

MODEL WW3 AND WW4 MANUAL

FOR CANON MEDICAL

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Haskris Contact Information

Contact Haskris with any questions about a unit and/or the information in this manual. Haskris has a team of engineers available to answer questions, troubleshoot issues, or provide supplemental information as needed.

Phone: 001 847 956 6420

Email: service@haskris.com or sales@haskris.com

Installation: Confirm MRI and Heat Exchanger Model

MRI Model

Details: Confirm the MRI model. Contact Canon for assistance.

Heat Exchanger Model

Instructions: There are several different heat exchanger models for cooling Canon MRIs. Use the MRI information to identify the appropriate heat exchanger model. These instructions include details for the two Haskris models.

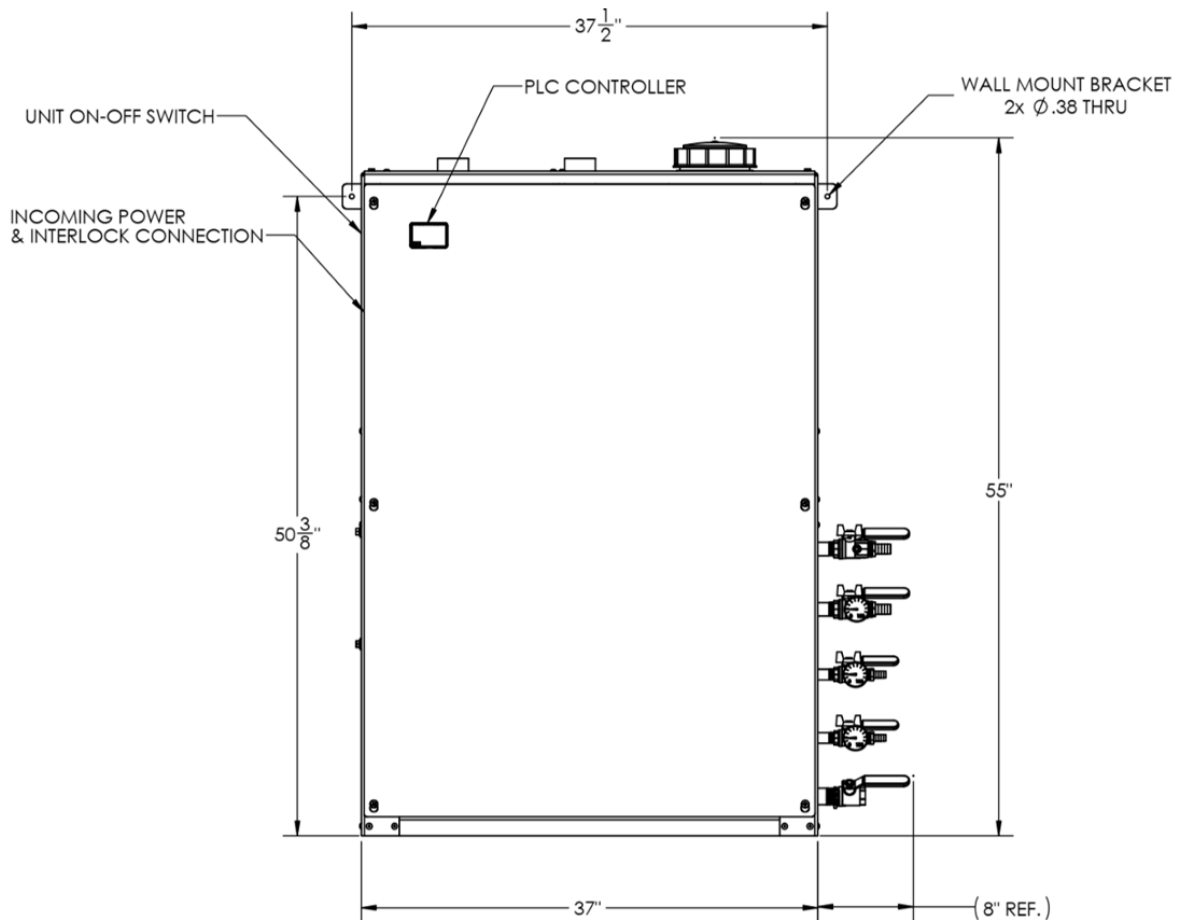
Canon MRI Model	Haskris Heat Exchanger Model
Vantage	WW3
Atlas	
Titan 1.5T	
Titan 3T	WW4
Galan	
Orian	Not provided by Haskris
Fortian	

MRI and Heat Exchanger Models

Installation: Mounting, Clearances, Connections

Mounting

- The WW is designed to be floor mounted with rear of the unit secured to a wall. Adjustable leveling legs are included. Use of the leveling legs is optional.
- Secure to wall through wall mount brackets in two locations.



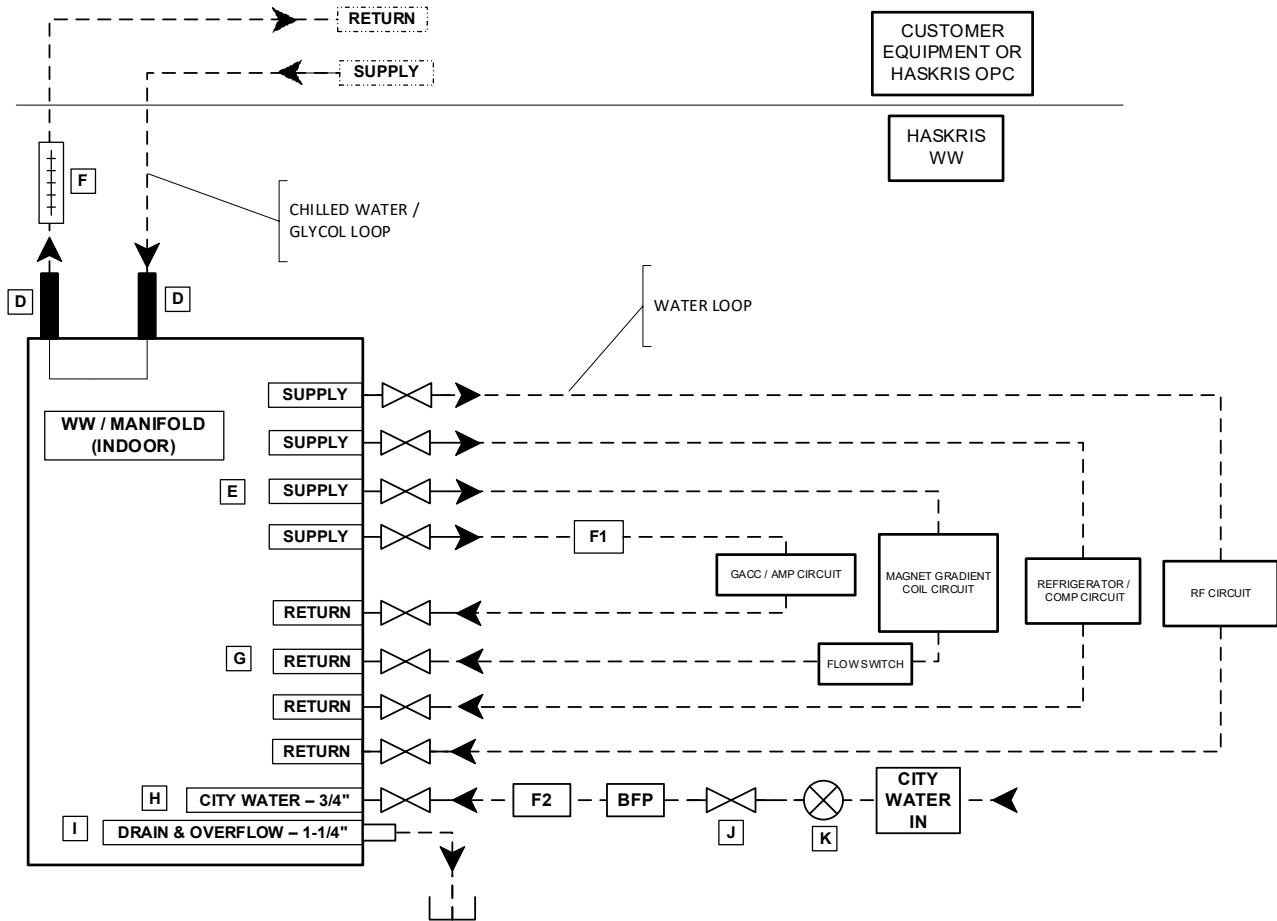
WW4 front view showing wall-mount brackets

Clearances

- Maintain a clearance of 18" (46cm) on the sides and top for water/electrical connections and access to the reservoir.
- Maintain a clearance of 36" (92cm) on the front for routine operation and maintenance.

Connections

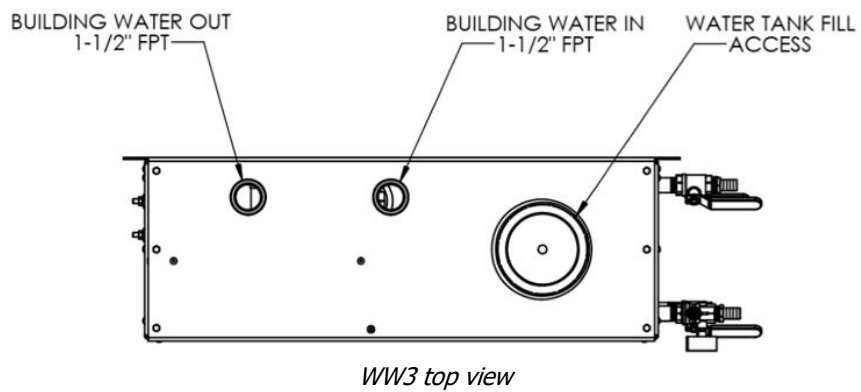
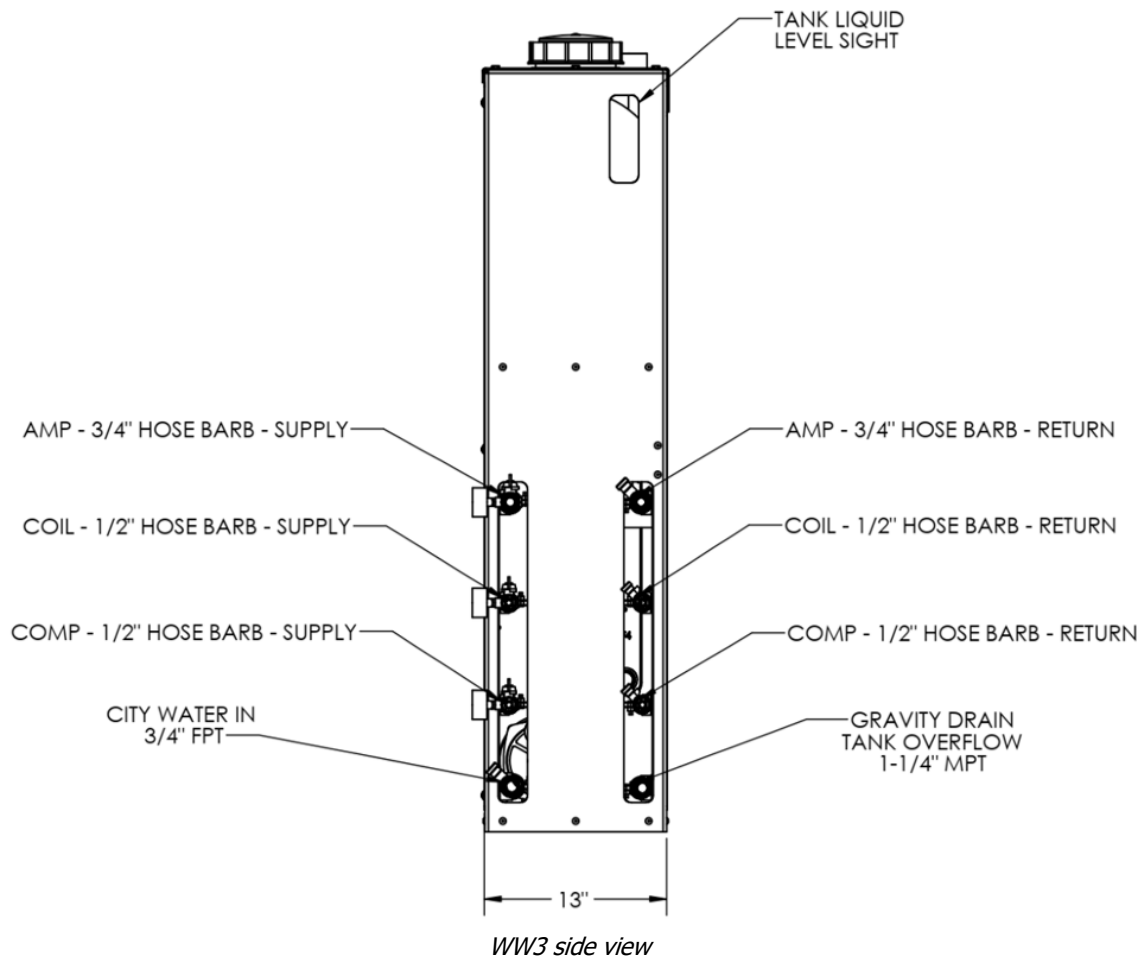
- Piping schematic below shows the plumbing connections.
- Drawings below show the location of the fluid connections on the unit.

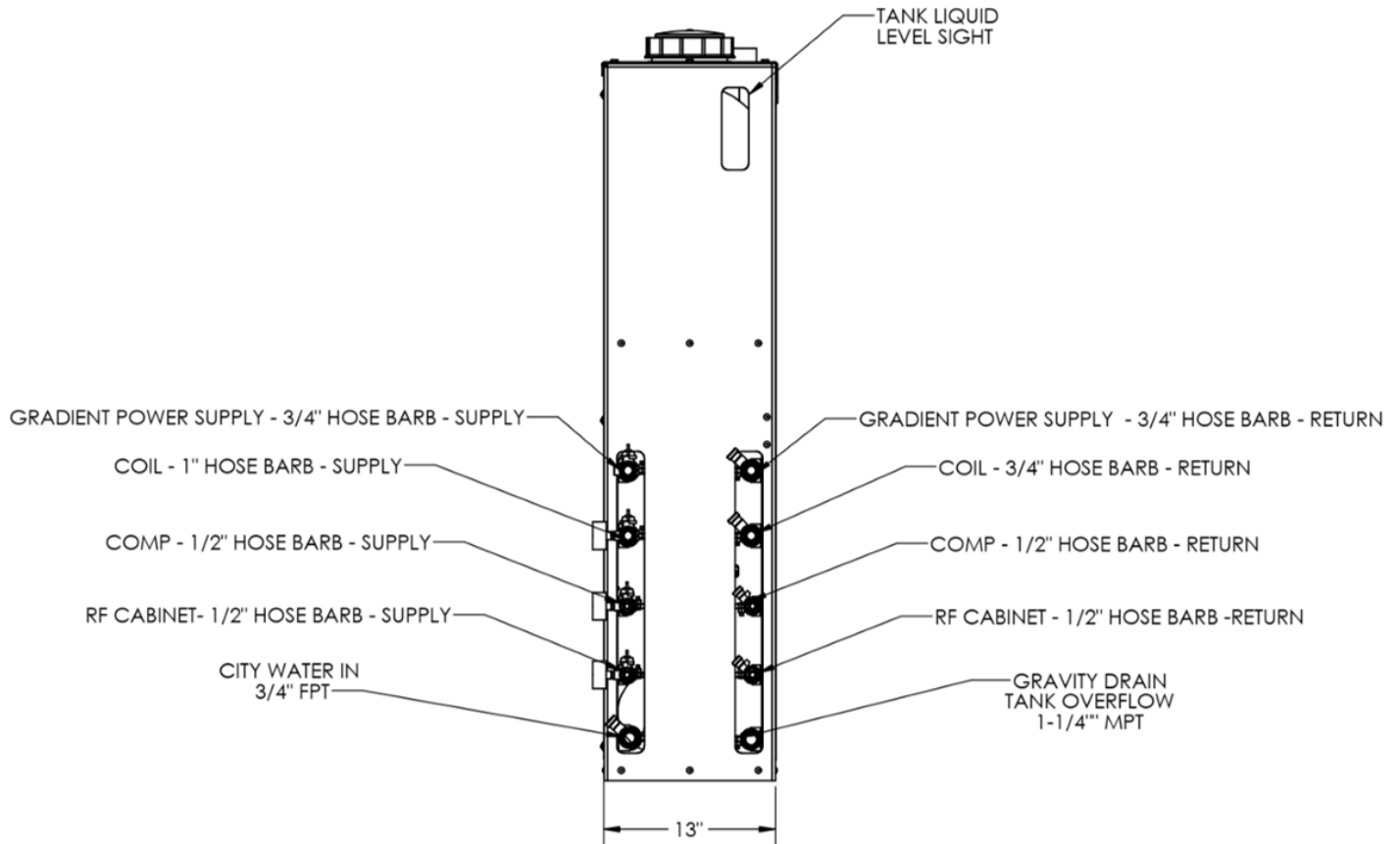


LEGEND

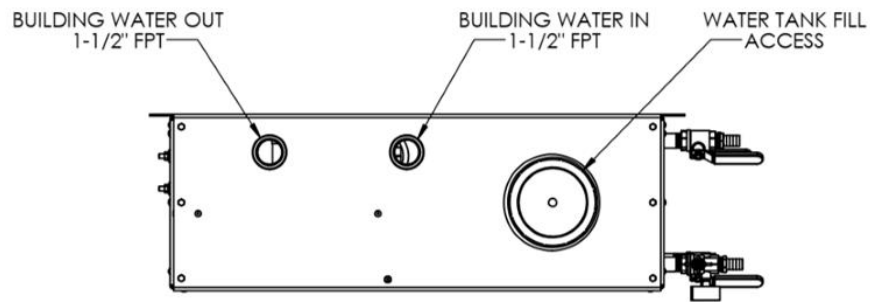
- D = ANTI-VIBRATION JOINTS; SUPPLIED AND INSTALLED BY CUSTOMER / CONTRACTOR.
 E = WW / MANIFOLD SUPPLY SIDE BALL VALVES; SUPPLIED WITH WW / MANIFOLD.
 F = FLOWMETER (40 GPM, SUPPLIED BY CUSTOMER/CONTRACTOR).
 G = WW / MANIFOLD RETURN SIDE BALL VALVES; SUPPLIED WITH WW / MANIFOLD.
 H = CITY WATER INLET BALL VALVE; SUPPLIED WITH WW / MANIFOLD.
 I = WW / MANIFOLD DRAIN / OVERFLOW CONNECTION; DRAIN VALVE SUPPLIED WITH WW / MANIFOLD (VALVE IS INTERNAL)
 J = SHUT OFF VALVE; SUPPLIED AND INSTALLED BY CUSTOMER / CONTRACTOR.
 K = PRESSURE REGULATOR (70 PSI MAXIMUM) SUPPLIED AND INSTALLED BY CUSTOMER / CONTRACTOR.
 F1 = FILTER SUPPLIED WITH MRI SYSTEM; INSTALLED BY CANON ENGINEER.
 F2 = 100 MICRON FILTER SUPPLIED AND INSTALLED BY CUSTOMER / CONTRACTOR.
 BFP = BACK FLOW PREVENTER SUPPLIED AND INSTALLED BY CUSTOMER / CONTRACTOR.

- NOTE: (1) CITY WATER SHALL NOT EXCEED 55 PSI.
 (2) IN THE EVENT OF POWER LOSS OR CHILLER FAILURE CITY WATER WILL PROVIDE COOLING TO THE REFRIGERATOR COMP CIRCUIT ONLY. WHEN IN CITY WATER BYPASS THE DRAIN MUST BE OPEN.
 (3) RF CIRCUIT IS NOT APPLICABLE TO WW3 MODEL





WW4 side view



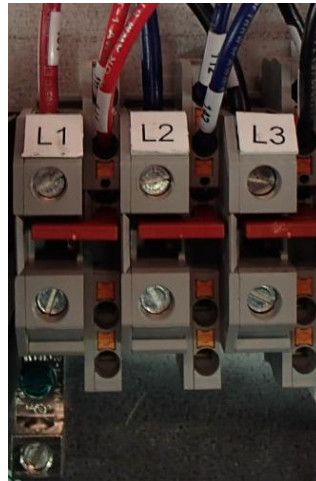
WW4 top view

Installation: Electrical, Connection to Outdoor Chiller

Electrical

- Comply with proper local electrical codes.
- Contact a licensed electrician to perform the electrical installation.
- The electrician should verify that the wiring is adequate in the installation area.
- Refer to the heat exchanger specification document or the unit's nameplate label for detailed electrical requirements.
- Do not mount or support any electrical service disconnect directly to the heat exchanger.

Electrical connection: Use a dedicated service disconnect and time delay fusing. Connect incoming electrical to the distribution block in the electrical box.



Distribution Block

Phase monitor: Heat exchangers include a phase monitor. Refer to the fault indicators provided on the phase monitor and contact a licensed electrician to correct any faults.



Phase monitor

	LED STATUS	STATUS
GREEN		NORMAL (RELAY ON)
		RESTART (DELAY)
RED		REVERSAL
		LOSS/UB (UNBALANCE)
		LOW VOLT (UNDERVOLTAGE)
		HIGH VOLT (OVERVOLTAGE)

Phase fault LED status patterns

Connection to Outdoor Chiller

Purpose: Some heat exchanger systems come with a Haskris outdoor chiller. For these systems, the heat exchanger must be wired to the chiller to ensure that Haskris will get remote notifications of heat exchanger faults.

Installation: A 150ft (45.7m) cable is provided for this connection. Connect the provided cable to the orange terminal strip in the chiller's electrical box. Connections are 1-to-1 and are labeled.

Installation: Filling the Reservoir


- Close all supply and return ball valves.
- Remove the cap from the reservoir.
- Fill the reservoir with drinking/spring water, up to just below the overflow drain port.
- Replace cap after filling.
- Make sure additional drinking/spring water is on hand to top off the tank during startup when the unit's pump fills the external piping.

Installation: Final Checks

Phase Monitor

Check: If the voltage and phase from the service disconnect is correct, the phase monitor should have a solid green LED. If the phase monitor has a solid or flashing red LED, contact a licensed electrician to correct the fault.

Controller Faults

Check: Press the  button on the controller. The screen should say NO ALARMS. If any faults are described, consult Haskris to resolve these.

Pre-Startup Checklist

Directions: Email completed checklist to service@haskris.com at least 10 days in advance of start-up.

Model: _____ **Serial Number:** _____

Site Name: _____ **Address:** _____

Location:

- Unit is securely mounted and level.
- Minimum of 36" clearance exists on the front of the unit, and minimum of 18" clearance exists above and to the sides of unit.

Fluid Connections:

- All piping is of non-ferrous materials and complies with local codes.
- Beginning and end of hard pipe runs are terminated with vibration isolators or a short length of hose.
- Isolation ball valves are installed between WW and building water or glycol loop connections.

Electrical Power:

- Incoming voltage and circuit breaker size for incoming power match unit's nameplate.
- Confirm proper electrical power and phase by checking the phase monitor's status indicator.

Nominal Power: CHECK NAMEPLATE				
Record Voltage at Disconnect (V)	L1-L2		Confirm and Record Size of Time Delay Breaker (Fusing) Supplying WW (A)	
	L2-L3			
	L1-L3			

Communication:

- Communication wiring between the WW and OPC is installed (if Haskris chiller was provided).

Fluid fill:

- The tank is full of drinking/spring water. The tank should be filled to about 3" from the top of the tank, just below the overflow.
- Additional drinking/spring water is on-hand for service contractor to top off system when start-up is performed.

Installation Completed By (Please Print):

Company: _____ Phone: _____ Email: _____

Name: _____ Title: _____

Signature: _____ Date: _____

Optional Modbus or BACnet Communication Capability

Building Management System

Purpose: Some facilities have centralized building monitoring systems (BMS). The exchanger can be monitored from the BMS using Modbus or BACnet communication.

Operation: The method of interfacing with the BMS varies depending on the specific design and whether the heat exchanger is paired with a Haskris outdoor chiller. Contact Haskris for details.

Startup

Phase Monitor

Purpose: The heat exchanger has a phase monitor to check incoming electrical power.

Operation: The phase monitor is factory adjusted by Haskris according to the proper electrical settings for the heat exchanger. Do not adjust the knobs on the phase monitor without discussion and approval from Haskris.

The phase monitor will show a solid green LED if the voltage and phase from the service disconnect is correct. If the phase monitor has a solid or flashing red LED, contact a licensed electrician to correct the fault.

- Reversal is caused by the 3 lines being in an improper sequence. To correct a reversal, switch any 2 of the 3 line connections. Make this switch at the disconnect, not in the heat exchanger.
- Loss/unbalance is caused by a percentage difference in voltage between the 3 lines relative to each other.
- Undervoltage is caused by a percentage difference in voltage between the 3 lines compared to the line-line voltage knob setting.
- Overvoltage is caused by the voltage between the 3 lines being >10% over the line-line voltage knob setting.



Phase monitor

	LED STATUS	STATUS
GREEN		NORMAL (RELAY ON)
		RESTART (DELAY)
RED		REVERSAL
		LOSS/UB (UNBALANCE)
		LOW VOLT (UNDERVOLTAGE)
		HIGH VOLT (OVERVOLTAGE)

Phase fault LED status patterns

ON/OFF Switch

Location: The heat exchanger has a rotary ON/OFF switch located on the left side of the unit.

Operation: Rotate the switch to make the heat exchanger run when in the ON position (horizontal) or stop when in the OFF position (vertical). If a fault occurs, turning the switch to OFF and then back ON will reset the fault. Note that city water backup is active while switch is in the OFF position.



ON/OFF switch, vertical position

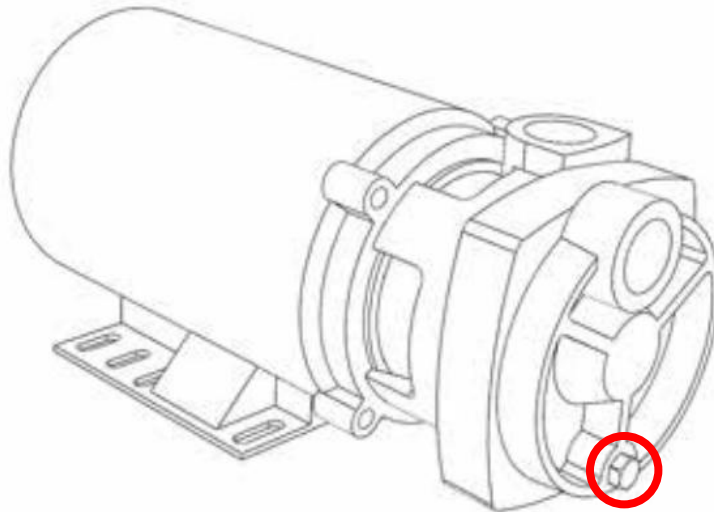
Pump Priming

Purpose: All fluid is removed from the pump head prior to shipment from Haskris. When starting the pump, it needs to be filled with fluid. This process is called priming the pump.

When the reservoir is full, the pump suction line is “flooded”. In some cases, this flooded suction will automatically prime the pump. When the heat exchanger is turned ON, the pump will run. If the controller display shows the pump generating pressure, then the pump is primed.

If the pump pressure gauge shows a low pressure <10 psi, then the pump did not automatically prime. Follow the procedure below.

1. Identify the priming plug on the face of the pump head

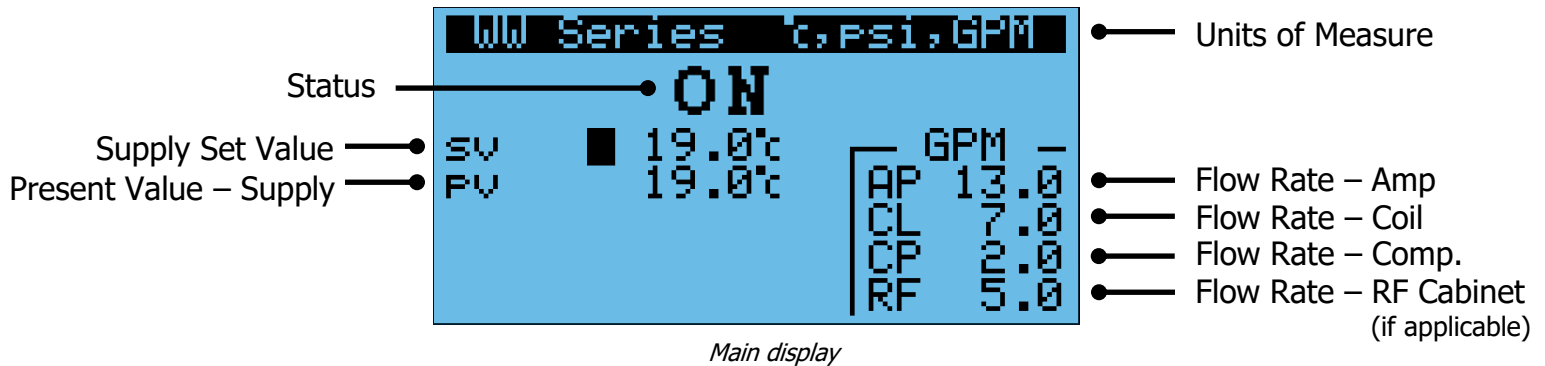


Pump priming plug circled

2. Use a wrench to loosen the priming plug slightly. The plug should remain threaded into the port, but air and liquid should be able to escape.
3. Allow air and a small amount of fluid to escape
4. Tighten the priming plug

Controller Display

Main Display



Status	Indicates the state of the heat exchanger
Supply Set Value	The desired temperature for the water
Present Value - Supply	Measured supply temperature
Flow Rate	Measured value of the flow rate on each cooling circuit

Description of main display data

Status Modes

ON	The ON/OFF switch is in the ON position and the pump is running City water backup is not active Note that on some programs the status text is blank when the unit is ON
OFF / City Water	The physical ON/OFF switch is in the OFF position City water backup is active
OFF→Alarm / City Water	An alarm or fault occurred and stopped the heat exchanger City water backup is active
OFF by BMS	The site's BMS is connected to the heat exchanger and sending it a signal to be OFF City water backup is active

Description of status modes

Adjusting Set Value (sv)

Notes: Set Value is the only adjustable value on this screen.
To change the setting, follow the procedure below.







1. Press the  or  buttons to adjust the value

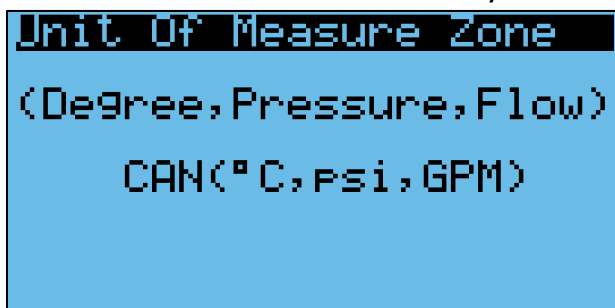
Units of Measure

Purpose: Several combinations of units of measure are available depending on what is most useful.
The following units of measure are available:





- CAN (°C, psi, GPM)
- UK (°C, bar, IGM)
- USA (°F, psi, GPM)
- SI (°C, bar, LPM)

To change the units of measure, follow procedure below.

1. Begin on the main display
2. Press the  button on the controller
3. Press the  or  buttons to highlight Settings
4. Press the  button to go into that menu section
5. Press the  or  buttons until you see Unit of Measure Zone



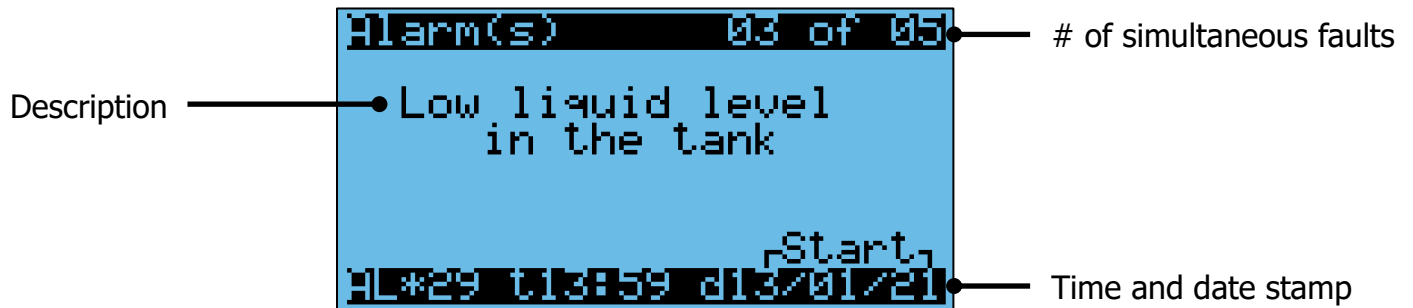
Units of measure screen

6. Press the  button to move the blinking cursor around the screen
7. Press the  or  buttons to select different units of measure
8. Press the  button several times to return to the main display

Faults

Identify if there is a fault: The  button will flash red when there is a fault.


Display faults and details: Press the  button to see fault descriptions.

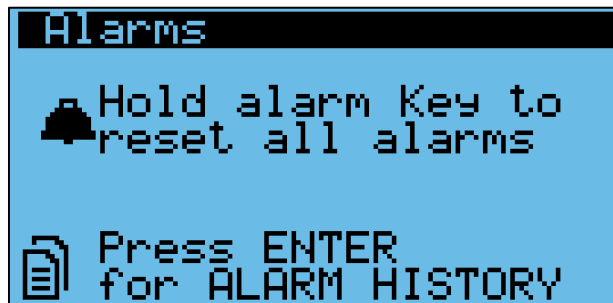


Example fault screen


Description: Provides information about the specific fault.

Multiple faults: If only 1 fault is active, you will see 01 of 01. If multiple faults occur before the faults have been cleared, you will see ## of ## in the top right-hand corner. At the bottom you will see a time and date stamp HH:MM DD/MM/YY

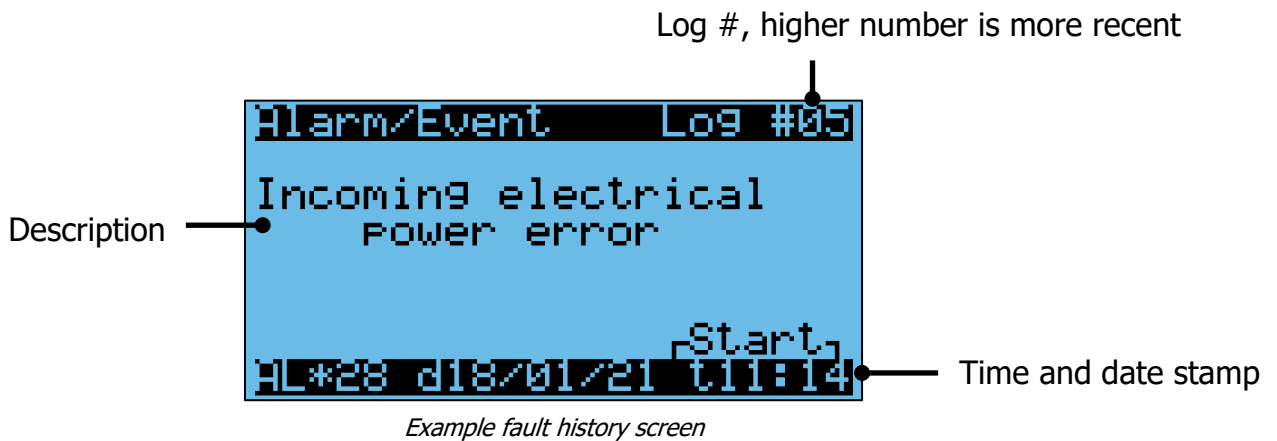
Fault reset: Press the  button until you go past the last active fault, you will see this screen which explains how to reset faults.



Fault reset screen

Fault history: When the screen says NO ALARMS, there are no faults currently. Press the  button to see the fault history if needed.

Start and stop: In the bottom right-hand corner, certain faults will display "Start" or "Stop". Start indicates when the fault occurred. Stop indicates when the fault was cleared.



Common Faults		
Wording	Explanation	Notes to Resolve
Power Fault	Phase monitor detected improper power	Check the phase monitor in the electrical box, see the LED status light and error codes
Liquid Level in tank has fallen	Liquid level switch opened	Check for a leak Note that when city water backup activates the tank is filled by city water, the tank water level will be higher than when the alarm condition occurred
Overload to fluid pump motor	Pump overload contact opened	Reset alarm, check overload, measure pump amp draw
Low Flow CP Circuit	Low flow rate on compressor circuit	Verify pump runs, verify there is no obstruction in the compressor circuit piping
Supply Fluid temp is above alarm setpoint	Supply water temperature rose too high	Confirm primary source of cooling water (central chilled loop, outdoor chiller) is operating normally

Description of common faults

Heat Exchanger Features

City Water Backup

Purpose: The heat exchanger is designed to provide emergency backup cooling to the MRI magnet's helium compressor.

Method: A solenoid valve at the city water inlet opens, and city water is passed directly to the helium compressor, then back to the heat exchanger's tank, then out to drain through the overflow drain line.

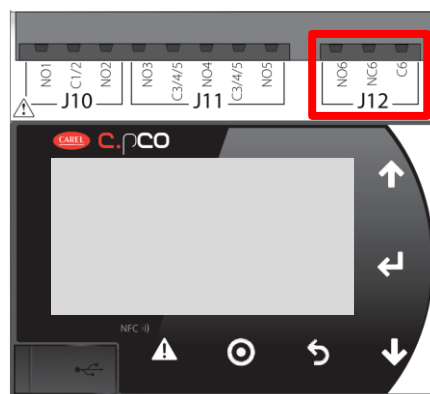
Operation: City water backup automatically activates on any fault condition, on loss of power, and when the unit is switched OFF. If manual operation is preferred, implement a manual ball valve in the external piping at the city water inlet. Leave the manual valve closed during normal operation, and open the manual valve when city water backup is required.

Local Monitoring

Purpose: The heat exchanger can be monitored remotely by users or facilities personnel as needed.

Method: The heat exchanger has available potential free fault contacts on the controller.

Operation: The potential free contact is the J12 terminal on the controller. There is a NO and NC contact available as needed.



Potential free fault contact

Maintenance

Frequency

Schedule: Inspections should happen at least once every 6 months.

Activity: During each inspection, the cleanliness of the water and electrical should be checked.

Secondary Water

Purpose: Maintaining sufficient volume of clean water ensures proper operation of the unit and consistent cooling for the Canon MRI.

Maintenance: The recommended full water level in the reservoir is the height of the tank's overflow drain port. If the level falls, replenish the reservoir as needed until the reservoir remains full. The water should be free of particles and biological growth. If the water is visibly dirty or contaminated flush the water from the whole system and refill with fresh drinking/spring water.

Electrical Inspection

Maintenance: Use a multimeter to check electrical values. Take measurements at contactors or terminal blocks. Compare values to the unit or component name plate.