

8. TROUBLESHOOTING AND ERROR CODES

The pressure and temperature relief valve and expansion control valve (if fitted) must be replaced by an authorised person at intervals not exceeding 5 years or more frequently in areas where the water is classified as scaling water.

The following information is supplied for consumers and installers and is included here as a reference.

INSUFFICIENT OR NO HOT WATER	
Heat Pump Unit Not Powered	Check to ensure the electric isolating switch at the switchboard (usually marked “Hot water” or “Water heater” is turned on. (note that the compressor will not start up for 2 minutes after power is turned on).
Excessive hot water consumption	If the amount of hot water used during the day exceeds the storage capacity of the cylinder, it is likely there will be insufficient hot water.
Pressure & Temperature Relief (PTR) Valve continually discharging water	<p>If it discharges more than a bucket of water in 24 hours or discharges continuously there may be problem.</p> <p>If the valve dribbles continuously, try easing the valve gear for a few second to dislodge any foreign matter.</p> <p>If the valve discharges at high flows, the water pressure may exceed the design pressure of the water heater.</p>
Expansion Control Valve (ECV) continually discharging water	<p>The valve allows some water discharge during the heating cycle. If more than a bucket of water in 24 hours discharges there may be another problem.</p> <p>If the valve leaks continuously, try easing the valve gear for a few seconds. This may dislodge any foreign matter and alleviate the problem. .</p>
Ambient conditions too hot	The unit may not operate when the ambient temperature is higher than 45°C. Customer may need to switch to Electric mode if water heating is required.
Ambient conditions too cold	To protect the components of the heat pump unit it may not operate when the ambient temperature is less than -10°C. Customer may need to switch to Electric mode if water heating is required.
NO WATER FROM THE TAP	
Restriction in the hot tap or failure of the cold water supply to the water heater	Check for water flow at the other taps and that the cold water isolation valve is fully open.
HIGH ELECTRICITY BILLS	
Higher Element Usage	In extreme cold conditions the element may operate more than normal.
WATER FLOW FLUCTUATIONS	
One or more hot taps opened at the same time	More than one or two hot taps in use at the same time may cause a decrease in the hot water flow from the taps.
HEAT PUMP ICES UP	
Defrosting function	The heat pump has a built in defrosting function which may operate and remove any ice.

HEAT PUMP ERROR CODES

HIGH ELECTRICITY BILLS	
Excessive hot water consumption	See entry under the heading 'Insufficient or no hot water'
High Electricity Tariffs	The electricity tariff will determine the running costs of the system. It is important the end user is aware of the applicable tariffs. Contact your electricity supplier to confirm what these tariffs are.
Higher Element Usage	In extremely cold conditions the element may be operating more than normal.
WATER FLOW FLUCTUATIONS	
One or more hot taps opened at the same time	More than one or two hot taps in use at the same time may cause a decrease in the hot water flow from the taps. Is there more than one or two hot taps open, or are appliances such as a dishwasher or washing machine, in use at the same time? Ensure only one or two hot taps are on at one time.
WATER HAMMER	
Hot and cold water plumbing in the premises	Have a plumber check clipping of hot and cold water pipe work and install a pressure limiting valve and water hammer arrestor as required.
HEAT PUMP ICES UP	
Defrosting function	The heat pump has a built in hot bypass defrosting function which may operate and remove any ice.

HEAT PUMP ERROR INDICATOR*

Error	Error Description	Possible Causes
LP SW Err	Low pressure switch protection	Pressure switch is broken/Connection is loose/EEV fault/Refrigeration system is blocked/Refrigerant is less.
HP SW Err	High pressure switch protection	Pressure switch is broken/Connection is loose/EEV fault/Refrigeration system is blocked/Water pump is broken
Coil Temp Err	Coil temperature sensor fault	Sensor fault/Connection is loose
Discharge Temp Err	Discharge temperature sensor fault	Sensor fault/Connection is loose
Suction Temp Err	Suction temperature sensor fault	Sensor fault/Connection is loose
Tank Temp Err	Tank temperature sensor fault	Sensor fault/Connection is loose
Ambient Temp Err	Ambient temperature sensor fault	Sensor fault/Connection is loose
Outlet Temp Err	Water outlet temperature sensor fault	Sensor fault/Connection is loose
Inlet Temp Err	Water inlet temperature sensor fault	Sensor fault/Connection is loose
DC Fan Err	DC Fan motor fault	DC Fan motor fault is broken/Connection is loose
High Discharge temp	Discharge temperature too high	Lack of refrigerant/system leak
Invertor Err	Compressor Invertor fault	Main PCB fault/Compressor connection is loose/Compressor fault
* If an error code is displayed on the control unit please contact Rinnai Customer Care Immediately.		

DIAGNOSTIC POINTS

General	
Check mains voltage at the isolating switch.	Normal voltage across L and N terminals should be 220-240 VAC.
Check mains voltage at the heat pump's terminal block.	Normal: Voltage across L and N terminals should be 220-240 VAC
Inspect the PCB fuse (250V, 30A ceramic fuse).	If blown, inspect wiring, circuitry, dry joints, solder cracks, and possible vermin damage. If all checks are clear, replace the PCB , restart and TEST
Examine PCB components for burnouts, blown parts, faulty circuitry, dry joints, or vermin damage	
Ensure all connections and terminals are secure and not loose	
Measure the tank water temperature by releasing water from the PTR valve.	If the temperature is at the set point, continue releasing water until it drops below the differential setpoint temperature for the heat pump to restart.
Check Power Input Ports	
Electric auxiliary heating input	
Compressor connection input	
Electronic Expansion Valve (EV) input	
4-way valve input	
Motor fan high-speed input	
Motor fan low-speed input	
Controller connector port	
Temperature sensor ports	
Check Compressor	
Turn off or isolate the power supply to the Heat Pump to measure winding resistance	The resistance between " U-V ", " U-W ", " V-W " is 0.93Ω
If values are normal, proceed. If not, consult Rinnai Australia.	
Power up the compressor in STAN mode.	Normal: Voltage across L and N terminals should be 220-240 VAC.
	If abnormal, check the PCB and inspect the harness for damage.
Check Heating Element:	
Turn off or isolate element power supply and measure its resistance (ensure tank is filled with water).	Normal: Element resistance at cold status should be 22Ω.
	If normal, proceed. If not, replace the element
Power up element in ELE mode and check voltage and current draw.	Normal: Voltage across L and N terminals should be 200-250 VAC, and current draw between 8.0-11 A.
Check the Klixon overheat switch for an open circuit, if it cannot be reset, replace the Klixon switch assembly.	If abnormal, replace the element

Check Temperature Sensors	
Disconnect the temperature tank sensor from the PCB and measure resistance across the wires as per the "Sensor Temperatures & Resistance Value" chart.	If normal, proceed to PCB check. If abnormal, replace the temperature sensor.
Check PCB	
Turn off or isolate the power supply and inspect the PCB control fuse (30 A).	If the fuse is blown, inspect the wiring, circuitry, dry joints, and solder cracks, vermin damage.
If abnormal, replace the PCB.	