

SERVICE MANUAL

JEM Glaciator X-Stream

Revision A, 06-19-2017, Level 1



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General information

This service manual contains information about how to service JEM Glaciator X-Stream.

Safety instructions



Read the safety precautions in this manual before installing, operating or servicing this product.



Warning!
This product is not for household use. It presents risks of injury due to electric shock, burns, falls and respiratory problems!

The following symbols are used to identify important safety information:



Danger!
Hazardous voltage. Contact will cause electric shock.



Caution!
Burn hazard. Hot surface. Do not touch.



Caution!
Safety hazard. Risk of severe injury or death.



Caution!
Fire hazard.

Read this manual before operating the machine, follow the safety precautions listed below, and observe all warnings in this manual and printed on the machine. Use the machine only as described in this manual and in accordance with local laws and regulations.

If you have questions about how to operate the machine safely, or if you have followed the instructions in this manual and the machine is malfunctioning, please contact Martin™ Service.



Figure 1: Safety instructions

Preventing electric shocks

- Always ground (earth) the machine electrically.
- Use only a source of AC power that complies with local building and electrical codes, and that has both overload and ground-fault protection.
- Before connecting the machine to power, check that the voltage indicated on the machine's serial label matches your local AC power voltage. If your AC power voltage does not match, do not use the machine. Contact Martin™ Service for assistance.
- Before using the machine, check that all power distribution equipment and cables are in perfect condition and rated for the current requirements of all connected devices.
- If the machine or any cables connected to it are in any way damaged, defective, wet, or show signs of overheating, stop using the machine and contact Martin™ Service for assistance. If the supply cord is damaged, it must be replaced by a special cord or assembly available from the manufacturer or its service agent.
- Disconnect the machine from AC power before servicing and when not in use as directed.
- This machine is not waterproof and must not be exposed to wet outdoor conditions. Do not immerse in water or any other liquid. Do not expose to high-pressure water jets.
- Do not spill fluid over or inside the machine. If fluid is spilled, disconnect AC power and clean with a damp cloth. If fluid is spilled onto electronic parts, take the machine out of service and contact Martin™ for advice.
- Do not remove the covers or attempt to repair a faulty machine. Refer any service not described in this manual to Martin™ Service.
- Do not operate the machine if any parts are damaged, defective or missing.
- Moisture and electricity do not mix. Do not aim fog output at electrical connections or devices.

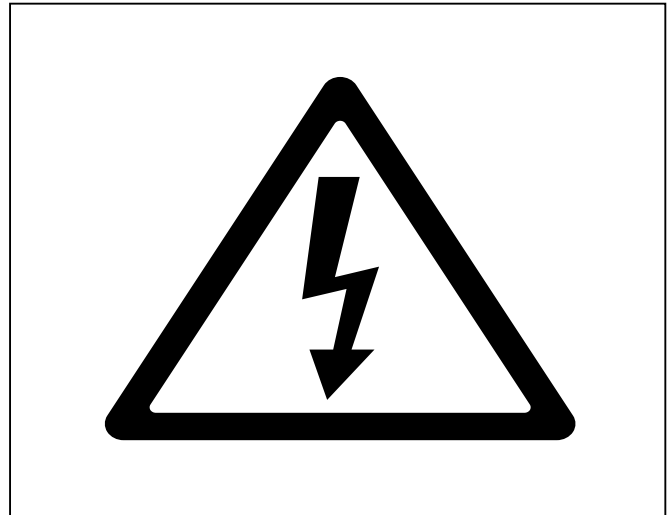


Figure 2: Preventing electric shocks

Preventing burns and fire

- Do not attempt to bypass thermostatic switches, fluid sensors or fuses.
- Replace fuses only with ones of the type and rating specified in this manual for the machine.
- Provide a minimum free space of 500 mm (20 in.) around the machine.
- Provide a minimum free space of 500 mm (20 in.) around fans and air vents and ensure free and unobstructed air flow to and around the machine.
- Do not operate the machine if the ambient temperature (T_a) is below 5° C (41° F) or above 40° C (104° F).

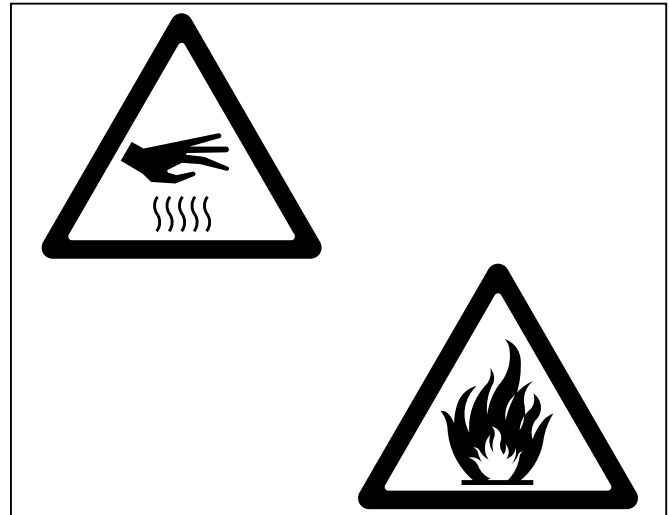


Figure 3: Preventing burns and fire

Preventing injuries

- Check that all external covers are securely fastened.
- Do not operate the machine with missing or damaged covers or shields.
- In the event of an operating problem, stop using the machine immediately and disconnect it from power. Do not attempt to use a machine that is obviously damaged.
- Do not modify the machine in any way not described in this manual or install other than genuine Martin™ parts.
- Refer any service operation not described in this manual to a qualified technician.
- Fog output can cause condensation. Do not point the output at smooth floors. Floors and surfaces may become slippery. Check these frequently and wipe dry as necessary to avoid any danger of slipping.
- Ensure at least 2 m (6.6 ft.) visibility in areas where fog is being produced.
- Fog fluid contains food-grade glycols in solution but may present health risks if swallowed. Do not drink it. Store it securely. If eye contact occurs, rinse with water. If fluid is swallowed, give water and obtain medical advice.
- 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. Children should be supervised to ensure that they do not play with the appliance.



Figure 4: Preventing injuries

Preventing breathing problems

- A machine can operate safely only with the fog fluid it is designed for. Use the machine only with fluids specified or you may cause the release of toxic gases, presenting a severe health hazard. You will also probably damage the machine.
- Do not create dense fog in confined or poorly ventilated areas.
- Do not expose people with health problems (including allergic and/or respiratory conditions such as asthma) to fog output.
- Do not point fog output directly at a person's face or at face height.



Figure 5: Safety instructions

Tools

Make sure that the tools below are available before you start working on the product.

- Pozi-driver #0, 1, 2
- Epsilon 5 Programmer (P/N: 50502004)
- Slotted screwdriver #0
- Temperature calibration box (P/N: 92620005)
- Digital multimeter with probes
- Flashlight or work light.

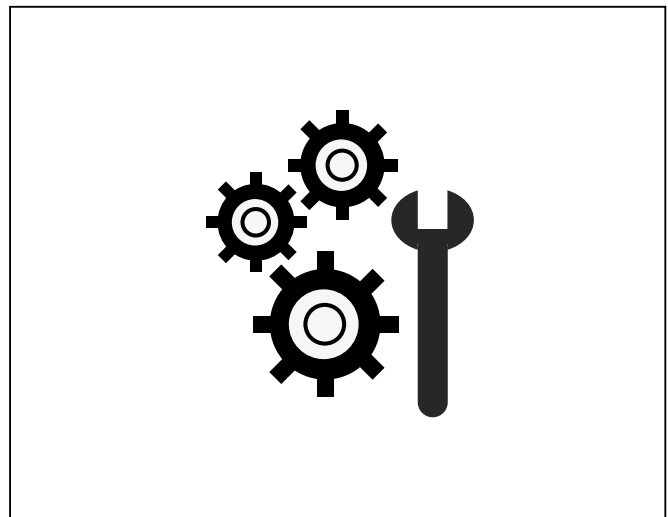


Figure 6: Tools



Take the necessary precautions to prevent static electricity from damaging the product during modification or repair.



Figure 7: ESD mat and wristband

Spare parts

For an overview of the spare parts and spare part numbers of JEM Glaciator X-Stream, refer to martin.com.

1. Login with your user login details.
2. Search for “JEM Glaciator X-Stream”.
3. Click “Partfinder: Layered” (1).

For the latest user documentation and other information for this and all Martin™ products, please visit the Martin™ website at martin.com.

If you have any questions about how to install, operate or service the fixture safely, please contact your Martin™ distributor (see www.martin.com/where-to for details) or call the Martin™ 24-hour service hotline on +45 8740 0000, or in the USA on 1-888-tech-180.

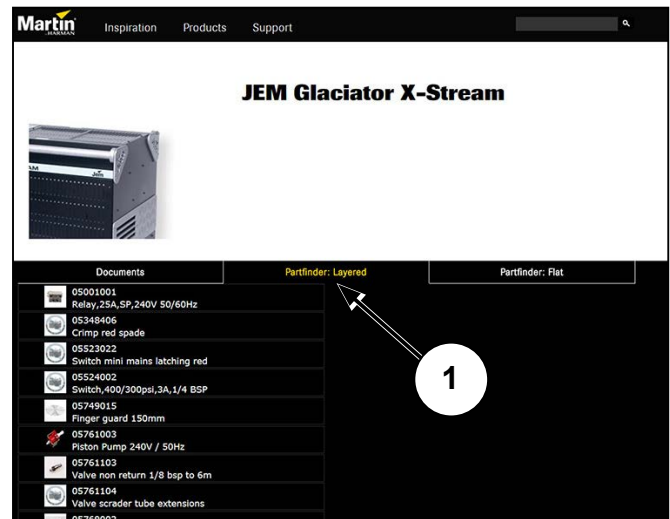


Figure 8: Partfinder: Layered

Product information

Before you start servicing the product, read and do the following:

- Observe all safety precautions.
- Disconnect all cables and the mains power cord from the machine where required.
- Place the machine on a flat solid working surface.
- Lock the braking casters.
- **Machines produced after April 2012 are fitted with digital mains PCBs and require different maintenance procedures. Please note the year of manufacture on your machines serial number label for correct procedures.**



Figure 9: JEM Glaciator X-Stream

Repair and maintenance

Heat exchanger calibration

The heat exchanger will require calibration after 1000 hours of operation or annually. This procedure will take about 45 minutes to complete and requires the temperature calibration box, available from Martin™. This procedure is for qualified service personnel only and only those competent should perform the task.

- For machines fitted with analog PCBs (manufactured before April 2012) follow the procedure in “Heat exchanger calibration - analog PCB” on page 8.
- For machines fitted with digital mains PCBs utilize the procedure in “Heat exchanger calibration - digital PCB” on page 11.

Heat exchanger calibration - analog PCB

1. Power off the machine.
2. Remove the control panel access cover (four M5 screws).

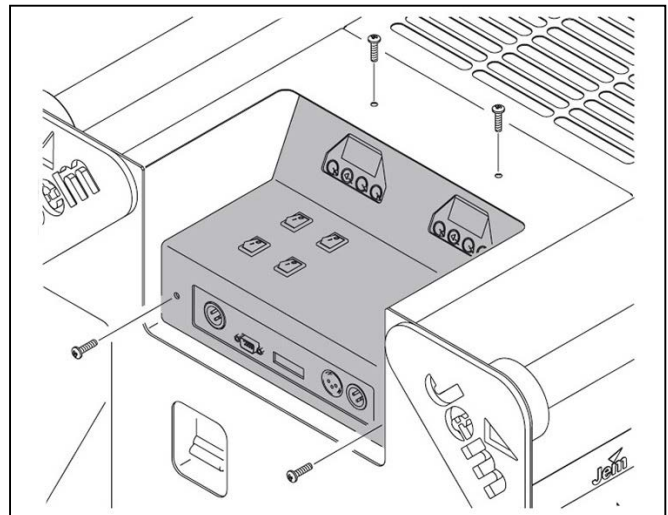


Figure 10: Removing the cover

3. Lift the control panel access cover up.

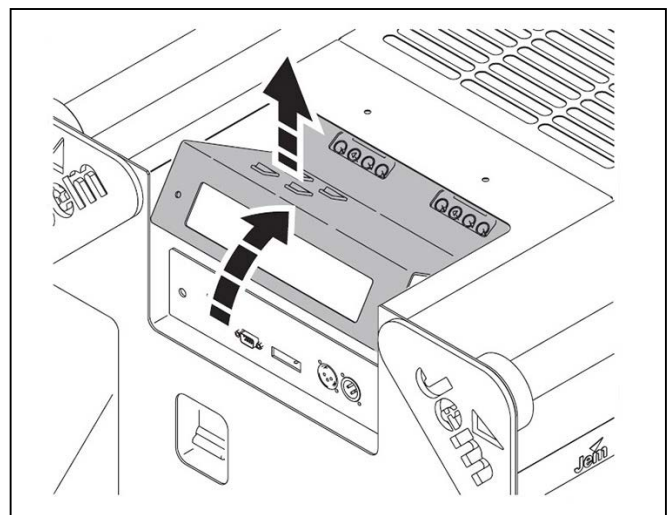


Figure 11: Lifting the cover

4. Locate the mains PCB.

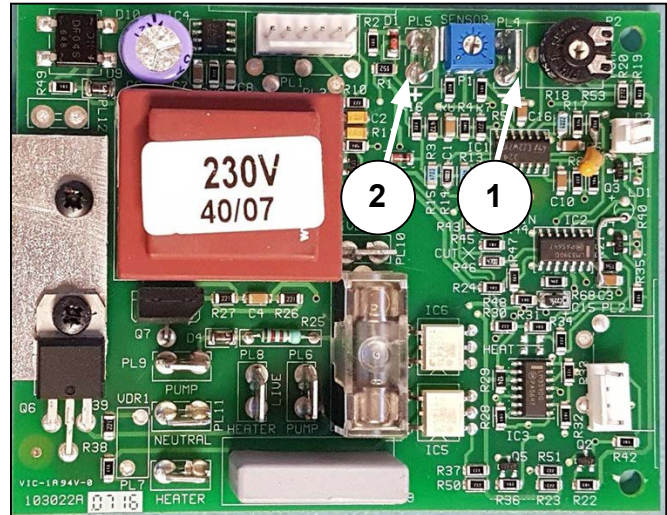


Figure 12: Mains PCB

5. Disconnect the thermocouple wires from their spade terminals, PL4 (1) and PL5 (2). See figure 12.

NOTE! If your machine was manufactured prior to November 2006 these wires may be colored green and yellow. Green is negative (-), and yellow is positive (+).

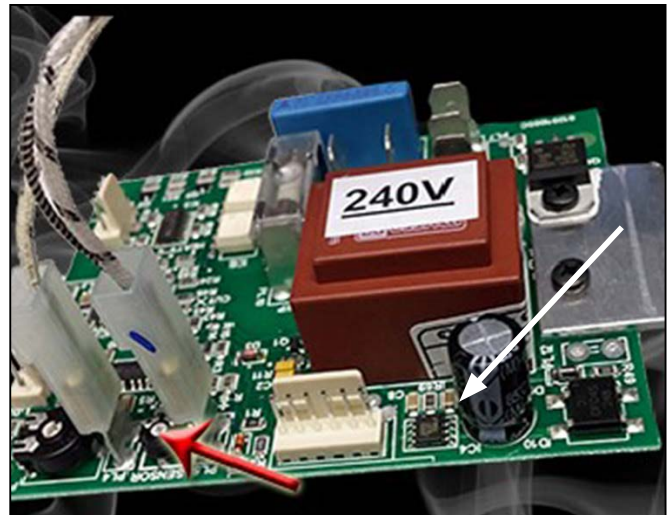


Figure 13: Disconnecting the thermocouple wires

6. Replace the thermocouple wires with the calibration box leads.
NOTE! The correct orientation: Red is positive, PL5 and black is negative, PL4.
7. Power on the calibration box.
8. Set the ramp button to off (LED flashing green) and depress the VAR button (LED on steady red).
9. Use the variable slider to set the calibration point to 11.5 mV.
10. Power on the machine.



Danger!
Take precaution to limit exposure to live wires.

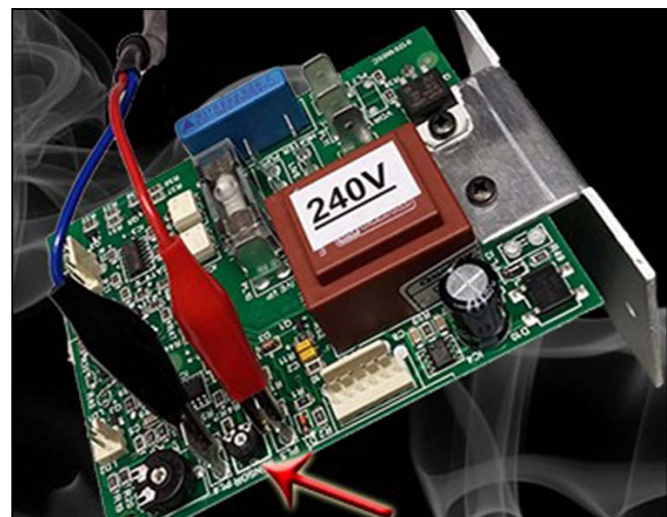


Figure 14: Replacing thermocouple wires

11. On the mains PCB, adjust potentiometer P1 until the red heating LED on the PCB starts to flash. See figure 16.
12. On the calibration box, turn ramp button on (LED on steady green). The red LED on the PCB should go off.
13. For verification, turn the ramp button off (LED flashing green), and the red heating LED on the PCB should start flashing again.
14. Adjust if necessary following directions from step 11.
15. Power off and disconnect the calibration box.

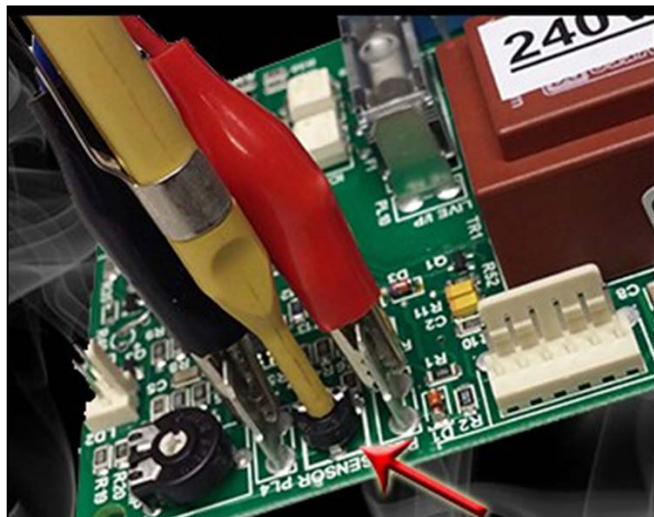


Figure 15: Adjusting potentiometer

16. Replace the thermocouple wires onto the correct terminals.
NOTE! Thermocouple wires are colored black/white and white. Black/white is positive (+), PL5 and white is negative (-), PL4. See figure 13.
NOTE! If your machine was manufactured prior to November 2006 these wires may be colored green and yellow. Yellow is positive (+), PL5 and green is negative (-), PL4.



Figure 16: Red LED is flashing

17. Connect a digital multimeter to the thermocouple connectors. Positive to PL5 and negative to PL4.
18. Power on and set DMM to read mV DC.
19. Allow the machine to heat to the ready state. DMM values should rise as machine heats.
20. DMM should read 11.5 mV when the machine displays "RDY" and the red LED on the PCB turns off.
21. Re-calibrate if necessary starting from step 7.
22. If no re-calibration is required, turn off and unplug the machine.
23. Remove the DMM probes and replace the control panel access cover and fasten the four M5 screws.
24. If re-calibration is not possible, the PCB may need to be replaced. Contact Martin service for detailed instructions to proceed.

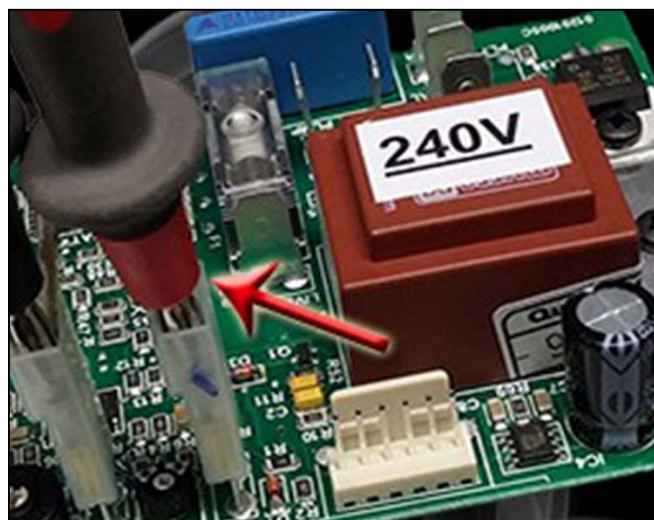


Figure 17: Connecting a digital multimeter

Heat exchanger calibration - digital PCB

1. Power off the machine.
2. Remove the control panel access cover (four M5 screws).

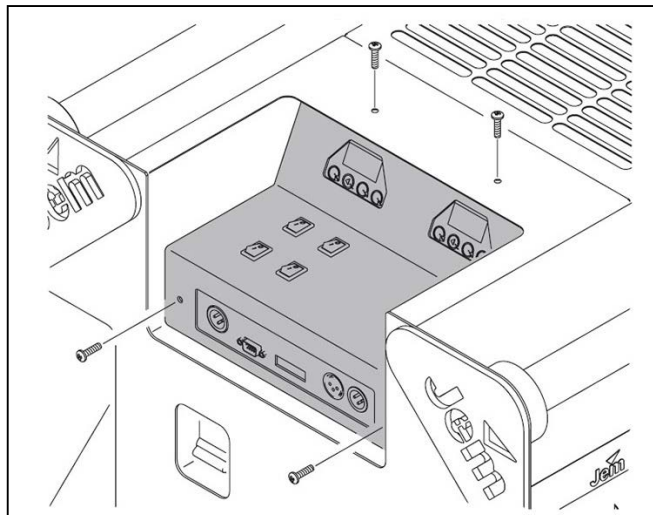


Figure 18: Removing the cover

3. Lift the control panel access cover up.

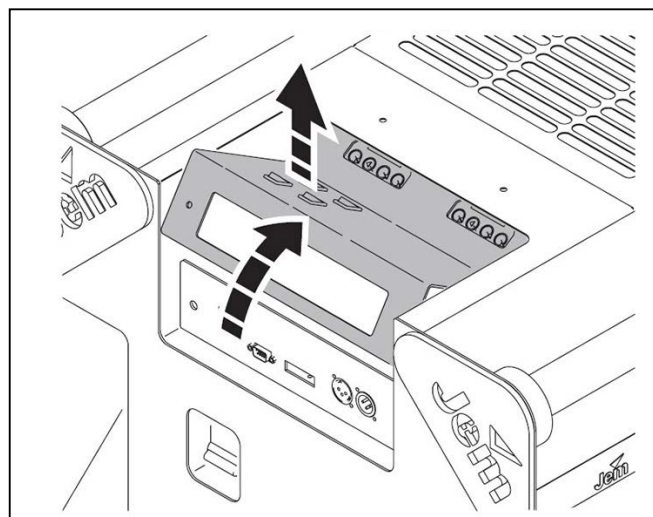


Figure 19: Lifting the cover

4. Locate the digital mains PCB.

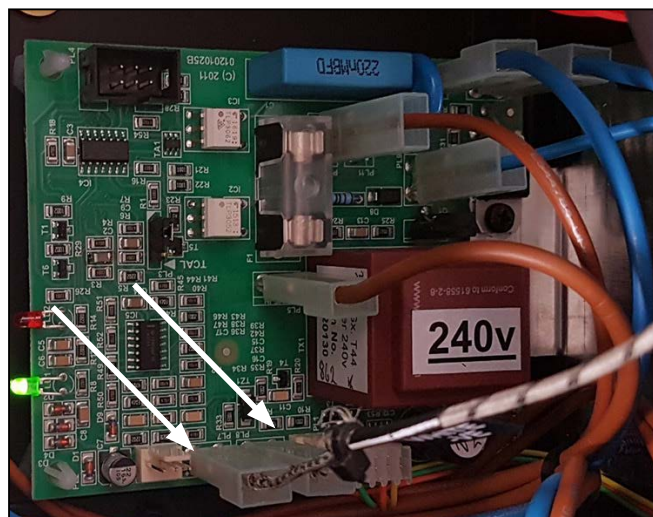


Figure 20: Digital mains PCB

5. Disconnect thermocouple wires. See figure 20 and figure 21.



Figure 21: Disconnecting thermocouple wires

6. Replace the thermocouple wires with the calibration box leads.
NOTE! The correct orientation: Red is positive, PL5 and black is negative, PL4.
7. Power on the calibration box.
8. Set the ramp button to on (LED on green) and depress the VAR button (LED on red).
9. Use the variable slider to set the calibration point to 11.5 mV.
10. On the mains PCB move the temperature calibration "TCAL" jumper to the calibration position, by moving over one position.
11. Power on the machine.



Figure 22: Replacing thermocouple wires



Danger!
Take precaution to limit exposure to live wires.

12. The machine should be in calibration mode; indicated by a flashing red and green LEDs on the mains PCB.
13. Count to ten and remove the TCAL jumper all together. The LEDs should flash slowly.
14. Turn the machine off.
15. Replace the TCAL jumper back to its original pin positions.
16. Power off and disconnect the calibration box from the mains PCB.

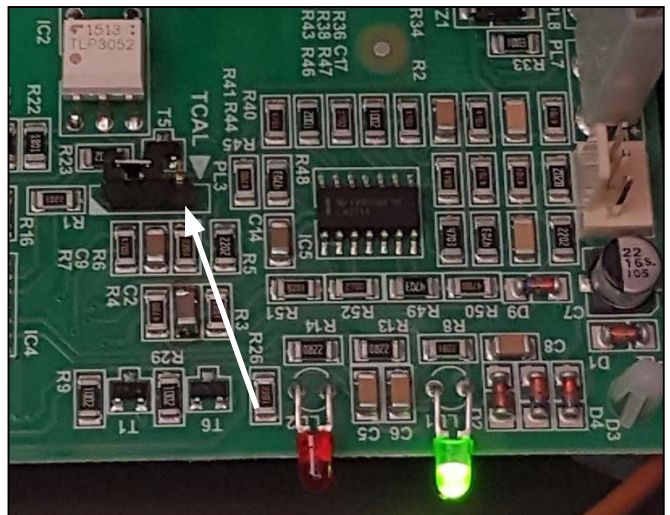


Figure 23: Replacing thermocouple wires

17. Replace the thermocouple wires to the mains PCB.
NOTE! The thermocouple wires are colored black/white and white. Black/white is positive (+) PL5, and white is negative (-) PL4.
18. Connect a digital multimeter to the thermocouple connectors. Positive to PL5 and negative to PL4.
19. Power on and set DMM to read mV DC.
20. Allow the machine to heat to the ready state.
NOTE! DMM values should rise as machine heats.
21. DMM should read 11.5 mV when the machine displays "RDY" and the red LED on the PCB turns off and green turns on.
22. Re-calibrate if necessary starting from step 7.
23. If no re-calibration is required, turn off and unplug the machine.
24. Remove the DMM probes and replace the control panel access cover and fasten the four M5 screws.
25. If re-calibration is not possible, the PCB may need to be replaced.
Contact Martin service or replace utilizing "PCBA power HFGX, 230V 50/60Hz, Tiny 44 – P/N: 62020130".

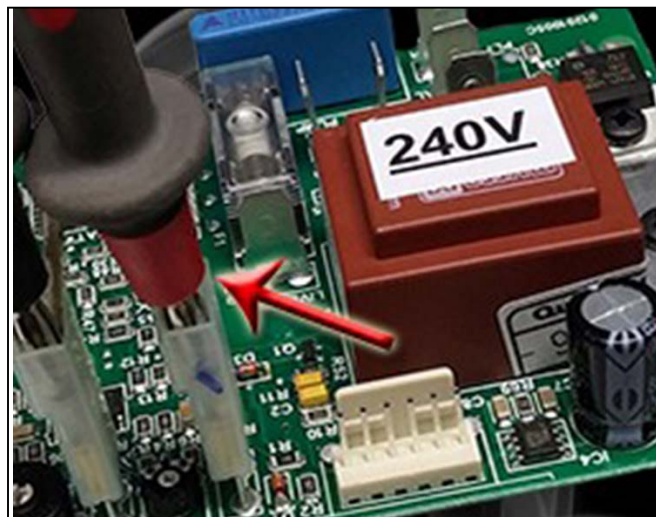


Figure 24: Replacing the thermocouple wires

Fluid pump speed calibration

For older machines (manufactured before April 2012) fitted with an analog mains PCB pump speed re-calibration is necessary annually or after every 1000 service hours. The below procedure will take about 45 minutes and is intended for qualified service personnel only. Newer machines (produced after April 2012) do not require this procedure.

1. Power off the machine.
2. Remove the control panel access cover (four M5 screws).

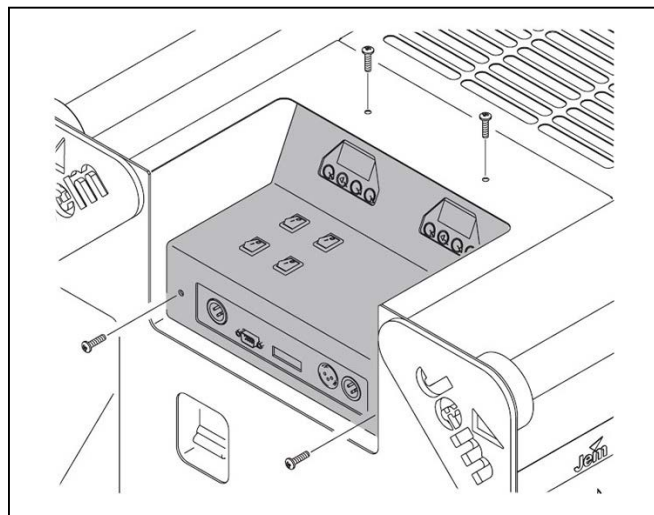


Figure 25: Removing the cover

3. Lift the control panel access cover up.

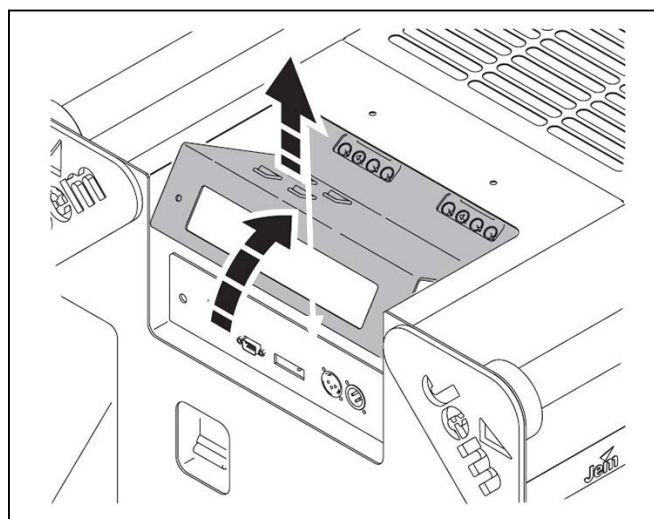


Figure 26: Lifting the cover

4. Locate the mains PCB.
5. Power on the machine and allow the machine to heat up.



Danger!
Take precaution to limit exposure to live wires.

6. Set the fog output level to one (1) on the left side LCD display.
7. Turn dipswitch S2 to ON for pump ramp override.

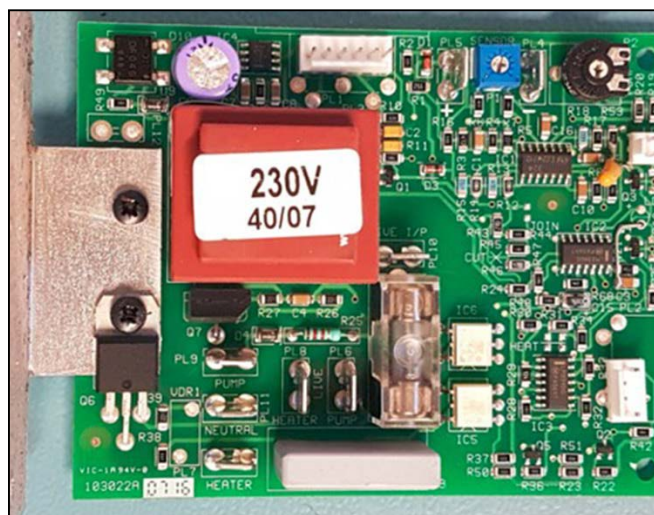


Figure 27: Mains PCB

8. Turn on DMM and set to measure volts DC.
9. Place the probes across the pump positive (PL6) and negative (PL9) terminals.
10. Press the “Fog” on button on the control panel.

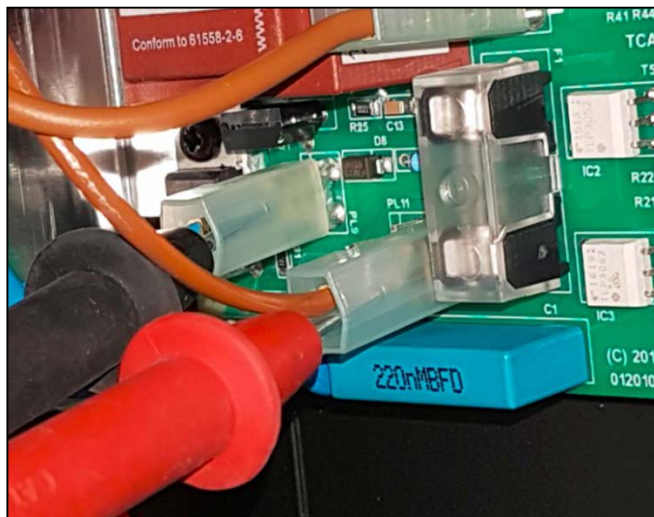


Figure 28: Placing the probes

11. Turn pot “P2” on the mains PCB until the voltage to the pump reads 90 V DC.
12. Check the fog flow output at the front of the machine.
NOTE! A smooth flow should be visible. If not quite enough, adjust slightly higher.
13. The pump is now calibrated.
14. Power off and unplug the machine.
15. Remove the DMM probes and close the control panel access cover replacing the four M5 screws.
16. Turn off dipswitch S2.

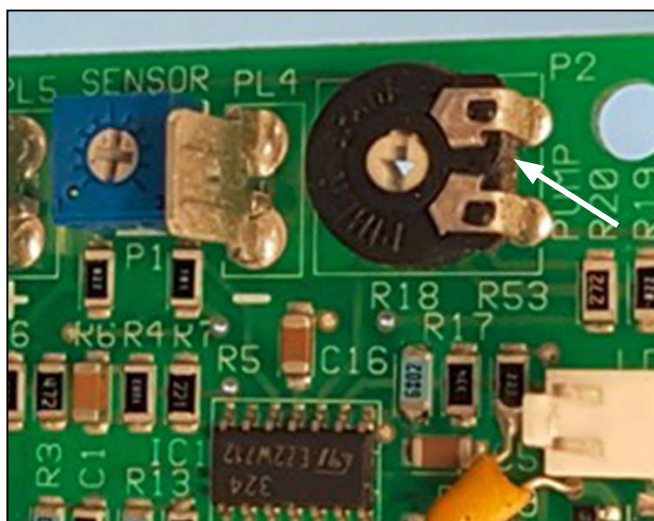


Figure 29: Turning pot P2 on

Fluid sensor calibration

The machine utilizes an electronic fluid sensor that periodically needs calibration. We recommended that you perform this task every 1000 hours or annually. This procedure should take about 30 minutes and requires a, Pozi-drive #2, slotted driver #0, and a DMM.

1. Ensure the fluid reservoir is filled and place the fluid inlet tubing (with sensor) into the fluid.
2. Remove the left side maintenance cover by removing the four M5 screws.
3. Gently remove the ground wire, and set aside.
4. Locate the fluid sensor PCB.
NOTE! It is on the front side of the machine just behind the fluid compartment.



Figure 30: Fluid sensor PCB

5. Connect the DMM to the fluid sensor PCB placing the positive lead onto "TP1" and the negative lead onto "ground". See figure 31 and figure 33.
6. Power on the machine.



Danger!
Take precaution to limit exposure to live wires.

7. Turn on and set the DMM to read mV DC, 2V
NOTE! The sensor should read 2.20 mV. If the reading is higher or lower than 2.20 mV, the PCB requires calibration.
8. If no calibration is necessary, proceed to step 12.

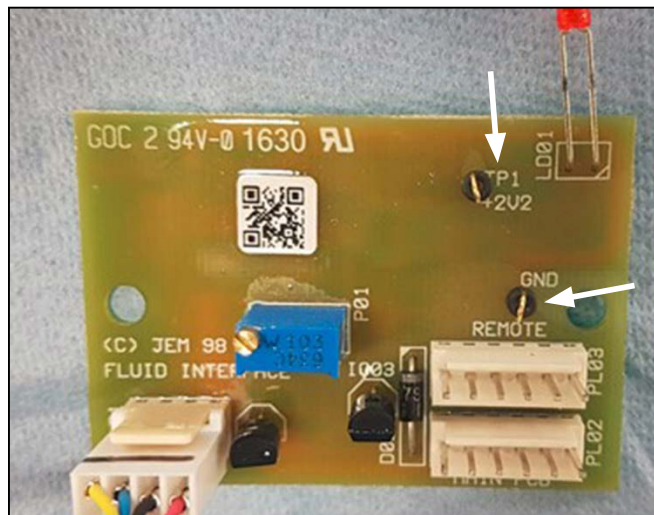


Figure 31: Connecting DMM to fluid sensor

9. To re-calibrate, locate and turn the potentiometer "P01" in the direction that will allow the fluid sensor to settle at 2.20 mV using a slotted driver #0.
NOTE! Clockwise will increase the reading and counter-clockwise will decrease the reading.
10. When the DMM reads 2.20 mV, remove the fluid sensor from the fluid bottle.
NOTE! The reading on the DMM will climb to 2.45 - 2.51 mV and the red LED on the top of the fluid sensor PCB will illuminate; indicating "fluid out".
11. Place the fluid sensor back into the fluid, the DMM should now read 2.20 mV and the red LED should turn off. The sensor is calibrated correctly.
12. If the sensor was successfully calibrated, power off and unplug the machine. If calibration was unsuccessful proceed to step 15.
13. Replace the left side maintenance cover, ensuring the grounding wire is firmly connected and tighten the four M5 screws.
14. Secure the fluid reservoir back in the fluid compartment.
15. If calibration was unsuccessful, the fluid sensor PCB is likely faulty. Replace it with "Loom fluid sensor c/w wire &h, P/N: 11862026".

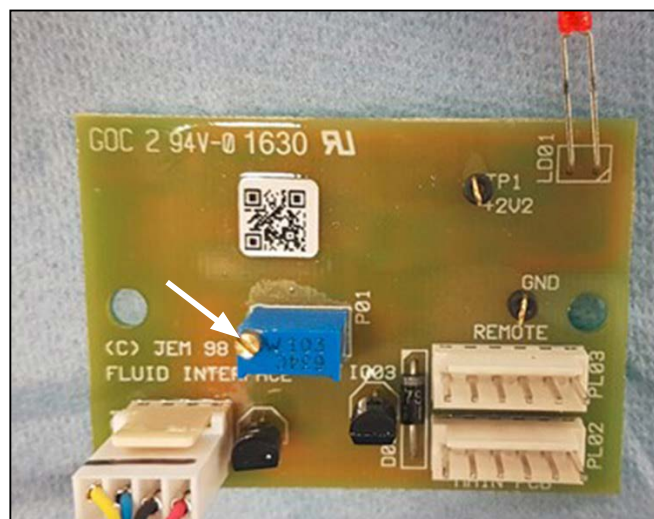


Figure 32: Turning the potentiometer

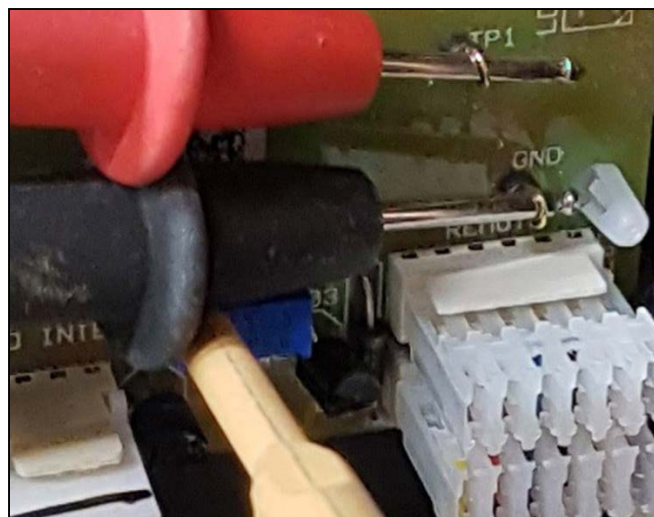


Figure 33: Turning the potentiometer

Refrigeration system

The refrigeration system of the machine is a closed loop refrigeration system and requires no preventative or periodic maintenance for the lifetime of the product.

Should a component fail or a refrigeration leak be suspected, immediately contact Martin Service.

Please contact Martin™ Service if you require service or support with the refrigeration system. A system check of the refrigeration system can be reviewed to determine that the system is operating with optimal performance. Please see the following section for the details of this procedure.

Refrigeration system check

1. To check the status of the refrigeration system at any time, use the ICE menu by putting S3 down (dipswitch 12).
2. The left hand panel will now display the name of the sensor on the left hand display, while the right hand display will show the temperature value.
3. Use the scroll keys on the right hand display to move through the available values.
NOTE! These values represent the temperatures at specific locations within the refrigeration system.

Abbreviation	Value
AI	No function at present
TA	Ambient temperature
EO	Evaporator outlet
EI	Evaporator inlet
CO	Condenser output
CI	Condenser input

Figure 34: Abbreviations

Follow the procedure below, notating the values of each sensor and compare to the values on page 18.

1. Turn the machine on.
2. Ensure the ICE button is ON.
3. Ensure STANDBY is ON.
4. Turn switch S3 ON - DO NOT FIRE THE MACHINE.
5. Leave the machine for 30 minutes to stabilize.
6. Scroll through the ICE menu and record your readings in the table to the right.

TA	EO	EI	CO	CI

Figure 35: Record your readings

7. Now fire the machine at full output (S3 off, set to Level 20, Fog ON) for 5 minutes.
8. After 5 minutes, keep the machine firing and record your readings (S3 ON) in the table to the right.

TA	EO	EI	CO	CI

Figure 36: Record your readings

Temperature values

The temperatures specified in the tables to the right are only a guide. These temperatures will vary from machine to machine.

These temperatures can be used for reference and diagnostic assistance when servicing/repairing the machine.

If your measurements are within the range, then no action is necessary. If your measurements are not within range, contact Martin™ Support.

TA	EO	EI	CO	CI
15	-39	-42	57	17
16	-38	-41	57	18
18	-37	-39	60	20
20	-35	-38	62	22
22	-34	-37	63	24
24	-33	-36	66	26
26	-33	-36	66	28
28	-33	-34	58	28
30	-33	-34	58	28

Figure 37: Ice no/no fog (tick over) after 40 minutes

TA	EO	EI	CO	CI
15	-14	4	71	27
16	-12	6	72	28
18	-10	8	73	30
20	-10	11	75	33
22	-10	11	77	34
24	-8	12	80	37
26	-7	12	81	38
28	-6	12	81	39
30	-6	13	81	42

Figure 38: Fog on level 20 after 5 minutes

Rear fan diagnostics

The rear fans should be visually and audibly checked for operation every 250 hours for correct operation. The rear fans are what propel the fog from the machine and are vital to operation.

To verify fan operation simply operate the machine manually from the control panel.

1. Turn on “ICE” and “Standby” then allow the machine to get to its ready state.
2. Once ready, set fog output at 10 on the left hand display and density to “Hi” on the right hand display.
NOTE! The fan speed should be low and the fan noise should match that speed.
3. Set density to “Nor”, the fan speed and noise should increase.
4. Set the density to “Lo”, the fan should now be operating at full speed.

If the fan speeds do not change or the fan is not running at all, contact Martin™ Support for service and support.

Sight glass level check

Inside of the fluid compartment is a sight glass for visual indication of the refrigeration's systems operation. Check this sight glass every 1000 hours or annually, alongside the refrigeration system check, “Refrigeration system check” on page 17.

1. Open the fluid compartment door and locate the sight glass.
NOTE! A flashlight or work light may be necessary to better illuminate the space.
2. With the machine powered on and in its ready state but not producing fog, observe the sight glass.
There will be visible liquid level rising and falling in the sight glass.
3. There is no defined level but the rising and falling should time with the expansion valve opening/closing, which can be audibly observed by the clicking/surging noise the machine's emits, approximately every 10-15 seconds.
4. If no level is seen and clicking noise is more frequent than normal, a possible refrigeration leak is possible. Contact Martin™ Service for service and support.

Condensate drain

When operating the machine for long periods, there will always be a buildup of condensation in the evaporator unit. This will drain into the drip tray, which should be emptied and cleaned regularly.

For installation purposes, a drain hose can be fitted into the condensate drain hole.

A visual inspection of the condensate drain should be performed every 500 hours or semi-annually. When performing an inspection, it is only necessary to verify that waste water is properly draining from the drain hole or drain hose.



Caution!
Isolate the machine from power and allow it to cool completely before performing the following procedure.

1. If the drain hose or drain hose appears to be clogged, clear the obstruction.
2. Use a small slotted screwdriver or an awl and simply dislodge any debris out of the way of the hole or clear the hose.
3. If an obstruction cannot be cleared contact Martin™ Service.

Firmware updates

The factory installed firmware version is indicated on the serial number label or the current firmware version is displayed upon powering on of the JEM Glaciator X-Stream as well.

The most current firmware can be found on the service webpage for the JEM Glaciator X-Stream.

In most cases firmware updates are not necessary nor required. Please contact Martin Support for questions about updating firmware on the JEM Glaciator X-Stream.

If firmware updates are required, a programmer will be required and is available from Martin™ by Harman as "Epsilon 5 Programmer: P/N: 5050200".

Maintenance

Read the user manual before performing service or maintenance on the product.

Failure to respect service and maintenance schedules may cause damage that is not covered by product warranties.

Cleaning the product

Casework, fan, drip tray cleaning

Excessive dust, fog fluid, and dirt build-up will degrade performance and cause overheating and damage to the machine that is not covered by the product warranty. To maintain adequate cooling, dust must be cleaned from the outer casing and air vents of the machine periodically.



Caution!
Isolate the machine from power and allow it to cool completely before cleaning.

- Remove dust from the air vents with a soft brush, cotton swab, vacuum, or compressed air.
- Remove contaminants from the fans with a soft brush, cotton swab, vacuum, or compressed air. If utilizing compressed air, do not allow the fans to spin uncontrollably by placing a screwdriver or similar object in the blades to temporarily lock them in place.
- Clean fog fluid residues from the fog output of the machine using a damp cloth.
- Clean the outer casing with a damp cloth only.
- Clean the drip tray using water and a mild detergent.

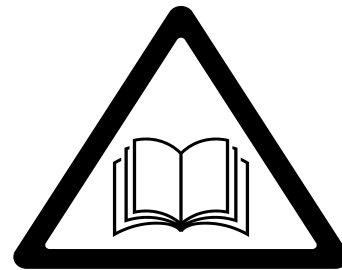


Figure 39: Read the user manual

Air filter maintenance

The machine uses a washable synthetic fiber filter in the air intake for the condenser unit (located at the top of the machine). This can be removed for cleaning by removing the ventilation grill above it (four M5 screws).



Caution!
Isolate the machine from power and allow it to cool completely before performing the following procedure.

Use the following guidelines for when to check the filter.

- Under normal conditions (clean and dry environment), inspect and clean/replace the filter every 250 hours.
- Under severe conditions (dirty and/or damp environment), inspect and clean/replace the filter every 150 hours.

The filter can either be replaced or cleaned. To clean the filter, simply wash with warm water and a mild detergent, and allow to air dry. If replacing the filter, it can be ordered from Martin™ by Harman using P/N: "56210020 – Filter, HFG-2 Condenser".

Heat exchanger cleaning

For optimum performance while providing longevity of the heat exchanger, we recommend that you utilize JEM Pro Clean Supreme cleaning solution. Applying JEM Pro Clean Supreme fluid on a regular basis reduces clogging and further extends the life of Martin™ fog and haze machines.

Using JEM Pro Clean Supreme every 200 hours, or once a month (depending on usage), will prolong the life of the heat exchanger.

1. Connect JEM Pro Clean Supreme fluid to the fluid inlet of the machine
2. Allow the machine to heat.
3. When fully ready, activate the machine or remote for approximately 30-45 minutes.
4. When completed, replace cleaning fluid with appropriate fluid heavy fog fluid.

NOTE! Cleaning procedure should be used if the unit is to be stored for 30 days or more. Ensure there is no fluid in the fluid tube when placing in storage.

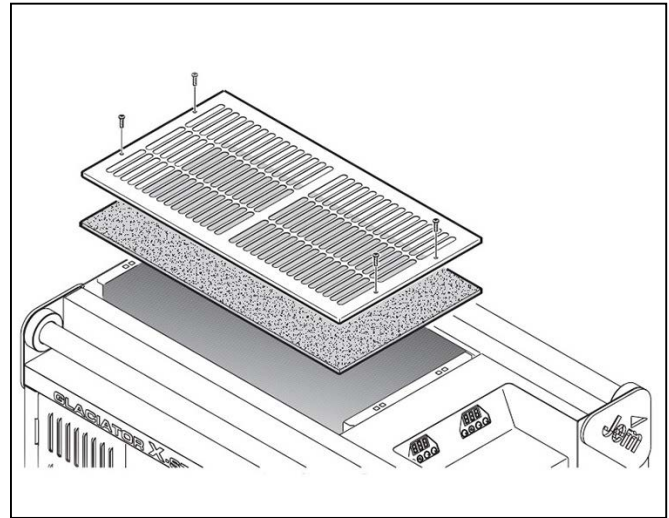


Figure 40: Air filter maintenance

Maintenance schedule

Part description	Service period recommendation	Service description
General service		
Cleaning	As needed or every 150-250 hours	See page 21
Air filter maintenance	As needed or every 150-250 hours	See page 22
Firmware updates	As required	See page 20
Fog system		
Heat exchanger calibration	Every 1000 hours or annually	See page 8
Heat exchanger cleaning	Every 200 hours or monthly	See page 22
Fluid pump speed calibration*	Every 1000 hours or annually	See page 14
Fluid sensor calibration	Every 1000 hours or annually	See page 15
Refrigeration system		
Refrigeration system	Lifetime	See page 17
Refrigeration system check	Every 1000 hours or annually	See page 17
Rear fan diagnostics	Every 250 hours	See page 19
Sight glass level check	Every 1000 hours or annually	See page 19
Condensate drain	Every 500 hours or annually	See page 20

* Not required for machines produced after April 2012.

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