INSTALLATION AND OPERATING INSTRUCTION

Model MWH-180EX

**[Residential indoor unit,
Manufactured home (mobile home)]**

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

- 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.

INSTALLER : Leave this manual with the appliance.
CONSUMER : Retain this manual for future reference.

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SPECIFICATIONS

Model number	MWH-180EX
Type of appliance	Gas continuous flow water heater
Approved gas type	Natural or Propane
Installation	Outdoor only / Wall hanging
Set point temperature (without remote)	Factory setting - 120° F
Temperature range with remote	Remote controller : 96 - 140° F
Exhaust system	Forced combustion
Dimensions	Height 22 5/8" (575mm) Width 13 25/32" (350mm) Depth 6 1/2" (165mm)
Weight	40 lbs.
Connections	Gas 3/4" MNPT Water inlet 3/4" MNPT Hot water outlet 3/4" MNPT
Ignition system	Direct electronic ignition
Electrical consumption	Normal 58 watts Standby Main/Bath remote controller on 3.7 watts Anti-frost operation 84 watts
Recommended minimum water supply pressure	15 PSI (recommended 25-75 psi for maximum performance)
Maximum water supply pressure	150 PSI
Power supply	Appliance AC120V - 60Hz Remote controller DC12V (digital)

SPECIFICATIONS

Safety devices	Flame failure - Flame rod
	Over heat switch 210° F
	Over heat limit 203° F
	Thermal fuse 363° F
	Automatic frost protection
	Fan motor rpm check - PCB
	Over current - Fuse (5 amp)
Remote controller (option)	CMR-2250(P/N 3748) Main control kitchen / laundry
	YST-2250(P/N 3749) Bathroom control
Remote controller cable (option)	Nonpolarized two core cable
Clearance from combustibles	Top of heater 12" (30.5cm) Front of heater 24" (61.0cm) Sides of heater 6" (15.2cm) Back of heater 0" (0cm) Floor 12" (30.5cm)

PERFORMANCE

		MAXIMUM	MINIMUM
Gas consumption	Natural Gas	180,000 Btu/h	20,000 Btu/h
	Propane Gas	180,000 Btu/h	20,000 Btu/h
Gas supply pressure	Natural Gas	10.5" W.C.	4.0" W.C.
	Propane Gas	14.0" W.C.	8.0" W.C.
Mainfold gas pressure	Natural Gas	2.75" W.C.(2.55)	0.4" W.C.
	Propane Gas	3.10" W.C.(2.75)	0.4" W.C.
Hot water capacity		0.58-5.8 GPM	
Maximum hot water capacity (54° F rise)		5.8 GPM	

FEATURES

The MWH-180EX is a new advanced technology water heater. It produces hot water, continuously, at the preset temperature of 120°F. For optimal performance, we recommend the use of the optional remote controllers.

The MWH-180EX will never run out of hot water. Hot water is available as long as a hot water faucet is open.

As soon as a hot water faucet is opened, a signal goes to the microprocessor to start the burner operation. Closing the faucet sends the shut down signal to stop the burner.
The MWH-180EX is furnished with an electronic ignition system.
This feature eliminates gas usage when no hot water is being used, leading to significant savings in energy and money.

The advanced control system uses a sensor to continuously maintain the outgoing water temperature.

The safety protections of the microprocessor include limiting the maximum temperature of the hot water. The maximum temperature of water, without using the remote controllers, is preset at 120°F.

A fault monitor will display malfunction codes on the remote controllers. This simplifies trouble shooting during service calls.

The MWH-180EX is designed to prevent varying temperature of hot water when the faucet is cycled on and off. There is also a quick response mode for rapid heating.

The dimensions of the MWH-180EX use less wall space and no floor space.

The remote controllers are a crisp, modern design to blend in any decor.

Endless loop in input and output control ensures a stable flow of hot water.

Low NOx. The Rich - Lean design of the burner produces minimum nitrogen oxide.

Greater reliability of electric components due to the potted control circuit board.

FOR YOUR SAFETY READ BEFORE OPERATING

For your safety and proper use of the unit.

Read and understand the following important symbols before use.
The cases shown below are classified by the degree of risk and damage.
Be sure to follow the instruction symbols for your safety.

⚠ **Danger**	"Danger" indicates that serious injuries or even death to the user may result if the instruction is neglected and the unit is mishandled.
⚠ **Warning**	"Warning" indicates the possibility that serious injuries or even death to the user may result if the instruction is neglected and the unit is mishandled.
⚠ **Caution**	"Caution" indicates the possibility that some injuries to the user, and/or material damage may result if the instruction is neglected and the unit is mishandled.

Each mark indicates:

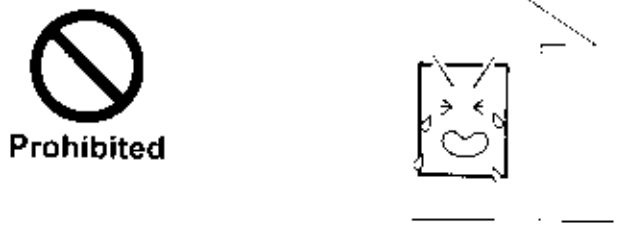
	General instruction
	Electric shock
	Fire
	High temperature
	General prohibited
	No flammables
	Do not touch
	Do not disassemble.
	Never fail to do.
	Ground

This product must be installed by a licensed plumber, or gas fitter, when installed in the commonwealth of Massachusetts.

FOR YOUR SAFETY READ BEFORE OPERATING

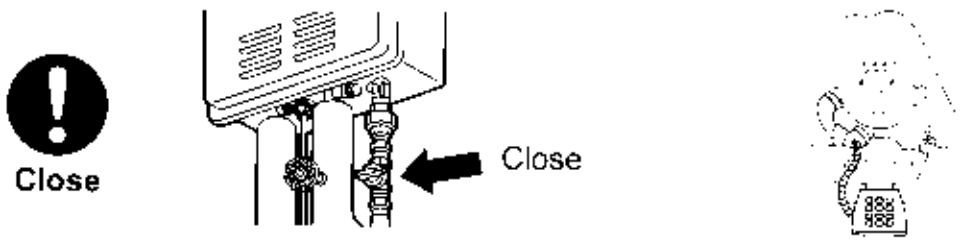
⚠ Danger

Prohibited installation indoors and in a bathroom.



Never install the unit indoors or in a bathroom due to outdoor installation type.
Incomplete combustion may result and it may cause carbon monoxide poisoning.

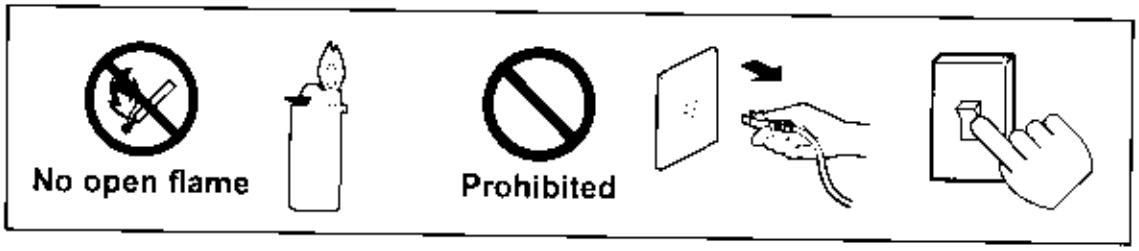
Check for gas leak. (May cause fire.)



If a gas leak is noticed, stop using the unit immediately and close the gas valve, then contact your service person, or the gas supply company.

Do not light any appliance, disconnect/connect the power plug or touch any electric switch.
Close the main gas valve in case the unit is not used for a long time.

Call from a neighbor's house. Do not use your home telephone.



FOR YOUR SAFETY READ BEFORE OPERATING

⚠ Warning

Caution to prevent scalding.

Caution

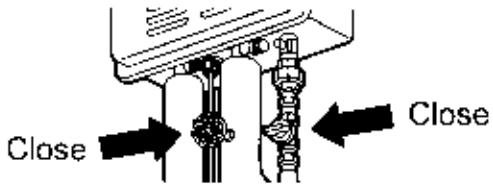
Check the water temperature by hand first before using shower or stepping into the bath tub.
Do not change the temperature setting while others are running hot water.
Gush of hot water may cause scalding or cold water may cause discomfort.

Measures to be taken in case of emergency.

When there is an emergency such as earthquakes, tornadoes, hurricanes or fire, follow these procedures.

1. Turn off the hot water faucet.

2. Close the gas valve and the main water valve.



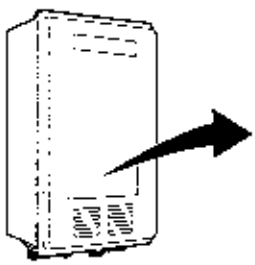
3. Turn off the main power.
   Warning, in case of gas leakage, first close the gas valve and wait for the leaked gas to disperse, then turn off the main power supply.

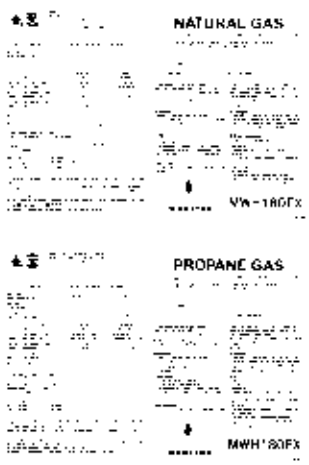
4. Contact your service technician, or gas supplier.
   Call from a neighbor's house. Do not use your home telephone.

Confirm type of gas and power supply.
(Wrong gas type may cause incomplete combustion, explosive ignition or fire.)

Check

Make sure to use the correct gas type as well as power supply (voltage/frequency) as indicated on the RATING LABEL located on the side of the cabinet.
Natural Gas or Propane Gas is stated on the GAS TYPE LABEL.





FOR YOUR SAFETY READ BEFORE OPERATING

⚠ Warning

Pay attention to children. (cause of accident.)

Prohibited

Do not allow small children to play in the bathroom or to play with the remote controllers.

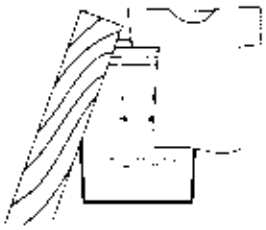
Disassembly, repair or modification of the unit may cause fire, electric shock or other accidents.

Do Not Disassemble

Do not disassemble or modify the units. Never fail to ask for professional assistance from your dealer for installation, removal, auxiliary installation work, or connection to solar units.

Caution for flammable items.
(May cause fire or explosion.)

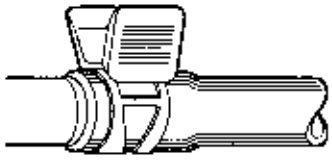
Warning



Do not place any flammable items such as gasoline, benzene, or spray cans near the appliance.
Do not use them around the heater or the exhaust vent terminal.
Take special care.

No rubber piping.
(May cause gas leakage or fire.)

Prohibited



Rubber pipe should never be used for gas piping line.

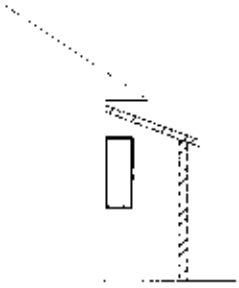
Do not go out or sleep while leaving the hot water running.

Turn off

Turn off

Prohibited installation of the unit in the enclosure.

Prohibited

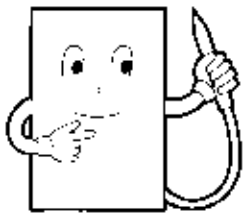


After installation, do not enclose the unit or the exhaust outlet by corrugated plate, vinyl sheet or wood sheeting etc.
Carbon monoxide or fire by incomplete combustion may result.

FOR YOUR SAFETY READ BEFORE OPERATING

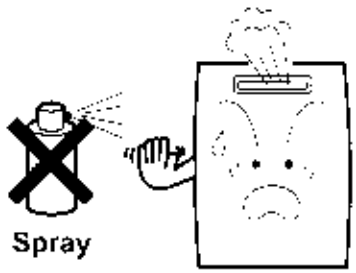
⚠ Caution

Be sure to electrically ground the unit.



Do not touch the exhaust vent pipe and water heater during or immediately after operation.

Do not use hair spray or spray detergent in the vicinity.



Do not install in locations where excessive dust or debris will be in the air.

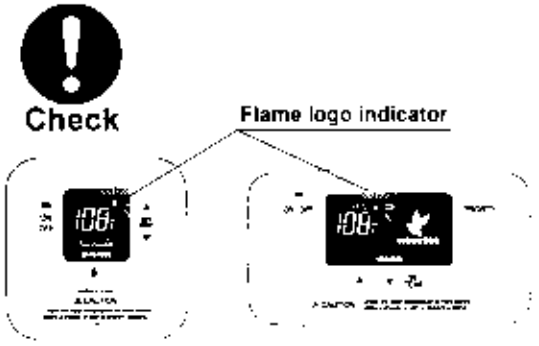
Do not wipe remote controller with gasoline, benzene, or detergents.

Do not turn off the water heater or change the water temperature while someone is bathing or washing. That may result in scalds or burns.

FOR YOUR SAFETY READ BEFORE OPERATING

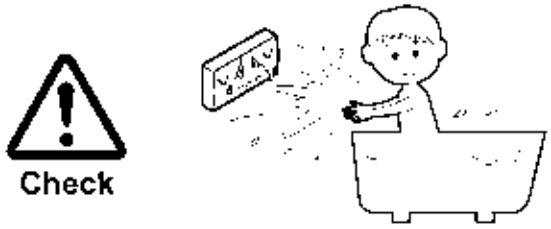
⚠ Caution

Confirm ignition, combustion and extinction.

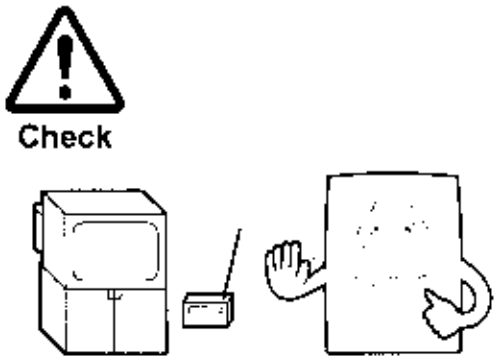


Always check Flame logo indicator for combustion and that the unit has shut down by checking the operation lamp on the Main or Bath remote controller.

Do not allow the remote controller to get wet. (May cause controller to fail.)

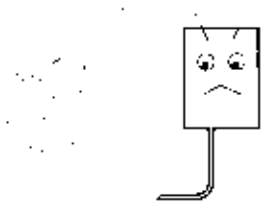


Do not install near electric appliances.



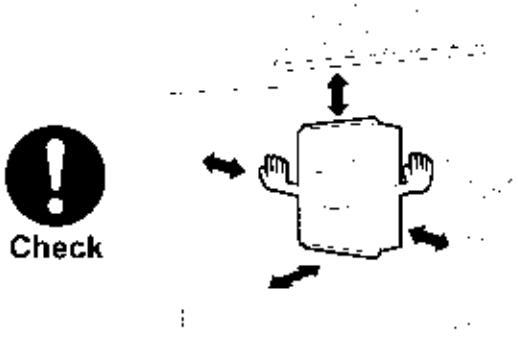
When installed near the TV or radio, it may cause picture disturbance or sound disturbance.

Measures to be taken for lightning possibility. (May cause failure.)



Temporary voltage surge caused by lightning can damage the electronic parts.
Turn off the main power when you hear thunder.

Provide adequate space around the unit for service.



Make sure to have enough room around the unit to ensure space necessary for checking and maintenance.

Pay attention to applications.

Do not use the unit for other applications than domestic hot water supply and shower.
For commercial use, see warranty.

FOR YOUR SAFETY READ BEFORE OPERATING

⚠ Caution

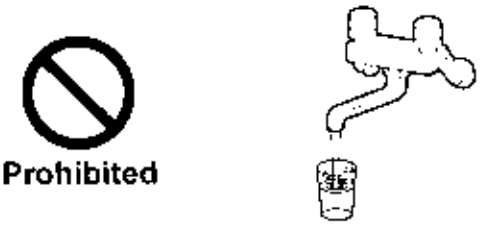
Use only genuine factory designated parts and accessories.

Instruction in case the unit is used in lime-rich water (hard water) area.

Drain the residual hot water in the unit away. Otherwise the lime may harden and deposit in the pipe, causing lower efficiency and damage to the unit. (refer to page 14)

The MWH-180EX is designed primarily for single family home use.

Notice:
If used in a commercial application, a limited warranty applies.



Water or hot water left in the unit for a long time is not suitable for drinking or cooking. Do not drink or use for cooking.

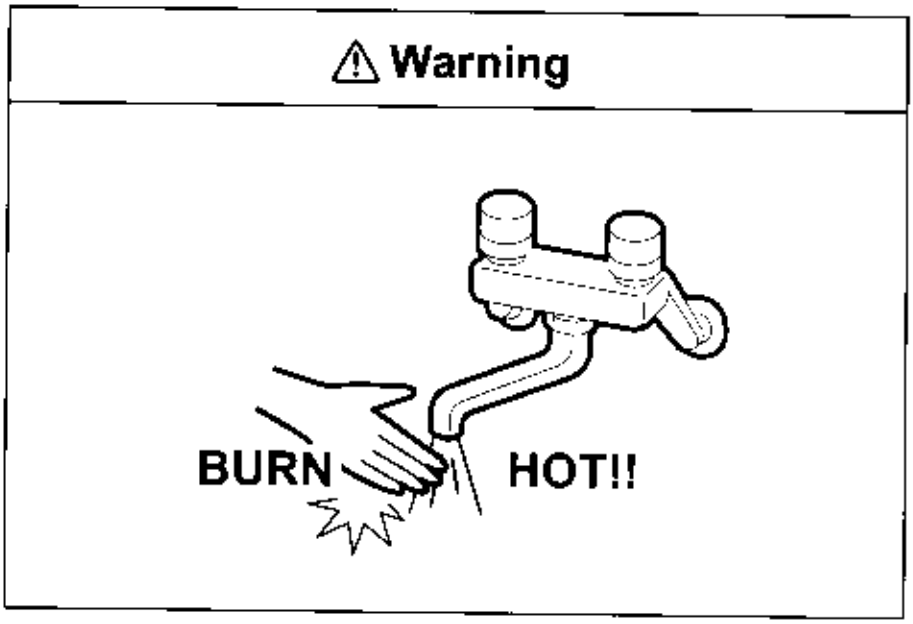
Blockage in exhaust outlet by snow.

In winter make sure snow does not block the exhaust outlet and air inlets.
Take necessary measures to prevent snow drifts from blocking the exhaust outlet and air inlets.

Do not put fingers or sticks into the exhaust outlet. This may cause injury and/or damage the water heater.

ABOUT HOT WATER

Hot water heater temperature over 125°F can cause severe burns instantly or death from scalding.
Children, disabled and elderly are at the highest risk of scalding.
Feel water temperature before bathing or showering.



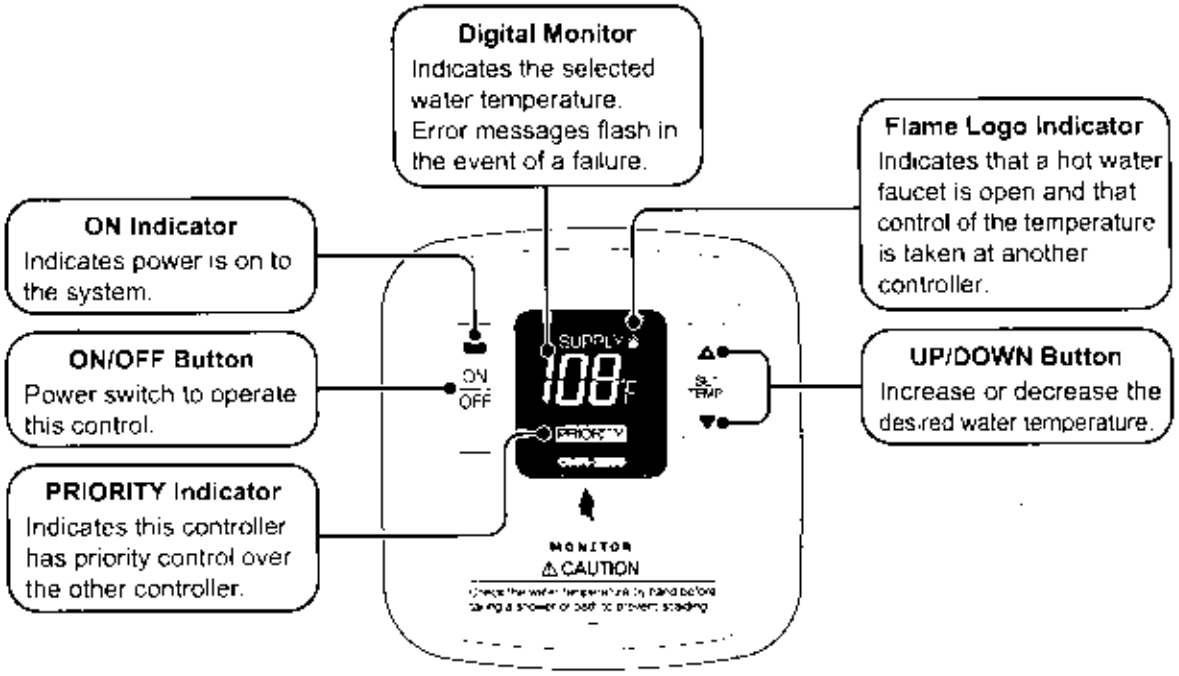
SCALDS - FIRST AID

1. **Remove clothing;** Remove all wet clothing quickly. Wet clothing retains the heat.
2. **Apply cold water for 30 minutes;** Immediately submerge the burnt area in cold water for 30 minutes to reduce the heat in the skin, preventing deeper burning.
   Never use butter, oils or ointment to cover the burn. They may retain the heat.
3. **Keep the scalded person warm;** Place a blanket around the person.
4. **Seek medical advice;** Call your medical advice hotline and describe the scald, follow their directions.

REMOTE CONTROLLER OPERATION

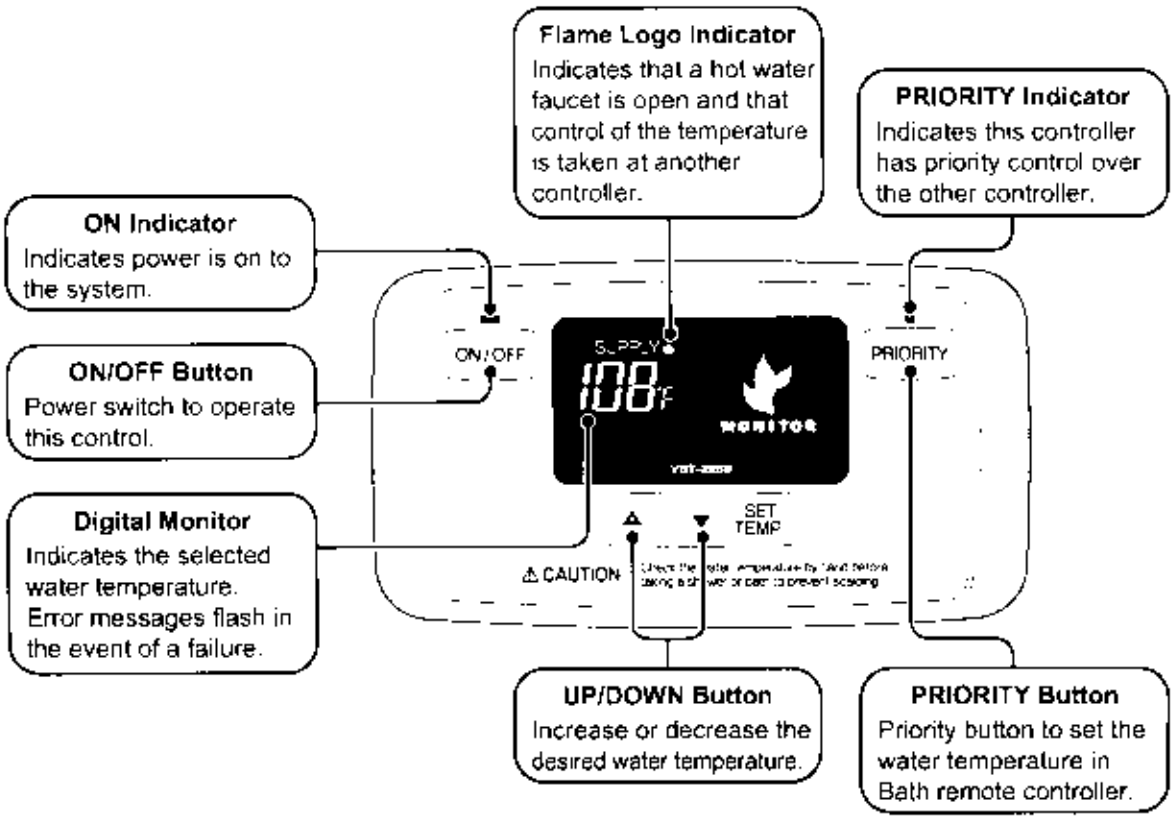
CMR-2250 (P/N 3748)
(Main remote controller)

This remote controller is intended to be used in the kitchen, laundry room or utility area.



YST-2250 (optional P/N 3749)
(Bath remote controller)

This remote controller is intended for installation in the bathroom.



REMOTE CONTROLLER OPERATION

Operation of Main/Bath remote controller.

Please read these instructions carefully before using this appliance.

1. Turn on the ON/OFF button. (refer to page 12.)
2. The temperature display will illuminate at 108°F.
3. The priority indicator will illuminate.
4. Select hot water temperature by pushing UP/DOWN button (▲ or ▼) on the controller.
5. Turn on the hot water faucet. Flame logo indicator will illuminate after a short delay. This indicator will remain illuminated until the hot water faucet is turned off.
6. The hot water temperature can be altered at any time during the operation by pushing UP/DOWN button (▲ or ▼) located on the controller.

PRIORITY control. (change.)

The temperature can only be controlled by the remote controller which has the priority indication.
Priority button is only located on the Bath remote controller.
When the priority switch is turned on, priority control over the water temperature is changed voluntarily.

⚠ Warning
Do not turn off the water heater or change the water temperature while someone is bathing or washing. That may result in scalds or burns.

- In case of installation of both a Main remote controller and a Bath remote controller with priority button ON, when pushing priority button on Bath remote controller, the hot water temperature will read 108°F.
- In case of installation for Bath remote controller only, when pushing priority button on them, hot water temperature will read 108°F.

USE IN THE LIME-RICH WATER (HARD WATER) AREA

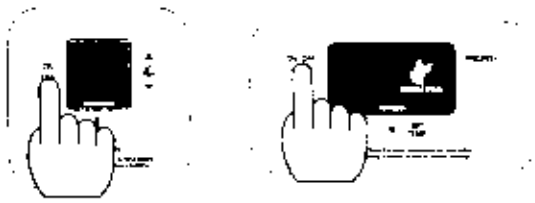
⚠ Caution

In case the unit is used in the lime-rich water (hard water) area, make sure to flush the residual hot water away.
Otherwise lime may harden and deposit in the pipes causing low efficiency and damage to the unit.

How to operate.

Perform the following steps after the hot water is used.
If control switch is not easily accessible :
Partially open the hot water faucet so that there is less than half gallon flow until the cold water starts to run.

1. Turn the ON-OFF button off.



2. Turn on the hot water faucet.

Let the residual hot water completely run out.

3.

Turn off the hot water faucet when the cold water starts to run.

- Contact a qualified MPI service technician to remove lime once a year.
  Failure to perform the annual maintenance will cause malfunction or damage to the heat exchanger.
  Damage caused by the lime build up is not covered by the unit's warranty.
  If a "LC" code shows in the remote controller, call a technician to flush the system.

CAUTION

The residual water in the unit.

Do not drink or cook with any of the water left in the unit or in the pipe for a long time because the quality may have deteriorated.

Power failure in winter.

Prevent freezing by following steps " **(2) By running water from any faucet.** " or " **(3) By removing water in unit as freezing may cause damage to the unit.** " as freezing may cause material damage to the unit. (refer to page 16,17)

Resetting after power failure.

Note :

When not using the remote controller : Ensure that the hot water faucets are turned off.
The unit will automatically reset after power is restored.
When using remote controller(s) : If the remote controller was turned ON, when power is restored, the remote controller will be ON, and the unit will automatically reset and deliver hot water on demand.
If the remote controller has been shut OFF, it will remain OFF. After power is restored, and the remote controller is turned back ON, the until will be ready to use at the next demand for hot water.
If an error code appears before the power outage, the unit will remain OFF until the problem is resolved.

In case damage is caused by natural disasters such as earthquakes, tornadoes or hurricanes.

If gas or water leakage is suspected even though there is no apparent damage, shut off the Main Gas valve, close the water valve, disconnect power supply, and check the extent of the damage. Contact your local dealer for further assistance.

PREVENTION OF FREEZING DAMAGE DURING WINTER SEASON

Prevention of freezing.

The unit or pipe is likely to be damaged by freezing, not only in the cold latitudes, but also in the mild-temperature zones in winter season. Pay careful attention to prevent freezing pipes.

(1) Anti-frost heater. (automatic.)

The power supply.

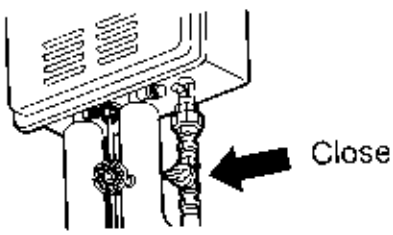
⚠ Caution

Make sure electrical power is supplied to the heater.
The anti-frost heater keeps the water supply circuit warm inside the unit.

In extremely cold temperature (10°F) the anti-frost heater may not be sufficient. Strong or constant winds at low temperatures can have an additional negative impact on anti-frost heater capactity. The following step **(2)** or **(3)** should be tried to avoid freeze-up.

(2) By running water from any faucet.

1. Close the main gas valve.



2. Turn on the hot water faucet.

Keep water running at about 1/10 gal/min (400cc/min).

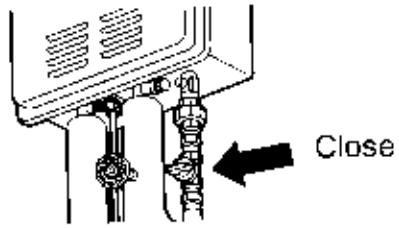
3. Turn off the main power.

Notice :
This helps prevent freezing of the pipes and the valves as well.
Check the flow volume 30 minutes after this procedure as the flow may fluctuate.

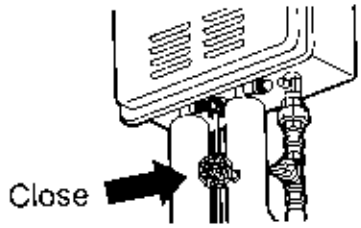
PREVENTION OF FREEZING DAMAGE DURING WINTER SEASON

(3) By removing water in unit as freezing may cause damage to the unit.

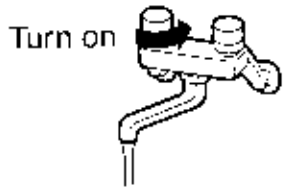
1. Close the main gas valve.



2. Close the main water supply valve.

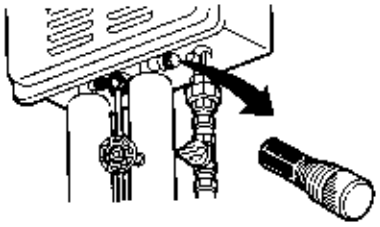


3. Turn on the hot water faucet.



Turn on a shower faucet if any.

4. Remove the drain plug and the water filter. (drain stopper.)



5. Turn off the main power.

Notice :
This is the best method for protecting the unit, although freeze prevention is not possible for the pipe and the valve.
When operation is resumed, put the water filter (drain stopper) back on and check if water runs from the hot water faucet by turning on the main water supply valve.

FOR YOUR SAFETY READ BEFORE OPERATING

WARNING : If you do not follow this instruction 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 that 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 neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

C. Use only your hand to turn the gas control knob. Never use tools. If the knob will not turn by hand, do not try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or an 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 parts of the control system and any gas control that have been under water.

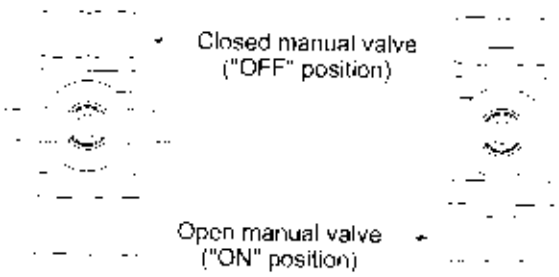
OPERATING INSTRUCTIONS

1. Stop! Read the safety information mentioned previously before proceeding.

2. Turn off all electric power to the appliance.

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

4. Turn the manual valve (installed on the gas supply line) clockwise ↷ to the full OFF position.



5. Wait (5) minutes to clear out any gas. If you then smell gas, STOP! Follow "B" in the safety information above on this manual. If you do not smell gas, go to next step.

6. Turn the manual valve (installed on the gas line) counterclockwise ↶ to the full ON position.

7. Turn on all electric power to the appliance.

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

2. Turn the manual valve (installed on the gas supply line) clockwise ↷ to the full OFF position.

DAILY INSPECTION AND MAINTENANCE

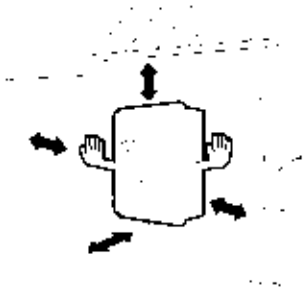
Tips for the inspection.

⚠ Caution

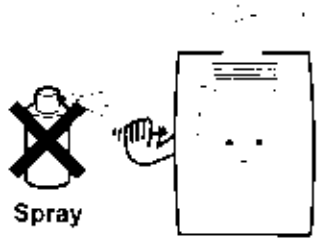
Carry out the inspection and maintenance after the unit is shut down and cools off.
Turn the gas valve off and disconnect the power supply.
Pay full attention to any sharp edges on metal parts when doing inspection and maintenance, as they may cause some injuries.
Never disassemble or modify the components.
Contact the service person when the unit does not work properly.

Inspection. (daily.)

Exhaust outlet, air intake and the surrounding area.

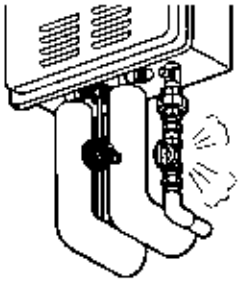


Make sure nothing obstructs the exhaust outlet and air intakes.
Make sure all clearances are maintained.



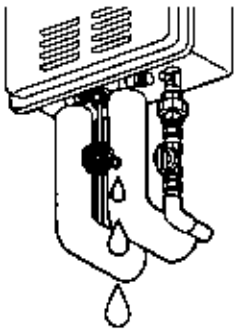
Make sure to keep the area surrounding the unit and the exhaust outlet clear of any combustibles and hazardous materials.

Gas leakage.



Check if gas is leaking from the unit and the Gas pipe.
Gas leakage will cause a strong odor.

Water leakage.



Check if water is leaking from the unit or the inlet or outlet pipes.

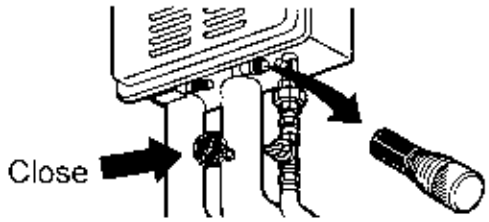
DAILY INSPECTION AND MAINTENANCE

Maintenance. (as required.)

Dust.

Wipe away dust and stains on the outside surface of the unit with a cloth or a sponge soaked in neutral detergent.
Make sure air intake louvers are clear.

Cleaning the water filter. (drain stopper.)



Close the main water supply, open a hot water faucet to relieve any water pressure, take the water filter (drain stopper) out, and clean the filter element inside.

How to replace a component.

Contact the dealer when you need a component replaced.
Make sure to use only factory authorized part(s) for replacement.

CAUTION : Do not use the unit if it is not operating correctly.
This may result in explosion, gas leakage, or faulty combustion.
Contact the dealer or qualified service person when a repair is required.

Scheduled inspection.

An inspection is necessary for the unit after it has operated for a long period.
The annual inspection of at least once a year is recommended.

IN CASE THE UNIT REMAINS UNUSED FOR A LONG TIME

Remove the water in the unit in accordance with **Prevention of freezing " (3) By removing water in unit as freezing may cause damage to the unit** "(refer to page 17) in case the unit is not used for a long time.

FAULT MONITOR

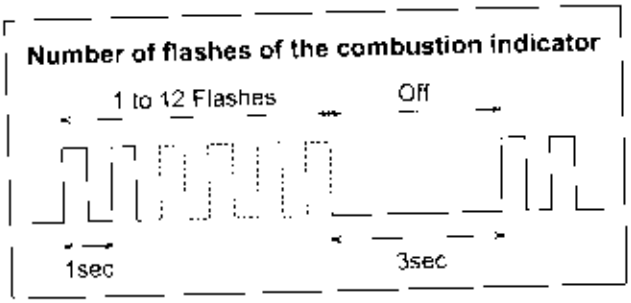
Fault monitor.

The MPI water heater has a self diagnosing function for faults.
When the unit does not operate correctly, an error code is displayed on the Main and Bath remote controllers digital monitor.
The cause of the fault can be determined after checking the fault numbers indicated on the remote controller digital monitor.

Error Code	Number of Flashes	Problem	Remedy
000	-	Power recovery detection.	Check power failure. (Alarm record can be indicated in calling mode)
001	6	During power failure, remote controller wiring is disconnected. (Only applies when using remote controller before power failure.)	Turn off the hot water faucets and turn on again. (Alarm record can be indicated in calling mode.)
111	1	Gas burner fails to ignite.	Check gas supply.
121	3	Loss of combustion.	Check gas supply and pressure.
141	4	Over heat switch activated.	Call service center.
321	5	Outgoing thermistor wire breakage.	Call service center.
331	10	Heat exchanger thermistor wire breakage.	Call service center.
611	7	Fan motor failure.	Call service center.
651	9	Water flow control device failure.	Call service center.
721	2	False flame detection.	Call service center.
740 750	-	After power on, nothing operates, but the error code displays in 1 minute.	Call service center.
740 750 760	8	Communication failure between remote controllers and PCB.	Turn off power and turn on again.
990	12	Air supply or exhaust blockage failure.	Check that nothing is blocking the air intake or exhaust.
LC	-	Scale build-up (in heat exchanger) failure.	Call service center.

Flashing design of combustion indicator of PCB

A light on the PCB will flash 1 to 12 consecutive times depending on the failure type.
A three second delay occurs between each set of flashes.
Call an authorized service technician for trouble shooting and repair.



FAULT MONITOR

Alarm record monitor mode

Alarm record can be monitored by special operation of remote controller

1. Start up of alarm record calling mode.
   While ON/OFF button is OFF, alarm record calling mode is obtained by simultaneously pushing both UP/DOWN buttons (▲ and ▼) at Main or Bath remote controller for 5 consecutive seconds.

• The ON indicator will flash while alarm record calling mode is ON.

2. Alarm record list indication method.
   Alarm record can be monitored by pushing UP/DOWN button. (▲ or ▼)
   Alarm occurrence order will match the following indication.
   1 ---- Previous alarm (If present alarm is not reset, it shows present alarm.)
   2 ---- Alarm 2 occurrences ago.
   3 ---- Alarm 3 occurrences ago.
   4 ---- Alarm 4 occurrences ago.
   5 ---- Alarm 5 occurrences ago.
   6 ---- Alarm 6 occurrences ago.
   7 ---- Alarm 7 occurrences ago.
   8 ---- Alarm 8 occurrences ago.

• If no alarm has been input, indicated by hyphen. (---)

3. Clearing alarm record.
   During alarm record monitor mode, you can clear alarm record index, alarm record 1-8 and combustion period during alarm by pushing ON/OFF button for 10 consecutive seconds.

• Clearing of compiled number of alarms shall not be done.
• In case the unit is relocated, be sure to use the above clearing procedure.

4. Completion of alarm record monitor mode.

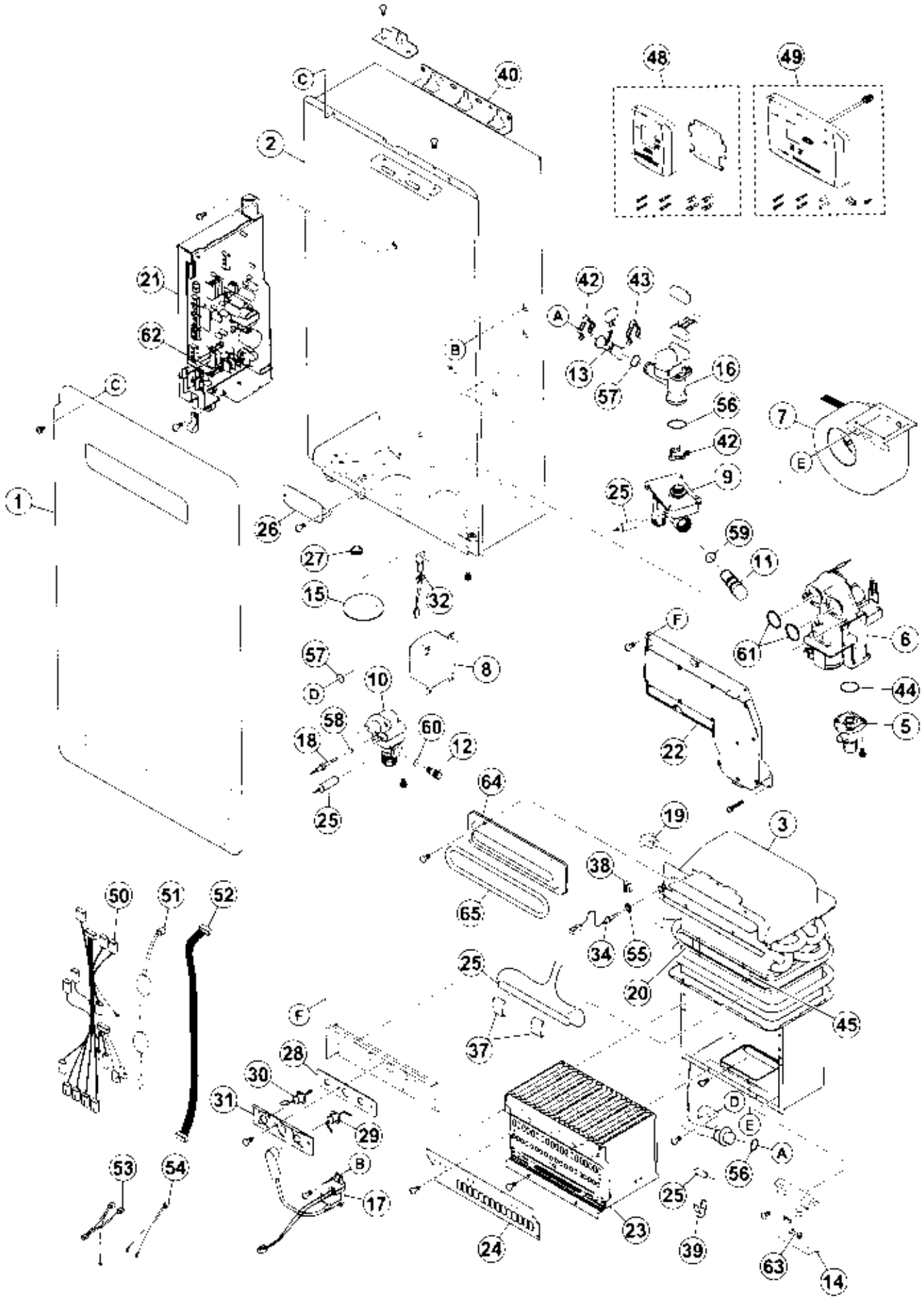
• Alarm record monitor mode will be completed by simultaneously pushing both UP/DOWN buttons (▲ and ▼) for 5 consecutive seconds.
• Alarm record monitor mode will be disengaged if no further operation is made for 5 consecutive minutes while alarm record monitor mode is ON.
• Alarm record monitor mode will be disengaged if operation is resumed by other connected remote controller.

TROUBLE SHOOTING AND SOLUTION

The following problems are not a malfunction or defect.
Check again before asking for servicing.

Problem	Explanation
Hard to ignite at the initial attempts.	Air in the gas pipe. Shut the hot water supply faucet and open. Repeat the process.
Hot water does not flow despite the faucet being open.	Needs minimum water flow to ignite. Turn the faucet further for more volume.
Hot water supply is discontinued during the blackout and no recovery after the power is back on.	The unit will automatically reset as described on page 15.
Hot water with the desired temperature is not available at an instant faucet is turned open.	It takes a little time to reach the set temperature because of the residual water in the pipe and of the distance between the unit and the faucet.
White steam comes out from the exhaust outlet.	The exhaust gas contains a lot of vapor which turns white in contact with cold air.
Hot water looks white.	Air dissolved in the water is separated and appears white.
The blower keeps running for a while after the hot water faucet is turned shut.	It continues to run for about 65 seconds to discharge the exhaust gas in the combustion chamber.
Water temperature and flow volume sometimes become unsteady.	Water temperature and flow volume may fluctuate in case hot water is used at other faucets at the same time or water pressure changes occur or gas regulator fluctuations.
The surface of the remote controller feels warm.	The remote controller itself feels warm because of the display screen light, etc. Electronic circuit is activated even when the switch of the remote controller is off. The heat is generated.
Hot water flow volume fluctuates, even in case of same set temperature.	Hot water flow volume may fluctuate by the difference in water supply temperature or water is supplied by a well with pump pressure fluctuations.
Temperature of the water at the faucet may also vary from the displayed temperature at the remote controller.	Hot water temperature may vary from set temperature by the climate, plumbing length or water flow.

EXPLODED VIEW



PARTS LIST

Number	MPI P/N	Description	Number	MPI P/N	Description
1	3764	Front Panel	37	3737	Anti-Frost Heater Clip A
2	3765	Casing Assembly	38	3738	Thermistor Clip
3	3766	Heat Exchanger Assembly	39	3739	Anti-Frost Heater Clip B
5	3705	Gas Connection	40	3778	Wall Hanging Bracket
6	3767	Gas Control Assembly	42	3742	Quick-Fastener 16A
7	3768	Fan Motor Assembly	43	3743	Quick-Fastener 16C
8	3708	Transformer	44	3744	Rubber Packing
9	3709	Water Inlet	45	3745	Thermal Fuse Clip
10	3710	Hot Water Outlet	48	3748	Main Remote Controller CMR-2250
11	3711	Water Filter	49	3749	Bath Remote Controller YST-2250
12	3712	Drain Plug	50	3779	Harness
13	3713	Water Flow Sensor	51	3751	Power Supply Lead Wire
14	3714	Surge Protector	52	3752	Water Flow Control Device Lead Wire
15	3769	Cable Inlet	53	3753	Heater Lead Wire
16	3716	Water Flow Control Device Assembly	54	3754	Terminal Block Lead Wire
17	3770	Igniter Transformer	55	3755	O-ring P4 Fluorine
18	3718	Thermistor	56	3756	O-ring P16 EPDM
19	3719	Over Heat Switch	57	3757	O-ring P14 EPDM
20	3720	Thermal Fuse	58	3758	O-ring P4 EPDM
21	3771	PCB (Propane Gas)	59	3759	O-ring P12 EPDM
	3772	PCB (Natural Gas)	60	3760	O-ring P8 EPDM
22	3722-1	Manifold Assembly (Propane Gas)	61	3761	O-ring P24 NBR
	3722-2	Manifold Assembly (Natural Gas)	62	3762	PCB Fuse
23	3773	Burner	63	3763	Surge Protector Fuse
24	3724-1	Damper (Propane Gas)	64	3780	Exhaust outlet
	3724-2	Damper (Natural Gas)	65	3781	Exhaust outlet packing
25	3774	Anti-Frost Heater Assembly			
26	3775	Junction Box Cover			
27	3727	Cable Inlet			
28	3776	Electrode Packing			
29	3729	Electrode			
30	3730	Flame Rod			
31	3731	Electrode Holder			
32	3777	Frost Sensing Switch			
34	3734	Heat Exchanger Thermistor			

INSTALLATION INSTRUCTIONS

- The cases shown below are classified by the degree of risk and damage. Be sure to follow the instruction for your safety.

⚠ **Danger**	"Danger" indicates that serious injuries or even death may result from the improper installation due to negligence of following the instructions.
⚠ **Warning**	"Warning" indicates the possibility that serious injuries or even death may result from the improper installation due to negligence of following the instructions.
⚠ **Caution**	"Caution" indicates the possibility that some injuries or material damage may result from the improper installation due to negligence of following the instructions.

Each mark indicates:

	General prohibited
	Never fail to do.
	Ground

⚠ Danger

- Never install the unit indoors as it is exclusively for outdoor use.
- Do not install it in the bathroom. Electric shock or leakage may result.

To the installers.

⚠ Warning

- Read and understand the installation manual to carry out the installation as specified for proper and safe usage.
- A competent dealer or plumber should perform the complete installation, including placement, plumbing, gas line, and electrical connection.
  Consumers should not try to install their own unit.
- Make double sure that the unit runs in accordance with the check items of "trial run" standard after it is installed. (refer to page 47, **Testing operation**)
- When installation of water heater, be sure to wear protective equipment to prevent injuries and burns.
  After installation, do not enclose the unit with anything such as corrugated sheets, which may develop an indoor-like closed environment. It poses serious danger due to the shortage of oxygen or imperfect combustion.
- If the supply water pipe is incorrectly connected to the gas inlet, do not attempt to operate the unit by simply reconnecting the pipe correctly. this will only cause further damage to the unit.

Corrective measures

It will be necessary to replace all the internal gas components if the gas piping is hooked up incorrectly.

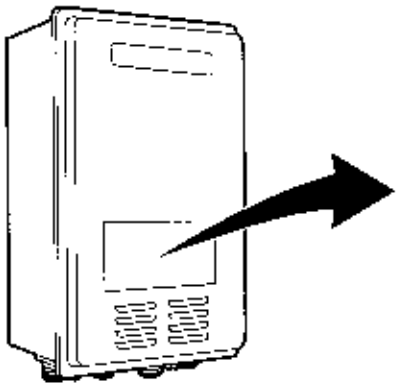
INSTALLATION INSTRUCTIONS

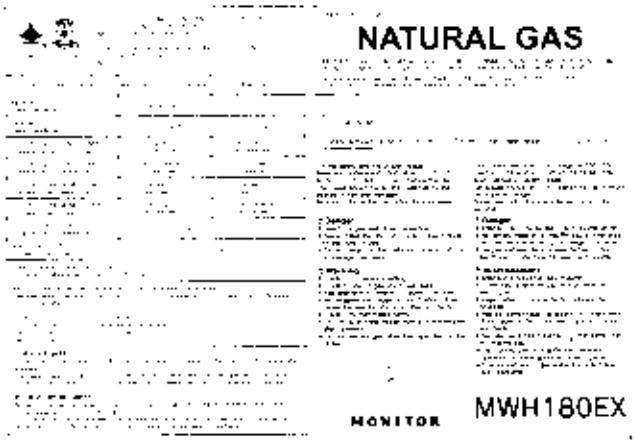
Before installation.

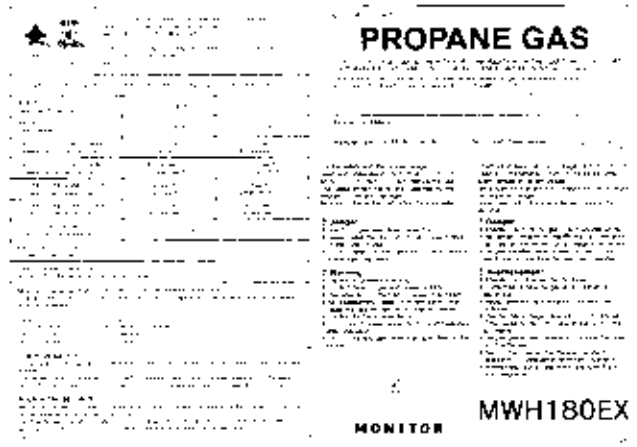
Verification of the unit.

⚠ Warning

- Make sure the unit to be installed suits the intended use and application.
- Do not use any gas other than specified on the sticker.
- Do not operate with any power source (voltage/frequency) other than specified on the sticker.







Location of the unit.
Decide where to install the unit by considering customer's request and venting length limitations and clearances.

⚠ Warning

Ventilation

- Install the unit where there is enough space for ventilation.
- Do not install the unit where flammables such as gasoline, benzene, and adhesive are handled.
- This unit does not allow the use of extended exhaust pipes.
- Install the unit as far as possible, away from anything in front or above even if it is non-combustible in order to prevent exhaust gas recirculation, and staining of surfaces.
- Take preventive measures against snow drifts for air inlet and exhaust outlet to stay unaffected in case there is a possibility that they may be blocked by snow fall.

INSTALLATION INSTRUCTIONS

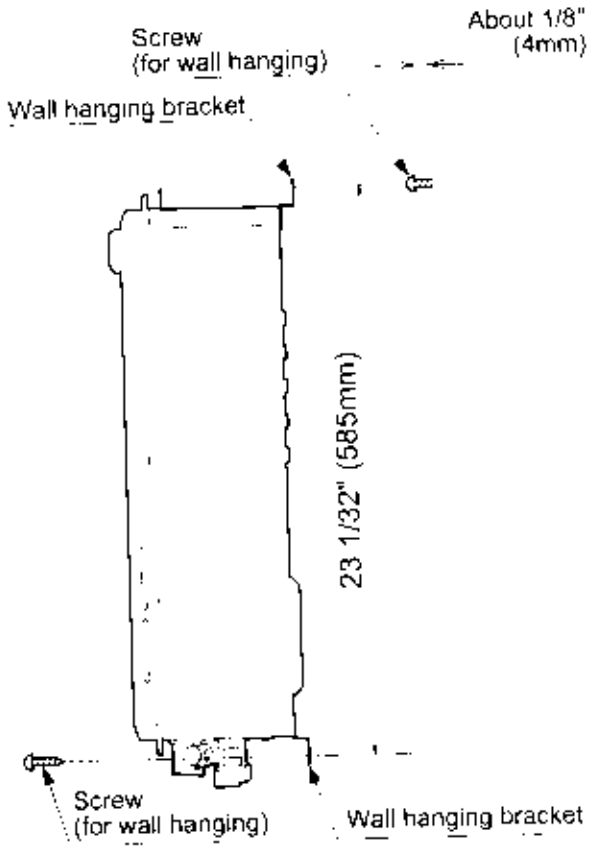
Installation.

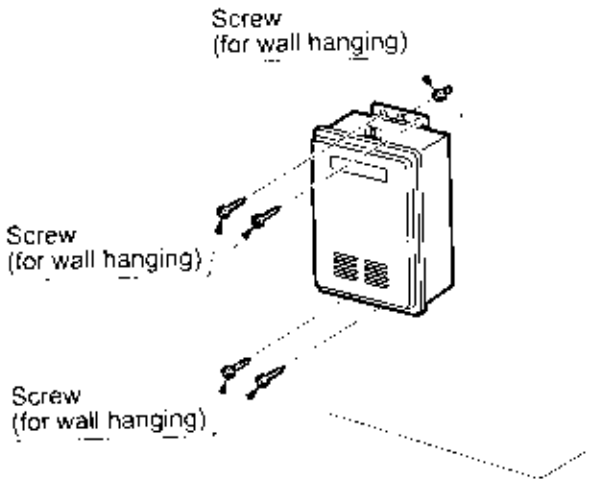
⚠ Caution

- Reinforce the wall if necessary as this unit weighs about 40lbs.

1. Twist 1 screw (for wall hanging) into the wall leaving about 1/8inch (4mm) length to hook on.

2. Hook the center hole of the wall hanging bracket onto the screw and securely fix the unit with 4 screws.





INSTALLATION INSTRUCTIONS

⚠ Caution

- Check if adjacent wall or ceiling is fire resistant and allows safe distance for fire prevention.
- This water heater is suitable for residential water (potable) heating only. Do not use this water heater for space heating, combination space heating/domestic water heating, or commercial water heating applications.
- MWH-180EX is not suitable for use in pool or spa applications.
- Maintain proper space around the unit for proper servicing and operation. Minimum clearances from combustible materials are listed below.

Top of heater	12" (30.5cm)
Front of heater	24" (61.0cm)
Sides of heater	6" (15.2cm)
Back of heater	0" (0cm)
Floor	12" (30.5cm)

Note : These clearances do not apply if installing unit into an MPI recess box, however they do apply from the exhaust port to combustible once the exhaust port comes out of the recess box.

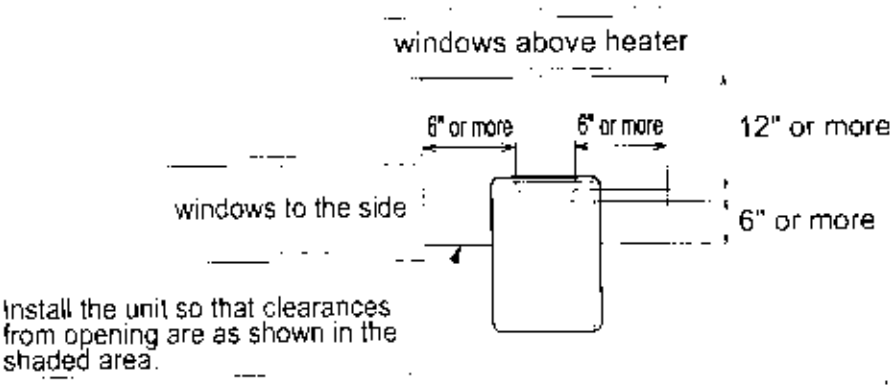
- Do not install MWH-180EX under an overhang less than 3feet from the top of the unit. When the overhang protrudes out over MWH-180EX greater than 3feet, the area under the overhang must be open on 3sides.
- When the water heater is installed within a recess box, the clearances from the top, bottom, sides, and back surfaces of the recess box to combustible materials are 0inch. The clearance from combustibles from the front of the recess box is 24inches.
- Secure enough space so that the inspection and repairs can be done easily.
- Secure space not only in front but also under the unit.
- Do not install the unit over other combustion appliances such as gas cooking stove or a range.
  Oil residue and dust in the air can adhere to the burner and the heat exchanger resulting in deformation, loss of efficiency, or damage to electronic components.
- Do not install the exhaust outlet near the outlets of the other appliances.
  Install the air inlets away from the wind path as the wind may cause imperfect combustion.
- Do not install the unit where commercial chemicals are used.
  Those chemicals are ammonia, sulfur, chloride, ethylene compound and acids which are used at beauty shop, laundry, factory and so forth.
- Do not install the unit over food or dishes.
- Installer must install a Pressure relief valve.
  Pipe pressure relief to a drain or outside environment, or within 4inches of the floor.
  Pipe pressure relief discharge to a drain or outside environment. (refer to page 38)
- The appliance should be located in an area where leakage from the unit or connections will not result in damage to the area adjacent to the appliance or to lower floors of the structure. When such locations can not be avoided, it is recommended that a suitable drain pan, adequately drained, be installed under the appliance. The pan must not restrict combustion airflow.

INSTALLATION INSTRUCTIONS

- Install the unit where there will be adequate distance from windows as shown in the diagram below.
  Pay special attention to distances from windows on adjacent buildings on both sides.

Definition of Clearances from Openings in the Building

Building openings refer to the windows of the building, or any openings resulting from an open door or sliding doors or windows. It does not include sky lights or the fixed part of a single sliding window.



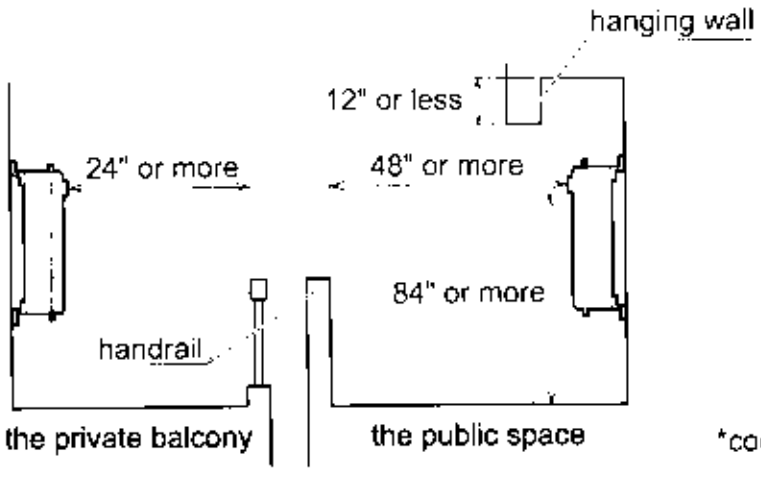
- Do not install the unit so that the exhaust gas directly hits against any reinforced glass plate. The glass may crack or break due to the exhaust heat.

- Do not install the unit near plants, pets, or low heat resistant plastic products that are susceptible to the exhaust heat. The plants may wither and the pets may die.

- In non-public areas the minimum height from the floor to the exhaust is 84inches (213.36cm).

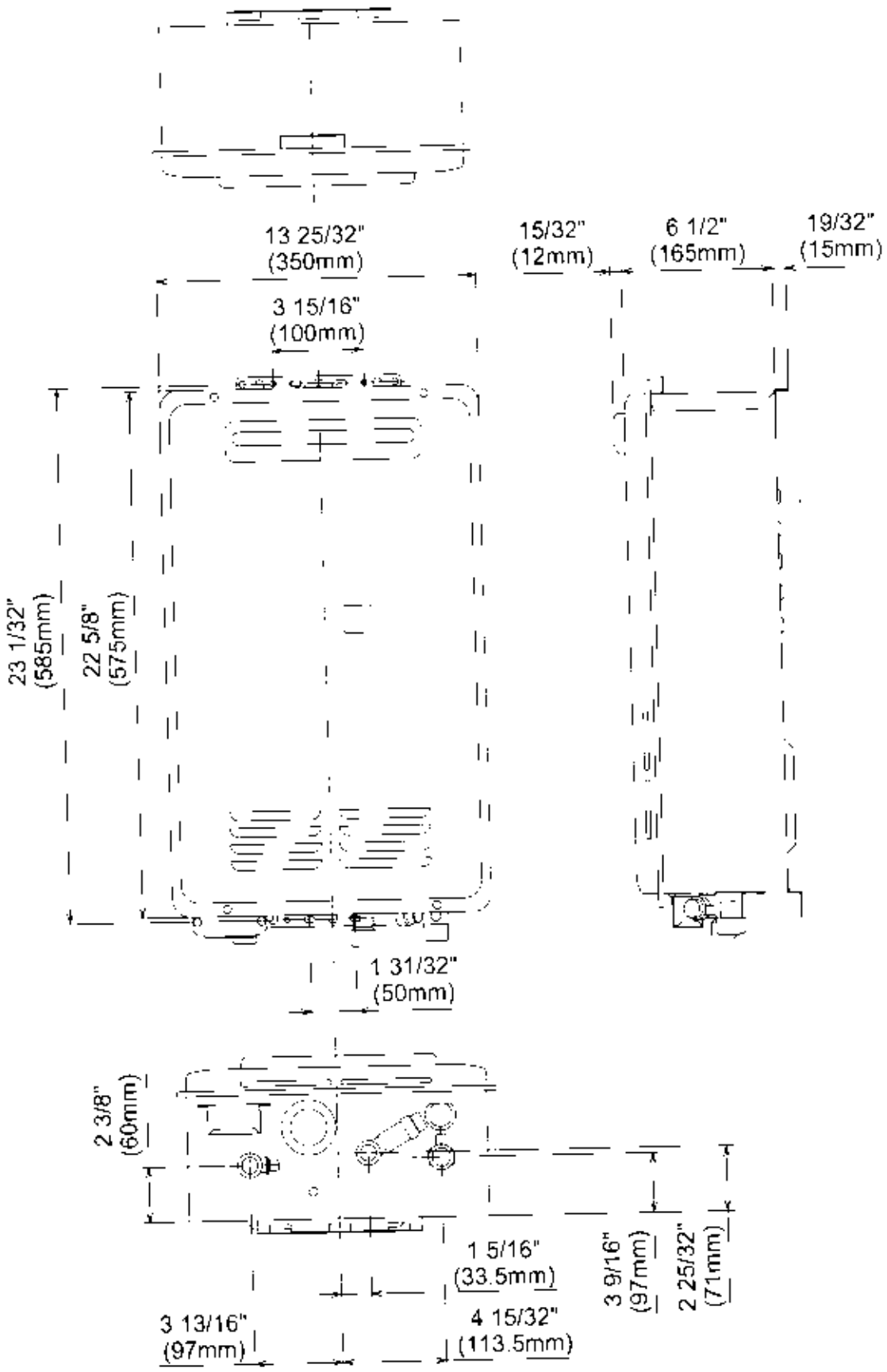
- If there is an overhanging eave ensure that there is a minimum of 12inches (30.48cm) clearance.

- Ensure a minimum of 24inches (60.96cm) clearance for the exhaust stream in non-public spaces. Ensure a minimum of 48" (121.92cm) clearance for the exhaust stream in public spaces.



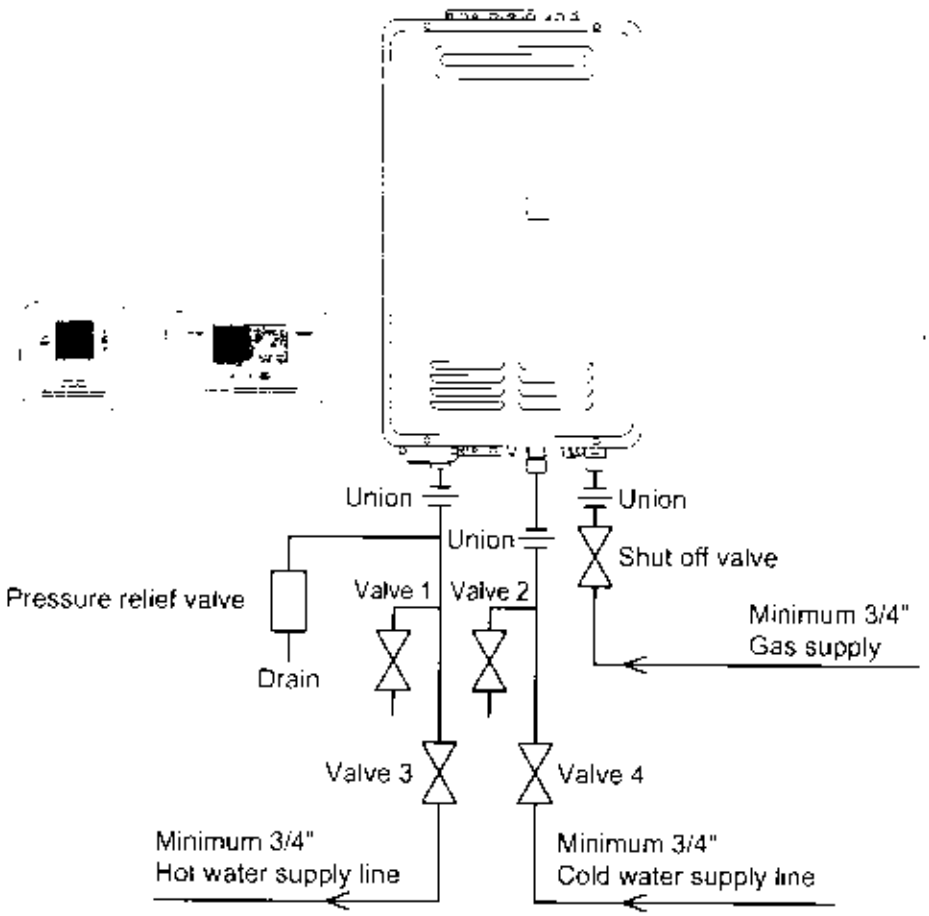
*code is NFPA 211

DIMENSIONS


13 25/32"
(350mm)
15/32"
(12mm)
6 1/2"
(165mm)
19/32"
(15mm)
3 15/16"
(100mm)
23 1/32"
(585mm)
22 5/8"
(575mm)
1 31/32"
(50mm)
2 3/8"
(60mm)
1 5/16"
(33.5mm)
3 9/16"
(97mm)
2 25/32"
(71mm)
3 13/16"
(97mm)
4 15/32"
(113.5mm)

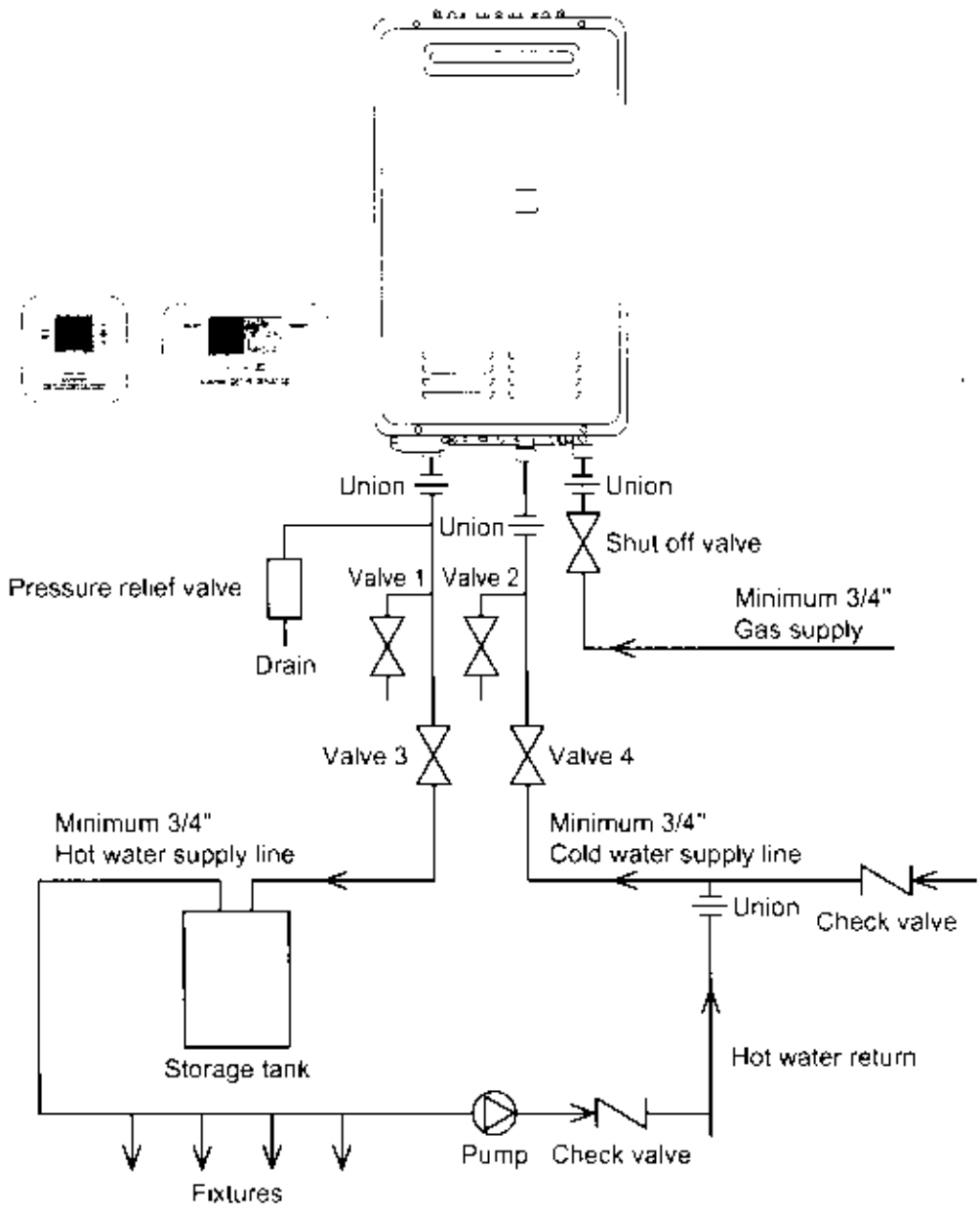
SUGGESTED PIPING-BASIC INSTALLATION

This drawing is intended only as a guide.
It does not imply compliance with local building codes.
Installation must be done in accordance with local building codes and may vary depending on installation location
Confer with local building officials before installation.



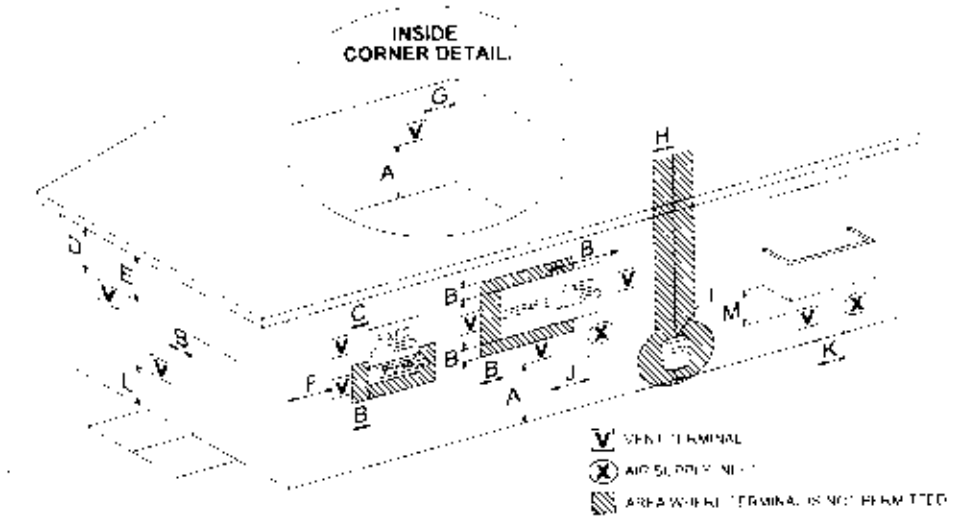
SUGGESTED PIPING-CIRCULATION SYSTEMS

This drawing is intended only as a guide.
It does not imply compliance with local building codes
Installation must be done in accordance with local building codes and may vary depending on installation location.
Confer with local building officials before installation



VENT TERMINAL CLEARANCES

Vent Terminal Clearances.



		Canadian Installations [1]	US Installations [2]
A=	Clearance above grade, veranda, porch, deck, or balcony	12 inches (30cm)	12 inches (30cm)
B=	Clearance to window or door that may be opened.	6 inches (15cm) for appliances ≤ 10,000 Btuh (3kW), 12 inches (30cm) for appliances >10 000 Btuh (3kW) and ≤ 100 000 Btuh (30kW), 36 inches (91cm) for appliances >100 000 Btuh (30kW)	6 inches (15cm) for appliances ≤ 10 000 Btuh (3kW), 9 inches (23cm) for appliances > 10,000 Btuh (3kW) and ≤ 50,000 Btuh (15kW), 12 inches (30cm) for appliances > 50,000 Btuh (15kW)
C=	Clearance to window or door that may be opened.	*	*
D=	Clearance to permanently closed window.	*	*
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 (91cm) within a height 15 feet above the meter/regulator assembly	*
I=	Clearance to service regulator vent outlet.	3 feet (1.83m)	*
J=	Clearance to nonmechanical air supply inlet to building or the combustion air inlet to any other appliance	6 inches (15cm) for appliances <10,000 Btuh (3kW), 12 inches (30cm) for appliances >10 000 Btuh (3kW) and ≤ 100,000 Btuh (30kW), 36 inches (91cm) for appliances >100 000 Btuh (30kW)	6 inches (15cm) for appliances < 10,000 Btuh (3kW), 9 inches (23cm) for appliances > 10,000 Btuh (3kW) and ≤ 50 000 Btuh (15kW) 12 inches (30cm) for appliances > 50 000 Btuh (15kW)
K=	Clearance to a mechanical air supply inlet.	6 feet (1.83m)	3 feet (91cm) above if within 10 feet (3m) horizontally
L=	Clearance above paved sidewalk or paved driveway located on public property	7feet (2.13m) [3]	*
M=	Clearance under veranda, porch deck, or balcony.	12 inches (30cm) [4]	*

[1] In accordance with the current CSA B149.1 Natural Gas and Propane Installation Code
[2] In accordance with the current ANSI Z223.1 / NFPA 54 National Fuel Gas Code
[3] A vent shall not terminate directly above a sidewalk or paved driveway that is located between two single family dwellings and serves both dwellings
[4] 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 CSA-B149.1, 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 :

Note : Check local codes and ordinances.

When applicable, installation must conform with the Manufactured Home Construction and Safety Standard, Title 24 CFR, Part 3280 or the Canadian Standard CAN/CSA-Z240 MH Mobile Homes, Series M86.

GAS LINE SIZING CHARTS

Maximum **Natural Gas** Delivery Capacity in Cubic Feet per Hour (0.60 Specific Gravity, 0.5" WC Pressure Drop)

PipeSize	Length in Feet										
	10'	20'	30'	40'	50'	60'	70'	80'	90'	100'	125'
1/2"	174	119	96	82	73	66	61	56	53	50	44
3/4"	303	249	200	171	152	138	127	118	111	104	93
1"	684	470	377	323	286	259	239	222	208	197	174
1 1/4"	1404	965	775	663	588	532	490	456	428	404	358
1 1/2"	2103	1445	1161	993	880	798	734	683	641	606	536
2"	4050	2784	2235	1913	1696	1536	1413	1315	1234	1165	1033
2 1/2"	6455	4437	3563	3049	2703	2449	2253	2096	1966	1857	1646
3"	11,412	7843	6299	5391	4778	4329	3983	3705	3476	3284	2910
3 1/2"	16,709	11,484	9222	7893	6995	6338	5831	5425	5090	4808	4261
4"	23,277	15,998	12,847	10,995	9745	8830	8123	7557	7091	6698	5936

Contact the Gas Supplier for Btu/Cubic Ft. of the Supplied Gas.
1000 Btu/Cubic Ft. is a Typical Value

Maximum **Liquified Petroleum** (Undiluted) Delivery Capacity in Thousands of Btuh (0.5" WC Pressure Drop)

PipeSize	Length in Feet												
	10'	20'	30'	40'	50'	60'	70'	80'	90'	100'	125'	150'	200'
1/2"	275	189	152	129	114	103	96	89	83	78	69	63	55
3/4"	567	393	315	267	237	217	196	185	173	162	146	132	112
1"	1071	732	590	504	448	409	378	346	322	307	275	252	213
1 1/4"	2205	1496	1212	1039	913	834	771	724	677	630	567	511	440
1 1/2"	3307	2299	1858	1559	1417	1275	1181	1086	1023	976	866	787	675
2"	6221	4331	3465	2992	2646	2394	2205	2047	1921	1811	1606	1496	1260

** For reference only. Please consult gas pipe manufacturer for actual pipe capacities.

Maximum Capacity of Flex TracPipe in Cubic Feet per Hour of **Natural Gas** (0.60 Specific Gravity, 0.5" WC Pressure Drop)

PipeSize	Length in Feet											
	10'	20'	30'	40'	50'	60'	70'	80'	90'	100'	150'	200'
3/4"	206	147	121	105	94	86	80	75	71	67	55	48
1"	383	269	218	188	168	153	141	132	125	118	94	82
1 1/4"	614	418	334	284	251	227	209	194	181	171	137	116
1 1/2"	1261	888	723	625	559	509	471	440	415	393	320	277
2"	2034	2075	1698	1472	1317	1203	1114	1042	983	933	702	661

Maximum Capacity of Flex TracPipe in Thousands of Btuh **Liquified Petroleum** (0.5" WC Pressure Drop)

PipeSize	Length in Feet											
	10'	20'	30'	40'	50'	60'	70'	80'	90'	100'	150'	200'
3/4"	329	232	191	166	149	136	126	118	112	106	87	76
1"	605	425	344	297	265	241	222	208	197	186	143	129
1 1/4"	971	661	528	449	397	359	330	307	286	270	217	183
1 1/2"	1993	1404	1143	986	884	805	745	696	656	621	506	438
2"	4638	3285	2684	2327	2082	1902	1761	1647	1554	1475	1206	1045

** For reference only. Please consult gas pipe manufacturer for actual pipe capacities. TracPipe is a registered trademark of Omega Flex.

Maximum Capacity of Gas Flex Connectors in Cubic Feet per Hour of **Natural Gas** (0.60 Specific Gravity, 0.5" WC Pressure Drop)

PipeSize	Length in Inches					
	12"	24"	36"	48"	60"	72"
1/2"	180	150	128	106	93	86
3/4"	-	280	255	215	197	173
1"	-	580	512	442	397	347
1 1/4"	-	1470	1200	1130	960	930

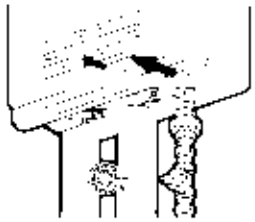
Maximum Capacity of Gas Flex Connectors in Thousands of Btuh **Liquified Petroleum** (0.5" WC Pressure Drop)

PipeSize	Length in Inches					
	12"	24"	36"	48"	60"	72"
1/2"	288	240	200	169	149	137
3/4"	-	465	403	344	315	278
1"	-	930	825	708	638	556
1 1/4"	-	2352	1920	1808	1536	1488

** For reference only. Please consult gas pipe manufacturer for actual pipe capacities.

GAS PIPING

- Install the manual gas control valve in the gas inlet connection of MWH-180EX.
- A union should be used to connect the unit and the gas pipe.
- Check the gas type and the gas inlet pressure before connecting.
- Remove the screw from the test plug before checking the gas inlet pressure.
  Connect the manometer to the plug with the silicon tube and measure the gas inlet pressure.
- The maximum and minimum gas inlet pressures are as follows.



  < Natural Gas supply pressure >
  Min. 4.0" W.C. (101.6mmH_2O)
  Max. 10.5" W.C. (267mmH_2O)

  < Propane Gas supply pressure >
  Min. 8" W.C. (203mmH_2O)
  Max. 14" W.C. (356mmH_2O)

- Put the screw back in the test plug and fasten tightly.
- Make sure to conduct gas leakage test before operating MWH-180EX.

WATER PIPING

- Install a manual water control valve in the water inlet connection of MWH-180EX.
- A union should be used on both the hot and cold water supply lines for connection.
- Use soldering materials or piping that will not cause any deterioration of potable water.
  NO LEAD!
- Purge the water lines to remove all debris and air.
- Make sure both the hot and cold water supply lines are connected correctly.
- A filter is placed at the water supply inlet to remove debris.
  Clean the filter regularly.
  Do not operate the unit without the filter in place.
  In areas of heavy debris, such as with some wells, install a whole house water filter in line before the unit.
- 15 PSI or higher water pressure is required to operate MHW-180EX.

PRESSURE RELIEF VALVE

- Install an approved pressure relief valve with every gas water heater installation.

- The pressure relief valve shall conform to the following requirements.
  Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems ANSI Z21, 22.
  This pressure relief valve shall activate with the pressure of 150PSI.

- The pressure relief valve shall be installed in the outgoing hot water supply line according to the manufacturer's instruction.

- No valves or shut off device shall be placed between the relief valve and the unit.
  The discharge from the pressure relief valve shall be piped to the ground or into the drain system to prevent possible burns to humans or animals. Hot water discharged from the relief valve may cause severe scalding instantly and even death.

- Do not cap the relief valve and do not install any depressurizer or restriction device in the relief line.

- Manually operate the pressure relief valve at least once a year to check if it functions properly.

ELECTRICAL CONNECTION

⚠ Warning

MWH-180EX must be electrically grounded in accordance with local codes or in the absence of local codes with the most recent edition of the National Electrical Code, ANSI/NFPA 70. In Canada, all electrical wiring to the MWH-180EX should be in accordance with local codes and the Canadian Electrical Codes, CSA C22.1 Part 1. Do not rely on the gas or water piping to ground the metal parts of the water heater.

⚠ Caution

- Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.
  Verify proper operation after servicing.
  Field wiring to be performed at time of appliance installation.
- Completely turn off the power before starting the work.
  Do not turn the power on until the electric wiring is finished and all work is completed.
  Otherwise electric shock or personal injury may result.

ELECTRICAL CONNECTION

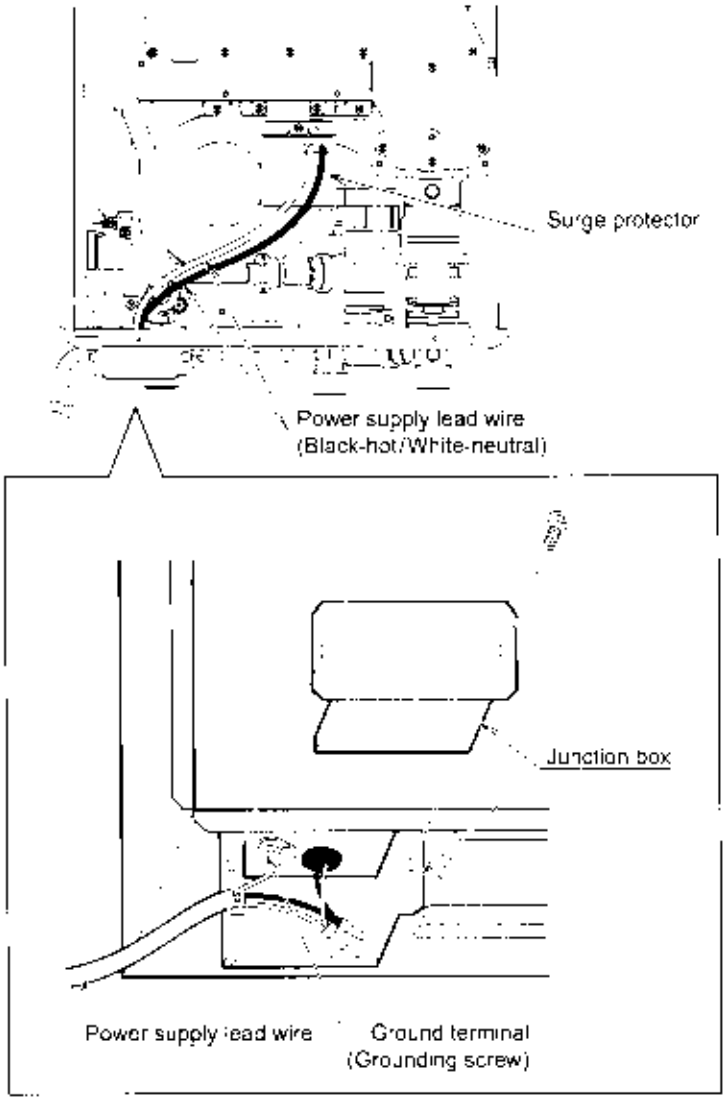
- MWH-180EX requires 120V AC at 60Hz.
  Disconnect the power supply if the unit is not in use for a long time.

- Remove residual water in the unit when the power supply is off because the freeze prevention in the unit will not activate, resulting in possible freezing damage.

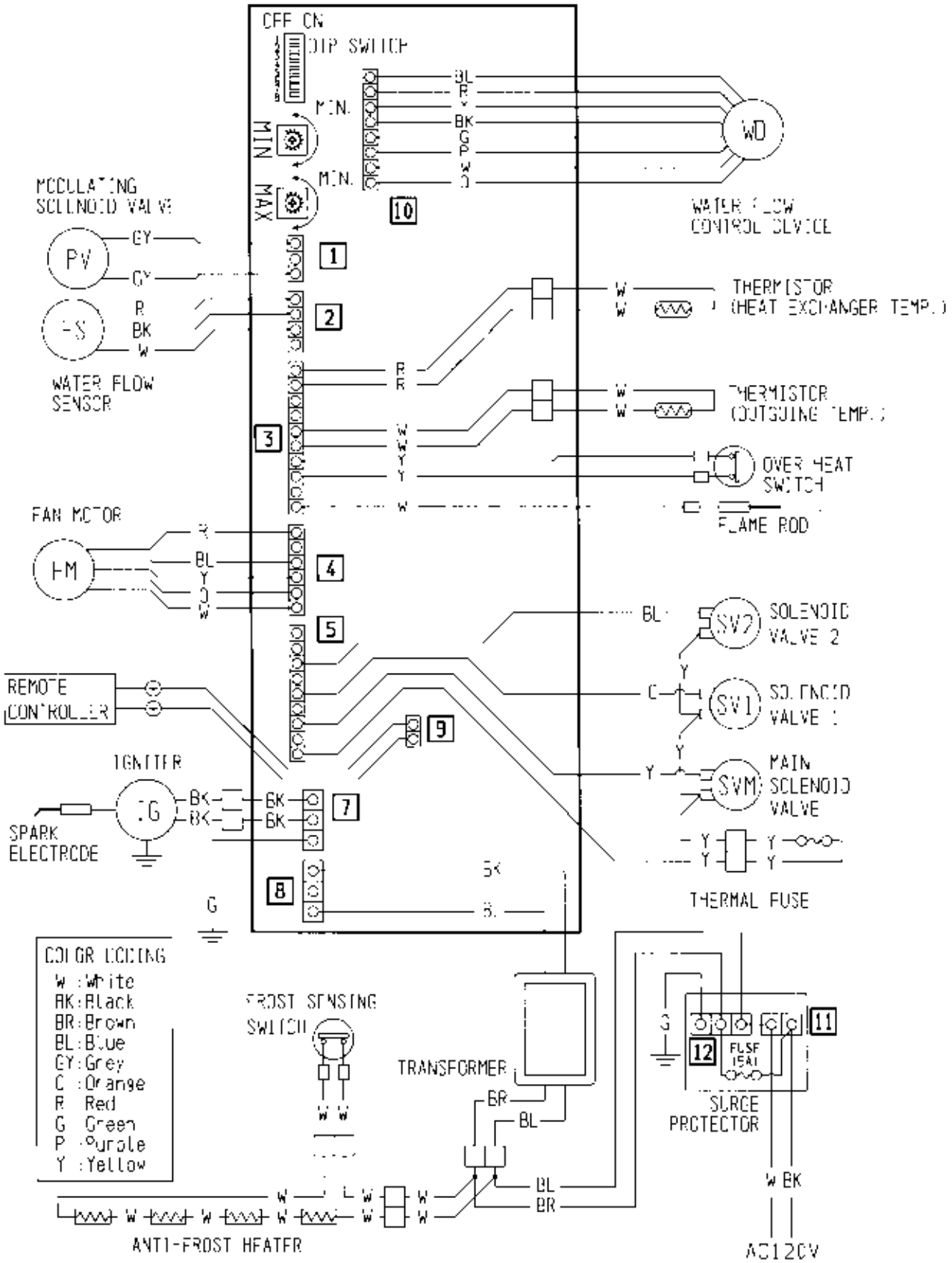
- Do not let the power cord contact the gas piping.

- The grounding screw is located in the junction box attached to the outside of bottom plate.

- To prevent electrical shock, provide a ground with resistance less than 100Ω. An electrician should do this work.

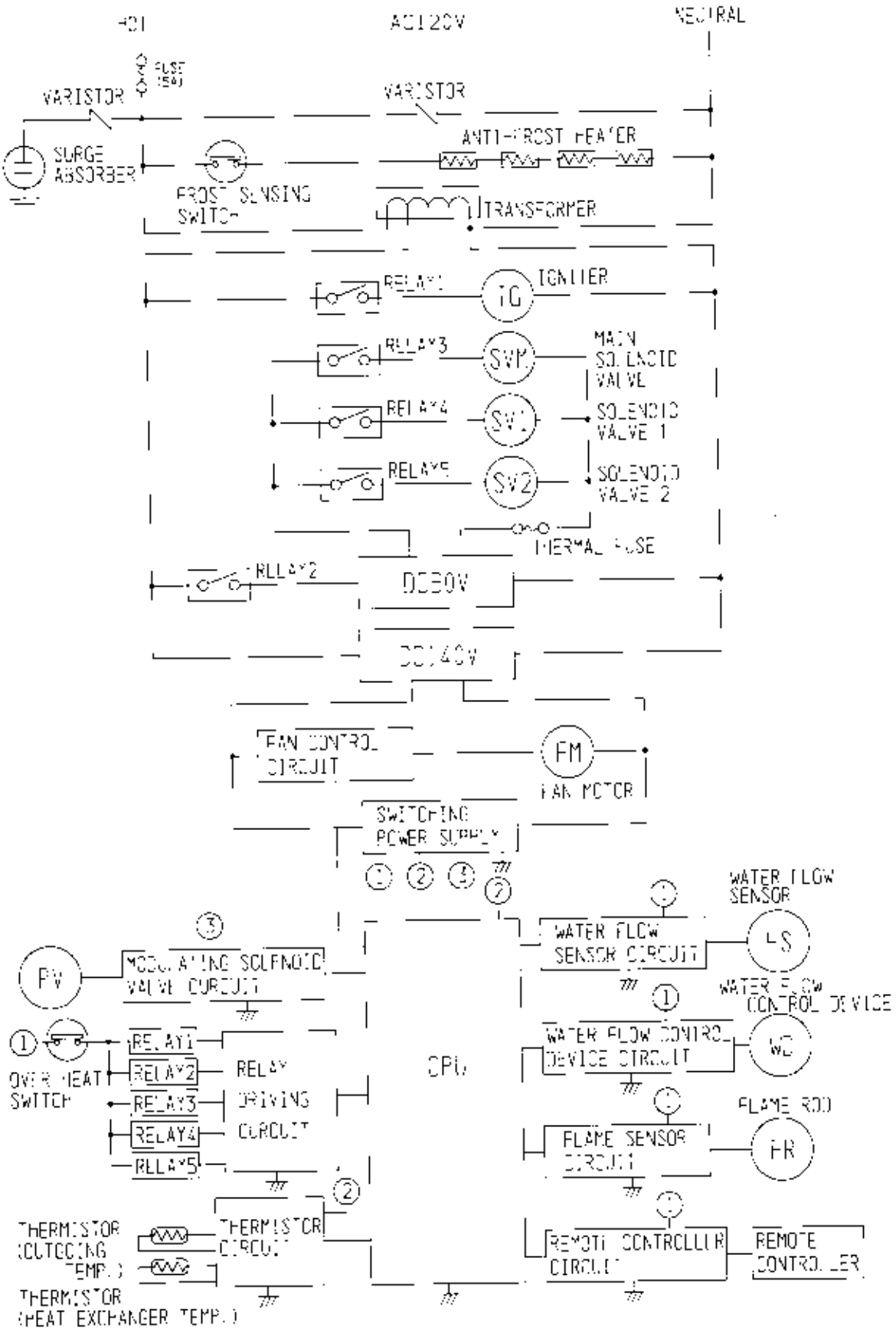


WIRING DIAGRAM



IF ANY OF THE ORIGINAL WIRE AS SUPPLIED WITH THE APPLIANCE MUST BE REPLACED. IT MUST BE REPLACED WITH A WIRE OF AT LEAST A 194°F TEMPARATURE RATING AND NUMBER 18AWG OR ITS EQUIVALENT.

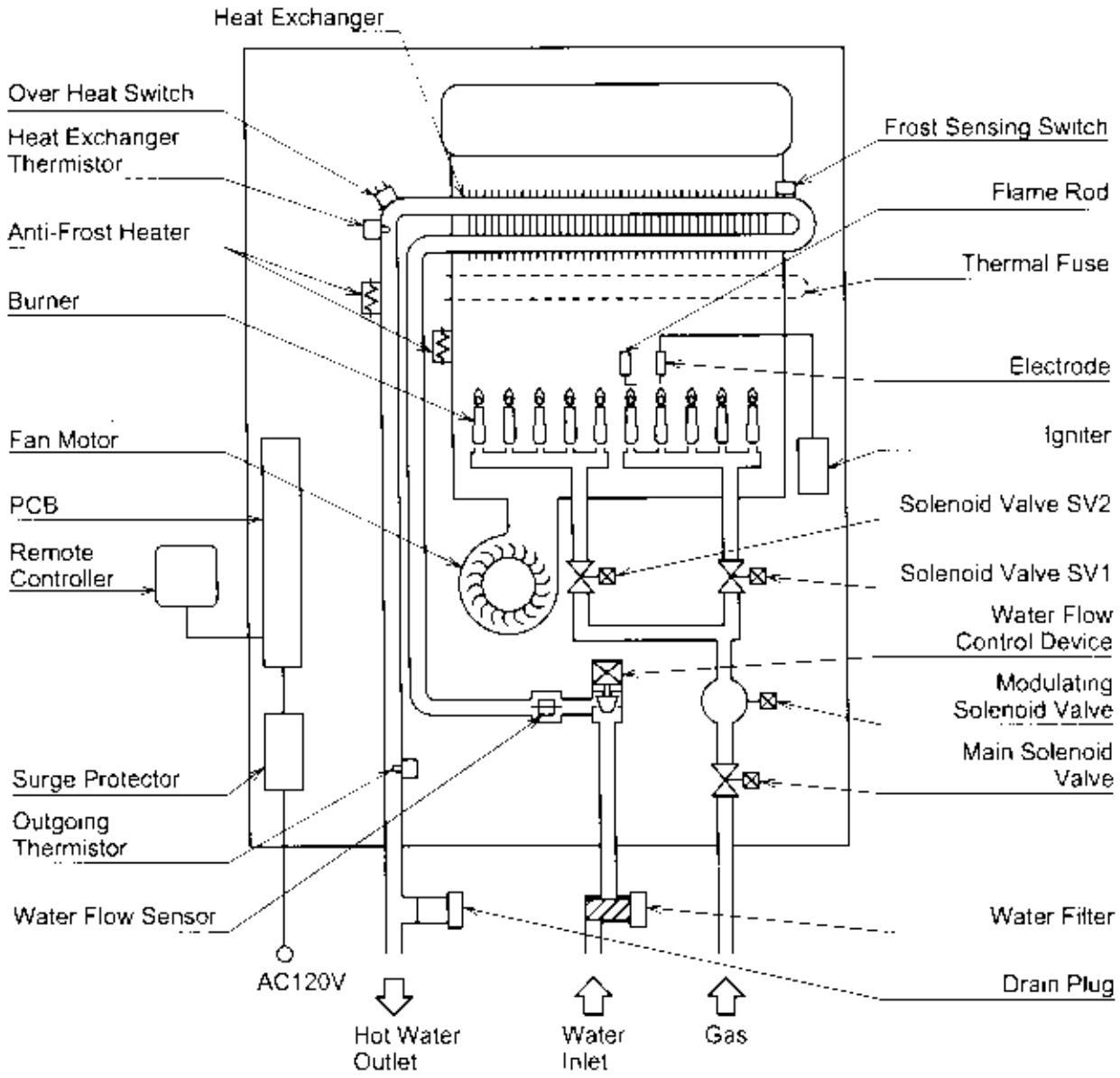
WIRING DIAGRAM



DIAGNOSTIC POINTS

Component	Measurement Point		Normal Value	Notes
	Comp. No	Wire Color		
Surge Protector	12	Brown-Blue	AC108~132V	
Water Flow Control Device	10	Blue-Red	DC11~13V	Power Supplied to Unit
		Black-White	55~65 Ω	
		Green-White	55~65 Ω	
		Purple-White	55~65 Ω	
		Orange-White	55~65 Ω	
Water Flow Sensor	2	Red-Black	DC11~13V	Power Supplied to Unit
		White-Black	DC5~7V or DC0~1V	Power Supplied to Unit
Modulating Solenoid Valve	1	Gray-Gray	DC2~12V	Flame Condition
			65~77 Ω	
Remote Controller	9	Black-Black	DC11~13V	Power Supplied to Unit
Fan Motor	4	Red-Blue	DC155~165V	Power Supplied to Unit
		Yellow-Blue	DC14~16V	Revolving Condition
		Orange-Blue	DC2~6V	Revolving Condition
		White-Blue	DC8~12V	Revolving Condition
Flame Rod	3	White-Green	AC50~150V	After Ignition
		White-Flame Rod	DC1~20μA	Flame Condition
Over Heat Switch	3	Yellow-Yellow	Below 1 Ω	
Igniter	7	Black-Black	AC90~110V	Igniting Condition
Thermal Fuse	5	Yellow-Yellow	Below 1 Ω	
Main Solenoid Valve	5	Yellow-Yellow	DC80~100V	Flame Condition
			1.4~1.6k Ω	
Solenoid Valve 1	5	Yellow-Orange	DC80~100V	Flame Condition
			1.55~1.75k Ω	
Solenoid Valve 2	5	Yellow-Blue	DC80~100V	Flame Condition
			1.5~1.7k Ω	
Outgoing Thermistor	3	White-White	40° F 19~21k Ω 80° F 7.5~8.5k Ω 120° F 3.3~3.9k Ω 160° F 1.7~1.9k Ω	
Heat Exchanger Thermistor	3	White-White		
Transformer				
Primary	C	Brown-Blue	AC108~132V 45~55 Ω	
Secondary	C	Black-Blue	AC90~110V 43~53 Ω	

SCHEMATIC DIAGRAM



WIRING REMOTE CONTROLLER

The Main remote controller model is CMR-2250. (P/N 3748)

The Bath remote controller model is YST-2250. (P/N 3749)

These controllers are to be fitted in the following locations:
Main remote controller - kitchen or laundry.
Bath remote controller - bathroom.

Only one of each type of controllers can be connected to one MWH-180EX water heater.
(i.e. Installations with two CMR-2250 or two YST-2250 will not function properly.)

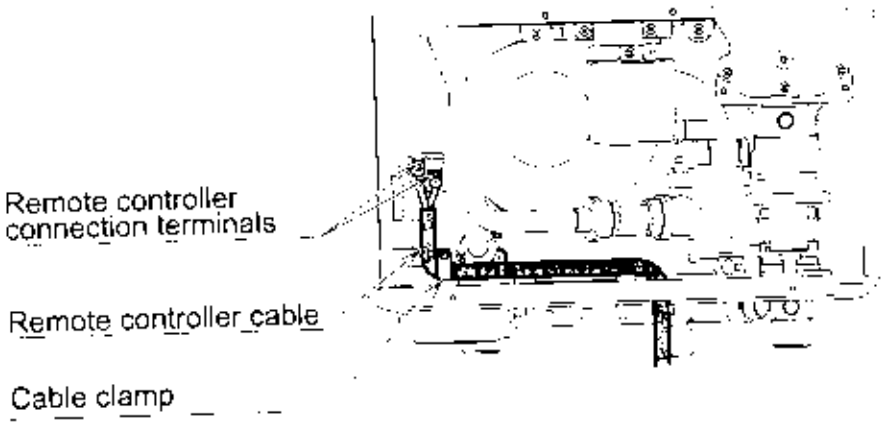
The remote controllers can be wired in parallel only depending on the distance from MWH-180EX to the remote controllers.

Be sure to peel the protective film off the surface of the remote controller after the installation.
The surface is covered with a film to prevent scratches during installation.

⚠ Caution

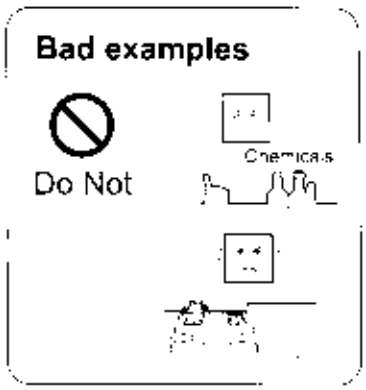
The appliance should always be disconnected from the power supply before REMOTE CONTROLLERS are connected.

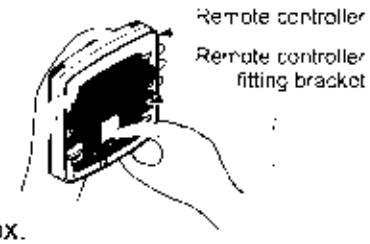
- Connect the cord to the terminal block of water heater.
  As remote controller cables are nonpolarized, they do not have specific plus and minus.
  Be sure not to touch other electronic components with the screwdriver.
- Replace the front panel of MWH-180EX.



MAIN REMOTE CONTROLLER CMR-2250 (P/N 3748)

1) Safety precautions on Main remote controller installation.
   - Connect remote controller cable after heater is unplugged.
   - Never install Main remote controller above a combustion appliance like hot plate or a kitchen range.
     The heat will cause electrical component problems, or deform the exterior.
   - Install Main remote controller out of the reach of steam, water drop, spray of water from tea kettle, or electrical pot.
   - Do not put Main remote controller in direct sunshine.
   - It is convenient to install it where it will be used most frequently.
   - Do not install Main remote controller at the place where any commercial chemicals like ammonia, sulfur, chlorine, ethylenic compound and acids etc are used.
   - The remote controller cables carry low voltage, 12VDC digital.

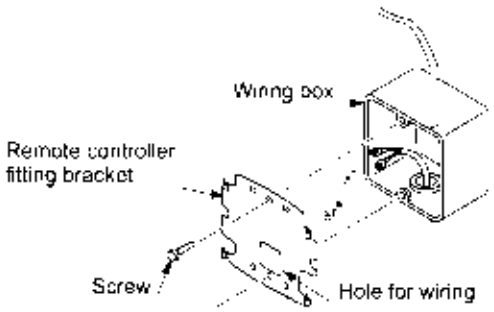


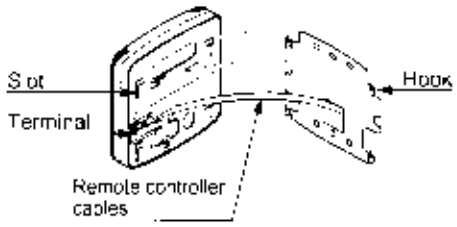


2) Installation of Main remote controller.
   - Detach the fitting bracket from Main remote controller by sliding it down.
   - Attach the fitting plate to wall.
   - Install conduit inside of wall in advance and secure the wiring box.
   - Pass remote controller cables through conduit.
     Then pass the cables through the hole of the fitting bracket and pull them out.
   - Attach the fitting bracket with screws adjusting the screw hole to the wiring box.
   - Connect the remote controller cables to the terminal for the remote controller of PCB.

In case of installing of the fitting bracket for remote controller.

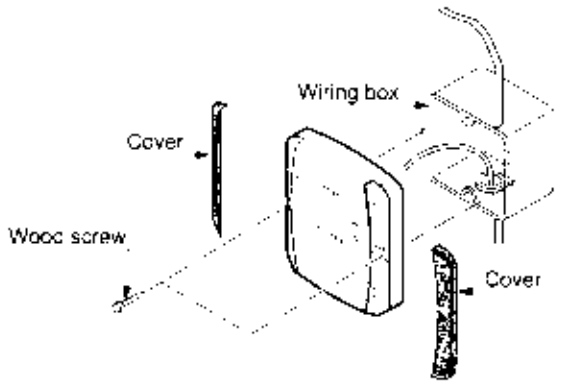
Align the slots of Main remote controller's back to 4 hooks on the fitting bracket.
Then slide them on from the top.





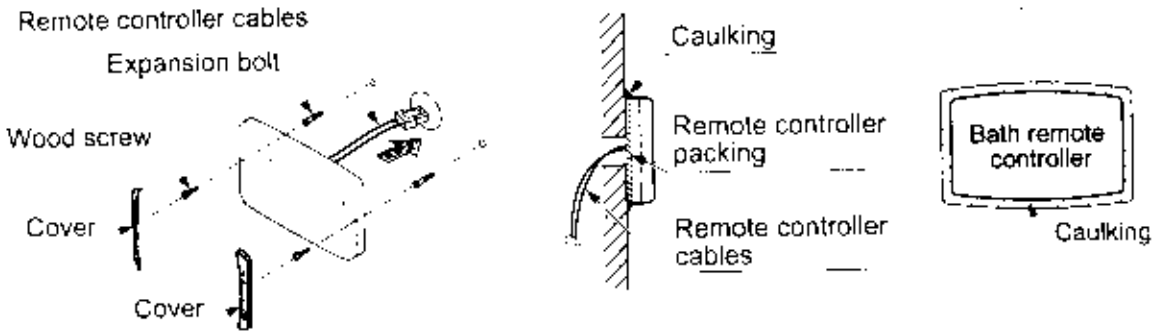
In case you are not using the fitting bracket of the remote controller.

Detach right-and-left covers of the remote controller and fix them to the wall directly with wood screws. Then attach the covers again. (You can detach the covers by catching the bottom corner's slot with nail.)



BATH REMOTE CONTROLLER YST-2250 (P/N 3749)

1) Safety precautions on Bath remote controller installation.
   - Before remote controller installation, check the hole position considering wall stud location.
   - **Note** : Do not dismantle the remote controller due to water-proof design.
   - Do not install remote controller where water will contact the remote controller directly.
   - The remote controller cables carry low voltage. 12VDC digital.
2) Installation of Bath remote controller.
   - Drill a hole (more than dia about 1/2inch (12mm)) in a wall for the remote controller cables.
   - After passing the remote controller cables through the hole, remove the packing's back paper of remote controller. Then attach the remote controller to the wall.
   - Detach both end covers of remote controller and fix the remote controller to the wall with wood screws(2 pcs) in the screw holes provided. (You can detach the covers with catching the bottom corner's slot with nail.) Do not tighten the screws excessively, as the screw hole may be damaged. In case of mounting the remote controller on tile, cement or mortar, use an expansion bolt.
   - Reattach the cover and caulk with silicone around surrounding of the remote controller.



In case of use of store-bought cables.

- The remote controller cable can be extended up to 100feet (30m) by splicing the cable and using 18 gauge wire to extend the cable to the appropriate length.
- Cut the connector of the remote controller lead wire and cut remote controller lead wire and store-bought cables' coating in 0.2inch (5mm) length.
- Insert the end of remote controller cables to clamping connector and caulk using a caulking tool.
- Caulk the store-bought cables inserted in the clamping connector using the caulking tool.

BATH REMOTE CONTROLLER YST-2250 (P/N 3749)

1) Safety precautions on Bath remote controller installation.
   - Before remote controller installation, check the hole position considering wall stud location.
   - **Note** : Do not dismantle the remote controller due to water-proof design.
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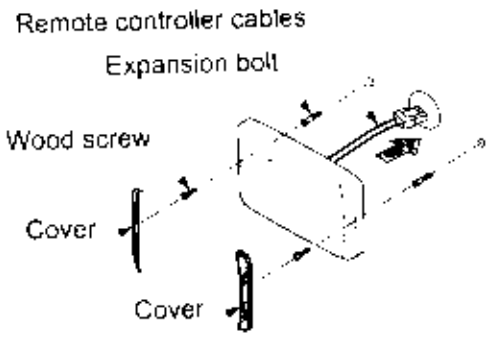

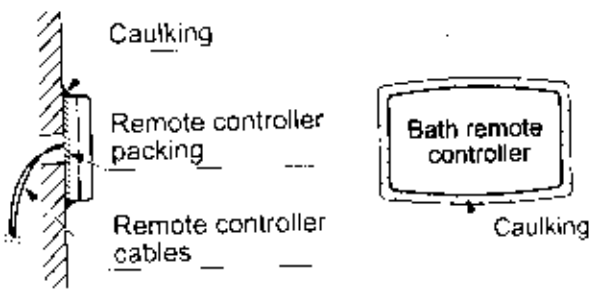

In case of use of store-bought cables.

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- Cut the connector of the remote controller lead wire and cut remote controller lead wire and store-bought cables' coating in 0.2inch (5mm) length.
- Insert the end of remote controller cables to clamping connector and caulk using a caulking tool.
- Caulk the store-bought cables inserted in the clamping connector using the caulking tool.

TESTING OPERATION

• Follow the steps below, to ensure the MWH-180EX has been properly installed.

Preparation for testing operation.

1. Fully open the water supply main valve.
2. Flush out the water supply piping to clean out any installation debris, clean out filter.
3. Turn on power to unit and open gas supply valve.

Testing operation.

1. Operate the unit according to " **Remote controller operation** " in the instruction manual.
2. Make sure the unit operates normally.
   • Does the burner ignite and shut off properly? Check the combustion lamp.
   The burner may not ignite at first until the air in the gas supply pipe is driven out.
   Repeat the procedure until it ignites.
   • Is temperature setting workable?
   Check if the temperature can be adjusted as desired.

Procedure after testing operation.

• If the residence is not ready for habitation or the unit will not be used for an extended time, the residual water in the unit and the pipe may freeze and damage the unit, or the residual water in the heat exchanger may deteriorate.
Be sure to remove the water in the unit and the pipe. Refer to the instruction manual.

1. Close the gas supply main valve.
2. Close the water supply main valve
3. Take off the water filter (drain stopper), drain the valve, and remove the water.
   Take this procedure when the unit cools down after the testing operation.
4. Disconnect the power, or turn off the power supply.
5. Open the faucet and shower faucet (if any) and remove the water.
6. Leave the unit in this condition until ready to use.

Explanation to customers.

Fill out the warranty form with the customer and send to it MPI.
Explain the " **How to use the unit** " section of this instructional manual to the customer.

INSTRUCTIONS FOR CONVERSION

Instructions for converting the MWH180EX from nat. gas to LP gas or LP gas to nat. gas.

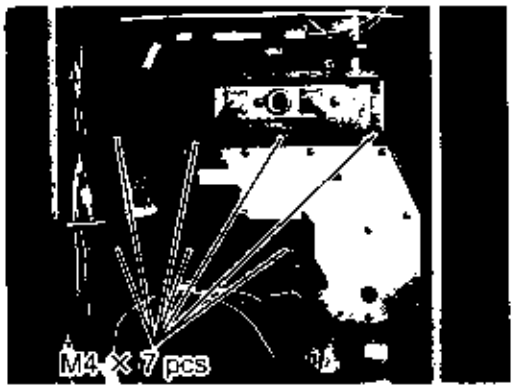
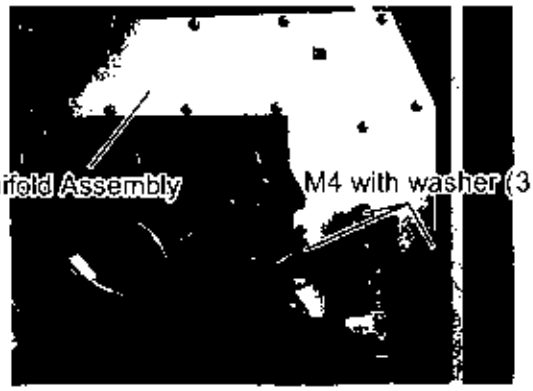
DANGER: Serious injury or death can result to individuals who are not licensed professionals properly trained in performing conversions. Proper tools and safety gear are always required. If you are not a professional trained in conversions do not attempt to perform a conversion.

WARNING: This conversion should only be performed by a qualified gas company, plumber, HVAC technician, or trained service person familiar with gas fired equipment. This person should have tools to perform the conversion, check gas pressures, re-adjust gas pressures if necessary, and leak test the unit once the conversion is complete.

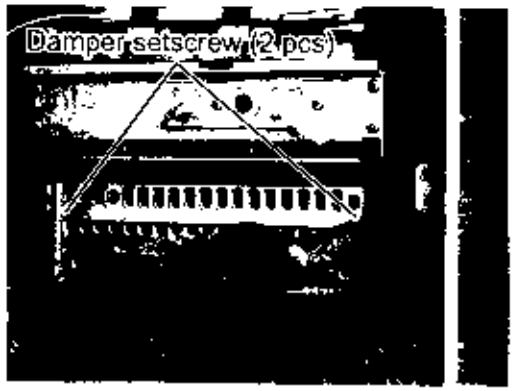
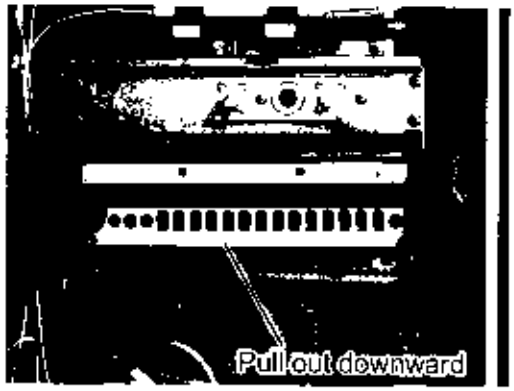
To convert to Natural gas you will need to contact your local MWH supplier and order part# 3724-2 Damper and part# 3722-2 Manifold Assembly. For conversion to Propane part# 3724-1 Damper and part# 3722-1 Manifold Assembly will be needed.

MPI P/N	Description
3722-1	Manifold Assembly (Propane Gas)
3722-2	Manifold Assembly (Natural Gas)
3724-1	Damper (Propane Gas)
3724-2	Damper (Natural Gas)

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

Procedure	Illustration
Step 1: (1) Remove the four screws from front panel, and place on the side so that they not get lost or damaged. (2) Remove wires from flame sensor and electrode. (3) Remove the set screws fixing the Manifold Assembly (M4 × 7pcs, M4 with washer × 3pcs). (4) Remove Manifold Assembly by gently pulling it from both sides. Once Manifold is removed make sure that the two O-rings that seal between the Manifold and gas valve are fixed in their groved surfaces. Should an O-ring stick to the Manifold or drop out, gently peal off the O-ring, inspect both O-rings to make sure they are clean and not damaged, then reinsert into groves in the Gas Control Assembly. If either O-ring is damaged it should not be reused but replaced.	 

INSTRUCTIONS FOR CONVERSION

Procedure	Illustration
Step 2: (1) Remove set screws (2pcs) fixing the Damper and pull the Damper out downward. (2) Replace Damper with appropriate one stamped LP or Nat. Note: Damper slides up in between the Burner and the Front Panel, housing the Flame Rod and Electrode, leaving Gasket exposed for sealing to the Manifold. (3) Re-attach the two screws to secure the Damper.	 

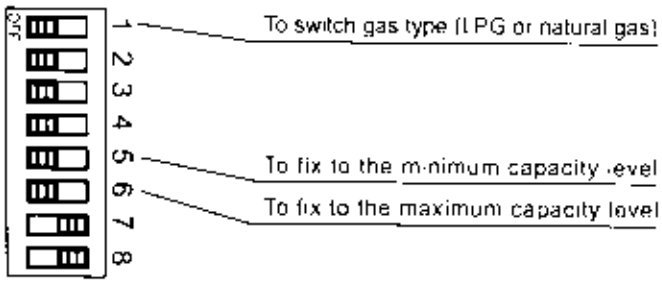
Step 3:

When reinstalling the new Manifold make sure the three fine thread screws w/ washers are used at the Gas Control Valve, and that there are no wires pinched under the Manifold before any screws are tightened. Once it has been confirmed there are no obstructions and the Manifold can seal properly to the Gasket on the Burner as well as the Gas Valve O-rings then all screws should be tightened firmly and evenly.

Step 4:

The DIP Switches in the illustration below can be adjusted without removing the Circuit Board. Familiarize yourself with their location and position, then adjust number 1 to appropriate gas type.

(The illustrated switch settings show the factory settings for the LPG as the gas type.)



INSTRUCTIONS FOR CONVERSION

Step 5: Gas Pressure Checking and Setting Procedure

1. Preparation

(1) It is assumed that the inlet gas pressure coming into the unit is within the min. to max. allowed, as per the Data Rating Plate, for gas type to be used. The gas inlet pressure can be checked at the threaded hose fitting of the 3/4 inch inlet gas connection to the unit by:
- turning off the gas valve,
- removing the screw from the hose fitting,
- attaching a gas pressure manometer,
- opening the gas valve and checking the incoming gas pressure.

"Should the pressure be out of range, adjustments need to be made by the gas supplier prior to any internal adjustments".

If inlet pressure is within range close gas valve, remove Gas Pressure Manometer, reinstall screw with washer into the threaded hose fitting, and reopen gas valve.

(2) Make sure the appliance is not in operation. Then, remove the screw from the Manifold pressure check inlet. (Do not mix the screw up with the front cover screws as they are the same type threads)

(3) Connect the hose of the manometer to the pressure check fitting.

2. Adjusting Manifold pressure settings <Minimum pressure should be set before setting the maximum pressure>

(1A) Make sure that "DIP Switch" No.1 is set to the position for the appropriate gas type.

(1B) Minimum Manifold gas pressure 0.4 inches w.c.
In case of Natural Gas, maximum Manifold gas pressure 2.75 inches w.c.
In case of Propane Gas, maximum Manifold gas pressure 3.10 inches w.c.
Note: A small Phillips head screwdriver will be needed if gas pressures are out of specification and need to be re-adjusted.

(2) After ignition and combustion is started, by opening the hot water supply valve, set "DIP Switch" No. 5 to ON position to set the combustion at a minimum capacity level. By turning the minimum gas adjusting control knob under the "DIP Switch", set the gas pressure for the minimum capacity level. Set the "DIP Switch" No. 5 to OFF.

INSTRUCTIONS FOR CONVERSION

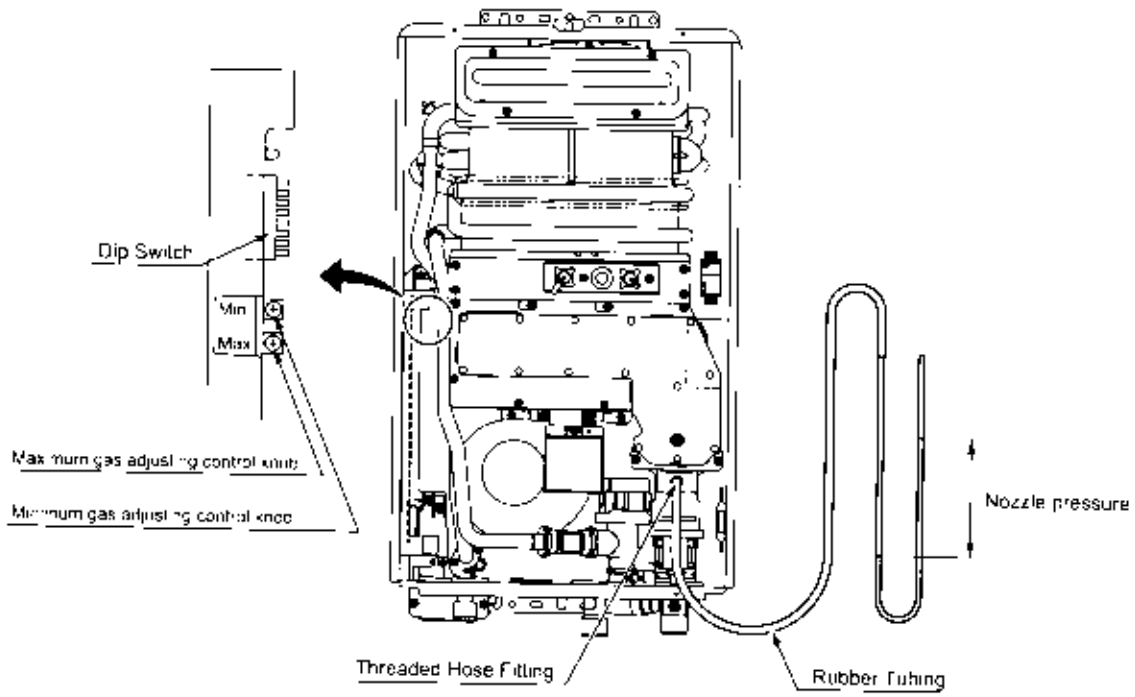
(3) With the unit still running, set "DIP Switch" No. 6 to ON position to set the combustion at a maximum capacity level. At this time, a substantial amount of water should be supplied. "Multiple faucets should be opened to prevent water from boiling, as the maximum capacity is forced, if the water temperature is high, the heated water may reach its boiling point."

(4) Set the gas pressure for the maximum capacity level by turning the maximum gas adjusting control knob under the minimum gas adjusting control knob. Then, set the "DIP Switch" No. 6 to OFF.

(5) Shut the hot water supply valve. Open the valve again for combustion. Repeat steps 2 and 4 to check that the settings are correct.

(6) Shut the hot water supply valve to stop combustion. Disconnect the rubber hose of the manometer from the pressure check fitting. Seal the hole by installing and tightening the screw.

(7) Restart the unit with full water supply and check for any gas leakage at the pressure check screw and around the gas manifold itself. If the gas pressure inlet screw was removed and reinstalled, it should also be leak tested.



Step 6:

Remark the gas type label on front cover with the new gas type. Reinstall the front cover with its four screws.

WARRANTY

Monitor Products, Inc.

LIMITED WARRANTY
MWH-180EX Instantaneous Water Heater

Monitor Products, Inc. hereby warrants this gas water heater to be free from defects in materials and workmanship, under the conditions stated below. This warranty is extended to the original purchaser, but only while the MWH-180EX remains at the original installation site.

Heat Exchanger

The Heat Exchanger is covered for ten (10) years of normal residential use. Monitor Products, Inc. (MPI) will repair or replace the heat exchanger at MPI's sole discretion.

If the heat exchanger fails due to defect in material or workmanship within the sixth (6) through tenth (10) year from the date of purchase, MPI will make the following allowances toward the purchase of a replacement heat exchanger: (Percentages are of list price)

Year of failure	Allowance	Year of Failure	Allowance
6	50%	9	20%
7	40%	10	10%
8	30%		

If the MWH-180EX is used in other than a single family dwelling, or if the MWH-180EX is supplied with pre-heated or circulated water, then the heat exchanger warranty shall be limited to three (3) years and all other parts are limited to two (2) years.

Parts

For all parts other than the heat exchanger, should MPI determine after an examination that there has been a part failure within three (3) years of the date of purchase, MPI will either repair or furnish a replacement part at the sole discretion of MPI. The replacement part is warranted for the remainder of the original warranty.

Conditions and Limitations

The warranty coverage is limited to the original purchaser of the MWH-180EX, in its original installation location, and only if the installation is in the United States of America or Canada.

This warranty will only apply if the water heater is installed in accordance with all state, local, and federal codes, and if the installation, service, and maintenance are performed following the Installation and operation Manual supplied with this unit.

This warranty does not cover any failures or operating difficulties due to accident, abuse, misuse, alteration, misapplication, acts of God, improper installation, improper maintenance or service, water quality, scale buildup, or for any other causes other than defects in material and workmanship. This warranty does not cover any units whose serial number or manufacture date has been defaced. This warranty does not cover a unit when used as a spa or pool heater.

This warranty does not cover damage resulting from fire, flood, water freezing inside the unit or piping, or from use with non-potable water, or water with high pH or hardness levels.

WARRANTY

This warranty does not apply if the water supply to the water heater does not meet the National Secondary Drinking Water Regulations as set forth in the U.S. Code of Federal Regulations, 40 CFR, Chapter 1, Part 143. The recommended water quality levels are as follows:

Description	pH	tds (total Dissolved solids)	Total Hardness	Aluminum	Chlorides	Copper	Iron	manganese	Zinc
Maximum Levels	6.5 -8.5	<500mg/l	<200mg/l	<0.2 mg/l	<250mg/l	<1.0mg/l	<0.3mg/l	<0.05mg/l	<5mg/l

Service and Repair costs

Under this limited warranty, MPI will provide repair or replacement parts or product only. The owner will be responsible for any other costs incurred including labor costs for servicing or replacing the part or unit, shipping, delivery and handling of the replacement part or product, costs for permits or materials necessary for the repair, or incidental costs resulting from damage external to the unit resulting from the failure.

Procedure For Obtaining Performance Under This Warranty

In order to obtain performance of the obligations under this warranty, the original purchaser must promptly (in no event later than thirty (30) days after discovery of the defect) notify the selling dealer authorized to service the MWH-180EX, or MPI at 732-329-0900 for the name of a local servicing dealer. All claims must be accompanied by a proof of purchase: sales receipt, cancelled check, or a warranty registration card mailed to MPI within 30 days of purchase.

Legal rights

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

NOTE:

Some states do not allow: (A) Limitations on how long an implied warranty lasts; or(B) The exclusion of limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

No person has the authority to orally, or in writing vary the terms, conditions, or exclusions of this warranty: nor to express or imply merchantability or fitness for a particular purpose beyond this warranty.

Monitor products, Inc.
P.O. Box 3408
Princeton, NJ 08543