



Kerosene-Fired Water Heater

Operation and Maintenance Instructions

MODEL FB-38N(FS)/FB-52N(FS)

IMPORTANT

READ AND UNDERSTAND INSTRUCTIONS BEFORE INSTALLING OR USING THIS WATER HEATER. RETAIN INSTRUCTIONS FOR FUTURE REFERENCE. CHECK LOCAL CODES AND ORDINANCES FOR PERMITTED USE.

CAUTION

THIS WATER HEATER SHALL NOT BE USED FOR COMMERCIAL USE OR ANY PURPOSES OTHER THAN HOT WATER SUPPLY USES. OTHER USAGE MAY CAUSE A MALFUNCTION OR SHORTEN ITS SERVICE LIFE. DO NOT REMOVE THE RATING PLATE AND LABELS FROM THE WATER HEATER UNIT.

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SECTION A: SAFETY TIPS

BE SURE TO FOLLOW THE FOLLOWING INSTRUCTIONS.

The instructions which are contained in this manual are classified into the following two types, which are "WARNING" and "CAUTION". These instructions are intended to provide the important information for safe operation.

"WARNING" indicates the possibility of causing the user a fatal accident or serious injury if the water heater is incorrectly operated.

"CAUTION" indicates the possibility of causing the user injuries or material damages if the water heater is incorrectly operated.

WARNING

1. Never use any fuel other than water-clear kerosene. NEVER USE GASOLINE! Use of such fuels can result in an explosion and/or fire and cause injury.
2. Never store flammable liquids or materials such as gasoline near the unit.
3. This unit should be installed by a licensed, authorized person(s) due to the necessity of making electrical, water and fuel connections.
4. RISK OF BACKFIRE AND INDOOR AIR POLLUTION. Before operation make sure exhaust pipe is free of snow, icing, leaves, bird's nest or strong drafts.
5. RISK OF INDOOR AIR POLLUTION AND FIRE. Be sure the exhaust pipe is properly installed and connected. Aluminum tape may be used for sealing exhaust pipe connections.
6. RISK OF INJURY FROM MOVING PARTS AND ELECTRICAL SHOCK. Disconnect power cord before servicing unit.
7. This water heater is designed to be used no more than 1,300 m above sea level. The water heater may have a failure of combustion at a high altitude.
Ask your local dealer for using at altitudes higher 800 m ~ 1,300 m above sea level.

CAUTION

1. Do not use the water heater without circulating water in the heat exchanger. Routinely make sure if the circulation water has decreased.
2. Do not touch hot areas, the exhaust pipe or the exhaust pipe top.
3. Never place any combustibles on or around your water heater.
4. Never place or use any flammable dangerous substances, such as gasoline and thinner, on or around your water heater. Also never use your water heater in a location where flammable gas is generated.
5. Do not use the water heater in the event of failure or breakage. A faulty repair or modification can be dangerous.
6. Do not damage, bundle, strain, or place heavy objects on the power cord. Never yank the cord to unplug it.

7. Insert the plug securely into the outlet as far as it will go. Do not use a damaged plug or loosened outlet. Do not remove or insert the plug with wet hands.
8. When you may not use it for a long period of time, turn off the operation switch, securely close the fuel feed valve of the fuel tank, and then remove the power cord plug from the outlet. When restarting the water heater, first check to be sure that circulating water is provided. Then, insert the power cord plug into the outlet, open the fuel feed valve of the fuel tank and turn on the power switch.
9. Remove the plug from the outlet and remove dust (and metal) from the plug. Accumulation of dust may cause defective insulation due to moisture, which could pose a fire hazard.

OTHER PRECAUTIONS

1. If the water heater is installed outside, the exhaust pipe top (optional parts) must be used.
2. If the unit appears to be operating abnormally or in an emergency, turn off the unit and call an authorized service person.
3. The circulating water should contain proper quantity of antifreeze solution. Avoid the use of hard water. In regions where hard water is the only source, take advantage of a water softener.
4. Do not use a damaged unit. If repairs are needed, contact your dealer.
5. Keep the area around the unit, the fuel tank and the exhaust pipe clean and free of flammable materials.
6. If you plan to be away from your home for a long period of time, shut-off the fuel valve on the fuel tank. Press operation switch to "OFF" position and disconnect the power supply cord.
7. If the unit is not used for a long period of time, the fuel tank may contain water cause by condensation. Be sure to check all filters and fuel strainers for this condition, clean or replace filter elements before using the unit..
8. Make sure that there are no leakage in fuel pipe and water circulation pipe.
9. Use the power source AC230, 50Hz only.
10. The unit must be installed at a place where there is enough air for combustion.
11. Plug on the power supply cord is disconnective device. The socket-outlet shall be installed near the water heater and shall be easily accessible.

SAFETY FEATURES

NOTE: When a safety device is activated, the water heater is automatically extinguished. At this time, the error code is indicated on the digital display. When your water heater does not operate properly after you take remedies for the error correction, contact your dealer.

1. Ignition Safety Device (Flame Sensor)

The unit will automatically stop all operations if ignition fails or if the flame fails during combustion. "E" and "6" or "E" and "7" will flash in the display alternately.

2. Over Heat Protector

In order to prevent burns, the over heat protector automatically stops all operations if the water in the heat exchanger reaches abnormally high temperatures due to temperature controller malfunction. "E" and "4" will flash alternately

3. Power Failure Recovery System

If power fails during water heater operation the unit will turn off. When power resumes the unit will automatically reignite.

4. Tip-over Switch

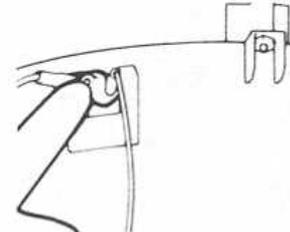
When the unit senses an earthquake or shock, this device activates to stop the operation. "E" and "5" will flash alternately.

5. Fuel Strainer

Special strainer catches any dirt or impurities present in the fuel before it is sent to the burner.

6. Heat Exchanger Bi-Metal Switch

If the heat exchanger temperature is raised abnormally because of a malfunctioning thermostat, the burner is automatically extinguished and "E" and "9" will flash alternately. Press the POWER SWITCH again after pressing the Reset button of the Heat exchange bi-metal switch.



CAUTION: Disconnect the power cord before servicing unit.

RISK OF BURN INJURY. Do not touch the heat exchanger while in hot.

7. Thermal Fuse

If the inside temperature of the water heater is raised abnormally, the unit is automatically extinguished and "E" and "9" will flash alternately. If this safety device is activated, disconnect the power cord and contact your dealer.

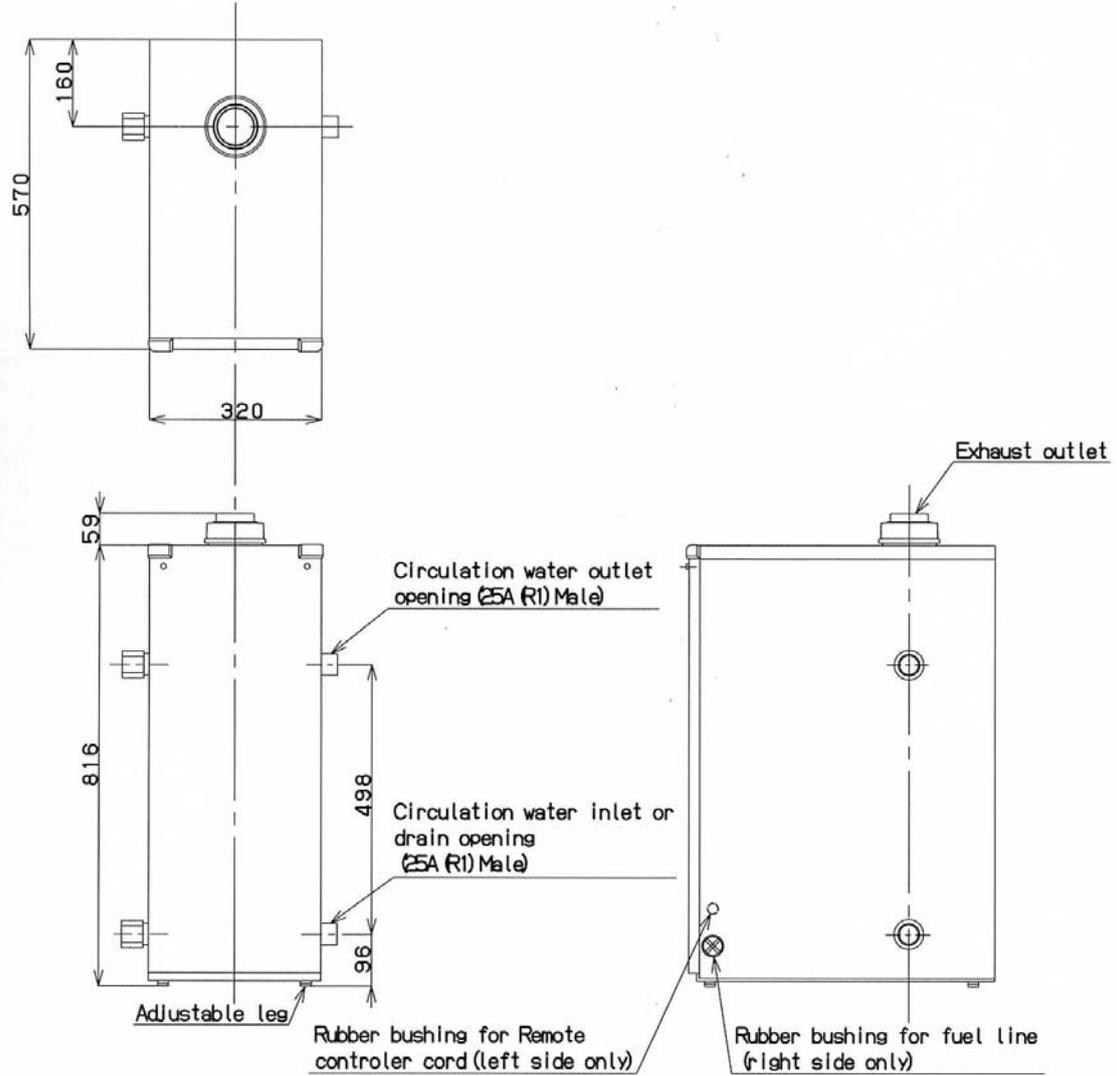
SECTION B: SPECIFICATIONS

SPECIFICATIONS

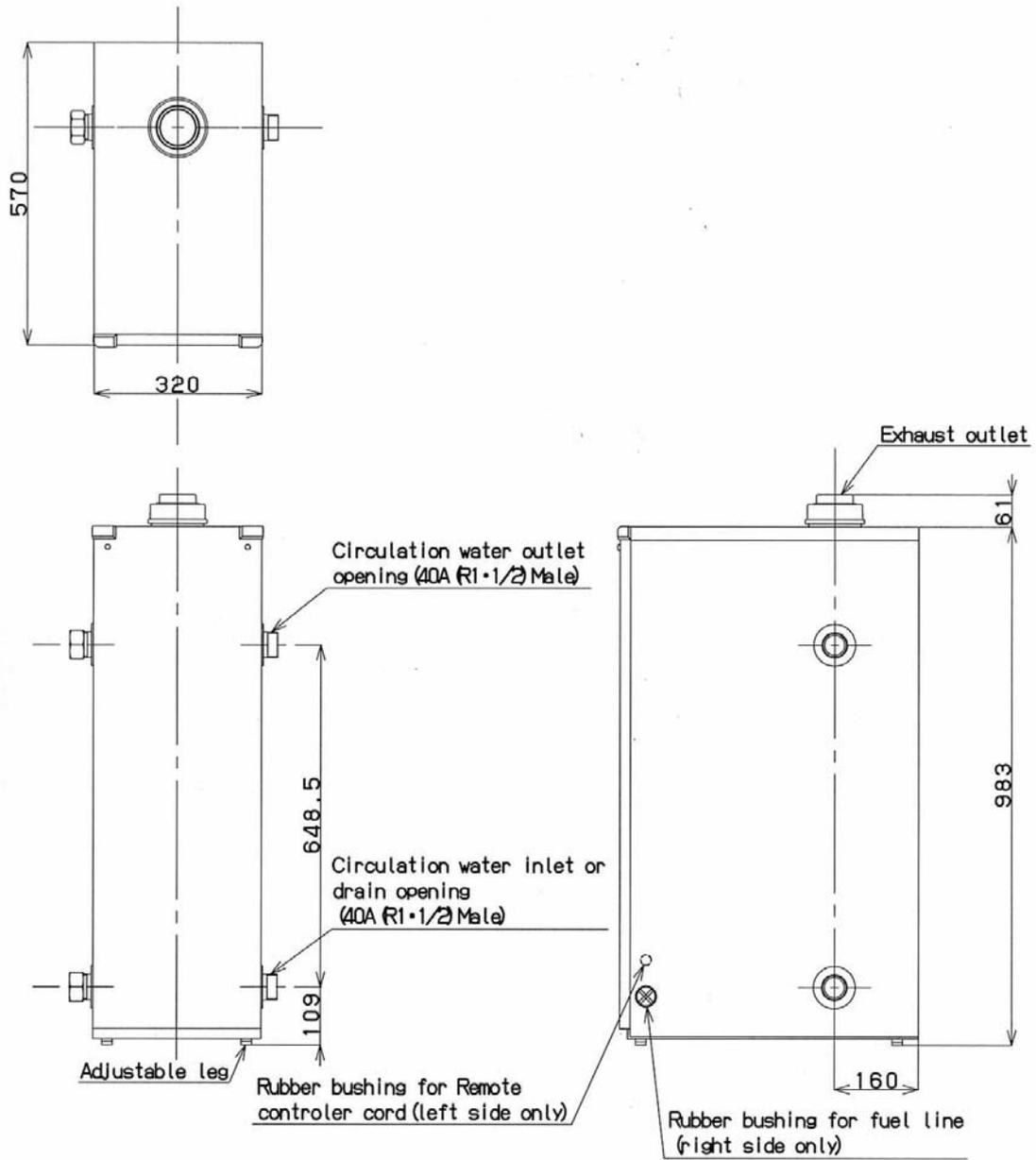
Model:		FB-38N(FS) / FB-52N(FS)
Type:	- Combustion Type - Exhaust system - Purpose	Pressure Vapor Forced Exhaust type Floor Heating
Ignition:		High Voltage Discharge Spark
Fuel:		Kerosene (Paraffin)
Fuel Consumption:		4.2 L/h / 5.85 L/h
Efficiency:		87.0%
Heating Output:		128,300 BTU/h / 179,000 BTU/h (37.6 kW) / (52.4 kW)
Capacity of Heat Exchanger:		19.5 lit. / 25 lit.
Max. Pressure:		100 kPa
Thermal Conduction area of Heat Exchanger:		0.9 m ² / 1.0 m ²
Dimensions (W x D x H):		320 x 570 x 816 mm / 320 x 570 x 983 mm
Weight:		35 kg / 37 kg
Electrical Rating:		AC230 V, 50 Hz Ignition: 106 W / 138 W Burning: 86 W / 129 W
Operating Ambient Temperature:		-20°C ~ 40°C
Humidity:		90 % (At the condition without dew condensation)
Exhaust Air Temperature:		less than 260°C
Diameter of Required Exhaust Pipe:		φ 106 mm
Sound Pressure Level:		48 dB (A) / 5 dB (A)
Nozzle	- Quantity of Vapor: - Spraying Pattern: - Spraying Angle:	1.10 GPH / 1.35 GPH Danfoss KH 60°
Electric Current Fuse:		250V AC, 5A
CE Marking	- Low Voltage Directive: - EMC Directive:	2006/95/EC 2004/108/EC
Safety Device:		Ignition Safety Device, Over-heat Protector, Power Failure Recovery System, Fuel Strainer, Heat Exchanger Bi-metal Switch, Tip-over Switch Thermal Fuse
Accessories:		Exhaust Pipe Top (1), Rubber Fuel Pipe (1), Hose band (2), Remote control (1), Remote Controller Cord (3m), Adhesive Tape (2), Wooden Screw (2), Screw (2)

DIMENSIONAL OUTLINE

FB-38N(FS)

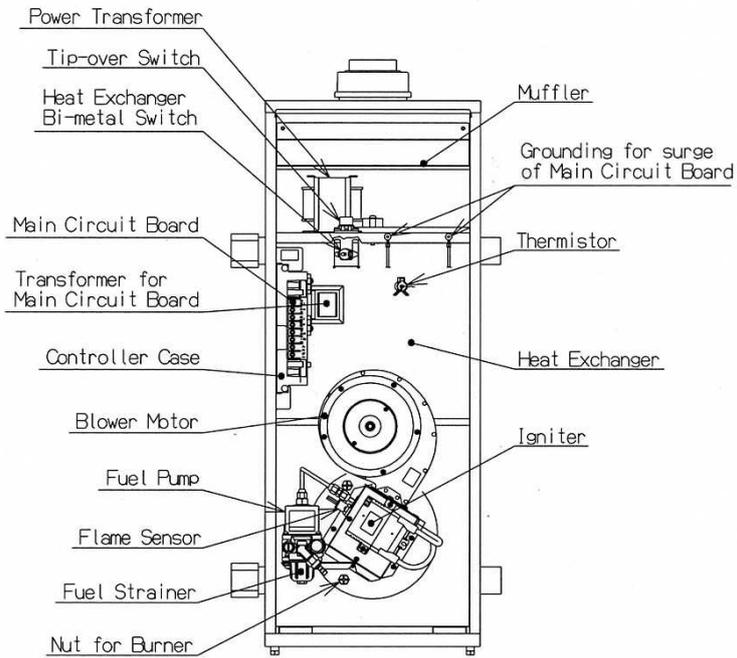


FB-52N(FS)

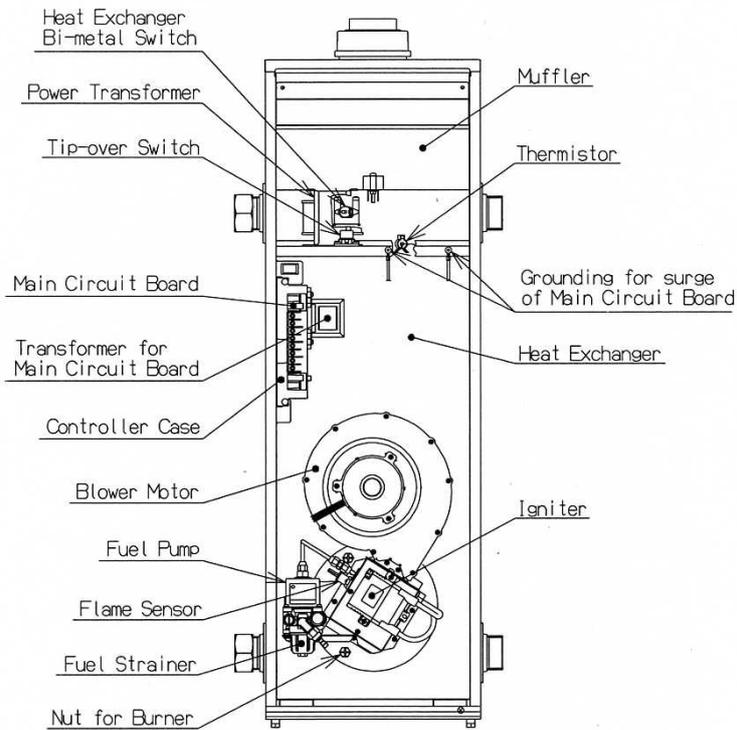


CONSTRUCTION

FB-38N(FS)



FB-52N(FS)



SECTION C: FUEL GUIDE

The Water Heater is designed for use with water clean and high quality kerosene only. Use of low-quality kerosene will cause burner performance to drop, leading to abnormal combustion and reduced the unit life.

Always store your fuel in a separate area from where you store gasoline for your power equipment to avoid accidental use of gasoline in your water heater.

What to Buy...

- ALWAYS: Clean and high-quality KEROSENE.
- ALWAYS: Fuel free of contaminants, water or cloudiness.
- NEVER: Gasoline, alcohol, white gas, camp stove fuel or additives.
- NEVER: Yellow or sour-smelling fuel.

How to Store It...

- ALWAYS: Store in a clean container, clearly marked "KEROSENE."
- ALWAYS: Store away from direct sunlight, heat sources or extreme temperature changes.
- NEVER: In a glass container, or one that has been used for other fuels.
- NEVER: For longer than six months.
- NEVER: In the living space.



Why It is Important...

Pure, clean kerosene is essential for safe and efficient water heater operation. Poor quality or contaminated kerosene can cause:

- Excess tar deposits on burner and flue pipe
- Incomplete combustion
- Reduced unit life

Use of a highly volatile flammable fuel such as gasoline can produce uncontrollable flames, creating a severe fire hazard.

SECTION D: OPERATION

FUELING

WARNING: Use KEROSENE only. Never use gasoline, thinner, benzene, light oil or waste oil.

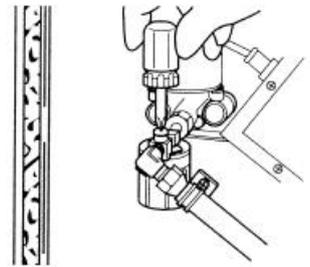
CAUTION: Make sure that the fuel is clean and free from dirt and water. Water and dirt may cause combustion failure and shorten the life of components such as the Fuel Pump. Be sure to refuel before the Tank runs out. Avoid having the Fuel Tank and Fuel Pipe run empty.

REMOVING AIR TRAP

When operating for the first time or when refueling an empty Tank, air may be trapped in the Fuel Pipe, making ignition difficult. In this situation, follow the procedures below:

1. Turn the unit off by pressing "POWER SWITCH". Disconnect the Power Supply Cord.
2. Release the two (2) screws from the Front Panel and remove the Front Panel.
3. To catch the fuel which will drain out, put a small container under the strainer.
4. Loosen the Screw on top of the Fuel Strainer. Immediately wipe off any spilled fuel.
5. Remove the trapped air thoroughly. Failure to remove all the air will cause improper ignition and may extinguish the unit.
6. Tighten the Screw after removing trapped air.
7. Plug into the receptacle. Turn the unit on by pressing "POWER SWITCH".

NOTE: In the event of an ignition failure, Turn the unit off by pressing "POWER SWITCH" and after 5 seconds press "POWER SWITCH" once again.



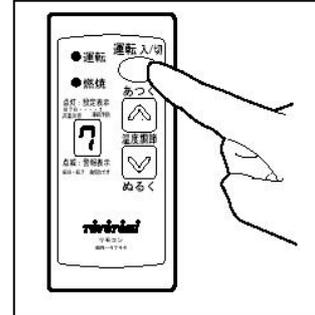
INSPECTION BEFORE OPERATION

1. Check for water leaks in the Circulation Pipes.
2. Be sure there is a sufficient amount of fuel in the Fuel Tank and that there are no leaks in the Fuel Pipe.
3. Be sure the Power Supply is properly connected and grounded to the unit.
4. Be sure the area around the Water Heater is clear of flammable materials such as gasoline, thinner or flammable vapors.
5. Be sure the Exhaust Pipes are securely connected and that there are no leaks.

OPERATION

CAUTION: The excessive high temperature setting increases the risk of scald injury. (Thermal burn at low temperature)

1. Open the Fuel Tank Valve.
2. Press “POWER SWITCH” of Remote Controller. Operation lamp will come on and display indicates “7”. Automatic operation is based upon the temperature of water inside the heat exchanger. “BURNER” lamp is lit when the burner is in its operation mode.



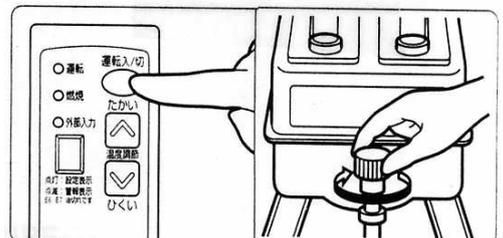
NOTE: When you first use your water heater after installing, the display indicates “7”. In other case the display indicates the previous setting number.

IF IGNITION FAILURE OCCURES

1. When first using the Water Heater after it is installed or refueled, it may not be ignited due to air left in the Fuel Pipe. If so, remove air from the Fuel Pipe as described in the previous section.
2. Make sure that the Fuel Tank is free of water. If not, remove water through the Drain Valve. If there is water inside of Drain Cup, remove water completely.

TURNING UNIT OFF

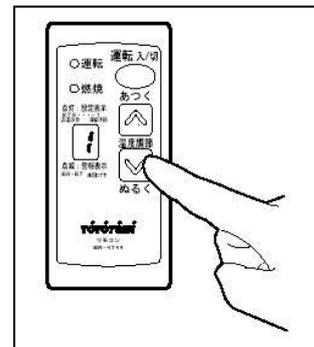
1. Press “POWER SWITCH” of Remote Control.
2. Close the Fuel Tank Valve.



ADJUSTING WATER TEMPERATURE

The temperature of the circulation water is raised or lowered by pressing the temperature select buttons. To adjust the water temperature, use the “^” button to set the temperature to a higher setting and the “v” button to lower the temperature. The setting temperature (setting display) remains even though the power failure occurs.

The display indicates “1” to “9”. “9” is the maximum high temperature setting.



Setting Display and Circulation Water Temperature									
Setting Display	1	2	3	4	5	6	7	8	9
Circulation Water Temp.	20°C	30°C	40°C	45°C	50°C	55°C	60°C	70°C	80°C

DIFFERENTIAL SWITCH AND DIP SWITCH

CAUTION: Please consult your dealer on the operation of DIP Switch.

By the Differential Switch on the Main Circuit Board, the temperature of circulation water is controlled in the range of 2°C differential, 6°C differential, 9°C differential or 12°C differential.

NOTE: If the wide differential is selected, the cycle frequency of ignition and extinguishments of the Burner will be reduced.

The position of DIP Switch is set to "6°C differential" from factory.

PREVENTING FREEZE UP

In order to prevent any kind of damage or leaks caused by freezing, make sure if the antifreeze fluid of adequate concentration contains in the circulation water regardless of being used in a cold region or in a warm or hot region.

- Change the circulation water every 2 years.

LONG TERM INACTIVITY

When leaving the unit unused over a long period of time, disconnect the Power Supply Cord after turn the unit off by pressing the "POWER SWITCH".

SECTION E: ROUTINE MAINTENANCE

INSPECTION AND MAINTENANCE

WARNING: RISK OF INJURY FROM MOVING PARTS AND ELECTRICAL SHOCK. Disconnect the Power Supply Cord before inspecting and servicing unit. All repairs should be left to professionals. RISK OF BACKFIRE AND INDOOR POLLUTION. Before operation make sure the Exhaust Pipe is free of snow, icing, leaves, bird's nest or strong drafts.

CAUTION: RISK OF BURN INJURY. Do not touch the Exhaust Pipe Top and the Exhaust Pipe.

When inspecting, ALWAYS do the following.

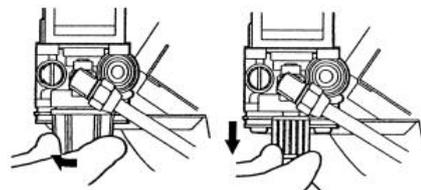
- a. Press the Power Switch to turn off.
- b. Disconnect the Power Plug from the Receptacle.
- c. Close the Fuel Tank Valve.

When inspecting, NEVER do the following.

- a. Do not remove the Thermistor.
- b. Do not remove the Tip-over Switch.
- c. Do not adjust the pressure of the Fuel Pump.

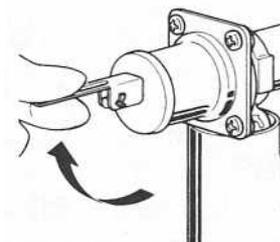
INSPECTION AND MAINTENANCE ITEMS

1. FLAMMABLE IN THE ENVIRONMENT (REGULARLY)
Remove all flammable material from the area.
2. FUEL LEAKS (REGULARLY)
Always check for fuel leaks. Clean off spilled fuel thoroughly when lubricating fuel. If a leak is found, shut down the unit until the problem is corrected.
3. FUEL PIPE INSPECTION (REGULARLY)
Check for fuel leaks from the Fuel Pipe. Replace it if any cracks or leaks are found.
4. WATER LEAKS (REGULARLY)
Check the heat exchanger for water leaks. Always correct if found.
5. ODOR OR SOOT (REGULARLY)
Check the Exhaust Pipe top for abnormal odor and accumulated soot. Consult your dealer if it is found.
6. DUST (ONCE A MONTH)
Check for dust inside of the unit and the bottom (base).
7. WATER INSIDE THE FUEL TANK (ONCE A MONTH)
Remove any water or waste particles that accumulate inside the Fuel Tank.
8. FUEL STRAINER (ONCE A MONTH)
Vibration, noise, ignition and combustion failure could be caused by water or waste particles in the Fuel Strainer. Clean the Fuel Strainer by kerosene once a month.



9. PRESSURE RELIEF VALVE (ONCE A MONTH)

The Pressure Relief Valve may become immovable at times due to corrosion of pipes or mineral deposits in the pipes. Pull up the lever of the Pressure Relief Valve every month and make sure the Valve is movable.



10. PLUG AND RECEPTACLE (ONCE A MONTH)

Make sure the Plug is free of dust. Be sure Plug fits Receptacle

11. BURNER INSPECTION (ONCE SIX MONTHS)

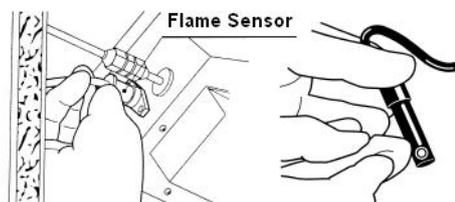
Check the burner and combustion area for soot. Clean if found.

12. GASKETS AND SEALING (ONCE SIX MONTHS)

Check for water leaks caused by improper sealing of the Circulation Water Pipe. Consult your dealer if there are leaks.

13. FLAME SENSOR (PHOTOELECTRIC CELL)
(ONCE SIX MONTHS)

- a. Take out the Flame Sensor which is located to the left of the Burner inside the Cabinet.
- b. If the receiving surface of the photoelectric cell of the Flame Sensor becomes dirty or contaminated, the unit will not operate properly. The receiving surface of photoelectric cell should be wiped with a soft cloth every 6 months.



14. BLOWER MOTOR (ONCE SIX MONTHS)

Make sure there is no dust on the blower motor fan.

15. EXHAUST PIPE (ONCE A YEAR)

A clogged Exhaust Pipe will cause improper combustion. Inspect for any clogging or soot accumulation should be done at least once every year. Make sure not to place combustibles in the Exhaust Pipe area.

SECTION F: TROUBLESHOOTING

WARNING: RISK OF INJURY FROM MOVING PARTS AND ELECTRIC SHOCK.
Disconnect the Power Supply Cord before servicing unit. All repairs should be left to professionals.
Do not re-use the unit until the cause of the problems have been determined.

CAUTION: RISK OF BURN INJURY. Do not touch the unit and the Heat Exchanger while in hot.

If there is any abnormality, determine for the causes from the list below and perform the specified measure. Consult your dealer if problems cannot be corrected from this chart.

	PROBLEM	ERROR CODE	CAUSE	SOLUTION
At the start of operation	POWER LAMP FAILS TO TURN ON	-	Disconnected power supply cord	Connect power supply cord.
	ALARM LAMP LIGHTS AFTER TURNING ON.	E3	Thermistor malfunction	Replace it.
		E9	Bi-metal switch activated	Reset after eliminating cause.
		E9	Thermal fuse activated	Replace it.
	BLOWER MOTOR OPERATES BUT IGNITION FAILS.	E2	Flame sensor malfunction or light is received on the receiving surface of photoelectric cell	Repair or replace it.
		E7	Abnormal location and adjustment of electrode	Consult your dealer.
		E7	Igniter malfunction.	Consult your dealer.
E7		Abnormal lowering of electrical voltage	Contact electricians.	
E7		Out of fuel	Check fuel gauge on fuel tank; refuel.	
E7		Trapped air in fuel pipe.	Remove the trapped air.	
While in operation	EXTINGUISHED AFTER IGNITION	E6	Stained photoelectric cell	Clean it.
		E6	Trapped air in fuel pipe	Remove the trapped air.
		E6	Excessive air for combustion	Consult your dealer.
		E6	Flame sensor malfunction	Replace it.
	NOISE FROM FUEL PUMP	-	Air lock in fuel line Clogged intake line and pump	Remove air. Consult your dealer.
	NOISY COMBUSTION	-	Fuel flow too much Fuel flow too little Improper installation of Exhaust Pipe	Consult your dealer. Consult your dealer. Consult your dealer.
	HOT WATER TEMP TOO LOW	-	Thermistor malfunction	Consult your dealer.
	SOOT ACCUMULATION	-	Dusty blower motor fan Improper installation of flue pipe Fuel flow too much	Consult your dealer. Re-install properly. Consult your dealer.
	DOES NOT HEAT	-	Power switch of remote controller is not pressed	Press Power switch.
			Leakage from circulation part Insufficient removing air	Consult your dealer. Consult your dealer.
After stop	FUEL LEAKAGE FROM FUEL PIPE	-	Loose connection of fuel pipes	Consult your dealer.
	WATER LEAKAGE	-	Water leakage from heat exchanger (Heat exchanger malfunction)	Consult your dealer.

ERROR CODE IN DISPLAY

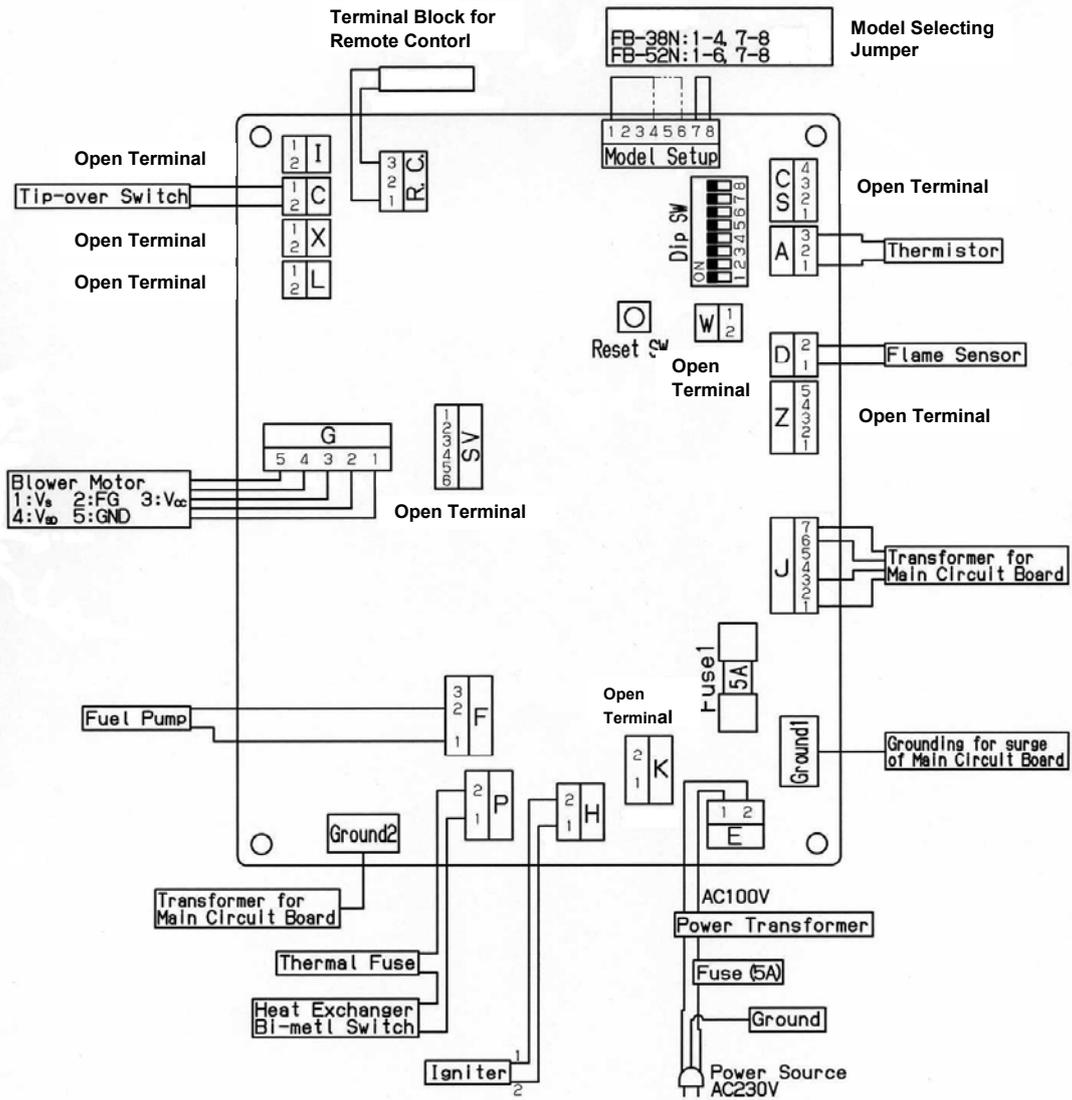
When the water heater is malfunctioned, the unit stops the operation automatically and Display indicates Error Code (“E” & “Number”) alternately by flashing.

Display	CAUSE		RESULT
E + 0	Disconnected model setting jumper terminal		Operation stops and operation lamp and display are flashing.
E + 2	Flame sensor detected flame before ignition		
E + 3	Disconnected thermistor		
E + 4	High limit switch activated		
E + 5	Tip-over switch activated		
E + 6	Extinguished after ignition	Out of fuel Refuel	
E + 7	No ignition		
E + 8	Blower motor malfunction		
E + 9	Heat exchanger bi-metal switch or Thermal fuse activated		
E + 卜	Malfunction of remote controller or remote controller cord		
E + 三			
E + -			

NOTE: To restart the unit, turn the unit off by pressing “POWER SWITCH” and after 5 seconds press “POWER SWITCH” to turn it on once again.

NOTE: Press the Reset Button of Heat Exchanger Bi-metal Switch to reset the unit when Heat Exchanger Bi-metal Switch is activated. Make sure to disconnect the Power supply cord before pressing the Reset Switch of Heat Exchanger Bi-metal Switch.

WIRING DIAGRAM



- B: Blue
- O: Orange
- Y: Yellow
- W: White
- R: Red
- K: Black

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5-17, MOMOZONO-CHO, MIZUHO-KU, NAGOYA, 467-0855 JAPAN

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Kerosene-Fired Water Heater

Installation Manual

MODEL FB-38N(FS) / FB-52N(FS)

IMPORTANT

THIS APPLIANCE SHOULD BE INSTALLED BY A LICENSED, AUTHORIZED PERSON(S) DUE TO THE NECESSITY OF MAKING ELECTRICAL, WATER AND FUEL CONNECTIONS. RETAIN THIS MANUAL FOR FUTURE REFERENCE. CHECK LOCAL CODES AND ORDINANCES FOR PERMITTED USE.

CAUTION

THIS WATER HEATER SHALL NOT BE USED FOR COMMERCIAL USE OR FOR ANY PURPOSES OTHER THAN HOT WATER SUPPLY USES. OTHER USAGE MAY CAUSE A MALFUNCTION OR SHORTEN ITS SERVICE LIFE. DO NOT REMOVE THE RATING PLATE AND LABELS FROM THE WATER HEATER UNIT.

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SECTION A: SAFETY TIPS FOR INSTALLATION

BE SURE TO FOLLOW THE FOLLOWING INSTRUCTIONS.

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“**WARNING**” indicates the possibility of causing the user a fatal accident or serious injury if the water heater is incorrectly operated.

“**CAUTION**” indicates the possibility of causing the user injuries or material damages if the water heater is incorrectly operated.

WARNING

1. Never use any fuel other than water-clear and high quality of kerosene. NEVER USE GASOLINE! Use of such fuels can result in an explosion and/or fire and cause injury.
2. Improper installation, adjustment, modification, or service and maintenance by an unauthorized person may cause SERIOUS UNIT DAMAGE, BODILY INJURY, HAZARD OR PROPERTY DAMAGE. This unit should be installed by a licensed, authorized person(s) due to the necessity of making electrical, water and fuel connections. Refer to the installation manual and the operation and maintenance instructions for assistance, or consult your dealer for further information.
3. HAZARD OF ELECTRICAL SHOCK! Before removing any access panels of water heater for service, make sure the electrical supply to the water heater is shut off. Failure to do this may result in HAZARD, SERIOUS BODILY INJURY, OR PROPERTY DAMAGE.
4. Check and comply with all state and local codes that may apply to water heater(s) before beginning the installation.
5. This water heater is designed to be used no more than 1,300 m above sea level. The water heater may have a failure of combustion at a high altitude.
Ask your local dealer for using at altitudes higher 800 m ~ 1,300 m above sea level.
6. RISK OF INDOOR AIR POLLUTION AND FIRE. Be sure the exhaust pipe is properly installed and connected. Aluminum tape provided may be used for sealing exhaust pipe connections.

CAUTION

1. Keep the area around the unit clean and free of flammable materials.
2. RISK OF FIRE AND ELECTRIC SHOCK. Do not apply any excessive force or pressure to the power supply cord. Make sure the plug is free of dust. Be sure plug fits receptacle securely.

SECTION B: UNPACKING

UNPACKING

1. Unpack the unit carefully.
2. Check to see if there are any loose screws that may have occurred in transit.
3. Take accessories and the Operation and Maintenance instructions out of the carton.

STANDARD INSTALLATION PARTS

The following standard installation parts are enclosed with unit.

1. Exhaust Pipe Top (1 pc.)
2. Rubber Fuel Hose (1 pc.)
3. Hose Band (2 pcs.)
4. Remote Control (1 set)
5. Remote Control Cord (3 m)
6. Adhesive Tape (2 pcs.)
7. Wooden Screw (2 pcs.)

SECTION C: INSTALLATION

WARNING: This unit must be installed in accordance with these instructions, local codes, ordinance and/or in the absence of local codes, the latest edition of the national fire protection association code.

WARNING: Check and comply with local codes that may apply to Water Heater(s) before beginning the installation.

WARNING: This unit should be installed by a licensed, authorized person(s) due to the necessity of making electrical, water and fuel connections.

SELECTING A LOCATION

Select a place to install the Water Heater where water pipes, electric supply, and surrounding surfaces will be at safe and noise prevention distances.

1. Select a place which is free of moisture, water spills, pools or snow.
2. Select a place which draining can be done easily.
3. Select a place which the Fuel Tank can be installed safely.
4. Select a place which is free of combustible substances.
5. The surrounding walls should be finished with non-flammable materials (concrete block, mortar, or plaster are allowable).
6. The floor on which the Water Heater is installed must prevent intensive vibrations or shock and must be strong enough to bear the weight of the water heater.

7. Select a place where proper maintenance and control can be provided for the unit after installation.
8. Select a place sheltered from weather.
9. Install the unit on a non-flammable surface in a stable position.
10. It is important to keep enough clearance for the purpose of maintenance, repair and possible servicing.
11. The Exhaust Pipe is free of snow, icing, leaves, bird's nest or strong drafts.
12. Before making a hole in your wall for the Exhaust Pipe, make sure the area is free of electrical wires, gas pipes and other obstacles.
13. Select a place that can draw in sufficient air for combustion. The air intake hole should be placed in a spot can draw in outside air near the floor.

[FB-38N(FS)]

Effective hole area	450 cm ² x 2 locations
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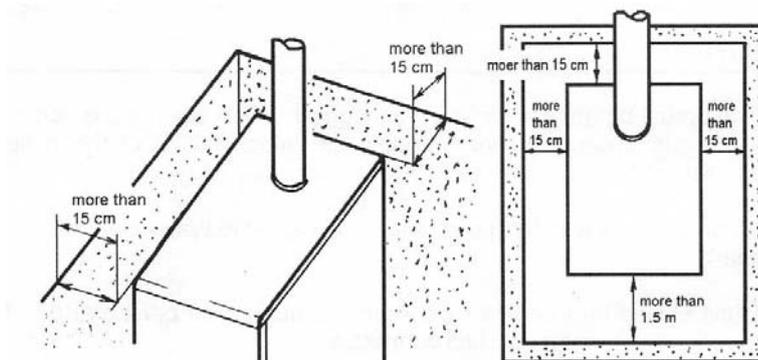
Type of ventilation hole	Aperture factor	Existing ventilation hole ara
Metal ventilation hole	50%	900 cm ²
Wooden ventilation hole	40%	1125 cm ²

[FB-52N(FS)]

Effective hole area	600 cm ² x 2 locations
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Type of ventilation hole	Aperture factor	Existing ventilation hole ara
Metal ventilation hole	50%	1200 cm ²
Wooden ventilation hole	40%	1500 cm ²

14. Select a place which maintain sufficient clearance to prevent fire. The clearance between the Water Heater and combustible objects should be maintained as illustrated in the figure.



LEVEL ADJUSTMENT

After positioning the Water Heater, adjust the level with the 4 adjusting legs located at the Water Heater bottom and make sure the position of the unit is leveled by using a plumb bob.

FUEL TANK INSTALLATION

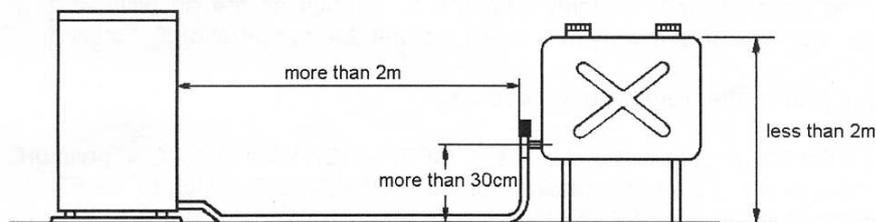
The fuel tank must be purchased separately and installed by a qualified fuel supply technician.

NOTE: Fuel tank installation must comply with locally applicable codes. Check with local building officials.

NOTE: Keep the fuel tank away from direct sunlight, high temperature, dust, rain and fire, and take preventive measures against falling during an earthquake.

NOTE: The fuel tank should be installed on non-flammable objects, and kept level to prevent the unit from falling or shaking.

NOTE: The fuel tank should be installed on a base finished with non-flammable objects (concrete, mortar or block). The legs of fuel tank should be secured with anchor bolts (4 locations) to prevent falling or shaking.



FUEL PIPE INSTALLATION

Insert the rubber fuel hose to the fuel valve connected with the fuel tank, and tighten by the hose band.

NOTE: Do not apply heavy pressure on the fuel hose. To prevent an air lock in the fuel line, the fuel line should not be deformed.

NOTE: Only regular pipe should be used as a fuel pipe.

NOTE: To install a rubber fuel hose, if the bending radius is too small, cracks will occur in a short time because of stress on the inside of the rubber, and an oil leakage may occur. Be sure to maintain a bending radius more than 100 mm, and avoid torsion.

NOTE: Select a place protected from direct sunlight. When a rubber fuel hose is exposed to UV rays, degradation will be accelerated.

NOTE: For outdoor installation, be sure to use a metal pipe (copper pipe with an external diameter of 8 mm) as a fuel pipe.

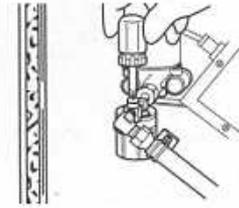
CAUTION: If metal fuel pipe is laid-out, be sure to clear away scraps or chips from the pipe which are produced during cutting or assembling. Leaving these scraps in the pipe may cause problem in the fuel pump.



REMOVING AIR TRAP

When operating for the first time or when refueling an empty Tank, air may be trapped in the Fuel Pipe, making ignition difficult. In this situation, follow the procedure below:

1. Turn the unit off by pressing "POWER SWITCH". Disconnect the power supply cord.
2. Release the two (2) Screws from the Front Panel and remove the Front Panel.
3. To catch the fuel which will drain out, put a small container under the Fuel Strainer.
4. Loosen the Screw on top of the Fuel Strainer. Immediately wipe off any spilled fuel.
5. Remove the trapped air thoroughly. Failure to remove all the air will cause improper ignition and may extinguish the unit during operation.
6. Tighten the Screw after removing trapped air.
7. Reconnect the Power Supply Cord. Turn the unit on by pressing "POWER SWITCH".
NOTE: In the event of an ignition failure, turn the unit off by pressing "POWER SWITCH" and after 5 seconds press "POWER SWITCH" to turn it on once again.



PLUMBING

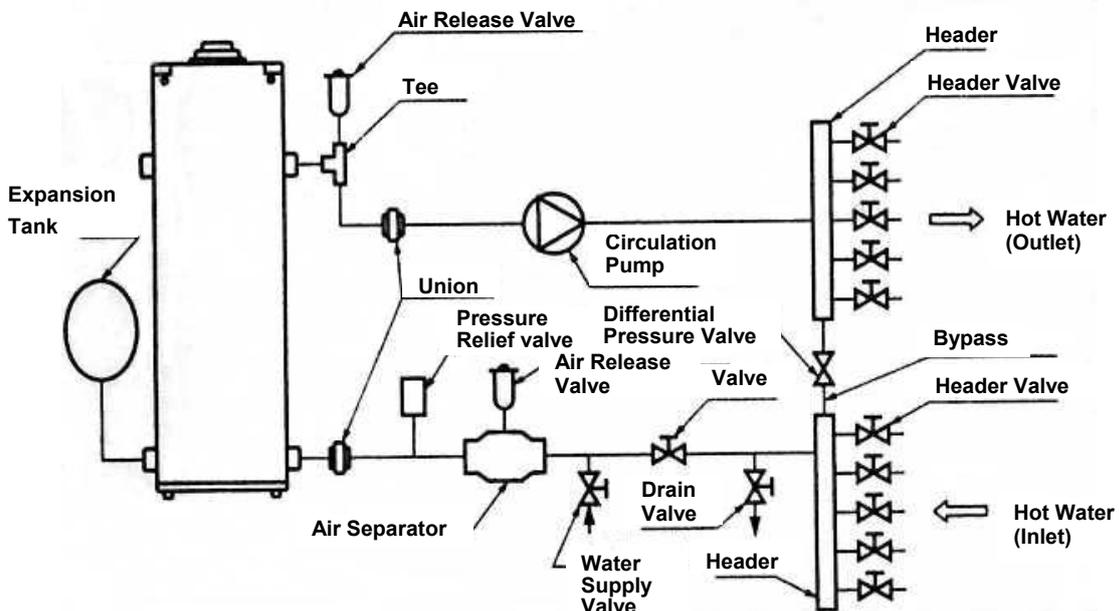
The unit should be equipped with floor heating panels or radiator (convector).

NOTE: Select a place where the Heating Piping for the Water Heater and radiator can be shortened as much as possible.

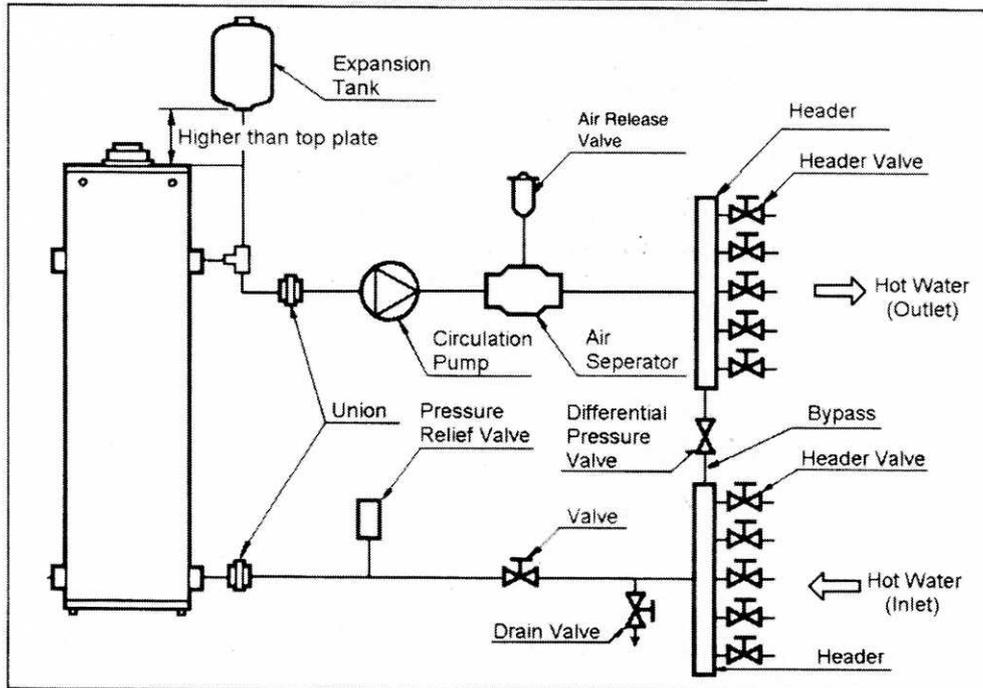
NOTE: Make sure the piping for the radiator is laid-out properly, and also check for leakage with a pressure test.

NOTE: Circulation Pump capacity should be selected in accordance with the water head loss caused by the required maximum flow and the longest piping.

CLOSED CIRCUIT PIPING EXAMPLE



SEMI-CLOSED CIRCUIT PIPING EXAMPLE



NOTE: Be sure to install the Pressure Relief Valve in the proper direction.

CAUTION: Be sure to assemble the piping system at a pressure than 100 kPa because the maximum water pressure is 100 kPa. If not, the heat exchanger may be damaged. Be sure to install a Pressure Relief Valve in the heating water piping on the inlet side of the Circulation Pump.

CAUTION: Use a pipe with a nominal diameter of 25A (R1) [FB-52N(FS): 40A (R1)] between the Water Heater and header. If not, air will become trapped and result in insufficient filling of Antifreeze Solution. This condition may lead to create holes on the heat exchanger.

1. Install heat insulation material on the hot water piping to prevent heat loss.
2. Be sure to use Antifreeze Solution specified by dealer with proper mix proportion for circulation water to prevent freezing and corrosion.
3. Copper or stainless steel pipe should be used for the main and branch pipes.
4. Be sure to connect a hot water pipe with the Semi-closed Expansion Tank or Closed Expansion Tank, and install at the inlet side of the Circulation Pump.
5. Install an Air Separator and Air Release Valve in the hot water pipe to release air inside of the pipe.
6. Be sure to install a Bypass circuit. (Closing the hot water pipe with a thermal valve or temperature control valve may cause problems in the Circulation Pump.)
7. Be sure to install unions in the hot water inlet and outlet sides for the purpose of maintenance.

SEMI-CLOSED / CLOSED EXPANSION TANK SELECTION

NOTE: The Semi-closed Expansion Tank (optional) should be selected in accordance with the total water volume contained in the hot water piping system.

NOTE: Refer to the formula below or the manufacturer's formula when selecting the closed expansion tank.

[Calculation formula for Closed Expansion Tank]

$$V = \{(P_2 + 100) / (P_2 - P_1)\} \times 1.1 \epsilon V_0$$

(When the discharge pressure of the Pressure Relief Valve on the hot water pipe indicates 95 kPa)

- V: Capacity of Closed Expansion Tank (lit.)
 V₀: Total water volume contained in hot water piping system (lit.)
 ε: Circulation water expansion rate
 P₁: Air injection pressure of Expansion Tank (kPa)
 The air injection pressure should be selected at the pressure, which is 10 to 20 kPa greater than the maximum static pressure that is applied on the Expansion Tank (maximum value between Expansion Tank and radiator).
 P₂: Discharge Pressure of Pressure Relief Valve (kPa)
 V₀ (lit.) = Heat exchanger capacity of Water Heater + retained water volume in radiator + retained water volume in pipe (see the following table.)

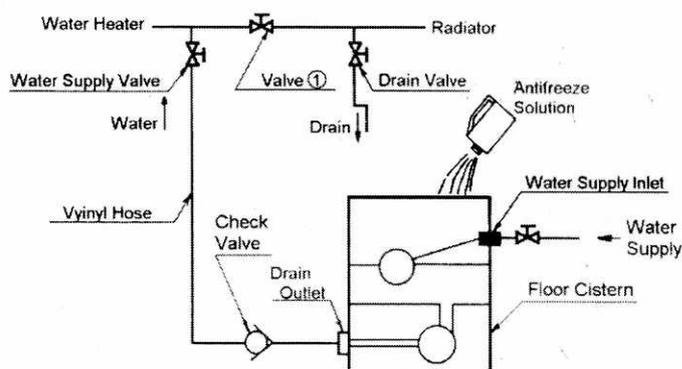
Retained water volume in copper pipe per 1m	Nominal Diameter	φ 8	1/4 (8A)	3/8 (10A)	1/2 (15A)	3/4 (20A)	1 (25A)	1-1/4 (32A)	1-1/2 (40A)
	Retained water volume (lit./ m)	0.040	0.050	0.103	0.165	0.334	0.565	0.844	1.183

Retained water volume in city water pipe per 1m	Nominal diameter	1/2 (15A)	3/4 (20A)	1 (25A)	1-1/4 (32A)	1-1/2 (40A)
	Retained water volume (lit./m)	0.20	0.37	0.60	1.10	1.36

Expansion rate of Antifreeze Solution (0~80°C)	Mix proportion of Antifreeze Solution	40%	50%
	Expansion rate ε		0.042

WATER INJECTION AND AIR RELEASE FROM WATER HEATER PIPING (FOR CLOSED CIRCUIT PIPING)

1. Connect the water outlet of the floor cistern (selected by dealer) with the water inlet of the hot water pipe with a vinyl hose.
2. Connect the water inlet of the floor cistern with the city water outlet with a vinyl hose.



3. Antifreeze Solution specified by dealer should be used, and the density should be at a ratio of 40% to 50%, as shown in the table.

Table of Antifreeze Solution composition ratio		
Freezing temp.	Antifreeze Solution	City water
-10°C	40%	60%
-20°C	50%	50%

CAUTION: The rust proofing capability will be reduced if a Solution with a ratio less than 40% is used.

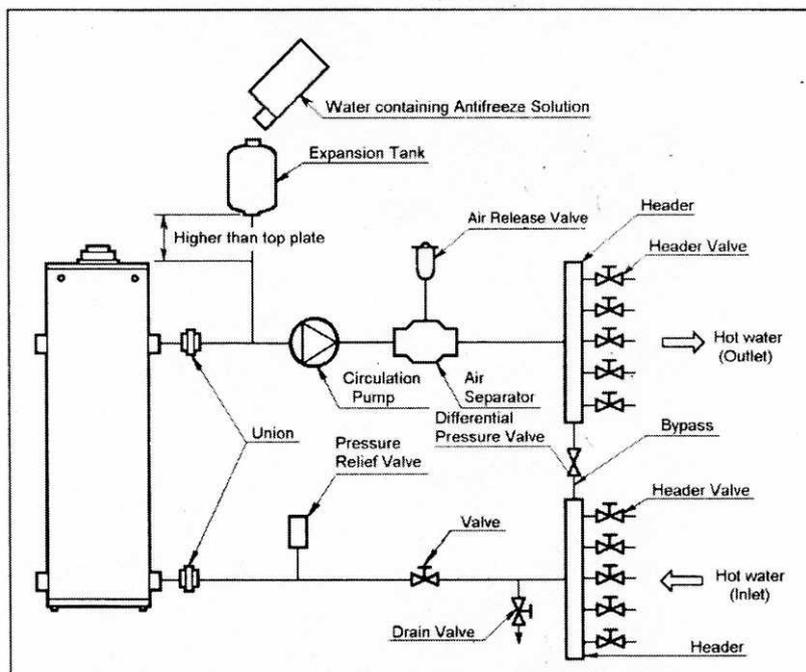
[Calculation formula for required amount of Antifreeze Solution]

Required amount of Antifreeze Solution (lit.) = {(Heat Exchanger Capacity of Water Heater) + (retained water volume in radiator) + (retained water volume in piping)} x Antifreeze Solution ratio (%) x 0.01

4. Supply water into the floor cistern, and then insert the Power Plug in the Receptacle.
5. Close the valve ①, open the Drain Valve and Water Supply Valve on the Water Heater piping.
6. By supplying water in the Water Heater piping, inject the required amount of Antifreeze Solution as per article 3 into the floor cistern.
7. As soon as the circulation water is drained, close the Drain Valve and then open the Air Release Valve on the Water Heater piping to release air of the line.
8. Start the Circulation Pump to circulate water.
9. Close the Feed Valve after 10 minutes, and then disconnect the Power Plug.
NOTE: If air is released with each circuit connected to the Water Heater piping, the air releasing will be more effective.
10. After air releasing, take off the vinyl hose between the floor cistern and Water Supply Valve.

WATER INJECTION AND AIR RELEASE FROM WATER HEATER PIPING (FOR SEMI-CLOSED CIRCUIT PIPING)

SEMI-CLOSED CIRCUIT PIPING EXAMPLE



1. Antifreeze Solution specified by dealer should be used, and the density should be at a ratio of 40% to 50%, as shown in the table.

Table of Antifreeze Solution composition ratio		
Freezing temp.	Antifreeze Solution	City water
-10°C	40%	60%
-20°	50%	50%

NOTE: The rust proofing capability will be reduced if a Solution with a ratio less than 40% is used.

[Calculation formula for required amount of Antifreeze Solution]

Required amount of Antifreeze Solution (lit.) = {(Heat Exchanger capacity of Water Heater) + (retained water volume in radiator) + (retained water volume in piping)} x Antifreeze Solution ratio (%) x 0.01

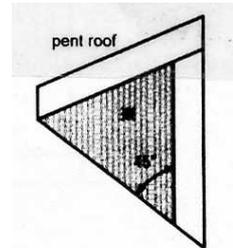
2. Inject the Antifreeze Solution as per article 1 into the Expansion Tank, and start Circulation Pump to release air from each circuit on the Water Heater line.
3. If the water level of Expansion Tank goes down, inject circulation water mixed with Antifreeze Solution until the water level does not go down.

ELECTRICAL WIRING

WARNING: RISK OF FIRE AND ELECTRIC SHOCK. Make sure the power supply cord is disconnected to avoid any electric shock before servicing. Electric shock may cause serious injury. It is recommended that installation should be conducted by a licensed electrician.

NOTE: If the power receptacle is not installed at the proper position, then contact the appropriate electrical company.

1. Power source: AC 230V, 50Hz single phase
2. Use or install a power receptacle that is rated for this power supply.
3. A receptacle equipped with a grounded breaker should be used to supply the power. If a grounded breaker is not equipped, then contact the appropriate electrical company.
4. For a receptacle that is not the rainproof type, install it within the shaded area in the figure, or prepare a device to keep out the rain.
5. The length of the power cord is 2 m. The power cord should be free from damage, bundling, and sharp bends and not placed under a heavy object. If the power cord is installed outdoors, then select a place sheltered from rain water, and pass it through a conduit.



INSTALLING REMOTE CONTROL

NOTE: Select a place that is free from rainwater, high-temperature and humidity, and dust. Be aware of tripping over the cord, having the cord become caught on a door, or crushing the cord under heavy objects.

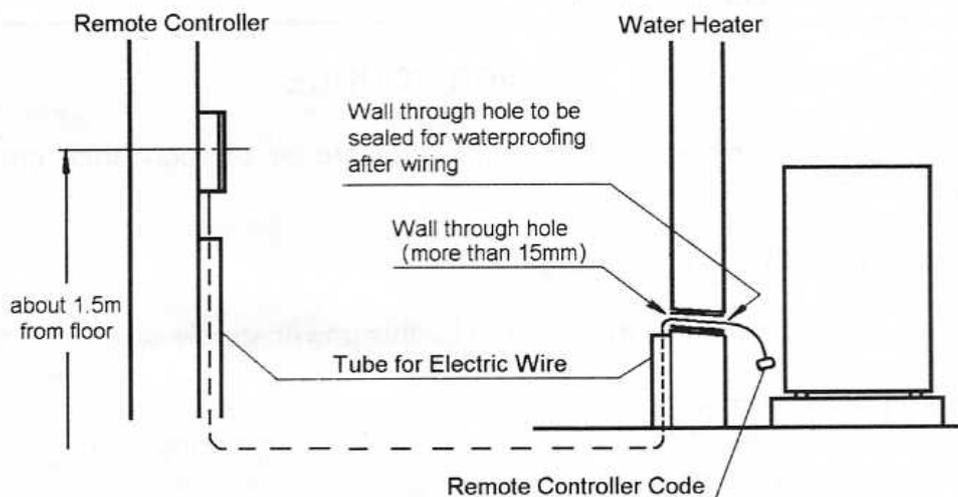
DO not bundle the remote controller cord with a power supply cord or other electric equipment cords. Install the cord separately.

Select a place for the installation that takes into account the cord length.

3 m remote control cord is attached.

An extension cord up to 20 m for the remote control is permitted.

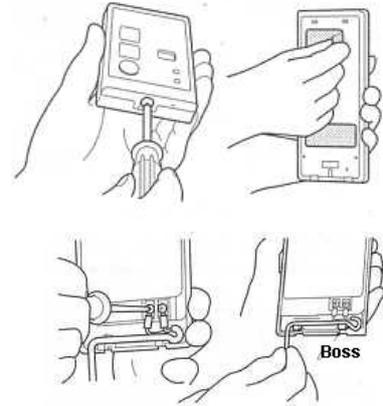
WIRING FOR REMOTE CONTROL CORD



For Installation on the wall

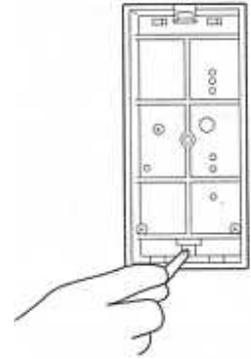
1. For installation with the double-sided adhesive tape (2 pcs.) included in the carton box

- (1) Remove the screw on the Remote Controller Cover, and remove it from the base.
- (2) Attach the adhesive double-coated tape at the back of the base first, and then affix the base to the wall.
- (3) After the Y-shaped terminal of the Remote Controller Cord is screwed on to the terminal on the circuit of Remote Controller, then put the cord around the boss as shown in the figure.
- (4) Return the Remote Controller Cover to the base.



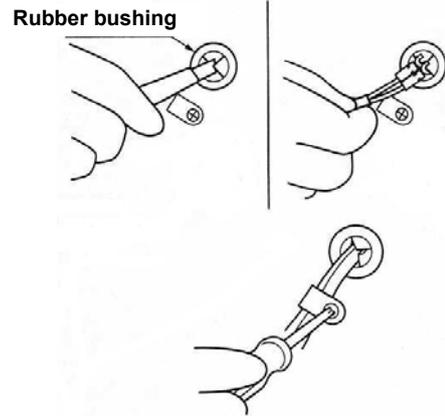
2. For installation with the wood screws (2 pcs.) included in the carton box

- (1) Remove the screw for the Remote Controller Cover, and remove it from the base.
- (2) Fix the base at the desired position by the attached screws (2 pcs.).
- (3) After the Y-shaped terminal of the Remote Controller Cord is screwed on to the terminal on the circuit of Remote Controller, then put the cord around the boss as shown in the figure.
- (4) Return the Remote Controller Cover to the base.

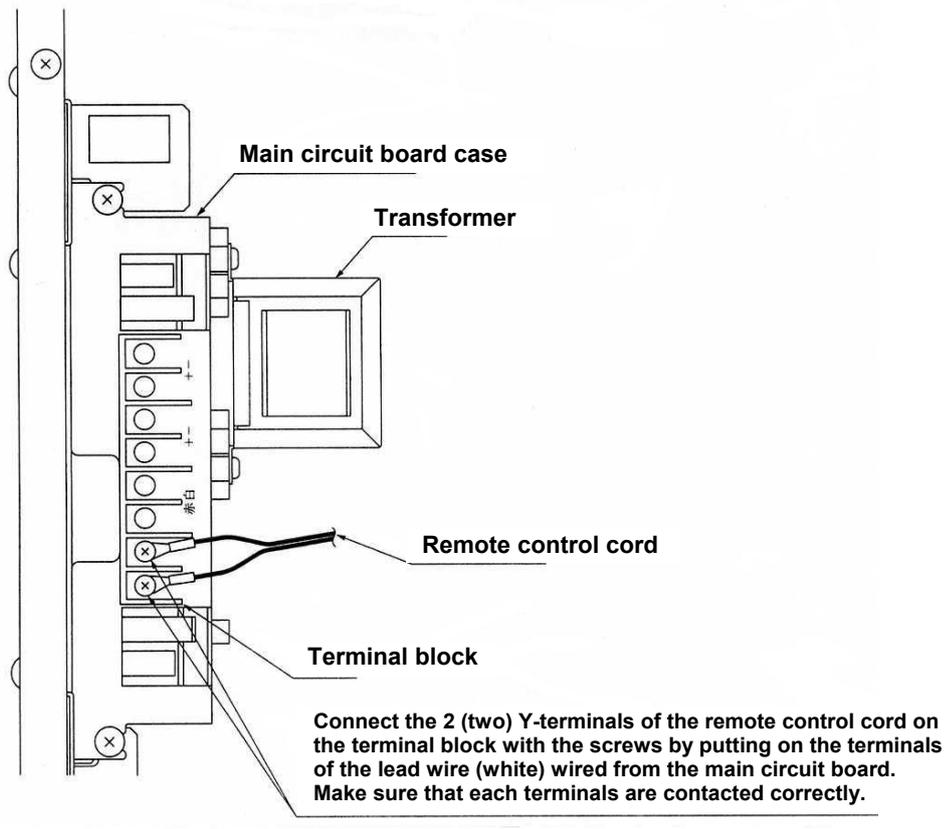


WIRING OF WATER HEATER

- (1) After making sure that the power supply cord is disconnected, remove the two (2) screws from the front panel and remove the front panel.
- (2) Cut the rubber bushing on the left side panel by a cutter and insert the remote control cord.
- (3) Connect the terminal of the remote control cord to the terminal block for the remote control on the main circuit board case together with the terminal wired from the circuit board.
- (4) Fix the remote control cord on the cable clamp located under the rubber bush. the main circuit board.



WIRING TERMINAL BLOCK FOR REMOTE CONTROL



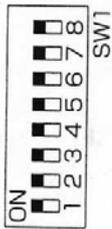
TEMPERATURE CONTROL (DIFFERENTIAL SWITCH AND DIP SWITCH)

NOE: Make sure that the power supply cord is disconnected when the position of DIP Switch is selected.

- The differential switch on the main circuit board controls the heat exchanger water temperature. The switch can be set at a delta (on/off) of 2°C, 6°C, 9°C or 12°C. A higher delta reduces burner short cycling. And you can set the maximum setting temperature at approx. 50°C, 60°C, 70°C or 80°C.
- The position of DIP Switch is set to 6°C differential from factory. The maximum setting temperature is set to approx. 80°C at factory. If you like to change the differential, select the DIP Switch as follows.

HOW TO SELECT DIP SWITCH

NOTE: DIP Switch is located on the main circuit board.

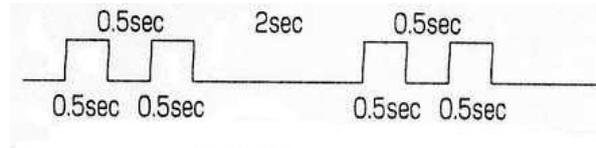


- (1) DIP Switch No. 1: Error history
When turning the DIP Switch No.1 to “OFF” position at the operation switch off, the burner lamp will flash and it indicates when the error occurred by number of flashing times and the error code is displayed on the remote control.

Example:

In case that the error occurred two times before;

1	Error History
2	Differential
3	
4	Max. Temp. Setting
5	
6	
7	High Altitude
8	



- (2) DIP Switch No. 2 and No.3: Temperature differential

Differential Dip No.	2°C	6°C (Factory setting)	9°C	12°C
2	ON	ON	OFF	OFF
3	OFF	ON	ON	OFF

- (3) DIP Switch No. 4 and No.5: Maximum setting temperature

Set Temp Dip No.	9 (80°C) (Factory setting)	8 (70°C)	7 (60°C)	5 (50°C)
4	ON	ON	OFF	OFF
5	ON	OFF	ON	OFF

- (4) DIP Switch No. 7: High altitude setting

When using at high altitude (800~1300m), turn the DIP Switch No.7 to “OFF” position.

This water heater will be not able to be used at more than 1300m higher altitude.

SECTION D: HOW TO INSTALL THE EXHAUST PIPE AND EXHAUST PIPE TOP

WARNING: This unit is required to be installed the exhaust pipe and the exhaust pipe top. Make sure that Exhaust Pipe and Exhaust Pipe Top are properly connected. If it is disconnected, exhaust gas leak indoor during operation which may cause danger.

INSTALLATION OF EXHAUST PIPE AND EXHAUST PIPE TOP

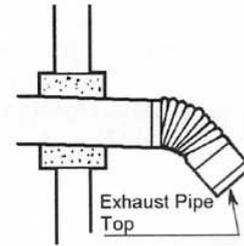
1. Diameter of Exhaust Pipe

The diameter (internal) of the Exhaust Pipe for the Water Heater is 106 mm.

NOTE: The exhaust pipe is optional.

2. Position of Exhaust Pipe and Exhaust Pipe Top

Install so that the end of the Exhaust Pipe and Exhaust Pipe Top will conform to the setting standard as shown in item 10.



3. Exhaust Pipe Top

Be sure to install the attached Exhaust Pipe Top to the end of Exhaust Pipe.

4. Limit of Exhaust Pipe extension

The length of the Exhaust Pipe should not be more than 3 m with less than 3 bends.

NOTE: The length of the Exhaust Pipe must comply with fire prevention measures, and be short as possible.

NOTE: The Exhaust Pipe should be laid down transversely at a downward slope (1/50) to the Exhaust Pipe Top.

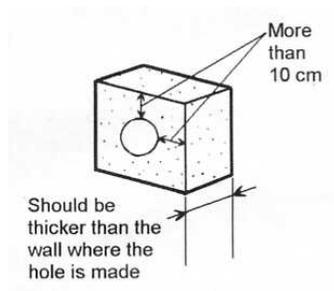
NOTE: The Exhaust Pipe should be covered with the insulating cloth cover (option).

5. Clearance from combustible objects

Install the Exhaust Pipe and Exhaust Pipe Top in accordance with the installation standard shown in item 10.

6. Hole section in roof

1. Use a non-flammable and insulated material for the section.
2. Use non-flammable insulation around the part placed under the roof by using non-flammable materials except for metallic materials.
3. Do not connect the pipes around the section of flammable wall or ceiling where the Exhaust Pipe passes through.
4. Before making a hole in your wall or ceiling, make sure the area is free of electrical wires, gas and water pipes.



7. Fixing the Exhaust Pipe and Exhaust Pipe Top

Fix the Exhaust Pipe by using a pipe bracket at intervals from 1.5 m to 2 m. Fix tightly the Exhaust Pipe Top by using a bracket and hung bracket so that it does not fall due to wind or vibration.

8. Joint seal

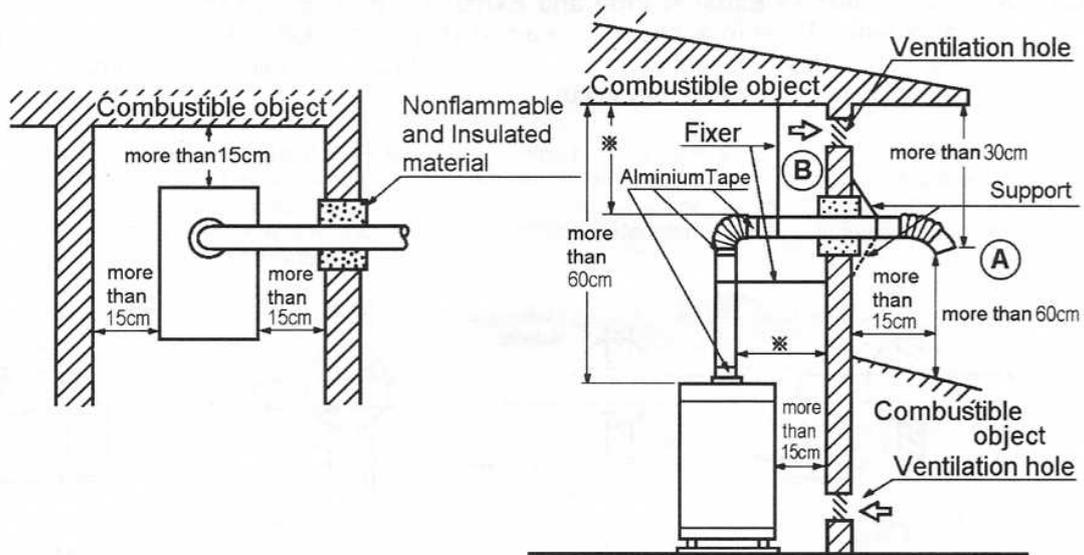
Be sure to seal tightly the connection of the Exhaust Pipe and Exhaust Pipe Top by using the aluminum tape (local supply) to avoid exhaust gas leakage.

9. Matters concerning the fire prevention code

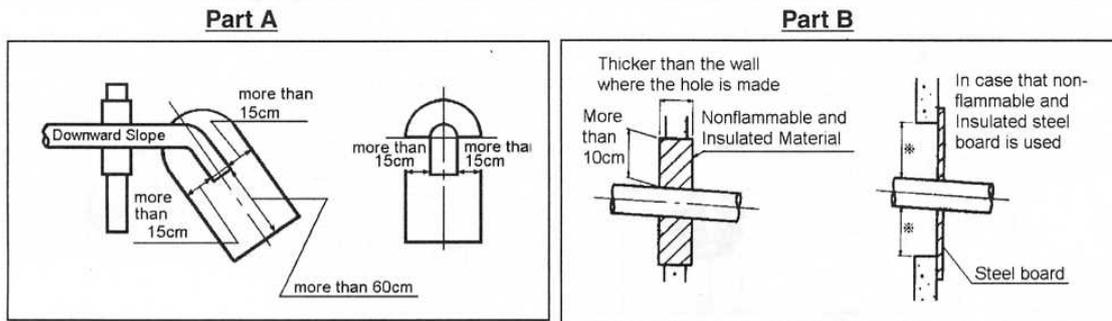
Installation of the Exhaust Pipe and Exhaust Pipe Top must comply with the

local code concerning fire prevention.

10. Securing diagram of Exhaust Pipe and Exhaust Pipe Top installation



NOTE: Put a semi-straight pipe or straight pipe in the Exhaust Pipe fitting hole at first, and lay transversely.



NOTE: Select a place which is clear of combustible objects within 15 cm around the Exhaust Pipe Top, and 60 cm in the exhaust direction. And any opening such as the window or ventilation hole which can blow exhaust gas back indoors is not allowed on the wall as shown above.

NOTE: Use corrosion and heat resistant steel.

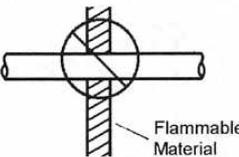
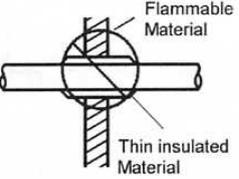
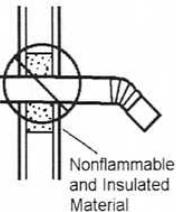
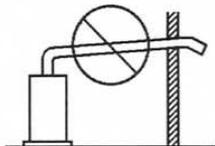
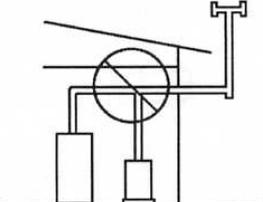
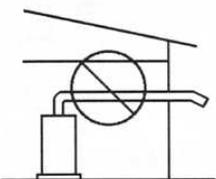
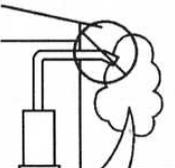
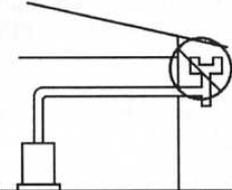
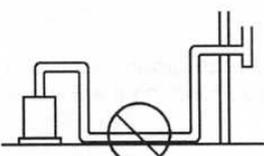
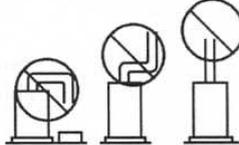
11. Caution in areas of heavy snowfall

In a cold-district (heavy snowfall), select a place where the Exhaust Pipe Top is free from snow. In case the Exhaust Pipe Top is blocked or plugged, exhaust gas may leak indoors and cause a danger.

NOTE: Clearance between ground surface and Exhaust Pipe Top should be increased as far as possible to avoid blocking the Exhaust Pipe Top.

CHECK FOR EXHAUST PIPE AND EXHAUST PIPE TOP

WARNING: Installation of Exhaust Pipe and Exhaust Top as shown below may cause an accident. Be sure to check once again after installation. Be sure to correct by following the installation presented below as an example in which a dangerous situation and incomplete combustion may occur.

<p>1. Pass through a wall without non-flammable and insulated material.</p>  <p>[Measure] Put in non-flammable and insulated material. thicker than the wall.</p>	<p>2. Pass through wall with thin non-flammable and insulated material.</p>  <p>[Measure] Put in non-flammable and insulated Materials.</p>	<p>3. Even though non-flammable and insulated material is installed, Wall material surrounds the material</p>  <p>[Measure] Replace it with the non-flammable and insulated material.</p>	<p>4. Lay transversely with upward slope.</p>  <p>[Measure] Correct for downward slope.</p>
<p>5. Use an Exhaust Pipe with the heater And Bath Heater.</p>  <p>[Measure] Install exclusive Exhaust Pipe.</p>	<p>6. Bending, extension Exhaust Pipe</p>  <p>[Measure] Extension pipe should be 3 bends or less</p>	<p>7. Lay Exhaust Pipe transversely directly from fitting hole.</p>  <p>[Measure] More than one semi-straight or straight pipe.</p>	<p>8. Install Exhaust Pipe under the roof.</p>  <p>[Measure] Connect the pipe out on roof.</p>
<p>9. In close proximity to combustible object.</p>  <p>[Measure] Free from combustible objects</p>	<p>10. Top is stuck out. Top is under ledge of the floor.</p>  <p>[Measure] Install top at 60 cm above ledge end.</p>	<p>11. Lay Exhaust Pipe on the floor or under.</p>  <p>[Measure] Modify correctly.</p>	<p>12. Use without Exhaust Pipe.</p>  <p>[Measure] Install correctly Exhaust Pipe to outdoors.</p>

WARNING

★ Inquire with your dealer about installation or relocation of your water heater.

- Inadequate installation done by yourself may cause electric shock or fire hazards.

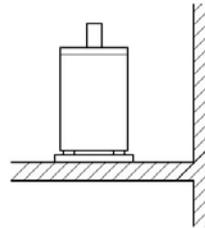


★ Please comply with the fire prevention ordinances, technical standards of electrical appliances, and any other mandated standards. Electrical work and plumbing shall be performed by specialists.



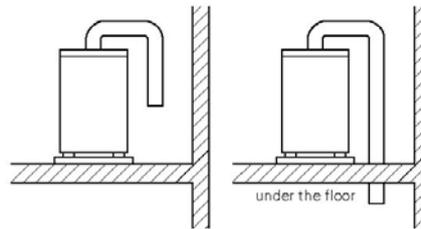
★ Never install indoors.

- Please install the water heater outdoors when you use the water heater outdoor installation type. Fire or unexpected hazards may result.



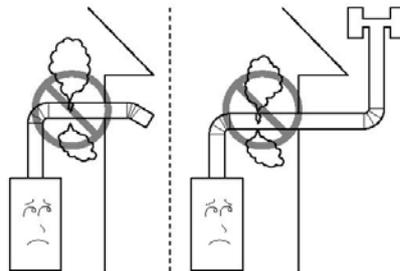
★ Never discharge gas into the room or under the floor.

- Please discharge gas outside of the room.
Exhaust gas can leak into the room (in the



★ Danger of disconnection

- Connect and secure the joints of the exhaust pipe. Exhaust gas can leak into the room during operation, if they are disconnected due to wind, vibrations, or shocks (in the case of indoor installation).



⚠ CAUTION

★ **Ground the water heater.**

- Ground the boiler. You may suffer an electric shock in the event of failure or leakage of current. Consult your dealer for grounding.

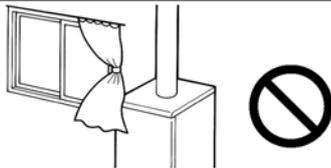


★ **Check the exhaust pipe.**

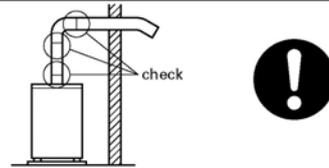
- After completion of the installation work, check the exhaust pipe again on the following points. If you find any inadequacies, be sure to correct them. They may pose hazards or cause imperfect combustion.



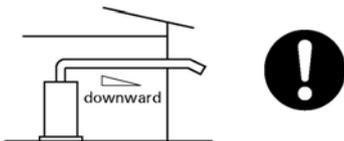
★ **Never place combustibles near the water heater.**



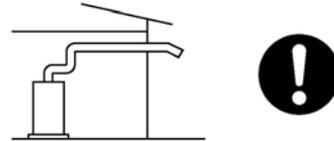
★ **Make sure the joints are tightly fastened.**



★ **Make sure the exhaust pipe is angled downward to the outside.**



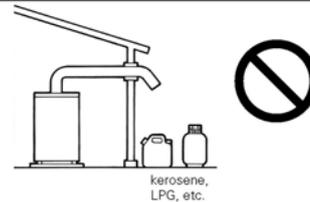
★ **Make sure the stack has a length of 3 m or shorter and three or fewer bends.**



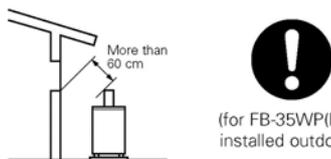
★ **Never place combustibles near or on the exhaust pipe.**



★ **Never place dangerous substances (kerosene, LPG, etc.) near the water heater.**



★ **Make sure the exhaust pipe top is at a distance of 60 cm or more from an opening of the building.**



(for FB-35WP(FS)C installed outdoors)

SECTION E: TEST RUN

PREPARATION

1. Make sure the exhaust pipe is installed properly.
2. Make sure the fuel tank is installed properly. Make sure there is no fuel leakage.
3. Make sure there is no water leaking from piping. (Plumbing)
4. Make sure electrical connections and grounding are wired properly.
5. Make sure the floor is stable and can withstand strong vibration and the weight of a full water heater.
6. Make sure the area is free of flammable materials.
7. Check for air trapped in fuel lines.

OPERATION

1. Open the fuel tank valve.
2. Press the power switch of the remote control to "ON" position. "Power" lamp goes on.
3. Make sure that the unit works properly.
4. To shutdown the water heater, press the power switch of the remote control to "OFF" position.
5. Close the fuel tank valve.

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