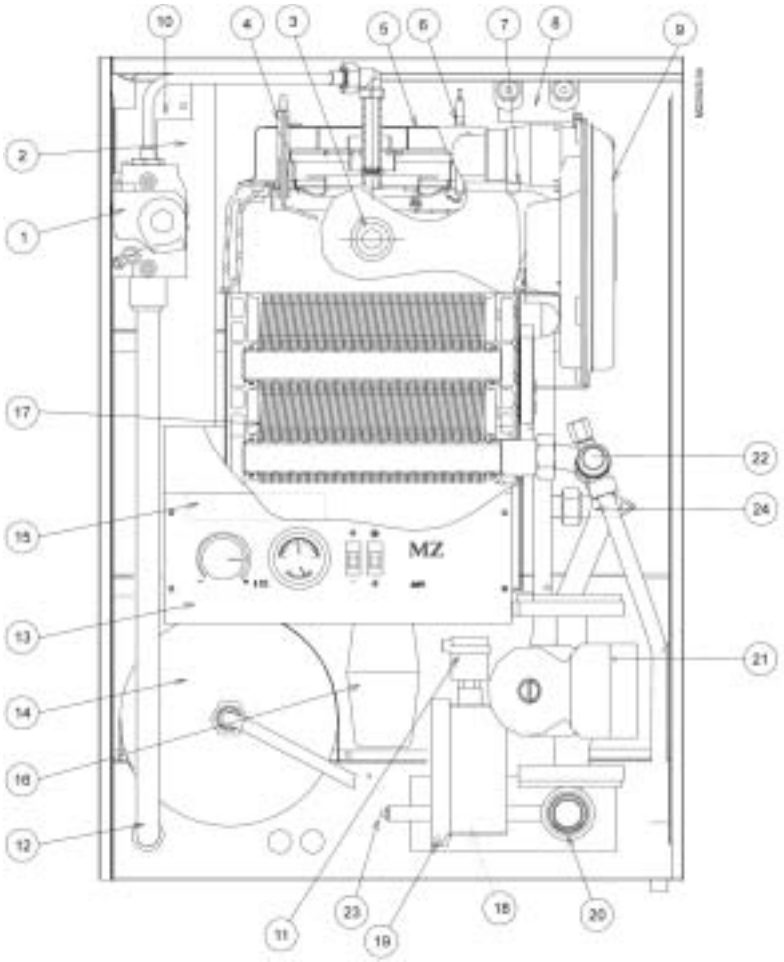
17) Exchanger with finned tubes
18) Heating flow
19) Thermostat sensors
20) Heating return
21) Circulating pump
22) Safety valve
24) Flow switch

Fig. 3

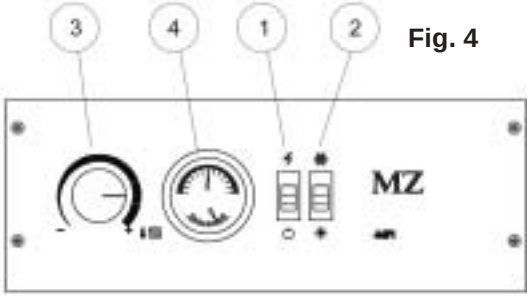


2 - CONTROL AND REGULATION

2.1 - CONTROL PANEL

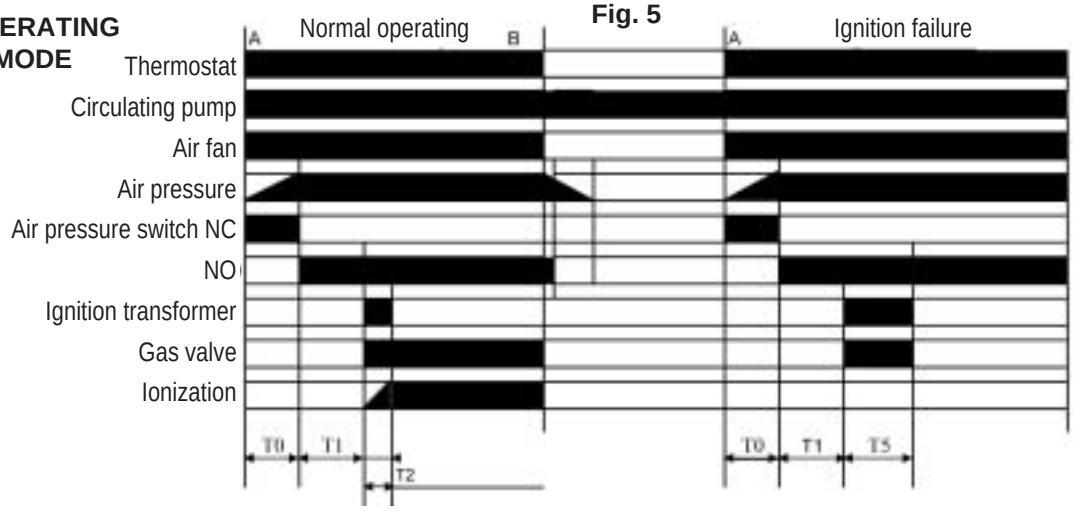
This is equipped with the following:
• A main on/off switch (1, fig. 4)
• A summer/winter switch (2, fig. 4)
• winter setting provides heating and hot water
• Summer setting provides hot water only
• A temperature control knob (68°F to 176°F, 20 to 80°C) (3, fig. 4)
• A combined temperature and pressure gauge, showing the heating output temperature and the installation water pressure (minimum pressure 14.5 psi,1 bar) (4, fig. 4).

Fig. 4



2.2 - DIAGRAM SHOWING OPERATING CYCLES, SPACE HEAT MODE

Fig. 5



A:	Heating thermostat on
B:	Heating thermostat off
T0:	Time required to reach nominal fan pressure (10 s)
T1:	Pre-purge time (10 s)
T2:	Ignition time (0.5 s)
T5:	Time required for safety device to function if no ignition ionization: max. 5 s

2.2.1 - OPERATION FLOW CHART (control unit S 89 E 1058 B)

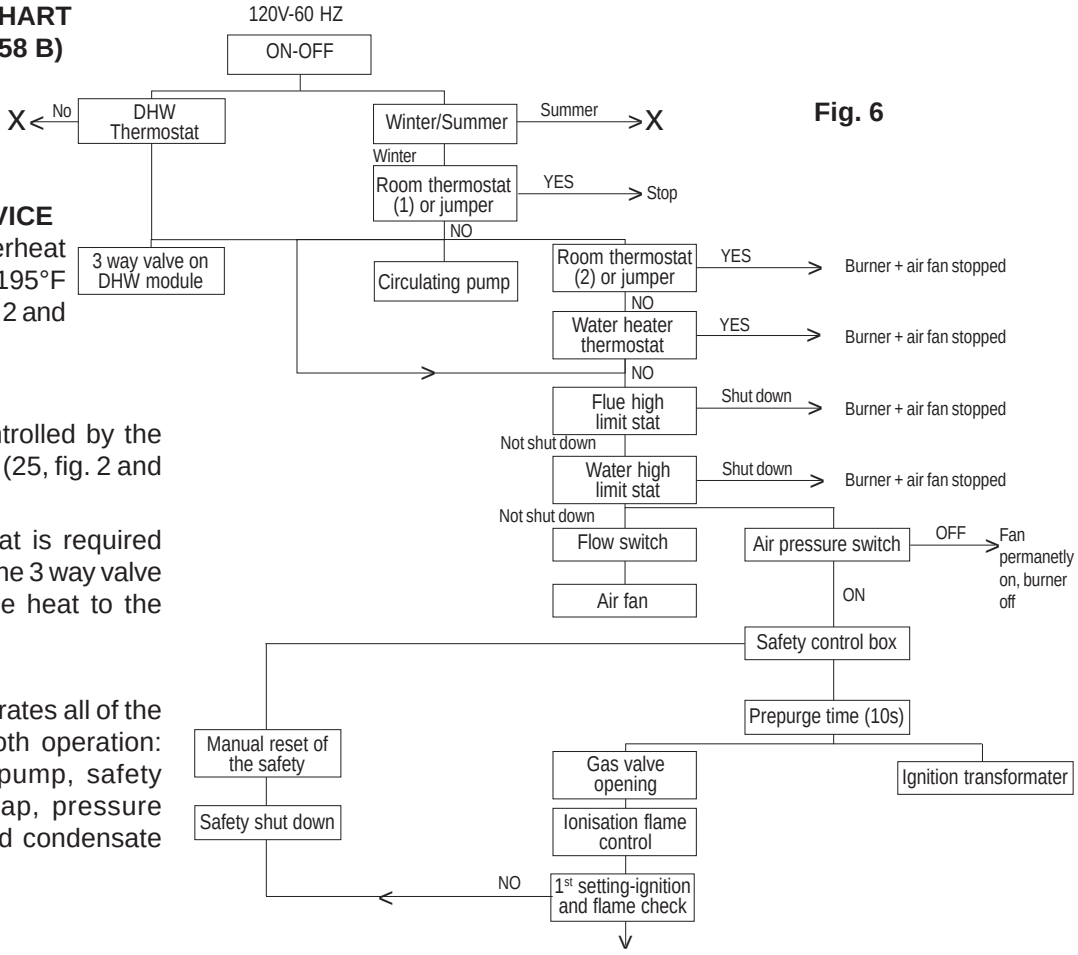


Fig. 6

2.3 - THERMAL SAFETY DEVICE

The unit is equipped with a overheat safety thermostat operating at 195°F (90°C) with manual reset (7, fig. 2 and fig. 3)

2.4 - 3 WAY-VALVE

The 3 way water valve is controlled by the domestic hot water thermostat (25, fig. 2 and fig. 3).

When domestic hot water heat is required (temperature <149°F / 65°C). The 3 way valve delivers 100% of the available heat to the water heater.

2.5 - ACCESSORIES

The wall-mounted unit incorporates all of the accessories needed for smooth operation: expansion tank, circulating pump, safety valve, air eliminator, drain tap, pressure gauge, heating water filter and condensate drain trap.

3 - BURNER

3.1 - INTRODUCTION

The unit's burner is a blown air burner with premixing. The flame burns on a grate made from heatresistant steel.

This technique gives a perfect gas mixture and a combustion which is sharp, silent, and well-adapted to the combustion unit.

3.2 - GAS UNIT

• Gas regulator

The gas regulator ensures the correct heat output from the appliance by regulating the gas burner pressure whatever the supply pressure (max input P = 20 IWG).

• Gas valve

The gas valve has a solenoid valve which controls the gas supply to the burner. This solenoid valve has a low power consumption and can operate constantly and silently.

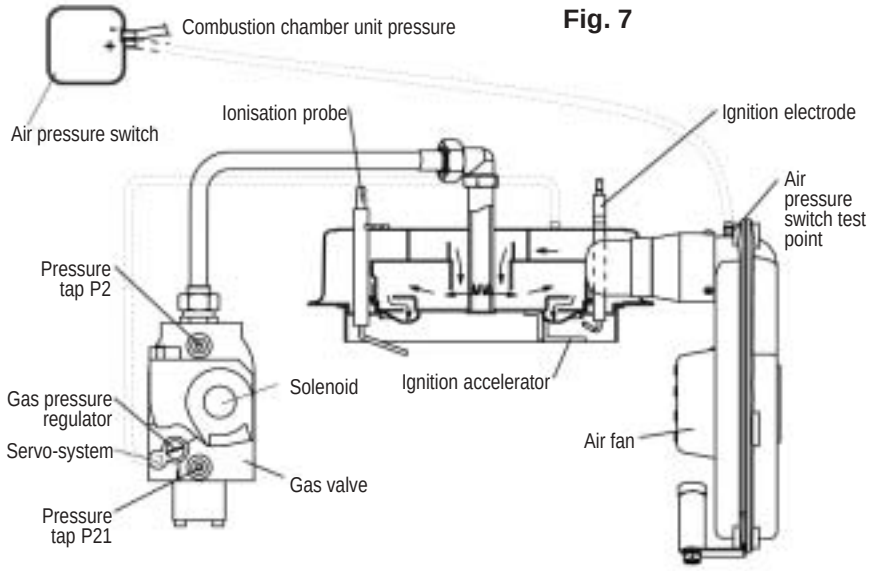


Fig. 7

• Filter

The unit input is fitted with a screen filter which protects it against any impurities carried in the gas supply.

4 - FAN

The fan, specially developed for the MZ, is very efficient and quiet. Its turbine provides a flow rate with a low sensitivity to pressure variations.

5 - HEAT EXCHANGER

The heating assembly has a particularly well-designed body consisting of two distinct parts:

• The square-section upper part constitutes the cold combustion chamber with its surrounding layer of water. A sight glass allows the flame to be observed.

• A " super exchanger " captures almost all the sensible heat and latent heat contained in the combustion products.

III. INSTALLATION

1 - GENERAL

The installation must conform with one or more of the following, as applicable:

- Local codes or, in the absence of local codes, the National Fuel Gas Code, ANSI Z 223.1 / NFPA 54 or Natural Gas and Propane Installation Code CSA B149.1.
- Can - CGA B149 installation code and/or local installation codes.
- The National Electrical Code ANSI/NFPA No.70.
- CSA Standard C22.2 No.0 and Canadian Electrical Code Pt.1.

This appliance must be grounded in accordance with these codes.

The unit must be located in an area where water leakage from the unit or the connections will not result in damage to the area adjacent to the unit or to lower floors of the structure. When such locations cannot be avoided, it is recommended that a suitable noncorrosive drain pan, adequately drained, be installed under the unit.

The maximum inlet gas pressure must not exceed the value specified and the minimum value listed is for the purpose of input adjustment.

If the water heater is installed in a closed water supply system, such as one having a back flow preventer in the cold water supply line, means shall be provided to control thermal expansion.

Contact the water supplier or local plumbing inspector on how to control this situation.

For the MZ 25 C is the water pressure exceeds 40 psi install an approved pressure regular set to 40 psi.

The installing technician shall install a relief valve in the supply pipe of primary hydronic heating circuit. The valve shall be readily accessible for servicing or replacement. The valve must comply with the ANSI/ ASME Boiler and Pressure Vessel Code, section IV. One typical valve is Watts regulator model poXL4, 150 psi. Equal alternate valves are also acceptable.

When installing this valve no shut off valve is to be placed between the relief valve and the unit. The discharge from this relief valve must be conducted to a suitable place for disposal when relief occurs and no reducing coupling or other restriction shall be installed in the discharge line. This discharge line shall be installed to allow complete drainage of both the valve and the line.

The relief valve must be located so that if it operates all water will be discharged to a location which will not impinge on any person or damage any property.

The preferred method is to pipe the relief valve discharge to a floor drain or a safe floor area near a floor drain.

Manually operate the pressure temperature relief valve at least once a year.

Note: Canadian units come equipped with a relief valve which must be installed by service technician.

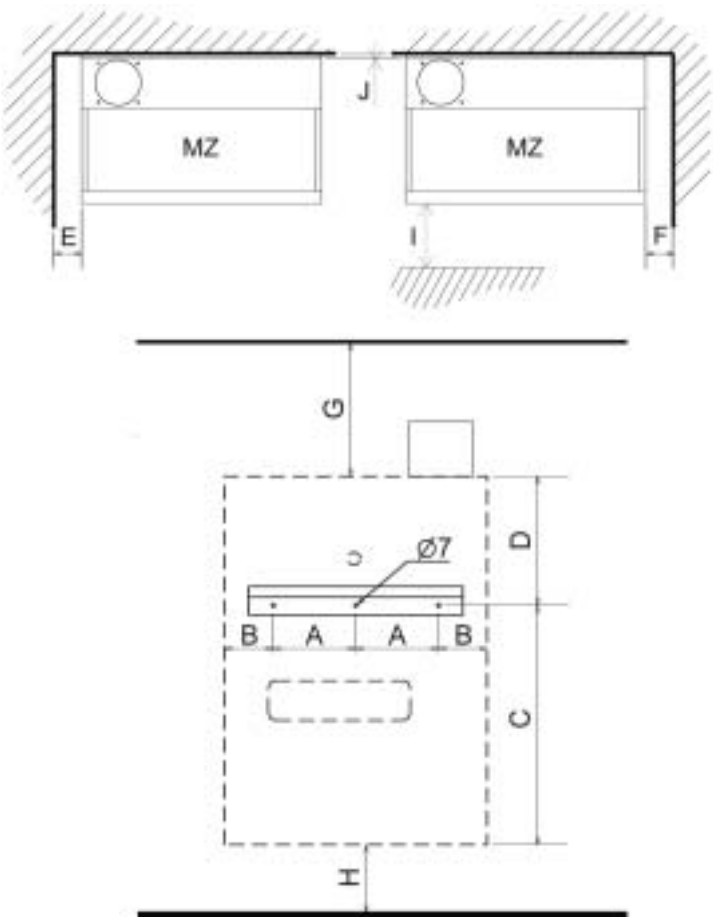
If the temperature pressure relief valve on the appliance discharges periodically, this may be due to thermal expansion in a closed water supply system. Contact the water supplier or local plumbing inspector on how to correct this situation. Do not plug the temperature and pressure relief valve.

Lighting and Shutdown Instructions are detailed on a label located inside the hinged front cover of the unit. These must be read and understood by all service personnel.

WARNING ! - All areas adjacent to, and surrounding, this unit must be kept free from combustible materials, gasoline, and other flammable vapors and liquids.

2 - FITTING THE ANGLE MOUNTING BRACKET

Fig. 8



Models	MZ C inches/mm	MZ S inches/mm
A	6.7/170	11.8/300
B	3.9/100	3.2/80
C	19.5/495	19.5/495
D	10.4/265	10.4/265
E mini	0.5/12.7	0.5/12.7
F mini	0.5/12.7	0.5/12.7
G mini	6/152.4	6.152.4
H mini	24.0/609.6	24.0/609.6
I mini	36.0/914.4	36.0/914.4
J*	0	0

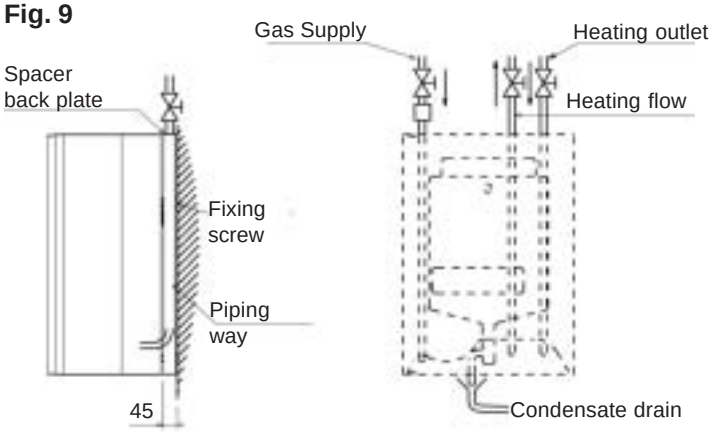
3 - FITTING THE SPACER BACK PLATE (optional)

The spacer back plate allows pipe work to be passed behind the water heater where the installation pipes arrive from above.

ASSEMBLY

- Fit the angle mounting to the wall (mounting delivered with the water heater).
- Hook the spacer back plate on to the angle mounting.
- Hook the water heater on to the spacer back plate.

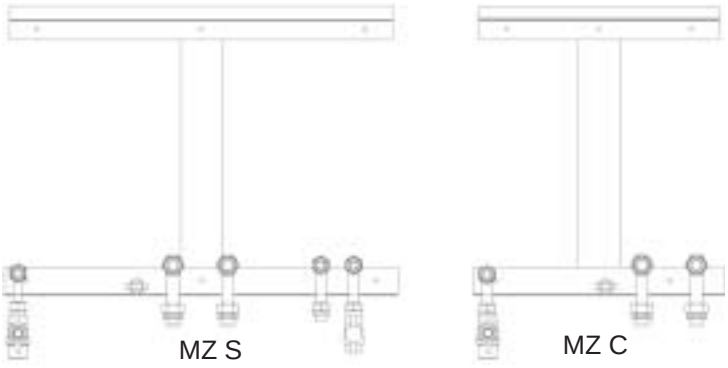
Fig. 9



4 - FITTING THE CONNECTION BACK PLATE (optional)

The connection back plate allows installation pipe work to be prefabricated, before fitting the water heater. It is equipped with the angle mounting for attaching the water heater to the wall. It also includes the stop valve to be fitted on the gas pipe. Backing plates exist for all models.

Fig. 10

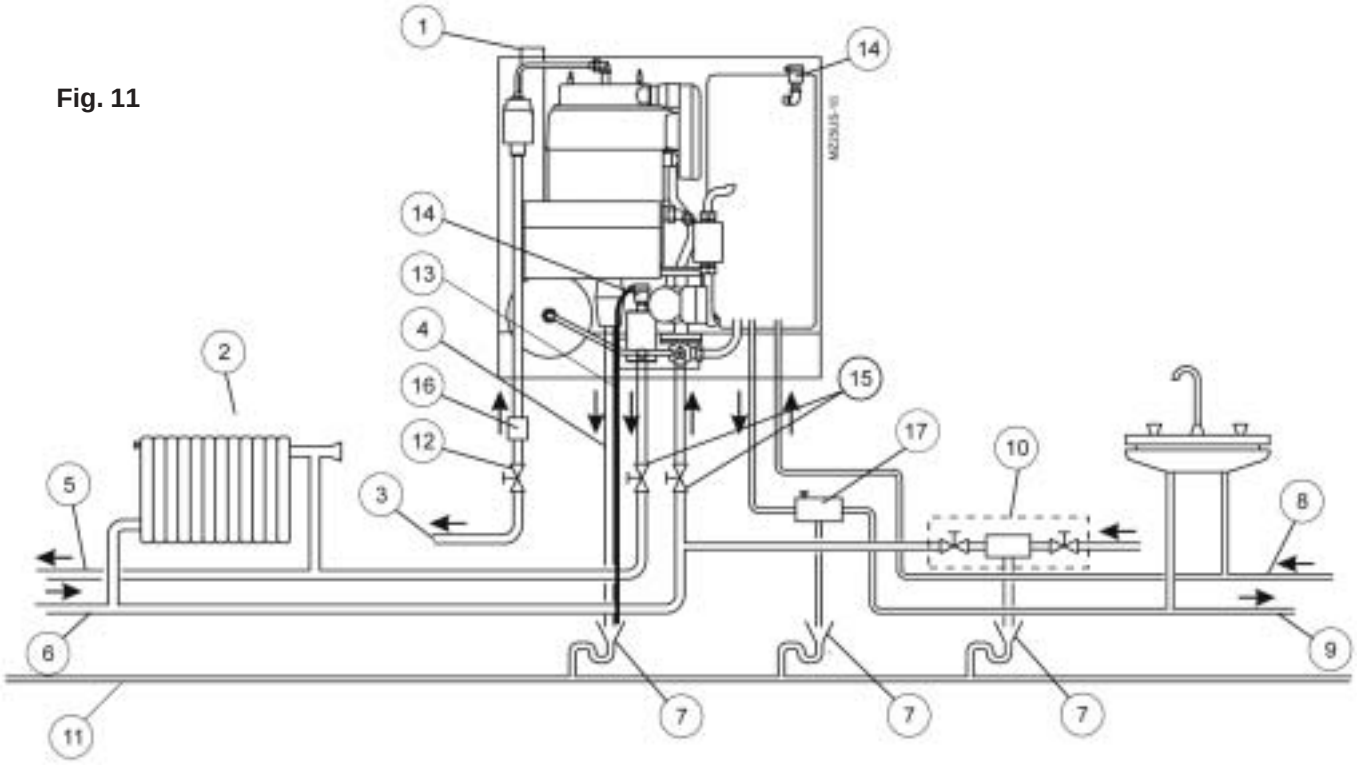


5 - PLUMBING CONNECTIONS

All connections are made at the bottom of the rear of the water heater. When operating the MZ, it is ESSENTIAL to maintain a CONSTANT minimum flow rate of 3.52 gal/min (800 liters/h) through the water heater. Consequently, if the heating installation has been designed for a lower flow rate, the by-pass has to be adjusted (23, fig. 2 and fig. 3). See section " Commissioning ". When the installation is fitted with thermostatic valves and does not have a differential pressure overflow valve, adjust the by-pass with the thermostatic valve closed.

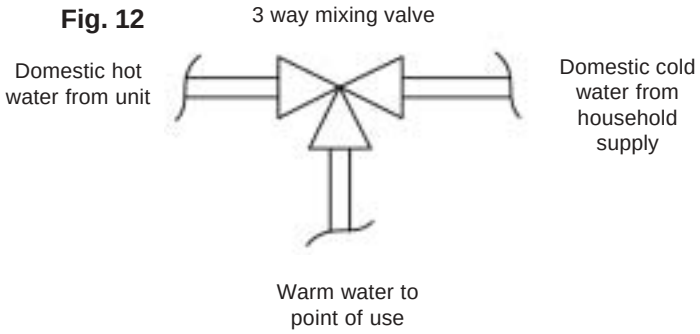
5.1 - MZ 25S FITTED WITHOUT CONNECTIONS BACK PLATE

Fig. 11



When system requires water for space heating at temperatures higher than required for other uses a means such as a mixing valve shall be installed to temper the water for those uses in order to reduce scald hazard potential. See piping diagram below:

Fig. 12



5.2 - RELIEF VALVE

A temperature and pressure relief valve listed as complying with the Standard for Relief Valves and Automatic Gas Shut-off Devices for Hot Water Supply Systems, ANSI Z21.22, shall be installed at the time of installation of the heater in the locations provided or specified by the manufacturer. Local codes shall govern the installation of such relief devices. For safe operation of the water heater, the relief valve(s) must not be removed or plugged.

5.3 - LOW TEMPERATURE FLOOR HEATING

The MZ water heater is designed to be connected to a low temperature heating circuit. For most such applications 115°F (45°C) maximum output temperature is adequate. Therefore it is recommended the unit's space heating thermostat control knob stops (3, fig. 4) be set to 115°F (45°C). Put the stops at 25 and 12 (figures inside the knob). Put the water heater on and check the maximum temperature on the thermometer. An additional 140°F (60°C) safety thermostat must also be fitted on the unit's heating circuit flow outlet.

5.4 - CONDENSATE AND VENTING CONNECTION

The unit is designed to drain condensate (from the bottom of the combustion chamber and the combustion products flue) by a condensate trap at the bottom of the heating unit. The condensate trap, which can be accessed for inspection, should be connected in PVC 1,26 inches Ø (32 mm) to the waste water system through a properly trapped drain. When installing, remember to fill the condensate traps with water before firing. They should be inspected twice a year. No reducing coupling or other restriction is allowed.

5.5 - PIPE CONNECTIONS

All the pipe junctions are located at the rear of the MZ water heater. Viewed from the rear, these are (from the left) the domestic cold water pipe junction, then the domestic hot water outlet ¾ inch Ø (20/27 mm) . Next comes the heating return, then the heating outlet 1 inch Ø (26/34 mm) . Finally on right is the gas supply ¾ inch (20/27 mm) Ø.

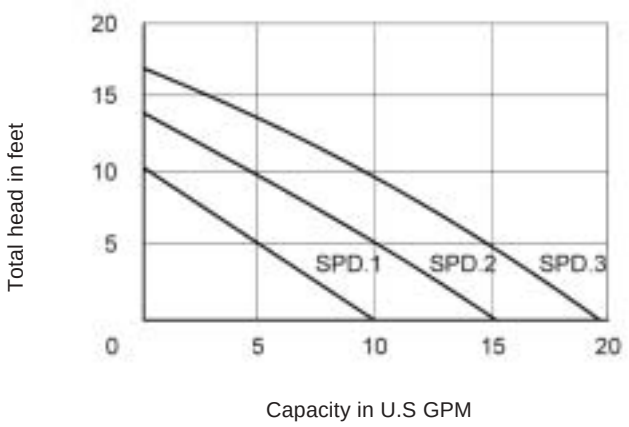
5.5.1 - FILLING THE INSTALLATION WITH WATER

The MZ water heater has two air purge valves, one on the heating outlet, the other on the domestic hot water heater (for the dual function model). Ensure that the water heater and installation are properly purged by increasing the water pressure to at least 14.5 psi (1 bar) (pressure gauge). Check that it is fully purged again a few days after commissioning.

5.6 - PRESSURE/FLOW RATE CURVES

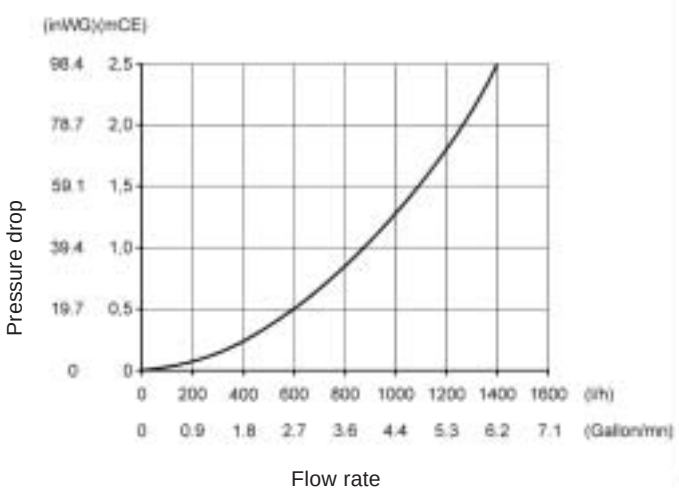
5.6.1 - CIRCULATING PUMP

Fig. 13 **UPS 15-42 F (3-SPEED MOTOR) 60 Hz**



5.6.2 - HOT WATER GENERATOR .P CONDENSING EXCHANGER

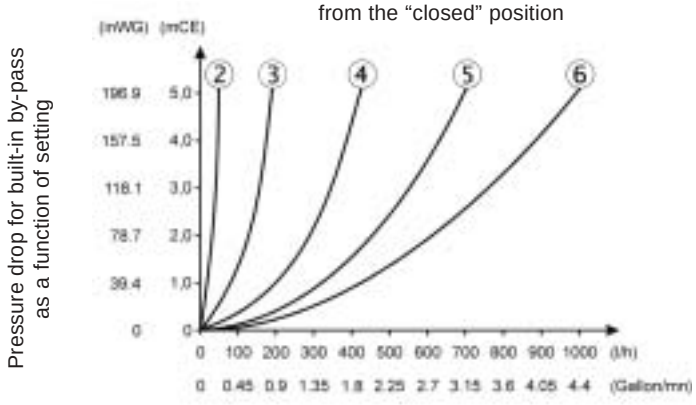
Fig. 14 **MZ 25 C/S HEAT EXCHANGER PRESSURE DROP**



5.6.3 - BY-PASS SETTING

Fig. 15

0 : Closed
8: Fully open
2 to 6 : Number of turns, counting from the “closed” position



Flow rate

6 - GAS CONNECTIONS

The appliance and its individual shut-off valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of ½ psi (3.5 kPa). The appliance must be isolated from the gas supply piping system by closing its individual manual shut-off valve during any pressure testing of the gas supply piping system at test pressures equal to or less than ½ psi (3.5 kPa).

- The appliance and its gas connection must be leak tested before placing the appliance in operating.

  The gas inlet diameter is ¾ inches (20/27 mm). The gas supply pipe must be fitted with a ¼ turnstop valve located in an easily accessible place. After commissioning, check that the pressure tapping points are properly closed and check the general leak tightness of the gas circuit (for example user a foaming product or a U-Tube).

  Always purge through the gas pipe work before commissioning the appliance (in order to get rid of any particles produced by welding or threaded joints).

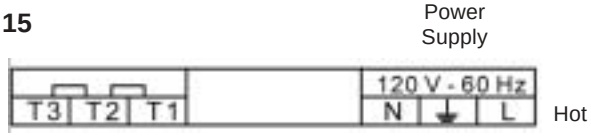
- The pipe supplying gas to the hot water heater must not cause a pressure loss of more than 0.4 inches (1 mbar WG).

7 - ELECTRICAL CONNECTIONS

The appliance, when installed, must be grounded in accordance with local codes or, in the absence of local codes, with the National Electrical Code, ANSI/NFPA 70 and the CSA standard “Canadian Electrical Code” C22.1.

7.1 - ORIGINAL CONNECTION (NO EXTERNAL CONTROL) WITH JUMPERS INSTALLED

Fig. 15



Observe the correct polarity for live (L) and neutral (N)

This appliance must be grounded

The power supply must be protected by a 6A fuse

All internal electrical components have been pre-wired. No attempt should be made to connect electrical wires to any other location except the terminals as designated in fig. 16.

7.2 - CONNECTION TO EXTERNAL CONTROL

7.2.1 - USING A ROOM THERMOSTAT TO CONTROL THE BURNER

- Burner stopped when the room thermostat switches off.
- Heating circulating pump continues to run after the thermostat switches off.
- Domestic hot water production continues even when room thermostat is switched off.

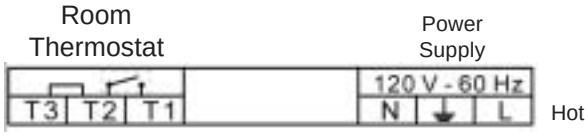
Fig. 17

Room thermostat connected between T2 and T3 after removing jumper T2/T3). Jumper T1/T2 remains in place.

7.2.2 - USING A ROOM THERMOSTAT TO CONTROL THE BURNER AND HEATING CIRCULATING PUMP SIMULTANEOUSLY

- Burner stopped when the room thermostat switches off.
- Heating circulating pump continues to run after the thermostat switches off.
- Domestic hot water production stops when room thermostat is switched off.

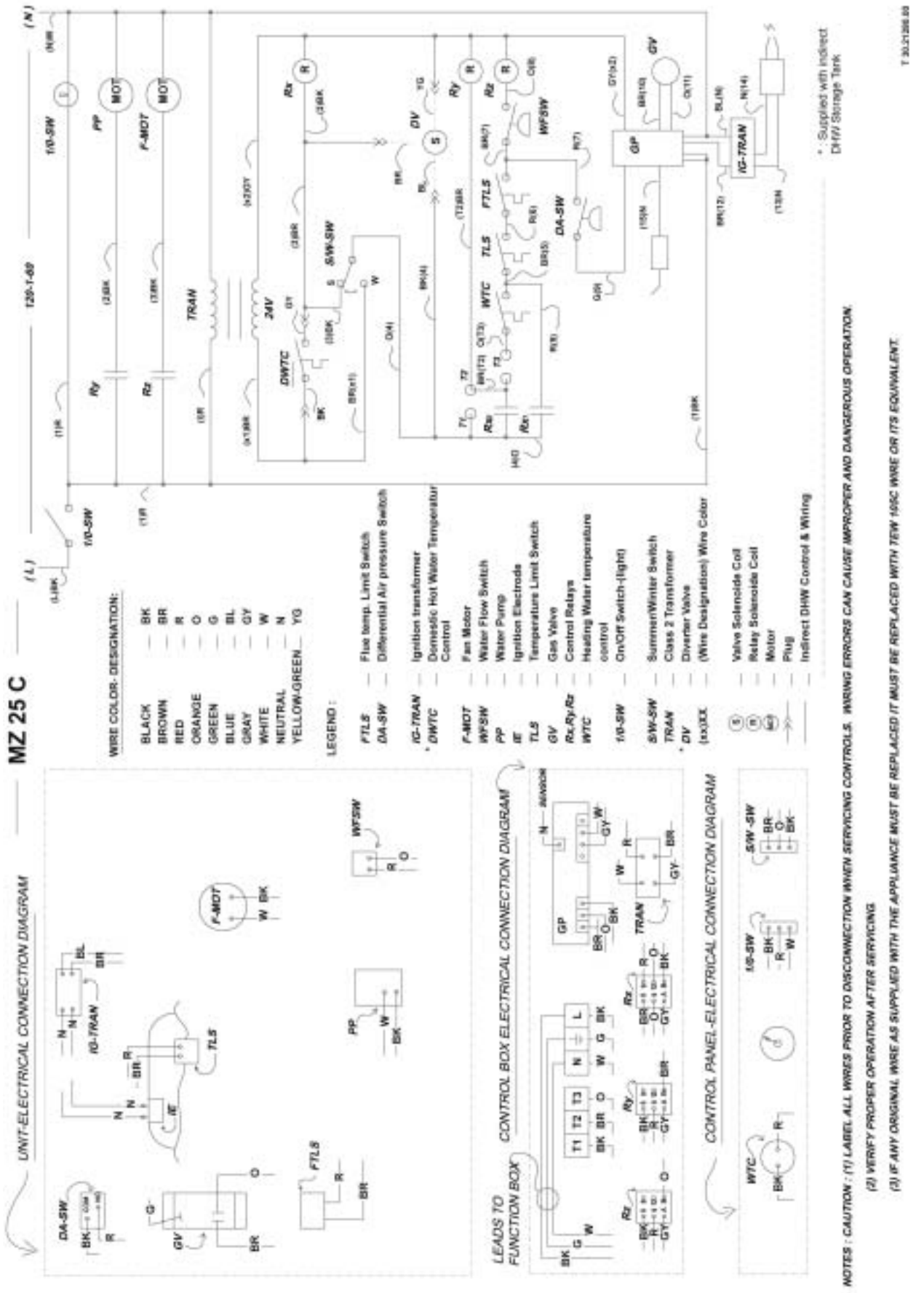
Fig. 18



Room thermostat connected between T1 and T2 after removing jumper T1/T2). Jumper T2/T3 remains in place.

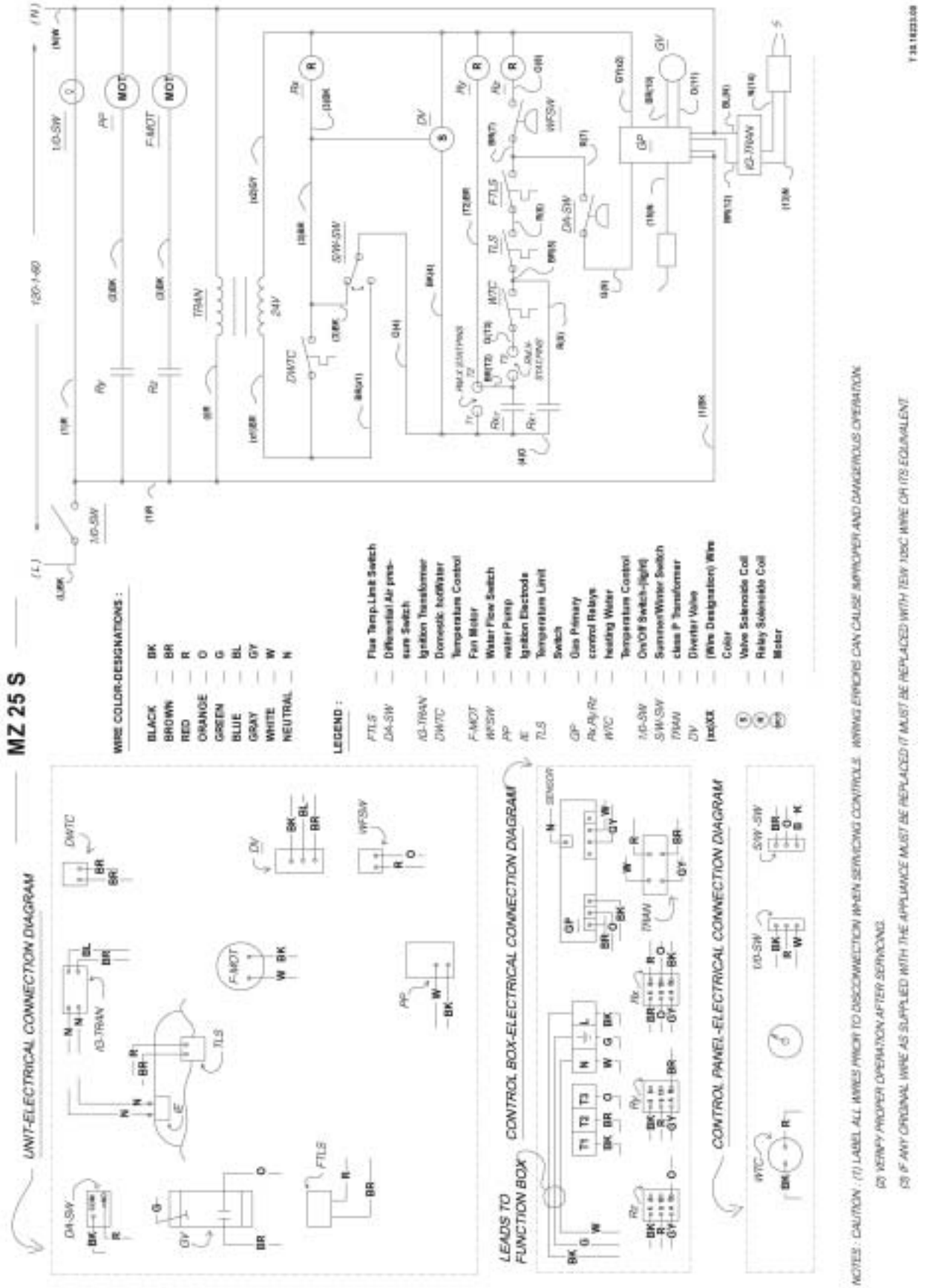
7.3 - CIRCUIT DIAGRAM (MZ 25C)

Fig. 19



7.4 - CIRCUIT DIAGRAM (MZ 25S)

Fig. 20



8 - COMBUSTION PRODUCTS EXHAUSED BY BALANCED FLUE

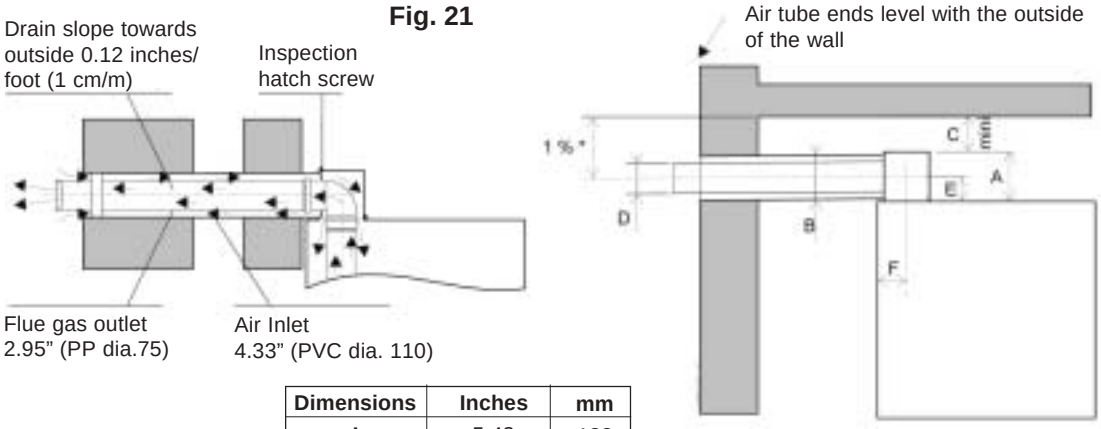
		Canadian Installations[1]	US Installations[2]
A=	Clearance above grade, veranda, porch, deck, or balcony	12 inches (30 cm)	12 inches (30 cm)
B=	Clearance to window or door that may be opened	6 inches (15 cm) for appliances ≤ 10,000 Btuh (3 kW), 12 inches (30 cm) for appliances > 10,000 Btuh (3 kW) and ≤ 100,00 Btuh (30 kW), 36 inches (91 cm) for appliances >100,00 Btuh (30 kW)	6 inches (15 cm) for appliances ≤ 10,000 Btuh (3 kW), 9 inches (23 cm) for appliances > 10,000 Btuh (3 kW) and ≤ 50,000 Btuh (15 kW), 12 inches (30 cm) for appliances > 50,000 Btuh (15 kW)
C=	Clearance to permanently closed window	*	*
D=	Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 feet (61 cm) from the center line of the terminal	*	*
E=	Clearance to unventilated soffit	*	*
F=	Clearance to outside corner	*	*
G=	Clearance to inside corner	*	*
H=	Clearance to each side of center line extended above meter/regulator assembly	3 feet (91 cm) within a height 15 feet above the meter/regulator assembly	*
I=	Clearance to service regulator vent outlet	3 feet (1.83 m)	*
J=	Clearance to nonmechanical air supply inlet to building or the combustion air inlet to any other appliance	6 inches (15 cm) for appliances ≤ 10,000 Btuh (3 kW), 12 inches (30 cm) for appliances > 10,000 Btuh (3 kW) and ≤ 100,00 Btuh (30 kW), 36 inches (91 cm) for appliances >100,00 Btuh (30 kW)	6 inches (15 cm) for appliances ≤ 10,000 Btuh (3 kW), 9 inches (23 cm) for appliances > 10,000 Btuh (3 kW) and ≤ 50,000 Btuh (15 kW), 12 inches (30 cm) for appliances > 50,000 Btuh (15 kW)
K=	Clearance to a mechanical air supply inlet	6 feet (1.83 m)	3 feet (91 cm) above if within 10 feet (3 m) horizontally
L=	Clearance above paved sidewalk or paved driveway located on public property	7 feet (2.13 m) †	*
M=	Clearance under veranda, porch deck, or balcony	12 inches (30 cm) ‡	*

[1] In accordance with the current CAN/CGA-B149 *Installation Codes*
[2] In accordance with the current *ANSI Z223.1 / NFPA 54 National Fuel Gas Code*
† A vent shall not terminate directly above a sidewalk or paved driveway that is located between two single family dwellings and serves both dwellings.
‡ Permitted only if veranda, porch, deck, or balcony is fully open on a minimum of two sides beneath the floor.
* For clearances not specified in ANSI Z223.1 / NFPA 54 or CAN/CGA-B149, one of the following shall be indicated:
a) A minimum clearance value determined by testing in accordance with section 2.20, or;
b) A reference to the following footnote:
"Clearance in accordance with local installation codes and the requirements of the gas supplier."

A balanced flue must be installed when the wall adjoining the water heater gives onto the outside in a well ventilated location. A water heater installed in this way possesses a sealed combustion circuit, completely independent of the ventilation circuit for the rooms.

The balanced flue outlet must be located at least 1.31 foot (0.4 m) from any opening window and 1.97 foot (0.6 m) from any air ventilation opening (see regulations). Two balanced flue outlets (from two distinct adjacent MZ units) must be at least 1.97 foot (0.6 m) apart.

Fig. 21



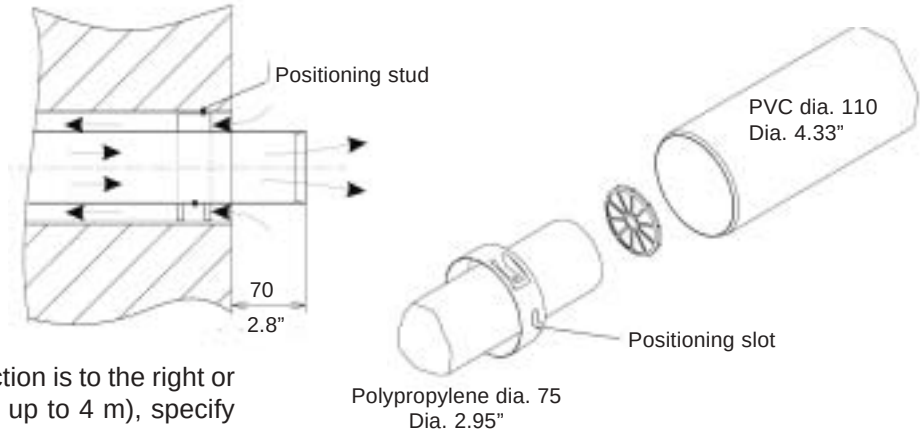
Dimensions	Inches	mm
A	5.43	138
B	4.33	110
C mini	6.0	152.4
D	2.95	75
E	2.76	70
F	2.64	67

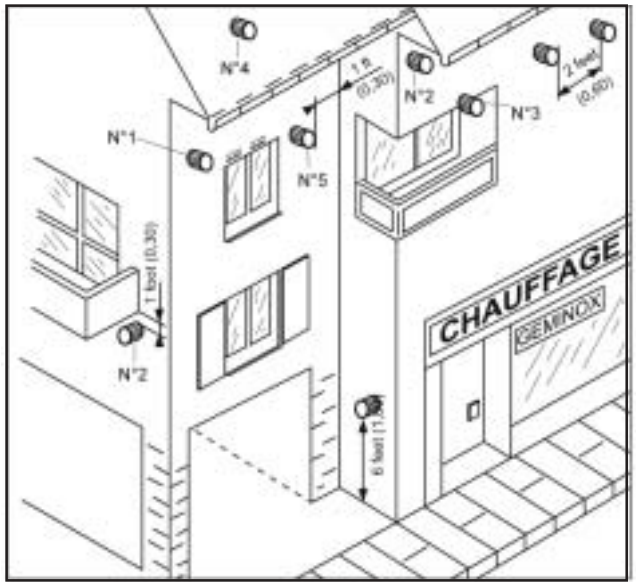
The flue may be mounted to the right , to the left, or directly behind the water heater. Its maximum length must not exceed 13.12 feet (4 meters). The flue gas exhaust tube Ø 2.95 inches (Ø 75 PP) must slope downward towards the outside at 0.12 inches/foot * (1 cm per meter) to avoid accumulation of rain water in the vent-air intake system.

The MZ is supplied with a standard length flue which can be used to run through a wall up to 1.64 foot thick (0.5 m) located directly behind the water heater.

For greater lengths, or when the connection is to the right or left of the hot water heater (13.12 feet, up to 4 m), specify with your order.

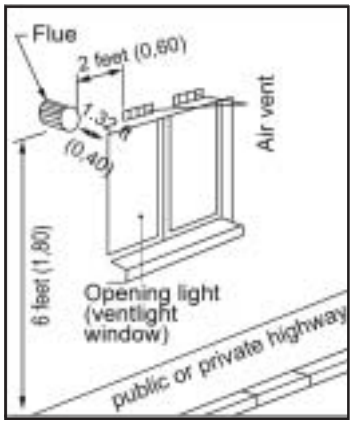
Fig. 22



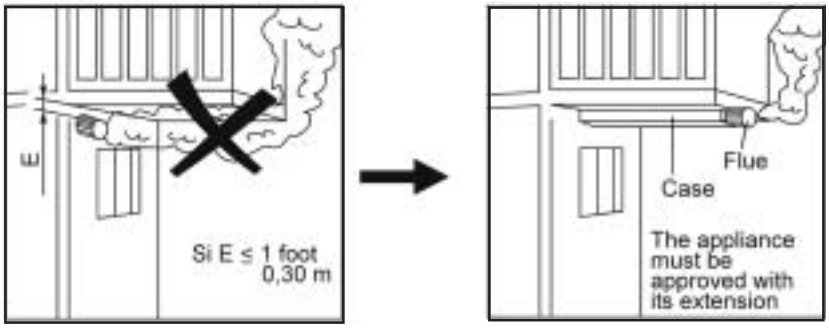


1) The three recommended distances (code of practice)
2) Outlet under balcony or roof
3) Outlet on a balcony
4) Roof outlet (refer to factory)
5) Outlet near to a corner

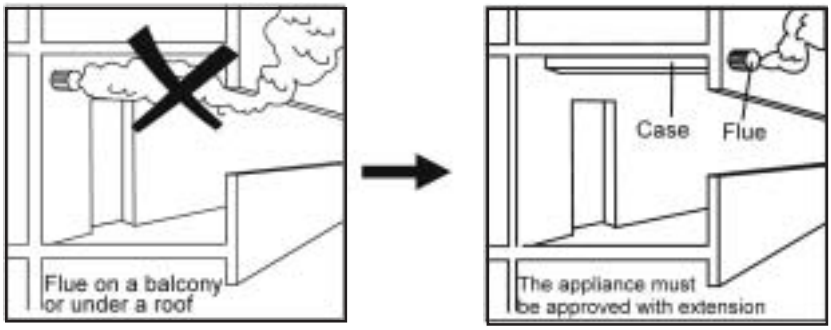
All dimensions are the minimum permissible



A public or private highway where a flue outlet is located includes:
- public or private pavement
- pedestrian walkway
- traffic route
- alleyway
- stairway (including landings and steps)



(No.2) Approved extension: 13.12 feet (4m)

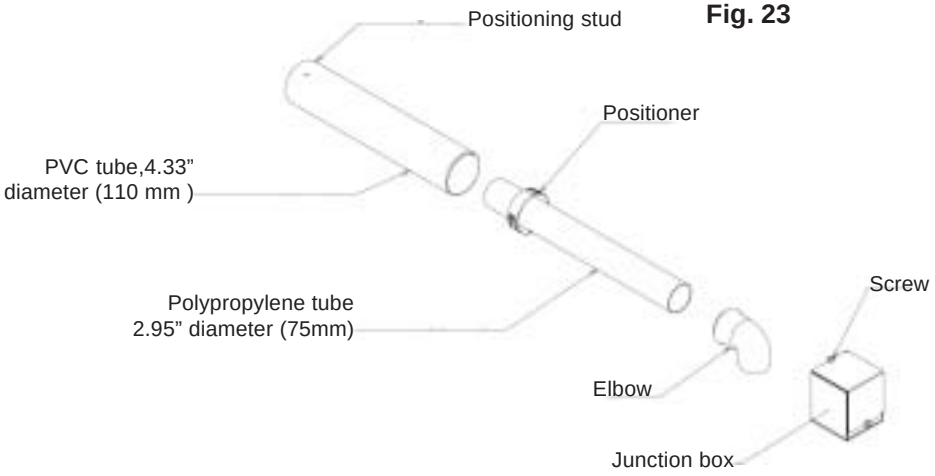


(No.3) Approved extension: 13.12 feet (4m)

8.1 - LEAK-TIGHTNESS

The MZ water heater has a sealed combustion circuit. Take care to keep the various seals in good condition (cover, flue box, etc.). Replace if necessary. The various elbows and connection pieces located on the flue gas exhaust route and on the air intake must be fitted in a leak-tight manner in order to avoid flue gases recycling.

Fig. 23



I V. C O M M I S S I O N I N G

1 - WARNING

If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

Should overheating occur or the gas supply fail to shut off, turn off the manual gas control valve to the appliance.

Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

Before commissioning the appliance, the installer should:
- check that the gas circuit is leak-tight
- carefully flush out the gas pipes. Where the installation is new, the purge serves to evacuate the air that is contained in the pipes so that the water heater has sufficient fuel. The presence of air in the gas prevents the burner from lighting and results in the flame control unit safety device cutting in. This applies to a new installation running on either natural gas or LPG. For the latter, the storage tank must also be flushed properly before commissioning.

All necessary safety precautions should be taken when venting the gas.

Flushing the gas will also have the effect of removing any oxide particles from the pipes produced during brazing
- check that the flue gas outlet is leak-tight and that combustion products can pass freely through this conduit;

- check the appearance of the flame through the round observation window inside the hinged door just above the controls. The flame's blue hue should almost completely fill the round observation window.
- check that the installation is filled with water. The water pressure should = 21.75 psi (1,5 bars), the radiators are purged and the valves open (**Attention**! the pressure must not drop below 14.5 psi (1 bar);
- check that the electricity supply is connected correctly: 120 V - 60 Hz, with correct polarity;
- check that the condensate outlet is connected,
- check that the siphon trap is filled with water.

(S model only): The domestic hot water thermostat is factory set to its lowest temperature position. If it becomes necessary to adjust this position it recommended that for energy efficiency the setting be kept at the minimum water temperature consistent with the consumers needs.
The preferred starting point is 115°F (48°C). Keep in mind there is a hot water scald potential if the thermostat is set too high.
When operating the appliance for the first time, the installer must verify

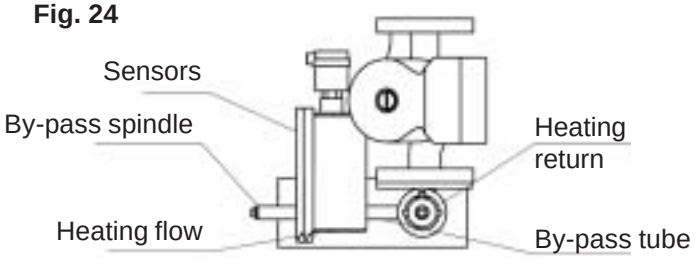
- that the governor works properly;
- that the flame control works properly;
- the burner setting: CO, C02

After the unit is installed select the nearest hot water faucet and let the water run until it is as hot as it will get. If the temperature of the water has a risk of scald temperatures reduce the DHW thermostat safety limit setting until the water temperature has cooled to a safe level.

2 - COMMISSIONING

- Open the manual valve on the gas inlet
- Switch on the main heating switch
- Set the on/off switch on the control unit to the on position
- Put the CIRCULATING PUMP switch to the "winter" position. In the "summer" position, the circulating pump only works when the domestic hot water tank requires heating (on the Dual Function Model)
- Adjust the by-pass setting: on installations where the flow rate is less than 3,52 gpm (800 l/h), the water flow rate through the water heater heat exchanger has to be adjusted GRADUALLY, by means of the by-pass (23, fig. 2 and fig. 3) until the flow detector is triggered. All the thermostatic valves in the installation must be kept shut during this adjustment.

Fig. 24



- Burner adjustment: this is factory preset to obtain satisfactory operation. However, when commissioning, it is necessary to carry out the following checks, with the burner operating:

2.1 - Check operating pressure

- P1:Supply pressure
- P2:Regulator valve output pressure
- Adjusting gas pressure regulator:
  - Turn to the right to increase the pressure
  - Turn to the left to decrease the pressure.

2.2 - Check gas flow rate Flow rate given at 59°F (15°C), 14.7 psi (1013 mbar)

Table of gas flow rates

		Natural Gas	LP gas
Ø Air reducer	inches/mm	1.14/29	1.22/31
Inlet pressure	P1 IWG/mmCE	7.0/177.8	11.0/279.4
Outlet pressure	P2 IWG/mmCE	2.8/71	5.5/140
Ø Reducer	inches/mm	0.213/5.4	0.138/3.5
Gas flow	Feet3/h	87.9	37.8
60°F 1.01,3 kPA	m3/h	2.49	1.07
CO2	%	9.5	10.7
CO	ppm	30	50

IWG = Inches of water pressure

2.3 - Changing gas type

The water heater is preset for natural gas. This operation must be carried out by a qualified person When changing to propane gas (LP), use gas reducer in burner gas inlet (ref: conversion set). Then check the P2 gas pressure (outlet gas valve) according to the framed indications. Be careful to check P2 gas pressure with the cap properly screwed on the governor because of the air pressure action through the governor breather. (Gas pressure increase about 2 inches when cap mounted). When the conversion is made, check the gas soundness with burner ignited and stick the label corresponding to the new gas.

FOR YOUR SAFETY READ BEFORE OPERATING
WARNING: If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life

A This appliance does not have a pilot. It is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.

B BEFORE OPERATING smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.
WHAT TO DO IF YOU SMELL GAS
- Do not try to light any appliance.
- Do not touch any electric 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.

C Use only your hand to push in or turn the gas control knob. Never use tools. If the knob will not push in or turn by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.

D Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

OPERATING INSTRUCTIONS

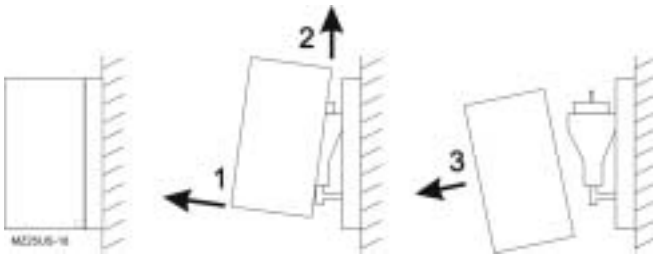
1 STOP ! Read the safety information above on this label.

2 Set the thermostat to lowest setting

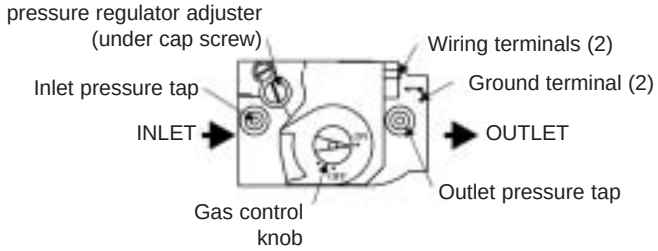
3 Turn off all electric power to the appliance.

4 This appliance has a sealed combustion chamber. DO NOT ATTEMPT TO LIGHT THE BURNER BY HAND.

5 To access the gas control the front cover must be removed. Remove screws and unlatch the retaining clips on the bottom of the front cover. To remove the front cover slightly lift the front cover while pulling it towards you. The gas control is located to the left of the burner.



6 Rotate the gas control knob clockwise to the OFF position. See illustration to the right.



7 Wait (5) five minutes to clear out any gas. If you then smell gas, STOP! Follow " B " in the safety information above on this label. If you don't smell gas, go to the next step.

8 Rotate the gas control knob counterclockwise to the ON position.

9 Replace the front cover (see section 5).

10 Turn on all electric power to the appliance.

11 Set thermostat to desired setting

12 If the appliance will not operate, follow the instructions "to turn off gas to appliance" and call your service technician or gas supplier.

TO TURN OFF GAS TO APPLIANCE

1 Set the thermostat to lowest setting

2 Turn off all electric power to the appliance if service is to be performed.

3 Remove access cover per item 5 of the OPERATING INSTRUCTIONS above.

4 Push in gas control knob slightly and turn clockwise (see diagram in item 6 of the operating instructions) to "OFF". Do not force.

5 Replace the access cover . See item 5 above.

V - SERVICING

A service visit must be carried out annually.

The main points to be verified are as follows:

- That the combustion gas circuit, the fan and burner are clean and that the ignition and ionization electrodes and seals are all in good condition.

  The burner can be cleaned using a household vacuum cleaner, placing the suction pipe on the air intake, then on the gas intake (with the burner dismantled).

  The exchanger can be cleaned by spraying with water with the burner dismantled (the water drains away via the condensate drainage siphon trap).

- Check the gas flow rate, pressure P2, CO and C02.

  The combustion products circuit is slightly pressurized.

  Any holes drilled in this circuit should subsequently be closed off.

- Check the flame control by disconnecting the ionization electrodes (the safety device should activate after attempting to ignite the flame).

- Check the differential air pressure switch by blocking the air inlet or flue gas outlet (burner operation should be interrupted immediately).

  The differential air pressure switch is a safety device. Never modify its setting (triggers off 40 mm WG / 1.57 inches WG).

- If the pressure switch triggers, this indicates insufficient air flow; in this event, check the fan and the air and combustion products circuits (flue, burner, exchanger, condensate chamber, etc.).
- Check the water flow detector (by stopping the circulating pump; burner operation should be interrupted immediately).
- **MANUAL OPERATION OF RELIEF VALVE :**
- Pressure relief valve must be manually operated at least once a year.

WARNING!: precautions must be taken prior to operating the relief valve to assure that hot water discharged from the relief valve will not contact people or damage property.

Turn the knob by hand, let some water drain out, then turn it again to close it and make sure there is no water leakage.

- Inspect the condensate drainage trap.

- In hard water areas, the domestic water exchanger should be de-scaled regularly (carry out de-scaling as soon as a reduction in the domestic hot water flow rate is observed).
- All moving parts have sealed, permanently lubricated bearings. Therefore no periodic oiling is required.
- Flame visual check : the normal flame color is blue it could be slightly blue-orange during a few minutes just after a burner ignition. Yellow flame is not normal. In such a case stop the water heater and call your gas service company.

1 - RECOMMENDED SERVICE PARTS

DESCRIPTION	PART NUMBER	
	MZ 25 S	MZ 25 C
Control panel	V00.12731	V00.12731
Viega condensate syphonic trap	A20.11061	A20.11061
Shell	V00.21225	V00.21225
Gas valve	L10.15083	L10.15083
Air pressure switch	L50.19250	L50.19250
Burner	X00.12734	X00.12734
Ignition transformer	L00.15086	L00.15086
DHW thermostat	L71.10492	/
Automatic air vent	L90.24635	L90.24635
DHW cylinder	V00.13874	/
Air fan	C50.15504	C50.15504
3 way valve (body)	L85.13803	L85.13803
Circulating pump	L30.15074	L30.15074
Stainless steel filter	U00.15093	U00.15093
½ inch drain cock	K50.11590	K50.11590
High limit	L72.01023	L72.01023
Pressure relief valve	L90.10548	L90.10548
Water heating thermostat	L71.04202	L71.04202
Thermometer	L60.31042	L60.31042
On/ Off light switch	C20.15505	C20.15505
Winter/summer switch	C20.7949	C20.7949
Flow switch	L50.12534	L50.12534
Flue pipe	N40.16810	N40.16810
Control box	L10.15253	L10.15253
Control relay	C60.15500	C60.15500
Transformer	C90.15411	C90.15411
3 way valve motor	L20.15499	L20.15499
Flue high limit thermostat	L72.10273	L72.10273
Ignition electrode	L00.16672	L00.16672
Ionization probe	L00.12950	L00.12950

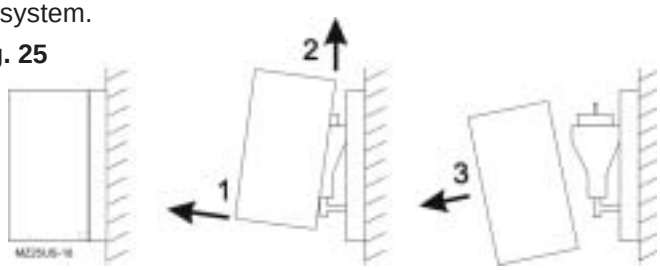
These service parts can be ordered from your distributor, if you need information contact **Monitor Products Inc. • (800) 524-1102**

VI - ASSEMBLY/DISMANTLING

1 - COVER

The hot water generator cover is fixed at the bottom by a clip on system.

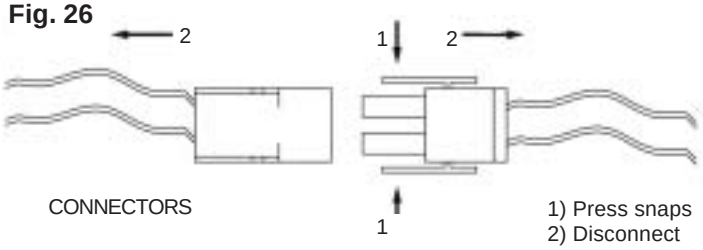
Fig. 25



2 - ELECTRICAL CONNECTION UNIT

The various electrical devices are all connected to the control unit by special connectors which prevent any incorrect connection after dismantling

Fig. 26



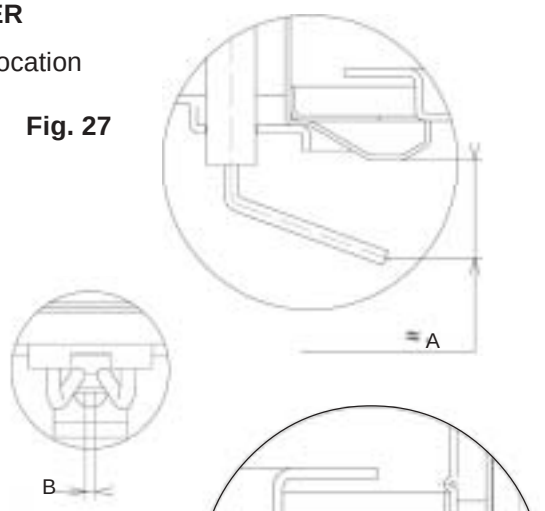
CONNECTORS

1) Press snaps
2) Disconnect

3 - BURNER

Electrode location

Fig. 27



A: 20 mm = 0.8 inches
B: 2.25 mm = 0.09 inches
C: 10 mm = 0.4 inches
D: 4 mm = 0.16 inches

VII - DOMESTIC WATER HEATER

Piping and components connected to the water heater for the space heating application shall be suitable for use with potable water.

Toxic chemicals (such as those used for heating system treatment) must not be added to the potable water used for space heating.

A water heater shall not be connected to any heating system or component(s) previously used with a non-portable water heating appliance.

1 - HEATER INCORPORATED INTO DUAL FUNCTION MODEL

For the plumbing connection, refer to chapter III - INSTALLATION - section 5 - page 13.

The cold water supply has a control valve. Adjust this according to the water supply pressure so as to obtain a flow rate of (2.91 gal/min / 11 l/mn); if possible, use the bath tap as a reference.

Aim to obtain a hot water temperature of at least 113°F (45°C).

NOTES:

MONITOR PRODUCTS, INC.
P.O. Box 3408 • Princeton, NJ 08543
www.monitorproducts.com
PHONE (732) 329-0900 • FAX (732) 329-0904

VIII - MONITOR PRODUCTS, INC. ("MPI") LIMITED WARRANTIES

First year-MPI warrants that each MZ Series Heating Systems sold by it to be free from defects in material and workmanship, under normal use and services, for a period of 1 year after date of purchase with an additional period of up to 3 months if unit is not installed at the time of purchase.

First through tenth year-MPI warrants that the primary heat exchanger assembly consisting of water-tube heat exchanger, water jacket and condensate collector is free from defects in material and workmanship for 10 years from the date of purchase.

MPI corrosion inhibitor must be used in every MZ series heating system. Failure to use this inhibitor will void this warranty.

NOTE: We will not accept any MZ heat exchangers for warranty consideration without an 8 ounce water sample from the system. This is required to test for the proper inhibitors. **No credit will be issued without a water sample.**

STANDARD PROVISIONS, TERMS AND CONDITIONS THAT ARE COMMON TO ALL MPI INDIVIDUAL PRODUCT WARRANTIES:

These warranties are subject to the condition that the MPI product(s) must have been installed in accordance with manufacturer's instructions. These warranties extend only to the first retail purchaser of the products and only to a product that has not been moved from its original installation site. These warranties do not apply to commercial applications.

In addition to each product warranty listed, MPI **warranties do not cover**:

1) *Components that are part of the heating system but were not furnished by MPI as part of the heating system.*
2) *The workmanship of any installer of MPI's product(s). In addition, this warranty does not assume any liability of any nature for unsatisfactory performance caused by improper installation.*
3) *Any costs for labor for removal and reinstallation of the alleged defective part, the cost of shipping or transportation to MPI and back to the consumer, if necessary, and any other materials necessary to perform the exchange.*
4) *Replacement parts beyond the balance of the original warranty period.*

REMEDY: If within the applicable warranty period, any product(s) or part(s) included in this warranty proves to be defective in material and/or workmanship, then MPI shall repair or replace, at its option, the defective product(s) or part(s) and return it to the consumer.

PROCEDURE FOR OBTAINING PERFORMANCE UNDER THIS WARRANTY: In order to obtain performance under this warranty, the original purchaser must promptly (in no event later than thirty (30) days after discovery of the defect) see to the return of the product(s) or part(s) in question, accompanied by a properly filled out MPI warranty claim form (Available from MPI by mail or phone). Any claim made under this warranty must be accompanied by proof of original purchase date, sales invoice or cancelled check showing the serial number as satisfactory evidence. Any replacements are made subject to validation by MPI of in-warranty coverage. An item to be replaced must be made available in exchange for the replacement.

SOLE REMEDY: The remedy and liability for any breach of warranty, express or implied, set forth herein is the sole and exclusive remedy and the limit of liability for any such breach.

EXCLUSIONS AND IMPLIED WARRANTIES: This warranty does not extend to any defect due to the negligence of others. Failure to install, operate or maintain the product(s) in accordance with the installation, operation and maintenance instructions furnished with each new product, unreasonable use, accidents, acts of god, fire, snow, floods, lightning, alteration, ordinary wear and tear, or the use of unauthorized or non-standard parts.

ALL IMPLIED WARRANTIES, IF ANY, ARISING UNDER LAW IN CONNECTION WITH THE SALES BY MPI OF ANY PRODUCT(S) ARE LIMITED IN EXTENT AND DURATION TO THE DURATION OF THIS WRITTEN WARRANTY. THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OTHER THAN AS EXPRESSLY STATED HEREIN. MPI SHALL NOT BE RESPONSIBLE FOR ANY INCIDENTAL, INDIRECT, PUNITIVE, OR CONSEQUENTIAL DAMAGES WHETHER AS A RESULT OF BREACH OF WARRANTY, NEGLIGENCE, STRICT LIABILITY IN TORT OR OTHERWISE.

Note: Some jurisdictions do not allow: (a) limitations on how long an implied warranty lasts; or (b) the exclusion or limitation of incidental, indirect, punitive or consequential damages, so the above limitations or exclusions may not apply to you.

NO VARIATION OF TERMS: the parties intend that this warranty be the exclusive and final expression of their agreement.

No person has the authority to orally, in writing or in any other way vary the terms, conditions or exclusions of this warranty, or to make any express warranties other than those contained herein.

LEGAL RIGHTS: This warranty gives you specific legal rights and you may also have other rights which vary from jurisdiction to jurisdiction.

ENERGY STAR PARTNER

RADIANT PANEL MEMBER RPA est. 1994 ASSOCIATION

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