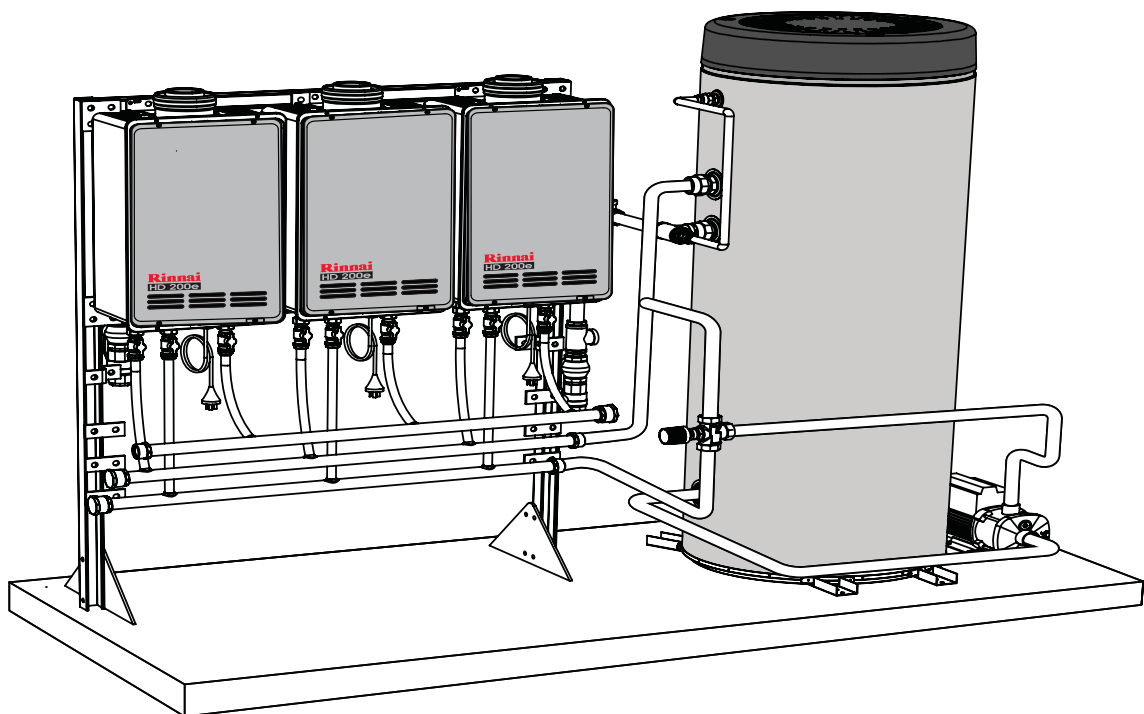


# Rinnai

## RINNAI DD HEX250 High Efficiency Heat Exchange Water Heater

### OWNERS GUIDE AND INSTALLATION INSTRUCTIONS



APPLICABLE TO THE FOLLOWING SYSTEMS:

DD1HEX250F200EN	DD2HEX250F200EN	DD3HEX250F200EN
DD1HEX250F200IN	DD2HEX250F200IN	DD3HEX250F200IN
DD1HEX250F200EL	DD2HEX250F200EL	DD3HEX250F200EL
DD1HEX250F200IL	DD2HEX250F200IL	DD3HEX250F200IL



NOTE

#### Important Notice for Installers

Please leave these instructions with the end user after commissioning of the system and alert the end user of the content in the sections "Warnings" and "Preventative Maintenance".

This product is NOT suitable as a pool or spa heater.



WARNING

#### This appliance shall be installed in accordance with:

- Manufacturer's Installation Instructions
- Current AS/NZS 3000, AS/NZS 3500 & AS/NZS 5601
- Local Regulations and Municipal Building Codes

This appliance must be installed, serviced and removed by an Authorised Person.



The Australian  
Gas Association  
AGA Lic 6330  
For HD Gas  
Boosters



N10378

Certified  
Product



WaterMark  
AS3498 Lic 60084  
AGA For HEX250

Certified  
Product



WaterMark  
AS3498 Lic W208  
SAI Global for  
HD Gas Boosters

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# IMPORTANT INFORMATION & WARNINGS

## Safety and Regulatory Information

The Rinnai DDHEX250 High Efficiency Heat Exchange hot water system is Watermark Certified as a heat exchange water heater with an external energy source.

The external energy sources referred to in this manual are specific Rinnai continuous flow water heater models. These water heaters have stand alone Watermark certificate number W208 and AGA Gas Certificate number 6330.

This appliance must be installed correctly by an authorised person and must conform to local regulations.

The installation must also comply with the instructions supplied by Rinnai. Please keep this instruction booklet in a safe place for future reference.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

For external applications any power leads from the water heater or system components **MUST BE** plugged into a weatherproof electrical outlet. If the power supply cord of the system is damaged, it **MUST BE** replaced by an authorised person in order to avoid a hazard, using genuine replacement parts available from Rinnai. Take care of not to touch the power plugs with wet hands.

## Notice to Victorian Consumers

This appliance must be installed by a person licensed with the Plumbing Industry Commission.

Only a licensed person will have insurance protecting their workmanship.

So make sure you use a licensed person to install this appliance and ask for your Compliance Certificate.

For Further information contact the Plumbing Industry Commission on 1800 015 129.

# WARNINGS

Installation and service only by an authorised person.

- **DO NOT** operate this appliance before reading the manufacture instructions.
- **DO NOT** remove covers while power is on.
- **DO NOT** place articles on or against this appliance.
- **DO NOT** operate with panels, covers or guards removed from this appliance.
- **DO NOT** enclose this appliance.
- **DO NOT** store chemicals or flammable materials near this appliance.

# IMPORTANT INFORMATION & WARNINGS

## Scald Hazards



Hot Water can cause scalds.

Children, disabled, and the elderly are at the highest risk of being scalded.

Feel water temperature before bathing or showering.

Scalds from hot water taps can result in severe injuries to young children.

Scalds can occur when children are exposed directly to hot water when they are placed into a bath which is too hot.

### DO

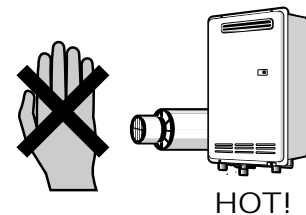
- Do stay with children whenever they are in the bathroom (Take the phone off the hook).
- Do take them out of the bathroom if you need to answer the phone or door.
- Do test the temperature of the water with your elbow before placing your child in the bath.
- Do make sure that the tap is turned off tightly.
- Do install a child proof tap cover OR
- Do install a child resistant tap.
- Consider child-resistant taps or tap covers, which prevent a small hand being able to turn on the tap.
- Consider installing tempering valves or thermostatic mixing valves which reduce the hot water temperature delivered to taps. Your local plumbing authority may already require that these be fitted. Contact your installer or local plumbing authority if in doubt.

### DON'T

- DO NOT leave a toddler in the care of another small child. The older child may not have set the water temperature to a safe level.

## HD200 Heat Source

- **DO NOT** touch the flue outlet.
- **DO NOT** insert any objects into the flue outlet.
- Keep flammable materials, spray cans, fuel containers, trees, shrubs and pool chemicals etc. well clear of the flue outlet.
- **DO NOT** use the gas types other than those designated on the data plate. For example, **DO NOT** use Propane/ Butane gas mixtures on appliances marked Propane Gas.
- **DO NOT** use Propane gas on appliances marked as Natural Gas and vice versa.

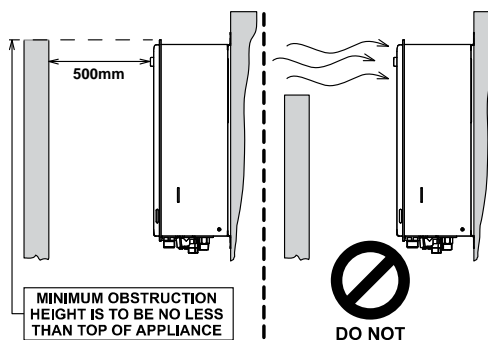


# IMPORTANT INFORMATION & WARNINGS

For detailed instructions on clearances refer to AS/NZS 5601 Fig. 6.2 and for all flueing requirements refer to separate flue instruction booklet supplied with the flue components.

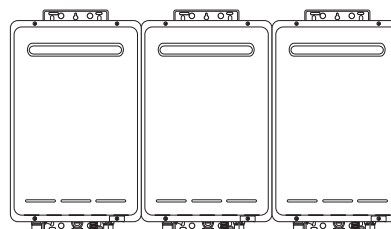
## Horizontal Obstructions

AS/NZS 5601 'Gas Installations' stipulates a minimum horizontal clearance of 500 mm between a building structure and obstruction facing the terminal. For Rinnai external continuous flow water heaters such a building structure must 'obstruct' the full front cover height of the appliance, or extend vertically above and below the front cover. There must be no partial obstructions to the front cover of the appliance or any other parts of the appliance casing. This will avoid the appliance failing to operate under windy conditions.



## Multiple Installations of External Models

Dimension above does not apply when multiple Rinnai external water heaters of the same model are installed on the same vertical face with flue terminals at the same height. Under these conditions appliances can abut each other as shown. The total gas consumption of all appliances applies when determining other clearances.



## Safety Devices

The water heating system is supplied with various safety devices including temperature sensors, overheat sensors and switches. These devices must not be tampered with or removed. The water heating system must not be operated unless each of these devices is fitted and is in good working order.



- **DO NOT tamper with or remove safety devices.**
- **DO NOT operate the water heater unless all safety devices are fitted and in good working order.**
- **DO NOT block or seal Vent / Overflow Outlet.**

## Expansion Control Valve (ECV) - if fitted

Operate the easing lever on the expansion control valve once every six months. It is very important you raise and lower the lever gently.

It is normal and desirable that this valve allows a small quantity of water to be discharged during the heating cycle. If it discharges more than a bucket of water during a 24 hour period or discharges continuously there may be another problem.

If the valve leaks continuously, try easing the valve gear for a few seconds. This may dislodge any foreign matter and alleviate the problem. If this does not alleviate the problem contact Rinnai.

Operate the easing gear regularly to remove any lime deposits and to verify that it is not blocked.

## Servicing and Repair

Our servicing network personnel are fully trained and equipped to give the best on your Rinnai appliance. If your appliance needs service, ring Rinnai the contact number is on the back of this booklet.

The expansion control valve when fitted must be checked for performance or replaced by an authorised person at intervals not exceeding 5 years or more frequently in areas where the water is classified as scaling water (see 'Water Quality').

If the electric conduit, power supply cord or plug to hot water system is damaged, they must be replaced by an authorised person in order to avoid a hazard. The power supply cord and plug must be replaced by a genuine replacement part available from Rinnai.

# IMPORTANT INFORMATION & WARNINGS

## Water Quality

Rinnai Warranty applies to water heaters connected to a water supply where the water chemistry and impurity levels **DO NOT** exceed the limits specified in Table - Water Characteristics below.

Refer to separate product warranty booklet for more details.

TABLE - WATER CHARACTERISTICS

Rinnai water heater system type	Total Dissolved Solids (TDS) mg/Litre or ppm	Hardness (as CaCO <sub>3</sub> ) mg/Litre or ppm	Saturation Index (Langelier)	pH	Dis-solved CO <sub>2</sub> mg/Litre or ppm	Chlorides mg/Litre or ppm
Rinnai DDHEX250	600	200	+0.4 to -1.0 @ 65°C	5.5 to 9.5	18	300

# SPECIFICATIONS

## DDHEX250 High Efficiency Heat Exchange Hot Water System Specifications

Models	DD1HEX250F200EN DD1HEX250F200IN DD1HEX250F200EL DD1HEX250F200IL	DD2HEX250F200EN DD2HEX250F200IN DD2HEX250F200EL DD2HEX250F200IL	DD3HEX250F200EN DD3HEX250F200IN DD3HEX250F200EL DD3HEX250F200IL
Maximum rated capacity (L/Min)	20	32	45
Rated continuous heat output (kW)	45	90	135
Pressure drop at maximum rated capacity (kPa)	35	80	130
Pressure Drop at 10 L/Min. (kPa)	12		
Fitting Kit - Part Numbers:	DDHEXHW1FITTING KIT	DDHEXHW23FITTING KIT	
Temperature rise across coil at maximum output	15°C to 60°C		
Maximum coil operating pressures	850 kPa		
Minimum dynamic coil working pressures	250 kPa		
Electrical power supply	240 Volts, 50 Hz - 10 Amp GPO		
Power consumption at maximum rated capacity	600 W	870 W	970 W
Number of HD200 gas boosters	1	2	3
Primary Pump	DDMSP303	DDMSP504	
Temperature set point on HD200	85°C		
Coil cold inlet connection	32 mm		
Coil hot inlet connection	32 mm		
Tank vent connection	50 mm		
Primary Circuit Vented Tank inlet connection	32 mm		
Primary Circuit Vented Tank outlet connection	32 mm		
Primary Circuit make-up connection	20 mm		
Primary Circuit/Heating circuit storage capacity (Litres)	218		
Empty weight (Kg)	88		
Total filled weight (Kg)	306		
Coil volume (litres)	14.5		
Vented Tank thread type	Rp: Internal Parallel		

# SPECIFICATIONS

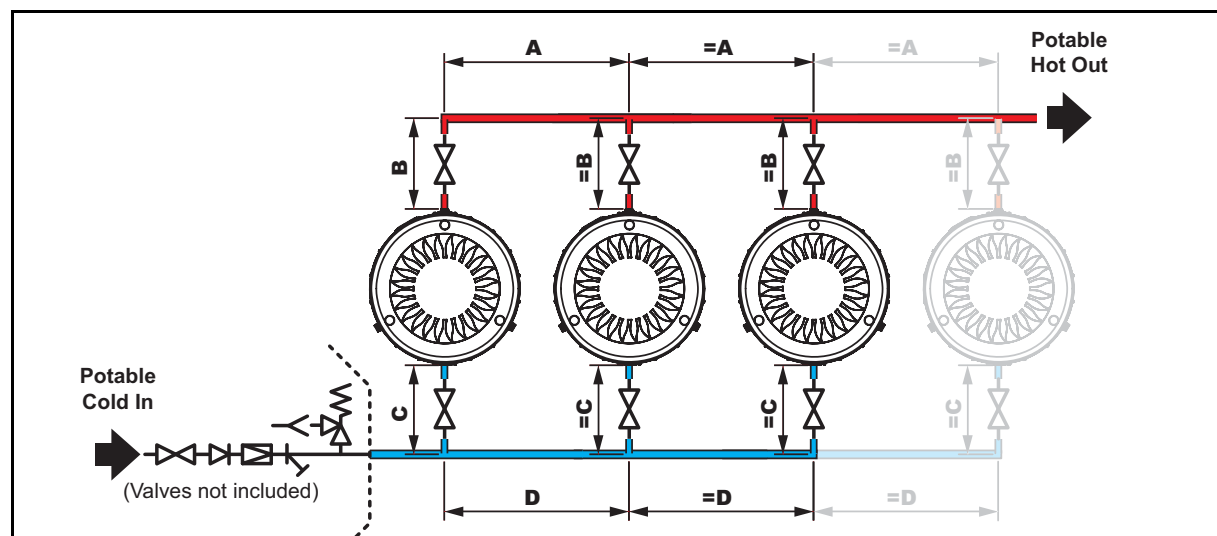
## Selection of DDHEX250 High Efficiency Heat Exchange Hot Water Systems

First Hour Hot Water Delivery Litres 15-60°C	Peak Flow Rate (10 min peak) Litres/min	Recovery Rate Litres/hour	System Number	Selection Systems	HEX250 Vented Tanks	HD250 Gas Boosters	Full Load kW Output	Gas Load MJ/hour
820	20	720	1 x 1 x 1 x 1 x	DD1HEX250F200EN DD1HEX250F200IN DD1HEX250F200EL DD1HEX250F200IL	1	1	45	200
1560	32	1440	1 x 1 x 1 x 1 x	DD2HEX250F200EN DD2HEX250F200IN DD2HEX250F200EL DD2HEX250F200IL	1	2	90	400
2300	45	2100	1 x 1 x 1 x 1 x	DD3HEX250F200EN DD3HEX250F200IN DD3HEX250F200EL DD3HEX250F200IL	1	3	135	600
3120	65	2820	2 x 2 x 2 x 2 x	DD2HEX250F200EN DD2HEX250F200IN DD2HEX250F200EL DD2HEX250F200IL	2	4	180	800
4600	90	4200	2 x 2 x 2 x 2 x	DD3HEX250F200EN DD3HEX250F200IN DD3HEX250F200EL DD3HEX250F200IL	2	6	270	1200
6910	136	6300	3 x 3 x 3 x 3 x	DD3HEX250F200EN DD3HEX250F200IN DD3HEX250F200EL DD3HEX250F200IL	3	9	405	1800
9200	181	8340	4 x 4 x 4 x 4 x	DD3HEX250F200EN DD3HEX250F200IN DD3HEX250F200EL DD3HEX250F200IL	4	12	540	2400
11500	226	10440	5 x 5 x 5 x 5 x	DD3HEX250F200EN DD3HEX250F200IN DD3HEX250F200EL DD3HEX250F200IL	5	15	675	3000



NOTE

- When multiple Vented Tanks are installed they must be equal length plumbed to ensure pipe-work is balanced (see diagram below).





# GENERAL INSTALLATION INSTRUCTIONS

These instructions apply to the Rinnai DDHEX250 High Efficiency Heat Exchange Hot Water System.

Rinnai DDHEX250 High Efficiency Heat Exchange hot water system must only be installed, commissioned, serviced and removed by an authorised person in accordance with these instructions, AS/NZS 5601, AS/NZS 3000 & AS/NZS 3500 and local regulations.

Rinnai DDHEX250 High Efficiency Heat Exchange hot water systems are not suitable or approved as a pool heater.

Read these instructions carefully before proceeding with the installation.

The Rinnai specified heat sources (Rinnai HD200 series continuous flow water heaters) must be installed and commissioned in accordance with the relevant section of the operation and installation manual supplied with these appliances. It is vital that an adequate gas supply is provided.

## **DDHEX250 High Efficiency Heat Exchange Hot Water Systems Principle of Operation:**

The DDHEX250 Vented Tank is certified to AS/NZS 3498 as a heat exchange water heater with external energy sources. It consists of three main components:

1. DDHEX250 - 250 Litre heat exchange Vented Tank. (Refer Ⓐ in Figure 1).
2. Fitting Kit - Kit includes Primary Circulating Pump and connections. (Refer Ⓑ in Figure 2).
3. Manifolded HD200 Gas Continuous flow water heaters (1, 2 or 3), Internal or External NG or Propane. (Refer Ⓒ in Figure 2).

The DDHEX250 Vented Tank is designed to separate potable hot water from the primary heat source by locating a set of heat exchange coils inside an open vented storage tank. This keeps any contaminants in the potable water separated from the external heat source, maintaining high efficiency and long life.

Potable cold water enters the coil set where it flows to the bottom of the tank, it is then heated as it rises through the coils.

The tank is filled with heating circuit water. It is pumped from the base of the tank through the external heat source (Rinnai HD gas boosters) and returned to the top of the tank in a counterflow heat exchange design. The primary heating circuit pump operates continuously, the rate of energy input into the primary heating circuit water is moderated by a valve that ensures the coil outlet temperature is maintained.

Primary water levels are maintained in the tank by an internal float valve that admits make up water as required under normal conditions etc.

Secondary heat sources other than Rinnai HD gas boosters or heat loads must not be connected to the primary heating circuit without prior consultation with Rinnai Commercial.

When an external heat load present, any thermal energy used in this process will result in a lower performance for potable water flowing through the coils.

When an external heat load is used in conjunction with the DDHEX250 High Efficiency Heat Exchange Hot Water system, expansion of the water in the heating circuit must be allowed for to prevent water overflow from the DDHEX250 Vented Tank. Contact Rinnai Commercial for further information.



- **Other external heat sources can be used to heat the primary water, subject to approval from Rinnai. Operating and over-temperature control of any external heat source will be part of any approval.**

# GENERAL INSTALLATION INSTRUCTIONS

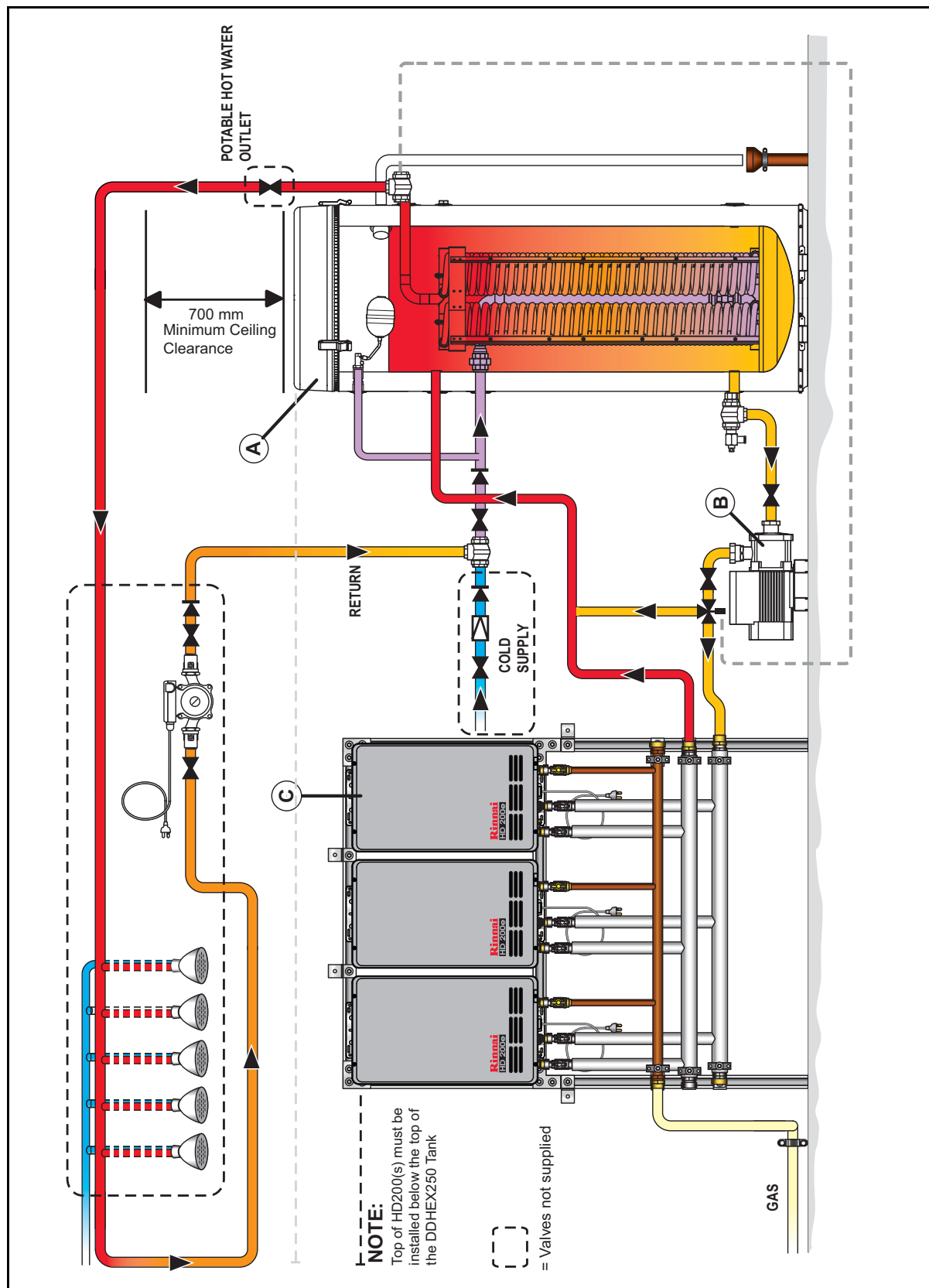


Figure 2 - DDHEX250 System Principle of Operation

## Temperature Control:

A temperature sensor is fitted to the thermowell located in the "Tee" piece of the potable Hot Outlet. This sensor detects potable water temperature under flow and no flow conditions. This sensor provides a signal to the valve located in the primary heating circuit. The valve determines the rate of energy required to maintain the coil outlet temperature.

# GENERAL INSTALLATION INSTRUCTIONS

Potable water is delivered at a minimum temperature of 60°C and therefore meets the requirement of AS/NZS 3498 for control of legionella bacteria.

Local regulations and/or the requirements of AS/NZS 3500.4 must be considered regarding the temperature of water delivered to sanitary fixtures used primarily for the purposes of personal hygiene. This temperature may be limited to 50°C or less depending on the application and may require the use of temperature limiting devices such as tempering or thermostatic mixing valves. (Refer to Figure 3).

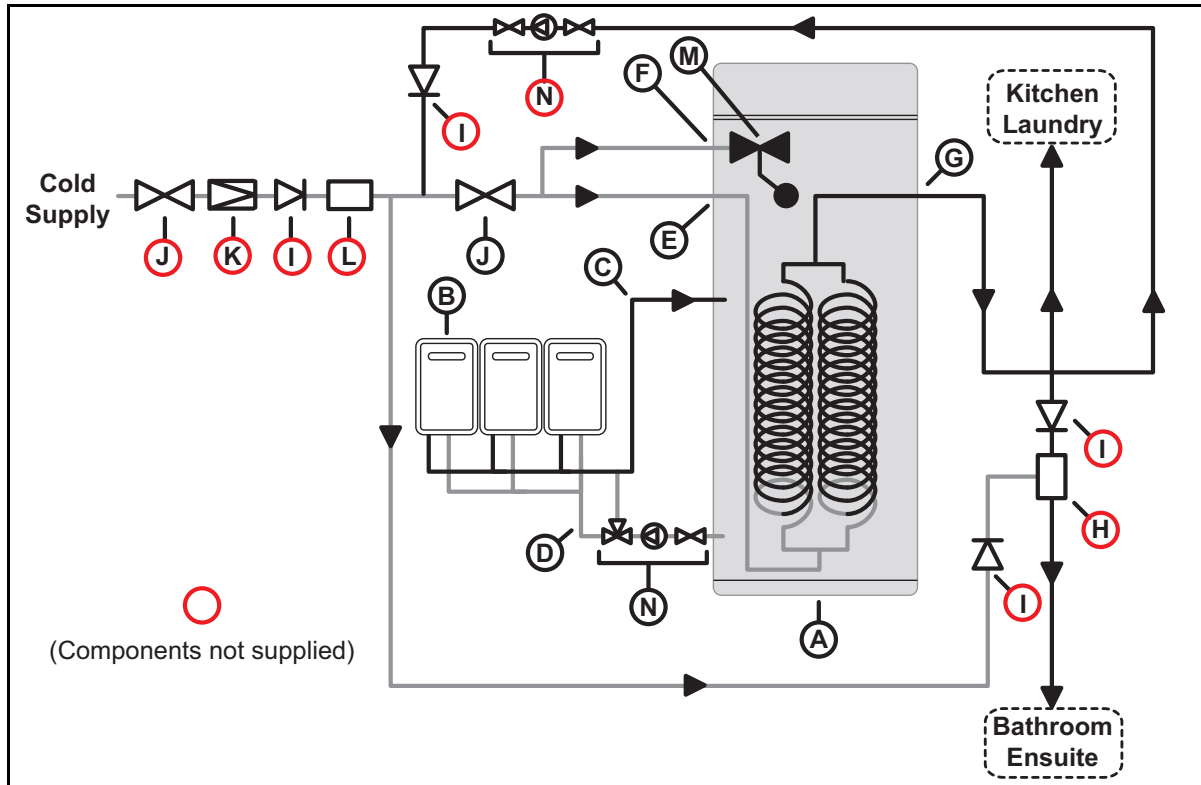


Figure 3 - Heated water plumbing system example to AS/NZS 3500.4, with temperature limiting device (TLD)

(A) - DDHEX250 Tank	(E) - Potable Cold Water (In)	(J) - Isolation Valve
(B) - Rinnai HD200 Heat Sources	(F) - DDHEX250 Top Up Water	(K) - PLV (if fitted)
(C) - Heating Circuit (Hot)	(G) - Potable Hot Water (Out)	(L) - ECV (if fitted)
(D) - Heating Circuit (Return)	(H) - Temperature Limiting Device (TLD)	(M) - Float Valve
	(I) - Non Return Valve(s)	(N) - Diverting Valve - Pump - Isolation Valve



NOTE

- Valves with pressure ratings other than specified are unsuitable and **MUST NOT** be used.
- It may be a requirement that the hot and cold water supply pressures to a Temperature Limiting Device (TLD) are similar. If this is the case, a cold water Pressure Limiting Valve (PLV) with the same pressure rating as the PLV for the hot water is required for the TLD as shown.
- Each system that includes a DDHEX250 needs to be serviced by two or more TLD's meeting the below specifications.

Adjustable Range:	30°C - 50°C	Minimum pressure:	20 kPa
Cold Inlet Temperature:	5°C - 30°C	Maximum unbalance pressure:	6:1
Hot Inlet Temperature:	55°C - 85°C	Minimum temperature differential between hot water inlet and mixed water:	10°C
Variability from set point:	+/- 3°C	Minimum flow rate:	4 L p/m
Maximum static pressure:	1400 kPa	Maximum flow rate:	40 L p/m
Maximum dynamic pressure:	500 kPa		

# GENERAL INSTALLATION INSTRUCTIONS

## Location

- Ensure reasonable access for installation, servicing and removal. All valves and pumps etc must be easily accessible. Allow a minimum of 700 mm clearance above the DDHEX250 tank for inspection and maintenance.
- Rinnai DDHEX250 tanks and any free standing frames must be mounted on a solid level base, capable of supporting the weight of the appliance when full of water. Ensure components are not allowed to stand in water. In wet areas it is recommended to place spacers under the tank.
- All Rinnai DDHEX250 Heat Exchange Hot Water Systems have an ingress protection rating of IPX4 making them suitable for internal or external installation.
- It is recommended that the water heater is installed at ground or floor level within a plant room. It must be installed in a vertically upright position. The water heater must be accessible without the use of a ladder or scaffold.
- The DDHEX250 vented tank **must not** be installed in confined or roof spaces.
- Ensure all valves, covers and enclosures have sufficient clearances and are accessible for service and removal.
- The information on the data plate must be readable.
- The top of the water heater(s) must be located below the top of the DDHEX250 vented tanks and the primary heating circuit pipe-work **MUST BE** below 1500 mm from the base of the DDHEX250 tank (Refer Figure 2 Note). For external installations, the water heater should be mounted on a concrete base at least 50 mm thick. Where property damage can occur as a result of water leakage, the water heater must be installed with a safe tray (overflow tray) and drain in accordance with AS/NZS 3500.4. Ensure the water heater does not stand on wet surfaces.
- The Grundfos primary pump is IP54 rated and includes a pump cover in the fitting kit. The potable cold water inlet, heating circuit inlet/outlet and make-up water connections are to the left when viewing from the front. Potable hot water outlet and vent fitting are on the right hand side of tank when viewing from the front.

Ensure adequate supplies (flow rate and pressure) of the following services are available:

- Gas
- Water
- Electricity (240V 10 Amp) \*
- Waste water



**\* Some non standard installations or DD systems may require more than 10 Amp. Single phase or 3 phase supply.**

The heat sources (Rinnai HD Series water heaters) must be located in accordance with the operation/ installation manual supplied with these appliances. Particular care must be taken with the location of flue terminals. It is vital that an adequate gas supply is provided.

Rinnai gas boosters are Fan-Assisted appliances and require clearances as per AS/NZS 5601, Figure 6.2.

## Warranty

\*\* Warranty terms and conditions are detailed in the separate product warranty booklet.

## Receiving the Rinnai DDHEX250 Hot Water System:

- This unit can be supplied as individual components or pre-assembled on a skid. All systems, skids and components should have the wrapping carefully removed and checked for any transport damage.
- **DO NOT** install if any systems/components which are damaged.

# GENERAL INSTALLATION INSTRUCTIONS

Where the system is delivered as individual components prepare the components as follows:

## **DDHEX250 VENTED TANK: Tank with internal coil heat exchange assembly**

- Remove outer cardboard box. Inspect for any transport damage.  
**DO NOT** install if any components are damaged.

## **MANIFOLDED HD200 GAS BOOSTERS**

- Remove outer cardboard box. Inspect for any transport damage.  
**DO NOT** install if any components are damaged.
- HD(s) are preset to 85°C (as per dip switch sheet supplied).
- In the case of a single HD200 system the manifold consists of a single HD200 unit.

## **FITTING KIT:**

- Inspect for any transport damage.  
**DO NOT** install if any of the components are damaged.

## **Installing the Rinnai DDHEX250 High Efficiency Heat Exchange Hot Water System:**

### **Cold Water Supply:**

- Cold water supply line should include required valves as shown above to comply to AS/NZS 3500 and local regulations.

### **Hot Water Pipe-work:**

- Ensure all hot water pipe-work is adequately insulated. The only non insulated lines should be the potable cold water supply up to the non return valve.

### **DDHEX250 Vented Tank:**

- Remove the lid and carefully remove the electrical tie supporting the float valve. Replace lid ensuring EPDM seal is properly located. Latch lid in place.

### **Assembly (for non skid mounted units):**

- Position the DDHEX250 VENTED TANK in desired location. If required, fit feet to base of tank and fix tank to floor (Refer Figure 4).

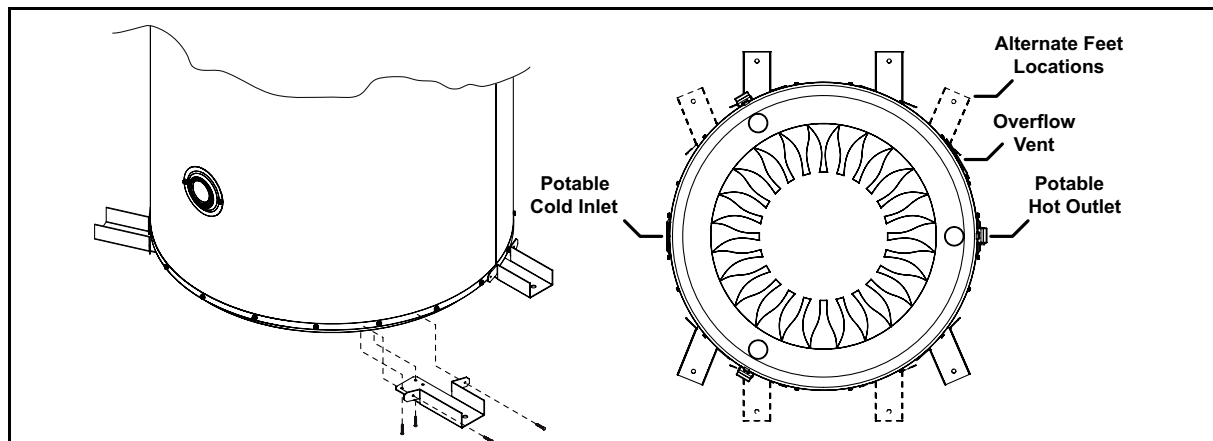


Figure 4 - DDHEX250 Vented Tank Feet Fitment

- Attach drain line to 50 mm vent, and run to drain. The outlet should remain visible for detecting overflow. To reduce heat loss it is recommended that this line be lagged.
- Position the heating circuit valve sensor into the dry well of the hot water outlet.

# GENERAL INSTALLATION INSTRUCTIONS

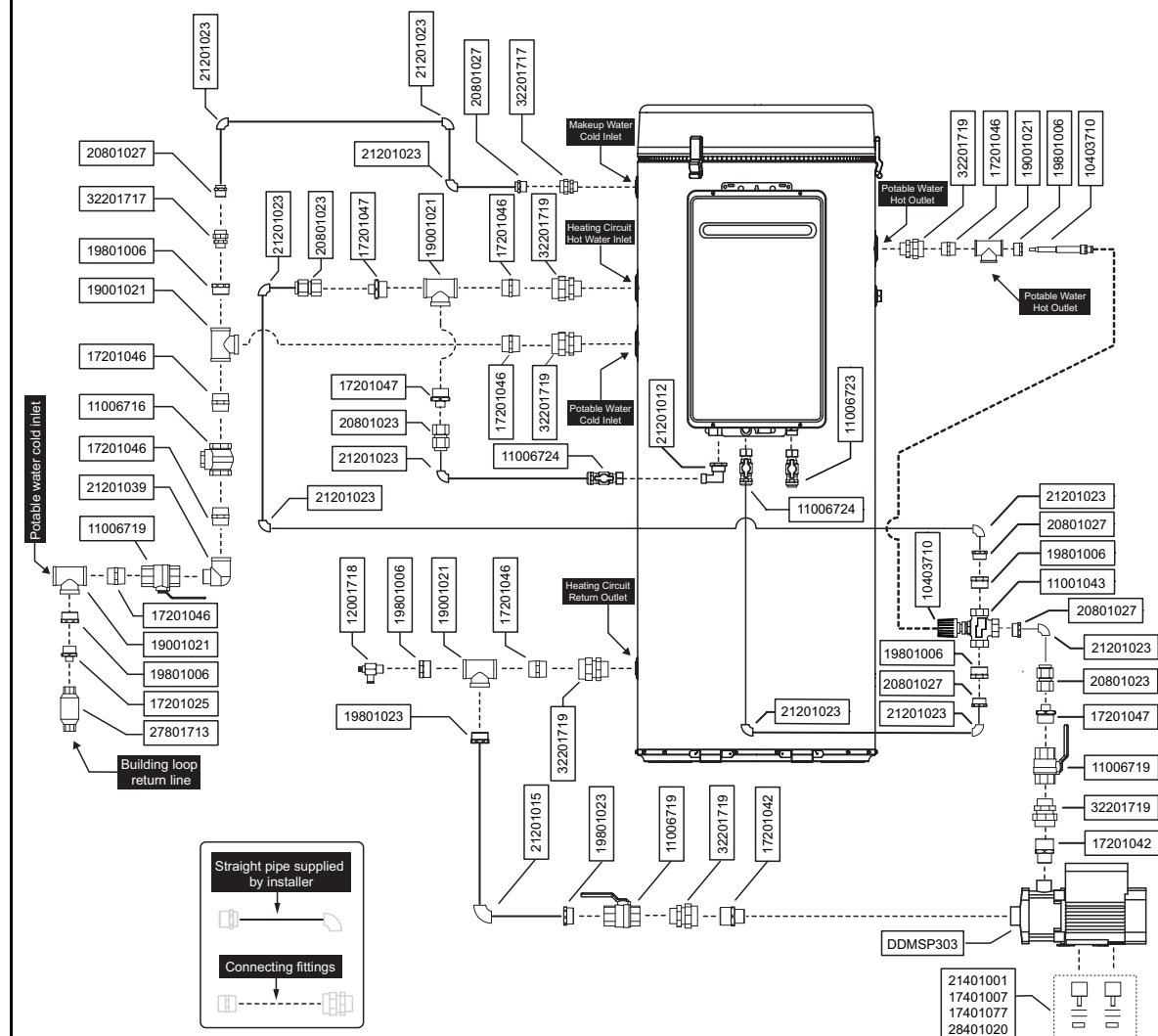
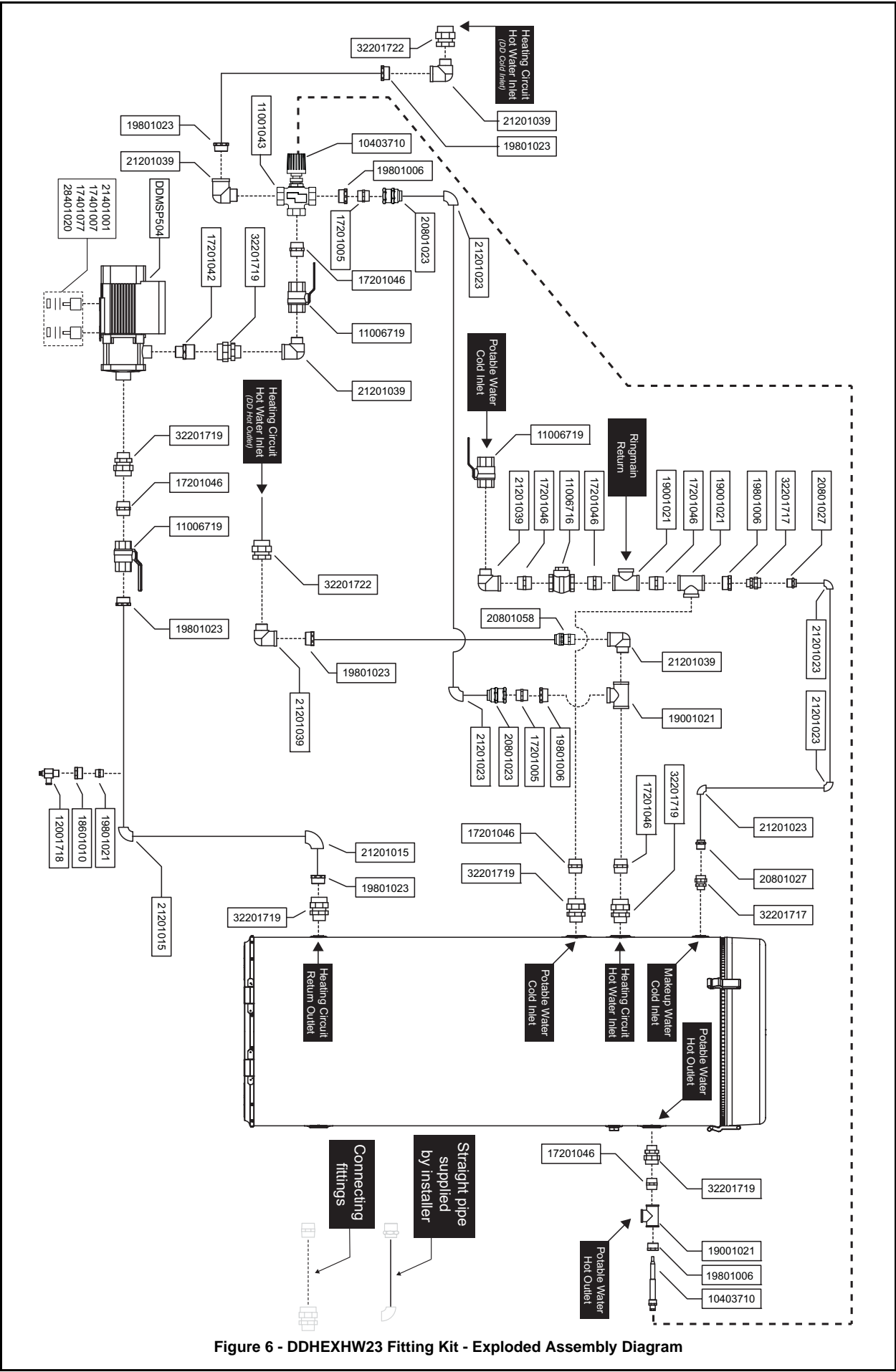


Figure 5 - DDHEXHW1 Fitting Kit - Exploded Assembly Diagram

## GENERAL INSTALLATION INSTRUCTIONS



### Figure 6 - DDHEXHW23 Fitting Kit - Exploded Assembly Diagram

# GENERAL INSTALLATION INSTRUCTIONS

- Identify where manifolded HD200's are to be mounted to suit primary circuit requirements. HD(s) supplied with DDHEX250 tanks are preset to 85°C. If the HD(s) has been supplied separate to the DDHEX250 tank ensure the set point temperature is 85°C if not, change as per supplied dip switch settings. This can occur at commissioning stage.
- A useful nominal height for the top of the HD200 is 1500 mm from floor level. This may change depending on desired position of flue terminal. It may be higher in trafficable areas or to reduce vertical flue length, for example:
- Figure 5 and Figure 6 provides exploded assembly for all connections supplied.
- Connect primary water manifold to 32 mm primary circuit inlet on tank.
- Mount primary circuit pump in a suitable location for connection to tank and manifold pack. Install isolating ball valves and diverting valve on suction and supply side. Mount pump on absorption isolators and fix pump cover. (Supplied in fitting kit). Refer Figure 3 (showing diverting valve arrangement).
- Join inlet of primary circuit pump to 32 mm primary circuit outlet on tank providing a tee and install drain valve. Pipe drain valve to drain.
- Fit cover so that pump is protected from rain. Ensure power cable enters pump from below and that it is not a track for water to enter pump.
- Fit an isolating valve, PLV, expansion valve (as required) and then a non return valve to the potable water supply and provide a tee for the return flow from the building hot water. Connect the building return to the potable water supply line using another isolating valve.
- Connect this potable water supply line to the 32 mm potable cold water inlet fitting on the tank, and using a tee extend the potable water line to the make-up water fitting above the potable cold inlet.
- Connect the supplied hot water outlet to the 32 mm hot outlet fitting on the tank.
- Using the potable hot water outlet assembly supplied connect to the 32mm potable hot water outlet fitting on the tank.



- **Potable water is delivered at a minimum temperature of 60°C and therefore meets the requirement of AS/NZS 3498 for control of legionella bacteria.**
- **Local regulations and/or the requirements of AS/NZS 3500.4 must be considered regarding the temperature of water delivered to sanitary fixtures used primarily for the purposes of personal hygiene. This temperature may be limited to 50°C or less depending on the application and may require the use of temperature limiting devices such as tempering or thermostatic mixing valves. (Refer to Figure 3).**

- Attach the potable hot water outlet line supplied to the potable hot water outlet assembly and then connect this line to the building hot water supply.
- System is now plumbed to the building.
- Run power supply to Manifold Pack GPOs and connect to relevant terminals.
- Plug HD200s into GPOs. **DO NOT** TURN 'ON'.
- Plug Primary Pump into manifold GPO pack.



- **The probe from the primary circuit pump must be fixed securely in place to avoid it from becoming dislodged.**



# GENERAL INSTALLATION INSTRUCTIONS

## Assembly:

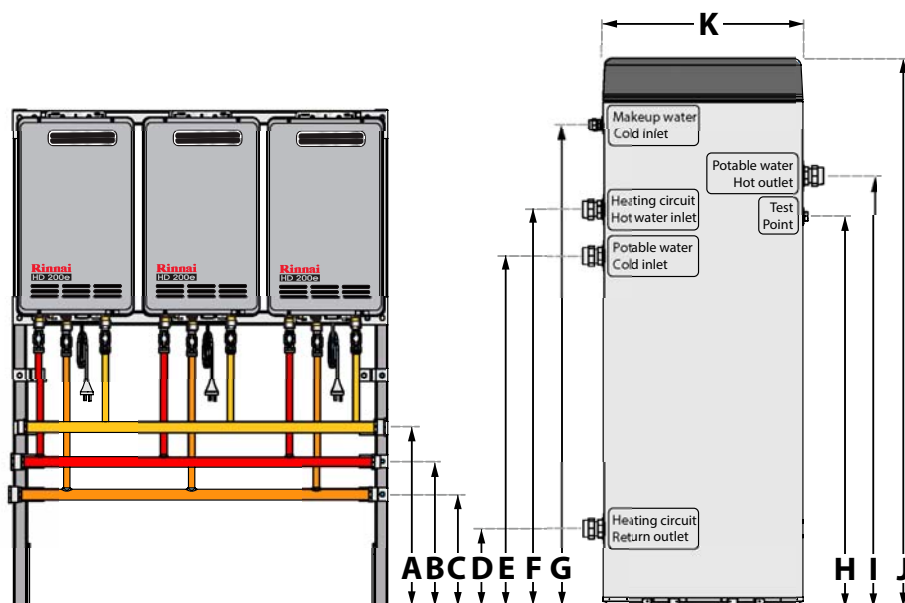


Figure 7 - DDHEX250 - 2/3 SYSTEM ONLY AS 1 X HD ON TANK

## Dimensions:

Model	D	E	F	G	H	I	J	K
Tank	235	1055	1195	1450	1175	1295	1650	600
	A	B	C					
HD200e	610	510	410					
HD200i	540	440	340					

## General Requirements (All Systems):

### Return Pump:

- A secondary or building return pump must be installed in conjunction with the Rinnai HEX250 High Efficiency Heat Exchange system. Pumps should be sized for minimal temperature loss around the ring-main and pressure losses across coil set. Pumps must have an isolation valve and non return valves on the discharge.
- Return line from building loop is connected to a tee on the cold water supply pipe down stream of the cold water non return valve.

### Gas Supply:

Refer to the operational/installation manual supplied with the HD200 appliance for full details. Some key points are:

- Check gas type of Rinnai HD200 units matches gas type available (Propane or Natural) on job site.
- Gas inlet connection is located on the top pipe on a manifold pack or RHS connection on a single HD200.
- Appropriate gas isolation valves to be fitted. Manifold pack includes a gas isolation valve for each unit.
- Ensure gas pipe sizing is adequate to deliver the required volume / pressure. Pipe size used on inlet fitting is no indication of pipe size required.
- Refer to pipe sizing chart in Appendix "F" AS/NZS 5601 for appropriate sized gas pipe to be used to ensure adequate gas supply.
- Gas meter / Propane cylinder and regulator must also be of a suitable size outlet and pressure rating to ensure sufficient gas supply to the gas installation.
- Purge gas pipe to ensure removal of debris etc prior to final connection.
- Check for gas escapes using suitable methods as listed in Appendix "E" AS/NZS 5601.

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## **Flueing and clearance requirements for HD200i:**

Refer to AS/NZS 5601 Figure 6.2 and flue instructions packed separately with the flueing components.

## **DDHEX250 Hot Water Electrical supply requirements:**

- Each HD200 requires a GPO.
- Primary pump requires a GPO.
- Ring main pumps require a GPO.
- Skid packages may include GPO's, reducing number of GPO's required in plant room.

## **Filling Instructions:**

When the primary water circuit is ready to be charged, open the cold water line which will supply potable cold water to the coils and to the make-up float valve fitting. Open the primary water circuit to the HD200 units for both flow and return. Water will begin to fill the tank via the float valve until the factory adjusted level is achieved (approximately 40 mm below the vent fitting). (Refer Figure 8). System will fill slowly to correct volume. Operate primary pump for several minutes and check air is bled from pump.

Open potable hot water isolating valve to building supply to allow coils to fill, then close.

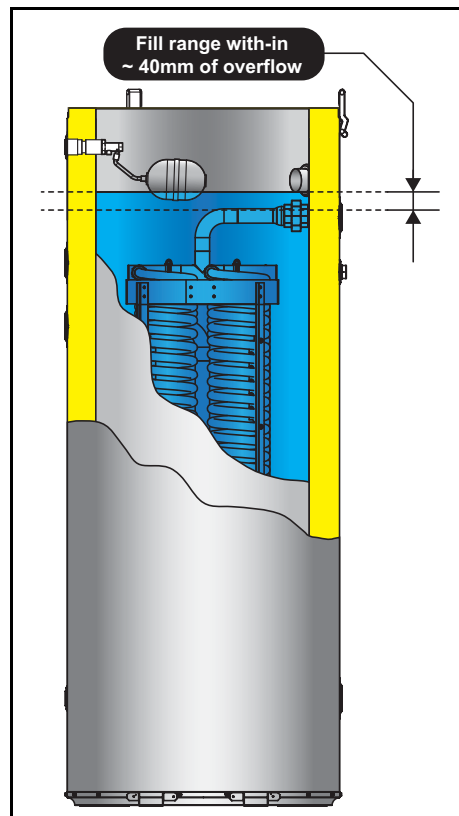


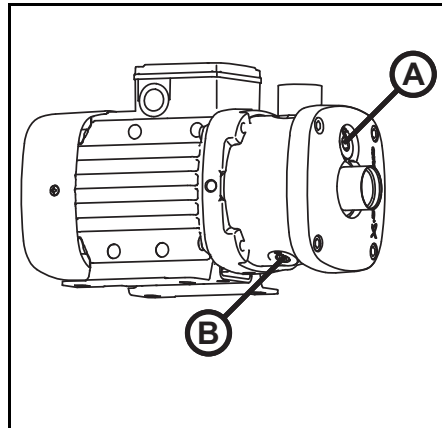
Figure 8 - DDHEX250 Tank fill level

## **Starting instructions:**

1. Check all relevant valves, water and gas, are opened on the primary circuit and ensure no blockages or restrictions are present.
2. Check all relevant branch outlets are closed on the ring main flow and return circuit.
3. Switch power to GPOs, and switch 'ON' GPOs to power both the Primary Pump and HD200 units.
4. The heating diverting circuit valve is factory pre-set to ensure the hot water delivery at the outlet is greater than 60°C.
5. Primary circuit will be activated and HD200 units will fire as the primary circuit pump starts.
6. You may need to bleed the pump of air, to do this:

# GENERAL INSTALLATION INSTRUCTIONS

- a). Disconnect power to pump and close the isolating valve on the discharge side of the pump.
- b). Open the isolating valve in the suction pipe completely before starting the pump.
- c). Remove the filling plug **(A)**.  
**(B)** is the pump drain plug. See Figure 9.
- d). Fill the pump housing and the suction pipe completely with liquid until a steady stream of liquid runs out of the filling hole.
- e). Fit and tighten the filling plug **(A)**.
- f). Slowly open the discharge isolating valve while the pump is running. This ensures venting and pressure build-up during start-up.



**Figure 9 - High Efficiency Heat Exchange Water System  
Primary Circulating Pump  
(DDMSP504 / DDMSP303)**

7. As the system is filled from cold a small quantity of water may drain from the overflow as the system comes up to operating temperature.
8. Once the primary circuit is commissioned open flow to the building hot water supply, and open the isolating valve on the return circuit.
9. Open an outlet load and observe system for 30 minutes to ensure system is functioning satisfactorily.
10. Check gas supply pressure whilst operating.
11. Clear strainers on HD200 cold inlets.

## **Preventative Maintenance:**

### **All items:**

- Inspect for damage, corrosion, water leaks or power failure.

### **Tank:**

- Ensure that tank is not leaking.
- Ensure that vent outlet and vent connections are not blocked and allow water/steam to be safely vented through to the drain network.
- Ensure lid is securely fastened and sealed and lid retention clips are in good working order.
- Check operating water level fully covers coil assembly but provides 40 mm distance to vent. Adjust float valve if required. Check float valve operation.

### **Primary circuit circulation pump:**



- Long primary pipe runs may require larger pump or larger pipe diameter.

- Pumps are installed in a weather resistant casing for protection against water ingress. Wet pump electrics may cause failure. Water can run along power lead so keep the lead looping under the pump and curving upwards toward the electrical box.
- Ensure shaft is horizontal. **DO NOT** aim shaft upwards or downwards.
- Bleed pump of air (refer Figure 9 page 17 for starting instructions).
- Ensure pump direction of flow arrow is towards HD200(s).
- If shaft is spinning but there is no flow: Check ball valves and any non return valve for correct installation and operation.

# GENERAL INSTALLATION INSTRUCTIONS

## HD200 Heat Source:

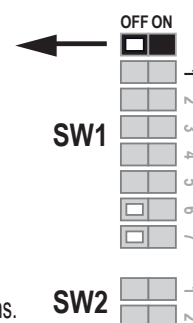
- Ensure that filter at water inlet is clean. Note that this is an 'O' ring seal and does not need to be excessively tightened. Just make sure 'O' ring is engaged inside machined surface in brass housing. Isolate circulating water supply before removing filter for cleaning and inspection. Ensure water in storage cylinder is not excessively hot before removing HD200 inlet filter.
- Ensure all HD200's are operating. These units are not staged. Ensure power is available to HD200, if it is not operating check GPO.
- Many new jobs or jobs where the gas supply has been modified need purging of the gas supply lines as they are full of air. Purge should be carried in accordance with AS/NZS 5601, Appendix 'D'.
- All new HD200 models: when operating the number displayed should be 85°C indicating potable hot water delivery temperature greater than 60°C.
- All new HD200 models will display a fault number if one has occurred. Refer to fault codes on page 20.
- In jobs that operate for long hours and/or in dusty or smoky environments the combustion air fan may become dirty. This may be indicated by fault 10. Contact Rinnai Service.
- Internal heaters (HD200i FFU models) may operate for a short period of time and then stop. This can be caused by improper assembly of flue system causing exhaust gases to re-enter inlet air supply. Check flue assembly and termination.

### *For Internal (FFU) models only*

☐ Have you used only Rinnai FFU flueing components?

☐ If flue length exceeds 1.5m, dip-switch 1 of SW1 is to be switched to the 'OFF' position as shown.

☐ If flue length exceeds 2m, connect a condensate drain pipe in accordance with the FFU flueing instructions.



# GENERAL INSTALLATION INSTRUCTIONS

Your Rinnai HD200 Series Continuous Flow Water Heaters have a self diagnostic capability. If a fault occurs, an Error Code will flash on the Digital Monitor.

## INFINITY HD Fault Codes:

ERROR	FAULT	REMEDY
-	Noticeable reduction in water flow.	Inlet water filter needs to be cleaned. Service call.
<b>03</b>	Power interruption during Bath fill (Water will not flow on power reinstatement).	Turn off all hot water taps. Press ON/OFF twice.
<b>10</b>	Air intake or flue blocked.	Service Call.
<b>11</b>	No ignition / No gas supply.	Check gas is turned on at water heater and gas meter or cylinder.
<b>12</b>	Flame Failure / Low gas flow.	Check gas is turned on at water heater and gas meter or cylinder. Check that nothing is obstructing flue outlet. Turn on gas supply to water heater.
<b>14</b>	Remaining Flame Safety Device.	Service Call.
<b>16</b>	Over Temperature Warning.	Service Call.
<b>25</b>	Condensate Pipe Blockage	Check for blockage on condensate drain path.
<b>32</b>	Outgoing Water Temperature Sensor Faulty.	Service Call.
<b>33</b>	Heat Exchanger Outlet Sensor Faulty.	Service Call.
<b>34</b>	Combustion Air Temperature Sensor Faulty.	Service Call.
<b>52</b>	Gas Modulating Valve Faulty.	Service Call.
<b>61</b>	Combustion Fan Failure.	Service Call.
<b>65</b>	Water Flow Control Faulty (Does not stop flow properly).	Service Call.
<b>71 &amp; 72</b>	Micro-processor Failure.	Service Call.
<b>LC</b>	Line calcification	Service Call.

In all cases, you may be able to clear the Error Code simply by turning the hot water tap OFF, then ON again. If this does not clear the Error Code, try pushing the On/Off button OFF, then ON again. If the Error Code still remains, contact Rinnai for advice.

## Ring Main Pump:

- These are used for circulating water around the building. They are normally left on or may have a time clock to switch it OFF at night when the building is not in use.
- These pumps need to develop sufficient head to deliver the designed flow rate.
- They must have a non return valve.
- Swing non return valves must be horizontal or upward as they rely on gravity to close the valve. Upward direction may cause noise issues as valve opens and shuts.
- Spring isolation valves can be located on any plane but may contribute excessive back pressure and restrict the pump flow rate.
- Return water should only be slightly cooler than water leaving the tank. If the temperature drop around the circuit is too high it may indicate excessive heat loss due to poor insulation, the ring main pump flow rate is not high enough or indicates a design fault or a blockage in the pipe work (or poor pipe work insulation). Investigate insulation, valves and operation of pump.

## Service:

Rinnai recommend that all commercial water heater installations have a service arrangement. Annual services are recommended at a minimum. Refer to the back cover for contact information.

# TROUBLE SHOOTING

## Fault Finding During Normal Operation:

FAULT	POSSIBLE CAUSES	REMEDY
Delivery Temperature not hot enough	No electrical or gas supplies to the heat source	Check and turn ON the power and gas supplies.
	Insufficient gas	Check gas supply, availability & pressure.
	Temperature sensor in coil outlet removed or short circuited or damaged	Check temperature sensor correctly located and providing signal to Diverting valve.
	Diverting valve set point incorrectly set	Arrange for a Rinnai service person to check and rectify.
	HD200 dip switches incorrectly set	Check heating circuit is operating with HD200 output at 85°C. Arrange for a service person to check and rectify.
	Excessive load on system	Check maximum demand does not exceed rated capacity.
	Fouled heating surfaces	External fouling of coil can be determined by inspection. Internal fouling may occur if water quality does not meet Warranty specifications. **
	Inadequate heating circuit Re circulating pump performance	Check all valves fully open. check float valve operation.
	Water level in tank too low	Check make-up line is open. check float valve operation.
	Tempering valve or thermostatic mixing valve malfunctioning - not a Rinnai DDHEX250 operating fault	Arrange for a service person to check and rectify. This work must be performed by persons permitted by law to do so.
	No ring main flow	Check re circulating pump operating.
	Other	Arrange for a service person to check and rectify. This work must be performed by persons permitted by law to do so.
No or insufficient water flow from coil heat exchanger	The mains cold supply to DDHEX250 coil heat exchanger isolated or restricted	Check position of mains cold supply or ring main to DDHEX250 tank connections. <b>IMPORTANT: DO NOT</b> alter the position of any other valves in the system.
	Blockage in coil heat exchanger	Check flow upstream of coil and pressure drop across coil with coil outlet open to drain. If greater than 150 kPa at 45 L/min. arrange for a service person to check and rectify. This work must be performed by persons permitted by law to do so.
	Leak in coil heat exchanger	Check for flow at tank vent. If there is no flow then coils are not leaking. If there is flow arrange for a service person to check and rectify. This work must be performed by persons permitted by law to do so.
	Other	Arrange for a service person to check and rectify. This work must be performed by persons permitted by law to do so.

\*\* Warranty terms and conditions are detailed in the separate product warranty booklet.

# TROUBLE SHOOTING

FAULT	POSSIBLE CAUSES	REMEDY
Delivery temperature too hot	Tempering valve or thermostatic mixing valve malfunctioning - not a Rinnai DDHEX250 operating fault	Arrange for a service person to check and rectify. This work must be performed by persons permitted by law to do so.
Water flowing to drain from tank	Float valve failed OPEN	Check operating of float valve and replace if damaged.
Make-up water flowing continuously	Leak in tank and/or heating circuit	Check for water on floor and identify source.
Steam issuing from lid of tank	Lid not fitted properly	Check fitting and latched down correctly.
	Seal missing	Check EPDM seal in place between lid and base of tank.
Other		Arrange for a service person to check and rectify. This work must be performed by persons permitted by law to do so.
** Warranty terms and conditions are detailed in the separate product warranty booklet.		

# Rinnai

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