



## **MAINTENANCE**

### **GS4-HPC45, GS4-HPC45-D Heat Pump Water Heaters & Storage Tanks**

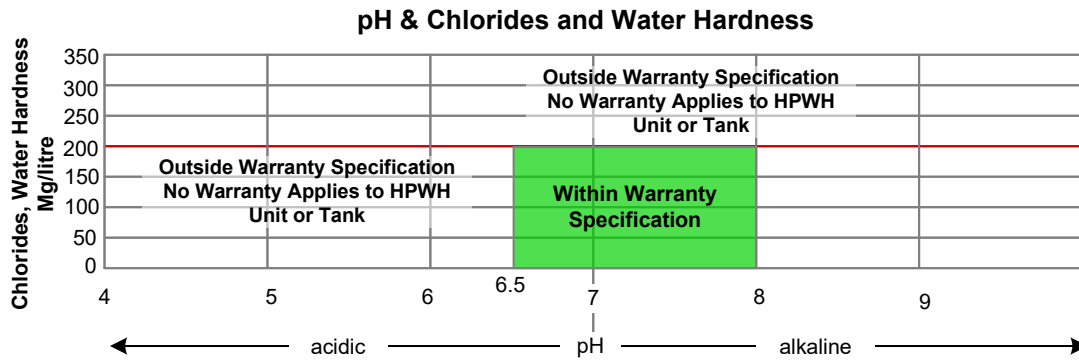
- **Water Hardness, Mineral Buildup**
- **Water Service Valve Kits**
- **General Maintenance**
- **Troubleshooting (Restrictions/blockage)**
- **Descaling Procedure**

# GS4-HPC45, GS4-HPC45-D & Tank(s) System Maintenance

## Water Supply Quality

### Chloride, Water Hardness and pH

In high chloride water supply areas, the water can corrode some parts and cause them to fail. Where the chloride level exceeds 200 mg/litre or Water Hardness level exceed 200 mg/litre warranty does not apply to the heat pump unit and tank unit. pH is a measure of whether the water is alkaline or acid. In an acidic water supply, the water can attack the parts and cause them to fail. No warranty applies to the heat pump unit and tank unit where the pH is less than 6.5 or more than 8.0 The water supply from a rainwater tank unit in a metropolitan area is likely to be corrosive due to the dissolution of atmospheric contaminants. Water with a pH less than 6.5 may be treated to raise the pH. It is recommended that an analysis of the water from a rainwater tank be conducted before connecting this type of water supply to the system.



## Annual Maintenance – Water Chemistry

In areas where water hardness is > 200 ppm or In the event water quality issues arise that effect system performance. The HPWH heat exchanger may need servicing. We recommend following the diagnostic procedures on page 34 and the descaling procedure on page 35.

**Service Valves.** For periodic general maintenance, servicing evaporator heat exchanger and any other service work performed, It is recommended that a set of field supplied Isolation Service Valve and Flush Kit be installed onto the GS4 Heat Pump water connections. They are available from several valve manufactures. Two field supplied 3/4" MNPT x 1/2" FNPT bushings/HPWH are necessary to make the connection to the HPWH 1/2" FNPT water connections

### Combination Isolation Service Valves and Flush Kits



**General Maintenance.** Split systems Heat Pump Water Heaters are very easy to maintain, in reality they are not very different to the maintenance on a ductless mini-split heat pump system. The HPWH can be placed on a similar maintenance schedule.

**Annually perform the following:** (Maintenance frequency can be increased if the system is in-stalled in a particularly dirty or hostile environment, e.g. Commercial Kitchen.

### Heat Pump

- Power wash the Heat Pump (use cold water at home pressure), remove any visible dirt or debris.

## GS4-HPC45, GS4-HPC45-D & Tank(s) System Maintenance

### *Continued*

- Remove the top and front panel of the unit and check the evaporator coil for any dirt or debris. On the evaporator coil, simply blow away the debris with an air hose when the panels are removed.
- GS4 panels MUST be reinstalled before completing this step. Spray the Evaporator coil down after the debris removal using a water hose.
- Evaporator coil cleaning solutions can be used without problem.
- Check for leaks of any kind from Cold Water, Hot Water piping to the Heat Pump.
- Ensure that pipe insulation for the piping is not torn off exposing the Water piping.
- Open both air bleed valves on the both the Cold Inlet and Hot Outlet piping of the Heat Pump to ensure no sediment or air is in the piping.
- A drain/air bleed valve is installed underneath the unit base. Open the valve to ensure no sediment or air is in the system.
- Check and verify voltage to GS4 HPWH. Make sure wiring is tight and secure.
- Check for operation of the FG2-6L trace heat protection (if this option part is fitted).
- The FG2-6L option will be connected to the 230V Power terminal connections to provide power to the trace heat system.

### **System**

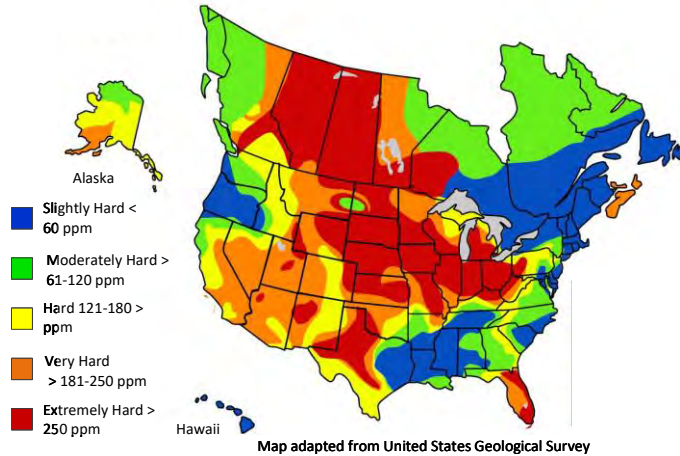
- Draw Domestic Hot Water from the tank via a faucet.
- Measure the delivered mixed water temperature versus the customer requirement. Adjust the mixing valve setting if needed to provide the required Water temperature.
- Draw sufficient Hot Water from the tank to start the heat pump.
- Check the unit operation to ensure delivery of the delivered water temperature to the storage tank.
- If freeze protection system is responding to low ambient temperature (below 37°F or 3°C) or low Cold or Hot Water temperatures check unit operation and ensure main power is provided to the Heat Pump.
- Check error history on unit controller. Note any recent or new error codes.

### **Tank**

- Check the piping for leaks of the pipe connections from the house to the Storage Tank.
- Cold Water from Building supply.
- Hot Water via Mixing valve to Domestic Hot Water piping to house.
- Cold Water piping to the GS4-45HPC & GS4-45HPC-D Heat Pump.
- Hot Water piping from the GS4-45HPC & GS4-45HPC-D Heat Pump to the Storage Tank.
- Open the Tank pressure relief valve to prevent the valve from sticking closed, ensure water is discharged from the Tank.
- Check the thermistor connection wired from the Heat Pump into the Tank thermistor well and the wiring connection to the terminals (both sides of the terminal) or directly to the Tank Thermistor (SAN-119GLBK).
- Thermistor resistance can be tested if required.

## MAINTENANCE – Water Hardness, Mineral Buildup and Descaling

### Water Hardness Map



**Annual Maintenance.** Water hardness varies though out North America, to avoid damage to system components, avoid nuisance error codes and maintain warranty. Where water hardness is > 200 ppm. It is recommended that after the first year of operation, the service technician go though the system control diagnostics and parameters to check if the heat pump is performing within allowable limits. Doing so could indicate there may be accumulation of mineral buildup (scale/lime) in the gas cooler/heat exchanger.

#### GEN4 Controller



Operation Panel

To check for possible restrictions in the SANCO<sup>2</sup> GS4 Heat Exchanger, the Technician must first enter into the Error Code Display and the Parameter Display on the GS4 Controller.

### Indicators of Possible Restrictions Due to Mineral Buildup by Error Codes

#### Check the Following Error Codes

- Enter into Commissioning Mode
- First option is the Heat Setting - Press the key
- Second is the Block Out Time - Press the key
- Next option is Error History (Err) - Press key

NOTE: This will display record of the last six error codes. They are not time stamped.

#### The Following are Error Codes to Check

To access error codes use the key

**E9 - Pump Speed** – indicates pump speed is not meeting performance requirements. We recommend the technician initiate the decaling process.

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**EC/HO - High Water Temperature** – Both indicate the same issue, flow is to low. The pump cannot overcome restrictions either due to resistance within the HP or resistance in external piping between the HP and Tank. Low flow will result in high water temperatures at the HP. The technician should initiate the decaling process.

**HJ - Water Circuit** – Indicates poor performance within the heat exchanger. Possible mineral buildup. We recommend the technician initiate the decaling process.

### Indicators of Possible Restrictions Due to Mineral Buildup by Parameter Display

#### Parameters Display

- Enter into Commissioning Mode
- First option is the Heat Setting – Press the key
- Second option is the Block Out Time – Press the key
- Third option is Error History – Press the key
- Next option is Parameter Display. Press the key, then press key

This displays all the values currently measured by the unit's temperature sensors, this will be used to troubleshoot and general unit performance.

#### Check the Following Parameters

Use the key to access these parameters

**01 - Hot Water Outlet Temperature** - At Start up, it should take 3-5 minutes for the GS4 Unit reach the following temperatures. It should read between 63°C and 65°C (145°F and 150°F). Notice, if after the HP has been running for about 10 minutes and the water temperature is at or below 57°C (135°F). This could indicate a blockage, either debris or possible mineral buildup in the Heat Exchanger. We recommend the technician initiate the decaling process.

**08 - Pump RPM** – The pump speed varies to overcome pressure drop and meet load based on demand. Based on experience, this value is normally between 1400 rpm and 2600 rpm. Pump speed greater than 3200 rpm could indicate high resistance due to mineral build-up. We recommend the technician initiate the decaling process.

### RECOMMENDED MANUFACTURES OF DESCALING KITS

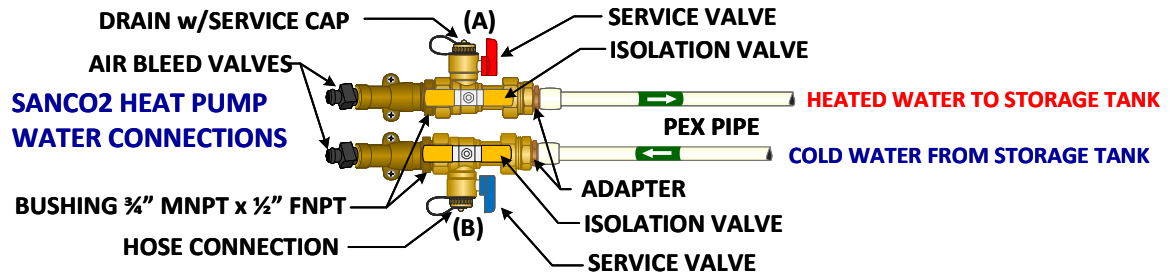
[J.C Whitlam Flow-Aide Biodegradable System Descaler Kit](#)

[Rhomar Water Scale-X™ Biodegradable Descaler Kit](#)



## MAINTENANCE – Water Hardness, Mineral Buildup and Descaling

### ISOLATION SERVICE VALVE/FLUSH KIT (Field Supplied)



### DESCALING SANCO2 GEN 4 GAS COOLER/HEAT EXCHANGER

(Descaling Kit Field Supplied).

- 1). Turn off power at disconnect box.
- 2). Close hot and cold isolation valves and service valves. Remove service caps.
- 3). Follow recommendations of the manufacturer supplying the descaling kit.
- 4). Connect one of the hoses to the pump. Connect the other end of the hose to the hot service valve drain (A) (reverse flow).
- 5). Place the pump in the supplied bucket. Add the contents of the descaling fluid. The fluid must cover the pump housing.
- 6). Remove the service cap to the cold service valve drain (B), connect the second hose to the cold service valve drain (B). Place the other end in the bucket below the fluid line as shown.
- 7). Now open both hot and cold service valves slowly.
- 8). Plug the pump into a grounded receptacle (GFCI). Never let the pump run below adequate fluid levels. Fluid must always be above housing.
- 9). Let the fluid flow through the heat pump heat exchanger for 30 to 45 minutes.
- 10). When completed, remove power from the pump. Close the cold service valve and remove the hose. Remove the pump from the bucket, disconnect the hose from the pump.
- 11). Time to flush the heat exchanger. To avoid damage to the HP pump, slowly open the cold isolation valve allowing water to flow through the open hot water service valve into a bucket or drain for about 4 to 6 minutes.
- 12). When finished flushing, close the hot water service valve, then disconnect the hose from the service valves. Replace the service caps.
- 13). Open both air bleed valves at and bleed screw located on the underside of the GS4 Heat Pump. Bleed the GS4 Unit for at least 3 minutes to ensure all air is bled from the Heat Pump. When spitting stops and water stream is clear of air bubbles close the air bleed valves and the bleed screw at the underside of the GS4 Heat Pump Unit.

- 14). To avoid damage to the HP pump, slowly open the hot and cold water isolation valves.
- 15). At the disconnect box, turn the power back on and return the heat pump to service.
- 16). Run through the HP control diagnostics, observe that the HP is operating within allowable limits and record.

**NOTE to TECHNICIAN: To Avoid Damage to the Heat Pump Water Pump Always Open and Close the Isolation Valves Slowly. Sudden Inrush of Pressure (Fluid) Could Damage the HPWH Pump.**

